ORANGE COUNTY, FLORIDA

ORANGE COUNTY MAYOR

TERESA JACOBS

DISTRICT 1 COMMISSIONER

S. SCOTT BOYD

DISTRICT 2 COMMISSIONER

BRYAN NELSON

DISTRICT 3 COMMISSIONER

PETE CLARKE

DISTRICT 4 COMMISSIONER

JENNIFER THOMPSON

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TED B. EDWARDS

DISTRICT 6 COMMISSIONER

VICTORIA P. SIPLIN

FIRE LOGISTICS WAREHOUSE
HVAC REPLACEMENT

10-01-15
BID DOCUMENTS

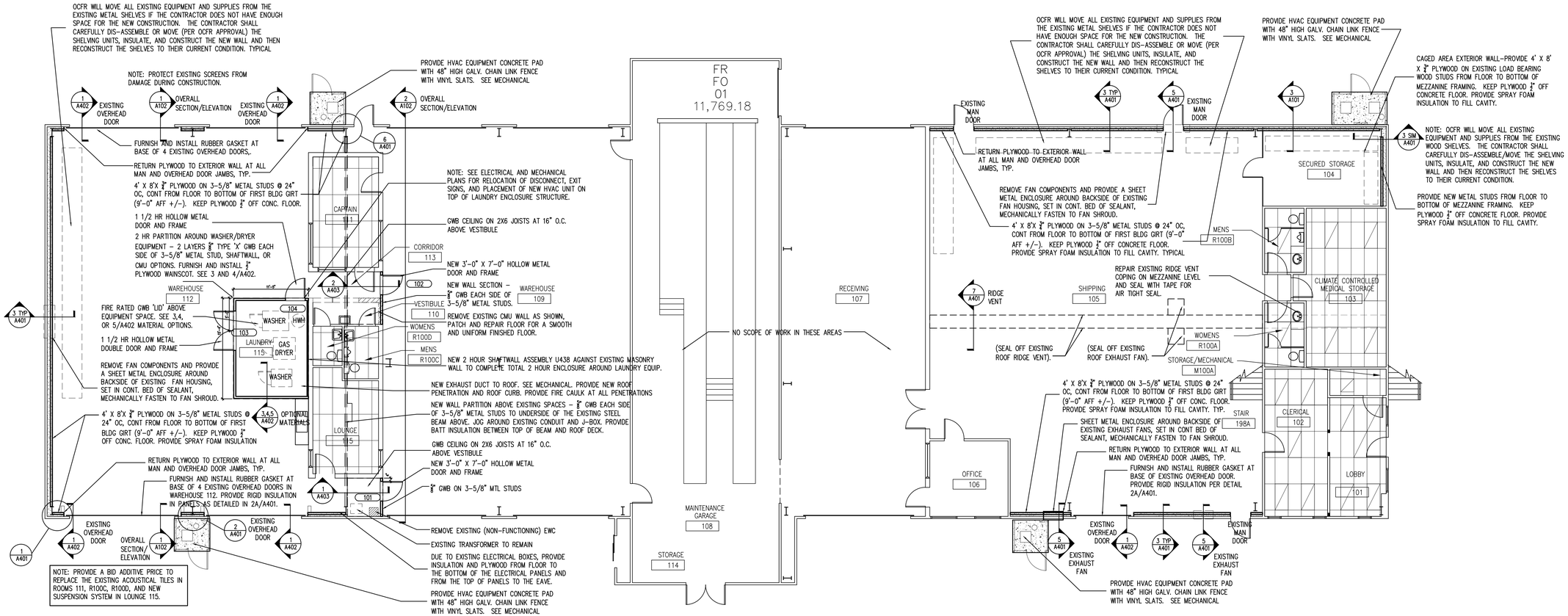
MATERN PROFESSIONAL ENGINEERING, INC.
ENG. BUS. No. EB-0005096
CERT. OF AUTH. No. 5096
130 Candace Drive
Maitland, FL 32751-3331
PHONE (407) 740-5020
FAX (407) 740-0365

PRIME CONSULTANT

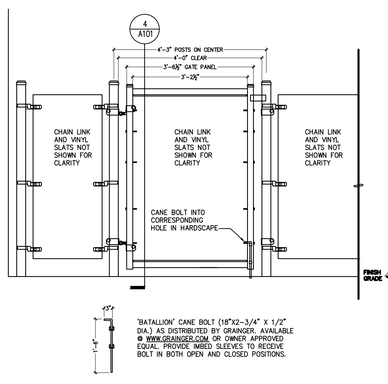
MATERN PROFESSIONAL ENGINEERING, INC.

KBJ ARCHITECTS

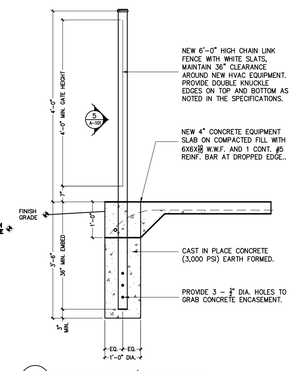
SHEET NO.	ARCHITECTURAL SHEET INDEX FOR	SCALE
A101	OVERALL RENOVATION	1/8"=1'-0"
A102	OVERALL SECTIONS	1/4"=1'-0"
A401	DETAILS	VARIES
A402	DETAILS	VARIES
A403	DETAILS	3/4"=1'-0"
A404	U.L. DETAILS	N.T.S.
SHEET NO.	**MECHANICAL SHEET INDEX FOR**	**SCALE**
M001	GENERAL NOTES LEGENDS, & SYMBOLS - MECHANICAL	NONE
MD101	FLOOR PLAN - DEMO - MECHANICAL	AS NOTED
M101	FLOOR PLAN - RENO - MECHANICAL	AS NOTED
M401	EXISTING PHOTOGRAPHS - MECHANICAL	AS NOTED
M402	EXISTING PHOTOGRAPHS - MECHANICAL	AS NOTED
M501	CONTROL SCHEMATICS - MECHANICAL	NONE
M601	SCHEDULES - MECHANICAL	NONE
M701	DETAILS - MECHANICAL	AS NOTED
M702	DETAILS - MECHANICAL	AS NOTED
SHEET NO.	**ELECTRICAL SHEET INDEX FOR**	**SCALE**
E001	GENERAL NOTES LEGENDS, & SYMBOLS - ELECTRICAL	NO SCALE
ED101	FLOOR PLAN - ELECTRICAL - DEMOLITION	1/8"=1'-0"
E101	FLOOR PLAN - ELECTRICAL - RENOVATION	1/8"=1'-0"
E501	ELECTRICAL SCHEDULES AND RISERS	NO SCALE
E502	ELECTRICAL SCHEDULES	NO SCALE
E901	ELECTRICAL DETAILS	NO SCALE



1 A101 OCFR WAREHOUSE FLOOR PLAN
1/8" = 1'-0"

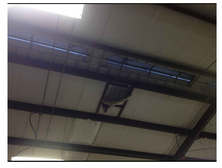


5 A101 ELEVATION @ CHAIN LINK FENCE GATE
SCALE: 1/2" = 1'-0"



4 A101 SECTION @ GATE/TERMINAL POST
SCALE: 1/2" = 1'-0"

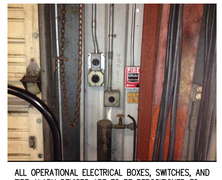

DUE TO EXISTING ELECTRICAL BOXES, PROVIDE INSULATION AND PLYWOOD FROM FLOOR TO THE BOTTOM OF THE ELECTRICAL PANELS AND FROM THE TOP OF PANELS TO THE EAVE.


SEVERAL AREAS OF THE EXISTING ROOF INSULATION HAS BEEN DISLODGED, PROVIDE AN ALLOWANCE OF 150 S.F. TO REATTACH THE INSULATION IN THE ENTIRE BUILDING.


IN THE NEWLY AIR CONDITIONED BAYS, PROVIDE AN INSULATED SHEET METAL ENCLOSURE OF THE RIDGE VENT AS SHOWN IN DETAIL 7/A401.


COORDINATE THE NEW "LID" AND EXISTING ELECTRICAL CONDUIT NEAR DOOR 101.

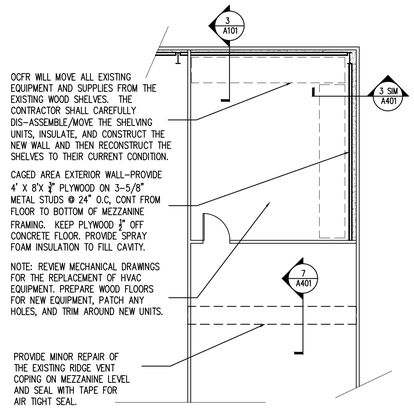

MAINTAIN ACCESS TO ALL EXISTING EQUIPMENT AND PANELS WHERE NEW INSULATION AND PLYWOOD ARE TO BE INSTALLED. TRIM OPENING.


ALL OPERATIONAL ELECTRICAL BOXES, SWITCHES, AND FIRE ALARM DEVISES ARE TO BE REPOSITIONED TO THE NEW WALL SURFACE. SEE ELECTRICAL DRAWINGS.


MAINTAIN ACCESS TO ALL EXISTING EQUIPMENT AND DISCONNECTS WHERE NEW INSULATION AND PLYWOOD ARE TO BE INSTALLED. TRIM OPENING.

THE CONTRACTOR SHALL IDENTIFY NON-FUNCTIONING AND ABANDONED WIRING. UPON THE APPROVAL OF OCFR, THE CONTRACTOR SHALL REMOVE ALL ABANDONED WIRING PRIOR TO INSTALLATION OF INSULATION FOAM AND PLYWOOD. TYPICAL

3 A101 MISC. IMAGES OF SCOPE OF WORK IN WAREHOUSE
1/8" = 1'-0"



2 A101 PARTIAL MEZZANINE PLAN
1/8" = 1'-0"

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Fax: 407-839-0668

Revisions

No.	Date	Description

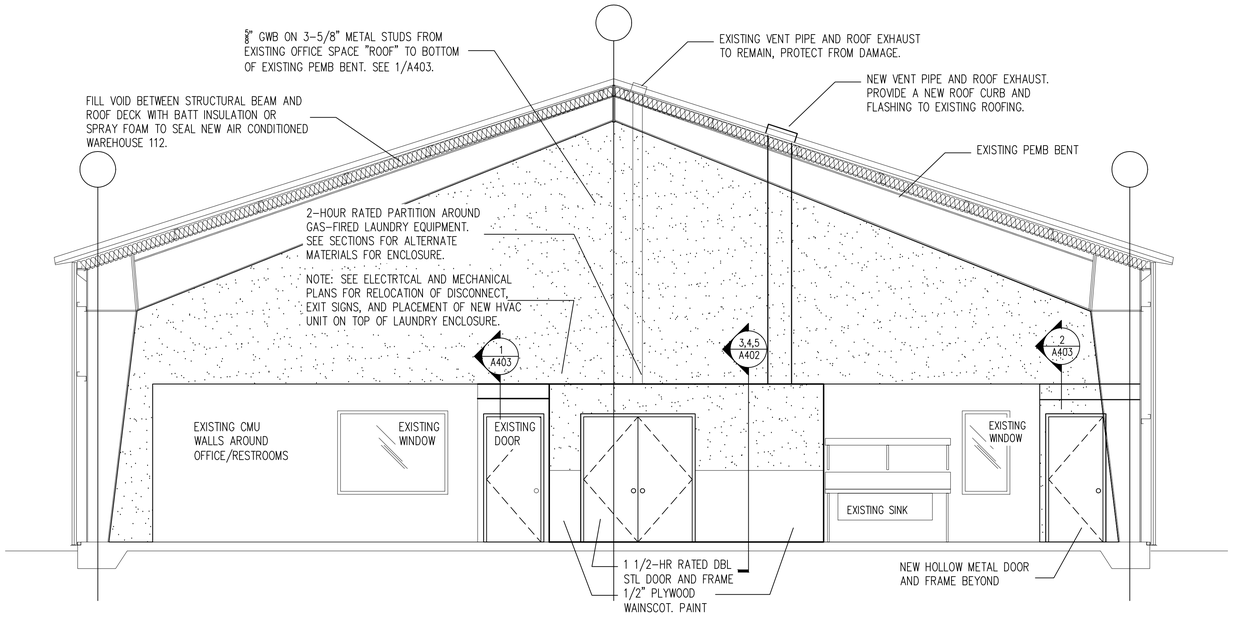
Key Plan

MPE PROJ#: 2013-171
Designed By: KBJ ARCHITECTS
Drawn By: GG / RB
Checked By: RB / Matern
Issue Date: 10/01/15
Drawing Scale: 1/8" = 1'-0"

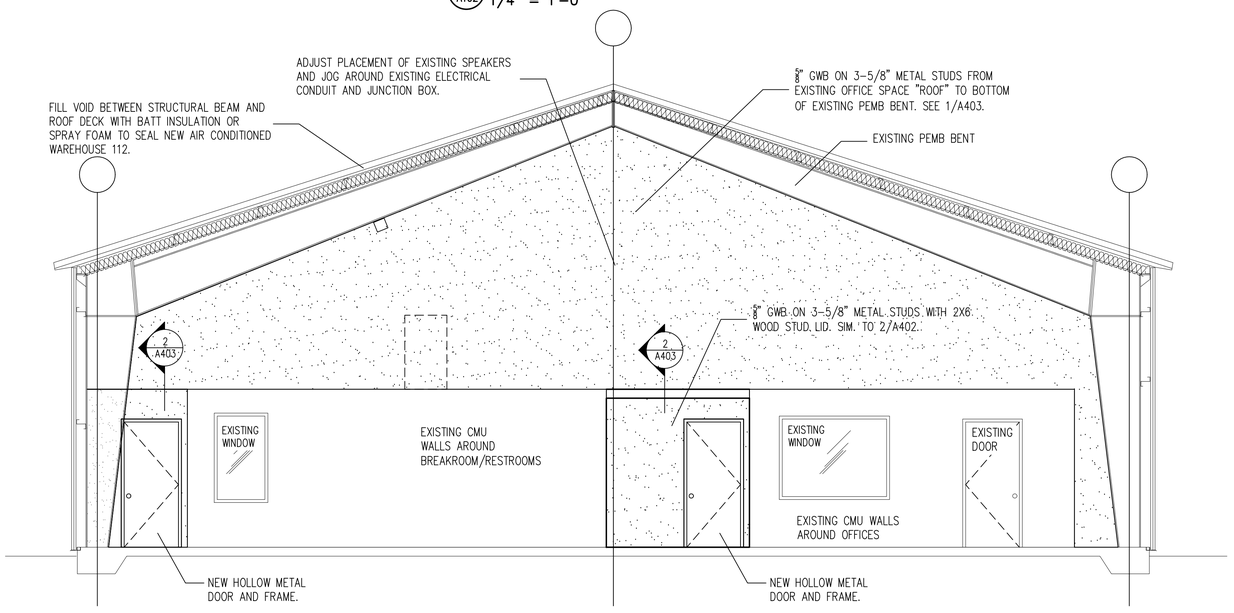
Drawing Title:
OCFR WAREHOUSE RENOVAITON FLOOR PLAN

BID DOCUMENTS

Drawing No.
A101



1 A102 OVERALL SECTION/ELEVATION
1/4" = 1'-0"



2 A102 OVERALL SECTION/ELEVATION
1/4" = 1'-0"

DOOR SCHEDULE

Opening			Door				Frame						
Mark	Width	Height	Type	Mat.	Thick	Lves.	Type	Mat.	Head	Jamb	Sill	Label	Remarks
101	3'-0"	7'-0"	A	HM	1 3/4"	1	1	HM	6/A402	6/A402	10/A402		PASSAGE LOCKSET WITH CLOSER
102	3'-0"	7'-0"	A	HM	1 3/4"	1	1	HM	6/A402	6/A402	10/A402		PASSAGE LOCKSET WITH CLOSER
103	6'-0"	7'-0"	A	HM	1 3/4"	2	2	HM	7/A402	7/A402	11/A402	B	CLASSROOM LOCKSET WITH CLOSERS & WEATHERSTRIPPING
104	3'-0"	7'-0"	A	HM	1 3/4"	1	1	HM	7/A402	7/A402	11/A402	B	CLASSROOM LOCKSET WITH CLOSERS & WEATHERSTRIPPING

CODE INFORMATION

GENERAL NOTES:

APPLICABLE CODES:

FLORIDA BUILDING CODE – EXISTING BUILDING, 2010
FLORIDA BUILDING CODE – EXISTING BUILDING, 2010
ADA: CHAPTER 11 OF THE FBC BUILDING 2010
FLORIDA BUILDING CODE – PLUMBING, 2010
FLORIDA BUILDING CODE– MECHANICAL, 2010
ELECTRICAL: NEC 2008 (NFPA 70)
FLORIDA FIRE PREVENTION CODE, 2014 5th EDITION.
NFPA 1 (FLORIDA SPECIFIC) FIRE CODE (2012 EDITION)
NFPA 10, 2010 EDITION, STANDARD FOR PORTABLE FIRE EXTINGUISHERS
NFPA 13, 2010 EDITION, STANDARD FOR INSTALLATION OF SPRINKLER SYSTEMS.
NFPA 14, 2010 EDITION, STANDARD FOR INSTALLATION OF STANDPIPE AND HOSE SYSTEMS.
NFPA 72, 2010 EDITION, NATIONAL FIRE ALARM AND SIGNALING CODE.
NFPA 90A, 2010 EDITION, STANDARD FOR INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS.
NFPA 101, 2012 EDITION, FLORIDA SPECIFIC LIFE SAFETY CODE.

FLORIDA ENERGY CODE, 2010

AGENCY HAVING JURISDICTION:

CITY OF ORLANDO, FLORIDA

OCCUPANCY CLASSIFICATION:

FBC EXISTING BUILIDNG 2010/ GROUP S (STORAGE)
FBC BUILIDNG 2010 EXISTING BUILDING –REPAIR LEVEL 1

CONSTRUCTION TYPE:

FBC BUILDING 2010 – TYPE II–B CONSTRUCTION – NON– FIRE SPRINKLERED

PER FBC 603.1 – PROVIDE FIRE RETARDANT TREATED WOOD BLOCKING AT ALL LOCATIONS.

COLUMNS: 0
INTERIOR BEARING WALLS: 0
FLOOR CONSTRUCTION: N/A
ROOF CONSTRUCTION: 0
EXTERIOR BEARING WALLS: 0
EXTERIOR NONBEARING WALLS: 0

SEE DOOR SCHEDULE FOR DOOR RATINGS AND LOCATIONS

ALLOWABLE BUILDING HEIGHT/NUMBER OF STORIES:

MAX NUMBER OF STORIES – 2
MAX BUILDING HEIGHT: 55 FEET

ACTUAL BUILDING HEIGHT AND NUMBER OF STORIES:

ACTUAL NUMBER OF STORIES – 1
ACTUAL BUILDING HEIGHT: 28'–0" AT EXISTING WAREHOUSE

ALLOWABLE BUILDING AREA:

FBC 2010 SECTION 500, TABLE 503 – 17,500 S.F.

ACTUAL BUILDING AREA :

EXISTING – GROSS BUILDING AREA = 12,500 SQ. FT.

ALTERATION:
THE SCOPE OF ALTERATION IS TO ADD INSULATION AND REPLACE HVAC SYSTEMS IN PORTIONS OF THE EXISTING WAREHOUSE. NEW 2 HOUR FIRE RATED PARTITIONS WILL BE PROVIDED AROUND EXISTING LAUNDRY EQUIPMENT TO SEGREGATE THIS HEAT SOURCE FROM THE NEW AIR CONDITIONED WORK AREA.

MEANS OF EGRESS:
ALL EXISTING EXTERIOR DOORS ARE TO REMAIN AND PROTECTED DURING CONSTRUCTION.

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Revisions

No.	Date	Description

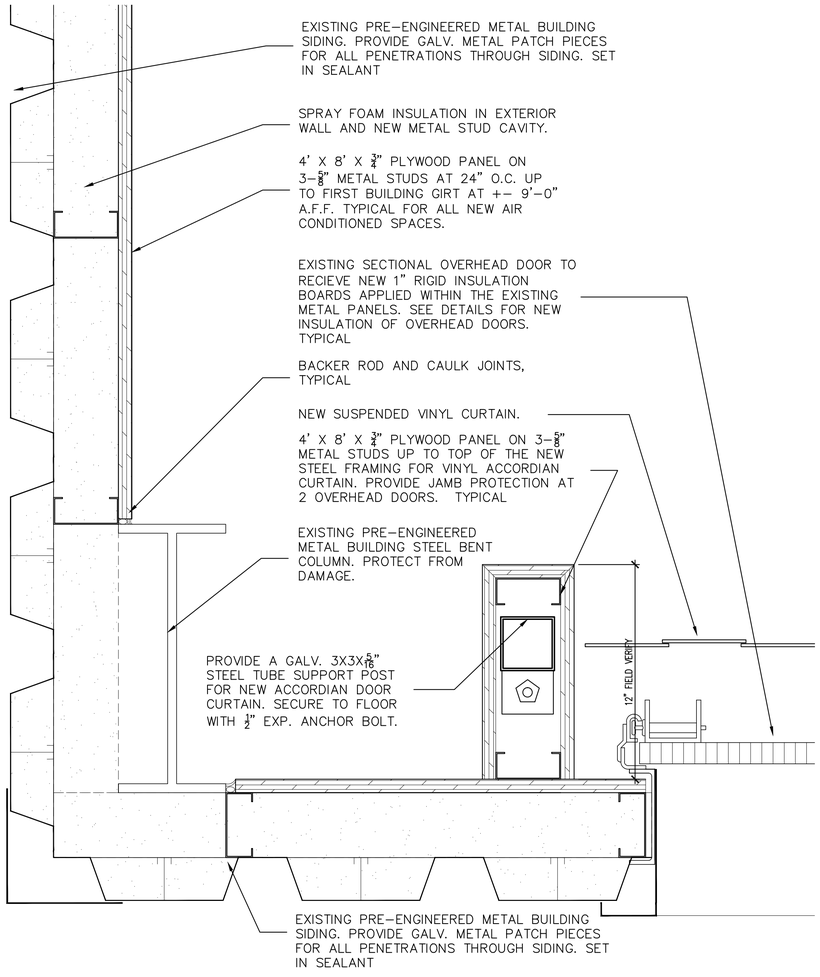
Key Plan

MPE PROJ#: 2013–171
Designed By: KBJ ARCHITECTS
Drawn By: GG / RB
Checked By: RB / Matern
Issue Date: 10/01/15
Drawing Scale: 1/4" = 1'–0"

Drawing Title:
OVERALL SECTIONS CODE INFORMATION

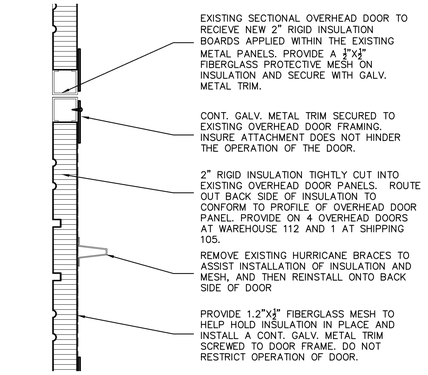
BID DOCUMENTS

Drawing No.
A102

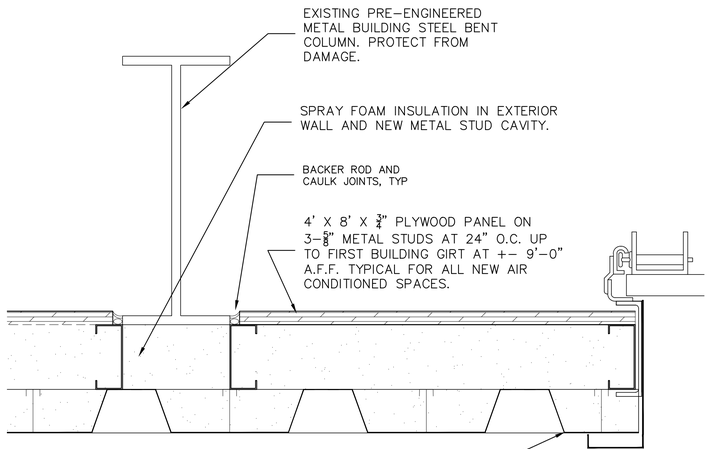


NOTE: THE NEW PVC ACCORDIAN TYPE MANUALLY RETRACTABLE CURTAIN AT THE 4 EXISTING OVERHEAD DOORS SHALL BE SIMILAR TO AKON CURTAIN & DIVIDER CO. OR APPROVED EQUIVALENT. SEE SPECIFICATIONS.

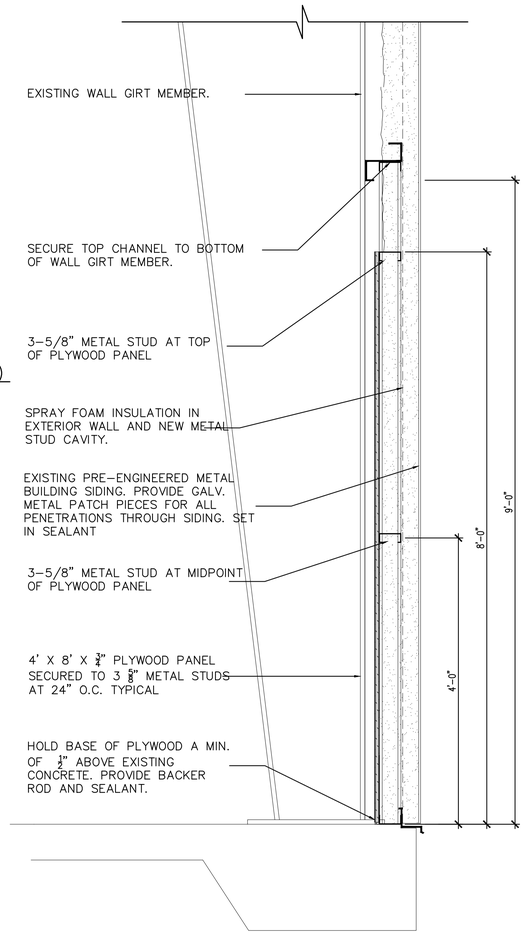
1 A401 DETAIL @ CORNER
SCALE: 3" = 1'-0"



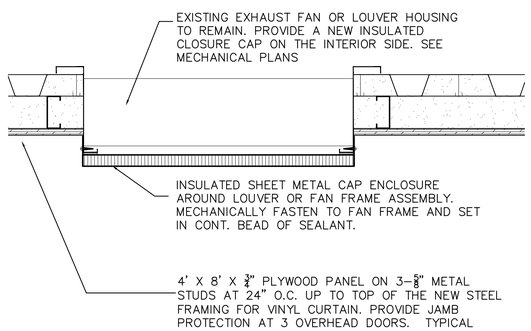
2A A401 INSULATED PANELS IN OVERHEAD DOOR (TOTAL OF 5)
SCALE: 3" = 1'-0"



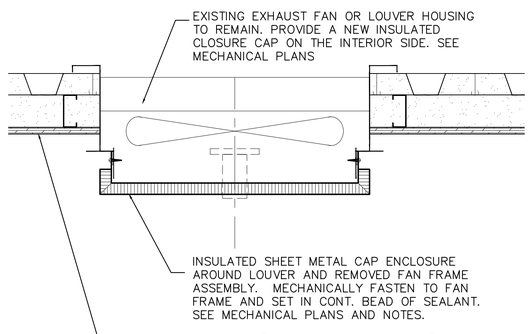
2 A401 TYPICAL DETAIL @ OVERHEAD DOOR JAMB
SCALE: 3" = 1'-0"



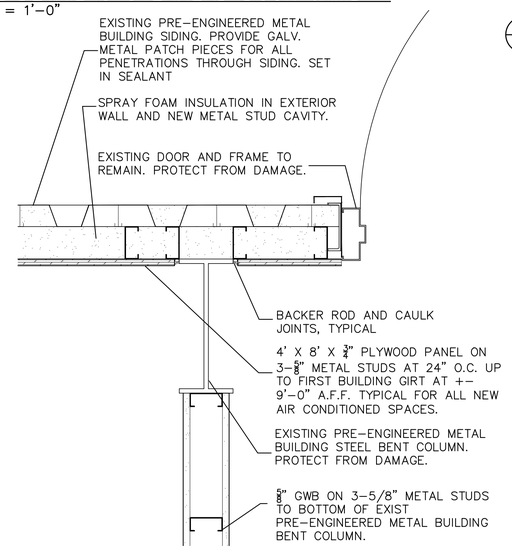
3 A401 TYPICAL EXTERIOR WALL SECTION
SCALE: 1" = 1'-0"



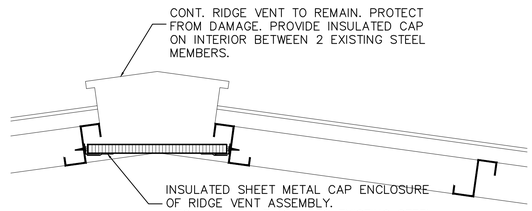
4 A401 DETAIL AT CAPPED WALL LOUVER
SCALE: 1 1/2" = 1'-0"



5 A401 DETAIL AT CAPPED WALL FAN
SCALE: 1 1/2" = 1'-0"



6 A401 DETAIL @ BENT COLUMN & DOOR FRAME
SCALE: 1 1/2" = 1'-0"



7 A401 DETAIL AT RIDGE VENT ENCLOSURE
SCALE: 1 1/2" = 1'-0"

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Drawn By: GG / RB
Checked By: RB / Matern
Issue Date: 10/01/15
Drawing Scale: Varies

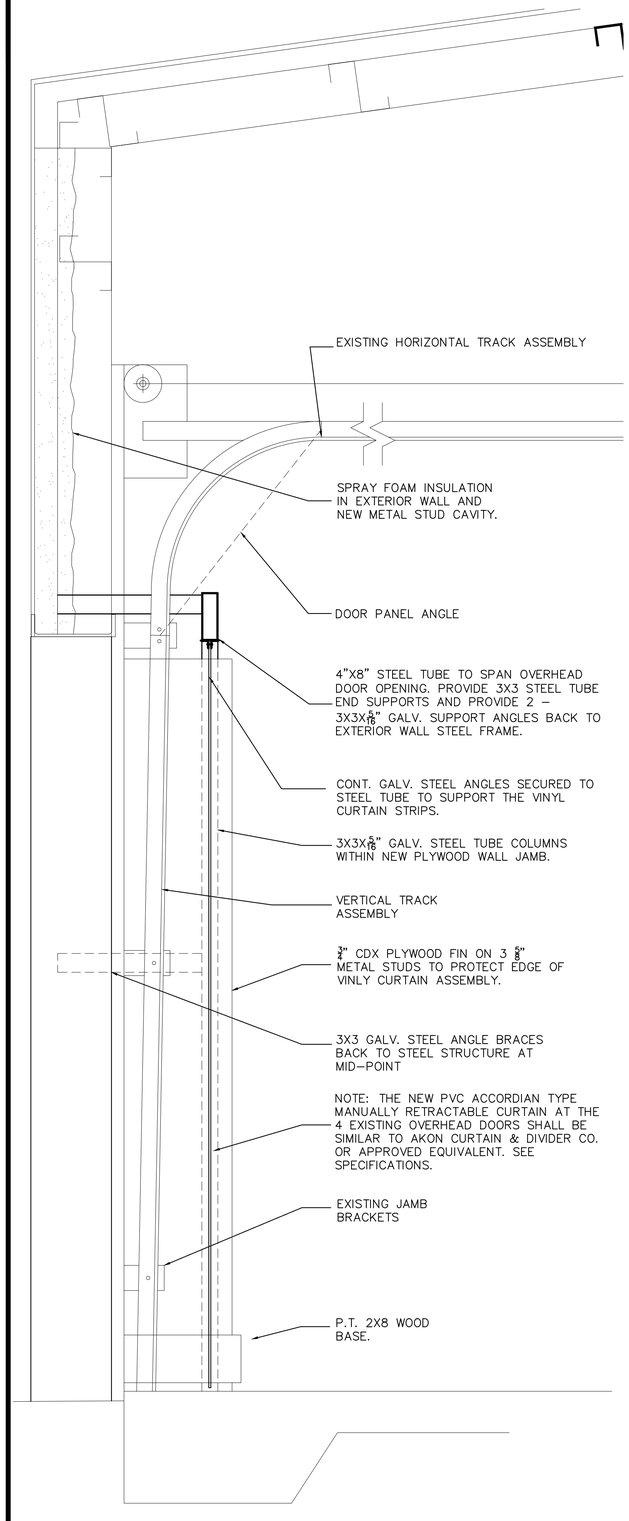
Drawing Title:

DETAILS

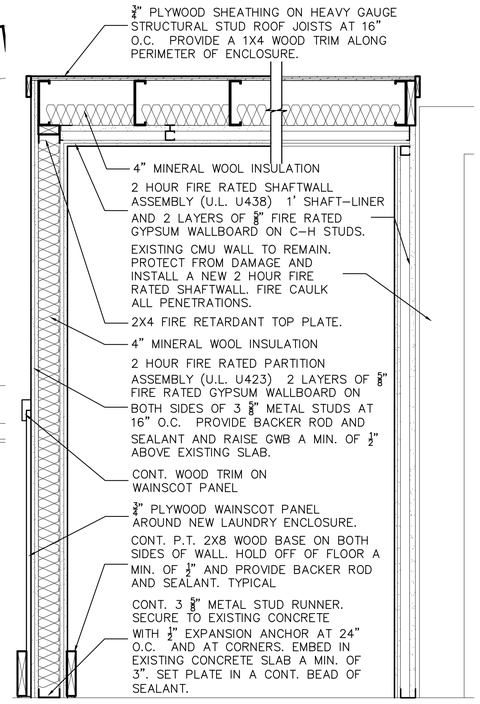
BID DOCUMENTS

Drawing No.

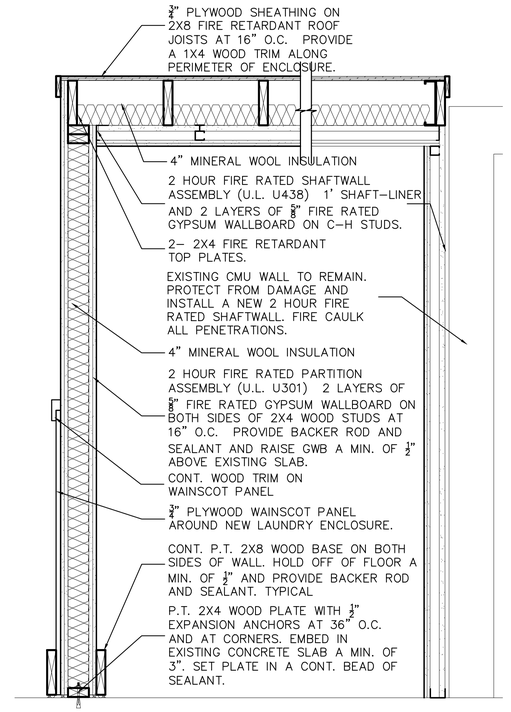
A401



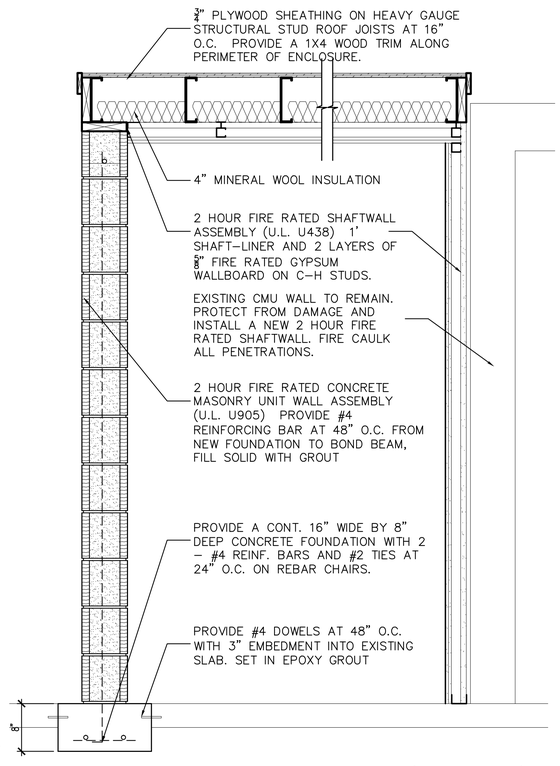
1 A402 TYPICAL SECTION @ OVERHEAD DOOR WITH CURTAIN
SCALE: 1" = 1'–0"



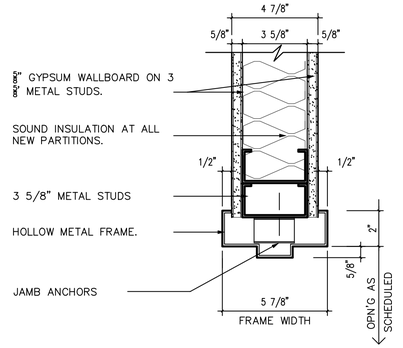
3 A402 SECTION @ LAUNDRY (U.L. U423)
SCALE: 1" = 1'–0"



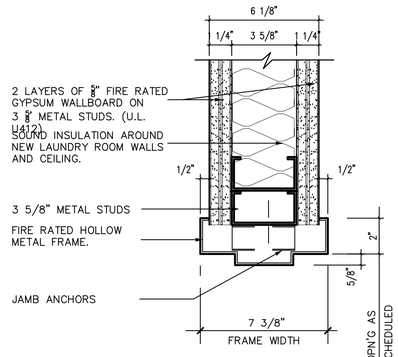
4 A402 OPTIONAL SECTION @ LAUNDRY (U.L. U301)
SCALE: 1" = 1'–0"



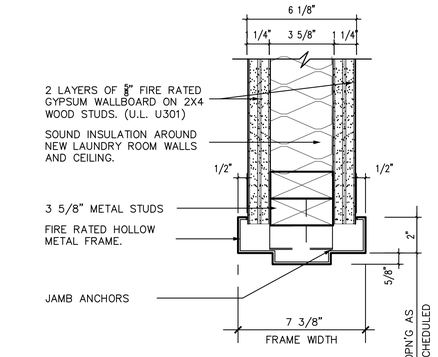
5 A402 OPTIONAL SECTION @ LAUNDRY (U.L. U905)
SCALE: 1" = 1'–0"



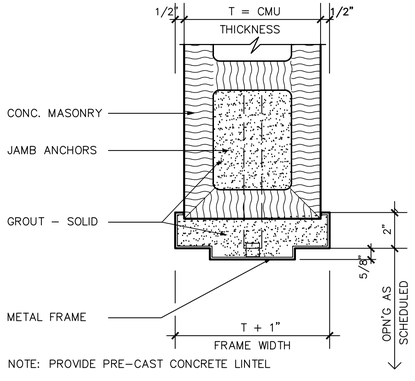
6 A402 JAMB DETAIL
SCALE: 3" = 1'–0"



7 A402 JAMB DETAIL @ RATED FRAME (U.L. U423)
SCALE: 3" = 1'–0"

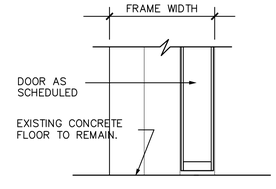


8 A402 JAMB DETAIL @ RATED FRAME (U.L. U301)
SCALE: 3" = 1'–0"

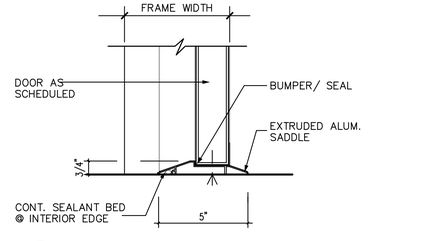


NOTE: PROVIDE PRE–CAST CONCRETE LINTEL

9 A402 JAMB DETAIL
SCALE: 3" = 1'–0"



10 A402 SILL DETAIL
SCALE: 3" = 1'–0"



11 A402 SILL DETAIL @ FIRE RATED DOOR
SCALE: 3" = 1'–0"

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Key Plan

MPE PROJ#: 2013–171
Designed By: KBJ ARCHITECTS
Drawn By: GG / RB
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Issue Date: 10/01/15
Drawing Scale: Varies

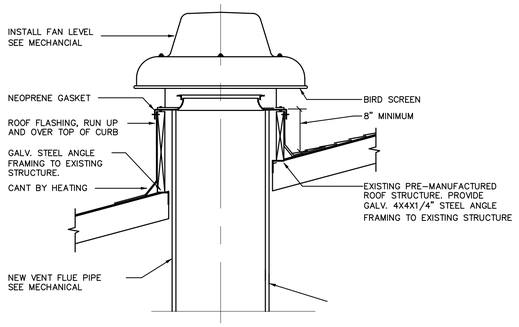
Drawing Title:

DETAILS

BID DOCUMENTS

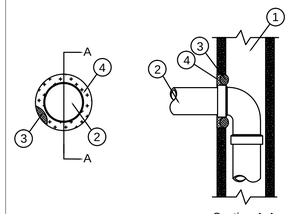
Drawing No.

A402



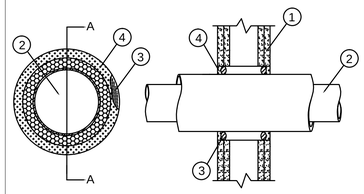
4 A403 SECTION AT NEW ROOF VENT
SCALE: 3/4" = 1'-0"

System No. W-L-2202
September 23, 2010
F Ratings - 1 and 2 Hr
T Ratings - 1, 1-3/4 and 2 Hr



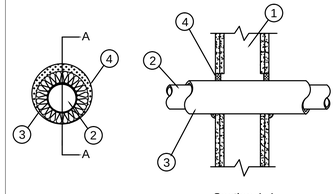
1. WALL ASSEMBLY.
2. THROUGH PENETRANT.
3. PACKING MATERIAL.
4. BIOSTOP 500+.

System No. W-L-5060
September 23, 2010
F Rating - 1 & 2 Hr (See Item 1)
T Ratings - 1 Hr



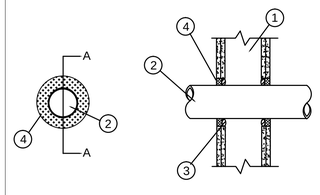
1. FLOOR OR WALL ASSEMBLY.
2. THROUGH PENETRANT.
3. PACKING MATERIAL.
4. BIOSTOP 500+.

System No. W-L-5146
December 7, 2002
F Ratings - 2 Hr
T Ratings - 1 Hr



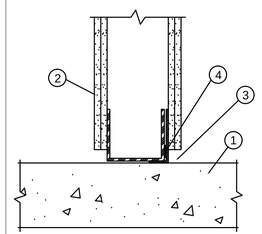
1. WALL ASSEMBLY.
2. THROUGH PENETRANT.
3. PIPE COVERING
4. BIOSTOP 500+.

System No. W-L-2105
May 8, 1998
F Ratings - 2 Hr
T Ratings - 1 1/2 Hr

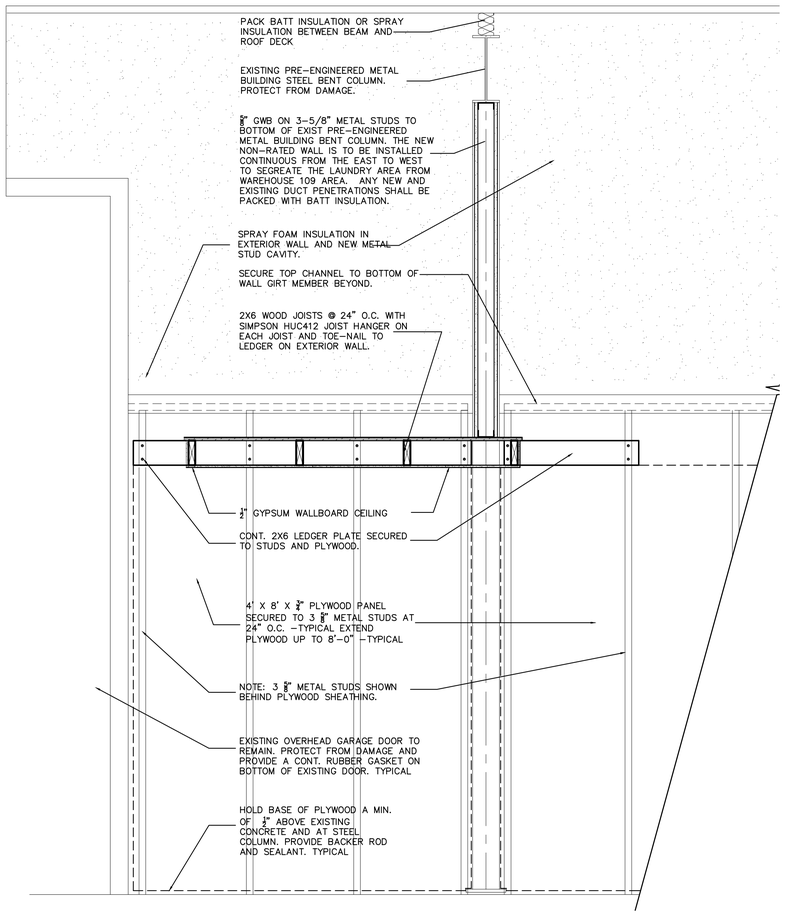


1. WALL ASSEMBLY.
2. THROUGH PENETRANT.
3. FOAM BACKER ROD
4. BIOSTOP 500+.

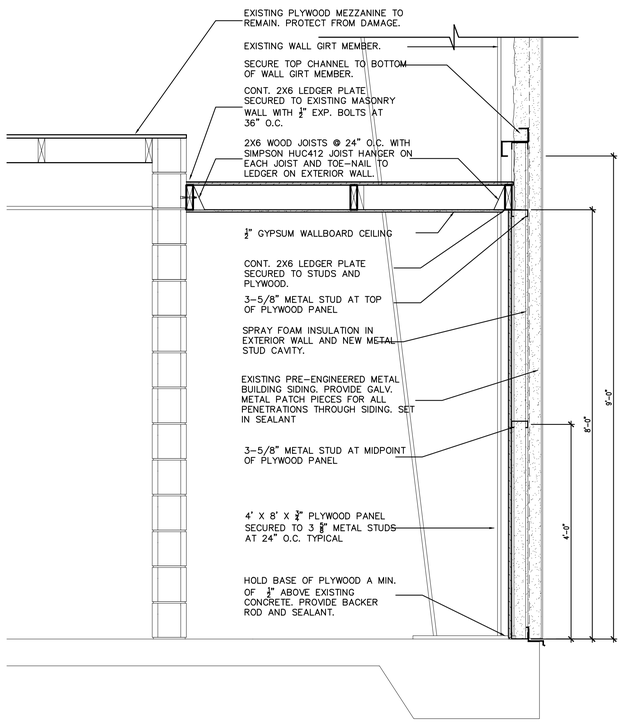
System No. BW-S-0030
October 30, 2013
F Ratings - 1 and 2 Hr



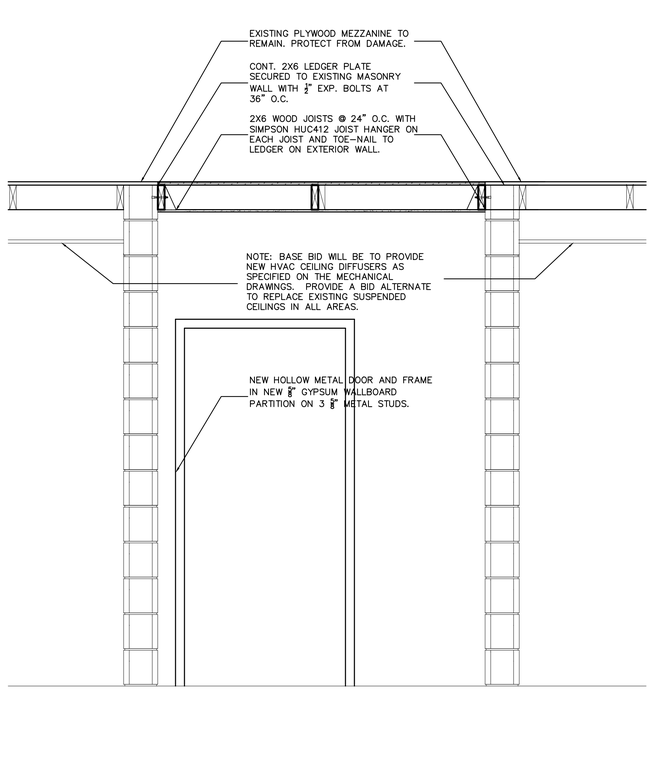
1. FLOOR ASSEMBLY.
2. WALL ASSEMBLY.
3. JOINT SYSTEM.
4. TRACK SAFE.



1 A403 SECTION AT NEW MEZZ. CEILING
SCALE: 3/4" = 1'-0"



2 A403 SECTION AT NEW MEZZ. CEILING
SCALE: 3/4" = 1'-0"



3 A403 SECTION AT NEW MEZZ. CEILING @ TOILETS
SCALE: 3/4" = 1'-0"

MATERN PROFESSIONAL ENGINEERING
MEP/FP Engineering
Consultants - A Solutions Based Firm
ORLANDO I Fort Myers I Jacksonville I Tampa
Matern Professional Engineering, Inc
130 Candace Drive
Maitland, Fl 32751-3331
PHONE (407) 740-5020 FAX (407) 740-0365

ENG. BUS. No. EB-0005096 CERT. OF AUTH. No. 5096

ORANGE COUNTY FIRE LOGISTICS WAREHOUSE HVAC REPLACEMENT

KBJ Architects, Inc.
500 Delaney Avenue
Suite 101
Orlando, FL 32801
Phone: 407-839-5501
Fax: 407-839-0668

Revisions

No.	Date	Description

Key Plan

MPE PROJ#: 2013-171
Designed By: KBJ ARCHITECTS
Drawn By: GG / RB
Checked By: RB / Matern
Issue Date: 10/01/15
Drawing Scale: 3/4" = 1'-0"

Drawing Title:

DETAILS

BID DOCUMENTS

Drawing No.

A403

ONLINE CERTIFICATIONS DIRECTORY

Design No. U438
BXUV.U438
Fire Resistance Ratings - ANSI/UL 263

Page Bottom

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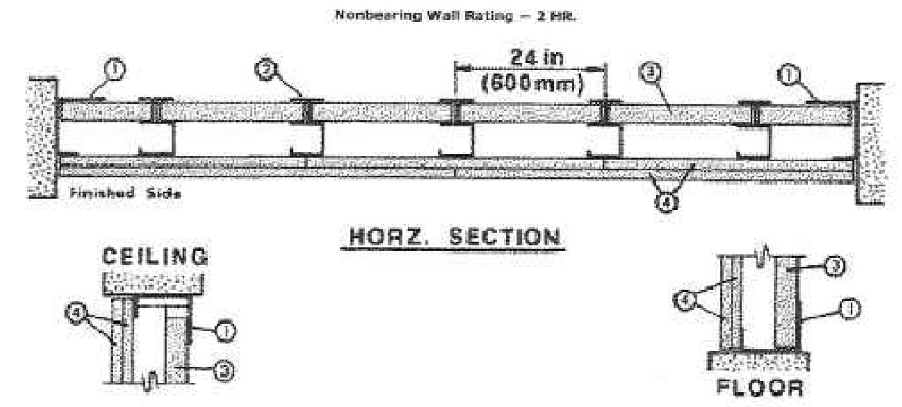
Fire-resistance Ratings - ANSI/UL 263

See General Information for Fire-resistance Ratings - ANSI/UL 263

Design No. U438

October 17, 2013

Nonbearing Wall Rating — 2 HR.



1. **Floor and Ceiling Runners** — "J" -shaped runner, 2-1/2 in. wide with unequal legs of 3 in. and 2 in., fabricated from 24 MSG galv steel (min 20 MSG when Item 4B is used). Runners positioned with short leg toward finished side of wall. Runners attached to structural supports with steel fasteners located not greater than 2 in. from ends and not greater than 24 in. OC.

2. **Steel Studs** — "C-H" -shaped studs, 2-1/2 in. wide by 1-1/2 in. deep, fabricated from 25 MSG galv steel (min 20 MSG when Item 4B is used). Cut to lengths 3/8 to 1/2 in. less than floor to ceiling height and spaced 24 in. or 600 mm OC.

2A. **Steel Studs** — (Not shown) "E" -shaped studs installed in place of "C-H" -shaped studs (Item 2) to secure the closure liner panels at the ends of walls. Fabricated from 25 MSG galv steel (min 20 MSG when Item 4B is used), 2-1/2 in. wide, with one leg 1 in. long and two legs 3/4 in. long. Shorter legs 1 in. apart to engage gypsum liner panels. Cut to lengths 3/8 in. less than floor to ceiling height. Sill and lintel of opening formed with "J" -shaped runners (Item 1) secured to "E" -shaped studs with angle clips and steel screws.

3. **Gypsum Board*** — 1 in. thick gypsum wallboard liner panels, supplied in nom 24 in. or 600 mm (for metric spacing) widths. Panels cut 1 in. less in length than floor to ceiling height. Vertical edges inserted in "H" -shaped section of "C-H" studs. Free edge of end panels attached to long leg of "J" -runners with 1-5/8 in. long Type S steel screws spaced not greater than 12 in. OC.

CGC INC — Type SLX.

UNITED STATES GYPSUM CO — Type SLX.

USG MEXICO S A DE C V — Type SLX.

4. **Gypsum Board*** — 1/2 in. thick, 4 ft. or 1200 mm (for metric spacing) wide wallboard applied vertically in two layers. Inner or base layer attached to studs with 1 in. long Type S steel screws spaced 24 in. OC along the edges and in the field of the boards. Outer or face layer attached to studs and "J" -runners with 1-5/8 in. long Type S steel screws spaced 12 in. along the edges and in the field of the boards, staggered from screws in inner layer. Joints between inner and outer layers staggered.

Outer layer joints covered with paper tape and joint compound. Exposed screw heads covered with joint compound.

As an alternate method, inner wallboard layer applied vertically, outer wallboard layer applied horizontally. Inner layer attached to studs with 1 in. Type S steel screws spaced 24 in. OC along vertical edges and in the field. Outer layer attached to the studs and "J" runners over the inner layer with 1-5/8 in. long Type S steel screws spaced 12 in. OC in the field, along the vertical edges and to the floor and ceiling runners. Outer layer secured to inner layer wallboard with 1-1/2 in. long Type G steel screws located midway between studs and 1 in. from the horizontal joint.

AMERICAN GYPSUM CO — Types AG-C.

CERTAINTEED GYPSUM INC — Type FRPC, Type C.

CERTAINTEED GYPSUM CANADA INC — Type C.

CGC INC — Type C, IP-X2, or WRC.

GEORGIA-PACIFIC GYPSUM L L C — Types 5, DAPC, TG-C.

LAFARGE NORTH AMERICA INC — Types LGFC-C, LGFC-C/A.

NATIONAL GYPSUM CO — Types FSK-C, FSW-C, FSMR-C.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Types PG-C.

THAI GYPSUM PRODUCTS PCL — Type C.

UNITED STATES GYPSUM CO — Type C, IP-X2 or WRC.

USG MEXICO S A DE C V — Type C, IP-X2 or WRC.

4A. **Gypsum Board*** — (As an alternate to Item 4) — 5/8 in. thick gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. Inner or base layer attached to studs with 1 in. long Type S or S-12 steel screws spaced 24 in. OC when installed vertically or 16 in. OC when installed horizontally. Outer or face layer attached to studs with 1-5/8 in. long Type S or S-12 steel screws spaced 12 in. OC when installed vertically and staggered 12 in. from base layer screws or 8 in. OC when installed horizontally and staggered 8 in. from base layer screws. Horizontal joints between inner and outer layers staggered a min of 12 in. Horizontal joints need not be backed by steel framing. Vertical joints centered over studs and staggered 24 in. OC. Outer layer joints covered with paper tape and joint compound. Exposed screw heads covered with joint compound. Paper tape and joint compound may be omitted when gypsum boards are supplied with square edges. When used in widths other than 48 in., gypsum panels to be installed horizontally.

CGC INC — Type AR, IP-AR, IP-X1, SCX, ULX, or WRX.

UNITED STATES GYPSUM CO — Type AR, FRX-G, IP-AR, IP-X1, SCX, ULX or WRX.

USG MEXICO S A DE C V — Type AR, IP-AR, IP-X1, SCX, ULX, or WRX.

4B. **Gypsum Board*** — (Not Shown) - May be used in lieu of Items 4 or 4A for the base layer - Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Lead batten strips (Item 6) required behind vertical joints.

RAY-BAR ENGINEERING CORP — Type RB-LBG

4C. **Gypsum Board*** — (As an alternate to Item 4, 4A, 4B) — 5/8 in. thick. Two layers installed as described in Item 4.

NATIONAL GYPSUM CO — Type FSMR-C.

4D. **Gypsum Board*** — (Not Shown) - May be used in lieu of Items 4 for the base layer - Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Lead batten strips required behind vertical joints. To be used with Lead Batten Strips (see Item 6B) or Lead Discs (see Item 6C).

MAYCO INDUSTRIES INC — Type X-Ray Shielded Gypsum

4E. **Gypsum Board*** — (Not Shown) - May be used in lieu of Items 4 for the base layer. Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws gypsum panel steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 8 ft long with a max thickness of 0.14 in. placed on the face of studs and attached to the stud with construction adhesive and two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, nominal 3/8 in. diam by max 0.085 in. thick. Compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

RADIATION PROTECTION PRODUCTS INC — Type RPP - Lead Lined Drywall

5. **Batts and Blankets*** — (Optional) — (Not shown) — Mineral wool or glass fiber batts partially or completely filling stud cavity. Any mineral wool or glass fiber batt material bearing the UL Classification Marking as to Fire Resistance.

5A. **Fiber, Sprayed*** — As an alternate to Batts and Blankets (Item 5) — (100% Borate Formulation) — Spray applied cellulose material. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product with a nominal dry density of 2.7 lb/ft³. Alternate Application Method: The fiber is applied without water or adhesive at a nominal dry density of 3.5 lb/ft³, in accordance with the application instructions supplied with the product.

U S GREENFIBER L L C — INS735 & INS745 for use with wet or dry application. INS765LD and INS770LD are to be used for dry application only.

5B. **Fiber, Sprayed*** — As an alternate to Batts and Blankets (Item 5) and Item 5A - Spray applied cellulose insulation material. The fiber is applied with water to interior surfaces in accordance with the application instructions supplied with the product. Applied to completely fill the enclosed cavity. Minimum dry density of 4.3 pounds per cubic ft.

NU-WOOL CO INC — Cellulose Insulation

5C. **Fiber, Sprayed*** — As an alternate to Batts and Blankets (Item 5) - Spray applied cellulose fiber. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. The minimum dry density shall be 4.30 lb/ft³.

INTERNATIONAL CELLULOSE CORP — Celbar-RL

6. **Lead Batten Strips** — For Use with Item 4B - (Not Shown) - Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 4A) and optional at remaining stud locations. Strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. Strips placed on the interior face of studs and attached from the exterior face of the stud with two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead

6A. **Lead Discs or Tabs** — (Not Shown) - Used in lieu of or in addition to the lead batten strips (Item 6) or optional at other locations - Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards (Item 5) underneath screw locations prior to the installation of the screws. Lead discs or tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

6B. **Lead Batten Strips** — (Not Shown, for use with Item 4D) Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.140 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.5% meeting the Federal specification QQ-L-201f, Grades "A, B, C or D". Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations.

6C. **Lead Discs** — (Not Shown, for use with Item 4D) Max 5/16 in. diam by max 0.140 in. thick lead discs compression fitted or adhered over steel screw heads. Lead discs to have a purity of 99.5% meeting the Federal Specification QQ-L-201f, Grades "A, B, C or D".

*Bearing the UL Classification Mark

ONLINE CERTIFICATIONS DIRECTORY

Design No. U905
BXUV.U905
Fire Resistance Ratings - ANSI/UL 263

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Design/System/Construction/Assembly Usage Disclaimer

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Fire Resistance Ratings - ANSI/UL 263

See General Information for Fire Resistance Ratings - ANSI/UL 263

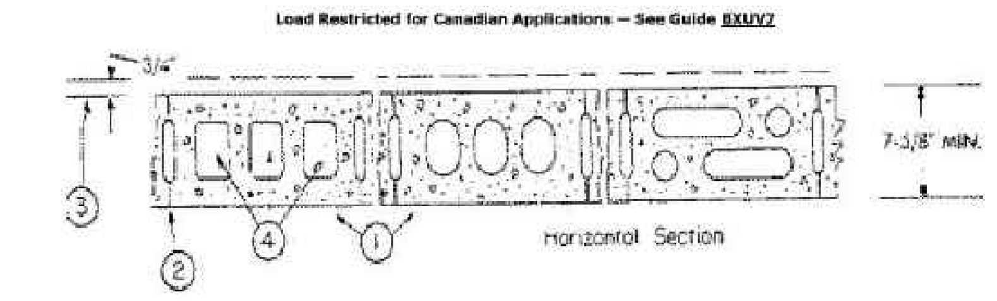
Design No. U905

September 30, 2010

Bearing Wall Rating — 2 HR.

Nonbearing Wall Rating — 2 HR

Load Restricted for Canadian Applications — See Guide BXUV7



1. **Concrete Blocks*** — Various designs. Classification D-2 (2 hr).

See **Concrete Blocks** category for list of eligible manufacturers.

2. **Mortar** — Blocks laid in full bed of mortar, nom. 3/8 in. thick, of not less than 2-1/4 and not more than 3-1/2 parts of clean sharp sand to 1 part Portland cement (proportioned by volume) and not more than 50 percent hydrated lime (by cement volume). Vertical joints staggered.

3. **Portland Cement Stucco or Gypsum Plaster** — Add 1/2 hr to classification if used. Where combustible members are framed in wall, plaster or stucco must be applied on the face opposite framing to achieve a max. Classification of 1-1/2 hr. Attached to concrete blocks (Item 1).

4. **Loose Masonry Fill** — If all core spaces are filled with loose dry expanded slag, expanded clay or shale (Rotary Kiln Process), water repellant vermiculite masonry fill insulation, or silicone treated perlite loose fill insulation add 2 hr to classification.

5. **Foamed Plastic*** — (Optional-Not Shown) — 1-1/2 in. thick max, 4 ft wide sheathing attached to concrete blocks (Item 1).

THE DOW CHEMICAL CO — Type Thermax Sheathing, Thermax Light Duty Insulation, Thermax Heavy Duty Insulation, Thermax Metal Building Board, Thermax White Finish Insulation, Thermax ci Exterior Insulation, Thermax IH Insulation, Thermax Plus Liner Panel and Thermax Heavy Duty Plus (HDP).

*Bearing the UL Classification Mark

ONLINE CERTIFICATIONS DIRECTORY

Design No. U301
BXUV.U301
Fire-resistance Ratings - ANSI/UL 263

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Fire-resistance Ratings - ANSI/UL 263

See General Information for Fire-resistance Ratings - ANSI/UL 263

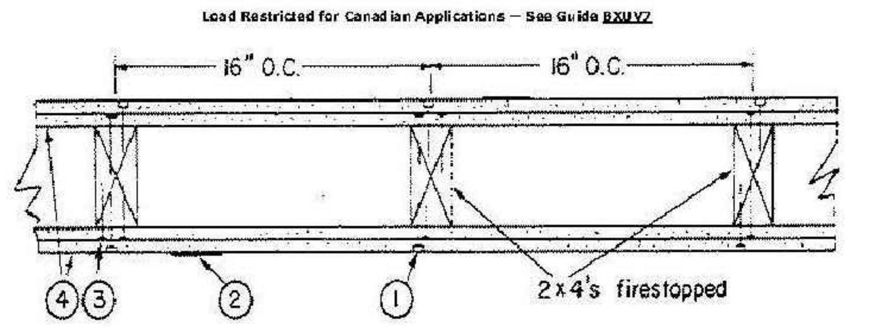
Design No. U301

January 29, 2014

Bearing Wall Rating — 2 HR.

Finish Rating — 66 Min.

Load Restricted for Canadian Applications — See Guide BXUV7



1. **Nailheads** — Exposed or covered with joint compound.

2. **Joints** — Exposed joints covered with joint compound and paper tape. Joint compound and paper tape may be omitted when square edge boards are used. As an alternate, nom 3/32 in. thick gypsum veneer plaster may be applied to the entire surface of Classified veneer baseboard with the joints reinforced with paper tape.

3. **Nails** — 6d cement coated nails 1-7/8 in. long, 0.0915 in. shank diam, 1/4 in. diam heads, and 8d cement coated nails 2-3/8 in. long, 0.113 in. shank diam, 9/32 in. diam heads.

4. **Gypsum Board*** — 5/8 in. thick, two layers applied either horizontally or vertically. Inner layer attached to studs with the 1-7/8 in. nails spaced 6 in. OC. Outer layer attached to studs over inner layer with the 2-3/8 in. long nails spaced 8 in. OC. Vertical joints located over studs. All joints in face layers staggered with joints in base layers. Joints of each base layer offset with joints of base layer on opposite side.

When used in widths other than 48 in., gypsum board to be installed horizontally.

When Steel Framing Members* (Item 6 or 6A) are used, base layer attached to furring channels with 1 in. long Type S bugle-head steel screws spaced max 24 in. OC; face layer attached with 1-5/8 in. long Type S bugle-head steel screws spaced max 12 in. OC.

ACADIA DRYWALL SUPPLIES LTD — Type X

AMERICAN GYPSUM CO — Types AGX-1, M-Glass, AG-C, AGX-11.

BEIJING NEW BUILDING MATERIALS PUBLIC LTD CO — Type DBX-1.

CERTAINTEED GYPSUM INC — Types 1, FRPC, EGRG, GlasRoc, Type C or Type X.

CERTAINTEED GYPSUM CANADA INC — Type C, Type X, Type Abuse-Resistant.

CGC INC — Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULX, WRC, WRX .

GEORGIA-PACIFIC GYPSUM L L C — Types 5, 6, 9, C, DAP, DD, DA, DAPC, DGG, DS, GPFS6. LS, TG-C, Type X, Veneer Plaster Base-Type X, Water Rated-Type X, Sheathing Type-X, Soffit-Type X, GreenGlass Type X, Type LWX, Veneer Plaster Base-Type LWX, Water Rated-Type LWX, Sheathing Type-LWX, Soffit-Type LWX, Type DGLW, Water Rated-Type DGLW, Sheathing Type- DGLW, Soffit-Type DGLW, Type LW2X, Veneer Plaster Base - Type LW2X, Water Rated - Type LW2X, Sheathing - Type LW2X, Soffit - Type LW2X, Type DGL2W, Water Rated - Type DGL2W, Sheathing - Type DGL2W.

LAFARGE NORTH AMERICA INC — Types LGFC-C, LGFC2, LGFC2A , LGFC6, LGFC6A., LGFC-C/A, LGFC-WD, LGLLX.

NATIONAL GYPSUM CO — Types FSK, FSK-C, FSK-G, FSW, FSW-3, FSW-5, FSW-6, FSW-C, FSW-G, FSMR-C, FSL.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Types C, PG-2, PG-3, PG-3W, PG-4, PG-5, PG-5W, PG-5WS, PG-9, PG-11, PG-C or PGS-WRS.

PANEL REY S A — Types PRC, PRX, RHX, MDX, ETX, GREX

SIAM GYPSUM INDUSTRY (SARABURI) CO LTD — Type EX-1

THAI GYPSUM PRODUCTS PCL — Type C or Type X.

UNITED STATES GYPSUM CO — Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULX, USGX, WRC, WRX.

USG MEXICO S A DE C V — Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULX, WRC, WRX.

4A. **Gypsum Board*** — (As an alternate to Item 4) — Nom 3/4 in. thick, installed as described in Item 4.

CGC INC — Types AR, IP-AR.

UNITED STATES GYPSUM CO — Types AR, IP-AR.

USG MEXICO S A DE C V — Types AR, IP-AR.

4B. **Gypsum Board*** — (As an alternate to Items 4 and 4A)—5/8 in. thick, 2 ft wide, tongue and groove edge, applied horizontally as the outer layer to one side of the assembly. Secured as described in Item 4. Joint covering (Item 2) not required.

CGC INC — Type SHX

UNITED STATES GYPSUM CO — Type SHX

USG MEXICO S A DE C V — Type SHX

4C. **Gypsum Board*** — (As an alternate to Items 4, 4A or 4B — Not shown) For Direct Application to Studs Only- For use on one or both sides of the wall as the base layer or one or both sides of the wall as the face layer. Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-5/8 in. long Type W coarse thread gypsum panel steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field when applied as the base layer. When applied as the face layer screw length to be increased to 2-1/2 in. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. placed on the face of studs and attached to the stud with two 1 in. long Type S-12 pan head steel screws, F4j.one at the top of the strip and one at the bottom of the strip. Lead discs or tabs may be used in lieu of or in addition to the lead batten strips or optional at other locations. Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards underneath screw locations prior to the installation of the screws. Lead discs or tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Fasteners for face layer gypsum panels (Items 4, 4A or 4B) when installed over lead backed board to be min 2-1/2 in. Type S-12 bugle head steel screws spaced as described in Item 4.

RAY-BAR ENGINEERING CORP — Type RB-LBG.

4D. **Gypsum Board*** — As an Alternate to Item 4 — 5/8 in. thick applied either horizontally or vertically. Inner layers fastened to framing with 1-1/4 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last screw 1 in. from edge of board. Outer layers fastened to framing with 1-7/8 in. long Type W coarse thread gypsum panel steel screws spaced a max 8 in. OC, with last screw 1 in. from edge of board. When used in widths other than 48 in., gypsum board to be installed horizontally. All joints in face layers staggered with joints in base layers. Joints of each base layer offset with joints of base layer on opposite side.

AMERICAN GYPSUM CO — Types AGX-1, M-Glass, AG-C.

4E. **Gypsum Board*** — (As an alternate to Items 4 through 4D) — 5/8 in. thick, 4 ft. wide, paper surfaced applied vertically and secured as described in Item 4.

GEORGIA-PACIFIC GYPSUM L L C — Type X ComfortGuard Sound Deadening Gypsum Board.

4F. **Gypsum Board*** — (As an alternate to Item 4) — Not to be used with item 6. 5/8 in. thick, 4 ft. wide, paper surfaced, applied vertically and secured as described in Item 4.

NATIONAL GYPSUM CO — SoundBreak XP Type X Gypsum Board

4G. **Gypsum Board *** — (As an alternate to Items 4 through 4F) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically and secured as described in Item 4.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Types QuietRock ES.

4H. **Gypsum Board*** — (As an alternate to Item 4) — Not to be used with item 6. 5/8 in. thick, 4 ft. wide, paper surfaced, applied vertically and secured as described in Item 4.

CERTAINTEED GYPSUM INC — Type SilentFX

4I. **Gypsum Board*** — (As an alternate to item 4) — 5/8 in. thick, two layers applied either horizontally or vertically. Inner layer attached to studs with 1-1/4 in. long Type W steel screws spaced 8 in. OC. Outer layer attached to studs over inner layer with 2 in. long Type W steel screws spaced 8 in. OC offset 6 in. from base layer. Vertical joints located over studs. Vertical and horizontal joints between inner and outer layers staggered. Outer layer joints covered with joint tape and compound, screwheads covered with joint compound. As an alternate, nom 3/32 in. thick gypsum veneer plaster may be applied to the entire surface of Classified veneer baseboard. Joints reinforced. Wallboard other than 48 in. wide must be applied horizontally. The SoundBreak XP Type X Gypsum Board is not to be used with Item 6.

NATIONAL GYPSUM CO — Types FSK, FSK-C, FSK-G, FSW, FSW-3, FSW-5, FSW-6, FSW-C, FSW-G, FSMR-C, SoundBreak XP Type X Gypsum Board.

4J. **Gypsum Board*** — (As an alternate to Items 4) For Direct Application to Studs Only- For use as the base layer or as the face layer. Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-5/8 in. long Type W coarse thread gypsum panel steel screws spaced 8 in. OC at perimeter and in the field when applied as the base layer. When applied as the face layer screw length to be increased to 2-1/2 in. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 10 ft long with a max thickness of 0.140 in. placed on the face of studs and attached to the stud with two 1 in. long Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, max 5/16 in. diam by max 0.140 in. thick. compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.5% meeting the Federal specification QQ-L-201f, Grades "B, C or D". Fasteners for face layer gypsum panels (Items 4, 4A or 4B) when installed over lead backed board to be min 2-1/2 in. Type S-12 bugle head steel screws spaced as described in Item 4.

MAYCO INDUSTRIES INC — "X-Ray Shielded Gypsum"

4K. **Gypsum Board*** — For use with Item 7 — 5/8 in. thick, two layers applied vertically. Inner layer attached to resilient channels with 1 in. long steel screws spaced 8 in. OC. Outer layer attached to resilient channels over inner layer with 1-5/8 in. long steel screws spaced 8 in. OC. All joints in face layers staggered with joints in base layers. Joints of each base layer offset with joints of base layer on opposite side. Insulation, Items 8 or 9 is required.

AMERICAN GYPSUM CO — Types AGX-1, M-Glass, AG-C, AGX-11.

4L. **Gypsum Board*** — (As an alternate to Items 4) For Direct Application to Studs Only- For use as the base layer or as the face layer. Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-5/8 in. long Type W coarse thread gypsum panel steel screws spaced 8 in. OC at perimeter and in the field when applied as the base layer. When applied as the face layer screw length to be increased to 2-1/2 in. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 8 ft long with a max thickness of 0.14 in. placed on the face of studs and attached to the stud with construction adhesive and two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, nominal 3/8 in. diam by max 0.085 in. thick. compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Fasteners for face layer gypsum panels (Items 4, 4A or 4B) when installed over lead backed board to be min 2-1/2 in. Type S-12 bugle head steel screws spaced as described in Item 4.

RADIATION PROTECTION PRODUCTS INC — Type RPP - Lead Lined Drywall

4M. **Gypsum Board*** — (As an alternate to Item 4) — 5/8 in. thick, 4 ft. wide, two layers applied vertically with vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Secured as described in Item 4.

CERTAINTEED GYPSUM INC — 5/8" Easi-Lite Type X

CERTAINTEED GYPSUM CANADA INC — 5/8" Easi-Lite Type X

4N. **Wall and Partition Facings and Accessories *** — (As an alternate to Items 4 through 4M) — Nominal 5/8 in. thick, 4 ft wide panels, applied vertically and secured as described in Item 4.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock 527

5. **Molded Plastic*** — Not shown, Optional — Solid vinyl siding mechanically secured over the outer layer to framing members in accordance with manufacturer's recommended installation details.

ALSIDE, DIV OF ASSOCIATED MATERIALS INC

GENTEK BUILDING PRODUCTS LTD

VYTEC CORP

6. **Steel Framing Members** — (Optional, Not Shown)* - Furring channels and resilient sound isolation clip as described below:

A. **Furring Channels** — Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Wallboard attached to furring channels as described in Item 4.

B. **Steel Framing Members*** — Resilient sound isolation clip used to attach furring channels (Item 6a) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. Furring channels are friction fitted into clips. RSIC-1 clip for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) clip for use with 2-23/32 in. wide furring channels.

PAC INTERNATIONAL INC — Types RSIC-1, RSIC-1 (2.75).

6A. **Steel Framing Members** — (Optional, Not Shown)* — Furring channels and resilient sound isolation clip as described below:

A. **Furring Channels** — Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and secured together with four self-tapping No. 8x1/2 Self Drilling screws (2 per side 1 in. and 4 in. from overlap edge). Gypsum board attached to furring channels as described in Item 4. Side joint furring channels shall be attached to studs with RESILMOUNT Sound Isolation Clips - Type A237R located approximately 2 in. from each end of length of channel. Both Gypsum Boards at side joints fastened into channel with screws spaced 8 in. OC, approximately 1/2 in. from joint edge.

B. **Steel Framing Members*** — Resilient sound isolation clip used to attach furring channels (Item 6Aa) to studs. Clips spaced 16 in. OC., and secured to studs with No. 10 x 2-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.

STUDCO BUILDING SYSTEMS — RESILMOUNT Sound Isolation Clips - Type A237R

7. **Furring Channel** — Optional — Not Shown — For use on one side of the wall with Item 4K — Resilient channels, 25 MSG galv steel, spaced vertically 24 in. OC, flange portion screw attached to one side of studs with 1-1/4 in. long diamond shaped point, double lead Phillips head steel screws. When resilient channels are used, insulation, Item 8 or 9 is required.

8. **Batts and Blankets*** — Required for use with resilient channels, Item 7, min. 3 in. thick mineral wool batts, placed to fill interior of wall, attached to the nom 4 in. face of the studs with staples placed 24 in. OC.

THERMAFIBER INC — Type SAFB

9. **Batts and Blankets*** — (As an alternate to Item 8) — min. 3 in. thick glass fiber batts bearing the UL Classification Marking as to Surface Burning and/or Fire Resistance, placed to fill the interior of the wall, attached to the nom. 4 in. face of the studs with staples placed 24 in. OC. See Batts and Blankets (BKNV or BZJZ) Categories for names of Classified companies.

10. **Wall and Partition Facings and Accessories*** — (Optional, Not shown) — Nominal 1/2 in. thick, 4 ft wide panels, for optional use as an additional layer on one or both sides of the assembly. Panels attached in accordance with manufacturer's recommendations. When the QR-510 panel is installed between the wood framing and the UL Classified gypsum board, the required UL Classified gypsum board layer(s) is/are to be installed as indicated as to fastener type and spacing, except that the required fastener length shall be increased by a minimum of 1/2 in. Not evaluated or intended as a substitute for the required layer(s) of UL Classified Gypsum Board.

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type QuietRock QR-510.

11. **Cementitious Backer Units*** — (Optional Item Not Shown — For Use On Face Of 2 Hr Systems With All Standard Items Required) — 7/16 in., 1/2 in., 5/8 in., 3/4 in. or 1 in. thick, min. 32 in. wide.- Applied vertically with vertical joints centered over studs. Face layer fastened over gypsum board to studs and runners with cement board screws of adequate length to penetrate stud by a minimum of 3/8 in. for steel framing members, and a minimum of 3/4 in. for wood framing members spaced a max of 8 in. OC.

NATIONAL GYPSUM CO — Type DuraBacker, PermaBase, DuraBacker Plus, or PermaBase Plus

ring the UL Classification Mark

ONLINE CERTIFICATIONS DIRECTORY

Design No. U423
BXUV.U423
Fire-resistance Ratings - ANSI/UL 263

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Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

Fire-resistance Ratings - ANSI/UL 263

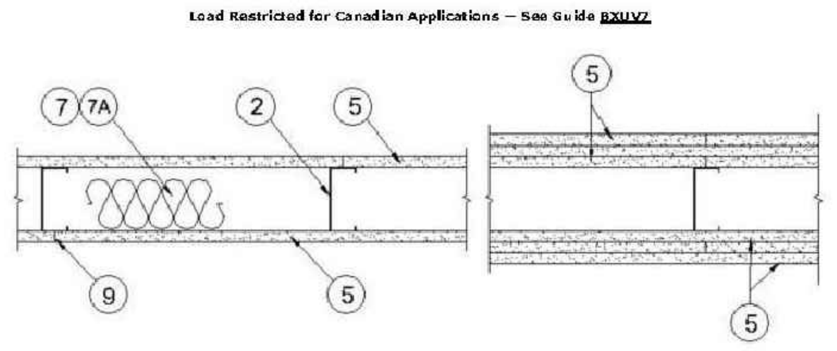
See General Information for Fire-resistance Ratings - ANSI/UL 263

Design No. U423

January 27, 2014

Bearing Wall Ratings — 45 min, 1, 1-1/2 or 2 Hr (See Items 5 & 7)

Load Restricted for Canadian Applications — See Guide BXUV7



1. **Floor and Ceiling Runners** — (Not shown) — Channel shaped, fabricated from min 0.0329 in., bare metal thickness (No. 20 MSG) corrosion-protected steel, that provide a sound structural connection between steel studs and adjacent assemblies such as floors, ceilings and/or other walls. Attached to floor and ceiling assemblies with steel fasteners spaced not greater than 24 in. OC.

1A. **Floor and Ceiling Runners** — (Not shown, As an alternate to Item 1, For Use With Item 5A and 5C) — Channel shaped runners min 3-1/2 in. deep with 1-1/4 in. flanges fabricated from min No. 20 MSG corrosion-protected steel. Attached to floor and ceiling assemblies with steel fasteners spaced not greater than 24 in. OC.

2. **Steel Studs** — Min 0.0329 in., bare metal thickness (No. 20 MSG) corrosion-protected steel studs, min 3-1/2 in. wide, cold formed, designed in accordance with the current edition of the Specification for the Design of Cold-Formed Steel Structural Members by the American Iron and Steel Institute (AISI). All design details enhancing the structural integrity of the wall assembly, including the axial design load of the studs, shall be as specified by the steel stud designer and/or producer, and shall meet the requirements of all applicable local code agencies. The max stud spacing shall not exceed 24 in. OC. Studs attached to floor and ceiling runners with 1/2 in. long Type S-12 steel screws on both sides of the studs or by welded or bolted connections designed in accordance with the AISI specifications.

2A. **Steel Studs** — (As an alternate to Item 2, For use with Item 5A and 5C) Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, 3-1/2 in. min width, min 1-1/2 in. flanges and 1/4 in. return, spaced a max of 16 in. OC. Studs friction-fit into floor and ceiling runners.

2B. **Steel Studs** — (As an alternate to Item 2 and 2A, For Use With Item 5B) - Min 0.0329 in., (No. 20 MSG) corrosion-protected cold formed steel studs, min 3-1/2 in. deep by 1-5/8 in. wide with 1/2 in. returns. Braced at mid-height and designed in accordance with the current edition of the Specification for the Design of Cold-Formed Steel Structural Members by the American Iron and Steel Institute (AISI). All design details enhancing the structural integrity of the wall assembly, including the axial design load of the studs, shall be as specified by the steel stud designer and/or producer, and shall meet the requirements of all applicable local code agencies. The max stud spacing shall not exceed 24 in. OC. Studs attached to floor and ceiling runners with 1/2 in. long Type S-12 steel screws on both sides of the studs or by welded or bolted connections designed in accordance with the AISI specifications.

2C. **Framing Members - Steel Studs** — (As an alternate to Item 2, For use with Item 5C) Channel shaped, fabricated from min 20 MSG (0.0327 in. thick) corrosion-protected or galv steel, 3-1/2 in. min width, min 1-1/2 in. flanges and 1/4 in. return, spaced a max of 16 in. OC. Studs friction-fit into floor and ceiling runners. Studs to be cut 5/8 to 3/4 in. less than assembly height.

3. **Lateral Support Members** — (Not shown) — Where required for lateral support of studs, support shall be provided by means of steel straps, channels or other similar means as specified in the design of a particular steel stud wall system.

4. **Wood Structural Panel Sheathing** — (Optional, For use with Item 5 only.)- (Not Shown) - 4 ft wide, 7/16 in. thick oriented strand board (OSB) or 15/32 in. thick structural 1 sheathing (plywood) complying with DOC PS1 or PS2, or APA Standard PRP-108, manufactured with exterior glue, applied horizontally or vertically to the steel studs. Vertical joints centered on studs, and staggered one stud space from wallboard joints. Attached to studs with flat-head self-drilling tapping screws with a min. head diam. of 0.292 in. at maximum 6 in. OC. in the perimeter and 12 in. OC. in the field. When used, fastener lengths for gypsum panels increased by min. 1/2 in.

The maximum loading on the steel studs was evaluated with the steel studs braced at mid-height and not braced by the plywood sheathing.

5. **Gypsum Board*** — Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered when load is reduced to 90 percent of max stud capacity. When load is at 100 percent, horizontal edge joints and horizontal butt joints on opposite sides of studs staggered a min of 12 in. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. When used in widths other than 48 in., gypsum panels to be installed horizontally. The thickness and number of layers and percent of design load for the 45 min, 1 hr, 1-1/2 hr, and 2 hr ratings are as follows:

Wallboard Protection on Each Side of Wall

Rating	No. of Layers & Thkns of Panel	% of Design Load
45 Min	1 layer, 1/2 in. thick	100
1 hr	1 layer, 5/8 in. thick	100
1-1/2 hr	2 layers, 1/2 in. thick	100
2 hr	2 layers, 5/8 in. thick	80
2 hr@	2 layers, 5/8 in. thick	100
2 hr	3 layers, 1/2 in. thick	100
2 hr	2 layers, 3/4 in. thick	100

@Rating applicable when Batts and Blankets (Item 7) are used.

CGC INC — 1/2 in. thick Type IP-X2, IPC-AR, C, WRC, or; 5/8 in. thick Type SCX, SHX, WRX, IP-X1, AR, C, IP-AR, IP-X2, IPC-AR, ULX, or WRC; 3/4 in. thick Types AR, IP-AR, IP-X3, ULTRACODE

UNITED STATES GYPSUM CO — 1/2 in. thick Type C, IP-X2, IPC-AR, or WRC; 5/8 in. thick Type AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SGX, SHX, ULX, WRX, or WRC; 3/4 in. thick Types AR, IP-AR or IP-X3, ULTRACODE

USG MEXICO S A DE C V — 1/2 in. thick Type C, IP-X2, IPC-AR, WRC; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULX, WRX or WRC; 3/4 in. thick Types AR, IP-AR, IP-X3, ULTRACODE

5A. **Gypsum Board*** — (As an alternate to Item 5 when used as the base layer on one or both sides of wall, For direct attachment only, not to be used with Item 4) - Nom 5/8 in. or ¾ in. may be used as alternate to all 5/8 in. or ¾ in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 in. or ¾ in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over 20 MSG steel studs and staggered min 1 stud cavity on opposite sides of studs. See Items 1A, 2A 8, 8A(a). Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. To be used with Lead Batten Strips (see Item 12) or Lead Discs or Tabs (see Item 13).

RAY-BAR ENGINEERING CORP — Type RB-LBG

5B. **Gypsum Board*** — (As an alternate to Items 5 and 5A,) - Nom 5/8 in. thick gypsum panels with square edges, applied horizontally or vertically. For the1 hour single layer system -when the gypsum board panels are installed horizontally the joints are to be staggered by a minimum of 12 in. on opposite sides of assembly, they are to be secured on each side of the studs with 1-1/4 in. long Type S-12 bugle head steel screws spaced 8 in. OC to the top and bottom tracks and in the field with screws 1 in. and 4 in. from the horizontal joints. When the gypsum board panels are installed vertically all vertical joints must be centered over studs and staggered min 1 stud cavity on opposite sides of studs. Gypsum board secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC to the top and bottom tracks and in the field with screws 1 and 4 in. from the perimeter. For the 2 hour double layer system - when the gypsum board panels are installed horizontally the joints need not be staggered on opposite sides of assembly. Base layer secured on each side of the studs with 1-1/4 in. long Type S-12 bugle head steel screws spaced 16 in. OC to the top and bottom track and in the field with screws beginning 1 in. and 8 in. from the horizontal joints. Face layer horizontal joints staggered 8 in from base layer joints and secured with 1-5/8 in. long Type S-12 bugle head steel screws spaced 16 in. OC to the top and bottom tracks and in the field with screws beginning 1 in. and 8 in. from the horizontal joints. Face layer screws offset 8 in. from base layer screws. When the gypsum board panels are installed vertically all vertical joints must be centered over studs and staggered min 1 stud cavity on opposite sides of studs. Face layer gypsum boards secured to studs with 1-5/8 in. long Type S-12 steel screws spaced 16 in. OC with screws 2 in. and 16 in. from the perimeter. Base layer gypsum boards secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 16 in. OC with screws 1-1/2 in and 8 in. from the perimeter. Face layer screws offset 8 in. from base layer screws.

UNITED STATES GYPSUM CO — 5/8 in. thick Type USGX (Joint tape and compound, Item 9, optional with Type USGX)

5C. **Gypsum Board*** — (As an alternate to Item 5 when used as the base layer on one or both sides of wall, For direct attachment only, not to be used with Item 4). Nominal 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 (or #6 by 1-1/4 in. long bugle head fine driller) steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field.

NEW ENGLAND LEAD BURNING CO INC, DBA NELCO — Nelco

5D. **Gypsum Board*** — (As an alternate to Item 5 when used as the base layer on one or both sides of wall, For direct attachment only, not to be used with Item 4) - Nom 5/8 or 3/4 in. may be used as alternate to all 5/8 or 3/4 in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over 20 MSG steel studs and staggered min 1 stud cavity on opposite sides of studs. See Items 1A, 2A 8, 8A(a). Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. To be used with Lead Batten Strips (see Item 12A) or Lead Discs (see Item 13A).

MAYCO INDUSTRIES INC — Type X-Ray Shielded Gypsum

5E. **Gypsum Board*** — (As an alternate to Item 5 when used as the base layer on one or both sides of wall, For direct attachment only, not to be used with Item 4). Nom 5/8 in. may be used as alternate to all 5/8. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over 20 MSG steel studs and staggered min 1 stud cavity on opposite sides of studs. See Items 1A, 2A 8, 8A(a). Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field.. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 8 ft long with a max thickness of 0.14 in. placed on the face of studs and attached to the stud with construction adhesive and two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, nominal 3/8 in. diam by max 0.085 in. thick. Compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

RADIATION PROTECTION PRODUCTS INC — Type RPP - Lead Lined Drywall

6. **Fasteners** — (Not shown) — For use with Item 5 - Type S-12 steel screws used to attach panels to runners (Item 1 or 1A) and studs (Item 2 or 2A) or furring channels (Item 8). **Single layer systems: 1** in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 8 in. OC when panels are applied horizontally, or 12 in. OC when panels are applied vertically. **Two layer systems:** First layer- 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC. Second layer- 1-5/8 in. long for 1/2 in. and 5/8 in. thick panels or 2-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC with screws offset 8 in. from first layer. **Three-layer systems:** First layer- 1 in. long for 1/2 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below.

7. **Batts and Blankets*** — (Required as indicated under Item 5) — Nom 2 in. thick mineral wool batts, friction fitted between studs and runners. See **Batts and Blankets (BKNV or BZJZ) Categories** for names of Classified companies.

7A. **Batts and Blankets*** — (Optional, not shown) — Placed in stud cavities, any glass fiber or mineral wool insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance. See **Batts and Blankets (BKNV or BZJZ) Categories** for names of Classified companies.

7B. **Batts and Blankets*** — (Optional, not shown) — Placed in stud cavities, glass fiber insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance.

OWENS CORNING — Type QuietZone Acoustic Batts

8. **Furring Channels** — (Optional on one or both sides, not shown, for single or double layer systems) — Resilient furring channels fabricated from min 25 MSG corrosion-protected steel, spaced vertically a max of 24 in. OC. Flange portion attached to each intersecting stud with 1/2 in. long Type S-12 panhead steel screws. Not for use with type FRX-G gypsum panels and Item 5A or 5C.

8A. **Steel Framing Members (Not Shown)*** — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 8, furring channels and Steel Framing Members as described below:

a. **Furring Channels** — Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with type FRX-G gypsum panels and Item 5A or 5C.

b. **Steel Framing Members*** — Used to attach furring channels (Item 8a) to studs (Item 2). Clips spaced max. 48 in. OC., and secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips. RSIC-1 clip for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) clip for use with 2-23/32 in. wide furring channels.

PAC INTERNATIONAL INC — Types RSIC-1, RSIC-1 (2.75).

8B. **Steel Framing Members*** — Optional - Not Shown - Used as an alternate method to attach resilient channels (Item 8). Clips attached at each intersection of the resilient channel and the steel studs (Item 2). Resilient channels are friction fitted into clips, and then clips are secured to the stud with min. 1 in. long Type S-12 panhead steel screws through the center hole of the clip and the resilient channel flange.

8C. **Steel Framing Members** — (Not Shown)* — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 8, furring channels and Steel Framing Members as described below:

a. **Furring Channels** — Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with type FRX-G gypsum panels and Item 5A or 5C.

b. **Steel Framing Members*** — Used to attach furring channels to studs (Item 2). Clips spaced max. 48 in. OC., and secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips.

PLITEQ INC — Type GENIECLIP

9. **Joint Tape and Compound** — Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw heads of outer layers. Paper tape, nom 2 in. wide, embedded in first layer of compound over all joints of outer layers. Paper tape and joint compound may be omitted when gypsum boards are supplied with square edges.

10. **Siding, Brick or Stucco** — (Optional, not shown) — Aluminum, vinyl or steel siding, brick veneer or stucco, meeting the requirements of local code agencies. Brick veneer attached to studs with corrugated metal wall ties attached to each stud with steel screws, not more than each sixth course of brick.

11. **Caulking and Sealants*** — (Optional, not shown) — A bead of acoustical sealant applied around the partition perimeter for sound control.

UNITED STATES GYPSUM CO — Type AS

12. **Lead Batten Strips** — (Not Shown, For Use With Item 5A) - Lead batten strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. Strips placed on the interior face of studs and attached from the exterior face of the stud with two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5A) and optional at remaining stud locations. Required behind vertical joints.

12A. **Lead Batten Strips** — (Not Shown, for use with Item 5D) Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.140 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.5% meeting the Federal specification QQ-L-201f, Grades "B, C or D". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 6) and optional at remaining stud locations.

13. **Lead Discs or Tabs** — (Not Shown, For Use With Item 5A) - Used in lieu of or in addition to the lead batten strips (Item 12) or optional at other locations - Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards (Item 5A) underneath screw locations prior to the installation of the screws. Lead discs or tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

13A. **Lead Discs** — (Not Shown, for use with Item 5D) Max 5/16 in. diam by max 0.140 in. thick lead discs compression fitted or adhered over steel screw heads. Lead discs to have a purity of 99.5% meeting the Federal Specification QQ-L-201f, Grades "B, C or D".

14. **Lead Batten Strips** — (Not Shown, For Use With Item 5C) Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.142 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5C) and optional at remaining stud locations.

15. **Lead Tabs** — (Not Shown, For Use With Item 5C) 2 in. wide, 5 in. long with a max thickness of 0.142 in. Tabs friction-fit around front face of stud, the stud folded back flange, and the back face of the stud. Tabs required at each location where a screw (that secures the gypsum boards, Item 5C) will penetrate the steel stud. Lead tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead tabs may be held in place with standard adhesive tape if necessary.

*Bearing the UL Classification Mark

MATERN PROFESSIONAL ENGINEERING

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ORANGE COUNTY FIRE LOGISTICS WAREHOUSE HVAC REPLACEMENT

KBJ ARCHITECTS

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Revisions

No.	Date	Description

Key Plan

MPE PROJ#: 2013-171

Designed By: KBJ ARCHITECTS

Drawn By: GG / RB

Checked By: RB / Matern

Issue Date: 10/01/15

Drawing Scale: N.T.S.

Drawing Title:

U.L. DETAILS

BID DOCUMENTS

Drawing No.

A404

CREATE DATE: 4/27/2015 10:51:20 AM LAST SAVED: 9/28/2015 2:28:26 PM LAST SAVED BY: RBEYER

MATERN PROFESSIONAL ENGINEERING PLOT DATE: 9/28/2015 3:27:35 PM FILENAME: R:\U_2013\13034 OCFR HVAC project\drawings\13034_A404.dwg

GENERAL NOTES

1. REFER TO THE DIVISION 15 SPECIFICATIONS.
2. VISIT AND CAREFULLY EXAMINE THOSE PORTIONS OF THE BUILDING AND SITE AFFECTED BY THIS WORK BEFORE SUBMITTING PROPOSALS, SO AS TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT EXECUTION OF THE WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WILL NOT BE RECOGNIZED.
3. ALL GRILLES, REGISTERS OR DIFFUSERS SHOWN IN THE CEILING SHALL BE 24x24 UNLESS OTHERWISE NOTED.
4. PROVIDE A VOLUME DAMPER AT EVERY BRANCH DUCT AND AS SHOWN ON THE DOCUMENTS FOR ALL DUCTWORK SYSTEMS. ALL DAMPERS MAY NOT BE SHOWN ON THE DOCUMENTS FOR CLARITY.
5. ALL VOLUME DAMPERS INSTALLED ABOVE GYPSUM BOARD CEILING SHALL HAVE A REMOTELY OPERATED DAMPER. FIELD VERIFY LOCATION OF DEVICE.
6. FULLY COORDINATE ALL CEILING MOUNTED AIR DISTRIBUTION DEVICES WITH ARCHITECTURAL CEILING GRID.
7. ALL OUTSIDE AIR INTAKES SHALL HAVE A REMOVABLE AND CLEANABLE BIRD SCREEN.
8. ALL DUCT SIZES INDICATED ON THE DOCUMENTS ARE NET FREE AREA DIMENSIONS.
9. UNFORESEEN CONDITIONS MAY EXIST AND WORK MAY NOT BE FIELD LOCATED EXACTLY AS SHOWN ON THE DRAWINGS. COOPERATION WITH OTHER TRADES IN ROUTING AS DETERMINED DURING CONSTRUCTION AND AS DIRECTED BY THE ARCHITECT/ENGINEER MAY BE NECESSARY. IT IS INTENDED THAT SUCH DEVIATIONS SHALL BE CONSIDERED AS PART OF THIS CONTRACT. SUCH DEVIATIONS MAY NOT BE CONSIDERED AS PART OF THIS CONTRACT WHEN PROPERLY DOCUMENTED IN WRITING. THE PLANS ARE NOT COMPLETELY TO SCALE.
10. ALL PIPING AND DUCT IS TO BE CONCEALED ABOVE CEILING OR IN NEW WALLS, UNLESS SPECIFICALLY NOTED AS EXPOSED OR SURFACE MOUNTED.
11. WORK SHALL BE PERFORMED, IN STRICT COMPLIANCE WITH THE ESTABLISHED WORK SCHEDULE BEING SET FORTH BY THE OWNER. COORDINATE ALL WORK WITH GENERAL CONTRACTOR. THIS CONTRACTOR SHALL FURNISH ADEQUATE FORCES, CONSTRUCTION PLANT AND EQUIPMENT, AND SHALL WORK SUCH HOURS, INCLUDING NIGHT SHIFTS, OVERTIME OPERATIONS, SUNDAYS AND HOLIDAYS IN ACCORDANCE WITH THE OWNER'S OPERATIONAL SCHEDULE AS LISTED IN DIVISION 1 OF THE SPECIFICATIONS. IF THE CONTRACTOR DOES NOT MAINTAIN THE CONSTRUCTION SCHEDULE BECAUSE OF INADEQUATE FORCES, SUPERVISION OR ANY OTHER REASON UNDER THE CONTRACTOR'S CONTROL, THE OWNER MAY REQUIRE THE CONTRACTOR TO INCREASE THE NUMBER OF SHIFTS AND/OR OVERTIME OPERATIONS, DAY OF WORK AND/OR THE AMOUNT OF CONSTRUCTION PLANT, AT NO ADDITIONAL COST TO THE OWNER UNDER THIS CONTRACT. FAILURE TO MAINTAIN THE CONSTRUCTION SCHEDULE DUE TO OWNER'S OPERATIONAL INTERFERENCES, WHICH WERE NOT IDENTIFIED IN OR PRIOR TO THE PRE-BID CONFERENCE, SHALL NOT BE THE CONTRACTOR'S LIABILITY.
12. ALL CONCRETE, WALL PATCHING, CEILING REPAIR, FENCE WORK AND OTHER GENERAL CONSTRUCTION WORK REQUIRED FOR INSTALLING MECHANICAL SYSTEMS SHALL BE PROVIDED BY MECHANICAL CONTRACTOR AND FULLY COORDINATED WITH GENERAL CONTRACTOR USING THE APPROPRIATE CONSTRUCTION TRADES.
13. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BE UL LISTED WHERE APPLICABLE.
14. IN GENERAL, PLANS AND DIAGRAMS ARE SCHEMATIC ONLY AND SHOULD NOT BE SCALED. CONTRACTOR SHALL COORDINATE ALL PLUMBING, HEATING AND ELECTRICAL WORK AT THE SITE, SO AS NOT TO CONFLICT IN LOCATION WITH OTHER WORK UNDER THE CONTRACT.
15. ANY CONFLICT WITH DOORS, WINDOWS, CABINETS OR ANY OTHER EQUIPMENT SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER.
16. THE MECHANICAL CONTRACTOR IS DIRECTED TO COMPLY WITH DIVISION 16 OF THE CONTRACT SPECIFICATIONS REFERRING TO MOTORS, STARTERS, ETC.
17. WHENEVER A REFERENCE IS MADE TO STANDARD, INSTALLATION AND MATERIALS SHALL COMPLY WITH THE LATEST PUBLISHED EDITION AT THE TIME THE PROJECT IS BID UNLESS OTHERWISE SPECIFIED.
18. ALL MATERIAL STORED ON SITE SHALL BE PROPERLY PROTECTED FROM INJURY OR DETERIORATION. MATERIAL SHALL NOT BE STORED IN CONTACT WITH THE GROUND OR FLOOR. ALL DUCTWORK AND EQUIPMENT STORED SHALL BE SEALED AT ANY OPENING TO PREVENT ANY DEBRIS OR DIRT ENTERING THE INSIDE OF THE DUCTWORK AND EQUIPMENT. IF DEBRIS OR DIRT IS FOUND INSIDE THE DUCTWORK DURING ANY INSPECTION, THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL COSTS INCURRED TO CLEAN THE DUCTWORK TO THE SATISFACTION OF THE OWNER AND ENGINEER.
19. VOLUME DAMPERS SHALL BE INSTALLED IN ALL BRANCH DUCTS LEADING FROM MAIN TRUNK LINES.
20. ALL EXTERNAL FIBROUS GLASS WRAPPED INSULATION JOINTS, SEAMS AND CONNECTIONS SHALL BE CONSTRUCTED WITH FAB AND STAPLES AND THEN SEALED WITH MASTIC. HEAT AND PRESSURE SENSITIVE TAPE ARE NOT ACCEPTABLE AS A FINAL CLOSURE.
21. DUCTWORK SHALL BE SHEET METAL, EXTERNALLY WRAPPED UNLESS OTHERWISE NOTED, MIN. 26 GA. AND CONSTRUCTED IN STRICT ACCORDANCE WITH SMACNA STANDARDS.
22. CONTRACTOR SHALL COORDINATE WORK WITH ALL OTHER TRADES.
23. MECHANICAL CONTRACTOR TO TEST AND BALANCE HVAC SYSTEMS TO PROVIDE MAXIMUM PERFORMANCE WITH REGARDS TO CFM, TEMPERATURE AND STATIC PRESSURE. REFER TO SPECIFICATIONS FOR TEST AND BALANCE REQUIREMENTS.
24. ALL INSULATION USED FOR DUCTWORK SHALL BE INSTALLED THICKNESS RECOMMENDED BY THE ASHRAE GUIDE AND DATA BOOKS. INSULATION MATERIAL SHALL MEET NFPA 90A REQUIREMENTS AND SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATING AS TESTED IN ACCORDANCE WITH NFPA 225 OR UL 723 NOT EXCEEDING FLAME SPREAD OF MORE THAN 25 AND SMOKE DEVELOPED 50. REFER TO SPECIFICATIONS.
25. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE 2010 FLORIDA BUILDING CODE, 2010 FLORIDA BUILDING CODE – PLUMBING AND 2010 FLORIDA BUILDING CODE – MECHANICAL, 2010 FLORIDA FIRE PREVENTION CODE & STANDARDS AS REFERENCED IN DIVISION 1 AND THROUGHOUT THE SPECIFICATIONS.

GENERAL LEGEND

- PIPE SECTION–SUPPLY
- PIPE SECTION–RETURN
- DIRECTION OF FLOW IN PIPE
- PITCH PIPE DOWN IN DIRECTION OF ARROW
- PIPE UP
- PIPE DOWN
- A — PIPE ANCHOR
- G — PIPE GUIDE
- EJ — EXPANSION JOINT
- FLEXIBLE PIPE CONNECTOR
- BALL VALVE
- CHECK VALVE, HORIZONTAL SWING
- CHECK VALVE, VERTICAL SPRING LOADED
- GATE VALVE
- GLOBE VALVE
- BC — BALANCING COCK
- BUTTERFLY VALVE TAPPED LUG WAFER
- STRAINER, Y–TYPE AND BLOWOFF VALVE
- SV — STRAINER/SHUT–OFF VALVE & PRESSURE TAP
- PTV — SHUT–OFF VALVE & PRESSURE TAP
- AUTOMATIC CONTROL VALVE (2–WAY, 3–WAY)
- NEEDLE VALVE
- MAV — MANUAL AIR VENT
- AAV — AUTOMATIC AIR VENT
- PP — TEMPERATURE & PRESSURE TAP (PETE'S PLUG)
- PG — PRESSURE GAUGE W/BALL VL. (WATER)
- PTW — PRESSURE GAUGE TAPPING (WATER)
- S — SOLENOID VALVE
- E — CAPPED LINE
- CHS–UG — CHILLED WATER SUPPLY (BELOW GRADE)
- CHS — CHILLED WATER SUPPLY (ABOVE GRADE)
- CHR–UG — CHILLED WATER RETURN (BELOW GRADE)
- CHR — CHILLED WATER RETURN (ABOVE GRADE)
- CF — CHEMICAL FEED PIPING
- CD–UG — CONDENSATE DRAIN (BELOW GRADE)
- CD — CONDENSATE DRAIN (ABOVE GRADE)
- CWS–UG — CONDENSER WATER SUPPLY (BELOW GRADE)
- CWS — CONDENSER WATER SUPPLY (ABOVE GRADE)
- CWR–UG — CONDENSER WATER RETURN (BELOW GRADE)
- CWR — CONDENSER WATER RETURN (ABOVE GRADE)

- 4" — 6" — PIPE REDUCTION
- T — THERMOMETER
- TW — THERMOMETER WELL
- ROUND DUCT
- FLAT OVAL DUCT
- 12x6, 8"ø,G–1 / 160 CFM — SIDEWALL SUPPLY SIZE, NECK SIZE,TYPE CAPACITY
- 6x6, 8"ø,G–2 / 110 CFM — SIDEWALL RETURN SIZE, NECK SIZE,TYPE CAPACITY
- 6X6,8"ø,G–3 / 150CFM — CEILING DIFFUSER SUPPLY SIZE, NECK SIZE, TYPE CAPACITY
- 6X6, 8"ø,G–3 / 150 CFM — CEILING RETURN OR EXHAUST SIZE, NECK SIZE, TYPE CAPACITY
- 6X6,8"ø,G–3 / 150CFM — FLOOR SUPPLY SIZE, NECK SIZE,TYPE CAPACITY
- 6X6, 8"ø,G–3 / 150 CFM — FLOOR RETURN OR EXHAUST SIZE, NECK SIZE,TYPE CAPACITY
- SUPPLY LINEAR – LENGTH,WIDTH,G#,PLENUM SIZE XXX CFM PER PLENUM — CONTINUOUS,2–SLOT,G–7,48" PLENUM 150 CFM PER PLENUM
- RETURN LINEAR – LENGTH,WIDTH,G#,PLENUM SIZE XXX CFM PER PLENUM — CONTINUOUS,2–SLOT,G–7,OPEN
- UC / CFM — DOOR UNDERCUT 3/4"MAX., CAPACITY
- ΔT — DELTA T (TEMPERATURE DIFFERENCE)
- ROUND DUCT SECTION–SUPPLY
- ROUND DUCT SECTION–RETURN
- DUCT SECTION–SUPPLY
- DUCT SECTION–RETURN OR EXHAUST
- FLEXIBLE DUCT CONNECTION
- FIRE DAMPER & ACCESS DOOR
- VOLUME DAMPER
- TURNING VANES
- SMOKE DAMPER & ACCESS DOOR
- FLEXIBLE ROUND DUCT
- A / M–1M–2 — SECTION DESIGNATION; SHEET WHERE SECTION APPEARS; SHEET WHERE SECTION CUT
- T — THERMOSTAT
- SD — SMOKE DETECTOR
- SP — DOWN DUCT STATIC PRESSURE SENSOR
- CO_2 — INDOOR AIR QUALITY SENSOR
- M — MOTORIZED VALVE
- T — REMOTE TEMPERATURE SENSOR
- H — HUMIDISTAT
- M — MOTORIZED DAMPER
- CFM — AIR FLOW MEASURING STATION
- FM — FLOW METER
- POINT OF DISCONNECTION
- POINT OF CONNECTION

MECHANICAL ABBREVIATIONS

A	AMPERES	EVAP	EVAPORATOR	MCA	MAXIMUM CIRCUIT AMPS
AC	AIR CONDITIONING	EWB	ENTERING WET BULB TEMPERATURE	MOCP	MAXIMUM OVERCURRENT PROTECTION
AD	ACCESS DOOR	EWT	ENTERING WATER TEMPERATURE	LRA	LOCK ROTOR AMPS
AFF	ABOVE FINISHED FLOOR	EXIST	EXISTING	RLA	RATED LOAD AMPS
AHU	AIR HANDLING UNIT	EXP	EXPANSION	PC	PLUMBING CONTRACTOR
APPROX	APPROXIMATELY	F	FIRE SPRINKLER PIPING	PCHWP	PRIMARY CHILLED WATER PUMP
AP	ACCESS PANEL	°F	DEGREES FAHRENHEIT	PD	PRESSURE DROP
ARCH	ARCHITECTURAL	FA	FREE AREA (SQ. FT.) OR FACE AREA	PHC	PREHEAT COIL
AS	AIR SEPARATOR	FBP	FIELD BUILT PLENUM	PSI	POUNDS PER SQUARE INCH
AUTO	AUTOMATIC	FCO	FLOOR CLEANOUT	PSIA	PSI ABSOLUTE
AUX	AUXILLIARY	FCU	FAN COIL UNIT	PSIG	PSI GAUGE
BCS	BUILDING CONTROL SYSTEM	FD	FLOOR DRAIN	PRESS	PRESSURE
BHP	BRAKE HORSEPOWER	FDPR	FIRE DAMPER	PVC	POLYVINYL CHLORIDE
BLDG	BUILDING	FLA	FULL LOAD AMPERES	RA	RETURN AIR
BOD	BOTTOM OF DUCT	FLEX	FLEXIBLE	RAF	RETURN AIR FAN
BTU	BRITISH THERMAL UNIT	FPI	FINS PER INCH	REQ'D	REQUIRED
BTUH	BRITISH THERMAL UNITS PER HOUR	FPM	FEET PER MINUTE	RF	RELIEF FAN
CC	COOLING COIL	FPS	FEET PER SECOND	RH	RELATIVE HUMIDITY
CD	CONDENSATE DRAIN	FTB	FAN POWERED TERMINAL BOX	RHC	REHEAT COIL
CFM	CUBIC FEET PER MINUTE	FV	FACE VELOCITY	RHG	*REFRIGERANT HOT GAS DISCHARGE
CH	CHILLER	GA	GAUGE	RLL	*REFRIGERANT LIQUID LINE
CHR	CHILLED WATER RETURN	GAL	GALLONS	RM	ROOM
CHS	CHILLED WATER SUPPLY	GPH	GALLONS PER HOUR	RPM	REVOLUTIONS PER MINUTE
CHWP	CHILLED WATER PUMP	GPM	GALLONS PER MINUTE	RSL	*REFRIGERANT SUCTION LINE
CLG	CEILING	HB	HOSE BIBB	RV	RELIEF VALVE
CMU	CONCRETE MASONARY UNIT	H20	WATER	S/FDPR	COMBINED SMOKE AND FIRE DAMPER
CO	CLEAN–OUT	HC	HEATING COIL	SA	SUPPLY AIR
COMB	COMBINATION	HD	HEAD	SAF	SUPPLY AIR FAN
COMPR	COMPRESSOR	HORIZ	HORIZONTAL	SAN	SANITARY
COND	CONDENSATE OR CONDENSER	HP	HORSEPOWER OR HEAT PUMP	SAU	SOUND ATTENUATION UNIT
CONN	CONNECTION	HW	HOT WATER	SCHWP	SECONDARY CHILLED WATER PUMP
CONT	CONTINUATION	HR	HOUR	SGCHS	SECONDARY GLYCOL CHILLED WATER SUPPLY
CU	CONDENSING UNIT	HT	HEIGHT	SGCHR	SECONDARY GLYCOL CHILLED WATER RETURN
CU FT	CUBIC FEET	HZ	FREQUENCY (HERTZ)	SDPR	SMOKE DAMPER
CUH	CABINET UNIT HEATER	ID	INSIDE DIAMETER	SP	STATIC PRESSURE
CU IN	CUBIC INCHES	IN	INCH OR INCHES	SPEC	SPECIFICATION
CW	COLD WATER (CITY)	INSUL	INSULATION	TAO	TRANSFER AIR OPENING
CWP	CONDENSER WATER PUMP	KW	KILOWATT	TD	TRENCH DRAIN
CWR	CONDENSER WATER RETURN	LAT	LEAVING AIR TEMPERTURE	TDH	TOTAL DYNAMIC HEAD
CWS	CONDENSER WATER SUPPLY	LB/HR	POUNDS PER HOUR	TEMP	TEMPERATURE
D	DRAIN LINE	LBS	POUNDS	TS	TIPSPEED
DB	DRY BULB	LDB	LEAVING DRY BULB TEMPERATURE	TYP	TYPICAL
DG	DOOR GRILLE	LIN FT	LINEAR FEET	UG	UNDERGROUND
DHW	DOMESTIC HOT WATER	LWB	LEAVING WET BULB	UH	UNIT HEATER
DIAM	DIAMETER	LWT	LEAVING WATER TEMPERATURE	VAV	VARIABLE AIR VOLUME UNIT
DN	DOWN	MAX	MAXIMUM	VD	VOLUME DAMPER
DWG	DRAWING	MB	MIXING BOX	W	WATT
DX	DIRECT EXPANSION	MBH	BTUH, THOUSANDS	W/	WITH
EA	EXHAUST AIR	MC	MECHANICAL CONTRACTOR	W/O	WITHOUT
EAT	ENTERING AIR TEMPERATURE	MIN	MINIMUM	WB	WET BULB
EDB	ENTERING DRY BULB TEMPERATURE	NC	NORMALLY CLOSED	WC	WATER COLUMN
EDH	ELECTRIC DUCT HEATER	NIC	NOT IN CONTRACT	WCO	WALL CLEANOUT
EF	EXHAUST FAN	NO	NORMALLY OPEN	WG	WATER GAUGE
EH	ELECTRIC HEATER	NO.	NUMBER	WP	WORKING PRESSURE
EL	ELEVATION	NTS	NOT TO SCALE	WMS	WIRE MESH SCREEN
ELEC	ELECTRICAL	OA	OUTSIDE AIR	ZD	ZONE DAMPER
EQ	EQUAL	OD	OUTSIDE DIAMETER		
ET	EXPANSION TANK	OV	OUTLET VELOCITY		

PROJECT DESIGN CONDITIONS

TEMPERATURE CONDITIONS

OUTDOOR

	DRY BULB (F)	WET BULB (F)	COMMENTS
SUMMER	94	76	(0.40% mean coincided db/wb)
SUMMER	X		(0.40% wetbulb used for Cooling Tower Selection)
WINTER	35	X	(99.6% db)
DAILY RANGE	16.6	X	
LOCATION BASED ON ASHRAE WEATHER DATA FOR: ORLANDO, FL			

INDOOR

	DRY BULB (F)	RH %	COMMENTS
COOLING	74	50	+/- 2 DEGREES
HEATING	70	X	+/- 2 DEGREES

BUILDING LOAD CONDITIONS

INTERNAL LOADS

	QUANTITY	UNITS	COMMENTS
PEOPLE			REFER TO VENTILATION SCHEDULE
LIGHTING	1.4	W/SF	
EQUIPMENT	1	W/SF	
VENTILATION AIR			REFER TO VENTILATION SCHEDULE
FLOOR AREA	7500	S.F.	CONDITIONED S.F.

EXTERNAL LOADS

	"U" FACTOR	SHADING COEF.	COMMENTS
WALL	0.1	X	
ROOF	0.049	X	
GLAZING	0.94	0.6	

VENTILATION DETERMINATION IS BASED ON OCCUPANCY PER ASHRAE STD. 62.1-2007

ENVELOPE AND EQUIPMENT EFFICIENCIES ARE BASED ON ASHRAE STD. 90.1-2007 & THE 2010 FLORIDA BUILDING CODE - ENERGY CONSERVATION

THIS PROJECT IS DESIGNED UNDER THE 2010 FLORIDA BUILDING CODE & 2010 FLORIDA FIRE PREVENTION CODE

SHEET NO.	MECHANICAL SHEET INDEX FOR	SCALE
M001	GENERAL NOTES LEGENDS, & SYMBOLS - MECHANICAL	NONE
MD101	FLOOR PLAN - DEMO - MECHANICAL	AS NOTED
M101	FLOOR PLAN - RENO - MECHANICAL	AS NOTED
M401	EXISTING PHOTOGRAPHS - MECHANICAL	AS NOTED
M402	EXISTING PHOTOGRAPHS - MECHANICAL	AS NOTED
M501	CONTROL SCHEMATICS - MECHANICAL	NONE
M601	SCHEDULES - MECHANICAL	NONE
M701	DETAILS - MECHANICAL	AS NOTED
M702	DETAILS - MECHANICAL	AS NOTED

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ENG. BUS. No. EB-0005096 CERT. OF AUTH. No. 5096

ORANGE COUNTY FIRE LOGISTICS WAREHOUSE HVAC REPLACEMENT

Revisions

No.	Date	Description

Key Plan

MPE PROJ#: 2013–171

Designed By: BWP

Drawn By: AG/RN

Checked By: BWP

Issue Date: 10/01/15

Drawing Scale: NONE

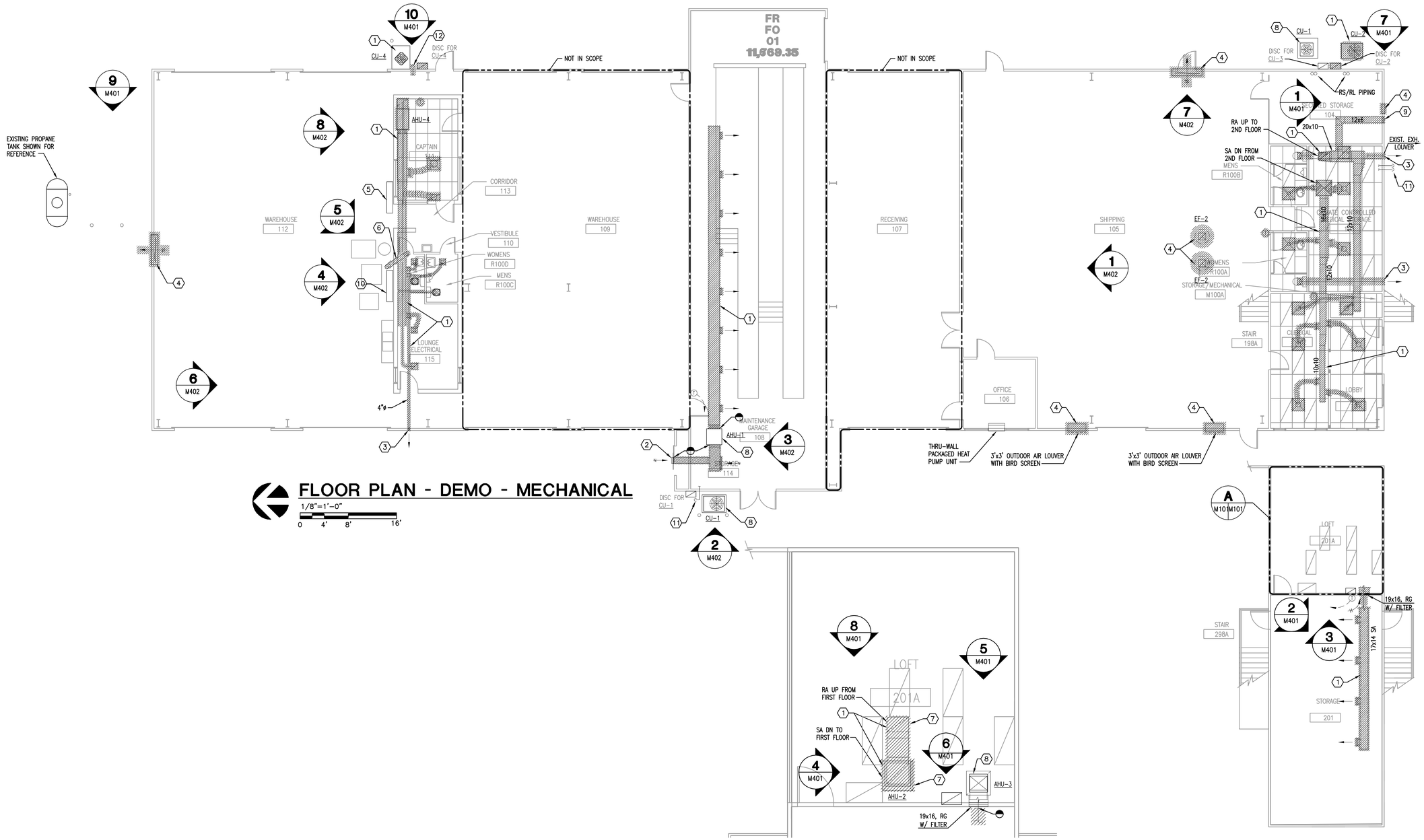
Drawing Title:

GENERAL NOTES LEGENDS, & SYMBOLS – MECHANICAL

BID DOCUMENTS

Drawing No.

M001



FLOOR PLAN - DEMO - MECHANICAL

1/8"=1'-0"

0 4' 8' 16'

ENLARGED MECH. ROOM

A M101|M101

1/4" =1'-0"

0 2' 4' 8'

2ND FLOOR PLAN - DEMO - MECH.

1/8"=1'-0"

0 4' 8' 16'

GENERAL NOTES

1. REFER TO GENERAL NOTES FOR THIS DISCIPLINE.
2. REFER TO SPECIFICATIONS.
3. ALL HEX NOTES NOT NECESSARILY USED ON ALL SHEETS.
4. THE FACILITY SHALL REMAIN OCCUPIED FOR THE DURATION OF THE PROJECT.
5. LIGHTING IS TO BE REMOVED AND PRESERVED IN ORDER TO FACILITATE THE INSTALLATION OF MECHANICAL EQUIPMENT, DUCTWORK, AND GRILLES/DIFFUSERS AS NEEDED. ALL LIGHTS ARE TO BE RE-INSTALLED BACK INTO ORIGINAL PLACEMENT AS FOUND BEFORE CONSTRUCTION INTO NEW CEILING GRID.
6. MECHANICAL CONTRACTOR TO REMOVE AND PRESERVE CEILING TILES IN ORDER TO FACILITATE THE INSTALLATION OF EQUIPMENT, DUCTWORK, AND GRILLES/DIFFUSERS AS NEEDED THROUGHOUT THE FLOOR. ALL CEILING GRIDS ARE TO BE RE-INSTALLED BACK INTO ORIGINAL PLACEMENT AS FOUND BEFORE CONSTRUCTION. CONTRACTOR TO REPLACE ALL BROKEN CEILING TILES AND GRIDS WITH NEW AS REQUIRED. REFER TO SPECIFICATION SECTION 09510.

DEMO HEX NOTES

1. REMOVE ALL EXISTING MECHANICAL EQUIPMENT IN THIS AREA, INCLUDING AIR HANDLING UNITS, EXHAUST FANS, CONDENSING UNITS, DUCTWORK, PIPING, CONTROLS, AND ALL OTHER ACCESSORIES, UNLESS OTHERWISE NOTED.
2. EXISTING INTAKE LOUVER TO REMAIN.
3. REMOVE EXISTING EXHAUST VENT.
4. REMOVE EXISTING HVAC COMPONENTS FROM EQUIPMENT. REPLACE WITH SHEET METAL ENCLOSURE. REFER TO ARCHITECTURAL DRAWINGS.
5. EXISTING GAS-FIRED UNIT HEATERS TO REMAIN.
6. EXIST. 8"ø DRYER VENT UP TO ROOF.
7. EXISTING FLOOR OPENINGS TO BE RE-USED FOR NEW DUCTWORK.
8. EXISTING MECHANICAL EQUIPMENT TO REMAIN.
9. REMOVE EXISTING INTAKE LOUVER.
10. EXISTING GAS-FIRED UNIT HEATER TO BE RELOCATED FOR NEW LAUNDRY ROOM WALL.
11. EXISTING CONDENSATE PIPING TO BE ROUTED TO DRYWELL. REFER TO M101.
12. EXIST. COND. DRAIN TO BE REMOVED.

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ORANGE COUNTY FIRE LOGISTICS WAREHOUSE HVAC REPLACEMENT

Revisions

No.	Date	Description

Key Plan

MPE PROJ#: 2013-171
Designed By: BWP
Drawn By: AG/RN
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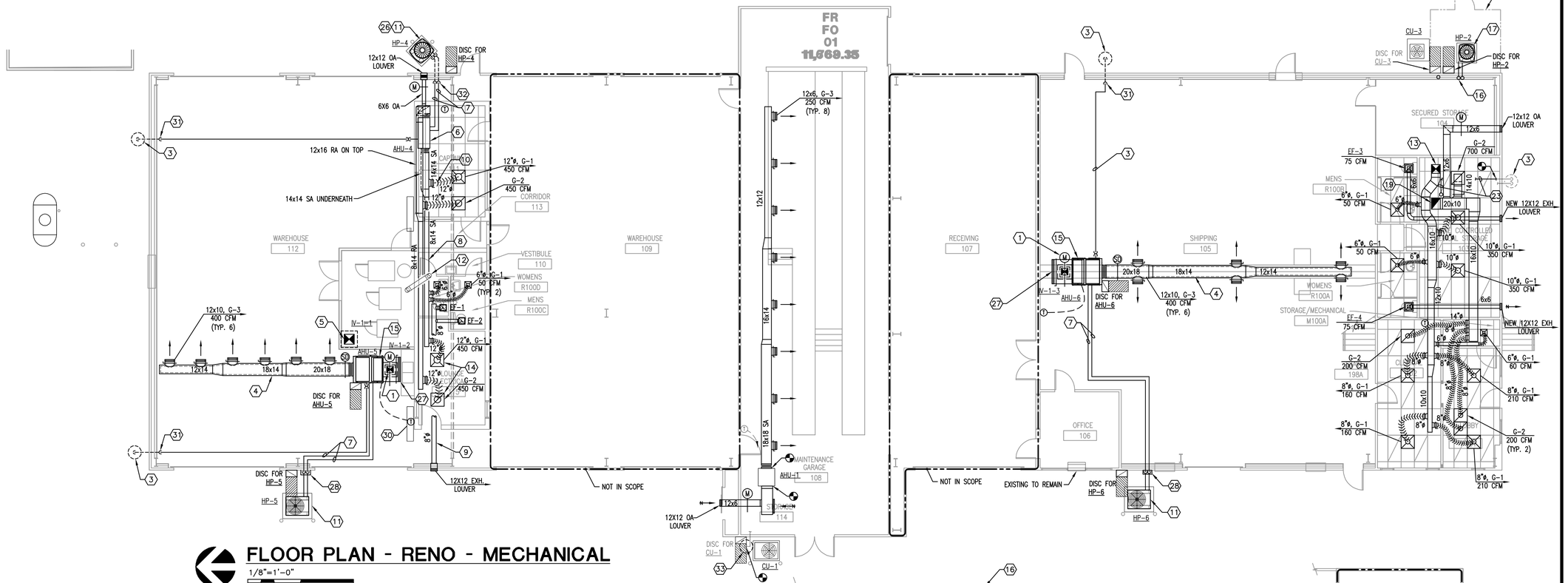
Drawing Title:
FLOOR PLAN - DEMO MECHANICAL

BID DOCUMENTS

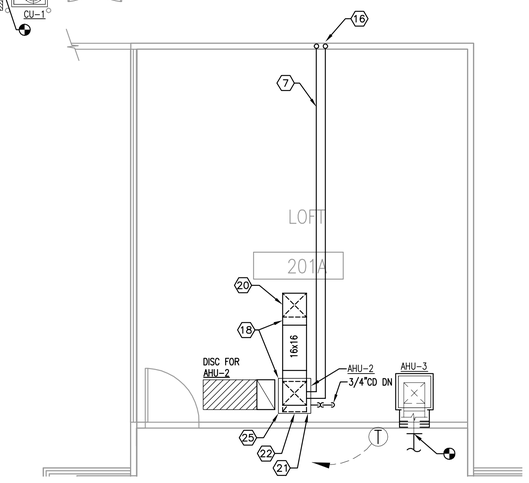
Drawing No.
MD101



FLOOR PLAN - RENO - MECHANICAL

1/8"=1'-0"

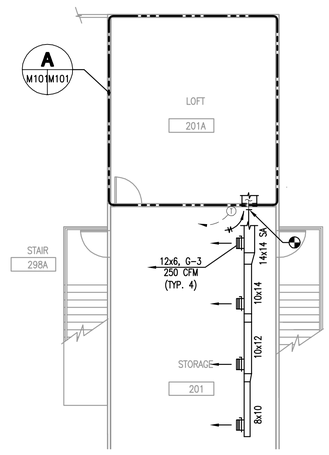
0 4' 8' 16'



A M101 ENLARGED MECH. ROOM

1/4" =1'-0"

0 2' 4' 8'



2ND FLOOR PLAN - RENO - MECH.

1/8"=1'-0"

0 4' 8' 16'

GENERAL NOTES

1. REFER TO GENERAL NOTES FOR THIS DISCIPLINE.
2. REFER TO SPECIFICATIONS.
3. ALL HEX NOTES NOT NECESSARILY USED ON ALL SHEETS.
4. THE FACILITY SHALL REMAIN OCCUPIED FOR THE DURATION OF THE PROJECT.
5. LIGHTING IS TO BE REMOVED AND PRESERVED IN ORDER TO FACILITATE THE INSTALLATION OF MECHANICAL EQUIPMENT, DUCTWORK, AND GRILLES/DIFFUSERS AS NEEDED. ALL LIGHTS ARE TO BE RE-INSTALLED BACK INTO ORIGINAL PLACEMENT AS FOUND BEFORE CONSTRUCTION INTO NEW CEILING GRID.
6. ALL AIR HANDLING SYSTEMS WILL UTILIZE A FULLY DUCTED RETURN AIR SYSTEM.
7. PROVIDE DUCT ACCESS DOOR FOR ALL S/FDPR, SDPR AND FDPR.
8. PROVIDE A VOLUME DAMPER ON ALL BRANCH DUCTWORK AND ANY RUN OUT TO A DIFFUSER, WHETHER SHOWN OR NOT ON THE DRAWINGS.
9. ALL VOLUME DAMPERS INSTALLED ABOVE GYPSUM BOARD CEILING SHALL HAVE A REMOTELY OPERATED DAMPER.
10. PROVIDE VOLUME DAMPERS ON EACH BATHROOM EXHAUST GRILLE.
11. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR ALL REFRIGERANT PIPE SIZES ACCORDING TO FINAL LENGTH OF RUN.
12. CONTRACTOR IS TO PROVIDE TEMPORARY COOLING AND/OR HEATING AS NECESSARY TO FACILITATE THE REPLACEMENT OF EXISTING AIR-HANDLING UNITS. PROVISIONS FOR TEMPORARY COOLING AND/OR HEATING SHALL BE INCLUDED IN THE BID.

HEX NOTES

1. 8x8 OA DN FROM INTAKE VENT ON ROOF W/ MOTORIZED DAMPER.
2. NEW RS/RL PIPING RUN LOW ABOVE GRADE.
3. 3/4" CD TO 24" DRY WELL. (TYP. WHERE SHWON)
4. EXPOSED DOUBLE WALL DUCTWORK CENTERED WITHIN WAREHOUSE BAY. COORDINATE ELEVATION WITH EXISTING SHELVING.
5. 18x18 COMBUSTION AIR DUCT DOWN FROM IV-1-1 ON ROOF. PROVIDE ONE 12x12 GRILLE 12" A.F.F. AND ONE 12x12 GRILLE 12" B.F.C. GRILLES EQUAL TO TITUS #350FL.
6. NEW HORIZONTAL DX FAN COIL UNIT MOUNTED ON EXISTING LOW ROOF. PROVIDE CONDENSATE PUMP.
7. NEW RS/RL PIPING RUN TIGHT TO METAL BUILDING STRUCTURE.
8. NEW SA & RA DUCTWORK MOUNTED ON EXISTING LOW ROOF.
9. NEW EA DUCTWORK MOUNTED ON EXISTING LOW ROOF.
10. PENETRATE STRUCTURE INTO CEILING CAVITY BELOW. TYP. ALL SA AND RA BRANCH CONNECTIONS FOR AHU-4.
11. 4" CONCRETE HOUSEKEEPING PAD.
12. EXISTING 8"ø DRYER VENT UP TO ROOF. RE-WORK VENT PIPE AS NECESSARY FOR NEW RATED WALL.
13. 16x16 SA DN FROM 2ND FLOOR.
14. ENLARGE EXISTING OPENINGS IN HARD CEILING TO ACCOMMODATE NEW DIFFUSERS AND GRILLES.
15. NEW HORIZONTAL DX UNIT SUSPENDED FROM STRUCTURE, MIN. 13' AFF.
16. RS/RL PIPING UP TO 2ND FLOOR IN WALL CAVITY.
17. NEW HEAT PUMP ON EXISTING CONCRETE PAD.
18. EXISTING FLOOR OPENINGS TO BE RE-USED.
19. 20x16 RA UP TO 2ND FLOOR.
20. 16x16 SA DN TO 1ST FLOOR.
21. NEW VERTICAL DX FAN COIL UNIT ON METAL STAND. REFER TO DETAIL ON SHEET M701.
22. COORDINATE NEW UNIT LOCATION WITH EXISTING SHELVING.
23. 3/4" CD RUN TIGHT TO METAL BUILDING STRUCTURE, CONNECT TO EXISTING CD DRAIN.
24. NOT USED
25. 20x16 RA UP FROM 1ST FLOOR INTO BOTTOM OF AHU-2.
26. NEW CONDENSING UNITS TO BE INSTALLED A MINIMUM OF 10' FROM EXISTING ABOVE-GROUND PROPANE TANK.
27. RETURN AIR DUCT FOR FAN COIL UNIT TO BE SAME SIZE AS RETURN AIR OPENING. COVER WITH WIRE MESH SCREEN.
28. SHEET METAL ENCLOSURE FOR REFRIGERANT PIPING. PAINT TO MATCH EXISTING STRUCTURE.
29. NEW SCREEN ENCLOSURE. REFER TO ARCHITECTURAL DRAWINGS FOR MORE DETAILS.
30. RELOCATED GAS-FIRED UNIT HEATER. EXTEND EXISTING GAS LINES AND ELECTRICAL AS REQUIRED.
31. RUN PIPING TIGHT TO WALL.
32. ROUTE RS/RL PIPING THROUGH WALL AT GRADE.
33. NEW 24" DRYWELL WITHIN ASPHALT. EXTEND EXISTING COND. DRAIN TO NEW DRYWELL.

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Drawing Title:

FLOOR PLAN - RENO MECHANICAL

BID DOCUMENTS

Drawing No.

M101

1 M401 **PHOTOGRAPH**
NOT TO SCALE

2 M401 **PHOTOGRAPH**
NOT TO SCALE

3 M401 **PHOTOGRAPH**
NOT TO SCALE

4 M401 **PHOTOGRAPH**
NOT TO SCALE

5 M401 **PHOTOGRAPH**
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6 M401 **PHOTOGRAPH**
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7 M401 **PHOTOGRAPH**
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8 M401 **PHOTOGRAPH**
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9 M401 **PHOTOGRAPH**
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10 M401 **PHOTOGRAPH**
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EXISTING PHOTOGRAPHS - MECHANICAL

BID DOCUMENTS

Drawing No.
M401

1 M402 **PHOTOGRAPH**
NOT TO SCALE

2 M402 **PHOTOGRAPH**
NOT TO SCALE

3 M402 **PHOTOGRAPH**
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7 M402 **PHOTOGRAPH**
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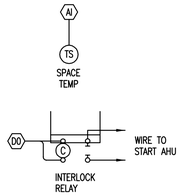
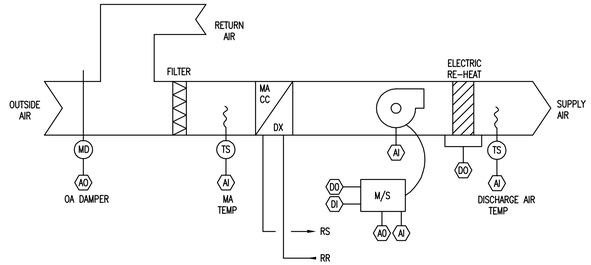
M402





SINGLE ZONE - MIXED AIR - CAV AHU CONTROL SCHEMATIC

NO SCALE

SEQUENCE OF OPERATIONS

SINGLE ZONE CAV, 1 SAF, NO RAF, ELECTRIC REHEAT (AHU-1, AHU-2, AHU-3, AHU-4, AHU-5, AHU-6):

1. UNOCCUPIED: WHEN THE BUILDING IS INDEXED FOR UNOCCUPIED OPERATION, THE UNIT SUPPLY FAN SHALL BE STOPPED, THE COMPRESSORS DISABLED. ALL ASSOCIATED EXHAUST FANS SHALL BE STOPPED.
2. NIGHT SET-UP: THE TEMPERATURE SENSOR SHALL SIGNAL THE UNIT TO START WHEN THE SPACE TEMPERATURE RISES TO 85 F. THE UNIT SHALL STOP WHEN THE TEMPERATURE DROP TO 80 F. THE UNIT SHALL OPERATE AS DESCRIBED UNDER OCCUPIED MODE.
3. SPACE TEMPERATURE CONTROL: THE ON-BOARD CONTROLLER SHALL CYCLE THE FAN AND COMPRESSORS TO MAINTAIN THE COOLING AND HEATING TEMPERATURE SETPOINTS FOR EACH ZONE.
4. OUTDOOR AIR MOTORIZED DAMPER SHALL OPEN WHENEVER ON-BOARD CONTROLLER CALLS FOR HEATING OR COOLING.

CONTROLS LEGEND

AFD	ADJUSTABLE FREQUENCY DRIVE	LAT	LEAVING AIR TEMPERATURE
AFMS	AIR FLOW MEASURING STATION	M/S	MOTOR STARTER/DISCONNECT
AI	ANALOG INPUT	OA	OUTSIDE AIR
AO	ANALOG OUTPUT	PD	DISCHARGE STATIC PRESSURE
BDD	BACK DRAFT DAMPER	R	RELAY
CC	COOLING COIL	RA	RETURN AIR
CHS	CHILLED WATER SUPPLY	RH	RELATIVE HUMIDITY
CHR	CHILLED WATER RETURN	Sa	SAFETY ALARM/SHUT-DOWN
CSR	CURRENT SENSING RELAY	SA	SUPPLY AIR
CV	CONTROL VALVE	SD	SMOKE DETECTOR
MD	MOTORIZED DAMPER	SPS	STATIC PRESSURE SENSOR
DI	DIGITAL INPUT	S/S	START-STOP
DO	DIGITAL OUTPUT	TEMP	TEMPERATURE
DP	DIFFERENTIAL PRESSURE	TS	TEMPERATURE SENSOR
DPS	DIFFERENTIAL PRESSURE SWITCH		
EHC	ELECTRIC HEATING COIL		
ES	END SWITCH		
F	AFD FAILURE ALARM		
Fa	FAILURE ALARM		
FR	FREEZESTAT		
FS	FLOW SWITCH		
HS	HUMIDITY SENSOR		
HC	HEATING COIL		
HL	HUMIDITY SENSOR (HIGH LIMIT)		
IAQ	INDOOR AIR QUALITY SENSOR		

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Drawing Title:

CONTROL SCHEMATICS - MECHANICAL

BID DOCUMENTS

Drawing No.

M501

SPLIT SYSTEM AIR HANDLING UNIT WITH ELECTRIC HEATING COIL SCHEDULE:

UNIT NO.	LOCATION	SUPPLY AIR FAN DATA								COOLING COIL DATA					HEATING COIL DATA			AUX ELECTRIC HEATING COIL DATA								FILTER DATA	SELECTION BASED ON		REMARKS
		TOTAL MAX. CFM	TOTAL O.A. CFM	FAN DATA						EAT F		LAT F		SEER/ EER @ ARI	TOTAL CAP (MBH)	EAT F	COND F	CFM	EAT F	LAT F	HEAT KW	STAGES	VOLT/ PH	MCA	MOCP	MIN. MERV RATING	MANUF.	MODEL	
				ESP IN H20	HP	FLA	RPM	VOLT	PH	DB	WB	DB	WB			DB	DB												
AHU-1 (EXISTING)	WAREHOUSE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	CARRIER	.	7
AHU-2	1ST FLOOR OFFICES	1,600	60	0.50	3/4	6.0	1050	230	1	76.7	63.5	54.5	53.4	14	44	68	47	1,600	70	85.2	7.7	1	230/1	48	50	10	TRANE	GAM5A0C48M41SA	1,2,3,4,5
AHU-3 (EXISTING)	2ND FLOOR STORAGE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	NORDYNE	B6BMM030K	7
AHU-4	1ST FLOOR OFFICES	1,050	50	0.50	1/2	4.1	1050	230	1	76.9	63.6	54.8	53.4	14.5	34.2	68	47	1,050	70	93.1	7.7	1	230/1	45	45	10	TRANE	GAM5A0B36M31SA	2,3,4,5,6
AHU-5	WAREHOUSE - LAUNDRY	2,400	160	0.50	1-1/2	2.5	1725	480	3	77.2	63.9	54.1	52.7		80.4	70	47	2,400	70	89.6	14.9	1	480/3	26	30	10	TRANE	TWE090	1,2,3,4,5
AHU-6	WAREHOUSE - SHIPPING	2,400	190	0.50	1-1/2	2.5	1725	480	3	77.4	64.0	54.1	52.7		80.4	70	47	2,400	70	89.6	14.9	1	480/3	26	30	10	TRANE	TWE090	2,3,4,5,6

NOTES:

1-VERTICAL DRAW-THRU/TOP DISCHARGE HEAT PUMP
2-CAV MOTOR STARTER CONTROLLED
3-MINIMUM MERV 10 FILTER
4-AUX HEATING COIL TO BE IN REHEAT POSITION
5-SINGLE POINT CONNECTION
6-HORIZ. DRAW-THRU/FRONT DISCHARGE HEAT PUMP
7-EXISTING AIR-HANDLER TO REMAIN.

SPLIT SYSTEM HEAT PUMP SCHEDULE:

UNIT NO.	SERVING	UNIT DATA		FAN MOTOR					COMPRESSOR DATA						UNIT ELECTRICAL DATA				SELECTION BASED ON		REMARKS
		CAPACITY MBH	COND. EAT F	NO.	HP	FLA (ea)	VOLT	PH	QUANTITY	STEPS	VOLT	PH	LRA (ea)	RLA (ea)	VOLT	PH	MCA	MOCP	MANUFACTURER	MODEL	
CU-1 (EXISTING)	AHU-1 (EXISTING)	60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	CARRIER	25HCD360	2
HP-2	AHU-2	48	95	1	1/5	0.6	480	1	1	1	480	3	41	6.2	480	3	8	15	TRANE	4TWA3048B	1
CU-3 (EXISTING)	AHU-3 (EXISTING)	30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	NORDYNE	JT4BD-030K	2
HP-4	AHU-4	36	95	1	1/5	0.6	480	1	1	1	480	3	38	5.8	480	3	8	15	TRANE	4TWA3036B	1
HP-5	AHU-5	90	95	1	1/2	1.6	480	1	1	1	480	3	100	13	480	3	17.9	25	TRANE	TWA090	1
HP-6	AHU-6	90	95	1	1/2	1.6	480	1	1	1	480	3	100	13	480	3	17.9	25	TRANE	TWA090	1

REMARKS
1 HEAT PUMP
2 EXISTING CONDENSING UNIT TO REMAIN

ROOF MOUNTED AIR INLET SCHEDULE:

UNIT NO.	SERVING	MAX CFM	MAX PRESS. DROP (IN)	TYPE			UNIT LENGTH (IN)	UNIT WIDTH (IN)	DUCT OPENING SIZE	SELECTION BASED ON		REMARKS
				INLET	FILTER	OUTLET				MANUFACTURER	MODEL	
IV-1-1	LAUNDRY ROOM	.	.	X			31	39	18x18	COOK	18X18GR	PROVIDE BIRDSCREEN
IV-1-2	AHU-5	160	0.011	X			27	31	12x12	COOK	12X12GR	PROVIDE BIRDSCREEN
IV-1-3	AHU-6	160	0.011	X			27	31	12x12	COOK	12X12GR	PROVIDE BIRDSCREEN

EXHAUST FAN SCHEDULE:

UNIT NO.	SERVING	TYPE	CFM	BLADE TYPE	SONES	TOTAL STATIC IN H20	FAN RPM	MOTOR DATA				SELECTION BASED ON:		REMARKS
								HP	RPM	VOLT	PH	MANUFACTURER	MODEL	
EF-1	TOILET	CABINET CEILING FAN	75	BI	1.2	0.25	769	59.5w	769	120	1	COOK	GC-144	1,2,3,4,5
EF-2	TOILET	CABINET CEILING FAN	75	BI	1.2	0.25	769	59.5w	769	120	1	COOK	GC-144	1,2,3,4,5
EF-3	TOILET	CABINET CEILING FAN	75	BI	1.2	0.25	769	59.5w	769	120	1	COOK	GC-144	1,2,3,4,5
EF-4	TOILET	CABINET CEILING FAN	75	BI	1.2	0.25	769	59.5w	769	120	1	COOK	GC-144	1,2,3,4,5

REMARKS:

1 PROVIDE BACKDRAFT DAMPER
2 PROVIDE DISCONNECT AT THE UNIT
3 PROVIDE SCR CONTROLLER ON ALL DIRECT DRIVE FANS
4 INTERLOCK WITH LIGHT SWITCH
5 PROVIDE ALUMINUM GRILLE

GENERAL COMMENTS:
1. ALL INLINE FANS WITH EXTERIOR MOTORS (NOT IN THE AIRSTREAM) TO HAVE AN INSULATED & VENTILATED FACTORY MOUNTED FAN ENCLOSURE BOX

GRILLE, REGISTER AND DIFFUSER SCHEDULE:

UNIT NO.	TYPE			SERVICE			MOUNTING DATA				CONSTRUCTION DATA			SELECTION BASED ON:		REMARKS
	G	R	D	SA	RA	EA	CEILING	DUCT	WALL HIGH	WALL LOW	SHAPE	MATERIAL	COLOR	MANUFACTURER	MODEL	
G-1			X	X			X				SQUARE	ALUMINUM	WHITE	TITUS	TMS-AA	
G-2	X				X		X		X		RECT.	ALUMINUM	WHITE	TITUS	50F	
G-3	X			X				X	X	X	RECT.	ALUMINUM	WHITE	TITUS	300FL	
G-4	X				X	X		X	X	X	RECT.	ALUM.	BY ARCH	TITUS	350FL	

NOTE: REFER TO ARCHITECTURAL DRAWINGS FOR BORDER TYPE ON ALL DIFFUSERS AND GRILLES.

NOTES:
1) PROVIDE MATCHING MOUNTING SCREWS. FINISH TO MATCH GRILLE.

VENTILATION RATE REQUIREMENT SCHEDULE

OCCUPANCY CATEGORY: MISC. SPACES		SPACE CLASSIFICATION	OCCUPANT COUNT	PEOPLE OUTDOOR AIR RATE	SQ. FT. OF AREA	AREA OUTDOOR AIR RATE	DEFAULT VALUES		TOTAL OUTDOOR AIR CFM REQUIRED
SERVED BY	ROOM			CFM/PERSON		REQ'D CFM/SQ. FT.	OCCUPANT DENSITY/1000 SQ. FT.	COMBINED OUTDOOR AIR RATE CFM/PERSON	
AHU-1	WAREHOUSE	WAREHOUSE	0	0	696	0.06	0	0	42
								TOTAL	42
AHU-2	OFFICE	OFFICE	2	5	415	0.06	5	17	35
	WAREHOUSE	WAREHOUSE	0	0	294	0.06	0	0	18
								TOTAL	53
AHU-3	WAREHOUSE	WAREHOUSE	0	0	1783	0.06	0	0	107
								TOTAL	107
AHU-4	OFFICE	OFFICE	2	5	320	0.06	5	17	29
								TOTAL	29
AHU-5	WAREHOUSE	WAREHOUSE	0	0	2600	0.06	0	0	156
								TOTAL	156
AHU-6	WAREHOUSE	WAREHOUSE	0	0	3160	0.06	0	0	190
								TOTAL	190

NOTE: REQUIRED OUTSIDE AIR CFM VALUES BASED ON ANSI/ASHRAE STANDARD 62.1-2007.

Duct & Pipe Construction & Insulation Requirements Schedule

Service	Thickness	Type	Notes
Supply Air Ducts			
AC Unit to Terminal - Balance of ductwork to terminal exposed 50 deg air system:	Installed R-6	Exposed: 2" rigid fiberblass with corner angles. Concealed: .75# density blanket.	
Return Air Ducts			
All return air ductwork:		Concealed - 2" thick external wrap Exposed - 1-1/2" rigid board with corner angles	
Outside Air Ducts			
All outside air ducts:	Installed R-6	Concealed - 2" thick external wrap Exposed - 1-1/2" rigid board with corner angles.	
Exhaust Air Ducts			
All general restroom exhaust ducts:		Not Required	
Refrigerant Piping			
Suction (RS) (Temp 35 - 45 deg F):		Up to 2": 3/4" Closed Cell Elast.	
RL (Temp 90 - 130 deg F):		Up to 2": Not Required	
Condensate Drain (CD): All sizes	1/2"	Closed Cell Elastomeric	
NOTES:			
Refer to specification section 23-07-00 for more details and information			
Insulation must meet or exceed FBC 2010 - Energy Conservation Code sections 503.2.7 through 503.2.8			
Insulation must meet or exceed FBC 2010 - Mechanical Code sections 604.1 through 604.13			
Insulation must meet or exceed ASHRAE 90.1-2010, Table 6.8.3			

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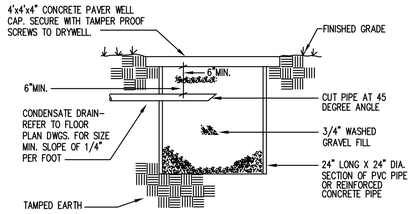
Drawing Title:
SCHEDULES - MECHANICAL

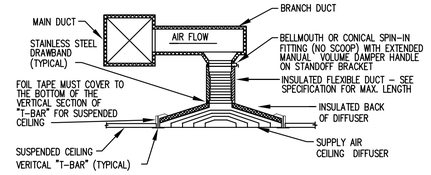
BID DOCUMENTS

Drawing No.
M601

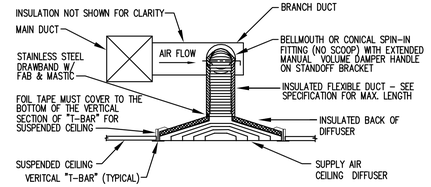


DRYWELL DIAGRAM

N.T.S.



BRANCH DUCT BOTTOM TAP



BRANCH DUCT SIDE TAP

INSULATION MUST BE SECURED TO BACK OF DIFFUSER BY ONE OF THE FOLLOWING METHODS:

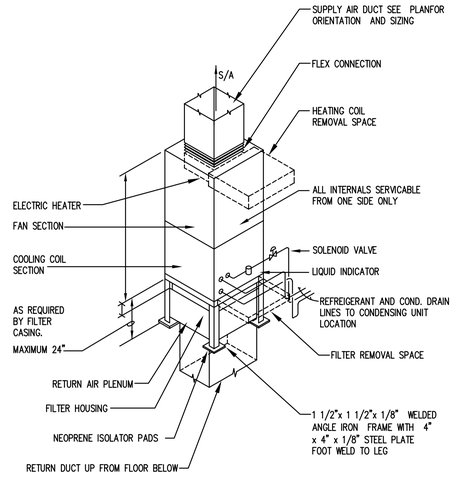
1) INSULATE TOP SIDE OF THE DIFFUSER TO THE EDGE. PLACE THE DIFFUSER ON THE SUSPENDED CEILING GRID AND TAPE FROM THE LOWEST PART OF DIFFUSER EDGE TO THE BOTTOM OF VERTICAL SECTION OF THE T-BAR ON THE OPPOSITE SIDE OF THE T-BAR WHERE DIFFUSER RESIDES. NO INSULATION SHOULD BE SHOWING AFTER TAPING AND ALL THE HOLES ON THE VERTICAL SECTION OF T-BAR SHOULD BE COMPLETELY COVERED.

2) INSULATE TOP SIDE OF THE DIFFUSER TO THE EDGE LEAVING ONLY 1/4" COMPLETELY AROUND THE EDGE. TAPE FROM THE TOP SIDE TO THE EDGE AND THEN PLACE THE DIFFUSER IN PLACE. THIS METHOD ALLOWS FOR THE DIFFUSER TO BE MOVED IF NECESSARY. 1/4" SPACE AROUND THE TOP LIP OF THE DIFFUSER IS FOR TAPING PURPOSES ONLY.

3) INSULATE TOP SIDE OF THE DIFFUSER TO THE EDGE. FLIP THE DIFFUSER WITH THE EXPOSED AREA FACING UP. TAPE 1/4" ON ALL FOUR SIDES. FLIP THE DIFFUSER WITH EXPOSED AREA FACING DOWN AND ROLL ALL FOUR TAPES OVER THE INSULATION AND SEAL. THIS METHOD ALSO ALLOWS FRO THE DIFFUSER TO BE MOVED IF NECESSARY.

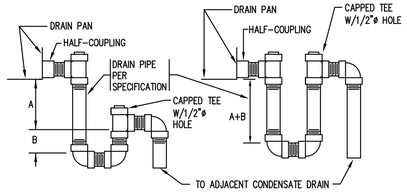
DIFFUSER CONNECTION DETAIL

N.T.S.



TYPICAL A/C MOUNTING DETAIL - AHU-2

N.T.S.



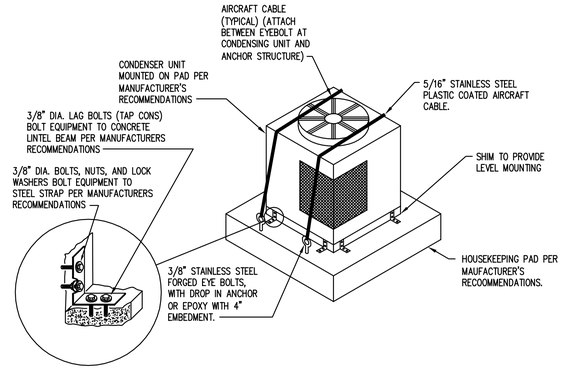
DRAIN PAN ON FAN INLET (NEGATIVE PRESSURE)

DRAIN PAN ON FAN OUTLET (POSITIVE PRESSURE)

NOTE:
1. DRAIN PIPE TO BE SAME SIZE AS UNIT OUTLET, BUT NOT LESS THAN 3/4" PIPE SIZE.
2. "A"=SYSTEM STATIC IN INCHES AT DRAIN POINT. "B"=1/2 SYSTEM STATIC IN INCHES AT DRAIN POINT.

AIR HANDLING UNIT DRAINS

N.T.S.



NOTE:
IT IS THE INTENT OF THIS DETAIL THAT THE CONTRACTOR PROPERLY INSTALL THE CONDENSER TO INSURE THAT THE CONDENSER SHALL WITHSTAND HURRICANE FORCE WINDS.

CONDENSING UNIT MOUNTING DETAIL

N.T.S.

MATERN PROFESSIONAL ENGINEERING
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ENG. BUS. No. EB-0005096 CERT. OF AUTH. No. 5096

ORANGE COUNTY FIRE LOGISTICS WAREHOUSE HVAC REPLACEMENT

Revisions

No.	Date	Description

Key Plan

MPE PROJ#: 2013-171

Designed By: BWP

Drawn By: AG/RN

Checked By: BWP

Issue Date: 10/01/15

Drawing Scale: AS NOTED

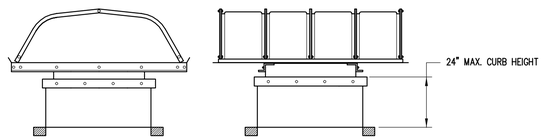
Drawing Title:

DETAILS - MECHANICAL

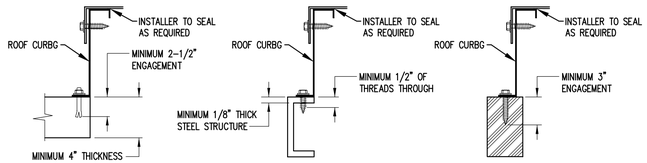
BID DOCUMENTS

Drawing No.

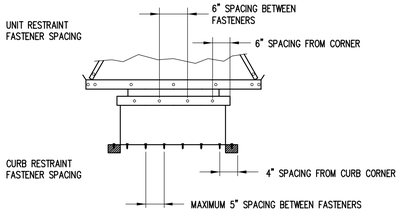
M701



ATTACHMENT OF CURB TO ROOF STRUCTURE



CONCRETE ROOF DECK | STEEL ROOF STRUCTURE | TIMBER ROOF STRUCTURE



NOTES:

1. GR GRAVITY VENTILATOR AS REFERRED TO HEREIN REFERS TO ALL LOREN COOK MODEL GR GRAVITY VENTILATORS IN SIZES DEFINED BY THE INSIDE THROAT DIMENSIONS UP TO 36 x 36. THE EXTERIOR HOUSING AND COMPONENTS MAY BE CONSTRUCTED OF EITHER GALVANIZED STEEL OR ALUMINUM WITH THE PRESSURE RATINGS OF +/- 130 PSF (GALVANIZED STEEL) OR +/- 60 PSF (ALUMINUM).
2. THIS APPROVAL IS FOR THE STRUCTURAL CAPACITY OF THE EXTERIOR HOUSING ONLY, IT DOES NOT INCLUDE ANY INTERIOR MECHANISM OR ELECTRICAL PART.
3. THIS PRODUCT HAS NOT BEEN TESTED FOR WATER PENETRATION.
4. UNIT IS TO INCLUDE A CURB CAP BASE TO FACILITATE MOUNTING OF THE UNIT TO A CURB. THE CURB WILL BE ADEQUATELY ATTACHED TO THE BUILDING STRUCTURE TO SUSTAIN ALL FORCES WHICH MAY BE PRODUCED BY THE PRESCRIBED ENVIRONMENTAL FORCES EXERTED ON THE FAN AND CURB. THE CURB MUST BE ATTACHED TO A STRUCTURAL MEMBER OF THE BUILDING.

   CONCRETE DECK: CURB IS TO BE ATTACHED WITH WEDGE TYPE CONCRETE ANCHOR – MINIMUM 3/8" DIAMETER CARBON STEEL – HILTI KWIK BOLT 3 OR EQUAL. MINIMUM 2-1/2" OF ENGAGEMENT IN 2000 PSI MINIMUM CONCRETE. MINIMUM DECK THICKNESS IS 4" AND ANCHORS ARE MINIMUM 2" FROM EDGE. ANCHORS ARE TO BE INSTALLED 4" FROM EACH CORNER AND SPACED 5" THEREAFTER.

   STEEL ROOF STRUCTURE: CURB IS TO BE ATTACHED WITH SELF-TAPPING STEEL SCREW OF MINIMUM NOMINAL SIZE OF 3/8" DIAMETER AND SCREW SHALL PASS THROUGH STEEL AT LEAST 1/2". THE SCREW MUST BE AT LEAST 2 SCREW DIAMETERS FROM MATERIAL EDGE. SCREWS SHALL BE INSTALLED 4" FROM EACH CORNER AND 5" THEREAFTER.

   TIMBER ROOF STRUCTURE: CURB IS TO BE ATTACHED WITH STEEL LAG BOLTS NOMINAL SIZE OF 3/8" DIAMETER OR LARGER. TIMBER IS TO BE 2" NOMINAL SIZE OR GREATER. THE BOLT SHALL HAVE A MINIMUM OF 3" OF THREAD ENGAGEMENT AND SHALL BE AT LEAST 1" FROM MATERIAL EDGE. BOLTS SHALL BE INSTALLED 4" FROM EACH CORNER AND 5" THEREAFTER.
5. THE CURB SHALL BE CONSTRUCTED OF 5052H-34 ALUMINUM OR G-90 GALVANIZED STEEL OR STAINLESS STEEL. THE CURB MATERIAL THICKNESS SHALL BE 18 GA (0.0470") OR GREATER. THE CURB HEIGHT SHALL NOT EXCEED 24".
6. THE GR GRAVITY VENTILATOR SHALL BE ATTACHED TO THE CURB WITH ONE OF THE FOLLOWING METHODS INSTALLED ON ALL FOUR SIDES OF THE CURB CAP. THE FASTENERS SHALL BE 6" FROM EACH CORNER OF THE FAN BASE AND SPACED NO GREATER THAN 6" THEREAFTER.
   A) #12 x 2" HEX WASHER HEAD SELF-DRILLING SCREW.
   B) ALTERNATE FASTENER – 0.25" HEAD BOLT AND WASHER WITH COMPANION NUT INSTALLED ON THE INTERIOR OF THE CURB.
7. ALL FASTENERS ARE TO BE HIGH QUALITY CORROSION RESISTANT STEEL OR STAINLESS STEEL.
8. ANY GAP BETWEEN THE CURB AND CURB CAP SHALL BE FILLED BY THE INSTALLING CONTRACTOR WITH A SUITABLE CORROSION RESISTANT MATERIAL THAT ALLOWS THE FASTENERS TO BE INSTALLED WITHOUT CAUSING EXCESSIVE DISTORTION OF THE UNIT FLANGES.
9. THE INSTALLER IS RESPONSIBLE FOR CHECKING THAT ALL FASTENERS ARE PROPERLY INSTALLED AND ALL ACCESS PANELS ARE IN PLACE BEFORE PUTTING THE UNIT INTO SERVICE.
10. ALL FASTENERS AND ACCESS PANELS MUST BE PROPERLY INSTALLED AFTER MAINTENANCE OPERATIONS FOR UNIT TO MAINTAIN CODE COMPLIANCE.

GR GRAVITY VENTILATOR HURRICANE RATED ALUMINUM AND STEEL

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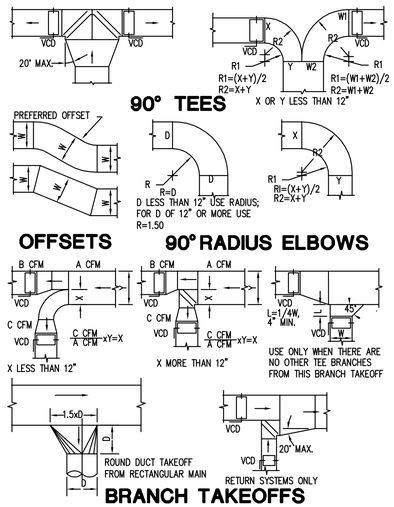

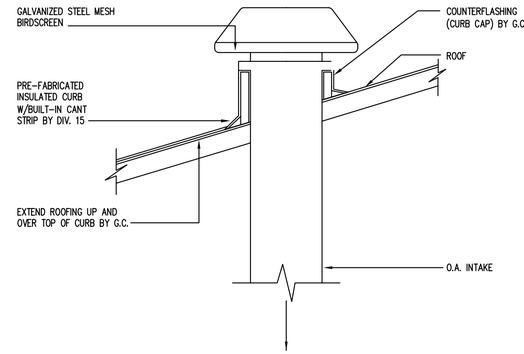

GRAVITY ROOF INTAKE DETAIL

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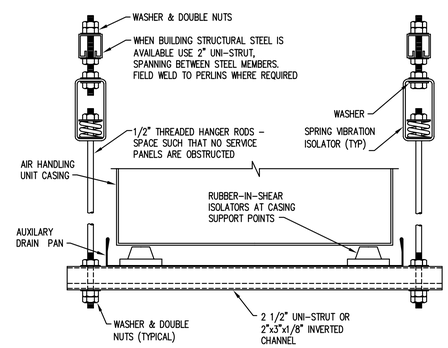

A/C UNIT HANGER DETAIL

N.T.S.

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ENG. BUS. No. EB-0005096 CERT. OF AUTH. No. 5096

ORANGE COUNTY FIRE LOGISTICS WAREHOUSE HVAC REPLACEMENT

Revisions

No.	Date	Description

Key Plan

MPE PROJ#: 2013-171

Designed By: BWP

Drawn By: AG/RN

Checked By: BWP

Issue Date: 10/01/15

Drawing Scale: AS NOTED

Drawing Title:

DETAILS – MECHANICAL

BID DOCUMENTS

Drawing No.

M702

GENERAL NOTES

1. ALL 277V, 20A CIRCUIT HOMERUNS OVER 100 FT. SHALL BE #10 CU. MINIMUM, UNLESS OTHERWISE NOTED.
2. ALL 277V, 20A CIRCUITS WITH HOMERUNS OVER 150 FT. SHALL BE #10 CU. THROUGHOUT ENTIRE CIRCUIT MINIMUM, UNLESS OTHERWISE NOTED.
3. NO MULTI-WIRE BRANCH CIRCUITS ARE TO BE USED. EACH CIRCUIT IS TO HAVE SEPARATE INDIVIDUAL NEUTRAL.
4. VERIFY EXACT LOCATION OF ALL MECH. EQUIP. INCLUDING WALL SWITCHES, T'STATS, ETC. WITH MECH. CONTRACTOR AND MECH. DRAWINGS.
5. REFER TO MECHANICAL EQUIPMENT SCHEDULE, FOR RESPECTIVE CONDUIT/CONDUCTORS, DISCONNECTS, MISC. EQUIPMENT REQUIRED FOR ALL MECHANICAL AND PLUMBING EQUIPMENT. REFER TO PANEL SCHEDULES FOR CIRCUITS NUMBERS OF CIRCUITS FOR MECHANICAL AND PLUMBING EQUIPMENT.
6. VISIT AND CAREFULLY EXAMINE THOSE PORTIONS OF THE BUILDING AND SITE AFFECTED BY THIS WORK BEFORE SUBMITTING PROPOSALS; SO AS TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT EXECUTION OF THE WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WILL NOT BE RECOGNIZED.
7. READ SPECIFICATIONS.
8. SEE RISER DIAGRAMS AND BUILDING PLANS.
9. ALL EMPTY CONDUITS ARE TO HAVE PULL-STRINGS PROVIDED IN THEM.
10. SPLICES IN POWER AND LIGHTING OUTLET BOXES SHALL BE KEPT TO A MINIMUM, PULL CONDUCTORS THROUGH TO DEVICES, EQUIPMENT CABINETS/PANELBOARDS. SPLICING IN WIREWAYS IS NOT PERMITTED UNLESS SPECIAL WRITTEN PERMISSION IS GRANTED BY A/E.
11. CONTRACTOR SHALL INCLUDE IN HIS BID THE TRANSPORT AND DISPOSAL OR RECYCLING OF ALL WASTE MATERIALS GENERATED BY THIS PROJECT IN ACCORDANCE WITH ALL RULES, REGULATIONS AND GUIDELINES APPLICABLE. CONTRACTOR SHALL COMPLY FULLY WITH FLORIDA STATUTE 403.7186 REGARDING MERCURY CONTAINING DEVICES AND LAMPS. LAMPS, BALLASTS AND OTHER MATERIALS SHALL BE TRANSPORTED AND DISPOSED OF IN ACCORDANCE WITH ALL DEP AND EPA GUIDELINES APPLICABLE AT TIME OF DISPOSAL. CONTRACTOR SHALL PROVIDE OWNER WITH WRITTEN CERTIFICATION OF ACCEPTED DISPOSAL.
12. MOUNT ALL DISCONNECT SWITCHES FOR MECHANICAL EQUIPMENT WITHIN 6 FT. OF EQUIPMENT CONNECTION POINT. VERIFY LOCATION OF POINT OF CONNECTION WITH EQUIPMENT INSTALLER PRIOR TO ELECTRICAL ROUGH-IN. (DRAWINGS ONLY SHOW DIAGRAMMATIC LOCATION OF CONNECTION).
13. PROVIDE, INSTALL AND CONNECT ONE 20 AMP DUPLEX RECEPTACLE IN CAST WEATHERPROOF BOX WITH WEATHERPROOF COVER WITHIN 25 FEET OF ALL MECHANICAL EQUIPMENT INSTALLED ON ROOFS OR IN ATTICS. CONNECT RECEPTACLES TOGETHER (MAXIMUM OF SIX PER CIRCUIT) WITH #10 WIRE AND CONNECT TO CLOSEST 120 VOLT PANEL. CONNECT TO 20 AMP 1 POLE SPARE CIRCUIT BREAKER AND RELABEL BREAKER "ROOF RECEPTS."
14. EXISTING CONDITIONS INDICATED ARE TAKEN FROM EXISTING CONSTRUCTION DOCUMENTS, VARIOUS SURVEYS, AND FIELD INVESTIGATIONS. IT IS TO BE UNDERSTOOD THAT UNFORESEEN CONDITIONS PROBABLY EXIST AND NEW WORK MAY NOT BE FIELD LOCATED EXACTLY AS SHOWN ON THE DRAWINGS. COOPERATION WITH OTHER TRADES IN ROUTING AND/OR BURIAL DEPTHS AS DETERMINED DURING CONSTRUCTION AND AS DIRECTED BY THE ENGINEER MAY BE NECESSARY AND IT IS INTENDED THAT SUCH DEVIATIONS SHALL BE CONSIDERED A PART OF THIS CONTRACT. IT IS ALSO UNDERSTOOD THAT THE PLANS ARE NOT COMPLETELY TO SCALE. THIS CONTRACTOR IS TO FIELD VERIFY DIMENSIONS OF ALL SITE UTILITIES, ETC., PRIOR TO BID AND INCLUDE ANY DEVIATIONS IN THE CONTRACT.
15. REMOVE EXISTING POWER, LIGHTING, SYSTEMS, MATERIAL AND EQUIPMENT WHICH ARE MADE OBSOLETE OR WHICH INTERFERE WITH THE CONSTRUCTION OF THE PROJECT.
16. REINSTALL ANY SUCH POWER, LIGHTING, SYSTEMS, MATERIALS AND EQUIPMENT WHICH ARE REQUIRED TO REMAIN ACTIVE FOR THE FACILITY TO BE FULLY FUNCTIONAL.
17. ALL EXISTING ELECTRICAL IS NOT SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS PRIOR TO BID, AND INCLUDE IN HIS BID THE REMOVAL OF ALL ELECTRICAL EQUIPMENT, WIRE, CONDUIT, DEVICES, FIXTURES, ETC. THAT IS NOT BEING REUSED, BACK TO ITS SOURCE.
18. ALL RECEPTACLES, DEVICES AND EQUIPMENT NOT SHOWN, AND IN AREAS OUTSIDE OF REMODELING SHALL REMAIN ACTIVE UNLESS OTHERWISE NOTED. FURNISH AND INSTALL ACCESSIBLE JUNCTION BOXES AND REWORK EXISTING CIRCUITS AS REQUIRED TO MAINTAIN CIRCUIT CONTINUITY TO RECEPTACLES, DEVICES AND EQUIPMENT REMAINING.
19. ALL CONDUIT TO BE CONCEALED UNLESS IMPOSSIBLE DUE TO EXISTING CONDITIONS (I.E. EXPOSED CEILINGS, BUILDING EXTERIOR WALL RUNS, IMPOSSIBLE UNDERGROUND RUNS). CONCEAL ALL CONDUITS ABOVE CEILINGS OR IN WALL/COUNTERS.
20. ALL NEW DEVICES TO BE FLUSH MOUNTED UNLESS SPECIFICALLY NOTED OTHERWISE.
21. PROVIDE NEW TYPED PANEL DIRECTORIES FOR ALL EXISTING AND NEW PANELBOARDS FOR PANELBOARDS ASSOCIATED WITH CONTRACT WHETHER SHOWN ON PLANS OR NOT REGARDLESS IF SCHEDULES/CIRCUITRY HAS BEEN CHANGED.
22. PROVIDE NEW PHENOLIC LABELS (PER SPEC'S) ON ALL (2) TWO POLE AND (3) THREE POLE CIRCUIT BREAKERS WITHIN ALL EXISTING AND NEW PANELBOARDS ASSOCIATED WITH CONTRACT WHETHER SHOWN ON PLANS OR NOT REGARDLESS IF SCHEDULES/CIRCUITRY HAS BEEN CHANGED.
23. ALL EXISTING AND NEW CIRCUIT BREAKERS WITHIN EACH EXISTING PANELBOARD SHALL BE THE SAME MFG. TYPE, STYLE AND A.I.C. RATING OF EXISTING PANELBOARD REGARDLESS OF WHAT IS SHOWN ON PANEL SCHEDULE. FIELD VERIFY ALL EXISTING PANELBOARD(S) RELATED WITH CONTRACT AND REPLACE CIRCUIT BREAKERS AS NECESSARY TO COMPLY WITH THIS REQUIREMENT.
24. ALL CONCRETE, WALL PATCHING, CEILING REPAIR, WALL FINISHES, AND OTHER GENERAL WORK REQUIRED FOR INSTALLING ELECTRICAL SYSTEMS SHALL BE REPAIRED TO "LIKE NEW/ORIGINAL CONDITION." (COORDINATE WITH GENERAL CONTRACTOR PRIOR TO BID.)
25. ALL OPENINGS IN FIRE RATED WALLS AND FLOORS, ETC. MADE BY RENOVATION SHALL BE SEALED AND FIREPROOFED. PROVIDE AND INSTALL FIRESTOPPING ON ALL NEW OR EXISTING CONDUIT AND/OR CABLE THAT PENETRATES ANY FIRE RATED NEW OR EXISTING WALL IN ALL AREAS AFFECTED BY THIS PROJECT. VERIFY LOCATION OF FIRE RATED WALLS WITH ARCHITECTURAL PLANS PRIOR TO BID. FIRESTOPPING SYSTEM SHALL BE AS REQUIRED BY UL FOR RATING OF WALL AND CONDUIT/CABLE PENETRATION.
26. DASHED ITEMS INDICATE EXISTING TO REMAIN.
27. "R" ADJACENT TO DEVICE INDICATES EXISTING TO BE REMOVED COMPLETE.
28. ALL ITEMS REMOVED AND NOT RE-USED SHALL BE IMMEDIATELY TURNED OVER TO OWNER AS THEY ARE MADE AVAILABLE BY RENOVATION. REMOVE ITEMS FROM JOB SITE AND DELIVER TO OWNERS STORAGE LOCATION(S) AS DIRECTED BY PROJECT MANAGER. DISCARD COMPLETE ITEMS WHICH OWNER ELECTS TO REFUSE.
29. CONTRACTOR MAY REUSE EXISTING CONDUIT (MIN. OF 10' LENGTHS) AND ASSOCIATED FITTINGS, PULL BOXES, ETC., WHICH ARE IN "LIKE NEW CONDITION" AND WHICH MEET THE INTENT OF THE SPECIFICATIONS FOR NEW PRODUCTS. WHERE EXISTING RACEWAYS ARE REUSED, THE CONTRACTOR SHALL REMOVE EXISTING WIRING, PULL IN NEW WIRING, AND CONNECT TO NEW DEVICES AS SHOWN ON THE DRAWINGS AND CALLED FOR IN THE SPECIFICATIONS. REUSE OF EXISTING DEVICES AND WIRING SHALL NOT BE ALLOWED UNLESS SPECIFICALLY NOTED OTHERWISE. ALL EXISTING CONDUITS THAT ARE REUSED SHALL BE PERMANENTLY IDENTIFIED IN ACCORDANCE WITH THE SPECIFICATIONS.
30. REWORK, RELOCATE, DISCONNECT AND RECONNECT EXISTING ELECTRICAL, INCLUDING LIGHTING FIXTURES, FIRE ALARM/SYSTEMS FIXTURES AND CIRCUITRY, I.E. CONDUIT, WIRE ETC. AS REQUIRED TO FACILITATE DEMOLITION OR INSTALLATION OF MECHANICAL EQUIPMENT. REFER TO MECHANICAL PLANS.

FIRE ALARM SYSTEM SYMBOL LEGEND			
SYMBOL	DESCRIPTION	MOUNTING HEIGHT	MOUNTING
	SINGLE REMOTE SMOKE DETECTOR/ALARM INDICATING LIGHT AND TEST SWITCH STATION. NUMBER INDICATES QUANTITY OF STATIONS.	6'-0" A.F.F. TO C/L OR FLUSH IN CEILING	FLUSH
	DUCT SMOKE DETECTOR, PHOTO-ELECTRIC TYPE, WITH TUBES SIZED AS REQUIRED FOR DUCT (R/A-DENOTES RETURN AIR DUCT, S-DENOTES SUPPLY DUCT)	---	DUCT
AR	AHU/EXHAUST FAN SHUT-DOWN RELAY, ADDRESSABLE	WITHIN THREE FEET (3') OF STARTER	SURFACE
FACP	FIRE ALARM CONTROL PANEL WITH SMOKE DETECTOR MOUNTED ABOVE PANEL PER NFPA.	6'-0" A.F.F. TO TOP OF FACP (UNLESS OTHERWISE NOTED)	SURFACE
FATC	FIRE ALARM TERMINAL CABINET	6'-0" A.F.F. TO TOP OF FATC (UNLESS OTHERWISE NOTED)	SURFACE
F	FIRE ALARM SYSTEM CONDUIT	---	CONCEALED
	RACEWAY INTERCEPTION POINT (TYPICAL)	CONCEALED	CONCEALED
SD	SMOKE DAMPER FURNISHED BY DIVISION 23, CONNECTED BY DIVISION 26	ABOVE CEILING REFER TO MECH. DRAWINGS	CONCEALED

FIRE ALARM SYSTEM GENERAL NOTES:

1. REFER TO SPECIFICATIONS.
2. REFER TO RISER DIAGRAM.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL PULL STRINGS IN ALL EMPTY RACEWAYS/CONDUITS.
4. LOCATION OF ALL DEVICES ON PLANS ARE APPROXIMATE ONLY. CONTRACTOR SHALL VERIFY EXACT LOCATIONS, HEIGHTS, ETC. WITH OWNER AND/OR ARCHITECT PRIOR TO ROUGH-IN.
5. PROVIDE FIRE STOPPING ON ALL CONDUITS PENETRATING A RATED WALL OR FLOOR.
6. ALL CABLES AND RACEWAYS TO BE CONCEALED UNLESS SPECIFICALLY NOTED OTHERWISE OR APPROVED BY ENGINEER. SEE SPECIFICATIONS AND GENERAL NOTES FOR ADDITIONAL CLARIFICATIONS.
7. ALL RACEWAY TERMINATIONS SHALL HAVE BUSHINGS AND BE GROUNDED WHERE RACEWAY IS METAL.
8. ALL WIRE/CABLE SHALL BE IN A COMPLETE RACEWAY/CONDUIT SYSTEM. INSTALL/SIZE RACEWAY SYSTEM AS REQUIRED TO COMPLY WITH SPECIFICATIONS, THE N.E.C. AND AS RECOMMENDED BY MANUFACTURER.
9. MINIMUM RACEWAY/CONDUIT SIZE TO BE 3/4".
10. CIRCUIT ALL DEVICES TO LOCAL RESPECTIVE FIRE ALARM TERMINAL CABINET (FATC).
11. PROVIDE AND INSTALL CABLE/WIRING AS RECOMMENDED BY MANUFACTURER AND APPLICABLE CODES AND STANDARDS, UNLESS OTHERWISE CALLED FOR ON DRAWINGS OR IN SPECIFICATIONS. WHERE CONFLICT EXISTS, THE LARGEST SIZE CALLED FOR SHALL BE USED.
12. SIZE PATHWAYS AS RECOMMENDED BY MANUFACTURER AND APPLICABLE CODES AND STANDARDS UNLESS OTHERWISE CALLED FOR ON DRAWINGS OR IN SPECIFICATIONS. WHERE CONFLICT EXISTS, THE LARGEST SIZE CALLED FOR SHALL BE USED.
13. ALL NEW EQUIPMENT MUST BE COMPATIBLE WITH EXISTING CONTROL PANEL. REWORK EXISTING FACP AND PROVIDE ALL ELECTRICAL AS REQUIRED FOR NEW ZONES, HORNS, DETECTORS, ETC. AND AS REQUIRED FOR PROPER INTERFACE AND OPERATION OF SYSTEM.
14. COORDINATE WITH AUTHORITY HAVING JURISDICTION PRIOR TO BID.
15. ALL EQUIPMENT/DEVICES TO BE ADDRESSABLE TYPE.
16. EACH DEVICE TO BE INDIVIDUAL ZONE/ANNUNCIATION POINT.
17. PROVIDE ALL PROGRAMMING, UPDATING, REVISIONS, ETC. REQUIRED TO MAIN CONTROL PANEL PROGRAMMING, ETC.
18. MECHANICAL AIR SYSTEM SHUT-DOWN:
    - A) COORDINATE SHUT-DOWN OF ALL MECHANICAL AIR SYSTEMS WITH DIVISION 15 SPECIFICATIONS, DRAWINGS, AND INSTALLER (AHU'S, EXHAUST FAN'S, FAN TERMINAL BOXES ETC.).
    - B) PROVIDE ALL WORK AND EQUIPMENT TO SHUT-DOWN ALL AIR MOVING EQUIPMENT AS REQUIRED BY APPLICABLE CODES.
    - C) VERIFY, WITH DIVISION 15 CONTRACTOR, LOCATION AND REQUIREMENTS FOR THE INTERFACE TO SHUT DOWN EQUIPMENT UPON FIRE ALARM SIGNAL.
    - D) UNITS REQUIRED TO BE SHUT DOWN BY THE STANDARD MECHANICAL CODE AND NOT REQUIRED TO BE SHUT-DOWN BY THE FIRE ALARM SYSTEM ARE TO HAVE ALL WORK AND EQUIPMENT PROVIDED AND INSTALLED BY DIVISION 15 CONTRACTOR.
    - E) WHERE REQUIRED, INSTALLER SHALL PROVIDE AND INSTALL AN INDIVIDUAL ADDRESSABLE RELAY OR MODULE AT EACH PIECE OF EQUIPMENT (I.E. AHU, EXHAUST FAN TERMINAL BOX, ETC.) FOR SHUTDOWN. DAISY-CHAINING MULTIPLE PIECES OF EQUIPMENT TO A COMMON RELAY OR MODULE SHALL NOT BE ACCEPTABLE.
37. COMPLY WITH ADA REQUIREMENTS.
38. CONTRACTOR SHALL PROVIDE, INSTALL AND TERMINATE ALL ELECTRICAL AND FIRE ALARM SYSTEM EQUIPMENT INCLUDING, BUT NOT LIMITED TO, RACEWAYS, WIRE/CABLE, CIRCUIT BREAKERS, MODULES, RELAYS (UL LISTED FOR USE WITH FIRE ALARMS), ETC., NECESSARY TO SHUT DOWN ANY AIR HANDLING UNIT (AHU), SUPPLY FAN, FAN TERMINAL BOX (FTB), ETC. (I.E. ANY AIR MOVING EQUIPMENT) REQUIRED TO BE SHUTDOWN BY FIRE ALARM SYSTEM. THIS REQUIREMENT FOR CONNECTION OF THE FIRE ALARM SYSTEM TO ANOTHER DEVICE OR SYSTEM SHALL BE EXTENDED TO INCLUDE ANY APPLICABLE CODE OR STANDARD, DIRECTLY OR INDIRECTLY REFERENCED BY THE SPECIFICATIONS, THAT REQUIRES INTERFACE WITH THE FIRE ALARM SYSTEM FOR CONTROLS OR MONITORING OF AN AIR MOVING DEVICE IN ORDER TO PROVIDE A COMPLETE CODE COMPLIANT FIRE ALARM SYSTEM. COORDINATE ALL WORK WITH DIVISION 15 (AND/OR ANY OTHER APPLICABLE DIVISION) PRIOR TO ROUGH-IN.
39. ALL ITEMS NOTED ON THE LEGENDS DO NOT NECESSARILY APPEAR ON PLANS.

SYMBOL LEGEND					
SYMBOL	DESCRIPTION	DESIGN SELECTION	APPROVED SUBSTITUTION	APPROVED SUBSTITUTION	REMARKS
	OUTLET BOX AND FLUORESCENT FIXTURE IN COVE OR MILLWORK. COORDINATE WITH ARCHITECTURAL PLANS	SEE FIXTURE SCHEDULE			d
S_O	WALL OUTLET BOX AND 20 AMP SINGLE POLE SWITCH ('o' INDICATES SWITCH-LEG)	P&S #PS20AC1	HUBBELL #HBL1221	LEVITON #1221-2	d
S_M	OUTLET BOX AND 20 AMP, 1P MANUAL MOTOR CONTROLLER WITHOUT OVERLOADS. RATED 1 HP @ 120V, 2 HP @ 277V.	P&S #PS20AC1	HUBBELL #HBL1221		d
S_{2M}	OUTLET BOX AND 20 AMP, 2P MANUAL MOTOR CONTROLLER WITHOUT OVERLOADS. RATED 2 HP @ 240V.	P&S #PS20AC2	HUBBELL #HBL1222		d
S_{M3}	OUTLET BOX AND 30 AMP, 3P MANUAL MOTOR CONTROLLER WITHOUT OVERLOADS. RATED 7.5 HP @ 240V, 10 HP @ 480V.	P&S #7803/7801	HUBBELL #HBL7810D/LOCK BRACKET	LEVITON #7810/LOCK BRACKET	d
	JUNCTION BOX AND BLANK PLATE ABOVE CEILING	STEEL CITY	RACO		b,d
	CAST IRON ZINC PLATED SURFACE MTD. OUTLET BOX AND BLANK PLATE	APPLETON #FS-ID WITH #DS-100 COVER			d, e, g, h
WP	CAST IRON ZINC PLATED SURFACE MTD. OUTLET BOX AND WEATHERPROOF BLANK PLATE	APPLETON #FS-ID WITH #DS-100G COVER			a, d, e, f, g, h
R	RELAY, AS NOTED				
C	CONTROL AND/OR POWER CONNECTION ON EQUIPMENT				i
	DISCONNECT SWITCH, SIZE AS NOTED	SQUARE "D"	G.E.	SIEMENS	g, i
	120/208V BRANCH CIRCUIT PANELBOARD SURFACE MOUNTED	SQUARE "D"	G.E.	SIEMENS	i
	120/208V BRANCH CIRCUIT PANELBOARD FLUSH MOUNTED	SQUARE "D"	G.E.	SIEMENS	i
	277/480V BRANCH CIRCUIT PANELBOARD SURFACE MOUNTED	SQUARE "D"	G.E.	SIEMENS	i
	277/480V BRANCH CIRCUIT PANELBOARD FLUSH MOUNTED	SQUARE "D"	G.E.	SIEMENS	i
	BRANCH CIRCUIT CONDUIT CONCEALED ABOVE CEILING OR IN WALL. SLASH MARKS INDICATE NUMBER OF CONDUCTORS (GROUND WIRE NOT SHOWN). TWO CONDUCTORS PLUS GROUND REQUIRED (UNLESS OTHERWISE NOTED OR MARKED)				
	BRANCH CIRCUIT CONDUIT CONCEALED BELOW SLAB OR UNDERGROUND				
	BRANCH CIRCUIT CONDUIT EXPOSED				
	HOME RUN WIRING. ONE CIRCUIT PER ARROW HEAD				
	CONDUIT CAPPED OFF				
	CONDUIT CONTINUED				
	CONDUIT RUN UP				
	CONDUIT RUN DOWN				
	CONDUIT SEAL-OFF FITTING	CROUSE HINDS	APPLETON		e
G	GROUND WIRE, CONCEALED				
	GROUND OR GROUND ROD AS NOTED				

NOTES:

1) ALL DEVICES TO BE GREY WITH SMOOTH METAL #302 S.S. PLATES UNLESS OTHERWISE NOTED.
2) "R" BY DEVICE DENOTES EXISTING TO BE REMOVED COMPLETELY.
3) "H" BY DEVICE DENOTES DEVICE TO BE MOUNTED HORIZONTALLY.
4) MOUNT SWITCHES AT 48" AFF TO TOP.
5) SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
6) ALL ITEMS NOTED ON THE LEGENDS DO NOT NECESSARILY APPEAR ON PLANS.

REMARKS:

a) U.L. LISTED FOR WET LOCATION IN CLOSED POSITION.
b) SUPPORT OUTLET BOX FROM STRUCTURE WITH (1) 3/8" ALL THREADS MINIMUM. BOXES LARGER THAN 25 SQUARE INCHES SHALL BE SUPPORTED WITH (2) 3/8" ALL THREADS MINIMUM.
c) U.L. LISTED FOR WET LOCATION IN OPEN POSITION WITH ATTACHMENT PLUG INSERTED.
d) JUNCTION/OUTLET BOX SHALL BE SIZED AS REQUIRED FOR CONDUCTOR/DEVICE FILL PER N.E.C.
e) THREADED CONDUIT HUBS SHALL BE SIZED AND CONFIGURED AS REQUIRED FOR APPLICATION.
f) IF WITHIN 30 MILES OF THE COAST LINE, COPPER FREE CAST ALUMINUM OUTLET BOXES SHALL BE USED FOR EXTERIOR APPLICATIONS.
g) PROVIDE KINDORF MTG. RACK FOR FREE STANDING APPLICATIONS. KINDORF SHALL BE PVC COATED FOR EXTERIOR APPLICATIONS. ALL CUT ENDS ARE TO BE SEALED.
h) WHEN SURFACE JUNCTION BOX SYMBOL IS COMBINED WITH DEVICE SYMBOL, PROVIDE APPROPRIATE SURFACE PLATE FOR OUTLET APPLICATION.
i) MAINTAIN WORKING CLEARANCES IN STRICT ACCORDANCE WITH N.E.C. COORDINATE EXACT LOCATION OF EQUIPMENT WITH ALL DISCIPLINES (I.E. STRUCTURAL, HVAC, PLUMBING, FIRE PROTECTION, KITCHEN, MILLWORK, ETC.) PRIOR TO ROUGH-IN TO MAINTAIN CLEARANCES.
j) OUTLET BOX SHALL BE SIZED PER SYSTEM INSTALLER REQUIREMENTS.

DEMOLITION LEGEND

(R1) REMOVE ALL ELECTRICAL ASSOCIATED WITH THIS ITEM, COMPLETE BACK TO ITS SOURCE. SOURCE IS CONSIDERED TO BE FIRST UPSTREAM DEVICE OR CIRCUIT BREAKER THAT FEEDS THIS AFFECTED CIRCUIT. SEE GENERAL NOTES AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

(R2) REMOVE ALL ELECTRICAL IN AREA OF REMODEL/RENOVATION COMPLETE BACK TO ITS SOURCE. SOURCE IS CONSIDERED TO BE FIRST UPSTREAM DEVICE OR CIRCUIT BREAKER OUTSIDE OF AREA OF REMODEL THAT FEEDS CIRCUITS/DEVICES WITHIN AREA OF REMODEL/RENOVATION. SEE GENERAL NOTES AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

(R3) REMOVE THE DEVICE ONLY. REFER TO RENOVATION PLAN FOR ADDITIONAL ELECTRICAL.

SHEET NO.	ELECTRICAL SHEET INDEX FOR	SCALE
E001	GENERAL NOTES LEGENDS, & SYMBOLS - ELECTRICAL	NO SCALE
ED101	FLOOR PLAN - ELECTRICAL - DEMOLITION	1/8"=1'-0"
E101	FLOOR PLAN - ELECTRICAL - RENOVATION	1/8"=1'-0"
E501	ELECTRICAL SCHEDULES & RISERS	NO SCALE
E502	ELECTRICAL SCHEDULES	NO SCALE
E901	ELECTRICAL DETAILS	NO SCALE

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ENG. BUS. No. EB-0005096 CERT. OF AUTH. No. 5096

ORANGE COUNTY FIRE LOGISTICS WAREHOUSE HVAC REPLACEMENT

Revisions

No.	Date	Description

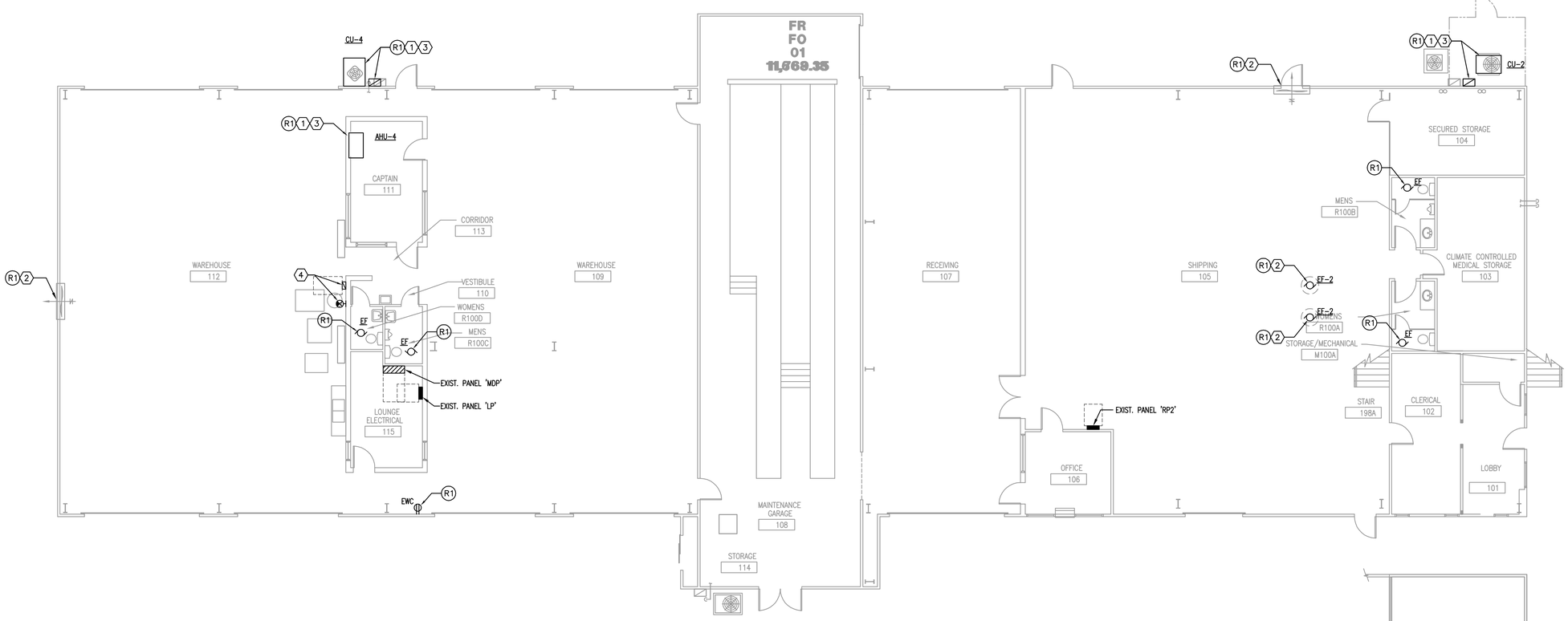
Key Plan

MPE PROJ#: 2013-171
Designed By: RB
Drawn By: AG/RB
Checked By: CT
Issue Date: 10/01/15
Drawing Scale: NO SCALE

Drawing Title:
GENERAL NOTES LEGENDS, & SYMBOLS ELECTRICAL

BID DOCUMENTS

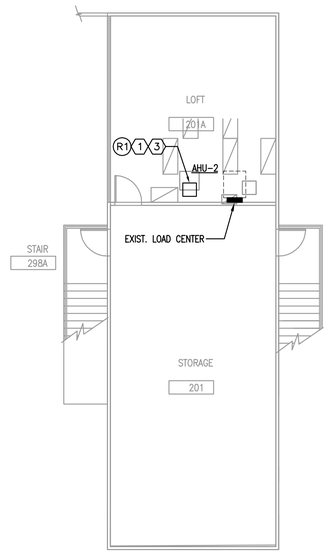
Drawing No.
E001



DEMO FLOOR PLAN - ELECTRICAL - LEVEL 1

1/8"=1'-0"

0 4' 8' 16'



DEMO FLOOR PLAN - ELECTRICAL - LOFT

1/8"=1'-0"

0 4' 8' 16'

GENERAL NOTES

1) REFER TO GENERAL NOTES FOR THIS DISCIPLINE.
2) REFER TO SPECIFICATIONS.
3) NO MULTI-WIRE BRANCH CIRCUITS ARE TO BE USED. EACH CIRCUIT IS TO HAVE SEPARATE INDIVIDUAL NEUTRAL.
4) ALL HEX NOTES NOT NECESSARILY USED ON ALL SHEETS.
5) EXISTING CONDUIT ROUTING IS UNKNOWN.
6) WHERE CONDUIT ROUTING IS SHOWN, THE CONDUITS ARE SHOWN FOR DIAGRAMMATIC PURPOSES AND ARE NOT NECESSARILY REPRESENTATIVE OF EXACT PLACEMENT.

HEX NOTES

1. MECHANICAL EQUIPMENT TO BE REPLACED. REMOVE ALL ELECTRICAL FOR MECHANICAL EQUIPMENT COMPLETE BACK TO ITS SOURCE.
2. EXISTING MECHANICAL EQUIPMENT TO BE ABANDONED IN PLACE.
3. EXISTING CONDUIT RUN MAY BE RE-USED IN RENOVATIONS PROVIDED SIZE AND CONDITION MEETS CODE REQUIREMENTS. REFER TO RENO DRAWINGS.
4. EXISTING ELECTRICAL TO BE RELOCATED. REFER TO RENO PLAN FOR NEW LOCATION.

DEMOLITION LEGEND

R1 REMOVE ALL ELECTRICAL ASSOCIATED WITH THIS ITEM, COMPLETE BACK TO ITS SOURCE. SOURCE IS CONSIDERED TO BE FIRST UPSTREAM DEVICE OR CIRCUIT BREAKER THAT FEEDS THIS AFFECTED CIRCUIT. SEE GENERAL NOTES AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

R2 REMOVE ALL ELECTRICAL IN AREA OF REMODEL/RENOVATION COMPLETE BACK TO ITS SOURCE. SOURCE IS CONSIDERED TO BE FIRST UPSTREAM DEVICE OR CIRCUIT BREAKER OUTSIDE OF AREA OF REMODEL THAT FEEDS CIRCUITS/DEVICES WITHIN AREA OF REMODEL/RENOVATION. SEE GENERAL NOTES AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

R3 REMOVE THE DEVICE ONLY. REFER TO RENOVATION PLAN FOR ADDITIONAL ELECTRICAL.

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ORANGE COUNTY FIRE LOGISTICS WAREHOUSE HVAC REPLACEMENT

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Issue Date: 10/01/15
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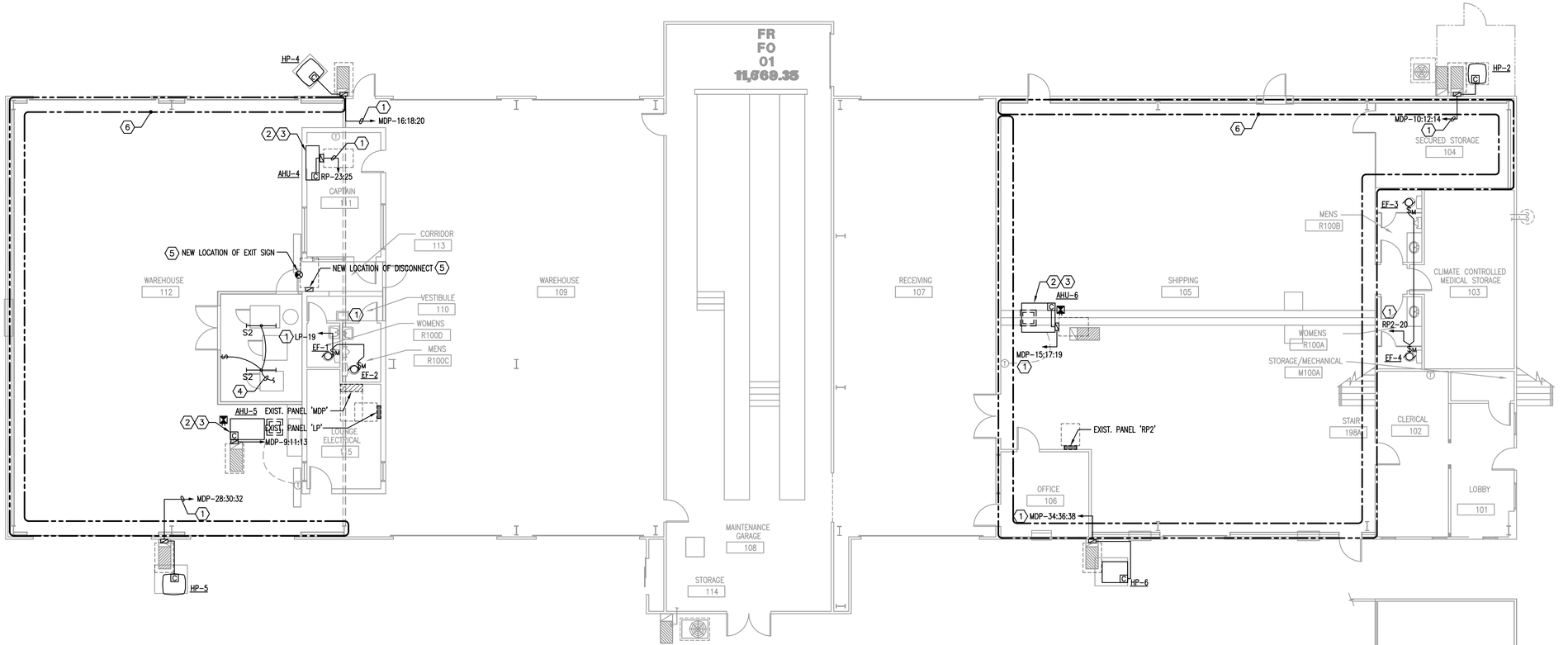
Drawing Title:
FLOOR PLAN ELECTRICAL DEMOLITION

BID DOCUMENTS

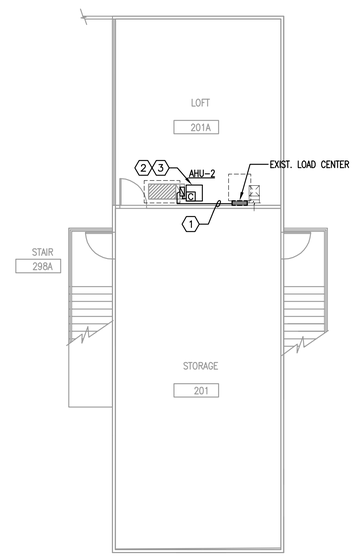
Drawing No.
ED101



RENO FLOOR PLAN - ELECTRICAL - LEVEL 1

1/8"=1'-0"

0 4' 8' 16'



RENO FLOOR PLAN - ELECTRICAL - LOFT

1/8"=1'-0"

0 4' 8' 16'

GENERAL NOTES

1) REFER TO GENERAL NOTES FOR THIS DISCIPLINE.
2) REFER TO SPECIFICATIONS.
3) NO MULTI-WIRE BRANCH CIRCUITS ARE TO BE USED. EACH CIRCUIT IS TO HAVE SEPARATE INDIVIDUAL NEUTRAL.
4) REWORK/RELOCATE EXISTING ELECTRICAL AS REQUIRED TO FACILITATE REMODELING.
5) CONTRACTOR SHALL MAINTAIN CONTINUITY TO EXISTING DEVICES REMAINING.
6) ALL DISCONNECTING MEANS (SWITCHES) FEEDING FAN TERMINAL BOXES SHALL BE MOTOR RATED SWITCHES.
7) REFER TO MECHANICAL EQUIPMENT FEEDER AND PANEL SCHEDULES FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL AND PLUMBING EQUIPMENT.
8) MOUNT ALL DISCONNECT SWITCHES FOR MECHANICAL EQUIPMENT WITHIN SIX (6) FEET OF EQUIPMENT AS REQUIRED BY APPLICABLE CODES AND STANDARDS. RELOCATE DISCONNECT SWITCHES SHOWN ON DRAWINGS TO LOCATION REQUIRED TO COMPLY WITH THIS REQUIREMENT AND APPLICABLE CODES/STANDARDS. LOCATIONS FOR DISCONNECT SWITCHES SHOWN ON DRAWINGS IS FOR GENERAL INFORMATION ONLY.

KEY NOTES

(1) REFER TO MECHANICAL FEEDER SCHEDULE.
(2) PROVIDE NEW DUCT DETECTORS AND RECONNECT TO EXISTING SYSTEM. REFER TO MECHANICAL PLANS FOR LOCATION AND QUANTITY.
(3) PROVIDE NEW SHUTDOWN RELAY. RECONNECT TO EXISTING SYSTEM.
(4) CONNECT TO NEAREST LIGHTING CIRCUIT AVAILABLE IN AREA.
(5) NEW LOCATION OF DEVICE/FIXTURE. MOUNT AT SAME HEIGHT AS THAT OF OLD LOCATION.
(6) NEW INTERIOR INSULATION/WALL SURFACE TO BE INSTALLED BY OTHERS IN THIS AREA. E.C. SHALL RELOCATE/MOVE ALL EXISTING ELECTRICAL DEVICES/FIXTURES I.E. SWITCHES, RECEPTACLES, LIGHT FIXTURES, ETC. AND PROVIDE EXTENSION RINGS AS NEEDED ALONG ENTIRE LENGTH AND HEIGHT OF WALL BEING INSULATED SO THAT DEVICES ARE MOUNTED RECESSED ON NEW WALL SURFACE. COORDINATE WITH GC/ARCHITECT.

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Drawing Title:

FLOOR PLAN ELECTRICAL RENOVATION

BID DOCUMENTS

Drawing No.

E101

MECHANICAL/KITCHEN EQUIPMENT FEEDER SCHEDULE FOR (9): OC FIRE LOGISTICS WAREHOUSE HVAC RENOV

 Version : W8 REVISED: 10-30-2013 DATE: April 30, 2015

EQUIPMENT DESCRIPTION	VOLTS	PH	NEUTRAL Y/N	LARGEST MOTOR HP	LARGEST MOTOR FLA	LARGEST MOTOR LRA	COMPRESSOR FLA(11)	COMPRESSOR LRA	ADD'L MOTORS FLA	ADD'L MOTORS LRA	HEAT STRIPS KW	HEAT STRIPS AMPS	MISC AMPS	TOTAL FLA	MCA (10)	MOCP (10)	PANEL CB (5)	DISCONNECT SWITCH CODE	DISCONNECT SWITCH SIZE (1)	DISCONNECT SWITCH FUSE (2)	DISCONNECT SWITCH TYPE (3)	STARTER CODE	STARTER TYPE	WIRE PER PHASE (6)	NEUTRAL WIRE (7)	GROUND WIRE	WIRE MATERIAL	# OF RUNS	CONDUIT SIZE	% VD	NOTES (SEE BELOW)
AHU-2	240	1	N	0.75	6.9	41.4					7.7	32.1		39		50	50	1	60	NF				#6		#10	COPPER	1	0.75	1.46	N
AHU-4	240	1	N	0.50	4.9	29.4					7.7	32.1		37		45	50	1	60	NF				#6		#10	COPPER	1	0.75	1.39	N
AHU-5	480	3	N	1.50	3.0	20.0					14.9	17.9		21	26	30	30	1	30	NF				#10		#10	COPPER	1	0.75	0.80	
AHU-6	480	3	N	1.50	3.0	20.0					14.9	17.9		21	26	30	30	1	30	NF				#10		#10	COPPER	1	0.75	0.80	
HP-2	480	3	N	0.50	1.1	10.0	6	46						7.3		20	20	1	30	NF	3R			#12		#12	COPPER	1	0.75	0.46	
HP-4	480	3	N	0.50	1.1	10.0	6	46						7		20	20	1	30	NF	3R			#12		#12	COPPER	1	0.75	0.46	
HP-5	480	3	N	0.50	1.1	10.0	13	81						14	17.9	30	30	1	30	NF	3R			#12		#12	COPPER	1	0.75	0.88	
HP-6	480	3	N	0.50	1.1	10.0	13	81						14	17.9	30	30	1	30	NF	3R			#12		#12	COPPER	1	0.75	0.88	
EF-1 & EF-2	120	1	Y	0.17	4.4	26.4			4.4	26.4				9			20	3	MMS	-				#12	#12	#12	COPPER	1	0.75	1.91	
EF-3 & EF-4	120	1	Y	0.17	4.4	26.4			4.4	26.4				9			20	3	MMS	-				#10	#10	#10	COPPER	1	0.75	1.54	

NOTES ( )

(1) PROVIDE DISC SW AT ALL PIECES OF EQUIPMENT AS REQUIRED BY THE N.E.C. AND AHJ UNLESS PROVIDED BY OTHERS (INCLUDING AT MOTORS AND AT STARTERS.

(2) FUSES SHOWN FOR REFERENCE ONLY, PROVIDE FUSES AS RECOMMENDED BY EQUIPMENT MANUFACTURER.

(3) PROVIDE NEMA OUTDOOR RATED ENCLOSURES FOR ALL DISC SWS MOUNTED OUTDOORS.

(4) COORDINATE STARTER TYPE WITH MECH EQUIP INSTALLER .

(5) CONTRACTOR TO VERIFY THAT C.B. FOR COMPRESSORS IS SUFFICIENT TO ALLOW STARTING OF UNIT, IF REQUIRED FOR STARTING C.B. TO BE INCREASED TO A MAX ALLOWED BY N.E.C. CB TO BE HACR RATED.

(6) #12 FEEDERS SHOWN AND OVER 50FT. LONG TO BE #10 FOR 120V CIRCUITS. #12 FEEDERS SHOWN AND OVER 100 FT. LONG TO BE #10 FOR 277 V CIRCUITS.

(7) NEUTRAL CONDUCTOR TO BE SAME SIZE AS PHASE CONDUCTORS.

(8) MOTOR CB IS SIZED BASED ON NEMA CODE 'F' OR HIGHER. CHANGE CB SIZE IF REQUIRED DUE TO NEMA CODE OF MOTOR PER N.E.C.

(9) ALL FEEDERS 100 AMP AND LESS ARE BASED ON 60 DEGREE CONDUCTOR/TERMINATION RATING. ALL OTHER FEEDERS ARE BASED ON 75 DEGREE CONDUCTOR TERMINATIONS. PROVIDE AND INSTALL PROPER TERMINATIONS ON ALL EQUIPMENT PROVIDED BY ANY DIVISION AND/OR SECTION OF THE CONTRACT DOCUMENTS. PROPER TERMINATIONS TO BE AS REQUIRED TO MATCH CONDUCTOR WITH REQUIRED AMPACITY.

(10) BASED ON MANUFACTURER'S RECOMMENDATION.

(11) OR BRANCH CIRCUIT SELECTION CURRENT WHEN AVAILABLE.

MCP = MOTOR CIRCUIT PROTECTOR W/COMBINATION STARTER

MMS = MANUAL MOTOR STARTER SWITCH WITH OVERLOADS AND PILOT LIGHT

I = NEMA I ENCLOSURE

3R = NEMA 3R ENCLOSURE

4SS = NEMA 4 WATER TIGHT STAINLESS STEEL ENCLOSURE

4 = NEMA 4 WATER TIGHT NON-CORROSIVE ENCLOSURE

VFD/AFD = VARIABLE (ADJUSTABLE-AFD) FREQ DRIVE UNIT

NF = NON-FUSED, WHERE ACCEPTABLE TO AHJ, CONTRACTOR MAY USE PROPERLY RATED MOTOR SWITCH FOR DISCONNECT SWITCH

AHJ = AUTHORITY HAVING JURISDICTION.

FNVR = FULL VOLTAGE NON-REVERSING

DFNVR = DUAL VOLTAGE NON-REVERSING

FVC = FULL VOLTAGE CONTACTOR

NOTES:
(A)=CONNECT VIA LINE VOLTAGE T'STAT BY DIV. 15/23 CONTRACTOR.
(B)=CONNECT VIA CONTROL DEVICES BY DIV. 15/23 CONTRACTOR.
(C)=CONNECT VIA VFD/AFD WITH INTEGRAL DISC. SW.
(D)=CONNECT VIA COMBINATION DISC/STARTER BY DIV. 15/23 CONTRACTOR.
(E)=CONNECT VIA DISC SWITCH AT EQUIP. BY DIV. 15/23 CONTRACTOR.
(F)=PROVIDE FULL SIZE NEUTRAL.
(G)=MMS WITHOUT OVERLOADS.
(H)=CONNECT VIA STARTER IN MCC (BY DIV 16/26).
(I)=2 SPEED,1 WINDING MOTOR/STARTER.
(J)=COORDINATE WITH DIV.15 TO BALANCE LOAD OF 1 PHASE FTB MOTORS.
(K)=PROVIDE NEW STARTER IN MCC TO MATCH EXISTING. SEE MCC SCHED.
(L)=WHERE MOTOR IS FED FROM MCC, PANEL CB NOT REQUIRED
(M)=CONNECT EXIST DISC SWITCH AT MOTOR. MODIFY AS NOTED ON DRWGS
(N)=EXISTING EQUIPMENT TO BE REPLACED. EXISTING WIRE/CONDUIT MAY BE RE-USED IF INSULATION IS TESTED, FOUND ACCEPTABLE AND MEETS MINIMUM SIZE SHOWN ON THIS SCHEDULE.

TYPE	DESCRIPTION	DESIGN SELECTION	APPROVED SUBSTITUTION	VOLTS	LAMP TYPE	LUMENS	ADDITIONAL REQUIREMENTS
S2	FOUR (4) FOOT VAPOR TIGHT LED.	CREE # WS4 59L 40K FD SSL	DAY BRITE # D W P E 51L 849 -4 - UNIV	120	LED	5100-5900	CCT - 4000K CRI - 82

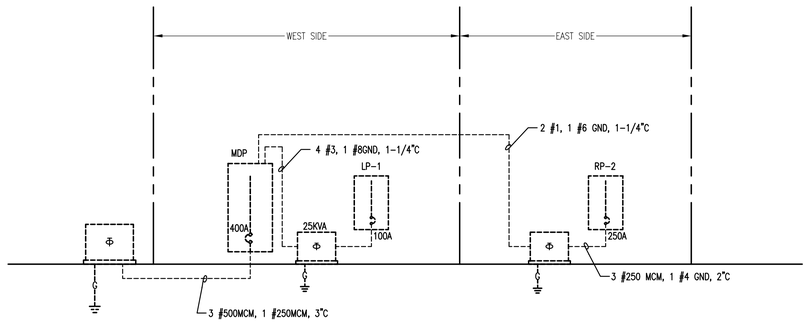
LIGHTING FIXTURE SCHEDULE GENERAL NOTES:

(1) PROVIDE ALL LED FIXTURES WITH LM79 AND LM80 DOCUMENTATION

(2) CONTRACTOR SHALL CAREFULLY COORDINATE THE LIGHTING FIXTURE TRIM TYPES WITH THE TYPE OF CEILING WHERE THE LIGHTING FIXTURES ARE TO BE INSTALLED. MODIFY FIXTURE CATALOG NUMBER AS REQUIRED TO COORDINATE FIXTURE WITH CEILING.

(3) CONTRACTOR, AT HIS OPTION, MAY USE A U.L. LISTED FLEXIBLE WIRING SYSTEM FOR LIGHTING FIXTURE BRANCH CIRCUITRY ABOVE ACCESSIBLE LAY-IN CEILINGS. ALL HOMERUNS, CONNECTIONS TO LIGHT SWITCHES, AND BRANCH CIRCUITRY FOR ALL OTHER CEILING CONDITIONS SHALL BE IN A CONVENTIONAL RACEWAY SYSTEM PER SPECIFICATIONS.

(4) WHEN FIXTURE MODEL NUMBER DIFFERS FROM FIXTURE DESCRIPTION, CONTRACTOR IS TO SUBMIT RFI REQUESTING CLARIFICATION PRIOR TO BID. PRIOR TO SHOP DRAWING SUBMITTAL AND PRIOR TO ORDERING OF FIXTURE. WHERE CONTRACTOR DOES NOT REQUEST CLARIFICATION PRIOR TO BID, CONTRACTOR SHALL PROVIDE THE MOST EXPENSIVE OPTION BETWEEN A FIXTURE THAT M



POWER RISER DIAGRAM

NOT TO SCALE

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ORANGE COUNTY FIRE LOGISTICS WAREHOUSE HVAC REPLACEMENT

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Key Plan

MPE PROJ#: 2013-171

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Drawing Title:

ELECTRICAL SCHEDULES & RISERS

BID DOCUMENTS

Drawing No.

E501

CREATE DATE: 11/21/2014 2:54:38 PM LAST SAVED: 9/28/2015 12:45:46 PM LAST SAVED BY: DSMITH

MATERN PROFESSIONAL ENGINEERING PLOT DATE: 9/30/2015 9:21:22 AM FILENAME: J:\2013\2013-171_OC Fire Logistics Warehouse HVAC Renovation\2013-171-E502.dwg

SECTION I WITH MAINS — COPYRIGHT ME, LLC 06/01/03 — PANEL: B2b — REVISED: 10/07/13

DIST PANEL MDP (EXIST)

VOLTS L/N: 277
VOLTS PH.: 480
PHASE : 3
MOUNTING : SURFACE
TYPE :
MFR : SQ D

MLO(***)
MCB 400
SH.TRIP
GFP

EXISTING : YES
NEMA 3R :

GENERAL NOTES:
(1) ALL C.B.'S FEEDING HVAC EQUIPMENT TO BE HACR TYPE.
(2) ALL C.B.'S FEEDING ELEV EQUIP TO BE SHUNT-TRIP TYPE.
(3) ALL C.B.'S FEEDING ELEV EQUIP TO BE SIZED AS REQ'D BY MFR.
(4) ALL C.B.'S FEEDING HID LTG TO BE HID RATED.
(5) NO MULTIWIRE BRANCH CKTS ARE ALLOWED
(6) NOT USED.
(7) IF HCP-SU PANEL THEN ALL BREAKERS TO BE ON ONE SIDE.

<------------AIC RATING (**)------------>
SERIES RATED 65 KA(*)
FULLY RATED KA
(*) NOTE: MAY REQUIRE FULL RATING TO ACHIEVE

NOTES AND REFERENCE NOTES:
MFR = SIZE CB PER MFR. RECOMMENDATIONS.
$ = NEW CB IN EXIST SPACE
& = REPLACE EXIST CB WITH NEW
SH = SHUNT TRIP C.B.
AF = ARC FAULT CB

TOTAL AMPS A PH 517
TOTAL AMPS B PH 517
TOTAL AMPS C PH 497
INFO CODE

(***) NOTE: SIZE SHOWN IS MINIMUM ACCEPTABLE MLO AMPERAGE. INCREASE SIZE IF REQUIRED TO ACHIEVE QUANTITY OF POLES OR BREAKER SIZE/AIC RATING AS CALLED FOR IN SCHEDULE.

OPTIONAL CALC NO
ACTUAL CONN LOAD 424 KVA 510 AMPS
DEMAND 276 KVA 332 AMPS
DIVERSITY 276 KVA 332 AMPS
TRANSFORMER SIZE KVA

SECTION 1 WITH MAINS — WIDTH: 32 DEPTH: 8.25

LOAD						C.B.	C.B.	REF	CKT.	CKT.	REF	C.B.	C.B.	LOAD					
DESCRIPTION	CONN	TYPE	AMPS	AMPS	AMPS	AMPS	POLE	NOTE	NO.	NO.	NOTE	POLE	AMPS	AMPS	AMPS	AMPS	DESCRIPTION	CONN	TYPE
REAR NORTH HTR	10	5.0	10			20	1		1	2		1	20	10			REAR SOUTH HTR	10	5.0
FRONT NORTH HTR	10	5.0		10		20	1		3	4		1	20		10		FRONT SOUTH HTR	10	5.0
SPACE							1		5	6		1					SPACE		
SPACE							1		7	8		1					SPACE		
EXHAUST FAN - PITS	10	5.0		10		20	3		9	10		3	20		15		EXHAUST FAN	15	5.0
--------	10	5.0			10	--------	--------		11	12		--------	--------			15	--------	15	5.0
--------	10	5.0	10			--------	--------		13	14		--------	--------	15			--------	15	5.0
EXHAUST FAN	15	5.0		15		20	3		15	16		3	20		10		EXHAUST FAN	10	5.0
--------	15	5.0			15	--------	--------		17	18		--------	--------			10	--------	10	5.0
--------	15	5.0	15			--------	--------		19	20		--------	--------	10			--------	10	5.0
TEMP XFMR	12	5.0		12		20	3		21	22		3	20		12		AIR COMPRESSOR	12	5.0
--------	12	5.0			12	--------	--------		23	24		--------	--------			12	--------	12	5.0
--------	12	5.0	12			--------	--------		25	26		--------	--------	12			--------	12	5.0
TRANSFORMER/ WASHER	15	5.0		15		30	3		27	28		3	30		15		EXIST LOAD	15	5.0
--------	15	5.0			15	--------	--------		29	30		--------	--------			15	--------	15	5.0
--------	15	5.0	15			--------	--------		31	32		--------	--------	15			--------	15	5.0
TRANSFORMER	25	5.0		25		50	3		33	34		3	30		18		EXIST LOAD	18	5.0
--------	25	5.0			25	--------	--------		35	36		--------	--------			18	--------	18	5.0
--------	25	5.0	25			--------	--------		37	38		--------	--------	18			--------	18	5.0
SPACE							3		43	44		3	250	200			PANEL RP2	200	5.0
--------						--------	--------		45	46		--------	--------		200		--------	200	5.0
--------						--------	--------		47	48		--------	--------			200	--------	200	5.0
EXIST LOAD	150	5.0	150			200	3		49	50		3					SPACE		
--------	150	5.0		150		--------	--------		51	52		--------	--------				--------		
--------	150	5.0			150	--------	--------		53	54		--------	--------				--------		

SECTION I WITH MAINS — COPYRIGHT ME, LLC 06/01/03 — PANEL: B2b — REVISED: 10/07/13

DIST PANEL MDP (EXIST. REV)

VOLTS L/N: 277
VOLTS PH.: 480
PHASE : 3
MOUNTING : SURFACE
TYPE :
MFR : SQ D

MLO(***)
MCB 400 (1)
SH.TRIP
GFP

EXISTING : YES
NEMA 3R :

GENERAL NOTES:
(1) ALL C.B.'S FEEDING HVAC EQUIPMENT TO BE HACR TYPE.
(2) ALL C.B.'S FEEDING ELEV EQUIP TO BE SHUNT-TRIP TYPE.
(3) ALL C.B.'S FEEDING ELEV EQUIP TO BE SIZED AS REQ'D BY MFR.
(4) ALL C.B.'S FEEDING HID LTG TO BE HID RATED.
(5) NO MULTIWIRE BRANCH CKTS ARE ALLOWED
(6) NOT USED.
(7) IF HCP-SU PANEL THEN ALL BREAKERS TO BE ON ONE SIDE.

<------------AIC RATING (**)------------>
SERIES RATED 65 KA(*)
FULLY RATED KA
(*) NOTE: MAY REQUIRE FULL RATING TO ACHIEVE

NOTES AND REFERENCE NOTES:
MFR = SIZE CB PER MFR. RECOMMENDATIONS.
$ = NEW CB IN EXIST SPACE
& = REPLACE EXIST CB WITH NEW
SH = SHUNT TRIP C.B.
AF = ARC FAULT CB

TOTAL AMPS A PH 537
TOTAL AMPS B PH 537
TOTAL AMPS C PH 517
INFO CODE

(***) NOTE: SIZE SHOWN IS MINIMUM ACCEPTABLE MLO AMPERAGE. INCREASE SIZE IF REQUIRED TO ACHIEVE QUANTITY OF POLES OR BREAKER SIZE/AIC RATING AS CALLED FOR IN SCHEDULE.

OPTIONAL CALC NO
ACTUAL CONN LOAD 374 KVA 450 AMPS
DEMAND 374 KVA 450 AMPS
DIVERSITY 374 KVA 450 AMPS
TRANSFORMER SIZE KVA

SECTION 1 WITH MAINS — WIDTH: 32 DEPTH: 8.25

LOAD						C.B.	C.B.	REF	CKT.	CKT.	REF	C.B.	C.B.	LOAD					
DESCRIPTION	CONN	TYPE	AMPS	AMPS	AMPS	AMPS	POLE	NOTE	NO.	NO.	NOTE	POLE	AMPS	AMPS	AMPS	AMPS	DESCRIPTION	CONN	TYPE
REAR NORTH HTR	10	5.0	10			20	1		1	2		1	20	10			REAR SOUTH HTR	10	5.0
FRONT NORTH HTR	10	5.0		10		20	1		3	4		1	20		10		FRONT SOUTH HTR	10	5.0
SPACE							1		5	6		1					SPACE		
SPACE							1		7	8		1					SPACE		
(2) AHU-5	21	11.2		21		30	3	&	9	10		3	20		8		HP-2 (2)	8	13.3
--------	21	11.2			21	--------	--------		11	12		--------	--------			8	--------	8	13.3
--------	21	11.2	21			--------	--------		13	14		--------	--------	8			--------	8	13.3
(2) AHU-6	21	11.2		21		30	3	&	15	16		3	20		8		HP-4 (2)	8	13.3
--------	21	11.2			21	--------	--------		17	18		--------	--------			8	--------	8	13.3
--------	21	11.2	21			--------	--------		19	20		--------	--------	8			--------	8	13.3
TEMP XFMR	12	5.0		12		20	3		21	22		3	20		12		AIR COMPRESSOR	12	5.0
--------	12	5.0			12	--------	--------		23	24		--------	--------			12	--------	12	5.0
--------	12	5.0	12			--------	--------		25	26		--------	--------	12			--------	12	5.0
TRANSFORMER/ WASHER	15	5.0		15		30	3		27	28		3	30		14		HP-5 (2)	14	13.3
--------	15	5.0			15	--------	--------		29	30		--------	--------			14	--------	14	13.3
--------	15	5.0	15			--------	--------		31	32		--------	--------	14			--------	14	13.3
TRANSFORMER	25	5.0		25		50	3		33	34		3	30		14		HP-6 (2)	14	13.3
--------	25	5.0			25	--------	--------		35	36		--------	--------			14	--------	14	13.3
--------	25	5.0	25			--------	--------		37	38		--------	--------	14			--------	14	13.3
									39	40									
									41	42									
SPACE							3		43	44		3	250	88			PANEL RP2	88	5.0
--------						--------	--------		45	46		--------	--------		88		--------	88	5.0
--------						--------	--------		47	48		--------	--------			88	--------	88	5.0
EXIST LOAD	150	5.0	150			200	3		49	50		3					SPACE		
--------	150	5.0		150		--------	--------		51	52		--------	--------				--------		
--------	150	5.0			150	--------	--------		53	54		--------	--------				--------		
SUBFEED LUGS/BREAKER																	SUBFEED LUGS/BREAKER		
									S.F.	S.F.									
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PANEL: RP2 (EXIST)

VOLTS L/N: 120
VOLTS PH.: 240
PHASE : 1
MOUNTING : SURFACE
TYPE :
MFR : SQ D

MLO(***)
MCB 250
SH.TRIP
GFP

EXISTING : YES
SECTIONS : 1
NEMA 3R :

GENERAL NOTES:
(1) ALL C.B.'S FEEDING HVAC EQUIPMENT TO BE HACR TYPE.
(2) ALL C.B.'S FEEDING ELEV EQUIP TO BE SHUNT-TRIP TYPE.
(3) ALL C.B.'S FEEDING ELEV EQUIP TO BE SIZED AS REQ'D BY MFR.
(4) ALL C.B.'S FEEDING HID LTG TO BE HID RATED.
(5) NO MULTIWIRE BRANCH CKTS ARE ALLOWED
(6) NOT USED.

<------------AIC RATING (**)------------>
SERIES RATED 65 KA(*)
FULLY RATED KA
(*) NOTE: MAY REQUIRE FULL RATING TO ACHIEVE

NOTES AND REFERENCE NOTES:
MFR = SIZE CB PER MFR. RECOMMENDATIONS.
$ = NEW CB IN EXIST SPACE
& = REPLACE EXIST CB WITH NEW
SH = SHUNT TRIP C.B.
AF = ARC FAULT CB

TOTAL AMPS A PH 229
TOTAL AMPS B PH 206
INFO CODE

(***) NOTE: SIZE SHOWN IS MINIMUM ACCEPTABLE MLO AMPERAGE. INCREASE SIZE IF REQUIRED TO ACHIEVE QUANTITY OF POLES OR BREAKER SIZE/AIC RATING AS CALLED FOR IN SCHEDULE.

OPTIONAL CALC NO
ACTUAL CONN LOAD 52 KVA 218 AMPS
DEMAND 42 KVA 174 AMPS
DIVERSITY 42 KVA 174 AMPS
TRANSFORMER SIZE KVA

SECTION 1 WITH MAINS — WIDTH: 20 DEPTH: 6.00

LOAD						C.B.	C.B.	REF	CKT.	CKT.	REF	C.B.	C.B.	LOAD					
DESCRIPTION	CONN	TYPE	AMPS	AMPS	AMPS	AMPS	POLE	NOTE	NO.	NO.	NOTE	POLE	AMPS	AMPS	AMPS	AMPS	DESCRIPTION	CONN	TYPE
EXIST LOAD	10	5.0	10			20	1		1	2		1	20	10			EXIST LOAD	10	5.0
EXIST LOAD	10	5.0		10		20	1		3	4		1	20		9		EXIST LOAD	9	5.0
EXIST LOAD	9	5.0	9			20	1		5	6		1	20	8			EXIST LOAD	8	5.0
EXIST LOAD	8	5.0		8		20	1		7	8		1	20		10		EXIST LOAD	10	5.0
EXIST LOAD	10	5.0	10			20	1		9	10		1	20	9			EXIST LOAD	9	5.0
EXIST LOAD	9	5.0		9		20	1		11	12		1	20		8		RECEPTS	5	4.0
EXIST LOAD	8	5.0	8			20	1		13	14		1	20	8			RECEPTS	5	4.0
EXIST LOAD	10	5.0		10		20	1		15	16		1	20		8		RECEPTS	5	4.0
EXIST LOAD	9	5.0	9			20	1		17	18		1	20	8			RECEPTS	5	4.0
EXIST LOAD	10	5.0		10		20	1		19	20		1	20		5		EF-1	5	9.0
EXIST LOAD	9	5.0	9			20	1		21	22		2	30	15			CU-1	15	10.0
EF-2 108	10	9.0		10		20	1		23	24		--------	--------		15		--------	15	10.0
EF-2 109	10	9.0	10			20	1		25	26		2	60	25			HPU-1	25	10.0
EXIST LOAD	9	5.0		9		20	1		27	28		--------	--------		25		--------	25	10.0
EXIST LOAD	8	5.0	8			20	1		29	30		1	20	10			WATER HEATER	10	5.0
FACP	5	5.0		5		20	1		31	32		1	20		10		EXTERIOR LIGHTS	1200	2.0
SHEDS	9	5.0	9			20	1		33	34		1	20	9			EXIST LOAD	9	5.0
EXIST LOAD	20	10.0		20		60	2		35	36		1	20		8		EXIST LOAD	8	5.0
--------	20	10.0	20			--------	--------		37	38		1	20	10			EXIST LOAD	10	5.0
EXIST LOAD	9	5.0		9		20	1		39	40		1	20		9		EXIST LOAD	9	5.0
EXIST LOAD	8	5.0	8			20	1		41	42		1	20	8			EXIST LOAD	8	5.0
SUBFEED LUGS/BREAKER																	SUBFEED LUGS/BREAKER		
									S.F.	S.F.									
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PANEL : RP2 (EXISTING REV)

VOLTS L/N: 120
VOLTS PH.: 240
PHASE : 1
MOUNTING : SURFACE
TYPE :
MFR : SQ D

MLO(***)
MCB 300
SH.TRIP
GFP

EXISTING : YES
SECTIONS : 1
NEMA 3R :

GENERAL NOTES:
(1) ALL C.B.'S FEEDING HVAC EQUIPMENT TO BE HACR TYPE.
(2) ALL C.B.'S FEEDING ELEV EQUIP TO BE SHUNT-TRIP TYPE.
(3) ALL C.B.'S FEEDING ELEV EQUIP TO BE SIZED AS REQ'D BY MFR.
(4) ALL C.B.'S FEEDING HID LTG TO BE HID RATED.
(5) NO MULTIWIRE BRANCH CKTS ARE ALLOWED
(6) NOT USED.

<------------AIC RATING (**)------------>
SERIES RATED 65 KA(*)
FULLY RATED KA
(*) NOTE: MAY REQUIRE FULL RATING TO ACHIEVE

NOTES AND REFERENCE NOTES:
MFR = SIZE CB PER MFR. RECOMMENDATIONS.
$ = NEW CB IN EXIST SPACE
& = REPLACE EXIST CB WITH NEW
SH = SHUNT TRIP C.B.
AF = ARC FAULT CB

TOTAL AMPS A PH 256
TOTAL AMPS B PH 233
INFO CODE: #REF!

(***) NOTE: SIZE SHOWN IS MINIMUM ACCEPTABLE MLO AMPERAGE. INCREASE SIZE IF REQUIRED TO ACHIEVE QUANTITY OF POLES OR BREAKER SIZE/AIC RATING AS CALLED FOR IN SCHEDULE.

OPTIONAL CALC NO
ACTUAL CONN LOAD 59 KVA 245 AMPS
DEMAND 48 KVA 200 AMPS
DIVERSITY 48 KVA 200 AMPS
TRANSFORMER SIZE KVA

SECTION 1 WITH MAINS — WIDTH: 20 DEPTH: 6.00

LOAD						C.B.	C.B.	REF			REF	C.B.	C.B.	LOAD					
DESCRIPTION	CONN	TYPE	AMPS	AMPS	AMPS	AMPS	POLE	NOTE	CKT. NO.	CKT. NO.	NOTE	POLE	AMPS	AMPS	AMPS	AMPS	DESCRIPTION	CONN	TYPE
EXIST LOAD	10	5.0	10			20	1		1	2		1	20	10			EXIST LOAD	10	5.0
EXIST LOAD	10	5.0		10		20	1		3	4		1	20		9		EXIST LOAD	9	5.0
EXIST LOAD	9	5.0	9			20	1		5	6		1	20	8			EXIST LOAD	8	5.0
EXIST LOAD	8	5.0		8		20	1		7	8		1	20		10		EXIST LOAD	10	5.0
EXIST LOAD	10	5.0	10			20	1		9	10		1	20	9			EXIST LOAD	9	5.0
EXIST LOAD	9	5.0		9		20	1		11	12		1	20		8		RECEPTS	5	4.0
EXIST LOAD	8	5.0	8			20	1		13	14		1	20	8			RECEPTS	5	4.0
EXIST LOAD	10	5.0		10		20	1		15	16		1	20		8		RECEPTS	5	4.0
EXIST LOAD	9	5.0	9			20	1		17	18		1	20	8			RECEPTS	5	4.0
EXIST LOAD	10	5.0		10		20	1		19	20	&	1	20		5		EF-3 & EF-4	5	5.0
EXIST LOAD	9	5.0	9			20	1		21	22		2	30	15			CU-1	15	10.0
(2) AHU-4	37	11.2		37		50	2	&	23	24		--------	--------		15		--------	15	10.0
--------	37	11.2	37			--------	--------		25	26		2	60	25			HPU-1	25	10.0
EXIST LOAD	9	5.0		9		20	1		27	28		--------	--------		25		--------	25	10.0
EXIST LOAD	8	5.0	8			20	1		29	30		1	20	10			WATER HEATER	10	5.0
FACP	5	5.0		5		20	1		31	32		1	20		10		EXTERIOR LIGHTS	1200	2.0
SHEDS	9	5.0	9			20	1		33	34		1	20	9			EXIST LOAD	9	5.0
EXIST LOAD	20	10.0		20		60	2		35	36		1	20		8		EXIST LOAD	8	5.0
--------	20	10.0	20			--------	--------		37	38		1	20	10			EXIST LOAD	10	5.0
EXIST LOAD	9	5.0		9		20	1		39	40		1	20		9		EXIST LOAD	9	5.0
EXIST LOAD	8	5.0	8			20	1		41	42		1	20	8			EXIST LOAD	8	5.0
SUBFEED LUGS/BREAKER																	SUBFEED LUGS/BREAKER		
									S.F.	S.F.									
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PANEL: LP (EXIST)

VOLTS L/N: 120
VOLTS PH.: 240
PHASE : 1
MOUNTING : SURFACE
TYPE :
MFR : SQ D

MLO(***) 100
MCB
SH.TRIP
GFP

EXISTING : YES
SECTIONS : 1
NEMA 3R :

GENERAL NOTES:
(1) ALL C.B.'S FEEDING HVAC EQUIPMENT TO BE HACR TYPE.
(2) ALL C.B.'S FEEDING ELEV EQUIP TO BE SHUNT-TRIP TYPE.
(3) ALL C.B.'S FEEDING ELEV EQUIP TO BE SIZED AS REQ'D BY MFR.
(4) ALL C.B.'S FEEDING HID LTG TO BE HID RATED.
(5) NO MULTIWIRE BRANCH CKTS ARE ALLOWED
(6) NOT USED.

<------------AIC RATING (**)------------>
SERIES RATED 65 KA(*)
FULLY RATED KA
(*) NOTE: MAY REQUIRE FULL RATING TO ACHIEVE

NOTES AND REFERENCE NOTES:
MFR = SIZE CB PER MFR. RECOMMENDATIONS.
$ = NEW CB IN EXIST SPACE
& = REPLACE EXIST CB WITH NEW
SH = SHUNT TRIP C.B.
AF = ARC FAULT CB

TOTAL AMPS A PH 101
TOTAL AMPS B PH 82
INFO CODE

(***) NOTE: SIZE SHOWN IS MINIMUM ACCEPTABLE MLO AMPERAGE. INCREASE SIZE IF REQUIRED TO ACHIEVE QUANTITY OF POLES OR BREAKER SIZE/AIC RATING AS CALLED FOR IN SCHEDULE.

OPTIONAL CALC NO
ACTUAL CONN LOAD 22 KVA 92 AMPS
DEMAND 16 KVA 65 AMPS
DIVERSITY 16 KVA 65 AMPS
TRANSFORMER SIZE KVA

SECTION 1 WITH MAINS — WIDTH: 20 DEPTH: 6.00

LOAD						C.B.	C.B.	REF	CKT.	CKT.	REF	C.B.	C.B.	LOAD					
DESCRIPTION	CONN	TYPE	AMPS	AMPS	AMPS	AMPS	POLE	NOTE	NO.	NO.	NOTE	POLE	AMPS	AMPS	AMPS	AMPS	DESCRIPTION	CONN	TYPE
EXIST LIGHTING	5	5.0	5			20	1		1	2		1	20	5			EXIST LIGHTING	5	5.0
EXIST LIGHTING	6	5.0		6		20	1		3	4		1	20		6		EXIST LIGHTING	6	5.0
EXIST LIGHTING	7	5.0	7			20	1		5	6		1	20	7			EXIST LIGHTING	7	5.0
EXIST LIGHTING	5	5.0		5		20	1		7	8		1	20		5		EXIST LIGHTING	5	5.0
EXIST LIGHTING	6	5.0	6			20	1		9	10		1	20	6			EXIST LIGHTING	6	5.0
EXIST LIGHTING	7	5.0		7		20	1		11	12		1	20		8		EXIST LIGHTING	5	4.0
EXIST LIGHTING	5	5.0	5			20	1		13	14		1	20	8			EXIST LIGHTING	5	4.0
EXIST LIGHTING	6	5.0		6		20	1		15	16		1	20		8		EXIST LIGHTING	5	4.0
EXIST LIGHTING	7	5.0	7			20	1		17	18		1	20	8			EXIST LIGHTING	5	4.0
SPACE							1		19	20		1	20		5		EXIST LIGHTING	5	5.0
EXIST LIGHTING	6	5.0	6			20	1		21	22		2	20	8			EF-2	8	5.0
EXIST LIGHTING	7	5.0		7		20	1		23	24		--------	--------		8		--------	8	5.0
GAS HEATERS	5	5.0	5			20	1		25	26		1	20	5			EXIST LIGHTING	5	5.0
EXIST LIGHTING	6	5.0		6		20	1		27	28		1	20		6		EXIST LIGHTING	6	5.0
DRYER + ICE MACHINE	7	5.0	7			20	1		29	30		1	20	7			EXIST LIGHTING	7	5.0
SPACE							1		31	32		1					SPACE		
SPACE							1		33	34		1					SPACE		
SPACE							1		35	36		1					SPACE		
SPACE							1		37	38		1					SPACE		
SPACE							1		39	40		1					SPACE		
SPACE							1		41	42		1					SPACE		
SUBFEED LUGS/BREAKER																	SUBFEED LUGS/BREAKER		
									S.F.	S.F.									
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---------------						-------	-------		S.F.	S.F.		--------	-------				---------------		

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PANEL: LP (EXIST. REV)

VOLTS L/N: 120
VOLTS PH.: 240
PHASE : 1
MOUNTING : SURFACE
TYPE :
MFR : SQ D

MLO(***) 100
MCB
SH.TRIP
GFP

EXISTING : YES
SECTIONS : 1
NEMA 3R :

GENERAL NOTES:
(1) ALL C.B.'S FEEDING HVAC EQUIPMENT TO BE HACR TYPE.
(2) ALL C.B.'S FEEDING ELEV EQUIP TO BE SHUNT-TRIP TYPE.
(3) ALL C.B.'S FEEDING ELEV EQUIP TO BE SIZED AS REQ'D BY MFR.
(4) ALL C.B.'S FEEDING HID LTG TO BE HID RATED.
(5) NO MULTIWIRE BRANCH CKTS ARE ALLOWED
(6) NOT USED.

<------------AIC RATING (**)------------>
SERIES RATED 65 KA(*)
FULLY RATED KA
(*) NOTE: MAY REQUIRE FULL RATING TO ACHIEVE

NOTES AND REFERENCE NOTES:
MFR = SIZE CB PER MFR. RECOMMENDATIONS.
$ = NEW CB IN EXIST SPACE
& = REPLACE EXIST CB WITH NEW
SH = SHUNT TRIP C.B.
AF = ARC FAULT CB
% LABEL EXIST CB AS SPARE

TOTAL AMPS A PH 93
TOTAL AMPS B PH 83
INFO CODE

(***) NOTE: SIZE SHOWN IS MINIMUM ACCEPTABLE MLO AMPERAGE. INCREASE SIZE IF REQUIRED TO ACHIEVE QUANTITY OF POLES OR BREAKER SIZE/AIC RATING AS CALLED FOR IN SCHEDULE.

OPTIONAL CALC NO
ACTUAL CONN LOAD 21 KVA 88 AMPS
DEMAND 15 KVA 64 AMPS
DIVERSITY 15 KVA 64 AMPS
TRANSFORMER SIZE KVA

SECTION 1 WITH MAINS — WIDTH: 20 DEPTH: 6.00

LOAD						C.B.	C.B.	REF	CKT.	CKT.	REF	C.B.	C.B.	LOAD					
DESCRIPTION	CONN	TYPE	AMPS	AMPS	AMPS	AMPS	POLE	NOTE	NO.	NO.	NOTE	POLE	AMPS	AMPS	AMPS	AMPS	DESCRIPTION	CONN	TYPE
EXIST LIGHTING	5	5.0	5			20	1		1	2		1	20	5			EXIST LIGHTING	5	5.0
EXIST LIGHTING	6	5.0		6		20	1		3	4		1	20		6		EXIST LIGHTING	6	5.0
EXIST LIGHTING	7	5.0	7			20	1		5	6		1	20	7			EXIST LIGHTING	7	5.0
EXIST LIGHTING	5	5.0		5		20	1		7	8		1	20		5		EXIST LIGHTING	5	5.0
EXIST LIGHTING	6	5.0	6			20	1		9	10		1	20	6			EXIST LIGHTING	6	5.0
EXIST LIGHTING	7	5.0		7		20	1		11	12		1	20		8		EXIST LIGHTING	5	4.0
EXIST LIGHTING	5	5.0	5			20	1		13	14		1	20	8			EXIST LIGHTING	5	4.0
EXIST LIGHTING	6	5.0		6		20	1		15	16		1	20		8		EXIST LIGHTING	5	4.0
EXIST LIGHTING	7	5.0	7			20	1		17	18		1	20	8			EXIST LIGHTING	5	4.0
EF-1 & EF-2	9	9.0		9		20	1	&	19	20		1	20		5		EXIST LIGHTING	5	5.0
EXIST LIGHTING	6	5.0	6			20	1		21	22	%	2	20				SPARE		0.2
EXIST LIGHTING	7	5.0		7		20	1		23	24		--------	--------				--------		0.2
GAS HEATERS	5	5.0	5			20	1		25	26		1	20	5			EXIST LIGHTING	5	5.0
EXIST LIGHTING	6	5.0		6		20	1		27	28		1	20		6		EXIST LIGHTING	6	5.0
DRYER + ICE MACHINE	7	5.0	7			20	1		29	30		1	20	7			EXIST LIGHTING	7	5.0
SPACE							1		31	32		1					SPACE		
SPACE							1		33	34		1					SPACE		
SPACE							1		35	36		1					SPACE		
SPACE							1		37	38		1					SPACE		
SPACE							1		39	40		1					SPACE		
SPACE							1		41	42		1					SPACE		
SUBFEED LUGS/BREAKER																	SUBFEED LUGS/BREAKER		
									S.F.	S.F.									
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HEX NOTES

(1) UTILITY LOAD ANALYSIS CALCULATED BELOW* DETERMINED PEAK LOAD OF MDP AND THE MCB WILL NOT NEED TO BE INCREASED.

(2) ABANDONED EQUIPMENT, AVAILABLE SPACES AND REUSED/ RECONDITIONED BREAKERS TO BE VERIFIED BY ELECTRICAL CONTRACTOR.

*PEAK KW FROM 2014: 209.8KW X 1000 / 480$\sqrt{3}$ = 252A
PER 220.87 (1)(2) [252 X 1.25] = 315A EXISTING LOAD
NET ADDT'L LOAD [NEW LOAD] 96A – [REMOVED LOAD] 78A = 18A
NEW TOTAL NET LOAD [EXISTING LOAD] 315A + [NET ADDT'L LOAD] 18A = 333A

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ENG. BUS. No. EB-0005096 CERT. OF AUTH. No. 5096

ORANGE COUNTY FIRE LOGISTICS WAREHOUSE HVAC REPLACEMENT

Revisions

No.	Date	Description

Key Plan

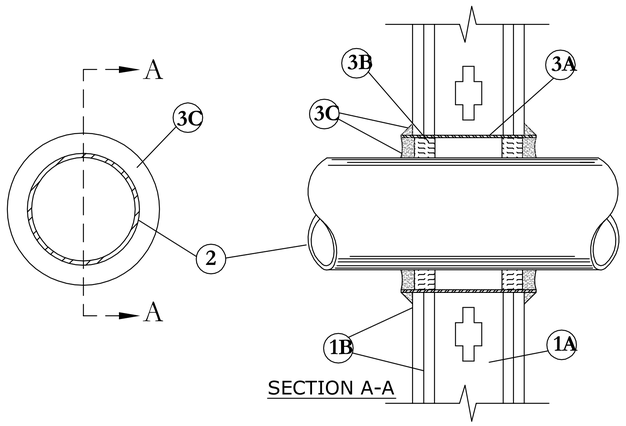
MPE PROJ#: 2013-171
Designed By: RB
Drawn By: AG/RB
Checked By: CT
Issue Date: 10/01/15
Drawing Scale: NO SCALE

Drawing Title:
ELECTRICAL SCHEDULES

BID DOCUMENTS

Drawing No.
E502

System No.W-L-1003
September 03, 2004
(Formerly System No. 147)
F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr



SECTION A-A

1. Wall Assembly – The 1 or 2 hr fire–rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

A. Studs – Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC with nom 2 by 4 in. lumber end plates and cross braces. Steel studs to be min 3–1/2 in. wide by 1–3/8 in. deep channels spaced max 24 in. OC.

B. Gypsum Board* – Nom 5/8 in. thick, 4 ft. wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 15 in.

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrant – One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The space between pipes, conduits or tubing and the steel sleeve (Item 3A) shall be min of 0 in. (point contact) to max 2–3/8 in. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:

A. Steel Pipe – Nom 12 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.

B. Iron Pipe – Nom 12 in. diam (or smaller) service weight (or heavier) cast iron soil pipe, nom 12 in. diam (or smaller) or Class 50 (or heavier) ductile iron pressure pipe.

C. Conduit – Nom 6 in. diam (or smaller) steel conduit or nom 4 in. diam (or smaller) steel electrical metallic tubing.

D. Copper Tubing – Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.

E. Copper Pipe – Nom 6 in. diam (or smaller) Regular (or heavier) copper pipe.

3. Firestop System – Installed symmetrically on both sides of wall assembly. The details of the firestop system shall be as follows.

A. Steel Sleeve – Cylindrical sleeve fabricated from min 0.019 in. thick (No. 28 gauge) galv sheet steel and having a min 2 in. lap along the longitudinal seam. Length of steel sleeve to be equal to thickness of wall plus 1 to 4 in. such that, when installed, the ends of the sleeve will project approximately 1/2 to 2 in. beyond the surface of the wall on both sides of the wall assembly. Sleeve installed by coiling the sheet steel to a diam smaller than the through opening, inserting the coil through the openings and releasing the coil to let it uncoil against the circular cutouts in the gypsum wallboard layers.

B. Packing Material – Min 1 in. thickness of mineral wool batt insulation firmly packed into steel sleeve on both sides of the wall assembly as permanent forms. Packing material to be recessed min 1/2 in. from end of steel sleeve (flush with or recessed into gypsum wallboard surface) on both sides of wall assembly.

B1. Packing Material – (Not shown) – As an alternate to Item B, nom 1 in. thick polyethylene backer rod may be used. The backer rod is to be recessed within the steel sleeve a min of 1 in. from each surface of wall.

C. Fill,Void or Cavity Materials* – Caulk or Sealant – When mineral wool batt insulation is used, applied to fill the steel sleeve to a min depth of 1/2 in. on both sides of wall assembly. When backer rod is used, a min thickness of 1 in. of CP–25WB+ caulk is required flush with surface of wall. A nom 1/4 in. diam continuous bead of caulk or sealant shall be applied around the circumference of the steel sleeve at its egress from the gypsum wallboard layers on both sides of the wall assembly.

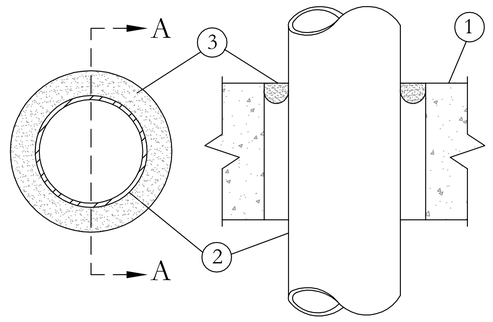
3M COMPANY – CP 25WB+ caulk or FB–3000 WT sealant.

*Bearing the UL Classification Marking

PENETRATION FIRESTOP FOR 12" MAX. DIA. METAL PIPE/CONDUIT THROUGH GYPSUM WALLBOARD ASSEMBLY

N.T.S. UL SYSTEM #147A (1 OR 2 HOUR RATING) FIREST5

SYSTEM NO
C-AJ-1027
FRATING--3 HR
TRATING--0 HR



SECTION A–A

1. Floor or Wall Assembly – Min 4–1/2 in. thick lightweight or normal weight (100–150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of through opening is 12–1/4 in. See Concrete Blocks (CAZT) category in Fire Resistance Directory for names of manufacturers.

2. Through Penetrants – One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. Min annular space between pipe, conduit or tubing and edge of opening is 0 in. (point contact). Max annular space is dependent on pipe, conduit or tubing type and size as well as the F Rating of the system, as shown in the table below. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:

A. Steel Pipe – Nom 10 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.

B. Conduit – Nom 6 in. diam (or smaller) rigid steel conduit.

C. Conduit – Nom 4 in. diam (or smaller) steel electrical metallic tubing or steel conduit.

D. Copper – Tubing Nom 3 in. diam (or smaller) Type L (or heavier) copper tubing.

E. Copper – Pipe Nom 3 in. diam (or smaller) Regular (or heavier) copper pipe.

F. Iron Pipe – Nom 10 in. diam (or smaller) cast or ductile iron pipe.

Pipe Conduit or Tubing Type	Max Nom Pipe Conduit or Tubing Diam In.	F Rating Hr	Max Annular Space In.
2–1/2	1/2–12	3	3/4
2–1/2	1/2–12	3	3/4
4–1/2	1/2–6	3	1–1/2
4–1/2	1/2–12	3	3/4
4–1/2	1/2–20	2	7/8

3. Fill,Void or Cavity Materials* – Putty – Moldable putty material kneaded by hand and applied to fill annular space to a min depth of 1 in., flush with top surface of floor. In wall assemblies, required putty thickness to be installed symmetrically on both sides of wall.
MINNESOTA MINING & MFG CO – MPS–2+
*Bearing the UL Classification Marking

PENETRATION FIRESTOP FOR 10" MAX. DIA. METAL PIPE/CONDUIT THROUGH A CONCRETE WALL

N.T.S. UL SYSTEM #202 (1 OR 2 HOUR RATING)

NOTES FOR FIRE STOPPING DETAILS (NEC & UL)

1) FIRE STOPPING DETAILS ARE SHOWN FOR GENERAL INTENT. PROVIDE FIRE STOPPING ASSEMBLY SUITABLE FOR THE APPLICATION IN COMPLIANCE WITH N.E.C. AND U.L.

2) DETAILS ARE BASED ON 3M PRODUCTS AND THEIR RECOMMENDED USAGE/ DETAILS. SUBSTITUTED PRODUCTS SHALL BE SUBMITTED AS OUTLINED IN SPECIFICATIONS. U.L. FIRE STOPPING ASSEMBLY DETAILS SHALL BE INCLUDED WITH PRODUCT DATA FOR REVIEW PRIOR TO INSTALLATION.

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ENG. BUS. No. EB-0005096 CERT. OF AUTH. No. 5096

ORANGE COUNTY FIRE LOGISTICS WAREHOUSE HVAC REPLACEMENT

Revisions

No.	Date	Description

Key Plan

MPE PROJ#: 2013–171
Designed By: RB
Drawn By: AG/RB
Checked By: CT
Issue Date: 10/01/15
Drawing Scale: NO SCALE

Drawing Title:
ELECTRICAL DETAILS

BID DOCUMENTS

Drawing No.
E901