CAMPUS BUILDING PERMIT NUMBER B19-163

GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING ANY WORK. SHOULD A DISCREPANCY APPEAR IN THE SPECIFICATIONS OR DRAWINGS, OR IN THE WORK DONE BY OTHERS FROM THE CONTRACT DOCUMENT THAT AFFECT ANY WORK, NOTIFY THE ARCHITECT AT ONCE FOR INSTRUCTION ON HOW TO PROCEED. IF THE CONTRACTOR PROCEEDS WITH THE WORK AFFECTED WITHOUT INSTRUCTION FROM THE ARCHITECT, THE CONTRACTOR SHALL CORRECT ANY RESULTING DAMAGE OR DEFECT TO THE SATISFACTION OF THE ARCHITECT. SHOULD A CONFLICT OCCUR BETWEEN DRAWINGS AND SPECIFICATIONS, OR WHERE DETAIL REFERENCES ON CONTRACT DRAWINGS HAVE BEEN OMITTED, THE CONTRACTOR IS DEEMED TO HAVE ESTIMATED THE MOST EXPENSIVE MATERIALS AND CONSTRUCTION METHOD INVOLVED, UNLESS A WRITTEN DECISION FROM THE ARCHITECT HAS BEEN OBTAINED WHICH DESCRIBES AN ALTERNATE METHOD AND/OR MATERIALS.
2. ALL DIMENSIONS SHALL HAVE PREFERENCE OVER SCALE.
3. WHERE EXISTING FINISHES, FACILITIES AND SURFACES ARE DISTURBED, DAMAGED, OR REMOVED DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR IS TO REPAIR OR REPLACE AS NECESSARY TO MATCH EXISTING. ALL NEW MATERIALS SHALL MATCH EXISTING IN ALL RESPECTS.
4. DRESS & BEHAVIOR OF ALL CONSTRUCTION WORKERS SHALL BE APPROPRIATE TO A SCHOOL SITE AND BE ACCEPTABLE TO THE UNIVERSITY REPRESENTATIVES.
5. THERE SHALL BE NO SMOKING, POSSESSION OR CONSUMPTION OF DRUGS OR ALCOHOLIC BEVERAGES ON THE JOB SITE BY ANY PERSON AT ANY TIME.
6. A PROJECT INSPECTOR EMPLOYED BY THE UNIVERSITY (OWNER) SHALL PROVIDE INSPECTION OF THE WORK.
7. ALL WORK SHALL CONFORM TO TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR).
8. CHANGES TO THE APPROVED DRAWINGS & SPECIFICATIONS SHALL BE MADE BY AN ADDENDUM OR A CONSTRUCTION CHANGE DOCUMENT (CCD).
9. ALL WORK SHALL CONFORM TO CHAPTER 14 (CFC) FOR FIRE SAFETY DURING CONSTRUCTION.
10. ALL CONSTRUCTION AND MATERIALS SHALL BE AS SPECIFIED AND AS REQUIRED BY THE CURRENT EDITION OF THE CBC, LOCAL CODES, AND AUTHORITIES.
11. THE CONTRACTOR SHALL CONFINE HIS/HER OPERATIONS ON THE SITE TO AREAS PERMITTED BY THE UNIVERSITY. CONTRACTOR SHALL PROVIDE ADEQUATE DUST CONTROL TO PREVENT DUST FROM ENTERING THE BUILDING AREA. THE WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE LAWS, LOCAL ORDINANCES, PERMITS, AND THE CONTRACT DOCUMENTS. THE JOB SITE SHALL BE MAINTAINED IN A CLEAN, ORDERLY CONDITION AND FREE OF DEBRIS AND LITTER. CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS AS A RESULT OF HIS OPERATION IMMEDIATELY UPON COMPLETION OF EACH PHASE OF HIS WORK.
12. ALL MATERIAL STORED ON THE SITE SHALL BE PROPERLY STACKED AND PROTECTED TO PREVENT DAMAGE AND DETERIORATION UNTIL USE. FAILURE TO PROTECT MATERIALS MAY BE CAUSE FOR REJECTION OF THE WORK.
13. NO PORTION OF THE WORK REQUIRING A SHOP DRAWING OR SAMPLE SUBMITTAL SHALL BE COMMENCED UNTIL THE SUBMITTAL HAS BEEN APPROVED BY THE ARCHITECT. ALL SUCH PORTIONS OF THE WORK SHALL BE IN ACCORDANCE WITH APPROVED SHOP DRAWINGS AND SAMPLES.
14. CONTRACTOR SHALL PROPERLY DISPOSE OF ALL CONSTRUCTION DEBRIS.
15. ALL WORK SHALL CONFORM TO 2016 EDITION TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR).
16. THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS THAT THE WORK OF THE ALTERATION, REHABILITATION OR RECONSTRUCTION IS TO BE IN ACCORDANCE WITH TITLE 24, CCR. SHOULD ANY EXISTING CONDITIONS SUCH AS DETERIORATION OR NON-COMPLYING CONSTRUCTION BE DISCOVERED WHICH IS NOT COVERED BY THE CONTRACT DOCUMENTS WHEREIN THE FINISHED WORK WILL NOT COMPLY WITH TITLE 24, CCR, A CONSTRUCTION CHANGE DOCUMENT (CCD), OR A SEPARATE SET OF PLANS AND SPECIFICATIONS, DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY UCR BEFORE PROCEEDING WITH THE WORK. (SECTION 4-317(c), PART 1, TITLE 24, CCR)
17. CONTRACTOR SHALL OBTAIN PARKING PERMITS FROM UCR.

REFERENCE SYMBOLS

BUILDING SECTION:
1 / A4.0 — SHEET LOCATION / SHEET NUMBER

BUILDING DETAIL:
SIM / A101 — REFERENCE NUMBER / MODIFIER VALUE / REFERENCE SHEET

WALL SECTION:
1 / A4.0 — SHEET LOCATION / SHEET NUMBER

PLAN ENLARGEMENT:
A4/A5 — REFERENCE NUMBER / REFERENCE SHEET

REVISION:
#

PLAN KEY NOTE:
1 NEW, 1 DEMO

DOOR CALL-OUT:
1

WINDOW CALL-OUT:
1

REFLECTED CEILING TAG:
0'-0"

GRIDLINE:
D/6 — GRID NUMBER OR LETTER

ROOM IDENTIFICATION TAG:
Room name / 101 — ROOM NUMBER IDENTIFER

UNIVERSITY OF CALIFORNIA RIVERSIDE

WEST LOTHIAN ROOF REPLACEMENT

PROJECT # 956399 - CANN # P5502

500 W. BIG SPRINGS ROAD
RIVERSIDE, CA 92507

ABBREVIATIONS

A.F.F.	ABOVE FINISH FLOOR	JST.	JOIST	WT	WEIGHT
ADJ.	ADJUSTABLE	LAV.	LAVATORY	WWM	WELDED WIRE MESH
A/C	AIR CONDITIONING	LT.	LIGHT	WIN.	WINDOW
ALT.	ALTERNATE	(M)	MODIFY	W/O	WITHOUT
ALUM.	ALUMINUM	MANUF.	MANUFACTURER	WD.	WOOD
A.B.	ANCHOR BOLT	MAX.	MAXIMUM		
APPROX.	APPROXIMATE	M.C.	MEDICINE CABINET		
ARCH.	ARCHITECT	MED.	MEDIUM		
AUTO.	AUTOMATIC	MIN.	MINIMUM		
BRG.	BEARING	MIRR.	MIRROR		
BM.	BEAM	MISC.	MISCELLANEOUS		
CONC.	CONCRETE	(N)	NEW		
C.M.U.	CONC. MASONRY UNIT	NAT. GR.	NATURAL GRADE		
CONT.	CONTINUOUS	N.I.C.	NOT IN CONTRACT		
C.T.	COOKTOP	N.T.S.	NOT TO SCALE		
DEPT.	DEPARTMENT	NO./#	NUMBER		
DIA.	DIAMETER	O.C.	ON CENTER		
DIM.	DIMENSION	OPP.	OPPOSITE		
DISH.	DISHWASHER	PNT.	PAINT		
DBL.	DOUBLE	PLAST.	PLASTER		
DN.	DOWN	PL. LAM.	PLASTIC LAMINATE		
D.O.	DOUBLE OVEN	PL.	PLATE		
DWG.	DRAWING	PLY.	PLYWOOD		
D.F.	DRINKING FOUNTAIN	P.L.	PROPERTY LINE		
EA.	EACH	RAD.	RADIUS		
ELEC.	ELECTRIC	REF.	REFRIGERATOR		
ELEV.	ELEVATOR	REQ.	REQUIRE		
EQ.	EQUAL	REQ'D	REQUIRED		
EXH.	EXHAUST	SCH.	SCHEDULE		
(E)	EXISTING	SECT.	SECTION		
EXT.	EXTERIOR	SHT.	SHEET		
F.O.M.	FACE OF MASONRY	SHTG.	SHEATING		
F.O.S.	FACE OF STUD	SHWR.	SHOWER		
FIN.	FINISH	SIM.	SIMILAR		
F.A.	FINISH FLOOR	S.C.	SOLID CORE		
FLR.	FLOOR	SPEC.	SPECIFICATIONS		
FLUOR.	FLUORESCENT	SQ.	SQUARE		
FRZ.	FREEZER	S.S.	STAINLESS STEEL		
FTG.	FOOTING	STD.	STANDARD		
GA.	GAUGE	STRUCT.	STRUCTURAL		
GALV.	GALVANIZED	SUSP.	SUSPENDED		
GL.	GLASS	SYS.	SYSTEM		
GR.	GRADE	TEL.	TELEPHONE		
GYP.	GYPSUM	T.O.C.	TOP OF CANOPY		
HDW.	HARDWARE	T.O.P.	TOP OF PARAPET		
HDR.	HEADER	T.O.R.	TOP OF ROOF		
HVAC	HEAT/VENT/A/C	T.V.	TELEVISION		
HT.	HEIGHT	T&G	TOUNGE & GROOVE		
H.C.	HOLLOW CORE	VERT.	VERTICAL		
H.M.	HOLLOW METAL	VEST.	VESTIBULE		
HORIZ.	HORIZONTAL	W.C.	WATER CLOSET		
H.B.	HOSE BIBB	W.P.	WATER PROOFING		

BUILDING CODES

APPLICABLE CODES

- 2016 CALIFORNIA ADMINISTRATIVE CODE (CAC), PART 1, TITLE 24 CCR*
- 2016 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R. (2015 INTERNATIONAL BUILDING CODE VOLUMES 1 & 2 AND 2016 CALIFORNIA AMENDMENTS)
- 2016 CALIFORNIA ELECTRICAL CODE (CEC) , PART 3, TITLE 24 CCR (2014 NATIONAL ELECTRICAL CODE AND 2016 CALIFORNIA AMENDMENTS)
- 2016 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24 CCR (2015 IAPMO UNIFORM MECHANICAL CODE AND 2016 CALIFORNIA AMENDMENTS)
- 2016 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24 CCR (2015 IAPMO UNIFORM PLUMBING CODE AND 2016 CALIFORNIA AMENDMENTS)
- 2016 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24 CCR
- 2016 CALIFORNIA FIRE CODE, PART 9, TITLE 24 CCR (2015 INTERNATIONAL FIRE CODE AND 2016 CALIFORNIA AMENDMENTS)
- 2016 CALIFORNIA EXISTING BUILDING CODE (CEBC), PART 10, TITLE 24 CCR (2015 INTERNATIONAL EXISTING BUILDING CODE AND 2016 CALIFORNIA AMENDMENTS)
- 2016 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN), PART 11, TITLE 24 CCR
- 2016 CALIFORNIA REFERENCED STANDARDS, PART 12, TITLE 24 CCR
- TITLE 19 CCR, PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS

BUILDING DATA (FROM RECORD DRAWINGS):

AUTOMATIC FIRE SPRINKLERS:	YES
NATURE OF USE:	DORM / STUDENT HOUSING
OCCUPANCY (RESIDENCE HALL):	R-2
TYPE OF CONSTRUCTION:	TYPE II
NO. OF STORIES:	4 + BASEMENT
HEIGHT ABOVE GRADE:	36'-8" (TOP OF ROOF)

SCOPE OF WORK

WORK INCLUDED IN THIS CONTRACT WILL CONSIST OF, BUT NOT LIMITED TO THE FOLLOWING:

- REMOVE/ REPLACE ROOF SYSTEM & FLASHING.
- REMOVE EXISTING SOLAR SYSTEM & PIPING.
- REMOVE/ REPLACE MECHANICAL SYSTEMS ON ROOF, INCLUDING EXHAUST FAN AND ASSOCIATED APPURTENANCES
- REMOVE/ REPLACE SCREEN WALLS AROUND ROOF MOUNTED TANKS.
- NEW SCREEN WALLS AROUND EXISTING ROOF HATCHES AND ON TOP OF RESTROOM CORE.
- AIR CONDITIONERS AND ASSOCIATED APPURTENANCES SHALL NOT BE ALTERED IN THIS PROJECT

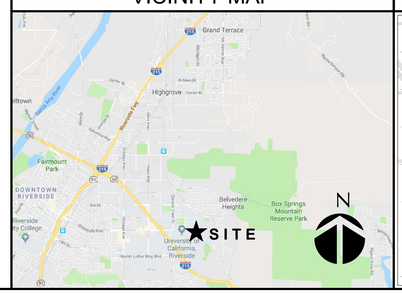
DEFERRED APPROVALS

NONE

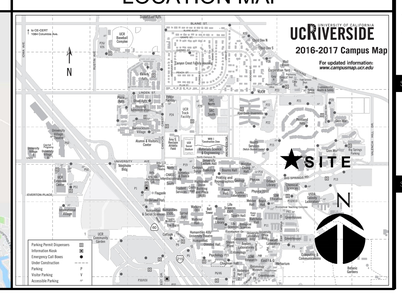
GENERAL NOTES

1. PROVIDE ALL MANUFACTURES CUT SHEETS, SPECIFICATIONS AND ALL MANUFACTURES INSTALLATION INSTRUCTION PRIOR TO COMMENCEMENT OF CONSTRUCTION. ANY SPECIAL INSTRUCTIONS FOR TEAR OFF AND DECK PREPARATION SHOULD ALSO BE INCLUDED FROM THE ROOFING MANUFACTURER. THIS REQUIREMENT IS PART OF THIS APPROVAL.

VICINITY MAP



LOCATION MAP



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ARCHITECT OF RECORD: DARRYL K. CARTOZIAN, A.I.A.
SENIOR PROJECT MANAGER: TIM CASSEL
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GOSS ENGINEERING
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T1.2	2016 GREEN BUILDING STANDARDS

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A0.1	DEMO ROOF PLAN
A1.1	NEW ROOF PLAN
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2	SCREEN WALL DETAILS
3	SCREEN WALL DETAILS

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M0.2	EQUIPMENT SCHEDULES
M1.1	ROOF DEMOLITION HVAC PLAN
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E1.2	ROOF POWER PLAN
E2.0	PANEL SCHEDULES & DETAILS

INSPECTION REQUIRED
University of California, Riverside
Office of Planning, Design & Construction
Signed CBO: *Robert K. Williams*
Building, Safety and Compliance Division
ALL INSPECTIONS SHALL BE REQUESTED USING THE CHORMS SYSTEM

APPROVED
UC RIVERSIDE
Office of Planning, Design & Construction
Signed CBO: *Robert K. Williams*
Building, Safety and Compliance Division
CAMPUS BUILDING PERMIT

DKC Architects, Inc.
DARRYL K. CARTOZIAN A.I.A.

ARCHITECTS:
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LICENSED ARCHITECT — DARRYL K. CARTOZIAN — NO.C32543 REN. 06-31-19 — STATE OF CALIFORNIA

CONSULTANT:

CLIENT:

WEST LOTHIAN ROOF REPLACEMENT

PROJECT # 956399 - CANN # P5502

UCR CAPITAL PROGRAMS
1223 UNIVERSITY AVE.
SUITE 240
RIVERSIDE, CA 92507
CONTACT: JOHN FRANKLIN
(951) 203-7910

APPROVALS:

100% Plan Submittal - 3/26/2019

REVISIONS:
1 DATE:
2 DATE:
3 DATE:

CHECKED BY: D.K.C. P.M.: T.C.
DATE: MARCH 26, 2019

SHEET TITLE:

TITLE SHEET

SHEET NO:

T1.1

10406 / T1.1 TITLE SHEET
03/28/2019

▲ DRAWING NAME: K:\194 UCR\10406 - UCR W LOTHIAN REROOF\DRAWING\T1.1 TITLE SHEET.DWG ▶ DATE/TIME: 2019-03-21 3:12 PM ▶ PLOTTED BY: JAKE BUCHENAUER

CAMPUS BUILDING PERMIT NUMBER B19-163

2016 CALIFORNIA GREEN BUILDING STANDARDS CODE NONRESIDENTIAL MANDATORY MEASURES

INSPECTOR SIGNOFF

CHAPTER 3
GREEN BUILDING
SECTION 301 GENERAL

301.1 SCOPE. Buildings shall be designed to include the green building measures specified as mandatory in the application checklists contained in this code. Voluntary green building measures are also included in the application checklists and may be included in the design and construction of structures covered by this code, but are not required unless adopted by a city, county, or city and county as specified in Section 101.7.

ABBREVIATION DEFINITIONS:

HCD	Department of Housing and Community Development
BSC	California Building Standards Commission
DSA-SS	Division of the State Architect, Structural Safety
OSHPD	Office of Statewide Health Planning and Development
LR	Low Rise
HR	High Rise
AA	Additions and Alterations
N	New

CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES
DIVISION 5.1 PLANNING AND DESIGN
SECTION 5.101 GENERAL

5.101.1 Scope
The provisions of this chapter outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties.

SECTION 5.102 DEFINITIONS

5.102.1 DEFINITIONS
The following terms are defined in Chapter 2 *(and are included here for reference)*

TENANT-OCCUPANTS. Building occupants who inhabit a building during its normal hours of operation as permanent occupants, such as employees, as distinguished from customers and other transient visitors.

DIVISION 5.4 MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

SECTION 5.408 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

5.408.1 CONSTRUCTION WASTE MANAGEMENT. Recycle and/or salvage for reuse a minimum of 50% of the non-hazardous construction and demolition waste in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.

5.408.1.1 Construction waste management plan. Where a local jurisdiction does not have a construction and demolition waste management ordinance, submit a construction waste management plan that:
1. Identifies the construction and demolition waste materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale.
2. Determines if construction and demolition waste materials will be sorted on-site (source-separated) or bulk mixed (single stream).
3. Identifies diversion facilities where construction and demolition waste material collected will be taken.
4. Specifies that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

5.408.1.2 Waste Management Company. Utilize a waste management company that can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with this section.

Note: The owner or contractor shall make the determination if the construction and demolition waste material will be diverted by a waste management company.

Exceptions to Sections 5.408.1.1 and 5.408.1.2:
1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.
3. Demolition waste meeting local ordinance or calculated in consideration of loacl recycleing facilities and markets.

5.408.1.3 Waste stream reduction alternative. The combined weight of new construction disposal that does not exceed two pounds per square foot of building area may be deemed to meet the 50% minimum requirement as approved by the enforcing agency.

5.408.1.4 Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with Sections 5.408.1.1, through 5.408.1.3. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the enforcing agency.

Notes:
1. Sample forms found in "A Guide to the California Green Building Standards Code (Nonresidential)" located at www.bsc.ca.gov/Home/CALGreen.aspx may be used to assist in documenting compliance with the waste management plan.
2. Mixed construction and demolition debris processors can be located at the California Department of Resources Recycling and Recovery (CalRecycle).

INSPECTOR SIGNOFF

SECTION 5.504 POLLUTANT CONTROL

5.504.1.3 Temporary ventilation. The permanent HVAC system shall only be used during construction if necessary to condition the building or areas of addition or alteration within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30% based on ASHRAE 52.1-1992 Replace all filters immediately prior to occupancy, or, if the building is occupied during alteration, at the conclusion of construction.

5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation, or during storage on the construction site and until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may collect in the system.

5.504.4 Finish material pollutant control. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.4.

5.504.4.1 Adhesives, sealants and caulks. Adhesives, sealants, and caulks used on the project shall meet the requirements of the following standards:
1. Adhesives, adhesive bonding primers adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.

2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of *California Code of Regulations*, Title 17, commencing with Section 94507.

TABLE 5.504.4.1 - ADHESIVE VOC LIMIT[1,2]

Less Water and Less Exempt Compounds in Grams per Liter

ARCHITECTURAL APPLICATIONS	CURRENT VOC LIMIT
INDOOR CARPET ADHESIVES	50
CARPET PAD ADHESIVES	50
OUTDOOR CARPET ADHESIVES	150
WOOD FLOORING ADHESIVES	100
RUBBER FLOOR ADHESIVES	60
SUBFLOOR ADHESIVES	50
CERAMIC TILE ADHESIVES	65
VCT & ASPHALT TILE ADHESIVES	50
DRYWALL & PANEL ADHESIVES	50
COVE BASE ADHESIVES	50
MULTIPURPOSE CONSTRUCTION ADHESIVES	70
STRUCTURAL GLAZING ADHESIVES	100
SINGLE-PLY ROOF MEMBRANE ADHESIVES	250
OTHER ADHESIVES NOT SPECIFICALLY LISTED	50
SPECIALTY APPLICATIONS	
PVC WELDING	510
CPVC WELDING	490
ABS WELDING	325
PLASTIC CEMENT WELDING	250
ADHESIVE PRIMER FOR PLASTIC	550
CONTACT ADHESIVE	80
SPECIAL PURPOSE CONTACT ADHESIVE	250
STRUCTURAL WOOD MEMBER ADHESIVE	140
TOP & TRIM ADHESIVE	250
SUBSTRATE SPECIFIC APPLICATIONS	
METAL TO METAL	30
PLASTIC FOAMS	50
POROUS MATERIAL (EXCEPT WOOD)	50
WOOD	30
FIBERGLASS	80

1. IF AN ADHESIVE IS USED TO BOND DISSIMILAR SUBSTRATES TOGETHER, THE ADHESIVE WITH THE HIGHEST VOC CONTENT SHALL BE ALLOWED.

2. FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THIS TABLE, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168, www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF

TABLE 5.504.4.2 - SEALANT VOC LIMIT

Less Water and Less Exempt Compounds in Grams per Liter

SEALANTS	CURRENT VOC LIMIT
ARCHITECTURAL	250
MARINE DECK	760
NONMEMBRANE ROOF	300
ROADWAY	250
SINGLE-PLY ROOF MEMBRANE	450
OTHER	420
SEALANT PRIMERS	
ARCHITECTURAL	
NONPOROUS	250
POROUS	775
MODIFIED BITUMINOUS	500
MARINE DECK	760
OTHER	750

NOTE: FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THESE TABLES, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168.

5.504.4.3 Paints and coatings. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 5.504.4.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-High Gloss coating, based on its gloss, as defined in Subsections 4.21, 4.36 and 4.37 of the 2007 California Air Resources Board Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 5.504.4.3 shall apply.

5.504.4.3.1 Aerosol Paints and coatings. Aerosol paints and coatings shall meet the PWMIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of *California Code of Regulations*, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.

INSPECTOR SIGNOFF

TABLE 5.504.4.3 - VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[2,3]

GRAMS OF VOC PER LITER OF COATING, LESS WATER & LESS EXEMPT COMPOUNDS

COATING CATEGORY	CURRENT VOC LIMIT
FLAT COATINGS	50
NONFLAT COATINGS	100
NONFLAT HIGH GLOSS COATINGS	150
SPECIALTY COATINGS	
ALUMINUM ROOF COATINGS	400
BASEMENT SPECIALTY COATINGS	400
BITUMINOUS ROOF COATINGS	50
BITUMINOUS ROOF PRIMERS	350
BOND BREAKERS	350
CONCRETE CURING COMPOUNDS	350
CONCRETE/MASONRY SEALERS	100
DRIVEWAY SEALERS	50
DRY FOG COATINGS	150
FAUX FINISHING COATINGS	350
FIRE RESISTIVE COATINGS	350
FLOOR COATINGS	100
FORM-RELEASE COMPOUNDS	250
GRAPHIC ARTS COATINGS (SIGN PAINTS)	500
HIGH-TEMPERATURE COATINGS	420
INDUSTRIAL MAINTENANCE COATINGS	250
LOW SOLIDS COATINGS[1]	120
MAGNESITE CEMENT COATINGS	450
MASTIC TEXTURE COATINGS	100
METALLIC PIGMENTED COATINGS	500
MULTICOLOR COATINGS	250
PRETREATMENT WASH PRIMERS	420
PRIMERS, SEALERS, & UNDERCOATERS	100
REACTIVE PENETRATING SEALERS	350
RECYCLED COATINGS	250
ROOF COATINGS	50
RUST PREVENTATIVE COATINGS	250
SHELLACS:	
CLEAR	730
OPAQUE	550
SPECIALTY PRIMERS, SEALERS & UNDERCOATERS	100
STAINS	250
STONE CONSOLIDANTS	450
SWIMMING POOL COATINGS	340
TRAFFIC MARKING COATINGS	100
TUB & TILE REFINISH COATINGS	420
WATERPROOFING MEMBRANES	250
WOOD COATINGS	275
WOOD PRESERVATIVES	350
ZINC-RICH PRIMERS	340

1. GRAMS OF VOC PER LITER OF COATING, INCLUDING WATER & EXEMPT COMPOUNDS

2. THE SPECIFIED LIMITS REMAIN IN EFFECT UNLESS REVISED LIMITS ARE LISTED IN SUBSEQUENT COLUMNS IN THE TABLE.

3. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, ARCHITECTURAL COATINGS SUGGESTED CONTROL MEASURE, FEB. 1, 2008. MORE INFORMATION IS AVAILABLE FROM THE AIR RESOURCES BOARD.

5.504.4.3.2 Verification. Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:
1. Manufacturer's product specification
2. Field verification of on-site product containers

5.504.4.5 Composite wood products. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the buildings shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.). Those materials not exempted under the ATCM must meet the specified emission limits, as shown in Table 5.504.4.5.

5.504.4.5.3 Documentation. Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:
1. Product certifications and specifications.
2. Chain of custody certifications.
3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).
4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards.
5. Other methods acceptable to the enforcing agency.

TABLE 5.504.4.5 - FORMALDEHYDE LIMITS[1]

MAXIMUM FORMALDEHYDE EMISSIONS IN PARTS PER MILLION

PRODUCT	CURRENT LIMIT
HARDWOOD PLYWOOD VENEER CORE	0.05
HARDWOOD PLYWOOD COMPOSITE CORE	0.05
PARTICLE BOARD	0.09
MEDIUM DENSITY FIBERBOARD	0.11
THIN MEDIUM DENSITY FIBERBOARD[2]	0.13

1. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, AIR TOXICS CONTROL MEASURE FOR COMPOSITE WOOD AS TESTED IN ACCORDANCE WITH ASTM E 1333. FOR ADDITIONAL INFORMATION, SEE CALIFORNIA CODE OF REGULATIONS, TITLE 17, SECTIONS 93120 THROUGH 93120.12.

2. THIN MEDIUM DENSITY FIBERBOARD HAS A MAXIMUM THICKNESS OF 5/16 INCHES (8 MM).

INSPECTOR SIGNOFF

CHAPTER 7
INSTALLER & SPECIAL INSPECTOR QUALIFICATIONS
702 QUALIFICATIONS

702.1 INSTALLER TRAINING. HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or contractor licensed to install HVAC systems. Examples of acceptable HVAC training and certification programs include but are not limited to the following:
1. State certified apprenticeship programs.
2. Public utility training programs.
3. Training programs sponsored by trade, labor or statewide energy consulting or verification organizations.
4. Programs sponsored by manufacturing organizations.
5. Other programs acceptable to the enforcing agency.

702.2 SPECIAL INSPECTION [HCD]. When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education may be considered by the enforcing agency when evaluating the qualifications of a special inspector:

1. Certification by a national or regional green building program or standard publisher.
2. Certification by a statewide energy consulting or verification organization, such as HERS raters, building performance contractors, and home energy auditors.
3. Successful completion of a third party apprentice training program in the appropriate trade.
4. Other programs acceptable to the enforcing agency.

Notes:
1. Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.
2. HERS raters are special inspectors certified by the California Energy Commission (CEC) to rate homes in California according to the Home Energy Rating System (HERS).

[BSC] When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The area of certification shall be closely related to the primary job function, as determined by the local agency.

Note: Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.

703 VERIFICATIONS

703.1 DOCUMENTATION. Documentation used to show compliance with this code shall include but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which demonstrate substantial conformance. When specific documentation or special inspection is necessary to verify compliance, that method of compliance will be specified in the appropriate section or identified applicable checklist.

APPROVED
UC RIVERSIDE
Office of Planning, Design & Construction
Signed CBO: Robert R. Williams
Building, Safety and Compliance Division
CAMPUS BUILDING PERMIT

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CONSULTANT:

CLIENT:

WEST LOTHIAN ROOF REPLACEMENT

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APPROVALS:

100% Plan Submittal - 3/26/2019

REVISIONS:
1 DATE:
2 DATE:
3 DATE:

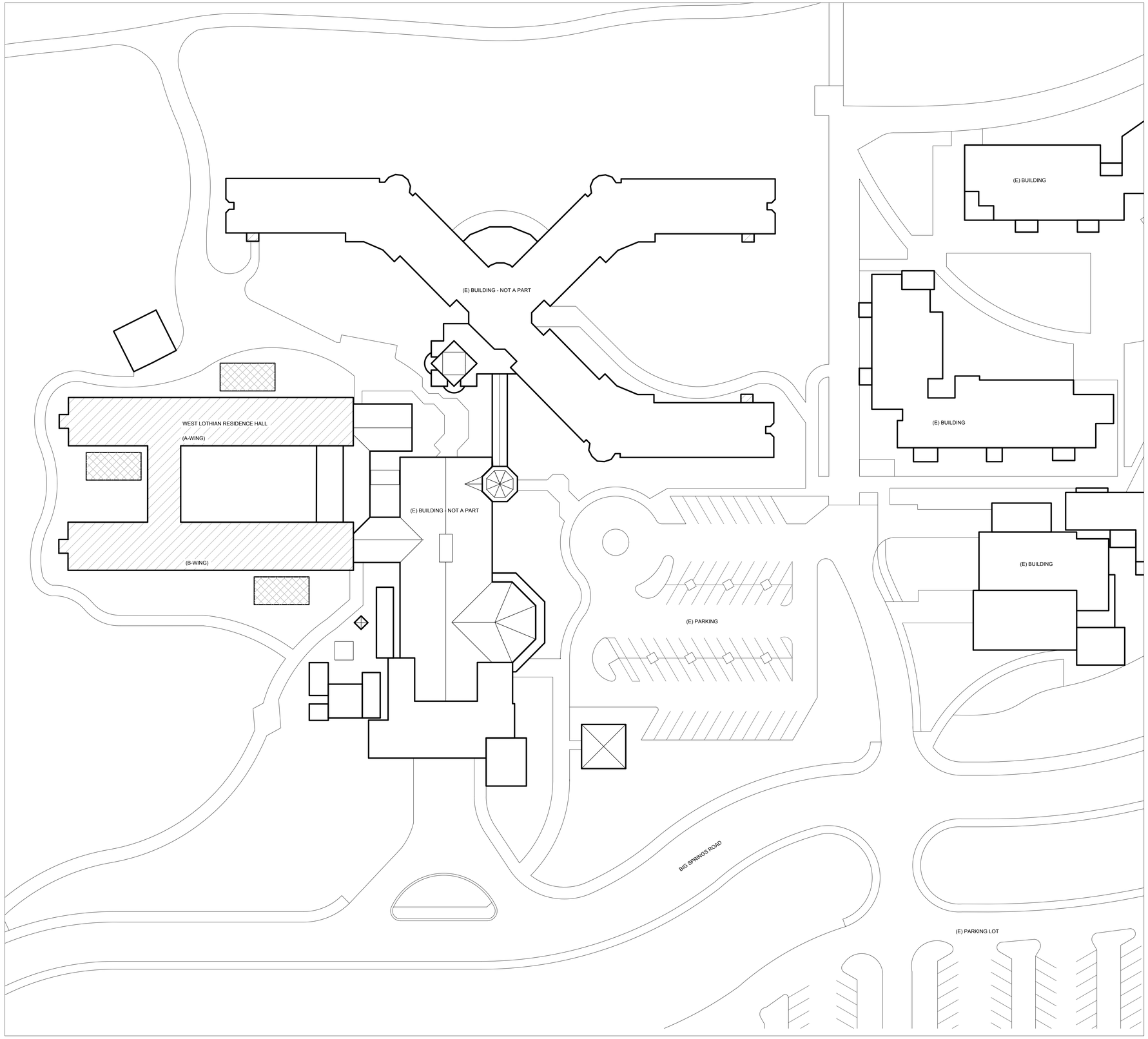
CHECKED BY: D.K.C. P.M.: T.C.
DATE: MARCH 26, 2019

SHEET TITLE:
2016 GREEN BUILDING STANDARDS

SHEET NO:
T1.2

10406 / T1.2 GREEN BUILDING
03/26/2019

CAMPUS BUILDING PERMIT NUMBER B19-163



SITE PLAN LEGEND

PROJECT SCOPE AREA.

PROPOSED LOCATION OF DUMPSTERS/ LAY DOWN AREAS. COORDINATE ACCESS PATH WITH UCR.

GENERAL NOTES

1. CONTRACTOR SHALL COORDINATE PROPOSED DUMPSTERS / LAY DOWN W/ UCR PRIOR TO ORDERING / PLACING ANYTHING ON SITE. CONTRACTOR SHALL OBTAIN APPROVAL FROM UCR.
2. CONTRACTOR SHALL PROTECT DUMPSTER / LAY DOWN AREAS EXISTING LANDSCAPE / HARDSCAPE / BUILDINGS.
3. CONTRACTOR SHALL REPAIR / REPLACE LANDSCAPE, IRRIGATION, HARDSCAPE TO PRE CONSTRUCTION CONDITIONS AT COMPLETION OF PROJECT AT CONTRACTORS EXPENSE.
4. DO NOT STORE SALVAGED ITEMS ON SITE UNLESS APPROVAL BY UCR PRIOR TO STORED ITEMS ON -SITE.
5. CONTRACTOR SHALL KEEP SITE / BUILDING AREAS CLEAN AND FREE OF DEBRIS PER GENERAL CONDITIONS OF THE CONTRACT.

APPROVED
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SHEET TITLE:

SITE PLAN

SHEET NO:

AS0.1

10406 / AS0.1 SITE PLAN
03/28/2019

SITE PLAN | 30' | 29

▲ DRAWING NAME: K:\104 UCR\10406 - UCR W LOTHIAN REROOF\DRAWING\AS0.1 SITE PLAN.DWG ▶ DATE/TIME: 2019-03-21 3:04 PM ▶ PLOTTED BY: JAKE BUCHENAUER

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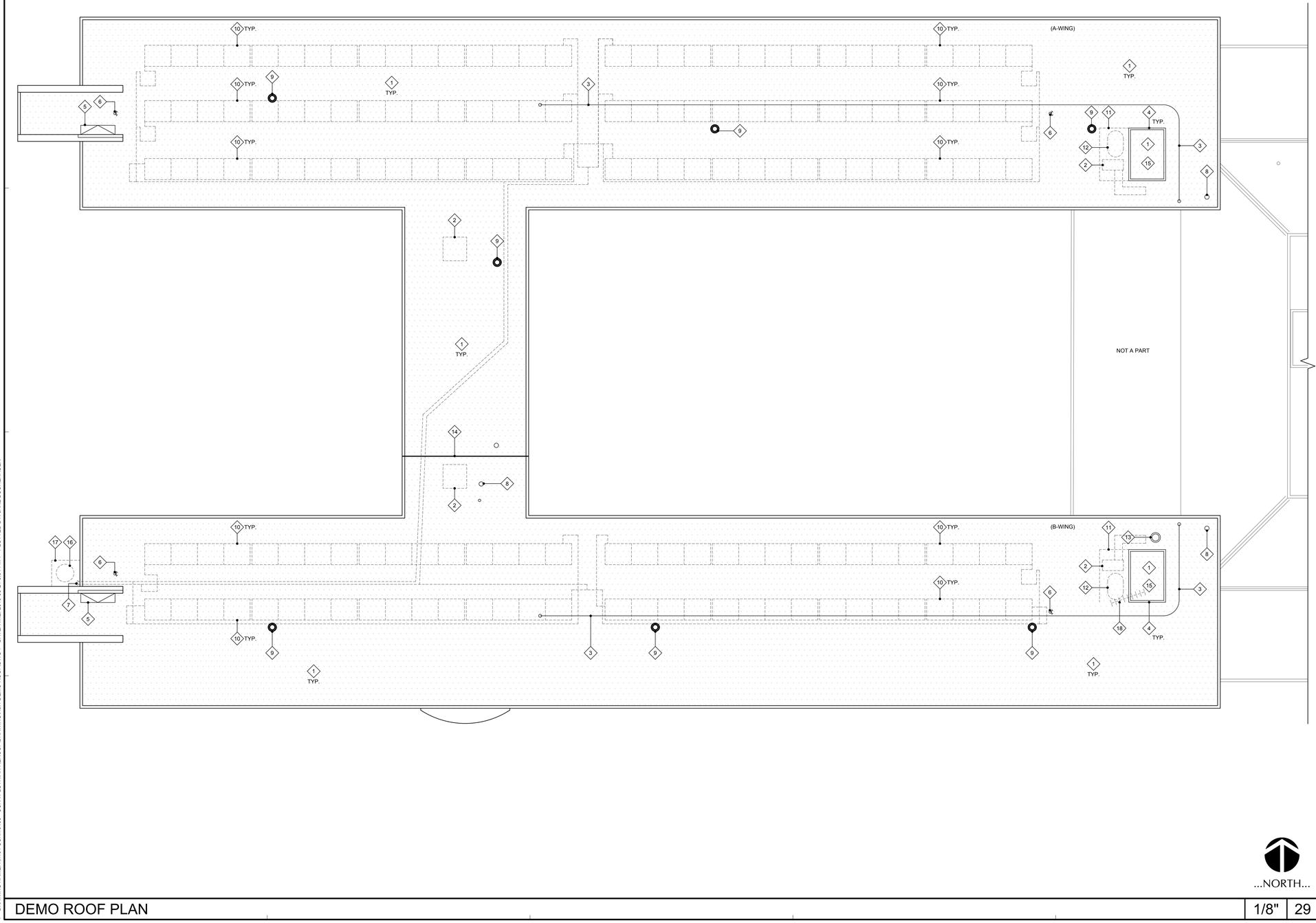


ROOF PLAN DEMO KEYNOTES

1.	02105	REMOVE ROOFING SYSTEMS / FLASHING: FOAM ROOF O/ BUILT UP O/ TAPERED FOAM SYSTEM O/ TAR COATING. REMOVE ALL COMPONENTS DOWN TO (E) CONC. ROOF DECK
2.	02105	REMOVE EXHAUST FAN & BASE
3.	-------	EXISTING CONDUIT, SEE ELECTRICAL DRAWINGS
4.	02105	REMOVE VERTICAL ROOFING
5.	-------	(E) ROOF ACCESS HATCH TO REMAIN, REMOVE ROOFING / ACCESSORIES AROUND HATCH
6.	-------	(E) F.D.C. TO REMAIN
7.	02105	REMOVE PIPES & SUPPORTS DOWN TO TANK
8.	-------	(E) ROOF VENT TO REMAIN, TYP.
9.	-------	REMOVE ROOF DRAIN & STRAINER
10.	02105	REMOVE (E) SOLAR SYSTEM, SUPPORTS & COMPONENTS
11.	02105	REMOVE (E) SCREEN WALLS & SUPPORTS
12.	02105	REMOVE (E) EXPANSION TANK
13.	-------	(E) CHIMNEY TO REMAIN, REMOVE ROOFING & BASE
14.	02105	REMOVE (E) EXPANSION JOINT SYSTEM
15.	-------	(E) ELEVATOR SHAFT TO REMAIN
16.	-------	REMOVE TANK BELOW
17.	-------	(E) FENCE BELOW TO REMAIN
18.	-------	REMOVE (E) ANTENNA & WIRE

GENERAL NOTES

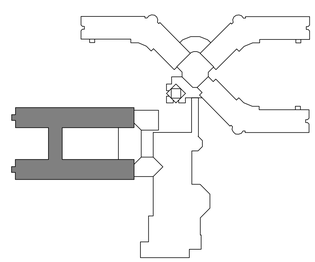
1. REMOVE ALL ROOFING SYSTEMS / COMPONENTS / FLASHING DOWN TO ROOF DECK. SEE KEYNOTE 1.
2. REMOVE ALL SOLAR SYSTEM PIPING & SUPPORTS.
3. REMOVE ALL EXHAUST FANS AND ROOF MOUNTED DUCTS. REFER TO MECHANICAL DRAWINGS.
4. CONTRACTOR TO PROPERLY REMOVE & DISPOSE OF ALL MATERIALS IN A PROPER AND COMPLIANT METHOD W/ ALL PERTINENT REGULATORY AGENCIES AND THEIR REQUIREMENTS

APPROVED
UC RIVERSIDE
Office of Planning, Design & Construction
Signed CBO: Robert K. Williams
Building, Safety and Compliance Division
CAMPUS BUILDING PERMIT

ROOF PLAN LEGEND

REMOVE EXISTING ROOF (SEE KEYNOTE 1)

KEY PLAN



...NORTH...

DEMO ROOF PLAN | 1/8" | 29

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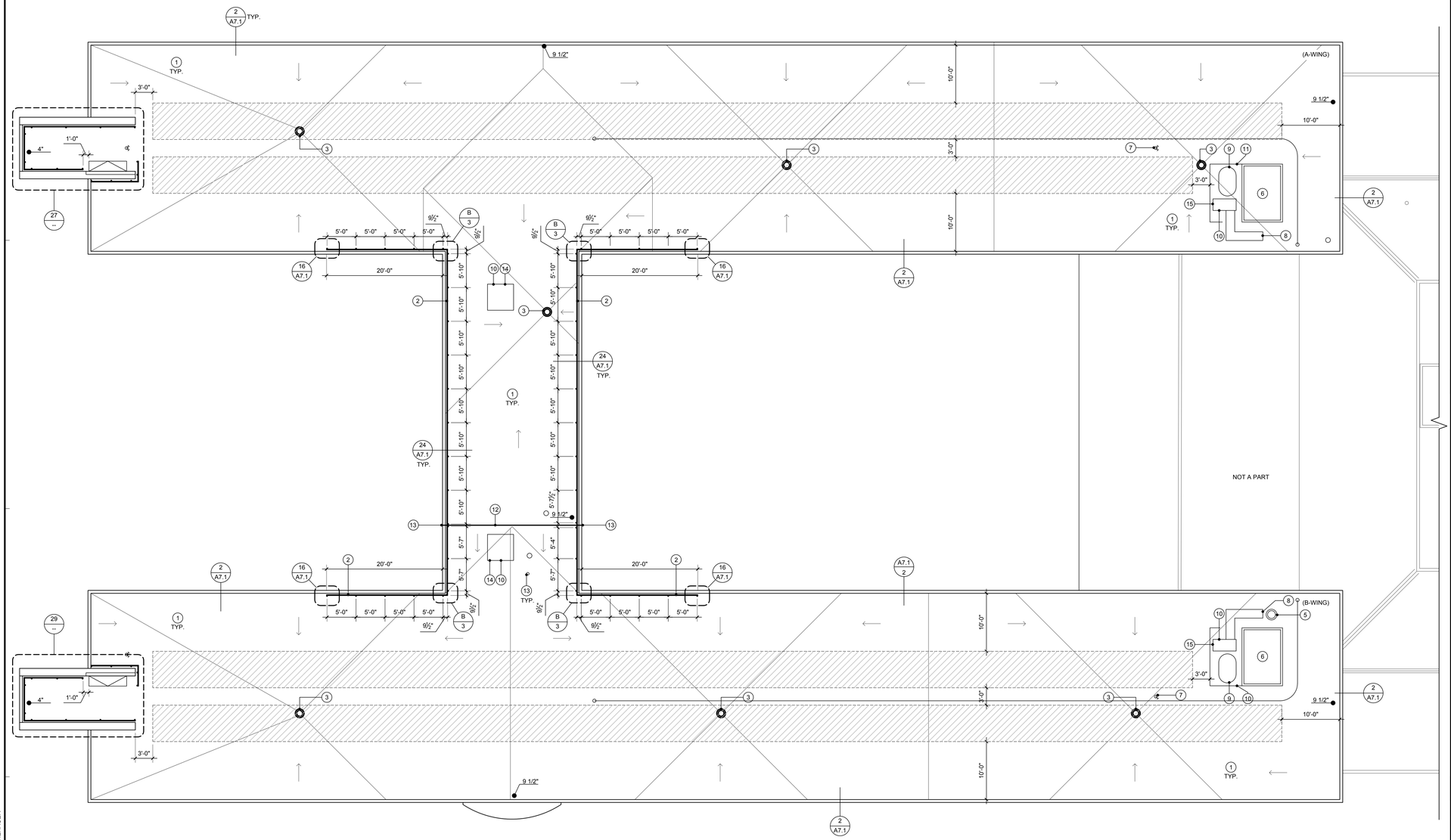
SHEET TITLE:
DEMO ROOF PLAN

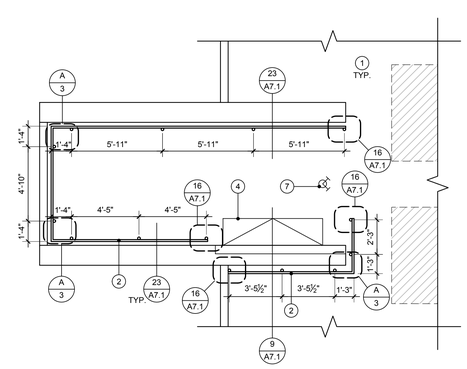
SHEET NO:
A0.1

10406 / A0.1 DEMO ROOF 03/28/2019

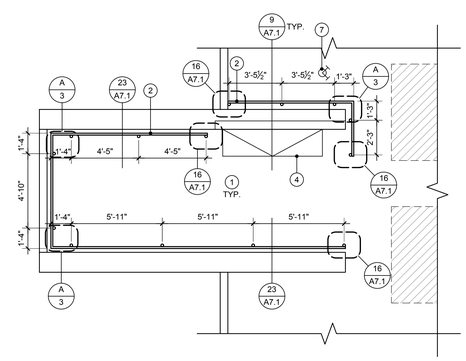
▲ DRAWING NAME: K:\104 UCR\10408 - UCR W LOTHIAN REROOF\DRAWINGS\A0.1 DEMO ROOF.DWG ▶ DATE/TIME: 2019-03-21 3:04 PM ▶ PLOTTED BY: JAKE BUCHENAUER



NEW ROOF PLAN — 1/8" — 23



ENLARGED ROOF PLAN — 1/4" — 27



ENLARGED ROOF PLAN — 1/4" — 29

ⓧ ROOF PLAN KEYNOTES

1.	07550	(N) CLASS A ROOFING, SEE 6/A7.1
2.	05120	(N) SCREEN WALL
3.	-------	(E) ROOF DRAIN, SEE 10/A7.1
4.	-------	(E) ROOF ACCESS HATCH
5.	-------	(E) CHIMNEY, SEE 1/A7.1
6.	-------	(E) ELEVATOR OVERHEAD, SEE 12/A7.1
7.	-------	(E) F.D.C.
8.	230000	(N) DUCT TRANSITION 22/A7.1
9.	230000	(N) EXPANSION TANK
10.	230000	(N) EXHAUST FAN, SEE 4/A7.1
11.	-------	(N) EQUIPMENT SCREEN WALL, SEE 8/A7.1
12.	07550	(N) EXPANSION JOINT, SEE 3/A7.1
13.	05120	PROVIDE 1" TO 3" GAP @ RAILS IN SCREEN WALL AT ROOF EXPANSION JOINT
14.	-------	CURB, SEE 21/A7.1
15.	-------	PLATFORM, SEE 20/A7.1

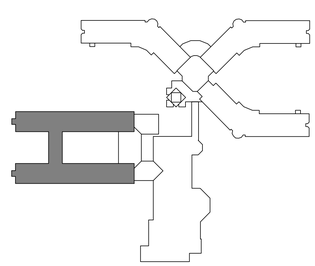
GENERAL NOTES

1. CONTRACTOR TO FIELD VERIFY LOCATIONS OF ALL PIPE PENETRATIONS. FOR PENETRATIONS REFER TO DETAIL 5/A7.1.
2. REFER TO STRUCTURAL CALCULATIONS FOR ADDITIONAL SCREEN / ROOF DETAILS.

ROOF PLAN LEGEND

PROPOSED FUTURE SOLAR AREA

KEY PLAN



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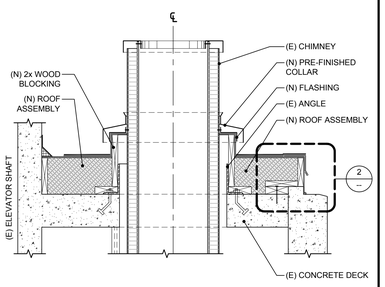
NEW ROOF PLAN

SHEET NO:

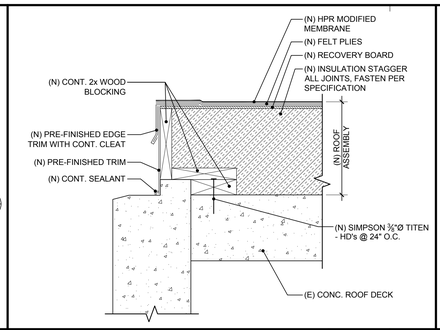
A1.1

10406 / A1.1 NEW ROOF
03/28/2019

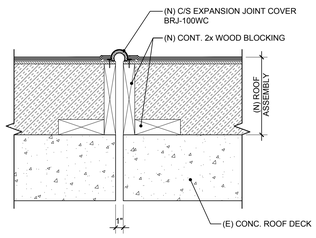
CAMPUS BUILDING PERMIT NUMBER B19-163



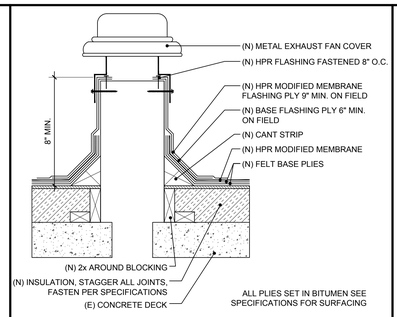
CHIMNEY	3/4"	1



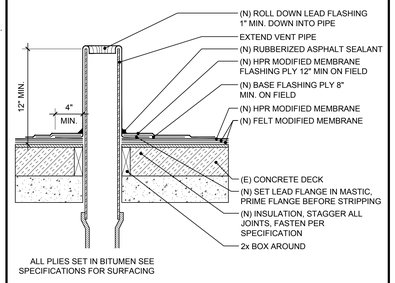
ROOF EDGE	1 1/2"	2



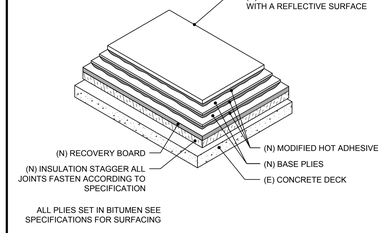
EXPANSION JOINT	1 1/2"	3



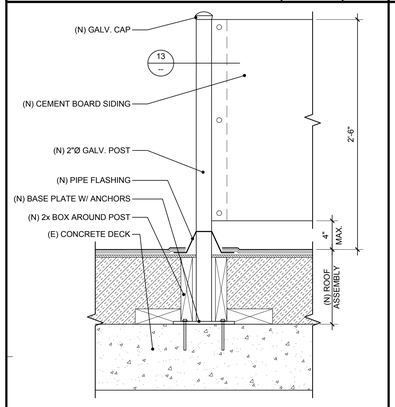
EXHAUST FAN	NTS	4



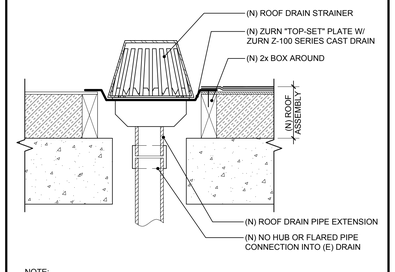
PLUMBING STACK	NTS	5



COATED FINISH	NTS	6

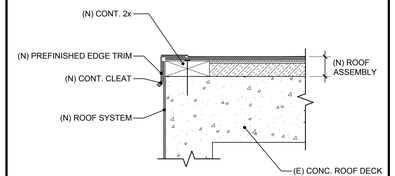


EQPMNT SCREEN WALL	3"	8

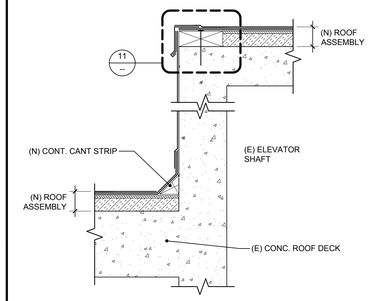


NOTE:
1. REINSTALL (E) STRAINERS IN GOOD CONDITION / UNBROKEN.
2. PROVIDE (N) STRAINERS WHERE (E) STRAINERS ARE BROKEN.

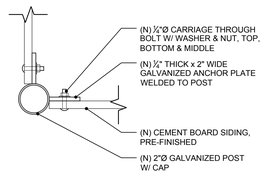
ROOF DRAIN	1 1/2"	10



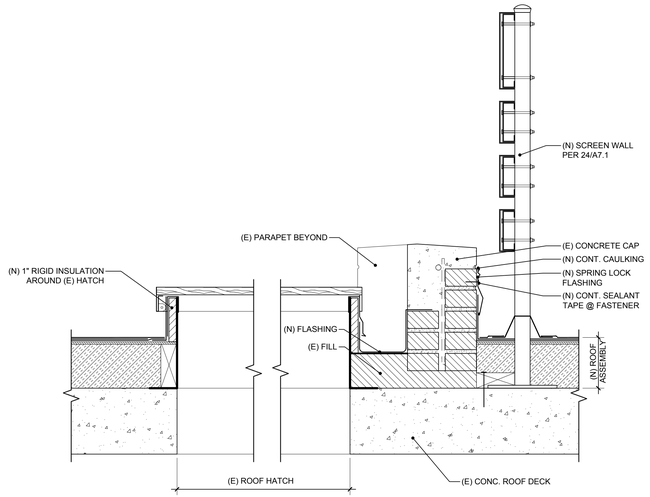
ELEVATOR SHAFT EDGE	1 1/2"	11



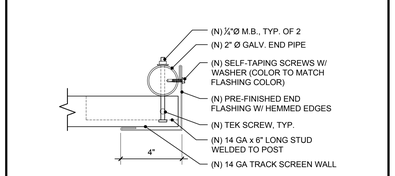
ELEVATOR SHAFT	1 1/2"	12



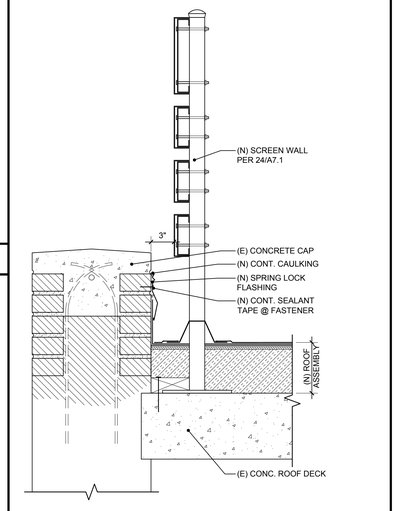
EQPMNT SCREEN WALL	3"	13



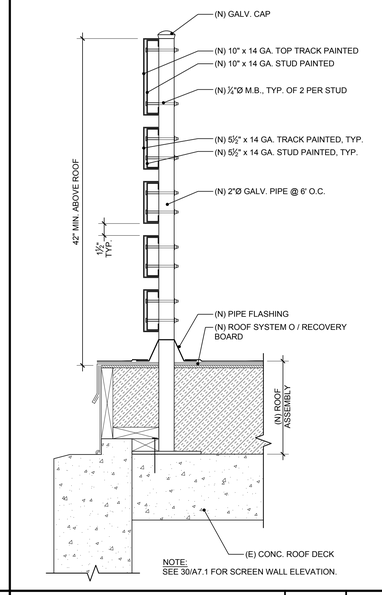
ROOF ACCESS HATCH	1 1/2"	9



ROOF SCREEN END	3"	16

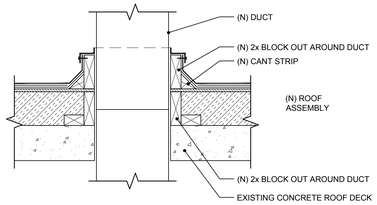


SCREEN @ PARAPET	1 1/2"	23

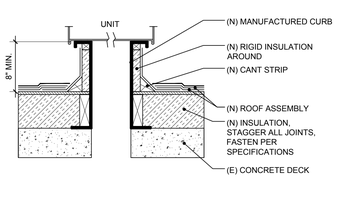


SCREEN WALL	1 1/2"	24

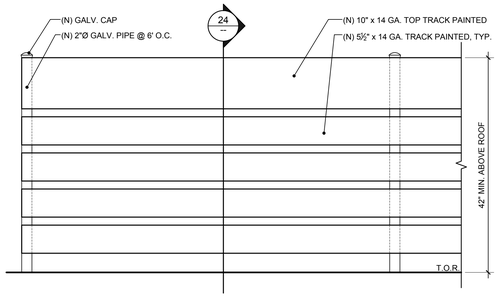
PLATFORM	NTS	20



DUCT	NTS	21



CURB	NTS	22



SCREEN WALL TYPICAL ELEVATION	1"	30

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PROJECT # 956399 - CANN # P5502

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APPROVALS:

100% Plan Submittal - 3/26/2019

REVISIONS:
1 DATE:
2 DATE:
3 DATE:

CHECKED BY: D.K.C. P.M.: T.C.
DATE: MARCH 26, 2019

SHEET TITLE:

DETAILS

SHEET NO:

A7.1

10406 / A7.1 DETAILS
03/28/2019

▲ DRAWING NAME: K:\104 UCR\10406 - UCR W LOTHIAN REROOF\DRAWING\A7.1 DETAILS.DWG ▶ DATE/TIME: 2019-03-21 3:05 PM ▶ PLOTTED BY: JAKE BUCHENAUER

ABBREVIATIONS

APPROX	APPROXIMATELY
BHP	BRAKE HORSE POWER
BLDG	BUILDING
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHW	CHILLED WATER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
D	DOWN
DDC	DIRECT DIGITAL CONTROL
DIA	DIAMETER
DWG	DRAWING
E	EXISTING
EA	EACH
ECWR	EQUIPMENT COOLING WATER RETURN
ECWS	EQUIPMENT COOLING WATER SUPPLY
EF	EXHAUST FAN
EG	EXHAUST GRILLE
EMS	ENERGY MANAGEMENT SYSTEM
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
FLA	FULL LOAD AMPS
FPM	FEET PER MINUTE
°F	DEGREES FAHRENHEIT
GA	GALVANIZED
HDG	HOT DIPPED GALVANIZED
HP	HORSEPOWER
Hz	HERTZ
IN.	INCH
LAB	LABORATORY
LBS	POUNDS
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MIN	MINIMUM
OPER.	OPERATING
OSA	OUTSIDE AIR
PDCV	PUMP DISCHARGE CONTROL VALVE
PDI	PRESSURE DIFFERENTIAL INDICATOR
PDT	PRESSURE DIFFERENTIAL TRANSMITTER
PH	PHASE
POC	POINT OF CONNECTION
POD	POINT OF DISCONNECTION/ PNEUMATIC OPERATED DAMPER
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UTR	UP TO ROOF
V	VENT/VOLT
VAR	VARIABLE
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
WC	WATER COLUMN
WG	WATER GAGE
WT	WEIGHT
&	AND
ø	PHASE/DIAMETER
'	FOOT
"	INCH

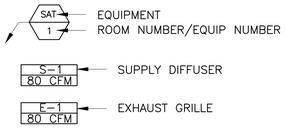
GENERAL SYMBOLS

POINT OF DEMOLITION

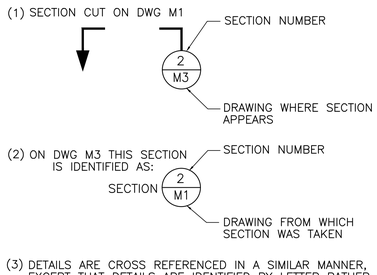
POINT OF CONNECTION

DRAIN

EQUIPMENT DESIGNATIONS



SECTION AND DETAIL DESIGNATIONS



(3) DETAILS ARE CROSS REFERENCED IN A SIMILAR MANNER, EXCEPT THAT DETAILS ARE IDENTIFIED BY LETTER RATHER THAN NUMBER

GENERAL MECHANICAL NOTES

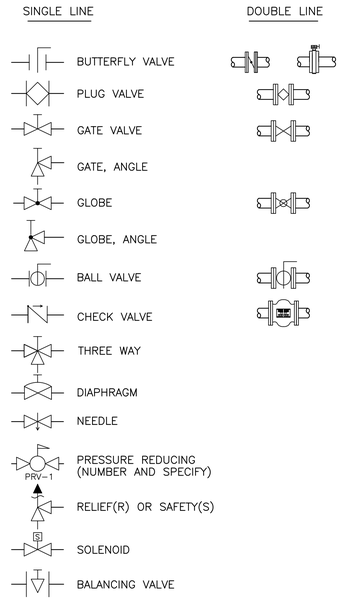
1. PERFORM CONSTRUCTION SUCH THAT ADJACENT SPACES ARE NOT AFFECTED. ADJACENT LABS MUST REMAIN IN OPERATION THROUGHOUT CONSTRUCTION. ANY ACTIVITIES WHICH AFFECT ADJACENT LAB OPERATIONS SHALL BE COORDINATED WITH AND APPROVED BY THE UNIVERSITY REPRESENTATIVE BEFORE CONSTRUCTION BEGINS.
2. ALL CORRIDORS AND ROOMS WITHIN THE SCOPE OF THE PROJECT SHALL BE AIR BALANCED TO AIR FLOWS NOTED ON DRAWINGS.

MECHANICAL INDEX

HEATING, VENTILATION AND AIR CONDITIONING LEGEND

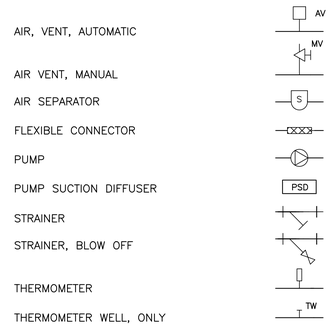
SYMBOL	DESCRIPTION
AH/AHU	AIR HANDLING UNIT
CFM	CUBIC FEET PER MINUTE
M	DAMPER ACTUATOR
	DUCT CARRYING RETURN AIR
	DUCT CARRYING SUPPLY AIR
	DUCT CARRYING EXHAUST AIR
EA	EXHAUST AIR
EF	EXHAUST FAN
	EXHAUST GRILLE
	FLEXIBLE CONNECTION
	MANUAL VOLUME DAMPER
OSA	OUTSIDE AIR
RA	RETURN AIR
RG	RETURN GRILLE
SA	SUPPLY AIR
SD	SMOKE DETECTOR

STANDARD MECHANICAL VALVE SYMBOLS

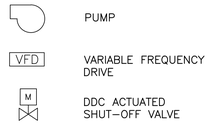


LINE TYPES

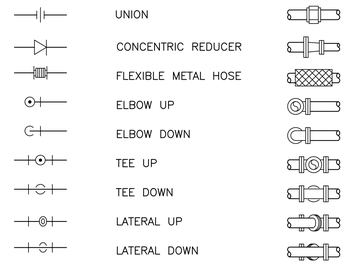
STANDARD PIPING SPECIALTY SYMBOLS



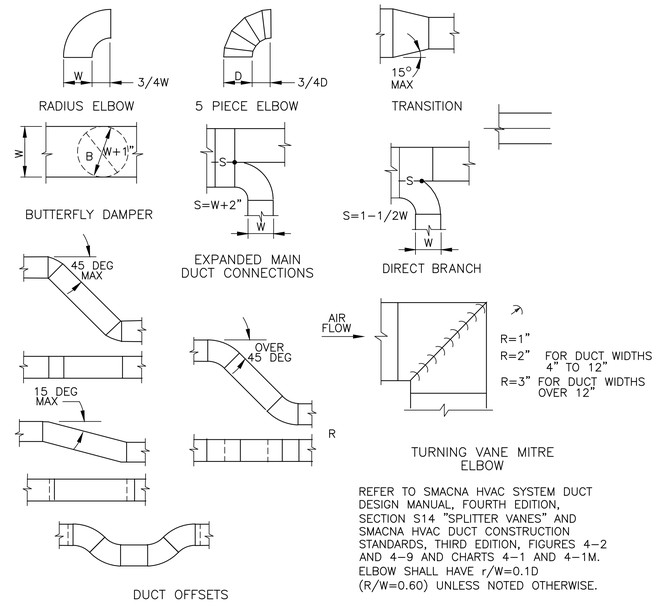
MISC. MECHANICAL EQUIP



STANDARD MECHANICAL FITTING SYMBOLS



GENERAL DUCTWORK INSTALLATION REQUIREMENTS



REFER TO SMACNA HVAC SYSTEM DUCT DESIGN MANUAL, FOURTH EDITION, SECTION S14 "SPLITTER VANES" AND SMACNA HVAC DUCT CONSTRUCTION STANDARDS, THIRD EDITION, FIGURES 4-2 AND 4-9 AND CHARTS 4-1 AND 4-1M. ELBOW SHALL HAVE r/W=0.1D (R/W=0.60) UNLESS NOTED OTHERWISE.

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DATE: MARCH 26, 2019

SHEET TITLE:

SYMBOLS, DESIGNATION AND ABBREVIATIONS

SHEET NO:

M0.1

10406 / M0.1
03/28/2019

CAMPUS BUILDING PERMIT NUMBER B19-163

EXHAUST FAN SCHEDULE

EQUIPMENT TAG	AREA SERVED	LOCATION	MANUFACTURER	MODEL	TYPE	CFM	EXTERNAL SP (IN. WC.)	MOTOR			OPERATING WEIGHT (LBS)	NOTES
								HP	VOLTS	PHASE		
EF-1A	RESTROOM EXHAUST	WEST LOTHIAN ROOF	GREENHECK	CUBE 180-VGD-20	BELT DRIVE	4,500	0.50	1 1/2	208	3	150	1,2,4
EF-2A	RESTROOM EXHAUST	WEST LOTHIAN ROOF	GREENHECK	CUBE 180-VGD-20	BELT DRIVE	4,500	0.50	1 1/2	208	3	150	1,2,4
EF-3A	RESTROOM EXHAUST	WEST LOTHIAN ROOF	GREENHECK	USFD-118-BI	BELT DRIVE	2,200	0.50	1	208	3	200	1,3,4
EF-4A	RESTROOM EXHAUST	WEST LOTHIAN ROOF	GREENHECK	USFD-118-BI	BELT DRIVE	2,200	0.50	1	208	3	200	1,3,4

NOTES:

1	PROVIDE FACTORY MOUNTED DISCONNECT
2	PROVIDE FACTORY ROOF CURB, PITCHED TO MATCH ROOF SLOPE. CONTRACTOR SHALL COORDINATE EXACT ROOF OPENING WITH MANUFACTURER AND PROVIDE AN ADAPTER CURB AS NECESSARY
3	PROVIDE FACTORY GALVANIZED BIRDSCREEN
4	PROVIDE FACTORY BACKDRAFT DAMPER

EXPANSION TANKS SCHEDULE

EQUIPMENT TAG	SERVICE	LOCATION	MANUFACTURER	MODEL	TANK SIZE (GAL)	SYSTEM CONNECTION (IN)	MINIMUM PRESSURE (PSIG)	MAXIMUM PRESSURE (125 PSIG)	DIAMETER (IN)	HEIGHT (IN)	OPERATING WEIGHT (LBS)	NOTES
ET-1	CHW SYSTEM	WEST LOTHIAN ROOF	BELL AND GOSSETT	B-400	100	1	10	125	24	65	1,175	1,2,3
ET-2	CHW SYSTEM	WEST LOTHIAN ROOF	BELL AND GOSSETT	B-400	100	1	10	125	24	65	1,175	1,2,3

NOTES:

1	PROVIDE CALIFORNIA CODE SIGHT-GLASS AND SEISMIC CLIPS
2	PROVIDE AIR CHARGING VALVE TO FACILITATE ADJUSTING PRE-CHARGE PRESSURE
3	REFER TO SPECIFICATIONS 23 2113 FOR ADDITIONAL INFORMATION

APPROVED
UC RIVERSIDE
Office of Planning, Design & Construction
Signed CBO: Robert R. Williams
Building, Safety and Compliance Division
CAMPUS BUILDING PERMIT

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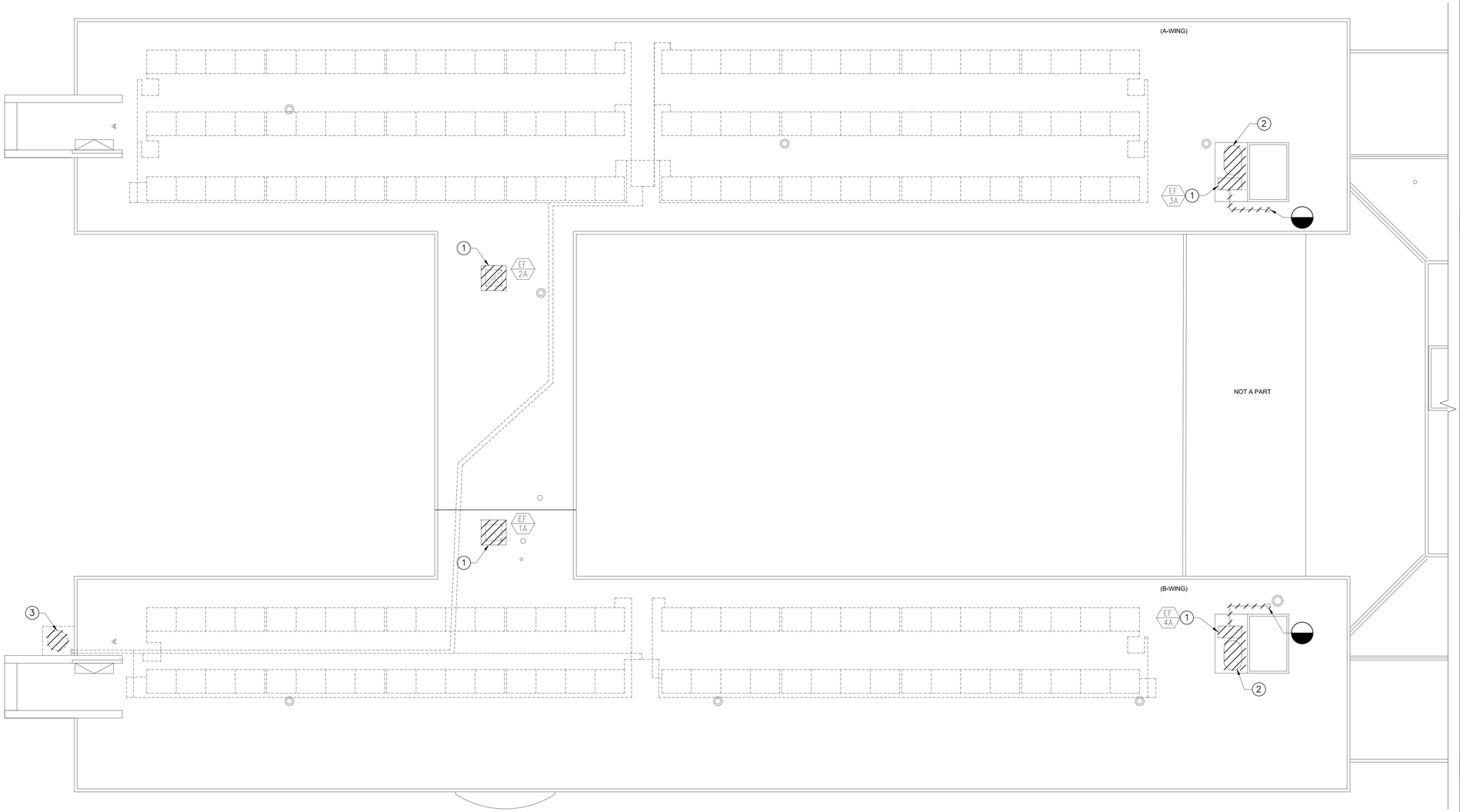
SHEET TITLE:

EQUIPMENT SCHEDULES

SHEET NO:

M0.2

10406 / M0.2
03/28/2019



...NORTH...

KEY NOTES

1. DEMOLISH EXISTING EXHAUST FAN AND ALL ASSOCIATED APPURTENANCES. REMOVE ALL EXISTING DUCTWORK AND PROVIDE TEMPORARY SEALS AT EXHAUST DUCT PENETRATION.
2. DEMOLISH EXPANSION TANK AND ALL ASSOCIATED APPURTENANCES. REMOVE PIPING BACK TO ROOF PENETRATION AND TEMPORARILY CAP.
3. DEMOLISH STORAGE TANK AND ASSOCIATED APPURTENANCES. PIPING SHOULD BE DEMOLISHED BACK TO WALL AND CAPPED.

GENERAL NOTES

1. THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND DO NOT SHOW ALL PIPES, DUCTS, FITTINGS, EQUIPMENT, AND OBSTACLES. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CLEARANCES BEFORE BEGINNING WORK.
2. PROPERLY REMOVE AND DISPOSE OF ALL MATERIALS IN A PROPER AND COMPLIANT METHOD WITH ALL PERTINENT REGULATORY AGENCIES AND THEIR REQUIREMENTS.

APPROVED
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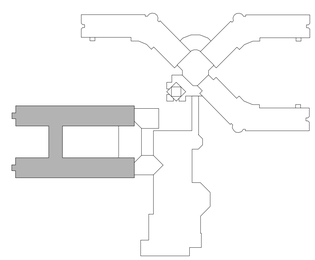
CAMPUS BUILDING PERMIT

KEY PLAN



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SHEET TITLE:

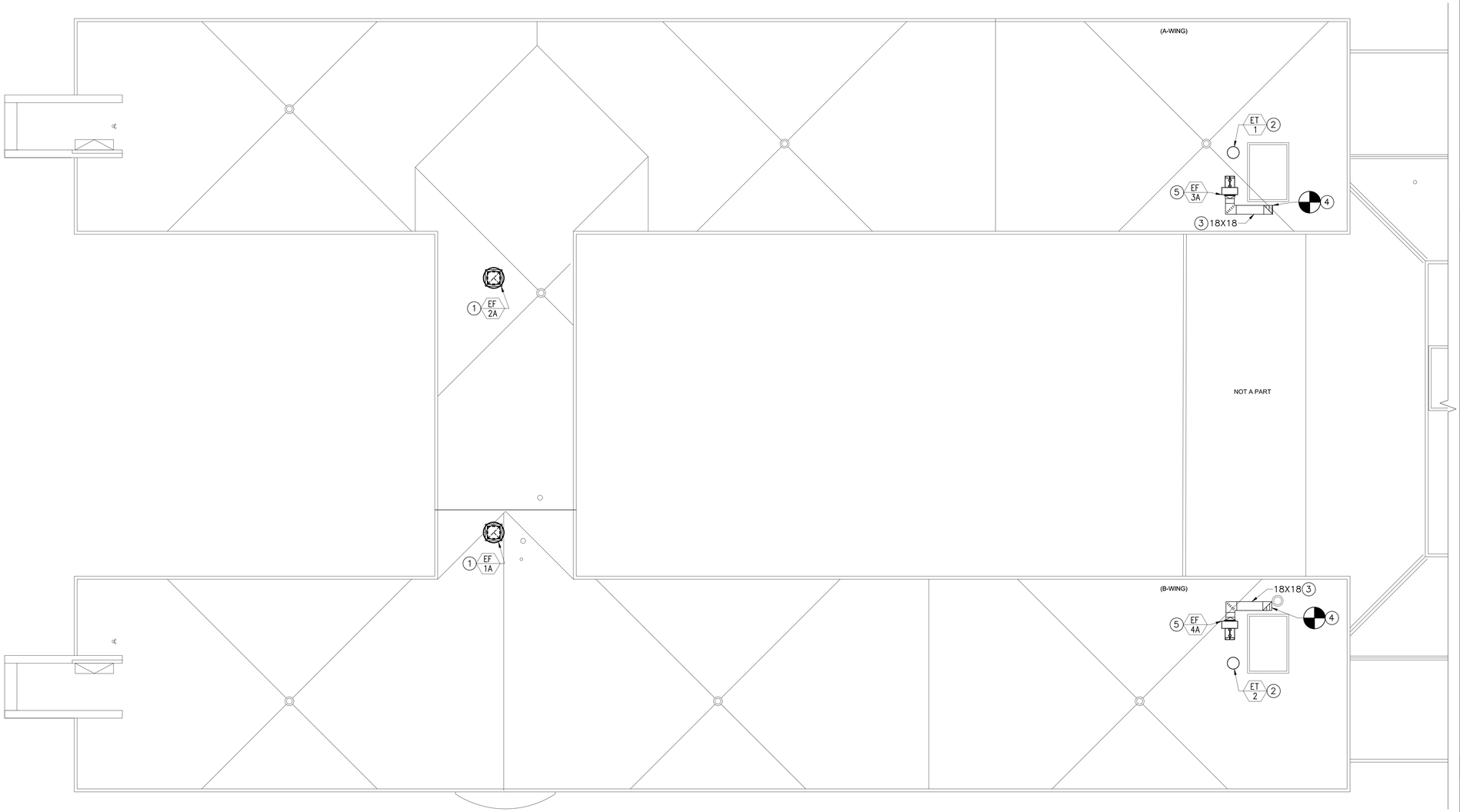
ROOF DEMOLITION HVAC PLAN

SHEET NO:

M1.1

10406 / M1.1
03/28/2019

ROOF DEMOLITION HVAC PLAN | 1/8" | 29



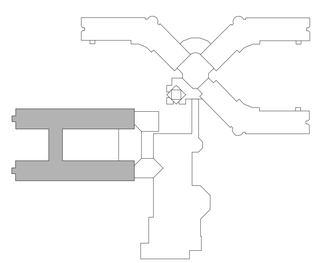
KEY NOTES

1. PROVIDE EF AND MOUNT PER DETAIL 01/M3.1.
2. PROVIDE EXPANSION TANK AND MOUNT AT LOCATION WHERE THE EXISTING TANK WAS LOCATED. PROVIDE APPROVED DOUBLE–CHECK VALVE ASSEMBLY. RECONNECT CHW, MAKE–UP WATER, AND DRAIN PIPING TO EXPANSION TANK. REFER TO DETAIL 3/M3.1 FOR ADDITIONAL APPURTENANCES. CONTRACTOR SHALL MATCH EXISTING PIPE SIZES AND PIPES SHALL BE SUPPORTED PER DETAIL 28/A7.1
3. ROUTE EXHAUST DUCT TO EF AND MOUNT DUCT PER DETAIL 02/M3.1
4. CONNECT EXHAUST DUCT AT ROOF PENETRATION. PROVIDE TRANSITION AT CONNECTION AS NECESSARY.
5. MOUNT UTILITY FAN ON PLATFORM. REFER TO DETAIL 22/A71 FOR ADDITIONAL INFORMATION ON THE PLATFORM.

GENERAL NOTES

1. THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND DO NOT SHOW ALL PIPES, DUCTS, FITTINGS, EQUIPMENT, AND OBSTACLES. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CLEARANCES BEFORE BEGINNING WORK.

KEY PLAN



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DATE: MARCH 26, 2019

SHEET TITLE:

ROOF RECONSTRUCTION HVAC PLAN

SHEET NO:

M1.2

10406 / M1.2
03/28/2019

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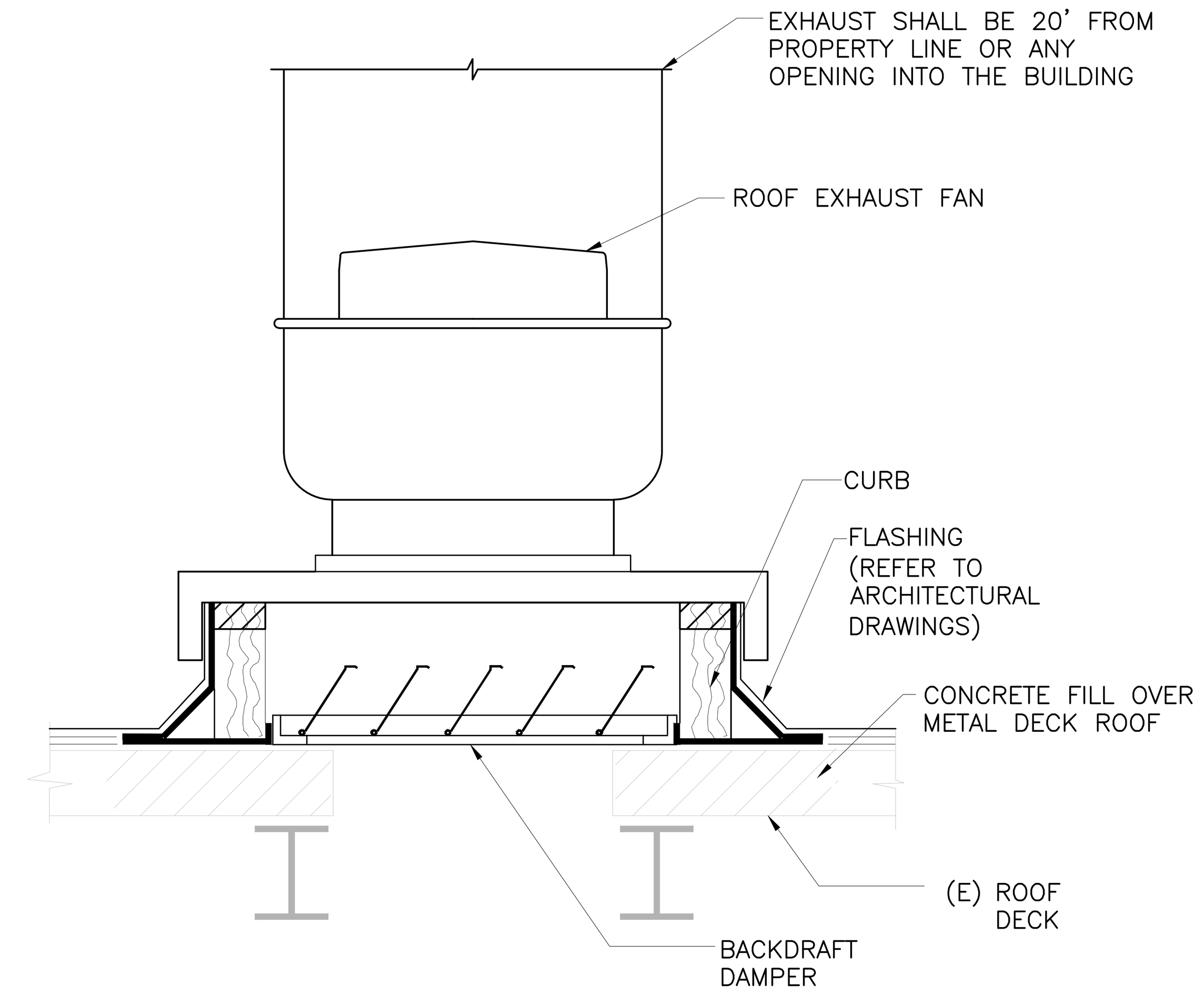
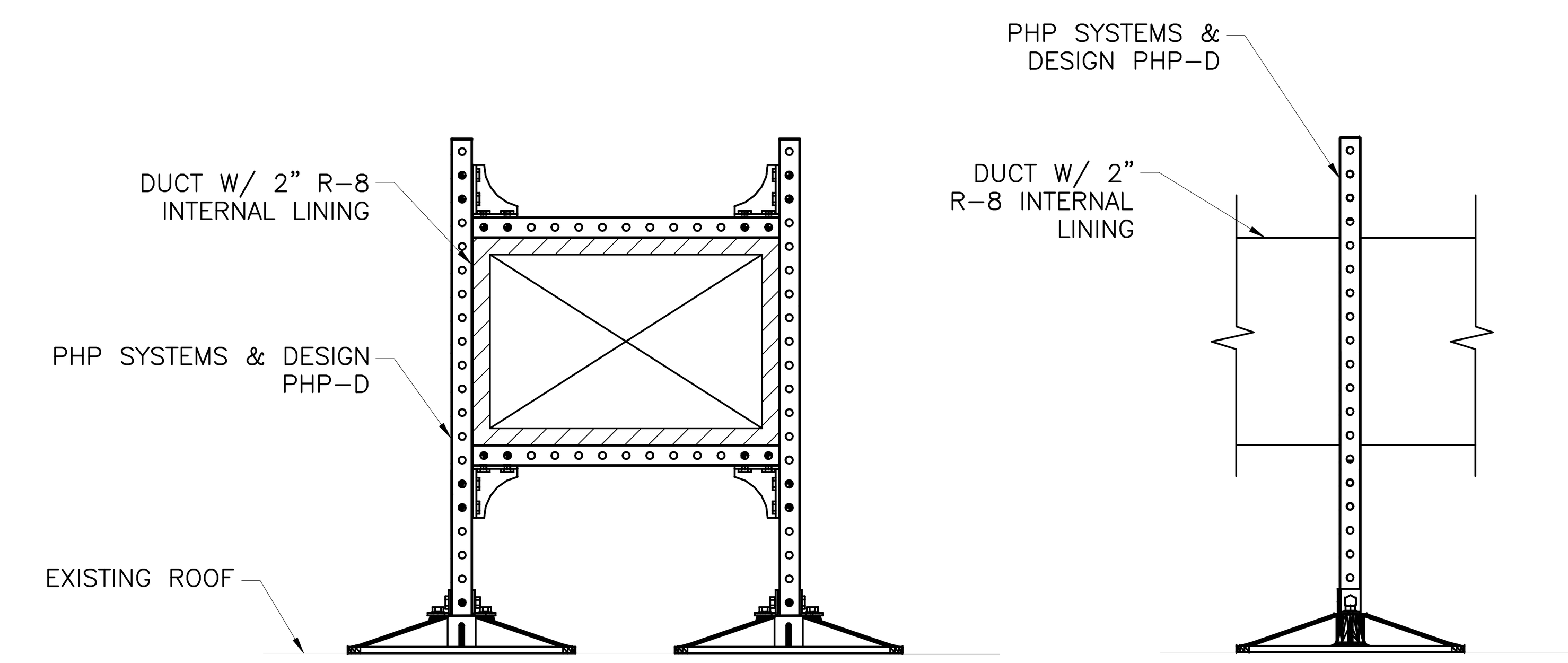
J:\2019\119-02-11 UCR W Lothian Rooftop Replacement\CAD\Mechanical\M1.2.dwg, 3/26/2019 2:24:48 PM

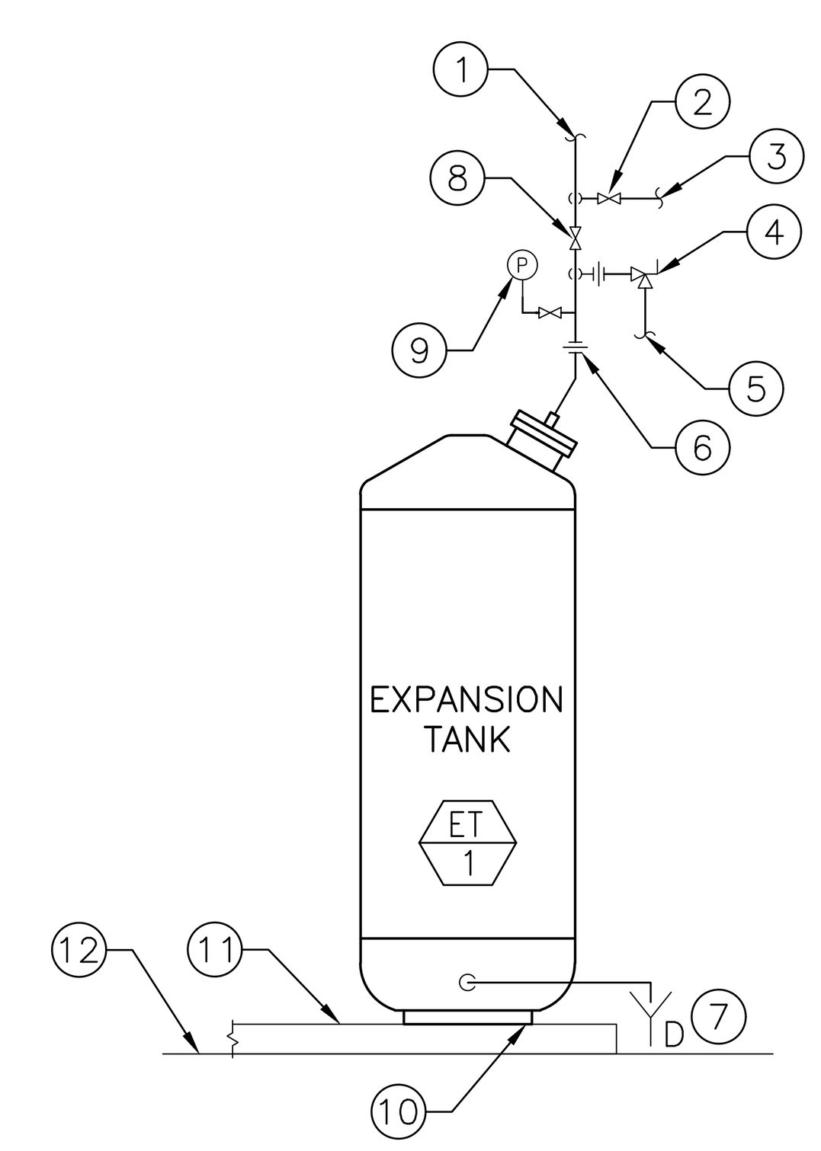
ROOF RECONSTRUCTION HVAC PLAN | 1/8" | 29



ROOF EXHAUST FAN INSTALLATION DETAIL | SCALE: NONE | 01



DUCT SUPPORT DETAIL | SCALE: NONE | 02



1. CONNECT TO CHW LOOP
2. REMOVE VALVE HANDLE AFTER PLUMBER CONNECTS MAKE-UP WATER
3. 3/4" CONNECTION FOR MAKE-UP WATER
4. PRESSURE/TEMPERATURE RELIEF VALVE
5. PIPE TO FLOOR DRAIN
6. UNION (TYPICAL)
7. DRAIN VALVE
8. SHUT-OFF VALVE
9. PRESSURE GAUGE
10. ATTACHMENT TO CONCRETE
11. CONCRETE PAD, REFER TO STRUCTURAL
12. FINISH GRADE

NOTES:

1. LOCATE ALL VALVES FOR CONVENIENT ACCESS WHEN STANDING NEXT TO TANK.

EXPANSION TANK INSTALLATION DETAIL | SCALE: NTS | 03

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CAMPUS BUILDING PERMIT

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DATE: MARCH 26, 2019

SHEET TITLE:

MECHANICAL DETAILS

SHEET NO:

M3.1

10406 / M3.1

03/28/2019

CAMPUS BUILDING PERMIT NUMBER B19-163

LEGEND AND SYMBOLS

	SWITCH
	FUSE
	FUSED DISCONNECT SWITCH
1	COMBINATION MOTOR STARTER/DISCONNECT SWITCH (NUMBER INDICATES STARTER SIZE)
	DISCONNECT SWITCH (NON–FUSED)
F	DISCONNECT SWITCH (FUSED) HORSE POWER RATED
	RECESSED PANELBOARD 120V/208V
	RECESSED PANELBOARD 277V/480V
	SURFACE MOUNTED PANELBOARD 120V/208V
	SURFACE MOUNTED PANELBOARD 277V/480V
	DISTRIBUTION BOARD
	GROUND CONNECTION
	MOTOR
	3/4" CONDUIT WITH 2#12 PLUS 1#12 GND.
///	3/4" CONDUIT WITH 3#12 PLUS 1#12 GND.
////	3/4" CONDUIT WITH 4#12 PLUS 1#12 GND.
	DUPLEX RECEPTACLE +18" A.F.F. (UNLESS NOTED OTHERWISE)
	SINGLE CIRCUIT DEDICATED OUTLET 20A 5–20R +18" A.F.F. (UNLESS NOTED OTHERWISE)
	DOUBLE DUPLEX RECEPTACLE +18" A.F.F. (UNLESS NOTED OTHERWISE)
	SPECIAL OUTLET
	THROUGH–FLOOR FITTING
3	COMBINATION VOICE/DATA OUTLET. 4S BOX WITH 1 GANG PLASTER RING. PROVIDE 1" CONDUIT STUBBED INTO ACCESSIBLE CEILING SPACE. "3" INDICATES QUANTITY OF PLENUM RATED CAT–5E OR CAT–6 CABLES. (2 DATA AND 1 VOICE)
J	JUNCTION BOX WITH COVER (MINIMUM 4" SQUARE OR AS REQUIRED)
	RACEWAY TRANSITION BOX OR CONNECTION POINT
$	120V. 20A LIGHT SWITCH (+42" A.F.F.)
$3	DENOTES 3–WAY SWITCH
$4	DENOTES 4–WAY SWITCH
$M	MANUAL MOTOR STARTER SWITCH WITH THERMAL OVERLOADS RATED 250V–30A–2P
$2	2–POLE TOGGLE SWITCH FOR MECHANICAL UNIT
DM	LOW VOLTAGE ON/OFF DIMMER SWITCH
DO	LOW VOLTAGE ON/OFF DIMMER SWITCH WITH OCCUPANCY SENSOR
OS	LOW VOLTAGE ON/OFF MANUAL SWITCH WITH OCCUPANCY SENSOR
PC x	DAYLIGHT HARVESTER PHOTOCELL SENSOR
CS	CEILING MOUNTED OCCUPANCY SENSOR
R EM	LIGHTING CONTROLS POWER/RELAY PACK, EM INDICATES EMERGENCY CIRCUIT
	TELECOM BACKBOARD 8'x4'x3/4", FIRE TREATED. PROVIDE 1#6 GROUND WIRE TO SYSTEM GROUND

ABBREVIATIONS

A	AMPERE
AC	ALTERNATING CURRENT
AF	AMPERE FRAME
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPTING CAPACITY
ANN	ANNUNCIATOR
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BKR	BREAKER
BLDG	BUILDING
C	CONDUIT
CB	CIRCUIT BREAKER
CEC	CALIFORNIA ELECTRICAL CODE
CATV	CABLE TELEVISION
CKT	CIRCUIT
CLG	CEILING
CO	CONDUIT ONLY
COMM	COMMUNICATIONS
COMP	COMPUTER
DISC	DISCONNECT
DIST	DISTRIBUTION
DL	DOUBLE LUG
DP	DISTRIBUTION PANEL
DWG	DRAWING
EG	EQUIPMENT GROUND
EM	EMERGENCY
ELEC	ELECTRICAL
EMH	ELECTRICAL MAN HOLE
EMT	ELECTRICAL METALLIC TUBING
EPO	EMERGENCY POWER OFF
EQUIP	EQUIPMENT
ER	EXISTING RELOCATED
EXIST	EXISTING
F	FUSE, FUSED
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPERES
G, GRD	GROUND
GALV	GALVANIZE, GALVANIZED
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
HID	HIGH INTENSITY DISCHARGE
HOA	HAND–OFF–AUTOMATIC
HP	HORSEPOWER,
HPF	HEAT PUMP HIGH POWER FACTOR
HPS	HIGH PRESSURE SODIUM
JB	JUNCTION BOX
RT	RADIOTOUCH SYSTEM
KA	THOUSAND AMPERES
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT–AMPERE
KW	KILOWATT
LTG	LIGHTING
MC	METAL CLAD CABLE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MH	METAL HALIDE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTR	MOTOR
MTS	MANUAL TRANSFER SWITCH
NEC	NATIONAL ELECTRICAL CODE
NF	NON–FUSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
P	POLE, POLES
PF	POWER FACTOR
PNL	PANEL
PRI	PRIMARY
PWR	POWER
ø	PHASE
RECP, RECEP	RECEPTACLE
RGS	RIGID GALVANIZED STEEL CONDUIT
R	RELOCATE OR REMOVE
RM	ROOM
SEC	SECONDARY
SPKR	SPEAKER
SUSP	SUSPEND, SUSPENDED
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TBB	TELECOMMUNICATIONS BACKBOARD
TMH	TELECOMMUNICATIONS MAN HOLE
TRANSF.	TRANSFORMER
TYP.	TYPICAL
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
UON	UNLESS OTHERWISE NOTED
V	VOLT, VOLTS
VA	VOLT–AMPERES
VAV	VARIABLE AIR VOLUME
WT	WATERTIGHT
W	WATT OR WIRE
WP	WEATHER PROOF
XFMR	TRANSFORMER
Y	WYE CONNECTION

CIRCUITS AND RACEWAYS

———	RACEWAY OR WIRING SYSTEM ABOVE FLOOR LEVEL, CONCEALED IN WALL OR ABOVE CEILING UON
– – – – – –	RACEWAY OR WIRING SYSTEM IN OR UNDER FLOOR OR CONCEALED IN OR BEHIND STRUCTURE OR EQUIPMENT
———┤	CONDUIT STUB ENDING WITH CAP
JB2700A (J)	JUNCTION BOX. OPTIONAL IDENTIFIER.
PB1035 (PB)	PULL BOX. OPTIONAL IDENTIFIER.
TB1035 (TB)	TERMINAL BOX. OPTIONAL IDENTIFIER.
1"C 3#10 AWG +1#10 AWG GRD.	RACEWAY SIZE WITH CONDUCTOR CONTENTS AND SIZES
00	DENOTES CONNECTION TO EQUIPMENT

DRAWING INDEX

E0.1	SYMBOLS, DESIGNATION AND ABBREVIATIONS
E1.1	ROOF DEMOLITION POWER PLAN
E1.2	ROOF POWER PLAN
E2.0	PANEL SCHEDULES AND DETAILS

APPLICABLE CODES

2016 CALIFORNIA BUILDING CODE (CBC) PART 2, VOLUMES 1 AND 2, TITLE 24
(BASED ON 2015 INTERNATIONAL BUILDING CODE)

2016 CALIFORNIA ELECTRIC CODE (CEC) PART 3, TITLE 24
(BASED ON 2014 NATIONAL ELECTRIC CODE)

2016 CALIFORNIA MECHANICAL CODE (CMC) PART 4, TITLE 24
(BASED ON 2015 UNIFORM MECHANICAL CODE)

2016 CALIFORNIA PLUMBING CODE (CPC) PART 5, TITLE 24
(BASED ON 2015 UNIFORM PLUMBING CODE)

2016 CALIFORNIA FIRE CODE (CFC) PART 9, TITLE 24
(BASED ON 2015 INTERNATIONAL FIRE CODE)

2016 CALIFORNIA ENERGY CODE PART 6, TITLE 24

2016 CALIFORNIA REFERENCED STANDARD CODE PART 12, TITLE 24

TITLE 19, PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS

PARTIAL LIST OF APPLICABLE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS

NFPA 13, 2016 EDITION – INSTALLATION OF SPRINKLER SYSTEMS
(AMENDED BY CSFM)

NFPA 14, 2013 EDITION – INSTALLATION OF STANDPIPE AND HOSE SYSTEMS
(AMENDED BY CSFM)

NFPA 17A, 2013 EDITION – WET CHEMICAL EXTINGUISHING SYSTEMS

NFPA 24, 2016 EDITION – INSTALLATION OF PRIVATE FIRE SERVICE MAINS
(AMENDED BY CSFM)

NFPA 25, (2013 CALIFORNIA EDITION, BASED ON NFPA 25, 2011 EDITION) – INSPECTION, TESTING, & MAINTENANCE OF WATER–BASED FIRE PROTECTION SYSTEMS

NFPA 72, 2016 EDITION – NATIONAL FIRE ALARM AND SIGNALING CODE
(AMENDED BY CSFM)

NFPA 80, 2016 EDITION – FIRE DOORS AND OTHER OPENING PROTECTIVES

REFER TO CBC CHAPTER 35 FOR ADDITIONAL STANDARDS NOT PROVIDED ON THIS LIST

GENERAL NOTES

1. ELECTRICAL CONTRACTOR SHALL PERFORM ELECTRICAL INSTALLATION WORK IN CONFORMANCE WITH THE 2016 EDITION OF THE CALIFORNIA ELECTRICAL CODE (CEC) AND ALL APPLICABLE CODES, ORDINANCES, REGULATIONS AND UNIVERSITY'S STANDARDS.

2. CONDUIT ROUTING AND OUTLET LOCATION AS SHOWN ON THE ELECTRICAL POWER PLAN ARE DIAGRAMMATIC IN NATURE. CONTRACTOR SHALL VERIFY FEASIBILITY OF THE INSTALLATION BEFORE COMMENCING THE JOB. ANY OBSERVATIONS TO THE EXECUTION OF THE WORK SHALL BE BROUGHT TO THE ATTENTION OF THE UNIVERSITY REPRESENTATIVE IMMEDIATELY.

3. PER SPECIFICATION SECTION "CONDUCTORS AND CABLES"
   a. CONDUCTOR MATERIAL APPLICATIONS:
      a.1 FEEDERS: COPPER.
          SOLID FOR NO. 10 AWG AND SMALLER;
          STRANDED FOR NO. 8 AWG AND LARGER;
      a.2 BRANCH CIRCUITS: COPPER.
          SOLID FOR NO. 10 AWG AND SMALLER;
          STRANDED FOR NO. 8 AWG AND LARGER,
   b. CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS:
      b.1 BRANCH CIRCUITS CONCEALED IN CIRCUITS, WALLS AND PARTITIONS: TYPE THHN–2–THWN–2, SINGLE CONDUCTORS IN RACEWAYS.
      b.2 BRANCH CIRCUITS CONCEALED IN CONCRETE, BELOW SLABS–ON–GRADE, AND UNDERGROUND: TYPE THHN–2–THWN–2, SINGLE CONDUCTORS IN RACEWAYS.

4. CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER CONSTRUCTION TRADES. CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE OF ANY UNRESOLVED ISSUES THAT MAY DELAY INSTALLATION OF WORK.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING PROPER WORKING SPACE PER CALIFORNIA ELECTRICAL CODE (CEC), PARAGRAPH 110–26.

6. CONTRACTOR SHALL PROVIDE NECESSARY HARDWARE AND SUPPORTS AS REQUIRED FOR ELECTRICAL CONDUIT/WIRE NOT SCHEDULED FOR DEMOLITION PER CALIFORNIA ELECTRICAL CODE (CEC), PARAGRAPH 110–12.

7. THE SEISMIC BRACING AND ANCHORAGE OF ELECTRICAL CONDUITS, BUS DUCT, WIREWAY, AND CABLE TRAY SHALL BE IN ACCORDANCE WITH THE CALIFORNIA BUILDING CODE, CHAPTER 16 AND "GUIDELINE FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS," PUBLISHED BY SMACNA AND PPIC, OR THE SUPERSTRUT–SEISMIC RESTRAINT SYSTEM, OR THE KIN–LINE SEISMIC RESTRAINT SYSTEM.

8. CONNECTIONS TO VIBRATING EQUIPMENT AND SEISMIC SEPARATIONS:
   - LIQUID–TIGHT FLEXIBLE STEEL CONDUIT IN DRY INTERIOR LOCATIONS.
   - LIQUID–TIGHT FLEXIBLE STEEL CONDUIT IN AREAS EXPOSED TO WEATHER, DAMP LOCATIONS, CONNECTIONS TO TRANSFORMER ENCLOSURES, AND FINAL CONNECTIONS TO MOTORS.

   PROVIDE A SEPARATE INSULATED EQUIPMENT GROUNDING CONDUCTOR IN FLEXIBLE CONDUIT RUNS. MAXIMUM LENGTH SHALL BE SIX FEET UNLESS OTHERWISE NOTED.

9. EQUIPMENT OUTLETS, CONDUIT, WIRE, AND CONNECTION METHODS IN HVAC AIR–PLENUMS SHALL BE APPROVED FOR USE IN PLENUMS AND SHALL CONFORM TO THE CEC.

10. ROUTE EXPOSED CONDUIT AND CONDUIT ABOVE ACCESSIBLE CEILING SPACES PARALLEL AND PERPENDICULAR TO WALLS AND ADJACENT PIPING. ARRANGE CONDUIT TO MAINTAIN HEADROOM AND TO PRESENT A NEAT APPEARANCE.

11. WHENEVER A DISCREPANCY IN QUANTITY OR SIZE OF CONDUIT, WIRE, EQUIPMENT DEVICES, CIRCUIT BREAKERS, GROUND FAULT PROTECTION SYSTEMS, ETC. (ALL MATERIALS), ARISES ON THE DRAWINGS OR SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL MATERIAL AND SERVICES REQUIRED BY THE STRICTEST CONDITIONS NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS TO ENSURE COMPLETE AND OPERABLE SYSTEMS.

APPROVED
UC RIVERSIDE
Office of Planning, Design & Construction
Signed CBO: Robert R. Williams
Building, Safety and Compliance Division
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REGISTERED PROFESSIONAL ENGINEER – EDWARD D. BUNN – No. E17083 – ELECTRICAL – STATE OF CALIFORNIA

CLIENT:

WEST LOTHIAN ROOF REPLACEMENT

PROJECT # 956399 - CANN # P5502

UCR CAPITAL PROGRAMS
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100% Plan Submittal - 3/26/2019

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1 DATE:
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CHECKED BY: C.C.L. P.M.: E.D.B.
DATE: MARCH 26, 2019

SHEET TITLE:

SYMBOLS, DESIGNATION AND ABBREVIATIONS

SHEET NO:

E0.1

10406 / E0.1
03/28/2019

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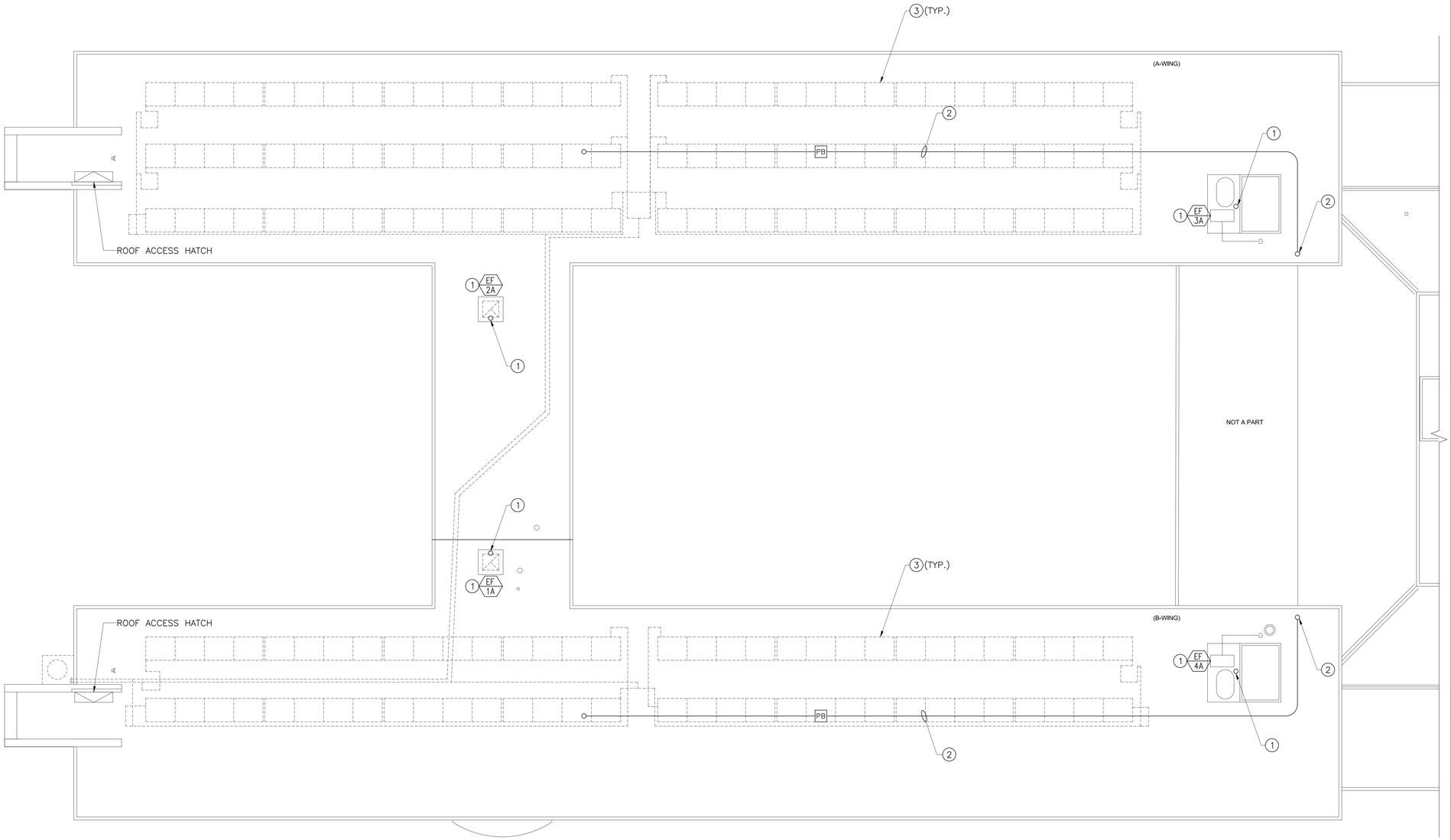

KEY NOTES

1. DISCONNECT AND REMOVE ALL EXISTING ASSOCIATED POWER AND/OR CONTROL CONNECTIONS FROM EXISTING EXHAUST FAN BACK TO ROOF STUB-UPS. EXISTING CIRCUITS INCLUDING ALL CONDUITS AND WIRING BELOW ROOF SHALL BE REUSED AND BE PROTECTED IN-PLACE. MAINTAIN CIRCUIT CONTINUITY OF EQUIPMENTS TO REMAIN. COORDINATE WITH MECHANICAL DRAWINGS.
2. EXISTING TELECOM 4" RGS CONDUIT WITH DATA CABLES/WIRES SHALL BE LOWERED DOWN TO UPPER ROOF LEVEL AND SUPPORTED BY PHP CONDUIT ROOF SUPPORTS, SEE ARCHITECTURAL DETAIL 28, SHEET A7.1. SEE KEYNOTE 4 ON SHEET E1.2. EXISTING SOLAR HOT WATER PANEL SYSTEM SUPPORTS SHALL BE REMOVED BY OTHERS. COORDINATE/VERIFY WITH ARCHITECT AND THE UNIVERSITY'S I.T. DEPARTMENT PRIOR TO BEGINNING OF WORK.
3. EXISTING SOLAR HOT WATER PANEL SYSTEM.

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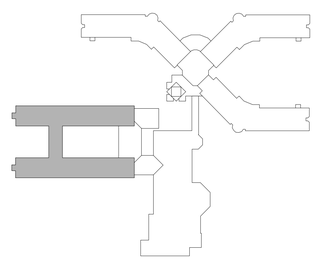
GENERAL NOTES

1. ELECTRICAL ENGINEERING FOR THIS PROJECT IS BASED ON EXISTING DRAWINGS AND A FIELD VISIT OF THE ELECTRICAL SYSTEM. IN CASE OF ANY DISCREPANCIES WITH EXISTING FIELD CONDITIONS, ELECTRICAL CONTRACTOR SHALL VERIFY THE EXACT DIFFERENCES AND NOTIFY THE ELECTRICAL ENGINEER FOR POSSIBLE REVISION TO THESE DOCUMENTS.
2. ENSURE THAT THE CONTRACTOR COORDINATES ALL ELECTRICAL WORK REGARDING LO/TO WITH THE UNIVERSITY'S REPRESENTATIVE PRIOR TO ANY EXHAUST FAN TO BE DISCONNECTED.
3. PROPERLY REMOVE AND DISPOSE OF ALL MATERIALS IN A PROPER AND COMPLIANT METHOD WITH ALL PERTINENT REGULATORY AGENCIES AND THEIR REQUIREMENTS.

ELECTRICAL LEGEND

REMOVE/DEMOLISH
EXISTING

KEY PLAN



...NORTH...

ROOF DEMOLITION POWER PLAN

1/8" | 1

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SHEET NO:
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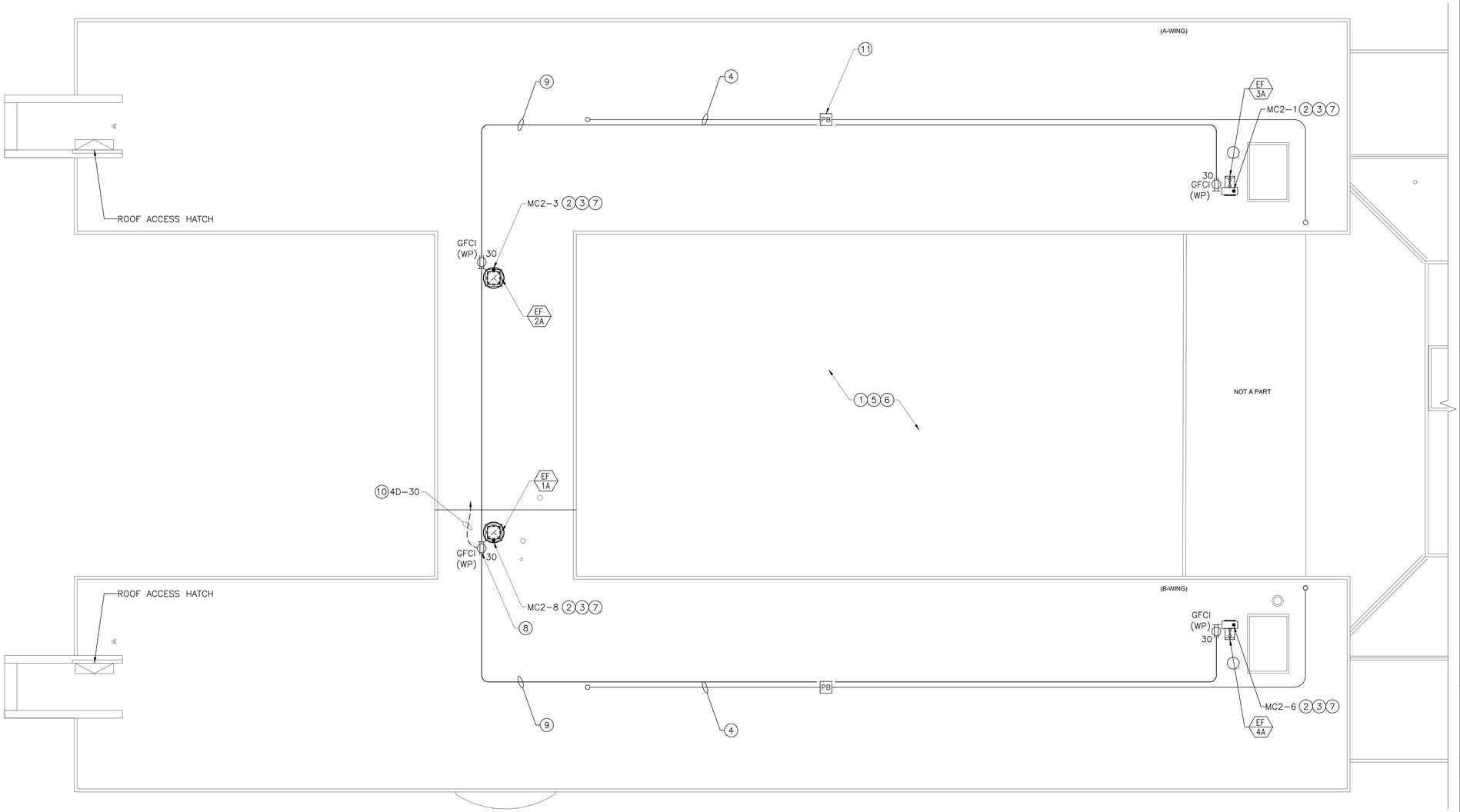

...NORTH...

ROOF RECONSTRUCTION POWER PLAN | 1/8" | 1

KEY NOTES

1. ALL ELECTRICAL EQUIPMENT/DEVICES ON THE ROOF SHALL BE WEATHER PROOF, NEMA–3R AND +8" ABOVE FINISHED ROOF LEVEL.
2. LOCAL REMOTE DISCONNECT SWITCH FOR EXHAUST FAN/S BY MECHANICAL. EXTEND CONDUIT AND WIRING FROM ROOF STUB–UP TO NEW SWITCH AS REQUIRED. REUSE EXISTING CIRCUIT.
3. EXHAUST FAN DISCONNECT SWITCHES TO BE MARKED/LABELED AS REQUIRED.
4. EXISTING DATA CABLES/WIRES SHALL BE CUT, SPLICED AND/OR EXTENDED TO SUIT THE LOWERED MOUNTING HEIGHT OF THE EXISTING 4" RGS CONDUIT. PROVIDE ADDITIONAL CONDUIT LENGTHS, FITTINGS AND/OR PULL BOXES AS REQUIRED. SHUT DOWN TIME SHALL BE COORDINATED WITH THE UNIVERSITY.
5. REFER TO ALL MECHANICAL DRAWINGS FOR EXACT LOCATIONS AND CHARACTERISTICS OF ALL EQUIPMENT LISTED IN THE MECHANICAL SCHEDULE. ANY MODIFICATIONS AND/OR ADDITIONAL WORK NECESSARY SHALL BE INCLUDED IN THE BASE BID.
6. REUSE ALL EXISTING ROOF PENETRATIONS AS POSSIBLE. ALL ELECTRICAL SEPERATE/ADDITIONAL ROOF PENETRATIONS SHALL BE FLASHED.
7. CONNECT DISCONNECT SWITCH TO EXISTING FEEDERS AND EXTEND 3#12 TO MECHANICAL UNIT.
8. PROVIDE NEW ROOF RECEPTACLE GFCI TYPE WITH WEATHER PROOF COVER. CIRCUIT AS SHOWN.
9. ROOF RECEPTACLE RGS CONDUITS SHALL BE SUPPORTED BY PHP CONDUIT ROOF SUPPORTS, SEE ARCHITECTURAL DETAIL 28, SHEET A7.1.
10. CORE DOWN DIRECTLY INTO ELECTRICAL ROOM ON THE FOURTH FLOOR. SEE DETAIL 3, SHEET E2.0.
11. PROVIDE NEW NEMA–3R PULL BOX COVER.

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CAMPUS BUILDING PERMIT

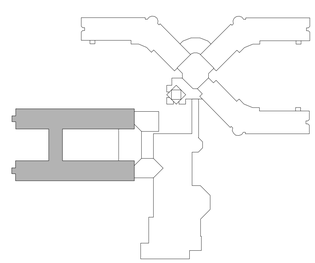
GENERAL NOTES

1. ELECTRICAL ENGINEERING FOR THIS PROJECT IS BASED ON EXISTING DRAWINGS AND A FIELD VISIT OF THE ELECTRICAL SYSTEM. IN CASE OF ANY DISCREPANCIES WITH EXISTING FIELD CONDITIONS, ELECTRICAL CONTRACTOR SHALL VERIFY THE EXACT DIFFERENCES AND NOTIFY THE ELECTRICAL ENGINEER FOR POSSIBLE REVISION TO THESE DOCUMENTS.
2. ENSURE THAT THE CONTRACTOR COORDINATES ALL ELECTRICAL WORK REGARDING LO/TO WITH THE UNIVERSITY'S REPRESENTATIVE PRIOR TO ANY EXHAUST FAN TO BE DISCONNECTED.

ELECTRICAL LEGEND

NEW
EXISTING

KEY PLAN



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SHEET NO:

E1.2

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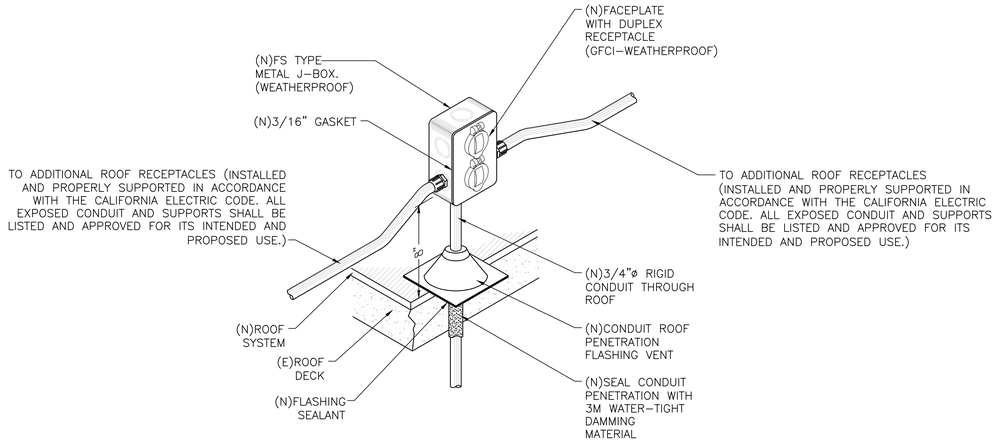

NOTE:

FOR ROOF CONDUIT SUPPORT (PP10–C) DETAIL, REFER TO ARCHITECTURAL SHEET A7.1, DETAIL 28.

ROOF RECEPTACLE MOUNTING DETAIL — NONE — 3

NOT USED — NONE — 4

PANEL: 4D (EXISTING)

LOCATION : FOURTH FLOOR, SOUTH
MOUNTING : RECESSED
NEMA : 1
VOLTAGE/ PHASE : 208Y/120V, 3Ø, 4W
BUS AMPS : 225A
MAIN BREAKER : LO
FED FROM : FED FROM 1600A BUS
RATING : 14,000A

LOADS	SEE NOTE	*	OUTLETS LTG	OUTLETS REC	OUTLETS MISC	VOLT-AMPS A	VOLT-AMPS B	VOLT-AMPS C	CKT	BKR/ POLE	ABC	BKR/ POLE	CKT	VOLT-AMPS A	VOLT-AMPS B	VOLT-AMPS C	OUTLETS LTG	OUTLETS REC	OUTLETS MISC	*	SEE NOTE	LOADS
RECEPTACLE				7		1,260			1	20/1	"-	20/1	2	1,440				6				RECEPTACLE
RECEPTACLE				6			1,080		3	20/1	-"-	20/1	4		1,260			7				RECEPTACLE
RECEPTACLE				6				1,080	5	20/1	-"-	20/1	6			1,260		7				RECEPTACLE
RECEPTACLE				7		1,260			7	20/1	"-	20/1	8	1,260				7				RECEPTACLE
RECEPTACLE				6			1,080		9	20/1	-"-	20/1	10		1,080			6				RECEPTACLE
RECEPTACLE				1				180	11	20/1	-"-	20/1	12			1,260		7				RECEPTACLE
RECEPTACLE				6		1,080			13	20/1	"-	20/1	14	360				2				RECEPTACLE
RECEPTACLE				6			1,080		15	20/1	-"-	20/1	16		180			1				RECEPTACLE
RECEPTACLE				7				1,260	17	20/1	-"-	20/1	18			1,440		8				RECEPTACLE
RECEPTACLE				1		180			19	20/1	"-	20/1	20	1,080				6				RECEPTACLE
RECEPTACLE				1			180		21	20/1	-"-	20/1	22		1,080			6				RECEPTACLE
RECEPTACLE				3				540	23	20/1	-"-	20/1	24			180		1				RECEPTACLE
SPARE									25	20/1	"-	20/1	26	180				1				RECEPTACLE
RECEPTACLE				3			540		27	20/1	-"-	20/1	28									SPARE
SPARE									29	20/1	-"-	20/1	30			720		4	1			ROOF SERVICE RECEPT.

TOTAL ØA = 8,100 VOLT-AMPS 68 AMPS
TOTAL ØB = 7,560 VOLT-AMPS 63 AMPS
TOTAL ØC = 7,920 VOLT-AMPS 66 AMPS
LCL = 0 VOLT-AMPS
TOTAL PANEL = 23,580 VA @ 208V, 3Ø = 66 AMPS

NOTES:
1. PROVIDE NEW CIRCUIT BREAKER TO MATCH EXISTING SIZE, TYPE AND AIC RATING
2. LOAD UPDATED

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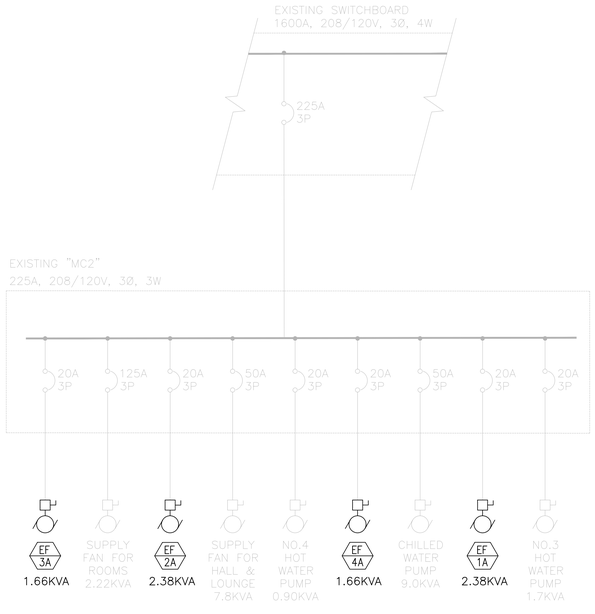
Building, Safety and Compliance Division
CAMPUS BUILDING PERMIT

INSPECTION REQUIRED
University of California, Riverside
Office of Planning, Design & Construction
Signed CBO: *Robert K. Williams*
Building, Safety and Compliance Division
ALL INSPECTIONS SHALL BE REQUESTED USING THE CFORMS SYSTEM

PANEL SCHEDULE — NONE — 1



SINGLE LINE DIAGRAM — NONE — 2

DKC Architects, Inc.
DARRYL K. CARTOZIAN A.I.A.
ARCHITECTS
DKC ARCHITECTS, INC.
31555 AVENUE E
YUCAIPA, CALIFORNIA 92399
Ph. (909) 798-7900
website: dkcarch.com

CONSULTANT:

GOSS ENGINEERING, INC.
255 EAST RINCON ST, SUITE 301
CORONA, CALIFORNIA 92879
Ph. (951) 340-1977
website: gossengineering.com
FILE NO.: 119-02-11

REGISTERED PROFESSIONAL ENGINEER — EDWARD D. BUNN — No. E17083 — ELECTRICAL — STATE OF CALIFORNIA

CLIENT:

WEST LOTHIAN ROOF REPLACEMENT

PROJECT # 956399 - CANN # P5502

UCR CAPITAL PROGRAMS
1223 UNIVERSITY AVE.
SUITE 240
RIVERSIDE, CA 92507
CONTACT: JOHN FRANKLIN
(951) 203-7910

APPROVALS:

100% Plan Submittal - 3/26/2019

REVISIONS:
1 DATE:
2 DATE:
3 DATE:

CHECKED BY: C.C.L. P.M.: E.D.B.
DATE: MARCH 26, 2019

SHEET TITLE:

PANEL SCHEDULES AND DETAILS

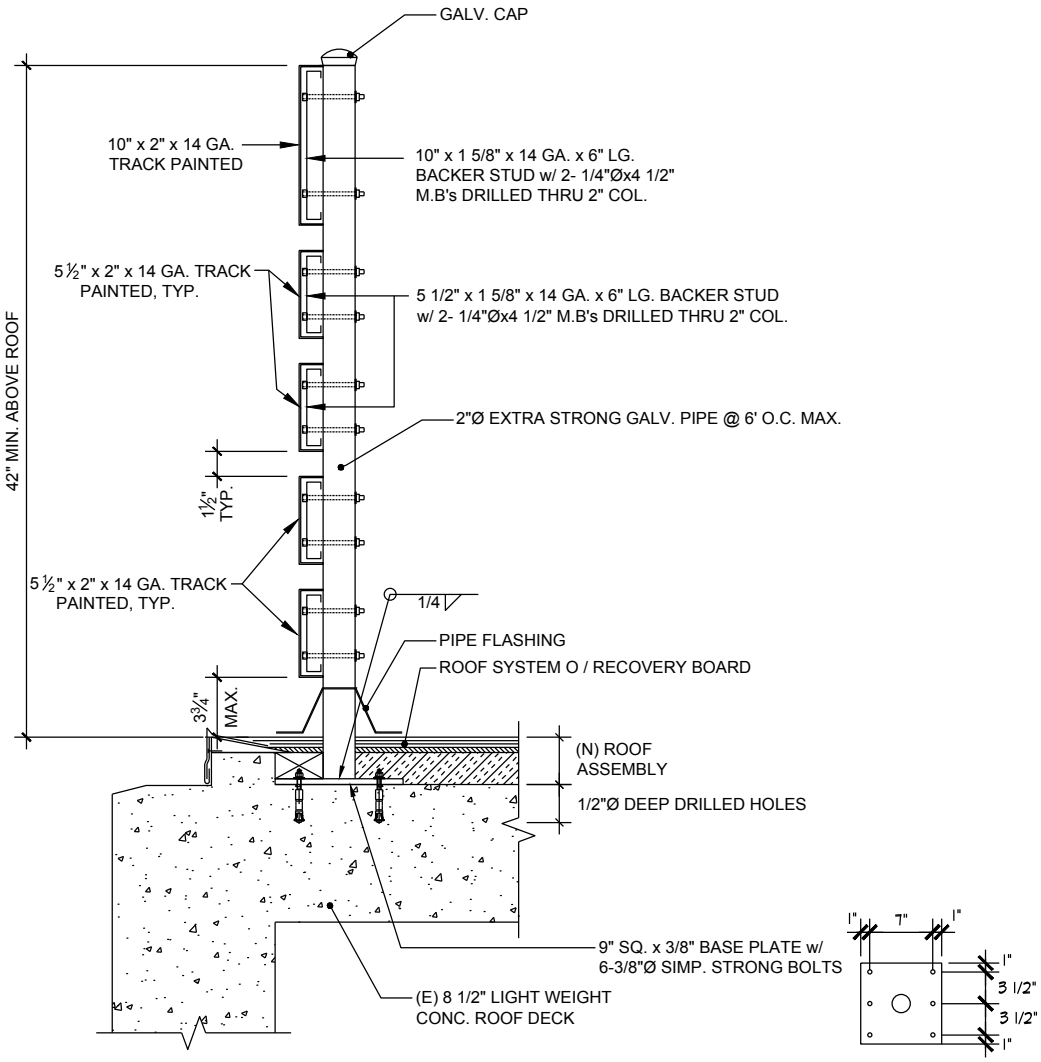
SHEET NO:

E2.0

10406 / E2.0
03/28/2019

CAMPUS BUILDING PERMIT NUMBER B19-163

APPROVED
UC RIVERSIDE
Office of Planning, Design & Construction
Signed CBO: *Robert K. Williams*
Building, Safety and Compliance Division
CAMPUS BUILDING PERMIT



Client: ***DKC Architects Inc.***
31555 Avenue E
Yucaipa, Ca. 92399

Project: ***West Lothian Screen Wall***
UCR Capital Programs
1223 University Ave.
Riverside, Ca. 92507

Title: ***Screen Wall Details***

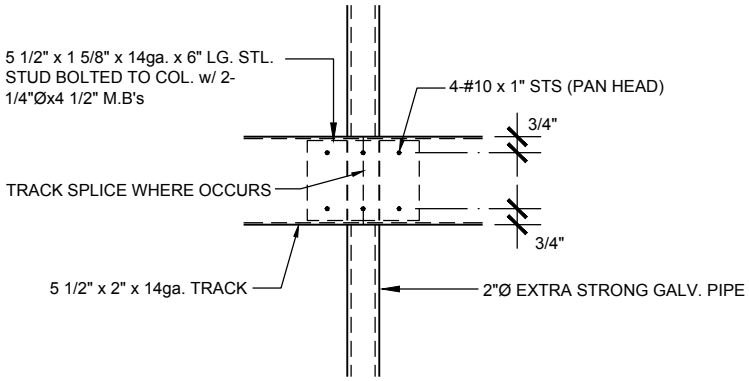
Knapp & Associates, Inc.
408 South Stoddard Avenue
San Bernardino, CA. 92401
E-Mail (KNAPPAE@AOL.COM)
Tel. (909) 889-0115
Fax. (909) 889-0455

REGISTERED PROFESSIONAL ENGINEER
LEONARD C. KNAPP
NO. C30577
Exp. 3-31-20
CIVIL
STATE OF CALIFORNIA

UCR Project # 956399 - CANN #P5502
90% PC Submittal set 3/20/2019

DATE: ***03-12-19*** ~~03/28/2019~~ SHEET: ***1***

CAMPUS BUILDING PERMIT NUMBER B19-163



DETAIL | 1"=1'-0" | A

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UC RIVERSIDE
Office of Planning, Design & Construction
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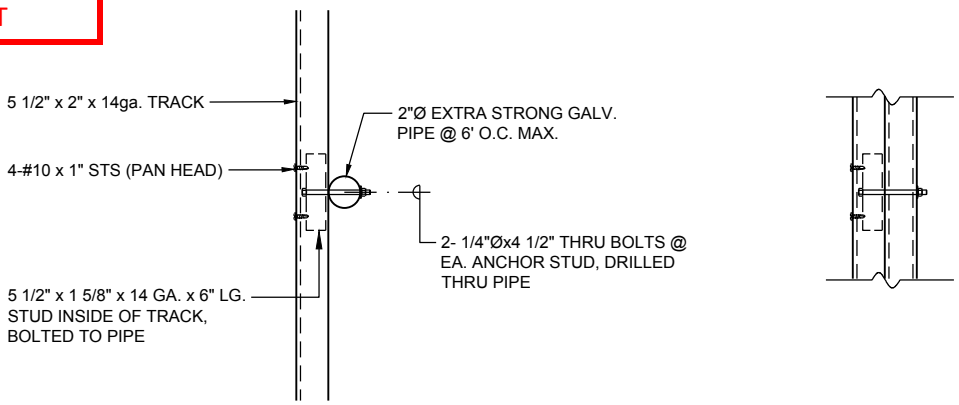
Building, Safety and Compliance Division
CAMPUS BUILDING PERMIT



DETAIL | 1"=1'-0" | B

Client: ***DKC Architects Inc.***
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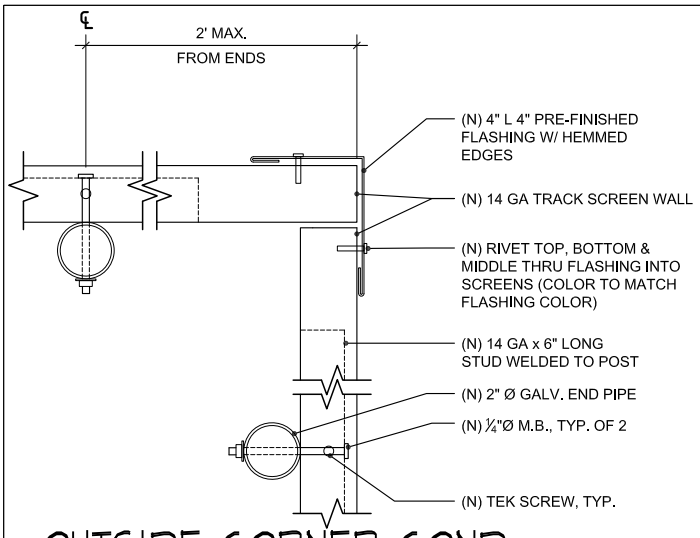
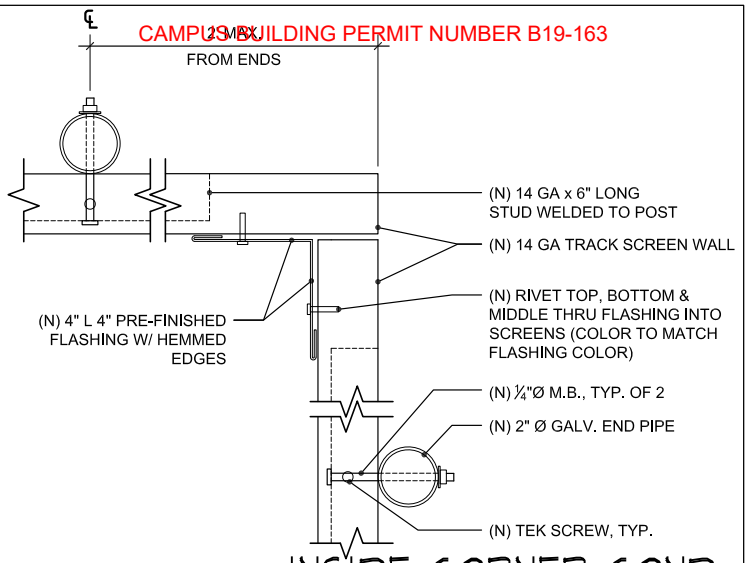
90% PC Submittal set 3/20/2019

DATE: ***03-12-19*** ~~03/28/2019~~ SHEET: ***2***

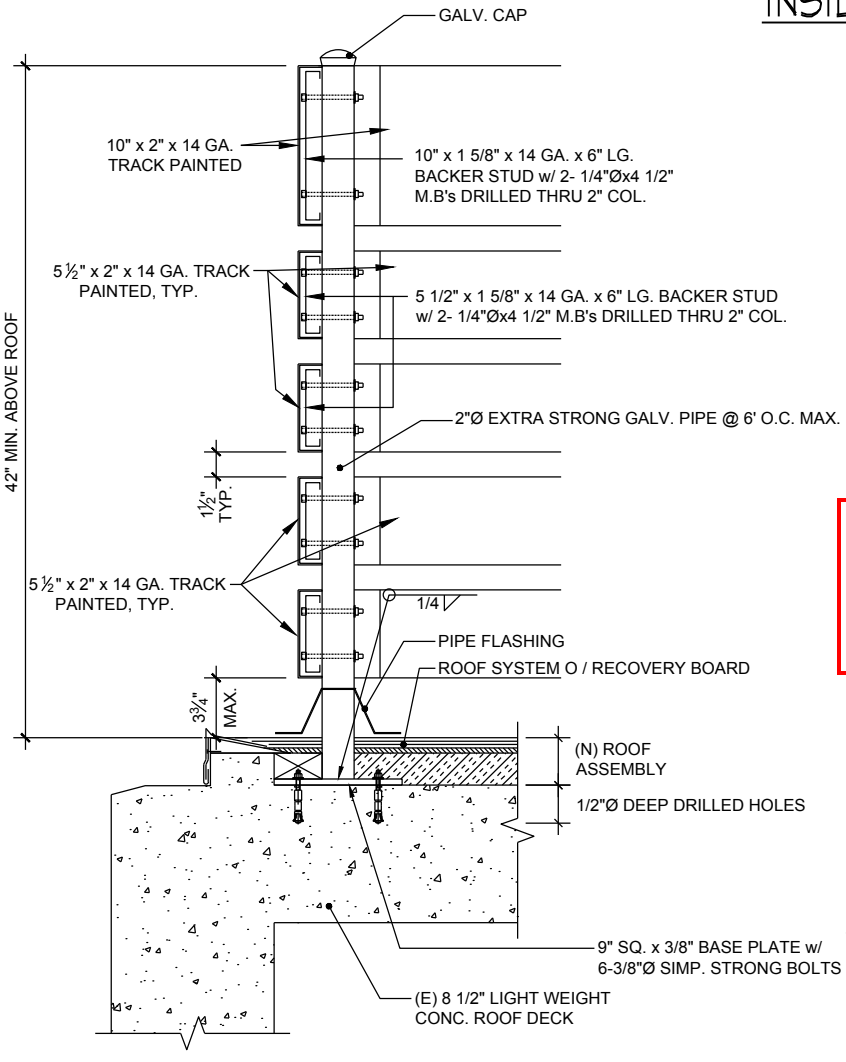
CAMPUS BUILDING PERMIT NUMBER B19-163



OUTSIDE CORNER COND.



INSIDE CORNER COND.



APPROVED
UC RIVERSIDE
Office of Planning, Design & Construction
Signed CBO: *Robert K. Williams*
Building, Safety and Compliance Division
CAMPUS BUILDING PERMIT

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REGISTERED PROFESSIONAL ENGINEER LEONARD C. KNAPP NO. C30577 Exp. 3-31-20 CIVIL STATE OF CALIFORNIA

UCR Project # 956399 - CANN #P5502
90% PC Submittal set 3/20/2019

DATE: ***03-12-19*** 03/28/2019 SHEET: ***3***

KNAPP & ASSOCIATES
CONSULTING STRUCTURAL ENGINEERS

UCR Project # 956399 - CANN #P5502
90% PC Submittal set 3/20/2019

Structural Calculations

for

West Lothian Roof Screens

University of Riverside
Riverside, Ca.

Date:
March 12, 2019

Prepared By:
LCK

Knapp & Associates, Inc. 408 South Stoddard Ave., San Bernardino Ca. 92401 Tel: (909) 889-0115 Fax: (909) 889-0455 E-mail:knappae@aol.com

Knapp & Associates Inc.
408 SOUTH STODDARD AVENUE
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Fax (909) 889-0455

WEST LOTHIA ROOF SCREENS
UNIVERSITY OF CA. @ RIVERSIDE
Riverside, CA

By: HL
Date: 03/04/19
Proj #
Sheet:

WIND PRESSURE FOR SOLID FREESTANDING WALLS AND SIGNS

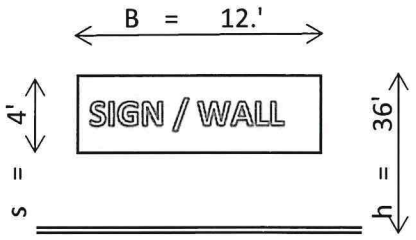
CHAPTER 29 OF ASCE 7-10

Risk Category	=	II	Table 1604.5-CBC 2013
Basic Wind Speed, V	=	110 mph	
Wind Directionality Factor, K_d	=	0.85	Table 26.6-1
Exposure Category	=	C	§ 26.7
Topographic Factor, K_{zt}	=	1	§ 26.8
Gust-effect Factor, G	=	0.85	§ 26.9
Mean Height	=	36 ft	
Velocity Pressure Coefficient, K_h	=	1.02	Table 29.3-1

Velocity Pressure
$q_h = 0.00256 K_h K_{zt} K_d V^2$ = **26.75** psf — Eq. 29.3-1

VEL (ASD) = 26.75 (.6)
= 16.05 PSF

B = 12.00 ft
s = 3.50 ft
h = 36.00 ft



Net Force Coefficient, C_f = 1.85 — Figure 29.4-1

CASE A

$P = q_h G C_f$ = 42.1 psf — Eq. 29.4-1 (STRENGTH LEVEL)

$P_{ASD} = 42.1(.6) = 25.26$ PSF

M/POST (@6'o/c) = $25.26(3.5'')^2/2 \times 6 = 982.3$ '#

FOR 2" ϕ ~~EXTRA STRONG~~ PIPE ; $F_b = 11{,}788$ psi.
.218 WALL THICKNESS
5.02 #/ LIN. FT.

SCREEN : 5½" × 2" × 14ga. TRACK (SPAN = 6')

$M = \frac{5.5}{12}(25.26)(6^2)/8 = 52.1$ '#; $S_y = 0.5113^{"3}$

$f_b = 52.1(12)/0.5113^{"3} = 1{,}222.7$ psi. — 5½" × 2" × 14ga TRACK IS OK

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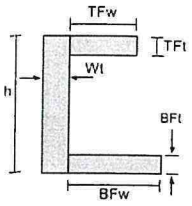
WEST LOTHIA ROOF SCREENS
UNIVERSITY OF CA. @ RIVERSIDE
Riverside, CA

CAMPUS BUILDING PERMIT NUMBER B19-163

By: LCK
Date: 3-19
Proj #
Sheet:

2019

Free Online Moment of Inertia Calculator | SkyCiv



Channel

h: 5

TFw: 2

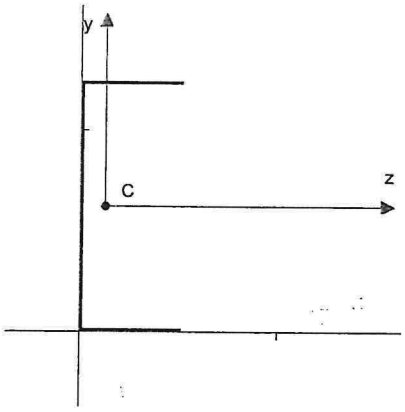
TFt: 0.068

BFw: 2

BFt: 0.068

Wt: 0.068

r: 0



Units: in

Calculate

Clear

5½" x 2" x 14 ga. TRACK

Notation	Value	Unit
A	0.612	in^2
I_z	2.362512576	in^4
I_y	0.2523590311	in^4
I_{zp}	2.362512576	in^4
I_{yp}	0.2523590311	in^4
α_p	0	deg
C_z	0.4935555556	in
C_y	2.5	in
Q_z	0.547876	in^3
Q_y	0.1612832899	in^3
S_z	0.9450050304	in^3
S_y	0.5113082575	in^3
J	0.000943296	in^4

SkyCiv
CLOUD ENGINEERING SOFTWARE

03/28/2019

Knapp & Associates Inc.
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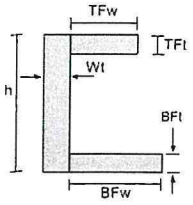
WEST LOTHIA ROOF SCREENS
UNIVERSITY OF CA. RIVERSIDE
Riverside, CA

By: LCK
Date: 3-19
Proj #
Sheet:

Free Online Moment of Inertia Calculator | SkyCiv



Channel

h: 10

TFw: 2

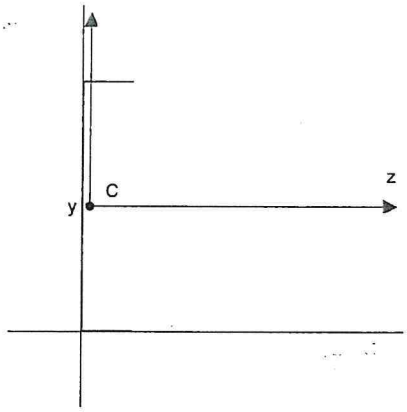
TFt: 0.068

BFw: 2

BFt: 0.068

Wt: 0.068

r: 0



Units: in

Calculate

Clear

10" x 2" x 14 ga. TRACK

Notation	Value	Unit
A	0.952	in^2
I_z	12.3746059093	in^4
I_y	0.2986504305	in^4
I_{zp}	12.3746059093	in^4
I_{yp}	0.2986504305	in^4
α_p	0	deg
C_z	0.3294285714	in
C_y	5	in
Q_z	1.525376	in^3
Q_y	0.1974997273	in^3
S_z	2.4749211819	in^3
S_y	0.9065711246	in^3
J	0.0014673493	in^4

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$$M = \frac{(6)^2 \cdot .833(25.26\ psf)}{8}$$

$$= 94.65^{1\#}$$

$$F_{b\ TRACK} = \frac{94.65(12)}{0.90657} = 1253\ psi$$

10" x 2" x 14ga. TRACK IS OK

Steel Base Plate

Code References

Calculations per AISC Design Guide # 1, IBC 2015, CBC 2016, ASCE 7-10
Load Combination Set : ASCE 7-10

General Information

Material Properties

AISC Design Method	Load Resistance Factor Design		Φ_c : LRFD Resistance Factor	0.60
Steel Plate Fy	=	36.0 ksi		
Concrete Support f'c	=	3.0 ksi		
Assumed Bearing Area :	Full Bearing		Nominal Bearing Fp per J8	3.40 ksi

Column & Plate

Column Properties

Steel Section : HSS2x2x1/4

Depth	2 in	Area	1.51 in^2
Width	2 in	Ixx	in^4
Flange Thickness	0.233 in	Iyy	in^4
Web Thickness	in		

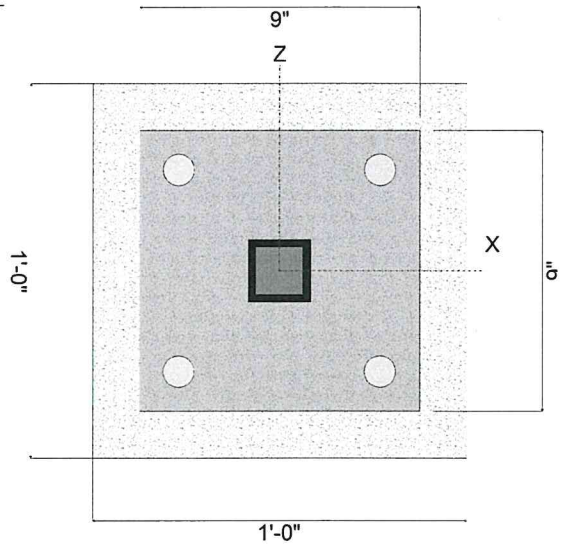
Plate Dimensions

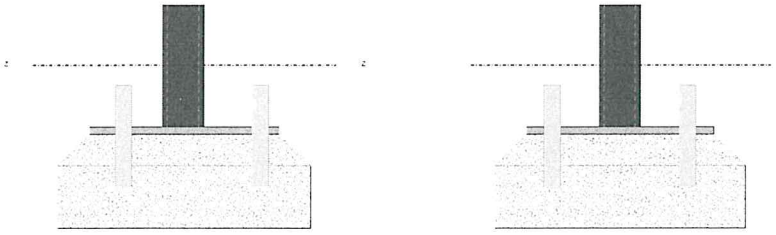
N : Length	9.0 in
B : Width	9.0 in
Thickness	0.3750 in

Column assumed welded to base plate.

Support Dimensions

Width along "X"	12.0 in
Length along "Z"	12.0 in



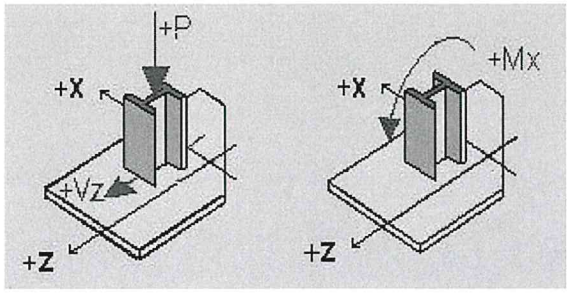


Applied Loads

	P-Y	V-Z	M-X
D : Dead Load	k	k	k-ft
L : Live	k	k	k-ft
Lr : Roof Live	k	k	k-ft
S : Snow	k	k	k-ft
W : Wind	k	0.540 k	1.550 k-ft
E : Earthquake	k	k	k-ft
H : Lateral Earth	k	k	k-ft

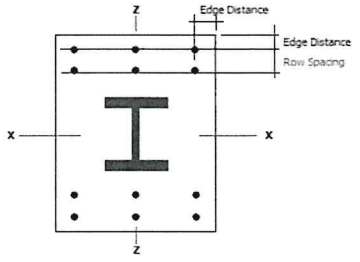
" P " = Gravity load, "+" sign is downward.

"+" Moments create higher soil pressure at +Z edge.
"+" Shears push plate towards +Z edge.



Anchor Bolts

Anchor Bolt or Rod Description	0.375"	
Max of Tension or Pullout Capacity.....		k
Shear Capacity.....		k
Edge distance : bolt to plate.....	1.250	in
Number of Bolts in each Row.....	2.0	
Number of Bolt Rows.....	1.0	



Steel Base Plate

GOVERNING DESIGN LOAD CASE SUMMARY

Plate Design Summary

Design Method	**Load Resistance Factor Design**
Governing Load Combination	**+1.20D+1.60Lr+0.50W+1.60H**
Governing Load Case Type	**Axial + Moment, L/2 < Eccentricity, Tension or**
Governing STRESS RATIO	**1.0**
Design Plate Size	**9" x 9" x 0 -3/8"**
Pu : Axial	0.000 k
Mu : Moment	0.000 k-ft
Mu : Max. Moment	0.974 k-in
fb : Max. Bending Stress	27.712 ksi
Fb : Allowable : Fy * Phi	32.400 ksi
Bending Stress Ratio	0.855
	Bending Stress OK
fu : Max. Plate Bearing Stress	2.040 ksi
Fp : Allowable :	2.040 ksi
Bearing Stress Ratio	1.000
	Bearing Stress OK

Load Comb. : +1.40D+1.60H

Axial Load Only, No Moment

Loading

Pu : Axial	0.000 k
Design Plate Height	9.000 in
Design Plate Width	9.000 in
Will be different from entry if partial bearing used.	
A1 : Plate Area	81.000 in^2
A2: Support Area	144.000 in^2
sqrt(A2/A1)	1.333

Distance for Moment Calculation

" m "	3.550 in
" n "	3.550 in
X	0.000 in^2
Lambda	0.000
n'	0.000 in
n' * Lambda	0.000 in
L = max(m, n, n")	3.550 in

Bearing Stresses

Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	0.000 ksi
Stress Ratio	**0.000**

Plate Bending Stresses

Mmax = Fu * L^2 / 2	0.000 k-in
fb : Actual	0.000 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.000**

Load Comb. : +1.20D+0.50Lr+1.60L+1.60H

Axial Load Only, No Moment

Loading

Pu : Axial	0.000 k
Design Plate Height	9.000 in
Design Plate Width	9.000 in
Will be different from entry if partial bearing used.	
A1 : Plate Area	81.000 in^2
A2: Support Area	144.000 in^2
sqrt(A2/A1)	1.333

Distance for Moment Calculation

" m "	3.550 in
" n "	3.550 in
X	0.000 in^2
Lambda	0.000
n'	0.000 in
n' * Lambda	0.000 in
L = max(m, n, n")	3.550 in

Bearing Stresses

Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	0.000 ksi
Stress Ratio	**0.000**

Plate Bending Stresses

Mmax = Fu * L^2 / 2	0.000 k-in
fb : Actual	0.000 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.000**

Steel Base Plate

Load Comb. : +1.20D+1.60L+0.50S+1.60H

Axial Load Only, No Moment

Loading	
Pu : Axial	0.000 k
Design Plate Height	9.000 in
Design Plate Width	9.000 in
Will be different from entry if partial bearing used.	
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A2: Support Area	144.000 in^2
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Distance for Moment Calculation	
" m "	3.550 in
" n "	3.550 in
X	0.000 in^2
Lambda	0.000
n'	0.000 in
n' * Lambda	0.000 in
L = max(m, n, n")	3.550 in

Bearing Stresses	
Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	0.000 ksi
Stress Ratio	**0.000**
Plate Bending Stresses	
Mmax = Fu * L^2 / 2	0.000 k-in
fb : Actual	0.000 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.000**

Load Comb. : +1.20D+1.60Lr+0.50L+1.60H

Axial Load Only, No Moment

Loading	
Pu : Axial	0.000 k
Design Plate Height	9.000 in
Design Plate Width	9.000 in
Will be different from entry if partial bearing used.	
A1 : Plate Area	81.000 in^2
A2: Support Area	144.000 in^2
sqrt(A2/A1)	1.333
Distance for Moment Calculation	
" m "	3.550 in
" n "	3.550 in
X	0.000 in^2
Lambda	0.000
n'	0.000 in
n' * Lambda	0.000 in
L = max(m, n, n")	3.550 in

Bearing Stresses	
Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	0.000 ksi
Stress Ratio	**0.000**
Plate Bending Stresses	
Mmax = Fu * L^2 / 2	0.000 k-in
fb : Actual	0.000 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.000**

Load Comb. : +1.20D+1.60Lr+0.50W+1.60H

Axial Load + Moment, Ecc. > L/2

Loading	
Pu : Axial	0.000 k
Mu : Moment	0.775 k-ft
Eccentricity	93,000.000 in
A1 : Plate Area	81.000 in^2
A2 : Support Area	144.000 in^2
sqrt(A2/A1)	1.333
Calculate plate moment from bearing . . .	
max(m, n)	3.700 in
"A" : Bearing Length	0.131 in
Mpl : Plate Moment	0.041 k-in

Calculate plate moment from bolt tension . . .	
Tension per Bolt	0.603 k
Tension : Allowable	0.000 k
Stress Ratio	**0.000**
Dist. from Bolt to Col. Edge	2.300 in
Effective Bolt Width for Bending	9.000 in
Plate Moment from Bolt Tension	0.308 k-in
Bearing Stresses	
Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	*(set equal to Fp)*
Stress Ratio	**1.000**
Plate Bending Stresses	
Mmax	0.490 k-in
fb : Actual	13.946 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.430**

Steel Base Plate

Load Comb. : +1.20D+1.60Lr-0.50W+1.60H

Axial Load + Moment, Ecc. > L/2

Loading	
Pu : Axial	0.000 k
Mu : Moment	0.775 k-ft
Eccentricity	93,000.000 in
A1 : Plate Area	81.000 in^2
A2 : Support Area	144.000 in^2
sqrt(A2/A1)	1.333

Calculate plate moment from bearing . . .	
max(m, n)	3.700 in
"A" : Bearing Length	0.131 in
Mpl : Plate Moment	0.041 k-in

Calculate plate moment from bolt tension . . .	
Tension per Bolt	0.603 k
Tension : Allowable	0.000 k
Stress Ratio	**0.000**
Dist. from Bolt to Col. Edge	2.300 in
Effective Bolt Width for Bending	9.000 in
Plate Moment from Bolt Tension	0.308 k-in

Bearing Stresses	
Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	*(set equal to Fp)*
Stress Ratio	**1.000**

Plate Bending Stresses	
Mmax	0.490 k-in
fb : Actual	13.946 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.430**

Load Comb. : +1.20D+0.50L+1.60S+1.60H

Axial Load Only, No Moment

Loading	
Pu : Axial	0.000 k
Design Plate Height	9.000 in
Design Plate Width	9.000 in
Will be different from entry if partial bearing used.	
A1 : Plate Area	81.000 in^2
A2: Support Area	144.000 in^2
sqrt(A2/A1)	1.333

Distance for Moment Calculation	
" m "	3.550 in
" n "	3.550 in
X	0.000 in^2
Lambda	0.000
n'	0.000 in
n' * Lambda	0.000 in
L = max(m, n, n")	3.550 in

Bearing Stresses	
Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	0.000 ksi
Stress Ratio	**0.000**

Plate Bending Stresses	
Mmax = Fu * L^2 / 2	0.000 k-in
fb : Actual	0.000 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.000**

Load Comb. : +1.20D+1.60S+0.50W+1.60H

Axial Load + Moment, Ecc. > L/2

Loading	
Pu : Axial	0.000 k
Mu : Moment	0.775 k-ft
Eccentricity	93,000.000 in
A1 : Plate Area	81.000 in^2
A2 : Support Area	144.000 in^2
sqrt(A2/A1)	1.333

Calculate plate moment from bearing . . .	
max(m, n)	3.700 in
"A" : Bearing Length	0.131 in
Mpl : Plate Moment	0.041 k-in

Calculate plate moment from bolt tension . . .	
Tension per Bolt	0.603 k
Tension : Allowable	0.000 k
Stress Ratio	**0.000**
Dist. from Bolt to Col. Edge	2.300 in
Effective Bolt Width for Bending	9.000 in
Plate Moment from Bolt Tension	0.308 k-in

Bearing Stresses	
Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	*(set equal to Fp)*
Stress Ratio	**1.000**

Plate Bending Stresses	
Mmax	0.490 k-in
fb : Actual	13.946 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.430**

Steel Base Plate

Load Comb. : +1.20D+1.60S-0.50W+1.60H

Axial Load + Moment, Ecc. > L/2

Loading	
Pu : Axial	0.000 k
Mu : Moment	0.775 k-ft
Eccentricity	93,000.000 in
A1 : Plate Area	81.000 in^2
A2 : Support Area	144.000 in^2
sqrt(A2/A1)	1.333

Calculate plate moment from bearing . . .	
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fu : Max. Bearing Pressure	*(set equal to Fp)*
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Fb : Allowable	32.400 ksi
Stress Ratio	**0.430**

Load Comb. : +1.20D+0.50Lr+0.50L+W+1.60H

Axial Load + Moment, Ecc. > L/2

Loading	
Pu : Axial	0.000 k
Mu : Moment	1.550 k-ft
Eccentricity	186000.000 in
A1 : Plate Area	81.000 in^2
A2 : Support Area	144.000 in^2
sqrt(A2/A1)	1.333

Calculate plate moment from bearing . . .	
max(m, n)	3.700 in
"A" : Bearing Length	0.264 in
Mpl : Plate Moment	0.081 k-in

Calculate plate moment from bolt tension . . .	
Tension per Bolt	1.214 k
Tension : Allowable	0.000 k
Stress Ratio	**0.000**
Dist. from Bolt to Col. Edge	2.300 in
Effective Bolt Width for Bending	9.000 in
Plate Moment from Bolt Tension	0.620 k-in

Bearing Stresses	
Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	*(set equal to Fp)*
Stress Ratio	**1.000**

Plate Bending Stresses	
Mmax	0.974 k-in
fb : Actual	27.712 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.855**

Steel Base Plate

Load Comb. : +1.20D+0.50Lr+0.50L-W+1.60H

Axial Load + Moment, Ecc. > L/2

Loading

Pu : Axial	0.000 k
Mu : Moment	1.550 k-ft
Eccentricity	186000.000 in
A1 : Plate Area	81.000 in^2
A2 : Support Area	144.000 in^2
sqrt(A2/A1)	1.333

Calculate plate moment from bearing . . .

max(m, n)	3.700 in
"A" : Bearing Length	0.264 in
Mpl : Plate Moment	0.081 k-in

Calculate plate moment from bolt tension . . .

Tension per Bolt	1.214 k
Tension : Allowable	0.000 k
Stress Ratio	**0.000**
Dist. from Bolt to Col. Edge	2.300 in
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fu : Max. Bearing Pressure	*(set equal to Fp)*
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Load Comb. : +1.20D+0.50L+0.50S+W+1.60H

Axial Load + Moment, Ecc. > L/2

Loading

Pu : Axial	0.000 k
Mu : Moment	1.550 k-ft
Eccentricity	186000.000 in
A1 : Plate Area	81.000 in^2
A2 : Support Area	144.000 in^2
sqrt(A2/A1)	1.333

Calculate plate moment from bearing . . .

max(m, n)	3.700 in
"A" : Bearing Length	0.264 in
Mpl : Plate Moment	0.081 k-in

Calculate plate moment from bolt tension . . .

Tension per Bolt	1.214 k
Tension : Allowable	0.000 k
Stress Ratio	**0.000**
Dist. from Bolt to Col. Edge	2.300 in
Effective Bolt Width for Bending	9.000 in
Plate Moment from Bolt Tension	0.620 k-in

Bearing Stresses

Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	*(set equal to Fp)*
Stress Ratio	**1.000**

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Load Comb. : +1.20D+0.50L+0.50S-W+1.60H

Axial Load + Moment, Ecc. > L/2

Loading	
Pu : Axial	0.000 k
Mu : Moment	1.550 k-ft
Eccentricity	186000.000 in
A1 : Plate Area	81.000 in^2
A2 : Support Area	144.000 in^2
sqrt(A2/A1)	1.333

Calculate plate moment from bearing . . .	
max(m, n)	3.700 in
"A" : Bearing Length	0.264 in
Mpl : Plate Moment	0.081 k-in

Calculate plate moment from bolt tension . . .	
Tension per Bolt	1.214 k
Tension : Allowable	0.000 k
Stress Ratio	**0.000**
Dist. from Bolt to Col. Edge	2.300 in
Effective Bolt Width for Bending	9.000 in
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Bearing Stresses	
Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	*(set equal to Fp)*
Stress Ratio	**1.000**

Plate Bending Stresses	
Mmax	0.974 k-in
fb : Actual	27.712 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.855**

Load Comb. : +1.20D+0.50L+0.20S+E+1.60H

Axial Load Only, No Moment

Loading	
Pu : Axial	0.000 k
Design Plate Height	9.000 in
Design Plate Width	9.000 in
Will be different from entry if partial bearing used.	
A1 : Plate Area	81.000 in^2
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sqrt(A2/A1)	1.333

Distance for Moment Calculation	
" m "	3.550 in
" n "	3.550 in
X	0.000 in^2
Lambda	0.000
n'	0.000 in
n' * Lambda	0.000 in
L = max(m, n, n")	3.550 in

Bearing Stresses	
Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	0.000 ksi
Stress Ratio	**0.000**

Plate Bending Stresses	
Mmax = Fu * L^2 / 2	0.000 k-in
fb : Actual	0.000 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.000**

Load Comb. : +0.90D+W+0.90H

Axial Load + Moment, Ecc. > L/2

Loading	
Pu : Axial	0.000 k
Mu : Moment	1.550 k-ft
Eccentricity	186000.000 in
A1 : Plate Area	81.000 in^2
A2 : Support Area	144.000 in^2
sqrt(A2/A1)	1.333

Calculate plate moment from bearing . . .	
max(m, n)	3.700 in
"A" : Bearing Length	0.264 in
Mpl : Plate Moment	0.081 k-in

Calculate plate moment from bolt tension . . .	
Tension per Bolt	1.214 k
Tension : Allowable	0.000 k
Stress Ratio	**0.000**
Dist. from Bolt to Col. Edge	2.300 in
Effective Bolt Width for Bending	9.000 in
Plate Moment from Bolt Tension	0.620 k-in

Bearing Stresses	
Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	*(set equal to Fp)*
Stress Ratio	**1.000**

Plate Bending Stresses	
Mmax	0.974 k-in
fb : Actual	27.712 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.855**

Steel Base Plate

Load Comb. : +0.90D-W+0.90H

Axial Load + Moment, Ecc. > L/2

Loading	
Pu : Axial	0.000 k
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sqrt(A2/A1)	1.333

Calculate plate moment from bearing . . .	
max(m, n)	3.700 in
"A" : Bearing Length	0.264 in
Mpl : Plate Moment	0.081 k-in

Calculate plate moment from bolt tension . . .	
Tension per Bolt	1.214 k
Tension : Allowable	0.000 k
Stress Ratio	**0.000**
Dist. from Bolt to Col. Edge	2.300 in
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Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	*(set equal to Fp)*
Stress Ratio	**1.000**

Plate Bending Stresses	
Mmax	0.974 k-in
fb : Actual	27.712 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.855**

Load Comb. : +0.90D+E+0.90H

Axial Load Only, No Moment

Loading	
Pu : Axial	0.000 k
Design Plate Height	9.000 in
Design Plate Width	9.000 in
Will be different from entry if partial bearing used.	
A1 : Plate Area	81.000 in^2
A2: Support Area	144.000 in^2
sqrt(A2/A1)	1.333

Distance for Moment Calculation	
" m "	3.550 in
" n "	3.550 in
X	0.000 in^2
Lambda	0.000
n'	0.000 in
n' * Lambda	0.000 in
L = max(m, n, n")	3.550 in

Bearing Stresses	
Fp : Allowable	2.040 ksi
fu : Max. Bearing Pressure	0.000 ksi
Stress Ratio	**0.000**

Plate Bending Stresses	
Mmax = Fu * L^2 / 2	0.000 k-in
fb : Actual	0.000 ksi
Fb : Allowable	32.400 ksi
Stress Ratio	**0.000**

SIMPSON Strong-Tie®

Anchor Designer™ Software
Version 2.6.6794.17

Company:		Date:	3/7/2019
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Address:			
Phone:			
E-mail:			

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Torque controlled expansion anchor
Material: Carbon Steel
Diameter (inch): 0.375
Nominal Embedment depth (inch): 2.750
Effective Embedment depth, h_{ef} (inch): 2.375
Code report: ICC-ES ESR-3037
Anchor category: 1
Anchor ductility: Yes
h_{min} (inch): 4.34
c_{ac} (inch): 6.06
C_{min} (inch): 6.00
S_{min} (inch): 3.00

Base Material
Concrete: All-lightweight
Concrete thickness, h (inch): 8.00
State: Cracked
Compressive strength, f'_c (psi): 3000
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: Not applicable
Build-up grout pad: No

Base Plate
Length x Width x Thickness (inch): 9.00 x 9.00 x 0.38

Recommended Anchor
Anchor Name: Strong-Bolt® 2 - 3/8"Ø CS Strong-Bolt 2, hnom:2.75" (70mm)
Code Report: ICC-ES ESR-3037

SIMPSON Strong-Tie

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Address:			
Phone:			
E-mail:			

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Torque controlled expansion anchor
Material: Carbon Steel
Diameter (inch): 0.375
Nominal Embedment depth (inch): 2.875
Effective Embedment depth, h_{ef} (inch): 2.500
Code report: ICC-ES ESR-3037
Anchor category: 1
Anchor ductility: Yes
h_{min} (inch): 4.50
c_{ac} (inch): 6.00
C_{min} (inch): 6.00
S_{min} (inch): 3.00

Base Material
Concrete: All-lightweight
Concrete thickness, h (inch): 8.00
State: Cracked
Compressive strength, f'_c (psi): 3000
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: Not applicable
Build-up grout pad: No

Base Plate
Length x Width x Thickness (inch): 9.00 x 9.00 x 0.50

Recommended Anchor
Anchor Name: Strong-Bolt® 2 - 3/8"Ø CS Strong-Bolt 2, hnom:2.875" (73mm)
Code Report: ICC-ES ESR-3037

SIMPSON Strong-Tie

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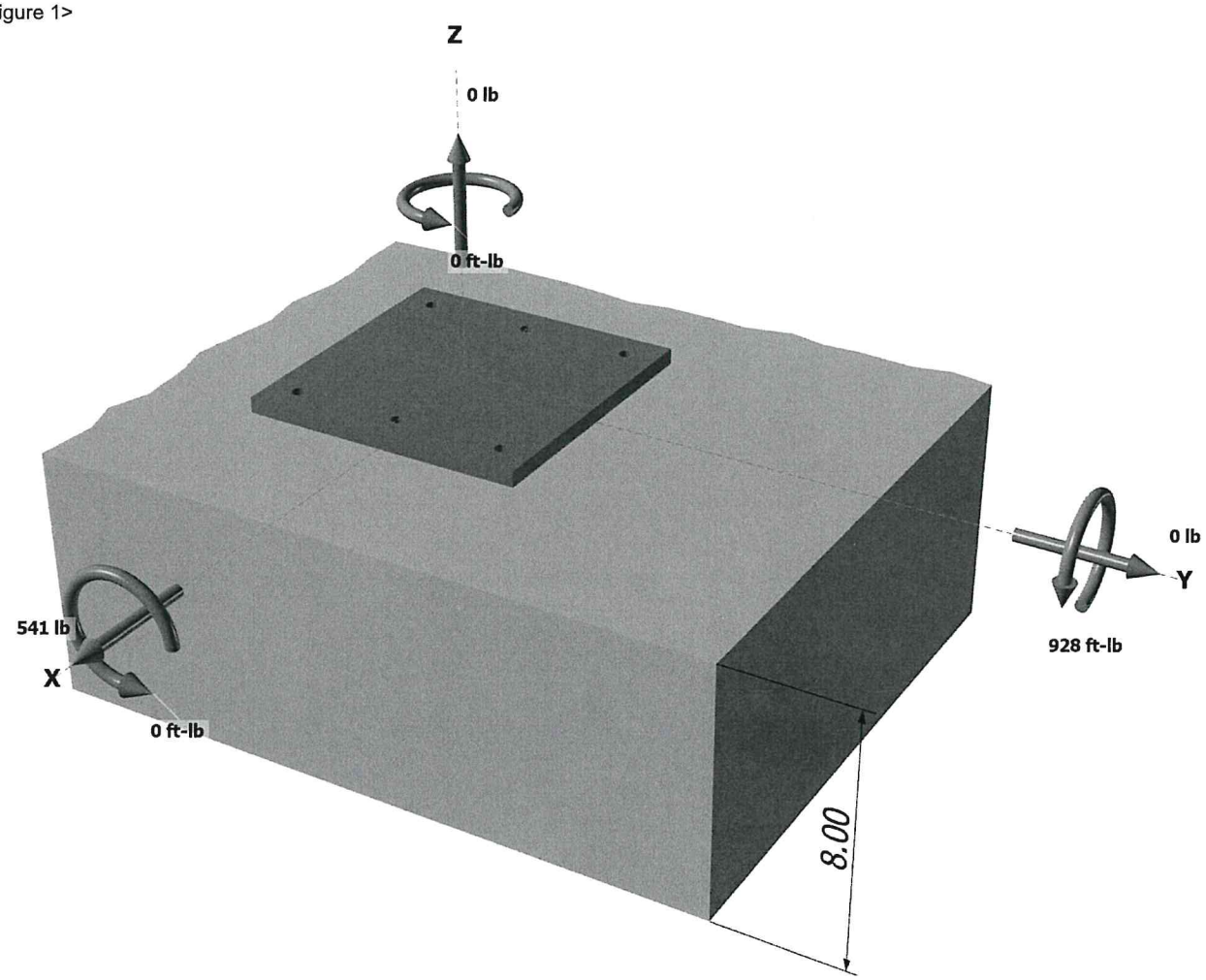
Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: Yes
Anchors subjected to sustained tension: Not applicable
Ductility section for tension: 17.2.3.4.3 (c) is satisfied
Ductility section for shear: 17.2.3.5.3 (b) is satisfied
Ω_0 factor: not set
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

Strength level loads:

N_{ua} [lb]: 0
V_{uax} [lb]: 541
V_{uay} [lb]: 0
M_{ux} [ft-lb]: 0
M_{uy} [ft-lb]: 928
M_{uz} [ft-lb]: 0

<Figure 1>



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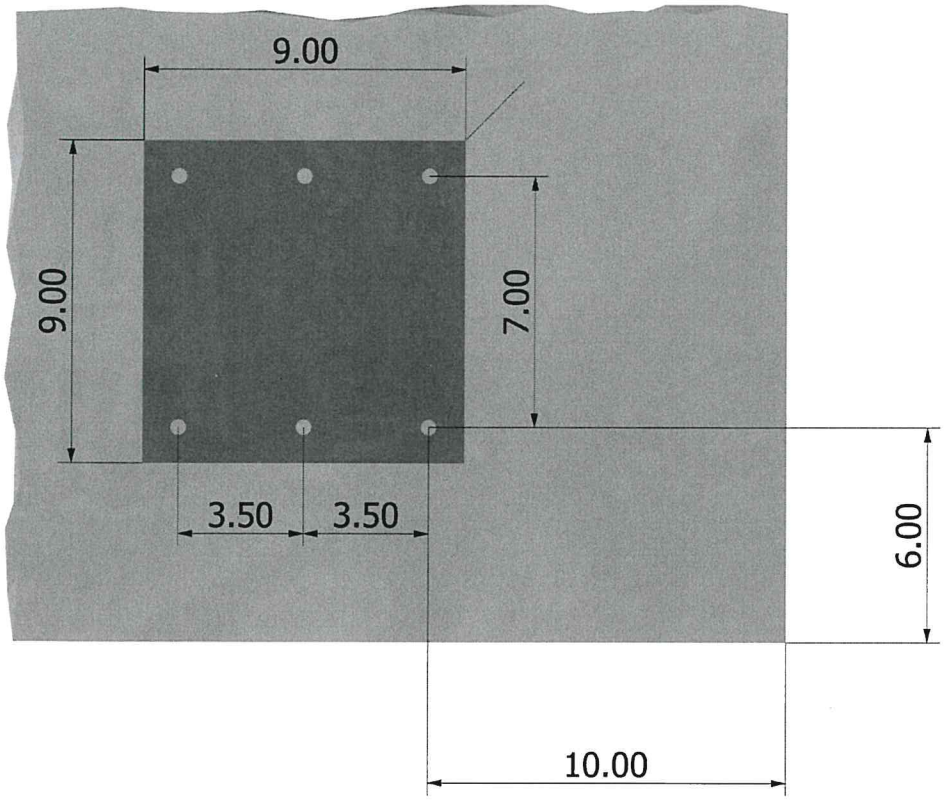
<Figure 2>



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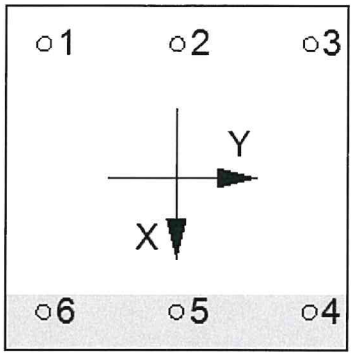
3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	493.3	90.2	0.0	90.2
2	493.3	90.2	0.0	90.2
3	493.3	90.2	0.0	90.2
4	0.0	90.2	0.0	90.2
5	0.0	90.2	0.0	90.2
6	0.0	90.2	0.0	90.2
Sum	1480.0	541.0	0.0	541.0

Maximum concrete compression strain (‰): 0.05
Maximum concrete compression stress (psi): 228
Resultant tension force (lb): 1480
Resultant compression force (lb): 1480
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

<Figure 3>



4. Steel Strength of Anchor in Tension (Sec. 17.4.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
5600	0.75	4200

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ (Eq. 17.4.2.2a)

k_c	λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
17.0	0.60	3000	2.500	2208

$0.75\phi N_{cbg} = 0.75\phi \, (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.4.2.1b)

A_{Nc} (in²)	A_{Nco} (in²)	$c_{a,min}$ (in)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	$0.75\phi N_{cbg}$ (lb)
108.75	56.25	10.00	1.000	1.000	1.00	1.000	2208	0.65	2081

6. Pullout Strength of Anchor in Tension (Sec. 17.4.3)

$0.75\phi N_{pn} = 0.75\phi \Psi_{c,P} \lambda_a N_p (f'_c / 2{,}500)^n$ (Sec. 17.3.1, Eq. 17.4.3.1 & Code Report)

$\Psi_{c,P}$	λ_a	N_p (lb)	f'_c (psi)	n	ϕ	$0.75\phi N_{pn}$ (lb)
1.0	0.60	2775	3000	0.50	0.65	889

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8. Steel Strength of Anchor in Shear (Sec. 17.5.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout}\phi V_{sa}$ (lb)
1800	1.0	0.65	1170

9. Concrete Breakout Strength of Anchor in Shear (Sec. 17.5.2)

Shear perpendicular to edge in x-direction:

$V_{bx} = \min\left|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}\right|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{bx} (lb)
2.50	0.375	0.60	3000	13.00	9650

$\phi V_{cbgx} = \phi\,(A_{Vc} / A_{Vco})\,\Psi_{ec,V}\Psi_{ed,V}\Psi_{c,V}\Psi_{h,V}V_{bx}$ (Sec. 17.3.1 & Eq. 17.5.2.1b)

A_{Vc} (in²)	A_{Vco} (in²)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{bx} (lb)	ϕ	ϕV_{cbgx} (lb)
292.00	760.50	1.000	0.854	1.000	1.561	9650	0.70	3457

Shear parallel to edge in x-direction:

$V_{by} = \min\left|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}\right|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{by} (lb)
2.50	0.375	0.60	3000	10.00	6510

$\phi V_{cbgx} = \phi\ (2)(A_{Vc} / A_{Vco})\,\Psi_{ec,V}\Psi_{ed,V}\Psi_{c,V}\Psi_{h,V}V_{by}$ (Sec. 17.3.1, 17.5.2.1(c) & Eq. 17.5.2.1b)

A_{Vc} (in²)	A_{Vco} (in²)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{by} (lb)	ϕ	ϕV_{cbgx} (lb)
224.00	450.00	1.000	1.000	1.000	1.369	6510	0.70	6213

10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.5.3)

$\phi V_{cpg} = \phi k_{cp}N_{cbg} = \phi k_{cp}(A_{Nc} / A_{Nco})\,\Psi_{ec,N}\Psi_{ed,N}\Psi_{c,N}\Psi_{cp,N}N_b$ (Sec. 17.3.1 & Eq. 17.5.3.1b)

k_{cp}	A_{Nc} (in²)	A_{Nco} (in²)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕV_{cpg} (lb)
2.0	210.25	56.25	1.000	1.000	1.000	1.000	2208	0.70	11556

11. Results

Interaction of Tensile and Shear Forces (Sec. 17.6.)

Tension	Factored Load, N_{ua} (lb)	Design Strength, øN_n (lb)	Ratio	Status
Steel	493	4200	0.12	Pass
Concrete breakout	**1480**	**2081**	**0.71**	**Pass (Governs)**
Pullout	493	889	0.55	Pass

Shear	Factored Load, V_{ua} (lb)	Design Strength, øV_n (lb)	Ratio	Status
Steel	90	1170	0.08	Pass
T Concrete breakout x+	**541**	**3457**	**0.16**	**Pass (Governs)**
|| Concrete breakout y+	**180**	**6213**	**0.03**	**Pass (Governs)**
Pryout	541	11556	0.05	Pass

Interaction check	$N_{ua}/\phi N_n$	$V_{ua}/\phi V_n$	Combined Ratio	Permissible	Status
Sec. 17.6..1	0.71	0.00	71.1%	1.0	Pass

3/8"Ø CS Strong-Bolt 2, hnom:2.875" (73mm) meets the selected design criteria.

12. Warnings

- Minimum spacing and edge distance requirement of 6da per ACI 318 Sections 17.7.1 and 17.7.2 for torqued cast-in-place anchor is waived per designer option.

- Per designer input, ductility requirements for tension have been determined to be satisfied – designer to verify.

- Per designer input, ductility requirements for shear have been determined to be satisfied – designer to verify.

- Designer must exercise own judgement to determine if this design is suitable.

- Refer to manufacturer's product literature for hole cleaning and installation instructions.