

# UNIVERSITY OF CALIFORNIA, LOTHIAN RESIDENCE H AHU REPLACEMENT PROJECT NO. 956394



VICINITY MAP

APPLICABLE CODES

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

2016 CALIFORNIA ELECTRICAL CODE (CEC) PART 3, TITLE 24

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]

[BASED ON 2014 NATIONAL ELECTRICAL CODE]

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

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

NFPA 17A, 2013 EDITION - WET CHEMICAL EXTINGUISHING SYSTEMS NFPA 24, 2016 EDITION – INSTALLATION OF PRIVATE FIRE SERVICE MAINS (AS AMENDED BY CSFM) NFPA 25, (2013 CALIFORNIA EDITION, BASED ON NFPA 25, 2011 EDITION) – INSPECTION, TESTING & MAINTENANCE OF WATEF NFPA 72, 2016 EDITION - NATIONAL FIRE ALARM AND SIGNALING CODE (AS 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. SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1146

FIRE SAFETY DURING CONSTRUCTION, ALTERATION, AND DEMOLITION

1. FIRE SAFETY DURING CONSTRUCTION, ALTERATION OR DEMOLITION OF A BUILDING SHALL BE IN THE ACCORDANCE WITH

2. FIRE-RESISTIVE ASSEMBLIES AND CONSTRUCTION SHALL BE MAINTAINED IN ACCORDANCE WITH CFC SECTION 141.2.

| <b>RIVE</b>                      | RSIDE   |
|----------------------------------|---|
| 'S<br>4                          |   |
|                                  | JOB DESCRIPTION   |
|                                  | IN BRIEF, THIS PROJECT INVOLVES THE LIKE KIND REPLACEMENT OF TWO EXISTING AIR HANDLING UNITS LOCATED IN THE WEST LOTHIAN<br>MECHANICAL ROOM. THE EXISTING HHW PUMPS WILL ALSO BE REMOVED AND NEW DDC CONTROLS WILL BE PROVIDED FOR THE NEW AIR<br>HANDLING UNITS.   |
|                                  | GENERAL NOTES   |
| ECT SITE                         | <ol> <li>THE ARRANGEMENT OF THE SYSTEM SHOWN ON THESE DRAWINGS IS BASED UPON INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME<br/>OF DESIGN. THE DRAWINGS ARE NOT INTENDED TO SHOW EXACT DIMENSIONS. THESE DRAWINGS ARE IN PART DIAGRAMMATIC, AND SOME<br/>FEATURES OF THE ILLUSTRATED EQUIPMENT INSTALLATION MAY REQUIRE REVISION TO MEET ACTUAL INSTALLATION REQUIREMENTS.<br/>STRUCTURAL SUPPORTS, CONNECTED PIPING, VALVES, CONDUIT AND WIRING SPECIFIED MAY HAVE TO BE ALTERED TO ACCOMMODATE THE<br/>EQUIPMENT PROVIDED. NO ADDITIONAL PAYMENT SHALL BE MADE FOR SUCH REVISIONS AND/OR ALTERATIONS.</li> <li>ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE CALIFORNIA ADMINISTRATIVE CODES, CALIFORNIA BUILDING STANDARD CODES,<br/>NFPA STANDARDS, LOCAL CODES, AND REQUIREMENTS OF THE CALIFORNIA ADMINISTRATIVE CODES, CALIFORNIA BUILDING STANDARD CODES,<br/>NFPA STANDARDS, LOCAL CODES, AND REQUIREMENTS SPECIFIED HEREIN.</li> <li>THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO BID IN ORDER TO THOROUGHLY FAMILIARIZE THEMSELVES WITH THE EXISTING FIELD<br/>CONDITIONS AND SCOPE OF WORK TO BE PERFORMED. THE CONTRACTOR SHALL ALSO VERIFY ALL DIMENSIONS OF THE EXISTING FACILITIES<br/>AND EQUIPMENT PROTINENT TO THE SCOPE OF WORK TO THIS PROJECT FINOR TO BID.</li> <li>THE CONTRACTOR SHALL PROVIDE AND BE RESPONSIBLE FOR PROTECTION AND REPAIR OF ADJACENT EXISTING SUFFACES, DUCT, AREAS,<br/>PIPING, CONDUIT, AND EQUIPMENT WHICH MAY BE DAMAGED AS A RESULT OF DEMOLITION AND/OR NEW WORK. THE CONTRACTOR SHALL<br/>NOT DEMOLISH OR ALTER ANY WORK WHICH IS NOT A PART OF THIS CONTRACT WITHOUT WRITTEN PERMISSION FROM THE UNIVERSITY.</li> <li>CONTRACTOR SHALL DESIGN AND PROVIDE PIPE SUPPORTS, SEISMIC SWAY BRACING AND RESTRAINT OF ALL NEW PIPING, CONDUIT, AND<br/>FLUE EXHAUST.</li> <li>CONTRACTOR SHALL PATCH, SEAL AND PAINT TO MATCH EXISTING ANY DEMOLITION TO EXISTING WALLS, FLOORS, AND CEILINGS REQUIRED<br/>TO FACILITATE CONSTRUCTION.</li> <li>REFER TO DETAIL 1/M3.0 FOR DUCT SUPPORT INSTALLATION REQUIREMENTS.</li> <li>REFER TO DETAIL 1/M3.0 FOR DUCT SUPPORT INSTALLATION NOT<!--</td--></li></ol> |
| 15                               | INDEX OF DRAWINGS   |
|                                  | MECHANICAL<br>M0.1 MECHANICAL NOTES, ABBREVIATIONS, AND SYMBOLS<br>M0.2 EQUIPMENT SCHEDULES<br>M1.0 MECHANICAL DEMOLITION<br>M2.0 MECHANICAL DETAILS<br>M3.0 MECHANICAL DETAILS<br>M3.1 AHU DETAILS<br>M4.0 P&ID<br>M5.0 CONTROL DIAGRAM / SEQUENCE OF OPERATION<br>M5.1 COMMUNICATION RISER DIAGRAM<br>ELECTRICAL<br>E0.1 ELECTRICAL SYMBOLS, LEGEND, AND GENERAL NOTES<br>E1.0 ELECTRICAL DEMOLITION & RECONSTRUCTION PLANS<br>E3.1 SINGLE LINE DIAGRAM AND SCHEDULES<br>STRUCTURAL<br>S1.0 GENERAL NOTES<br>S2.0 BASEMENT FLOOR PLAN<br>S3.0 STRUCTURAL DETAILS  |
| ER-BASED FIRE PROTECTION SYSTEMS |   |
|                                  |   |
| TH 2016 CFC CHAPTER 14.          |   |





| ABBREV     | ABBREVIATION  | LWB           | LEAVING WET BULB          |
|------------|---|---------------|---------------------------|
| ACFM       | ACTUAL CUBIC FEET PER MINUTE                            | LWT           | LEAVING WATER TEMPERATURE |
| AFM        | AIRFLOW METER   | М             | MOTOR                     |
| AHU        | AIR HANDLING UNIT                                       | MAX           | MAXIMUM                   |
| AS         | AIR SEPARATOR   | MBH/<br>MBTUH | THOUSAND BTU PER HOUR     |
| AW         | ACID WASTE  | MBTOIT        |                           |
| AWV        | ACID WASTE VENT   | MECH          | MECHANICAL                |
| BLDG       | BUILDING  | MFG           | MANUFACTURER              |
| BMS        | BUILDING ENERGY MANAGEMENT                              | MIN           | MINIMUM                   |
| BTU        | BRITISH THERMAL UNIT                                    | Ν             | NORTH                     |
| BTUH       | BRITISH THERMAL UNITS PER                               | NC            | NORMALLY CLOSED           |
|            | HOUR  | NG            | NATURAL GAS               |
| CC         | COOLING COIL  | No            | NUMBER                    |
| CD         | CEILING DIFFUSER  | NO            | NORMALLY OPEN             |
| CFM        | CUBIC FEET PER MINUTE                                   | OSA           | OUTSIDE AIR               |
| CHWR       | CHILLED WATER RETURN                                    | PD            | PRESSURE DROP             |
| CHWS       | CHILLED WATER SUPPLY                                    | PH            | PHASE                     |
| CNDS       | CONDENSATE  | POC           | POINT OF CONNECTION       |
| CSFM<br>Cv | CALIFORNIA STATE FIRE MARSHAL<br>VALVE FLOW COEFFICIENT | POD           | POINT OF DISCONNECTION    |
| CV         | CONTROL VALVE   | PSI           | POUNDS PER SQUARE INCH    |
| DB         | DRY BULB  | QTY           | QUANTITY                  |
| DDC        | DIRECT DIGITAL CONTROL                                  | R             | RADIUS                    |
| DEG        | DEGREE  |               |                           |
|            |   |               |                           |
|            |   | REQD          | REQUIRED                  |
|            | DOWN  | REV           | REVISIONS                 |
| DwG        |   | RF            | RETURN FAN                |
| EA         | EACH/EXHAUST AIR  | RM            | ROOM                      |
| EAT        | ENTERING AIR TEMPERATURE                                | RPM           | REVOLUTIONS PER MINUTE    |
| EDB        | ENTERING DRY BULB                                       | RR            | RETURN REGISTER           |
| EF         | EXHAUST FAN   | SA            | SUPPLY AIR                |
| EG         | EXHAUST GRILLE  | SF            | SUPPLY FAN                |
| EQUIP      | EQUIPMENT   | SD            | SMOKE DETECTOR            |
| ESP        | EXTERNAL STATIC PRESSURE/<br>SAMPLE PORT                | SG            | SUPPLY GRILLE             |
| ET         | EXPANSION TANK  | SQFT          | SQUARE FEET               |
| EWB        | ENTERING WET BULB                                       | SR            | SUPPLY REGISTER           |
| EWT        | ENTERING WATER TEMPERATURE                              | тл            |                           |
| FPI        | FINS PER INCH   |               |                           |
| FPM        | FEET PER MINUTE   |               |                           |
|            |   | тер           |                           |
| FSD        | DAMPER  | ICP           | TEMPERATURE CONTROL PANEL |
| °F         | DEGREES FAHRENHEIT                                      | TD            | TO DRAIN                  |
| GA         | GALVANIZED  | TEMP          | TEMPERATURE               |
| GAL        | GALLONS   | TG            | TRANSFER GRILLE           |
| GPM        | GALLONS PER MINUTE                                      | TSF           | TEMPORARY SUPPLY FAN      |
| HC         | HEATING COIL  | TSP           | TOTAL STATIC PRESSURE     |
| HP         | HORSEPOWER  | TYP           | TYPICAL                   |
| HR         | HOUR  | VAV           | VARIABLE AIR VOLUME       |
| HW         | HOT WATER   | VFD           | VARIABLE FREQUENCY DRIVE  |
| HHWR       | HEATING HOT WATER RETURN                                |               |                           |
| HHWS       | HEATING HOT WATER SUPPLY                                |               |                           |
| Hz         | HERTZ   | VVB           | WEIBULB                   |
| ICW        | INDUSTRIAL COLD WATER                                   | WFM           | WATERFLOW METER           |
| IN         | INCHES  | WG            | WATER GAGE                |
| KW         | KILOWATT  | WPD           | WATER PRESSURE DROP       |
| KWH        | KILOWATT HOUR   | WT            | WEIGHT                    |
| L          | LONG/LINER  | W/            | WITH                      |
| LAT        | LEAVING AIR TEMPERATURE                                 | &             | AND                       |
| LBS        | POUNDS  | Ø             | PHASE/DIAMETER            |
| LD         | LOW VELOCITY DIFFUSER                                   | '             | FOOT                      |
| LDB        | LEAVING DRY BULB  | "             | INCH                      |

| STAN | IDARD MECHANICAL VAL | VE AND FIT | TING SYMBOLS       |   |  |
|------|----------------------|------------|--------------------|---|--|
|      |                      |            |                    |   |  |
|      |                      |            |                    |   |  |
|      | BUTTERFLY VALVE      | •          | ELBOW UP           | - |  |
|      |                      | C+         | ELBOW DOWN         | - |  |
|      | GATE VALVE           |            | TEE UP             |   |  |
|      |                      |            | TEE DOWN           |   |  |
|      | BALL VALVE           |            | FLANGED JOINT      |   |  |
|      | CHECK VALVE          |            | UNION              |   |  |
|      |                      |            | CONCENTRIC REDUCER |   |  |
| +    | FLOW BALANCING VALVE |            | ECCENTRIC REDUCER  |   |  |
|      |                      |            |                    |   |  |
|      |                      |            |                    |   |  |



ALL DUCTWORK CONSTRUCTION SHALL COMPLY WITH CMC AND SMACNA STANDARDS

### HVAC LEGEND

| SYMBOL         | DESCRIPTION               |
|----------------|---------------------------|
| $\square$      | 4-WAY CEILING DIFFUSER    |
|                | 3-WAY CEILING DIFFUSER    |
|                | 2-WAY CEILING DIFFUSER    |
|                | RETURN/TRANSFER GRILLE    |
|                | EXHAUST GRILLE            |
| UP 📕 🍼 DN 🗌 🤇  | DUCT CARRYING RETURN AIR  |
| UP 📕 🗑 DN 🔀 🔅  | DUCT CARRYING SUPPLY AIR  |
| UP 📕 🌑 DN 🖂 🤅  | DUCT CARRYING EXHAUST AIR |
| $\sim\sim\sim$ | FLEXIBLE CONNECTION       |
|                | MANUAL VOLUME DAMPER      |

NOTE:

THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE USED ON THIS SPECIFIC PROJECT





|        |                          |                 |                   |        |        |          |                |       |       |                |                |               |                  | AIR H   | IANDLE | R UNIT S     | CHEDU  | LE    |              |             |            |       |                |               |         |        |              |         |     |             |             |            |            |         |           |           |          |
|--------|--------------------------|-----------------|-------------------|--------|--------|----------|----------------|-------|-------|----------------|----------------|---------------|------------------|---------|--------|--------------|--------|-------|--------------|-------------|------------|-------|----------------|---------------|---------|--------|--------------|---------|-----|-------------|-------------|------------|------------|---------|-----------|-----------|----------|
|        |                          |                 |                   |        | BLO    | WER DATA | ł              |       |       |                |                | COOLIN        | G COIL PEF       | RFORMAN | CE DAT | A            |        |       |              |             |            |       |                | HEAT          | ING COI | _ PERF | ORMAN        | ICE DAT | ٩   |             |             |            | EL!<br>REQ | ECTRICA | ۸L<br>NTS | OPERATING | <u>à</u> |
|        | LOCATION                 |                 | MANUFACTURER      |        |        |          | # 05           | τοται |       |                |                | A             | <b>IRSIDE DA</b> | TA      |        |              |        | W     | <b>ATERS</b> | IDE DA      | TA         |       |                | AI            | RSIDE D | ٩TA    |              |         | W   | ATERSID     | E DATA      | ٠          |            | ļ       | 1         | WEIGHT    | NOTES    |
| TAG    |                          | SERVED          |                   | CFM    | (W.C.) | MOTOR    | # OF<br>MOTORS | (MBH) | (MBH) | OSA DB<br>(°F) | OSA WB<br>(°F) | SA DB<br>(°F) | SA WB<br>(°F)    | ROWS    | FPI    | PD<br>(W.C.) | FT/MIN | I GPM | EWT<br>(°F)  | LWT<br>(°F) | PD<br>(FT) | (MBH) | OSA DB<br>(°F) | SA DB<br>(°F) | ROWS    | FPI    | PD<br>(W.C.) | FT/MIN  | GPM | EWT<br>(°F) | LWT<br>(°F) | PD<br>(FT) | VOLTS      | PHASE   | HZ        | (LBS)     |          |
| AHU-3  | MECHANICAL<br>ROOM A-005 | WEST<br>LOTHIAN | SCOTT SPRINGFIELD | 12,340 | 4.5    | 7.5      | 3              | 732   | 631   | 102            | 72             | 55            | 55               | 5       | 12     | 0.52         | 485    | 95    | 42           | 57          | 15.84      | 809   | 34             | 95            | 3       | 12     | 0.34         | 485     | 54  | 140         | 100         | 7.66       | 208        | 3       | 60        | 4,100     | 1,2,3    |
| AHU-4  | MECHANICAL<br>ROOM A-005 | WEST<br>LOTHIAN | SCOTT SPRINGFIELD | 9,400  | 1.0    | 3        | 3              | 552   | 478   | 102            | 72             | 55            | 55               | 5       | 12     | 0.64         | 501    | 73    | 42           | 57          | 15.07      | 622   | 34             | 95            | 4       | 8      | 0.33         | 501     | 42  | 140         | 100         | 9.22       | 208        | 3       | 60        | 3,700     | 1,2,3    |
| NOTES: |                          |                 |                   |        |        |          |                |       |       |                |                |               |                  |         |        |              |        |       |              |             |            |       |                |               |         |        |              |         |     |             |             |            |            |         |           |           |          |

PROVIDE FACTORY MOUNTED VFD WITH INTEGRAL LOCKABLE DISCONNECT TO
 PROVIDE 4" RIGID MERV 13 FILTERS TO SERVE THE AHU AIR INTAKE.
 FANS SHALL BE INTERNALLY ISOLATED.

PROVIDE FACTORY MOUNTED VFD WITH INTEGRAL LOCKABLE DISCONNECT TO SERVE EACH AHU. VFD LOCATIONS ARE INDICATED ON THE FLOOR PLANS AS VFD-3 AND VFD-4 SERVING AHU-3 AND AHU-4 RESPECTIVELY.



|  | P   | IPE SCHEDULE   |  |   |
|--|---|--|--|---|
| ERVICE                                 | MATERIAL  | FITTINGS   | JOINTS   | INSULATION                                      |
| IC HOT WATER,<br>_Y & RETURN<br>PIPING | ASTM A53, GRADE A OR B<br>SEAMLESS OR ELECTRIC<br>RESISTANCE WELDED, SCHEDULE<br>40 BLACK | ASME B16.3 MALLEABLE IRON,<br>ASTM A234/A234M FORGED STEEL<br>WELDING TYPE | WELDED ANSI 150 LB.<br>FLANGED,<br>150 LB. RATED | PREFORMED<br>MINERAL<br>FIBER                   |
| LED WATER,<br>Y AND RETURN<br>PIPING   | ASTM A53, GRADE A OR B<br>SEAMLESS OR ELECTRIC<br>RESISTANCE WELDED, SCHEDULE<br>40 BLACK | ASME B16.3 MALLEABLE IRON,<br>ASTM A234/A234M FORGED STEEL<br>WELDING TYPE | WELDED ANSI 150 LB.<br>FLANGED,<br>150 LB. RATED | CELLULAR<br>GLASS OR<br>FLEXIBLE<br>ELASTOMERIC |

#### PRESSURE INDEPENDENT CONTROL VALVE SCHEDULE

|           |        |              |         |            |          | DOLL |           |                 |           |
|-----------|--------|--------------|---------|------------|----------|------|-----------|-----------------|-----------|
| FOUIPMENT |        |              | VAI VE  | MODEL N    | UMBERS   |      |           | SUPPLY          |           |
| TAG       | SERVES | MANUFACTURER | TYPE    | VALVE      | ACTUATOR | GPM  | SIZE (IN) | VOLTAGE<br>(AC) | NOTES     |
| CWCV-3    | AHU-3  | BELIMO       | ePIV/EV | P6250S-100 | ARX24-PI | 95.3 | 2.5       | 24              | 1,2,3,4,5 |
| CWCV-4    | AHU-4  | BELIMO       | ePIV/EV | P2200S-761 | ARX24-EP | 72.6 | 2.0       | 24              | 1,2,3,4,5 |
| HWCV-3    | AHU-3  | BELIMO       | ePIV/EV | P2200S-563 | ARX24-EP | 54.3 | 2.0       | 24              | 1,2,3,4,5 |
| HWCV-4    | AHU-4  | BELIMO       | ePIV/EV | P2200S-441 | ARX24-EP | 42.1 | 2.0       | 24              | 1,2,3,4,5 |
| NOTES:    |        |              |         |            |          |      |           |                 |           |

1. CONTROL VALVE IS TO BE MOUNTED WITHIN THE COIL RETURN PIPE.

 PROVIDE A STRAIGHT PIPE LENGTH FIVE (5) TIMES THE PIPE DIAMETER BEFORE THE CONTROL VALVE INLET PER MANUFACTURER RECOMMENDATION..
 CONTRACTOR IS TO PROVIDE ALL PIPE AND TRANSITION FITTINGS REQUIRED TO FACILITATE INSTALLATION.

4. INSTALL ACCORDING TO MANUFACTURERS INSTRUCTIONS.

|  | GENERAL VALVE SCHEDULE          |  |       |  |  |  |  |  |  |  |
|--|---------------------------------|--|-------|--|--|--|--|--|--|--|
| SERVICE  | TYPE                            | MANUFACTURER/MODEL   | NOTES |  |  |  |  |  |  |  |
| MANUAL SHUTOFF<br>FOR SMALLER THAN 3"          | BALL                            | NIBCO FIGURE T-585-70-66   | 1     |  |  |  |  |  |  |  |
| MANUAL SHUT OFF, 3"<br>AND LARGER.             | BUTTERFLY                       | NIBCO MODEL LD 2000 OR APPROVED<br>EQUAL   | 1     |  |  |  |  |  |  |  |
| CHECK VALVES FOR<br>PUMP SERVICE- ALL<br>SIZES | NON SLAM SPRING<br>LOADED CHECK | NIBCO MODEL F-910 OR APCO GLOBE<br>TYPE NON-SLAM SILENT CHECK VALVE OR<br>APPROVED EQUAL | 1     |  |  |  |  |  |  |  |

NOTES: 1. BODY: ANSI CLASS 150 CAST OF DUCTILE IRON WITH REPLACEABLE EPDM SEATS, LUG ENDS, EXTENDED NECK FOR INSULATED PIPE, & STAINLESS STEEL SHAFTS. PROVIDE GEAR OPERATOR WHEEL HANDLE (TYP).







|    | DEMOLITION NOTES   |
|----|--|
| 1  | DEMOLISH CHWR/S PIPE FROM P.O.D. AND TO THE EXTENT<br>NECESSARY TO FACILITATE RECONSTRUCTION.        |
| 2  | DEMOLISH HHWS/R PIPE FROM P.O.D. AND TO THE EXTENT<br>NECESSARY TO FACILITATE RECONSTRUCTION.        |
| 3  | DEMOLISH HHW PUMP AND ASSOCIATED EQUIPMENT PAD.  |
| 4  | DEMOLISH AHU AND ASSOCIATED SUPPLY DUCTING UP TO P.O.D   |
| 5  | DEMOLISH VIBRATION ISOLATION PAD, AND PROTECT REMAINING CONCRETE PAD IN PLACE FOR RECONSTRUCTION.    |
| 6  | DEMOLISH PORTION OF HHWS/R PIPING TO THE EXTENT<br>NECESSARY TO FACILITATE RE-INSTALLATION.          |
| 7  | DEMOLISH EXPANSION TANK AND ALL ASSOCIATED APPARATUSES.  |
| 8  | REMOVE OUTSIDE AIR LOUVER TO FACILITATE AHU INSTALLATION AND PROTECT FOR FUTURE RE-INSTALLATION.     |
| 9  | IF NECESSARY, REMOVE STAIRS TO FACILITATE AHU<br>INSTALLATION AND PROTECT FOR FUTURE RECONSTRUCTION. |
| 10 | PROTECT CHW PUMP IN PLACE.   |
| 11 | PROTECT REMAINING CONCRETE EQUIPMENT PAD IN PLACE.   |

- 12 EXISTING ELECTRICAL SWITCHGEAR TO BE PROTECTED IN PLACE.
- (13) EXISTING CONCRETE COLLUM.

BEFORE BEGINNING WORK.

WEEK IN ADVANCE.









![](_page_4_Picture_2.jpeg)

![](_page_5_Picture_0.jpeg)

![](_page_5_Figure_1.jpeg)

NOTES:

- 1. MAX DUCT SUPPORT SPACING SHALL BE 10'. PROVIDE DUCT SUPPORT WITHIN 1' OF ALL FITTINGS.
- 2. PROVIDE SWAY AND SEISMIC BRACING PER SMACNA SEISMIC GUIDELINES.
- 3. HANGER MATERIAL SUPPORTING FLEXIBLE SHALL IN NO CASE BE LESS THAN 1-1/2" WIDE. FLEXIBLE DUCT SHALL BE SUPPORTED PER MANUFACTURER'S RECOMMENDED MATERIALS. BUT AT NO GREATER DISTANCE THAN 4 FEET MAX. PERMISSIBLE SAG IS MAX. 1/2" PER FOOT OF SPACING BETWEEN SUPPORTS.
- 4. PROVIDE DUCT SUPPORT ON EACH SIDE OF PROPOSED COOLING COIL.

## 4 DUCT MOUNTING N.T.S.

![](_page_5_Figure_8.jpeg)

![](_page_5_Figure_9.jpeg)

- SCHEDULED HW FLOW RATES GREATER THAN 3 GPM SHALL USE 1-INCH DIAMETER PIPING MINIMUM. PROVIDE PIPE

1 N.T.S.

![](_page_5_Picture_15.jpeg)

![](_page_6_Figure_0.jpeg)

SECTION B-B

2 AHU-4 DETAIL 1/2" = 1'-0"

GENERAL NOTES

1 MEASUREMENT UNITS ARE INCHES.

![](_page_6_Figure_9.jpeg)

![](_page_6_Picture_11.jpeg)

![](_page_7_Figure_0.jpeg)

![](_page_7_Figure_1.jpeg)

![](_page_7_Figure_2.jpeg)

![](_page_7_Figure_3.jpeg)

|   | GENERAL NOTES  |
|---|--|
| 1 | THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND DO NOT<br>SHOW ALL PIPES, DUCTS, FITTINGS, EQUIPMENT AND OBSTACLES.<br>CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CLEARANCES<br>BEFORE BEGINNING WORK. |
| 2 | TO MINIMIZE DOWNTIME, THE CONTRACTOR SHALL COORDINATE<br>SHUTDOWN OF EXISTING EQUIPMENT SERVED BY HOT WATER<br>SYSTEM WITH THE UNIVERSITY REPRESENTATIVE AT LEAST ONE<br>WEEK IN ADVANCE.            |
| 3 | PROTECT ALL PIPES, FITTINGS, AND EQUIPMENT NOT MARKED FOR<br>DEMOLITION IN PLACE FOR FUTURE RECONSTRUCTION.  |
|   |  |
|   |  |
|   | DEMOLITION NOTES   |
| 1 | DEMOLISH CHWS/R PIPE TO THE POINT NECESSARY TO FACILITATE RECONSTRUCTION.  |
| 2 | DEMOLISH HHWS/R PIPE TO THE POINT NECESSARY TO FACILITATE<br>RECONSTRUCTION  |
| 3 | DEMOLISH THREE WAY VALVE AND ALL ASSOCIATED APPARATUSES.   |
| 4 | DEMOLISH HHWS/R PIPE TO FACILITATE INSTALLATION OF A DIFFERENTIAL PRESSURE SENSOR.   |
| 5 | PROTECT CHW PUMP IN PLACE.   |
|   |  |
|   | RECONSTRUCTION NOTES   |

| 1 | PROVIDE NEW HHWS/R PIPE AND EXTEND TO SERVE AHU.   |
|---|--|
| 2 | PROVIDE NEW CHWS/R PIPE AND EXTEND TO SERVE AHU.   |
| 3 | PROVIDE NEW 2-WAY PRESSURE INDEPENDENT CONTROL VALVE TO<br>SERVE THE HEATING COIL. REFER TO DETAIL 5/M3.0 FOR<br>INSTALLATION. |
| 4 | PROVIDE NEW 2-WAY PRESSURE INDEPENDENT CONTROL VALVE TO<br>SERVE THE COOLING COIL REFER TO DETAIL 6/M3.0 FOR<br>INSTALLATION.  |
| 5 | PROVIDE DIFFERENTIAL PRESSURE SENSOR TO SERVE HHW LOOP.  |

![](_page_7_Picture_6.jpeg)

![](_page_8_Figure_0.jpeg)

### NOTES:

- SMOKE DETECTOR(S) PROVIDED BY OTHERS AND SHUTDOWN WIRED BY FLS.
- LOCATE DUCT STATIC PRESSURE SENSOR <sup>2</sup>/<sub>3</sub> DOWN DUCT.
   SUPPLY FAN AIRFLOW SENSOR PROVIDED BY UNIT MFR. CONFIRM WIRING REQUIRED WITH FLOW TRANSMITTER PROVIDED.

### **SEQUENCE OF OPERATION:**

### AHU FAN SPEED

AHU-3 and AHU-4 shall modulate VFD controlled fan speed to maintain system pressure is met, VFD shall maintain fan speed until measured system pressure deviates from set point pressure. Upon receiving a disable command, the AHU shall be commanded off and both the CHW and HHW control valves shall close.

### HEATING AND COOLING MODE

During heating mode, the CHW control valve shall close while the HHW control valve shall modulate to maintain the setpoint supply heating air temperature of 90 °F (adjustable). Once setpoint temperature is met, valve shall maintain valve position until the measured supply air temperature deviates from the set point temperature.

During cooling mode, the HHW control valve shall close while the CHW control valve shall modulate to maintain the setpoint supply cooling air temperature of 55 °F (adjustable). Once setpoint temperature is met, valve shall maintain valve position until the measured supply air temperature deviates from the set point temperature.

### SMOKE DETECTOR

If smoke is detected within the supply ductwork, the AHU shall be comanded off and both the CHW and HHw control valves shall close.

### AHU-3 CONTROL DIAGRAM (TYP AHU-4)

![](_page_8_Figure_15.jpeg)

(E) = PROVIDED BY ELECTRICAL CONTRACTOR

(M) = PROVIDED BY MECHANICAL CONTRACTOR

(C) = PROVIDED BY CONTROLS CONTRACTOR

![](_page_8_Figure_19.jpeg)

![](_page_8_Picture_20.jpeg)

![](_page_9_Picture_0.jpeg)

INSTALLATION REQUIREMENTS.

DRAWING CONTROL NOTES:

1. CONTROL POWER FROM AHU POWER - PROVIDE MULTI-TAP TRANSFORMER.

![](_page_9_Picture_5.jpeg)

### WEST LOTHIAN HALL - BAS NETWORK COMMUNICATION RISER DIAGRAM

(C) = PROVIDED BY CONTROLS CONTRACTOR

(E) = PROVIDED BY ELECTRICAL CONTRACTOR

(M) = PROVIDED BY MECHANICAL CONTRACTOR

------ MSTP COMMUNICATION WIRING ----- CAT-5 ETHERNET CABLING

— — — — — LINE VOLTAGE AC WIRING

![](_page_9_Picture_15.jpeg)

![](_page_10_Picture_0.jpeg)

|               | LEGEND AND SYMBOLS   |                 | CIRCUITS AND<br>RACEWAYS   | GENERAL NOTES   |
|---------------|--|-----------------|--|---|
| ۵,            | TRANSFORMER  |                 | RACEWAY OR WIRING SYSTEM ABOVE FLOOR LEVEL,<br>CONCEALED IN WALL OR ABOVE CEILING UON.   | <ol> <li>ELECTRICAL CONTRACTOR SHALL PERFORM ELECTRICAL INSTALLATION WORK<br/>CONFORMANCE WITH 2016 CALIFORNIA ELECTRICAL CODE (CEC) EDITION<br/>ELECTRICAL INSTALATION REQUIREMENTS.</li> <li>CONDUIT ROUTING AND OUTLET LOCATION AS SUCIAL ON THE ELECTRICAL POLY</li> </ol>                            |
|               | SWITCH   |                 | RACEWAY OR WIRING SYSTEM IN OR UNDER FLOOR, OR<br>CONCEALED IN OR BEHIND STRUCTURE OR EQUIPMENT.<br>CONDUIT STUB UP ENDING WITH CAP. | 2. CONDUIT ROUTING AND OUTLET LOCATION AS SHOWN ON THE ELECTRICAL POW<br>PLAN ARE DIAGRAMMATIC IN NATURE. CONTRACTOR SHALL VERIFY FEASIBILITY<br>THE INSTALLATION BEFORE COMMENCING THE JOB. ANY CONFLICT OF THE WOF<br>SHALL BE BROUGHT TO THE ATTENTION OF THE UNIVERSITY REPRESENTATIVE<br>IMMEDIATELY |
| °)            | LOW VOLTAGE<br>C/B   | JB2700A         |  | 3. CONTRACTOR SHALL COORDINATE ALL HIS WORK WITH OTHER CONSTRUCTION<br>TRADES. CONTRACTOR SHALL NOTIFY THE UNIVERSITY REPRESENTATIVE OF AN  |
|               | LOW VOLTAGE DRAWOUT TYPE<br>C/B                                | J               | IDENTIFIER.  | UNRESOLVED ISSUES THAT MAY DELAY INSTALLATION OF HIS<br>WORK.<br>4 PROVIDE GROUND WIRE IN ALL CONDUITS  |
|               |  | TB<br>1" C 3#10 | TERMINAL BOX. OPTIONAL<br>IDENTIFIER.  |   |
|               | LOW VOLTAGE NETWORK PROTECTOR GROUND<br>FAULT DETECTOR TYPE CB | AWG+1#10G       | RACEWAY SIZE WITH<br>CONDUCTOR CONTENTS AND SIZES  |   |
|               | SURFACE MOUNTED PANEL  |                 | 3/4" CONDUIT WTH 2#12<br>& 1#12 GND U.N.O  |   |
|               | GROUND BAR 3/4-INCH DIA. 10 FOOT<br>LONG                       |                 |  |   |
|               | MOTOR HP<br>RATED<br>COMBINATION MOTOR STATER, HORSE POWER     |                 |  |   |
|               | RATED<br>SAFETY DISCONNECT SWITCH, HORSE POWER<br>RATED        |                 |  |   |
|               | SOLID STATE<br>STARTER   |                 |  |   |
| F             | FUSE DISCONNECT<br>SWITCH                                      |                 | GROUNDING  | APPLICABLE CODES  |
|               | POWER<br>METER<br>VARIABLE REQUENCY DRIVE WITH LOCKABLE        |                 |  |   |
| VFD-J         | DISCONNECT   |                 | GROUND<br>ROD<br>GROUND CONNECTION, BOLTED   | 2010 GALIFORNIA BUILDING CODE (CBC), PART 2, VOLUMES 1 AND 2 ,TITLE 24<br>2016 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24   |
| МСР           | MOTOR CIRCUIT<br>PROTECTOR                                     | <b>_</b>        | TYPE<br>GROUND CONNECTION,<br>EXOTHERMIC<br>TYPE   | 2016 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24<br>2016 CALIFORNIA REFERENCED STANDARDS, PART 12, TITLE 24<br>TITLE 19, PUBLIC SAFETY STATE FIRE MARSHAL REGULATIONS.<br>PARTIAL LIST OF APPLICABLE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)   |
|               | MOTOR CONTROL<br>CENTER  |                 | GROUNDING ELECTRODE<br>CONDUCTOR   | STANDARDS:<br>NFPA 72, 2016 NATIONAL FIRE CODE (CALIFORNIA AMMENDED BY CSFM)  |
| Je            | FLEXIBLE CONNECTION TO<br>EQUIPMENT                            |                 |  |   |
| \$:           | 2-POLE TOGGLE SWITCH FOR MECHANICAL UNIT                       |                 |  |   |
| $\rightarrow$ | 120V. 20A. CONV.<br>OUTLET                                     |                 |  |   |
| $(\bigcirc$   | QUAD BOX<br>OUTLET   |                 |  |   |
| SD            | DUCT MOUNTED SMOKE<br>DETECTOR                                 |                 |  |   |
|               |  |                 |  |   |
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|               |  |                 |  |   |
|               |  |                 |  |   |

![](_page_10_Picture_2.jpeg)

![](_page_11_Figure_0.jpeg)

### 2 MECHANICAL RM. ELECTRICAL RECONSTRUCTION PLAN 1/4" = 1'-0"

 $1 \frac{\text{MECHANICAL RM. ELECTRICAL DEMOLITION PLAN}}{1/4" = 1'-0"}$ 

| 1.               | ELECTRICAL ENGINEERING FOR THIS PROJECT IT BASED<br>ON EXISTING DRAWINGS, AND A FIELD SURVEY OF THE<br>ELECTRICAL PANELS/DEVICES. IN FILED CONDITIONS,<br>CONTRACTOR SHALL VERIFY THE EXACT DIFFERENCES<br>AND NOTIFY THE ELECTRICAL ENGINEER FOR POSSIBLE<br>REVISIONS TO THIS DOCUMENT.  |
|------------------|--|
|                  | DEMOLITION NOTES   |
| 1                | DISCONNECT AND REMOVE ALL ASSOCIATED POWER AND CONTROL<br>CONDUITS AND WIRING CONNECTIONS FROM AHU-3 BACK TO EXISTING<br>MC2 PANEL.  |
| 2                | DISCONNECT AND REMOVE ALL ASSOCIATED POWER AND CONTROL<br>CONDUITS AND WIRING CONNECTIONS FROM AHU-4 AND HHW-4 BACK TO<br>EXISTING MC2 PANEL.  |
| 3                | DISCONNECT AND REMOVE ALL ASSOCIATED POWER AND CONDUIT<br>FROM HHW-3 TO EXISTING LB CONDUIT FITTING. ABBANDON WIRING IN<br>EXISTING CONDUIT TO REMAIN.   |
|                  | RECONSTRUCTION NOTES   |
| 1<br>2<br>3<br>4 | PROVIDE 120V CONNECTION TO NEW CONTROL VALVES.<br>COORDINATE EXACT LOCATION WITH DIV. 23.<br>PROVIDE ELECTRICAL CONNECTON TO NEW AHU BUILT IN VFD.<br>SEE SINGLE LINE DIAGRAM 02 ON SHEET E3.1 FOR CONDUIT AND<br>FEEDER INFORMATION.<br>PROVIDE 120V CONNECTION TO NEW BMS CONTROL PANEL.<br>UNIVERSITY APPROVED DUCT SMOKE DETECTOR TO BE<br>FURNISHED BY DIV. 26 AND INSTALLED BY DIV. 26. PROVIDE 120V<br>CONNECTION TO DUCT SMOKE DETECTOR. COORDINATE EXACT<br>LOCATION WITH DIV. 23. ALL CONTROLS WIRING AND CONDUIT TO<br>BE FURNISHED AND INSTALLED BY CONTROLS CONTRACTOR.   |
|                  |  |
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|                  | Image: Constrained of the second |

![](_page_11_Picture_4.jpeg)

![](_page_12_Figure_0.jpeg)

### 1 'MC2' SINGLE LINE DIAGRAM DEMOLITION

|                  | Branch Panel                                     | : (E)                           | PAN      | IEL F     | 12         |         |                             |                     |           |         |       |                            |                             |                        |     |
|------------------|--|---------------------------------|----------|-----------|------------|---------|-----------------------------|---------------------|-----------|---------|-------|----------------------------|-----------------------------|------------------------|-----|
|                  | Location<br>Supply Fron<br>Mounting<br>Enclosure | n:<br>n:<br>g: Surfa<br>e: Type | ce<br>1  |           |            |         | Volts:<br>Phases:<br>Wires: | 208Y/120\<br>3<br>4 | /         |         |       | A.I.C. F<br>Bus<br>Main Br | Rating:<br>Amps:<br>reaker: | 10kAIC<br>225A<br>MLO  |     |
| СКТ              | Circuit Description                              | SEE<br>NOT<br>E                 | Trip     | Poles     |            | 4       |                             | В                   |           | C       | Poles | Trip                       | SEE<br>NOT<br>E             | Circuit Description    | СКТ |
| 1                | WALK LIGHTING                                    |                                 | 30 A     | 1         | 1800 VA    | 1200 VA |                             |                     |           |         | 1     | 20 A                       |                             | EXISTING LOAD          | 2   |
| 3                | TIMECLOCK  |                                 | 20 A     | 1         |            |         | 100 VA                      | 1500 VA             |           |         | 1     | 30 A                       |                             | WALK LIGHTING          | 4   |
| 5                | RECEPTACLE FOR PUMP                              |                                 | 30 A     | 1         |            |         |                             |                     | 1500 VA   | 1800 VA | 1     | 30 A                       |                             | WALK LIGHTING          | 6   |
| 7                | Control Valves                                   | 1                               | 20 A     | 1         | 20 VA      | 0 VA    |                             |                     |           |         |       |                            |                             | Space                  | 8   |
| 9                | Control Valves                                   | 1                               | 20 A     | 1         |            |         | 20 VA                       | 1872 VA             |           |         | 2     | 30 A                       |                             | SOLAR HOT WATER SYSTEM | 10  |
| 11               | BMS CONTROL PANEL                                | 1                               | 20 A     | 1         |            |         |                             |                     | 500 VA    | 1872 VA |       |                            |                             |                        | 12  |
| 13               | DUCT SMOKE DETECTORS                             | 1                               | 20 A     | 1         | 10 VA      | 0 VA    |                             |                     |           |         |       |                            |                             | Space                  | 14  |
| 15               | Space  |                                 |          |           |            |         | 0 VA                        | 0 VA                |           |         |       |                            |                             | Space                  | 16  |
| 17               | Space  |                                 |          |           |            |         |                             |                     | 0 VA      | 0 VA    |       |                            |                             | Space                  | 18  |
| 19               | Space  |                                 |          |           | 0 VA       | 0 VA    |                             |                     |           |         |       |                            |                             | Space                  | 20  |
|                  |  |                                 | То       | tal Load: | 303        | AV C    | 349                         | 2 VA                | 567       | 2 VA    |       |                            |                             |                        |     |
|                  |  |                                 | Tot      | al Amps:  | 25         | δA      | 30                          | A                   | 48        | 3 A     | -     |                            |                             |                        |     |
| Notes:<br>1. PRO | VIDE NEW CIRCUIT BREAKER                         | TO MAT                          | CH EXIST | TING TYPI | E AND AIC  | RATING. |                             |                     |           |         |       |                            |                             |                        |     |
| Load C           | Classification                                   |                                 |          | Con       | nected Loa | ad C    | Demand Fa                   | ctor                | Estimated | Demand  |       |                            |                             | Panel Totals           |     |
| Power            |  |                                 |          |           | 550 VA     |         | 100.00%                     | 0                   | 550       | VA      |       |                            |                             |                        |     |
|                  |  |                                 |          |           |            |         |                             |                     |           |         |       | Tot                        | al Coni                     | n. Load: 12194 VA      |     |
|                  |  |                                 |          |           |            |         |                             |                     |           |         |       | Tota                       | l Est. D                    | emand: 12194 VA        |     |
|                  |  |                                 |          |           |            |         |                             |                     |           |         |       | Total (                    | Conn. (                     | Current: 34 A          |     |
|                  |  |                                 |          |           |            |         |                             |                     |           |         | Tota  | al Est. De                 | mand (                      | Current: 34 A          |     |
|                  |  |                                 |          |           |            |         |                             |                     |           |         |       |                            |                             |                        |     |
|                  |  |                                 |          |           |            | I       |                             | I                   |           |         | 1     |                            |                             | 1                      |     |
|                  |  |                                 |          |           |            |         |                             |                     |           |         |       |                            |                             |                        |     |

![](_page_12_Figure_3.jpeg)

![](_page_12_Picture_4.jpeg)

|          |             | Location:<br>Supply From:<br>Mounting: FLOC<br>Enclosure: Type | OR<br>212      |                | I   | Volts: 208Y/<br>Phases: 3<br>Wires: 4 |
|----------|-------------|--|----------------|----------------|-----|---------------------------------------|
| Notes:   |             |  |                |                |     |                                       |
| СКТ      |             | Circ   | uit Descriptio | n              |     | # of Poles                            |
| 1        | AHU-4       |  |                |                |     | 3                                     |
| 2        | Spare       |  |                |                |     | 3                                     |
| 3        | CHWP        |  |                |                |     | 3                                     |
| 4        | AHU-3       |  |                |                |     | 3                                     |
| 5        | Spare       |  |                |                |     | 3                                     |
| 6        | EF          |  |                |                |     | 3                                     |
| 7        | EF          |  |                |                |     | 3                                     |
| 8        | EF          |  |                |                |     | 3                                     |
| 9        | EF          |  |                |                |     | 3                                     |
| 10       |             |  |                |                |     |                                       |
| Legend:  |             |  |                |                |     |                                       |
| Load Cla | ssification |  |                | Connected Load | Der | nand Factor                           |
| Power    |             |  |                | 36795 VA       |     | 100.00%                               |
|          |             |  |                |                |     |                                       |
|          |             |  |                |                |     |                                       |
|          |             |  |                |                |     |                                       |
|          |             |  |                |                |     |                                       |
|          |             |  |                |                |     |                                       |
|          |             |  |                |                |     |                                       |
| NOTES:   |             |  |                |                |     |                                       |
|          |             |  |                |                |     |                                       |
|          |             |  |                |                |     |                                       |
|          |             |  |                |                |     |                                       |

![](_page_12_Picture_9.jpeg)

![](_page_13_Figure_0.jpeg)

![](_page_13_Figure_1.jpeg)

### STATEMENT OF SPECIAL INSPECTIONS

- 1. THE OWNER SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS TO PROVIDE INSPECTIONS DURING CONSTRUCTION. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.
- 2. SPECIAL INSPECTIONS ARE NOT REQUIRED WHERE THE WORK IS DONE ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION. APPROVED FABRICATORS MUST SUBMIT A CERTIFICATE OF COMPLIANCE FOR OFFSITE FABRICATIONS SUCH AS STRUCTURAL STEEL, PRECAST CONCRETE, GLUED LAMINATED TIMBER, ETC.
- ALL INSPECTIONS SHALL BE PERFORMED BY INDEPENDENT SPECIAL INSPECTORS. JOB SITE VISITS BY THE STRUCTURAL ENGINEER OR BUILDING OFFICIAL DO NOT CONSTITUTE AND ARE NOT A SUBSTITUTE FOR INSPECTIONS BY A SPECIAL INSPECTOR.
- 4. ALL INSPECTION REPORTS SHALL BE SUBMITTED TO THE BUILDING OFFICIAL AND EOR. THE FINAL REPORTS BY THE SPECIAL INSPECTOR(S) MUST CERTIFY THAT THE ENTIRE STRUCTURAL SYSTEM COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS.
- IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT THESE INSPECTIONS ARE PERFORMED.
   WORK REQUIRING SPECIAL INSPECTION SHALL BE INSPECTED BY THE SPECIAL INSPECTOR WHO
- IS PRESENT IN THE AREA WHERE THE WORK IS PERFORMED AND AT THE COMPLETION OF WORK. CONTINUOUS INSPECTION CONSISTS OF FULL-TIME INSPECTION; PERIODIC INSPECTION CONSISTS OF PART-TIME OR INTERMITTENT INSPECTION.
- 7. THE FOLLOWING SPECIAL INSPECTIONS ARE IN ADDITION TO INSPECTIONS BY THE BUILDING OFFICIAL. THIS LIST IS NOT INTENDED TO BE ALL INCLUSIVE.

STRUCTURAL CONCRETE PERIODIC: INSPECTION OF REINFORCING STEEL AND PLACEMENT

| CONT:                       | INSPECT BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE   |
|-----------------------------|---|
| PERIODIC:                   | VERIFY USE OF REQUIRED DESIGN MIX   |
| CONT:<br>010000-0003 (06/06 | SAMPLING FRESH CONCRETE & PERFORMING SLUMP AND AIR CONTENT TESTS &<br><sup>17</sup> DETERMINING THE TEMPERATURE OF FRESH CONCRETE AT THE TIME OF MAKING<br>SPECIMENS FOR STRENGTH TESTS |
| CONT:                       | INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES  |
| PERIODIC:                   | INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUE  |
| PERIODIC:                   | VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS   |
| PERIODIC:                   | INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED   |
| PERIODIC:                   | POST-INSTALLED AND ADHESIVE ANCHORS   |

NON-STRUCTURAL COMPONENTS

PERIODIC: ANCHORAGE OF ELECTRICAL EQUIPMENT.

### ABBREVIATIONS

|           | 010000-0002-ALT2 (04/30/1  | 8)            |  |
|-----------|----------------------------|---------------|--|
| V         |                            | HSS<br>HT     | HOLLOW STRUCTURAL STEEL                  |
| וחו       |                            |               |  |
| J         | ADJACENT                   | I.F.          | INSIDE FACE                              |
| F         | ABOVE FINISH FLOOR         | IN            | INCH                                     |
| Т         | ALTERNATE                  | INT           | INTERIOR                                 |
| CH        | ARCHITECT(URAL)            | IOR           | INSPECTOR OF RECORD                      |
| DG        | BUILDING                   | JST           | JOIST                                    |
| K         | BLOCK                      | JT            | JOINT                                    |
| KG        | BLOCKING                   | KLF           | KIPS PER LINEAR FOOT                     |
| W         | BELOW                      | KSF           | KIPS PER SQUARE FOOT                     |
|           |                            | KSI           | KIPS PER SQUARE INCH                     |
| h         |                            |               |  |
| ).<br>ПТТ | BOTTOM                     | LFRO          |  |
| B         | BUCKI ING-RESTRAINED BRACE |               | LONG LEG VERTICAL                        |
| G         | BEARING                    | LONG          | LONGITUDINAL                             |
|           | BOTH SIDES                 | LP            | LOW POINT                                |
| WN        | BETWEEN                    | LWC           | LIGHT WEIGHT CONCRETE                    |
|           | CAMBER                     | MAX           | MAXIMUM                                  |
| D         | CAST IN PLACE              | MB            | MACHINE BOLT                             |
| _         | CONTROL/CONSTRUCTION JOINT | MECH          | MECHANICAL                               |
| Р         |                            | MFR           | MANUFACIURER                             |
| c         |                            | IVIIIN        |  |
| R         |                            | IVITL<br>(NI) |  |
| 10        | CONCRETE MASONRY UNIT      | NS            | NEAR SIDE OR NON-SHRINK                  |
| )L        | COLUMN                     | NTS           | NOT TO SCALE                             |
| NC        | CONCRETE                   | NWC           | NORMAL WEIGHT CONCRETE                   |
| NN        | CONNECTION                 | OC            | ON CENTER                                |
| NT        | CONTINUOUS                 | OD            | OUTSIDE DIAMETER                         |
| )         | COMPLETE PENETRATION       | 0.F.          | OUTSIDE FACE                             |
| K         | COUNTERSINK                | OH            | OPPOSITE HAND                            |
| R(D)      |                            | OPNG          |  |
|           |                            | PDF           | POWDER/POWER DRIVEN FASTENER             |
|           |                            | PJ<br>DID     | PANEL JUINT<br>PARTIAL IOINT PENETRATION |
| T         | DETAIL                     | PI            | PLATE                                    |
| 4         | DIAMETER                   | PLC(S)        | PLACE(S)                                 |
| ٩G        | DIAGONAL                   | PLF           | POUNDS PER LINEAR FOOT                   |
| Λ         | DIMENSION                  | PLYWD         | PLYWOOD                                  |
| २         | DIRECTION                  | PREFAB        | PREFABRICATED                            |
| )         | DITTO                      | PSF           | POUNDS PER SQUARE FOOT                   |
| /G        |                            | PSI           | POUNDS PER SQUARE INCH                   |
|           |                            | P1            |  |
|           | EACH FACE                  | QTY           | QUANTITY                                 |
|           | EXPANSION JOINT            | RAD, R        | RADIUS                                   |
| IBED      | EMBEDMENT                  | REF           | REFERENCE                                |
| EC        | ELECTRICAL                 | REINF         | REINFORCING                              |
| EV        | ELEVATION OR ELEVATOR      | REQD          |  |
| h         |                            | (5)           | SIMPSON' STRONG THE CO. OR 'USP          |
| ).<br>R   |                            | SB            |  |
|           | FOUAI                      | SC            | SAW CUT OR SLIP CRITICAL                 |
| UIP       | EQUIPMENT                  | SCHED         | SCHEDULE                                 |
|           | EACH SIDE OR EDGE SCREW    | SEOR          | STRUCTURAL ENGINEER OF RECORD            |
| /         | EACH WAY                   | SHTG          | SHEATHING                                |
| Р         | EXPANSION                  | SIM           | SIMILAR                                  |
| 1         | EXTERIOR                   | SMS           | SHEET METAL SCREW                        |
| •<br>•    |                            | SN            |  |
| 2         | FLANGE                     | 50G<br>50     | SCHARE                                   |
| `         |                            | SS            | STAINI ESS STEEL                         |
| D         | FOUNDATION                 | STD           | STANDARD                                 |
| ).        | FACE OF                    | STGRD         | STAGGERED                                |
|           | FAR SIDE OR FIELD SCREW    | STIFF         | STIFFENER                                |
| MG        | FRAMING                    | STL           | STEEL                                    |
| Р         | FIBER REINFORCED POLYMER   | STRUCT        | STRUCTURAL                               |
| ~         | FOOT OR FEET               | T&B           | TOP & BOTTOM                             |
| G         | FUUTING                    |               |  |
|           |                            |               |  |
| l V       | GAL VANIZED                | TRANS         | TRANSVERSE                               |
|           | GRADE BEAM                 | TYP           | TYPICAL                                  |
| ;         | GENERAL CONTRACTOR         | UNO           | UNLESS NOTED OTHERWISE                   |
| В         | GLUED-LAMINATED BEAM       | VERT          | VERTICAL                                 |
| В         | HEADED ANCHOR BOLT         | VIF           | VERIFY IN FIELD                          |
| _         | HOLDOWN                    | W/            | WITH                                     |
| R         | HEADER                     | W/O           | WITHOUT                                  |
| ĸ         |                            | WF, W         |  |
|           |                            |               |  |
| n \I∠     | HIGH POINT                 | WP            | WORK POINT                               |
|           | HIGH STRENGTH              | WT            | WEIGHT                                   |
| В         | HIGH STRENGTH BOLT         | WWF           | WELDED WIRE FABRIC                       |
|           |                            |               |  |

### STRUCTURAL CONCRETE

1. CONCRETE SHALL BE MIXED, PLACED AND CURED IN ACCORDANCE WITH ACI 318 AND ACI 301 LATEST EDITION, AND PROJECT SPECIFICATIONS. 2. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL (AS IN WALLS) SO AS TO CAUSE SEGREGATION OF AGGREGATES. IN SUCH CASES, HOPPERS AND VERTICAL CHUTES OR TRUNKS SHALL BE USED. CHUTES OR TRUNKS SHALL BE OF VARIABLE LENGTHS SO THAT FREE UNCONFINED FALL OF CONCRETE SHALL NOT EXCEED SIX FEET. A SUFFICIENT NUMBER OF CHUTES OR TRUNKS SHALL BE USED TO ENSURE THE CONCRETE IS KEPT LEVEL AT ALL TIMES. STRUCTURAL CONCRETE SHALL MEET THE FOLLOWING DESIGN CRITERIA: MIN 28-DAY MAX MAX W/C CONC LOCATION COMP AGGREGATE RATIO TYPE STRENGTH SIZE CONC PADS & FOUNDATION 3000 PSI NWC 0.50

- a. WHEN THE USE OF PLASTICIZER (ASTM C1017, TYPE I OR II) OR WATER REDUCER (ASTM C494, TYPE F OR G) IS USED, MAXIMUM SLUMP SHALL BE 4" PRIOR TO ADMIXTURE AND 8" INCLUDING ADMIXTURE AT THE POINT OF DELIVERY. IN THE ABSENCE OF PLASTICIZER AND WATER REDUCER, SLUMP AT THE POINT OF DELIVERY SHALL NOT EXCEED 4".
- b. W/C RATIO INDICATES WATER TO CEMENTITIOUS MATERIALS RATIO.
  c. FOR INTERIOR SLABS ON GRADE AND ALL OTHER SLABS RECEIVING ADHERED FLOORING FINISHES (I.E., GLUED, ETC.), THE MAXIMUM W/C RATIO SHALL NOT EXCEED 0.46. CURING COMPOUNDS USED ON CONCRETE THAT IS TO RECEIVE FINISHES SHALL BE COMPATIBLE WITH TILE AND ADHESIVES OR GROUTS IN ACCORDANCE WITH MANUFACTURER'S DATA AND BE APPROVED BEFORE USE.
  d. SLABS ON GRADE, TOPPING SLABS, AND ELEVATED CONCRETE FLOORS SHALL HAVE A
- MAXIMUM SHRINKAGE RATE OF 0.04% AT 28 DAYS PER ASTM C 157 (CURING TEST SPECIMENS TO BE CONSISTENT WITH FIELD CONDITIONS), OR USING EMBEDDED VIBRATING WIRE STRAIN GAUGES. RESULTS OF TESTING SHALL BE SUBMITTED TO ENGINEER.
  e. SEE ACI 318 FOR ADDITIONAL REQUIREMENTS REGARDING MAXIMUM AGGREGATE SIZE.
  f. AGGREGATE GRADATION OF 3/8" MAXIMUM (PEA GRAVEL) SHALL NOT BE USED WHERE FINISHED CONCRETE SURFACE IS EXPOSED TO VIEW.
- 5. CONCRETE MIX DESIGN AND TESTING SHALL MEET THE REQUIREMENTS OF THE BUILDING CODE, AND SPECIFICATIONS. ALL CONCRETE MIXES SHALL BE DESIGNED PER ACI 318 SECTION 5.2 BY A RECOGNIZED TESTING LAB STAMPED AND SIGNED BY A LICENSED CALIFORNIA CIVIL ENGINEER AND SUBMITTED TO THE EOR FOR REVIEW PRIOR TO CONCRETE PLACEMENT. STRUCTURAL CONCRETE MIXES SHALL CONSIST OF 5 SACK MINIMUM UNO.
- 6. AGGREGATES IN NORMAL WEIGHT CONCRETE SHALL CONFORM TO ASTM C-33 (HARDROCK). AGGREGATES IN LIGHT WEIGHT CONCRETE SHALL CONFORM TO ASTM C-330.
- 7. COMPRESSIVE STRENGTH TEST REPORTS SHALL BE SUBMITTED TO THE BUILDING DEPARTMENT AND THE EOR.
- 8. PORTLAND CEMENT SHALL BE TYPE II AND SHALL CONFORM TO ASTM C150, LOW ALKALI. MILL TESTS WITH CERTIFICATES OF COMPLIANCE SHALL BE SUBMITTED.
- 9. FLY ASH OR OTHER POZZOLANS CONFORMING TO ASTM C618 CLASS F MAY BE USED AS A PARTIAL SUBSTITUTION FOR PORTLAND CEMENT UP TO A MAXIMUM OF 25% TOTAL CEMENTITIOUS MATERIALS BY WEIGHT IF THE MIX DESIGN IS PROPORTIONED BY FIELD EXPERIENCE OR TRIAL MIXTURES.
- 10. CONCRETE MIXING OPERATIONS, ETC. SHALL CONFORM TO ASTM C94.
- CUBIC YARD OF CONCRETE.
  12. DRYPACK OR NONSHRINK GROUT SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5000 PSI, AND CONSIST OF MASTERFLOW 713, EUCON NS GROUT, SIKA GROUT 212, OR APPROVED EQUAL. FOR THICK GROUT LAYERS FOLLOW MANUFACTURER'S GUIDELINES TO ATTAIN THE REQUIRED STRENGTH, WHICH MAY INCLUDE THE ADDITION OF PEA GRAVEL. FOR

11. LEAN CONCRETE, WHERE SPECIFICALLY INDICATED, SHALL CONTAIN 2 SACKS OF CEMENT PER

- BASE PLATES LARGER THAN 6 SQUARE FEET, USE HI-FLOW GROUT OR MASTERFLOW 928.13. DO NOT USE ANY CONCRETE OR GROUT CONTAINING CHLORIDES. WATER USED IN MIX SHALL BE CLEAN AND POTABLE.
- 14. PRIOR TO ERECTING ANY ELEMENTS THAT LOAD THE FOUNDATION, CONCRETE MUST REACH AN UNCONFINED COMPRESSION STRENGTH OF 2000 PSI MINIMUM AS DETERMINED BY TESTING OR PREVIOUSLY DOCUMENTED DATA FOR THE MIX DESIGN USED UNDER SIMILAR CONDITIONS, AND MUST BE ALLOWED TO CURE FOR A MINIMUM OF 3 DAYS.
- 15. MAINTAIN CONCRETE ABOVE 50 DEGREES FAHRENHEIT AND IN A MOIST CONDITION FOR A MINIMUM OF 7 DAYS AFTER PLACEMENT UNLESS OTHERWISE ACCEPTED BY EOR.
- 16. EXPOSED CORNERS OF SLABS, BEAMS, WALLS, COLUMNS, ETC. SHALL BE FORMED WITH 3/4" CHAMFER OR 1/2" RADIUS TOOLED EDGE, UNO.

### **REINFORCING STEEL**

- 1. REINFORCING GRADES FOR CONCRETE OR MASONRY: A. ALL BARS EXCEPT THOSE TO BE WELDED...... ASTM A615, GRADE 60
- D. ALL BARS TO BE WELDED ......
- 2. MAINTAIN MINIMUM CONCRETE COVER FROM FACE OF CONCRETE TO EDGE OF ALL REINFORCEMENT AS FOLLOWS (UNO):

.. ASTM A706, GRADE 60

| CONDITION   | COVER  |
|---|--------|
| CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH                           | 3"     |
| FORMED AND EXPOSED TO EARTH OR WEATHER                                  |        |
| - #6 BARS AND LARGER  | 2"     |
| - #5 BARS AND SMALLER   | 1 1/2" |
| UNEXPOSED RAISED SLABS AND WALL FACES<br>(#11 BARS AND SMALLER)         | 3/4"   |
| UNEXPOSED COLUMNS AND BEAMS   | 1 1/2" |
| STRUCTURAL SLABS ON GRADE   |        |
| - FROM BOTTOM OF SLAB   | 2"     |
| - FROM TOP OF SLAB  | 1 1/2" |
| OTHER CONCRETE NOT EXPOSED TO WEATHER OR EARTH FOR #11 BARS AND SMALLER | 3/4"   |

PROVIDE THE LARGEST COVER REQUIRED FOR ALL APPLICABLE CONDITIONS. WHERE #3 STIRRUPS OR TIES ARE USED, ENSURE THAT THE COVER FOR LONGITUDINAL BARS IS ADEQUATE.

- 3. REINFORCEMENT SHALL BE PLACED IN ACCORDANCE WITH THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI) "MANUAL OF STANDARD PRACTICE". EACH REINFORCING BAR SHALL BE WIRED TO A CROSS BAR AT A MAXIMUM SPACING OF 24"OC. PROVIDE ALL ACCESSORIES NECESSARY TO SUPPORT REINFORCING IN POSITIONS SHOWN ON THE PLANS. DO NOT USE WOOD OR BRICK TO SUPPORT REINFORCING.
- 4. SPLICES IN CONTINUOUS REINFORCEMENT AS USED IN WALLS, WALL FOOTINGS, ETC., SHALL HAVE A CLASS "B" LAP (1'-6" MIN) AND THE SPLICES IN ADJACENT BARS SHALL BE NOT LESS THAN 5'-0" APART. VERTICAL WALL BARS SHALL BE SPLICED AT OR NEAR FLOOR LINES. BARS MAY BE WIRED TOGETHER AT SPLICES OR LAPS EXCEPT FOR TOP REINFORCING OF BEAMS AND SLABS OR WHERE SPECIFICALLY DETAILED TO BE SEPARATED. WELDED WIRE FABRIC SHALL BE LAPPED 12" MINIMUM.
- 5. ALL DOWELS, ANCHOR BOLTS AND OTHER HARDWARE TO BE SET IN CONCRETE SHALL BE TIED IN PLACE PRIOR TO PLACEMENT OF CONCRETE. NO WET SETTING, STABBING, RODDING OR OTHER MOVEMENT OF EMBEDDED ITEMS SHALL BE PERFORMED DURING PLACEMENT OF CONCRETE.
- 6. BEND REINFORCING BARS COLD.
- 7. STEEL SHALL BE KEPT CLEAN AND FREE OF RUST.
- 8. DOWELS BETWEEN FOOTING AND WALLS OR COLUMNS SHALL BE THE SAME GRADE, SIZE AND SPACING AS THE MAIN REINFORCING UNO.
- 9. ALL BARS SHALL BE MARKED SO THEIR IDENTIFICATION CAN BE MADE WHEN THE FINAL IN PLACE INSPECTION IS MADE.
- 10. CHAIRS OR SPACERS FOR REINFORCING SHALL BE PLASTIC WHEN RESTING ON EXPOSED SURFACES.
- 11. WHERE LONGITUDINAL REINFORCING BARS ARE PLACED IN 2 OR MORE LAYERS, BARS IN THE UPPER LAYERS SHALL BE PLACED DIRECTLY ABOVE BARS IN THE BOTTOM LAYER.
- 12. ALL BENDS WITHIN STIRRUPS, HOOPS, AND CROSS-TIES SHALL ENGAGE A LONGITUDINAL BAR. PROVIDE #4 SPACER BAR WHERE A LONGITUDINAL BAR IS NOT SPECIFICALLY DETAILED.
- WELDING OF REINFORCING BARS SHALL BE PERFORMED PER AMERICAN WELDING SOCIETY (AWS) D1.4 USING E90XX ELECTRODES FOR A615 REINFORCING AND E80XX ELECTRODES FOR A706 REINFORCING.

### GENERAL

- REFER TO THE TYPICAL DETAIL SHEETS FOR TYPICAL DETAILS OF CONSTRUCTION. TYPICAL DETAILS APPLY TO ALL CONSTRUCTION UNLESS SPECIFICALLY NOTED OR SHOWN OTHERWISE. WHERE CONDITIONS REQUIRE MODIFICATIONS OF A TYPICAL DETAIL, THE CONTRACTOR SHALL SUBMIT MODIFIED DETAIL FOR APPROVAL BY THE ENGINEER OF RECORD PRIOR TO FABRICATION AND INSTALLATION. DETAILS OF CONSTRUCTION NOT SHOWN SHALL BE OF SAME NATURE AS THOSE SHOWN FOR SIMILAR CONSTRUCTION.
- 2. WHERE INFORMATION IS CONFLICTING, SPECIFIC DETAILS SHALL GOVERN OVER TYPICAL DETAILS WHICH SHALL GOVERN OVER THESE NOTES.
- 3. ALL DIMENSIONS ON STRUCTURAL DRAWINGS SHALL BE CHECKED AGAINST ARCHITECTURAL DIMENSIONS. DO NOT SCALE DRAWINGS. IF DIMENSIONS ARE OMITTED OR NOT CLEAR, CONTACT THE ARCHITECT (ARCH) OR ENGINEER OF RECORD (EOR). ALL DIMENSIONS RELATED TO EXISTING CONDITIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR. DIMENSIONS ARE TO THE FACE OF STUDS, AND TO CENTERLINE OF COLUMNS UNO.
- 4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO IMMEDIATELY NOTIFY THE EOR OF ANY CONFLICTS BETWEEN THE STRUCTURAL DRAWINGS AND OTHER DRAWINGS; OR EXISTING CONDITIONS NOT SHOWN OR DIFFERENT FROM THOSE SHOWN ON DRAWINGS PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE SCOPE THAT IS IN CONFLICT UNTIL THE CONFLICT IS RESOLVED WITH THE AFFECTED PARTIES.
- 5. THE STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. UNLESS OTHERWISE SHOWN THEY DO NOT INDICATE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE CONSTRUCTION AND ALL ADJACENT PROPERTIES DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE BUT ARE NOT LIMITED TO BRACING, SHORING OF LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. OBSERVATION VISITS TO THE SITE BY THE ARCHITECT OR EOR SHALL NOT INCLUDE OBSERVATION OF THE ABOVE ITEMS.
- 6. SUBSTITUTION REQUESTS FOR MATERIALS SPECIFIED ON THE STRUCTURAL DRAWINGS MAY BE CONSIDERED WITH MATERIALS HAVING EQUIVALENT OR GREATER CAPACITY AND PERFORMANCE. CURRENT EVALUATION REPORTS AND PRODUCT INFORMATION SHALL BE PROVIDED TO THE STRUCTURAL ENGINEER DEMONSTRATING THE REQUIRED CAPACITY AND PERFORMANCE OF THE MATERIAL TO BE SUBSTITUTED. WRITTEN APPROVAL FROM THE EOR SHALL BE OBTAINED PRIOR TO THE SUBSTITUTION OF ANY MATERIAL SPECIFIED ON THE STRUCTURAL DOCUMENTS.
- 7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH THE PERTINENT SECTIONS OF THE "CONSTRUCTION SAFETY ORDERS" ISSUED BY THE STATE OF CALIFORNIA, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT. THE ARCHITECT, EOR, AND THE OWNER DO NOT ACCEPT ANY RESPONSIBILITY FOR THE CONTRACTOR'S FAILURE TO COMPLY WITH THESE REQUIREMENTS.
- 8. ALL WORK IS NEW (N) UNLESS INDICATED AS EXISTING (E).
- 9. CONSTRUCTION MATERIALS SHALL BE DISTRIBUTED WHEN PLACED ON THE STRUCTURE SUCH THAT LOADS DO NOT EXCEED DESIGN LIVE LOADS OR RESULT IN AN UNBALANCED CONDITION.
- 10. REFER TO THE PROJECT SPECIFICATIONS FOR SHOP DRAWING REQUIREMENTS AND SUBMITTALS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE EOR (ALLOW FOR A REVIEW DURATION OF 10 BUSINESS DAYS), AND SHALL CONSIST OF EITHER ELECTRONIC FILES OR ONE SET FOR OUR RECORDS AND ONE REPRODUCIBLE SET. REVIEW OF SHOP DRAWINGS AND SUBMITTALS BY THE EOR IS FOR GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR WILL REMAIN RESPONSIBLE FOR ALL ERRORS OF DETAILING, FABRICATION, AND FOR CORRECT FITTING OF ALL STRUCTURAL MEMBERS, INCLUDING COORDINATION WITH OTHER TRADES. SHOP DRAWINGS AND SUBMITTALS DO NOT CONSTITUTE CHANGE ORDERS. ANY PROPOSED CHANGES TO THE STRUCTURAL DOCUMENTS MUST BE SUBMITTED IN WRITING AS A REQUEST FOR SUBSTITUTION TO THE ARCHITECT AND EOR FOR APPROVAL. SEE "STRUCTURAL SUBMITTALS" FOR MORE INFORMATION.
- 11. CORE DRILLS REQUIRED SHALL NOT CUT ANY REINFORCING. THE CONTRACTOR IS TO COORDINATE WORK OF ALL TRADES TO ENSURE COMPLIANCE. ALL CORE DRILLS ARE TO BE PRESENTED TO THE INSPECTOR OF RECORD (IOR) FOR VERIFICATION. THE IOR IS TO DOCUMENT CORES EXAMINED INDICATING AN ABSENCE OF REINFORCING.
- 12. STRUCTURAL JOINT DIMENSIONS SHOWN ON PLANS (EXPANSION, SEISMIC, SEPARATION, ETC) (WHERE OCCURS) INDICATE THE MINIMUM CLEAR DISTANCE REQUIRED. SEE PLANS, DETAILS, AND ARCHITECTURAL DRAWINGS FOR ADDITIONAL REQUIREMENTS.

### STRUCTURAL DESIGN CRITERIA

| CODES:  |
|---|
| ALL NEW WORK SHALL BE IN CONFORMANCE WITH THE CALIFORNIA BUILDING CODE (CBC) 20   |
| EDITION (TITLE 24, PART 2), INCLUDING ALL AMENDMENTS. ALL STANDARDS USED SHALL BE |
| THE LATEST VERSION APPROVED BY THE CODE ENFORCEMENT AGENCY ON THE DATE OF TH      |
| PERMIT ISSUANCE UNLESS SPECIFICALLY NOTED OTHERWISE.                              |
|   |

2. SEISMIC DESIGN INFORMATION:

| l <sub>e</sub> = 1.0   | RISK CATEGORY          | / II                    | DESIGN CAT. D           | SITE CLASS D |
|------------------------|------------------------|-------------------------|-------------------------|--------------|
| S <sub>S</sub> = 1.500 | S <sub>1</sub> = 0.626 | S <sub>DS</sub> = 1.000 | S <sub>D1</sub> = 0.626 |              |

### **EXISTING CONDITIONS**

1. SEE "AS BUILT" DRAWINGS FOR EXISTING BUILDING ITEMS NOT SHOWN OR NOTED.

- 2. FIELD VERIFY ALL CONDITIONS & DIMENSIONS PRIOR TO SHOP DRAWING PRODUCTION AND FABRICATION OF STRUCTURAL ELEMENTS.
- WHERE ALL OTHER EXISTING CONDITIONS VARY SIGNIFICANTLY FROM THOSE SHOWN ON THESE DRAWINGS, THE STRUCTURAL ENGINEER SHALL BE NOTIFIED PRIOR TO CONTINUED CONSTRUCTION RELATED TO SUBJECT CONDITIONS.
- 4. SHORE ALL EXISTING CONSTRUCTION AS REQUIRED, INCLUDING WHERE WELDING TO EXISTING STEEL FRAMING. SHORING DESIGN BY OTHERS.
- ALL EXISTING CONCRETE SURFACES TO BE IN CONTACT WITH NEW CONCRETE SHALL BE CLEANED AND ROUGHENED TO 1/4" MINIMUM AMPLITUDE. USE ICC APPROVED BONDING AGENT ON EXISTING CONCRETE PRIOR TO PLACING NEW CONCRETE.
- 6. VERIFY LOCATION OF EXISTING REBAR BEFORE FABRICATION USING NON-DESTRUCTIVE TESTING. EXISTING REINFORCING SHALL BE AVOIDED WHERE DRILLING FOR POST-INSTALLED ANCHORS OR CONCRETE DOWELS.
- 7. THE GENERAL CONTRACTOR SHALL COORDINATE THE WEIGHT AND SPECIFIC LOCATION OF ALL MECHANICAL EQUIPMENT WITH THE STRUCTURAL FRAMING. IF THE EQUIPMENT DEVIATES IN WEIGHT OR LOCATION FROM THOSE INDICATED IN THE DRAWINGS, THE STRUCTURAL ENGINEER'S APPROVAL MUST BE OBTAINED PRIOR TO INSTALLATION OF THE UNITS.
- 8. ALL EXISTING WOOD FRAMING MEMBERS SUPPORTING NEW MECHANICAL UNITS SHALL BE INSPECTED FOR DAMAGE AND DETERIORATION PRIOR TO INSTALLATION OF THE UNITS. NOTIFY THE STRUCTURAL ENGINEER IF DAMAGE OR DETERIORATION IS DISCOVERED.

### POST-INSTALLED ANCHORS

UNLESS OTHERWISE NOTED ON THE DRAWINGS, THE FOLLOWING APPLIES TO ALL POST-INSTALLED ANCHORAGE INTO HARDENED CONCRETE OR MASONRY WHICH INCLUDES TYPES SUCH AS EXPANSION, WEDGE, SLEEVE, ADHESIVE/EPOXY, SHOT-PIN, SCREW AND UNDERCUT.

- 1. INSTALL PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII) EXCEPT AS OTHERWISE STATED IN THE SPECIFIED PRODUCT REPORTS. USE INSTALLATION PROCEDURES FOR CRACKED CONCRETE CONDITIONS. DO NOT USE CORE DRILL BITS FOR ANCHOR HOLES WITHOUT PRIOR EOR APPROVAL. COPIES OF INSTALLATION INSTRUCTIONS SHALL BE MAINTAINED ON SITE.
- 2. CLEAN OUT ANCHOR HOLES AND SET ANCHORS PER THE PRODUCT'S ICC REPORT FOR THE APPROPRIATE CONDITIONS. INSTALL UNDER SUPERVISION OF THE SPECIAL INSPECTOR WHERE REQUIRED.
- PROVIDE GALVANIZED CARBON STEEL ANCHORS AT DRY INTERIOR LOCATIONS AND STAINLESS STEEL TYPE 304 OR 316 AT EXTERIOR / DAMP INTERIOR LOCATIONS, REINFORCEMENT BARS TO RECEIVE CONCRETE COVER MAY BE UNCOATED. ANCHORS SHALL BE CLEAN AND FREE OF DEBONDING SUBSTANCES.
- 4. EMBEDMENT REFERS TO THE FINAL INSTALLED EFFECTIVE DEPTH "Hef" AS DEFINED IN THE PRODUCT REPORT, REQUIRED ANCHOR HOLE DEPTH FOR INSTALLATION MAY BE DEEPER.
- 5. MAINTAIN A MINIMUM OF 2 INCHES FROM EXISTING REINFORCEMENT, CONDUIT, POST-TENSIONING (WHERE OCCURS), ETC. PRIOR TO DRILLING, CORING OR SHOOTING PINS INTO EXISTING CONCRETE OR MASONRY. USE NON DESTRUCTIVE TESTING TO LOCATE SUCH ITEMS, FOR INSTALLATION DEEPER
- THAN 3 INCHES USE GROUND PENETRATING RADAR OR X-RAY METHODS.6. WHEN THE FULL ANCHOR EMBEDMENT DEPTH, SPACING OR EDGE DISTANCE CANNOT BE OBTAINED, NOTIFY THE EOR AND IOR.
- 7. FILL ABANDONED HOLES WITH EPOXY AND PATCH SPALLS USING NON-SHRINK GROUT AND REPAIR FINISHES AS REQUIRED. CLEAR DISTANCE BETWEEN NEW HOLES AND ABANDONED HOLES SHALL BE 2" OR TWO ANCHOR DIAMETERS, WHICHEVER IS GREATER, UNLESS OTHERWISE SPECIFIED BY EOR. ANCHORS PENETRATING THROUGH WATERPROOFING OR VAPOR MEMBRANES SHALL BE SEALED OR FLASHED.
- 8. INSTALL IN DRY CONCRETE OR MASONRY HAVING A MINIMUM AGE OF 21 DAYS.
- 9. ADHESIVE/EPOXY ANCHORS ON THIS PROJECT ARE NOT DESIGNED TO SUPPORT OR INTENDED TO RESIST SUSTAINED TENSION LOADS UNLESS NOTED OTHERWISE.

![](_page_13_Picture_87.jpeg)

![](_page_14_Figure_1.jpeg)

![](_page_14_Picture_5.jpeg)

![](_page_15_Figure_0.jpeg)

![](_page_15_Figure_2.jpeg)

![](_page_15_Figure_4.jpeg)

![](_page_15_Figure_5.jpeg)

![](_page_15_Picture_7.jpeg)