APPLICABLE CODES

2019 CALIFORNIA BUILDING CODE
2019 CALIFORNIA ELECTRICAL CODE
2019 CALIFORNIA MECHANICAL CODE
2019 CALIFORNIA PLUMBING CODE
2019 CALIFORNIA ENERGY CODE
2019 CALIFORNIA FIRE CODE
2019 CALIFORNIA GREEN BUILDING CODE

CITY OF BERKELEY MUNICIPAL CODES AND ALL OTHER APPLICABLE STATE AND LOCAL ORDINANCES AND REGULATIONS

THE FOLLOWING IS A SUMMARY OF THE PRIMARY BUILDING CODE ISSUES RELATED TO THE PROJECT. CODE REFERENCES, WHERE PROVIDED, ARE PARAPHRASED AND ARE NOT INTENDED TO BE COMPLETE.

SHELTER UNITS:

| | | |
|---|---|---|
| OCCUPANCY | | |
| GROUP R, EMERGENCY HOUSING | | CBC 310.4, O104 |
| CONSTRUCTION TYPE | | |
| TYPE VB | | CBC 602.5 |
| BUILDING AREA | | |
| ALLOWABLE MIN. AREA | 53 SF | CBC O103.3 EX3 |
| ACTUAL AREA | | |
| SMALL SHELTER | 64 SF | |
| LARGE SHELTER | 100 SF | |
| BUILDING HEIGHT AND STORIES | | |
| ALLOWABLE HEIGHT | 60 FT | CBC TABLE 504.3 |
| ACTUAL HEIGHT | 9 FT | |
| ALLOWABLE NUMBER OF STORIES | 4 STORIES | CBC TABLE 504.4 |
| ACTUAL NUMBER OF STORIES | 1 STORY | |
| ALLOWABLE MIN. CEILING HEIGHT | 80 INCHES | CBC O104.3 |
| ACTUAL MIN. CEILING HEIGHT | 80 INCHES | |
| LIVE LOADS | | |
| SHELTERS SHALL BE DESIGNED TO SUPPORT FOLLOWING LIVE LOADS: | | CBC O104.2 |
| FLOOR LIVE LOADS | >40 LBS/SF FLOOR AREA | |
| HORIZONTAL LIVE LOADS | >15 LBS/SF VERTICAL WALL AREA | |
| ROOF LIVE LOADS | >20 LBS/SF HORIZONTAL ROOF AREA | |

SEE SH8.01A - SH8.03A FOR EMERGENCY SHELTER STRUCTURAL CALCULATIONS TO MEET LIVE LOAD REQUIREMENTS

| | | |
|---|---|---|
| MEANS OF EGRESS | | |
| AT LEAST TWO MEANS OF EGRESS IN SHELTERS | | CBC O104.4 |

FIRE-RESISTANCE FOR BUILDING ELEMENTS — CBC TABLE 601

| | |
|---|---|
| PRIMARY STRUCTURAL FRAME: | 0 |
| EXTERIOR BEARING WALLS: | 0 |
| INTERIOR BEARING WALLS: | 0 |
| EXTERIOR NON-BEARING WALLS: | 0 |
| INT NON-BEARING PARTITIONS: | 0 |
| FLOOR CONSTRUCTION: | 0 |
| ROOF CONSTRUCTION: | 0 |

FIRE-RESISTANCE FOR EXT. WALLS BASED ON FIRE SEPARATION DISTANCE

| | | |
|---|---|---|
| 3 FT | NO RATING REQ | CBC TABLE 602 (i) |

| | | |
|---|---|---|
| SITE OCCUPANT LOAD | | CBC 1004.5 EX |
| SHELTER RESIDENTS | 32 (1 PER SHELTER) | |
| FACILITY STAFF | 10 | |
| TOTAL MAX OCCUPANT LOAD | 42 | |
| MIN GATE WIDTH | | |
| 0.2 INCH PER OCCUPANT MIN | | CBC 1005.3.2 |
| 32" CLEAR MIN | | CBC 1010.1.1 |
| PANIC HARDWARE | | |
| NOT REQ'D FOR OCCUPANT LOAD < 50 IN GROUP A | | CBC 1010.1.10 |
| FIRE SPRINKLER SYSTEM | | |
| REQUIRED | | BBC O112.8 |

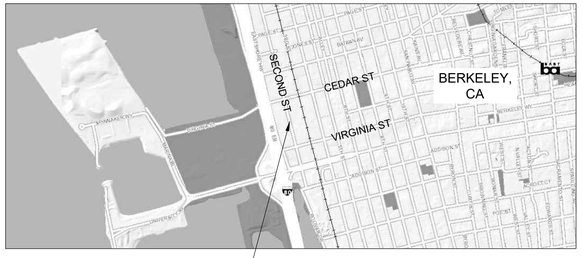
BY AGREEMENT WITH CITY OF BERKELEY FIRE MARSHAL, WET PIPE FIRE SPRINKLER SYSTEM WILL BE PROVIDED THROUGHOUT EACH EMERGENCY SHELTER UNITS IN ACCORDANCE WITH NFPA 13D (2016 EDITION). EACH SHELTER UNIT WILL BE EQUIPPED WITH A SEPARATE CONTROL VALVE ON THE RISER ASSEMBLY AND SYSTEMS WILL BE DRAINED VIA REMOVAL OF A PIPE CAP AT EACH SPRINKLER HEAD FITTING ASSEMBLY.

| | | |
|---|---|---|
| SMOKE ALARM SYSTEMS | | |
| REQUIRED, PROVIDED IN ACCORDANCE WITH CRC R314. | | CBC O104.8 |
| ACCESSIBLE PATH OF TRAVEL | | |
| MAX. RUNNING SLOPE | 1:20 | CBC 11B-403.3 |
| MAX. CROSS SLOPE | 1:48 | CBC 11B-403.3 |
| MIN. CLEAR WIDTH | 48" | CBC 11B-403.5.1 EX3 |

7 G0.00 CODE ANALYSIS
SCALE: N/A

1. THESE NOTES APPLY TO ALL DRAWINGS AND GOVERN UNLESS NOTED OR SPECIFIED FOR MORE SPECIFIC REQUIREMENTS APPLICABLE TO PARTICULAR DIVISIONS OF THE WORK. SEE SPECIFICATIONS AND SHEET NOTES CONTAINED IN SUBSECTIONS OF THESE DRAWINGS.
2. THE GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION AND THE SPECIFICATIONS SUPPLEMENT THESE DRAWINGS AND ARE A PART OF THE CONTRACT DOCUMENTS.
3. ALL WORK SHALL BE IN COMPLIANCE WITH ALL APPLICABLE LOCAL BUILDING CODES AND REGULATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR PERMITS APPLICABLE TO SPECIFIC TRADES OR SUBCONTRACTORS' WORK.
4. CONTRACTOR SHALL EXAMINE THE PREMISES AND SITE SO AS TO COMPARE THEM WITH THE DRAWINGS AND WILL HAVE SATISFIED THEMSELF AS TO THE CONDITION OF EXISTING WORK PRIOR TO SUBMISSION OF FINAL BID. ANY CONFLICTS OR DISCREPANCIES BETWEEN THE DRAWINGS AND SITE CONDITIONS SHALL BE BROUGHT TO THE ARCHITECTS' AND OWNERS REPRESENTATIVE'S ATTENTION PRIOR TO COMMENCING WORK.
5. BY ACCEPTING AND USING THESE DRAWINGS, CONTRACTOR AGREES THAT THEY SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
6. CONTRACTOR ACKNOWLEDGES THOROUGH FAMILIARIZATION WITH THE BUILDING SITE CONDITIONS, WITH THE DRAWINGS AND SPECIFICATIONS, WITH THE DELIVERY FACILITIES, AND ALL OTHER MATTERS AND CONDITIONS WHICH MAY AFFECT THE OPERATIONS AND COMPLETION OF THE WORK, AND ASSUMES ALL RISK THEREFROM.
7. CONTRACTOR SHALL COORDINATE THE WORK OF THE VARIOUS TRADES AND SUBCONTRACTORS AND SHALL BE RESPONSIBLE FOR ANY ACTS, OMISSIONS OR ERRORS OF THE SUBCONTRACTORS AND OF PERSONS DIRECTLY OR INDIRECTLY EMPLOYED BY THEM.
8. CONTRACTOR TO VERIFY ALL EXISTING DIMENSIONS IN FIELD. ON DRAWINGS, ONLY WRITTEN DIMENSIONS SHALL BE USED. DO NOT SCALE DRAWINGS. CONTRACTOR SHALL VERIFY AND BE MADE COMPLETELY RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB. ARCHITECT MUST BE NOTIFIED IN WRITING OF ANY PROPOSED OR REQUIRED VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN, AND A WRITTEN CHANGE ORDER ISSUED BEFORE MAKING ANY CHANGES AT THE JOB SITE.
9. ALL CONSTRUCTION MATERIALS AND SUPPLIES TO BE STORED, HANDLED AND INSTALLED ACCORDING TO MANUFACTURERS' RECOMMENDATIONS.
10. DRAWINGS INDICATE NEW CONSTRUCTION UNLESS NOTED AS (E) FOR "EXISTING".
11. THE CONTRACTOR SHOULD ANTICIPATE BASED ON EXPERIENCE, A REASONABLE NUMBER OF ADJUSTMENTS AND REPAIR TO EXISTING CONDITIONS TO BE NECESSARY TO MEET THE DESIGN OBJECTIVES.
12. FEATURES OF CONSTRUCTION SHOWN ARE TYPICAL AND SHALL APPLY GENERALLY THROUGHOUT SIMILAR CONDITIONS. ALL DETAILS REFERENCED, AND DETAILS NOT REFERENCED ON PLANS, SHALL BE CONSIDERED TYPICAL AND APPLY TO ALL SIMILAR CONDITIONS OF THE CONSTRUCTION.
13. WHEN SPECIFIC FEATURES OF CONSTRUCTION ARE NOT FULLY SHOWN ON THE DRAWINGS, OR CALLED FOR IN THE GENERAL NOTES, THEIR CONSTRUCTION SHALL BE OF THE SAME CHARACTER AS SIMILAR CONDITIONS.

5 G0.00 GENERAL NOTES
SCALE: N/A




4 G0.00 VICINITY MAP
SCALE: N/A

N

SCOPE OF WORK

SITE IMPROVEMENTS REQUIRED FOR THE PLACEMENT OF PRE-MANUFACTURED SINGLE-OCCUPANCY SHELTERS TO REPLACE CONGREGATE SLEEPING TRAILERS. THE PROJECT INCLUDES:

- REMOVE (2) EXISTING CONGREGATE SLEEPING TRAILERS AND REPLACE WITH (32) PRE-MANUFACTURED SHELTERS.
- PREPARATION OF SITE TO RECEIVE SHELTERS. SHELTERS TO BE INSTALLED BY OTHERS. CONTRACTOR TO WORK DIRECTLY WITH SHELTER MANUFACTURER TO COORDINATE INSTALLATION REQUIREMENTS.
- GRADING, DRAINAGE, PAVING AND COURTYARDS AS REQUIRED TO PROVIDE ACCESSIBLE PATH AND MANAGE STORMWATER.
- UPGRADE THE EXISTING PATH OF TRAVEL RUNNING THE LENGTH OF THE SITE TO MEET CODE, INCLUDING UPGRADES TO PEDESTRIAN EGRESS GATES AT THE NORTH AND SOUTH ENDS OF THE SITE.
- UPGRADE THE EXISTING PARKING AREA TO INCLUDE (1) ACCESSIBLE PARKING STALL AND MEET CODE.
- POWER AND FIREWATER CONNECTION AT EACH SHELTER.
- MODIFICATION OF EACH SHELTER TO INSTALL SPRINKLER HEAD.

BID ALTERNATES

ADDITIVE ALTERNATE A1:
- RETAIN EXISTING PLANTS AND PLANTERS THAT ARE TO BE RELOCATED OR TRANSPLANTED, AS SHOWN ON SHEETS L1.4 AND L1.5.
- EXISTING PLANTS TO BE RELOCATED OR TRANSPLANTED ARE TO BE HAND WATERED AND KEPT HEALTHY UNTIL PROJECT COMPLETION, AS SHOWN ON SHEET L1.5.
- EMPTY, SALVAGE, AND STORE EXISTING PLANTERS, AS SHOWN ON DETAIL 1, SHEET L2.4.
- PROVIDE AND INSTALL IRRIGATION EQUIPMENT AND LINES AS SHOWN ON SHEET L3.1 AND L3.2. END LATERAL LINES AT STUB OUTS CAPPED AT GRADE.
- PROVIDE AND INSTALL CHAIN LINK FENCE SLATS, AS SHOWN ON SHEET L1.2 AND DETAIL 1, SHEET L2.1.

BID ALTERNATE B1:
- PROVIDE AND INSTALL SITE FURNISHINGS AS SHOWN ON SHEET L1.2; DETAIL 1, SHEET L2.2; AND SHEET L2.3.

BID ALTERNATE B2:
- INSTALL EXISTING PLANTERS, AS SHOWN ON SHEETS L1.4, L1.5, AND L2.4.
- PROVIDE AND INSTALL NEW PLANTERS, PLANTING MATERIAL, AND PLANTS, AS SHOWN ON SHEET L1.4, SHEET L1.5; DETAIL 2, SHEET L2.2; AND SHEET L2.4.
- TRANSPLANT EXISTING PLANTS IDENTIFIED TO BE TRANSPLANTED TO NEW LOCATIONS, RELOCATE PLANTERS THAT ARE IDENTIFIED TO BE RELOCATED, AS SHOWN ON SHEETS L1.4, L1.5, AND L2.4.
- COMPLETE INSTALLATION OF IRRIGATION AS SHOWN ON SHEET L3.1.

BID ALTERNATE B3:
- PROVIDE AND APPLY PAINTED PATTERN TO ASPHALT AS SHOWN ON SHEETS L1.2 AND L1.3 AND DETAIL 3, SHEET L2.2.

BID ALTERNATE B4:
- PROVIDE AND INSTALL ARTIFICIAL TURF AS SHOWN ON SHEETS L1.2 AND L1.3, AND DETAILS 2 AND 3, SHEET L2.1.

BID ALTERNATE B5:
- PROVIDE AND INSTALL ACRYLIC PRIVACY SCREENS AS SHOWN ON SHEET L1.2 AND DETAILS 5 AND 6, SHEET L2.1.

BID ALTERNATE B6:
- PROVIDE AND INSTALL 5 FREESTANDING PERGOLAS WITH SUNSHADE FABRIC AS SHOWN ON SHEET A1.02, L1.2, L1.3, AND DETAIL 4, SHEET L2.1.

BID ALTERNATE B7:
- PROVIDE AND INSTALL 2 WEATHERPROOF FREESTANDING PERGOLAS AS SHOWN ON SHEETS A1.02, A2.01, A2.02, A8.02, L1.2 AND L1.3.

UNIT RATE U1:
- PROVIDE AND PAINT EXTERIOR SURFACES OF PALLET SHELTERS WITH URETHANE PAINT AT LOCATIONS APPROVED BY THE CITY. PREPARE SURFACES AND INSTALL BASE COAT AND MINIMUM 2 TOP COATS PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
- PAINT: SHERWIN WILLIAMS EMERALD URETHANE TRIM ENAMEL, SEMI-GLOSS ULTRADEEP BASE, OR APPROVED EQUIVALENT
- COLORS: UP TO 6 COLORS, APPROVED BY THE CITY.

3 G0.00 PROJECT DESCRIPTION
SCALE: N/A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2 G0.00 PROJECT TEAM
SCALE: N/A


**GENERAL**

| | |
|---|---|
| G0.00 | COVER SHEET |

**CIVIL**

| | |
|---|---|
| C1.0 | NOTES, LEGEND, & ABBREVIATIONS |
| C2.0 | IMPROVEMENT PLAN |
| C2.1 | IMPROVEMENT PLAN |
| C3.0 | ASPHALT PLAN |
| C3.1 | ASPHALT PLAN |
| C4.0 | GRADING AND DRAINAGE |
| C4.1 | GRADING AND DRAINAGE |
| C5.0 | UTILITY PLAN |
| C5.1 | UTILITY PLAN |
| C6.0 | CONSTRUCTION DETAILS |
| C7.0 | EROSION CONTROL PLAN |

**LANDSCAPE & IRRIGATION**

| | |
|---|---|
| L1.1 | LEGEND AND NOTES |
| L1.2 | MATERIALS PLAN |
| L1.3 | LAYOUT PLAN |
| L1.4 | PLANTING PLAN |
| L1.5 | PLANTING SCHEDULE AND NOTES |
| L2.1 | LANDSCAPE DETAILS - 1 |
| L2.2 | LANDSCAPE DETAILS - 2 |
| L2.3 | SITE FURNISHING DETAILS |
| L2.4 | PLANTING DETAILS |
| L3.1 | IRRIGATION PLAN |
| L3.2 | IRRIGATION PLAN |

**ARCHITECTURAL**

| | |
|---|---|
| A0.00 | ARCHITECTURAL ABBREVIATIONS, SYMBOLS |
| A1.01 | DEMO SITE PLAN |
| A1.02 | SITE PLAN |
| A2.01 | CEDAR ST PERGOLA - PLAN, SECTION, ELEVATIONS |
| A2.02 | VIRGINIA ST PERGOLA - PLAN, SECTION, ELEVATIONS |
| A8.01 | SITE DETAILS |
| A8.02 | PERGOLA DETAILS |

**EMERGENCY SHELTER SHOP DRAWINGS**

| | |
|---|---|
| SH2.01A | 64SF SHELTER PLAN |
| SH2.02A | 64SF SHELTER BOTTOM VIEW |
| SH3.01A | 64SF SHELTER FRONT ELEVATION |
| SH3.02A | 64SF SHELTER SIDE ELEVATION |
| SH3.03A | 64SF SHELTER BACK ELEVATION |
| SH8.01A | 64SF SHELTER STRUCTURAL CALCULATIONS |
| SH8.02A | 64SF SHELTER STRUCTURAL CALCULATIONS |
| SH2.01B | 100SF SHELTER PLAN |
| SH3.01B | 100SF SHELTER FRONT ELEVATION |
| SH3.02B | 100SF SHELTER SIDE ELEVATION |
| SH3.03B | 100SF SHELTER BACK ELEVATION |
| SH8.01B | 100SF SHELTER STRUCTURAL CALCULATIONS |
| SH8.02B | 100SF SHELTER STRUCTURAL CALCULATIONS |
| SH8.01C | TIEDOWN ANCHOR TEST REPORT |

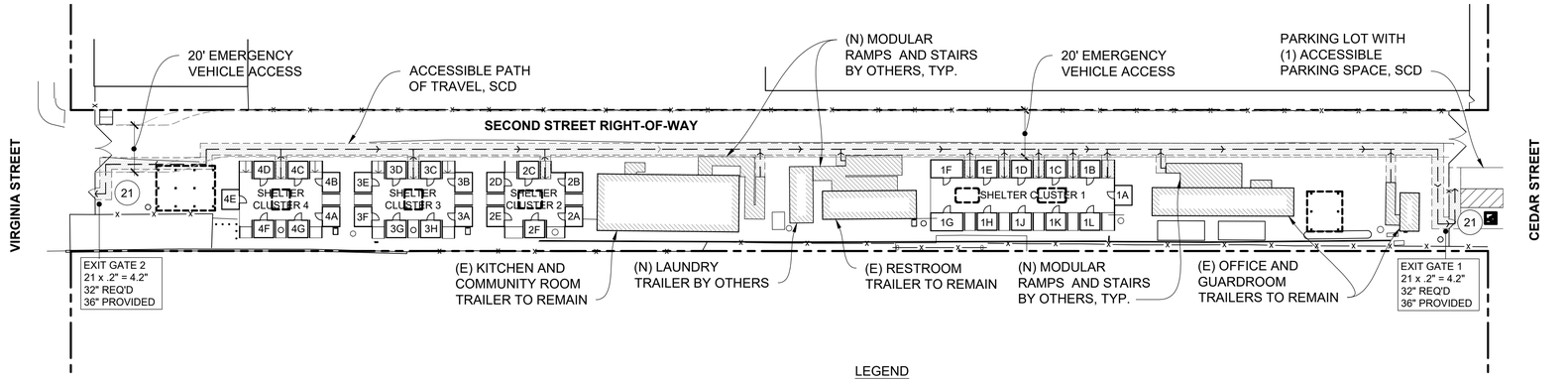
**ELECTRICAL**

| | |
|---|---|
| E0.1 | ELECTRICAL ABBREVIATIONS, SYMBOLS |
| E0.2 | TITLE 24 COMPLIANCE FORMS & SCHEDULES - POWER |
| E1.0 | OVERALL SITE PLAN - POWER |
| ED2.0 | ENLARGED DEMOLITION SITE PLANS - POWER |
| E2.0 | ENLARGED SITE PLANS - POWER |
| E3.0 | SPECIFICATIONS - ELECTRICAL |
| E3.1 | SPECIFICATIONS - ELECTRICAL |

**FIRE PROTECTION**

| | |
|---|---|
| FP0.1 | GENERAL NOTES, SYMBOL LIST & SHEET INDEX |
| FP1.01 | SITE PLAN - FIRE PROTECTION |
| FP2.01 | ENLARGED PLANS - TYPICAL UNITS A,B,C,&H |
| FP2.02 | ENLARGED PLANS - TYPICAL UNITS D,E,F,&G |
| FP2.03 | ENLARGED PLANS - TYPICAL 100 SQFT UNITS |
| FP6.01 | DETAILS - FIRE PROTECTION |
| FP8.01 | SPECIFICATIONS - FIRE PROTECTION |
| FP8.02 | SPECIFICATIONS - FIRE PROTECTION |
| FP8.03 | SPECIFICATIONS - FIRE PROTECTION |
| FP8.04 | SPECIFICATIONS - FIRE PROTECTION |


1 G0.00 SHEET INDEX
SCALE: N/A




6 G0.00 SITE MAP
SCALE: 1/32" = 1'-0"

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

1601 SECOND STREET, BERKELEY, CA 94710

APN #: 57-2112-5


Design Firm:
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www.siegelstrain.com

Consultant:


LICENSED ARCHITECT
MARJORIE SMITH
C 29241
08-31-25
STATE OF CALIFORNIA

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |
| | 10/9/23 | BID SET |
| | 02/12/24 | BID SET |

Issue Note:
PERMIT SET
09/21/22

| | |
|---|---|
| Project ID: | BSC |
| File Name: | |
| Drawn By: | HL |
| Review By: | MS |
| Plot Date: | |

Sheet Title:
COVER SHEET

Sheet No.:
G0.00

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# GENERAL NOTES

1. WORK SHOWN HEREON SHALL BE DONE IN ACCORDANCE WITH THE **CITY** OF BERKELEY STANDARD CONSTRUCTION PLANS AND SPECIFICATIONS, LATEST EDITION, THE STANDARD SPECIFICATIONS FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION, AND UTILITY COMPANY'S STANDARD PLANS AND SPECIFICATIONS AS APPLICABLE, LATEST EDITION.
2. THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY, AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR FURTHER AGREES TO HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL.
3. CONTRACTOR SHALL HOLD HARMLESS THE **CITY** AND ITS AUTHORIZED REPRESENTATIVES FROM ALL LIABILITIES AND DAMAGES RESULTING FROM HIS CONSTRUCTION OPERATIONS.
4. PRIOR TO COMMENCING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL VERIFY ALL INTERFACES BETWEEN EXISTING CONDITIONS AND NEW CONSTRUCTION FOR GRADING, DRAINAGE, UNDERGROUND, AND OVERHEAD FACILITIES, INCLUDING LOCATION AND ELEVATION OF EXISTING UNDERGROUND OR AT GRADE FACILITIES AT CROSSINGS WITH PROPOSED UNDERGROUND FACILITIES. IF CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND SHALL NOT BEGIN CONSTRUCTION OPERATIONS UNTIL THE CHANGED CONDITIONS HAVE BEEN EVALUATED.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REVIEW AND COORDINATION OF ALL CONTRACT DOCUMENTS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES THAT OCCUR SHALL BE BROUGHT TO THE ATTENTION OF THE **CITY** PRIOR TO THE START OF CONSTRUCTION SO THAT A CLARIFICATION CAN BE ISSUED. ANY WORK PERFORMED IN CONFLICT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT THEIR OWN EXPENSE.
6. THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.
7. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE GIVEN, CONSTRUCTION SHALL BE AS SHOWN FOR SIMILAR WORK.
8. ALL EASEMENTS OR OTHER ENCUMBRANCES SHOWN OR REFERENCED IN THESE PLANS OR DISCLOSED IN THE TITLE REPORT ARE SUBJECT TO INHERENT OR EXPLICIT RESTRICTIONS. THE OWNER IS RESPONSIBLE FOR DETERMINING THE IMPACT OF THESE RESTRICTIONS ON HIS OR HER INTENT FOR THE PROPERTY.
9. CONSTRUCTION STAKING FOR IMPROVEMENTS SHOWN ON THESE PLANS SHALL BE PERFORMED BY A LICENSED LAND SURVEYOR.
10. THE CONTRACTOR SHALL REPAIR OR REPLACE ALL EXISTING UNDERGROUND, AT-GRADE OR OVERHEAD IMPROVEMENTS DAMAGED DURING CONSTRUCTION TO THE SATISFACTION OF THE **CITY**, INCLUDING PERMANENT TRENCH RESURFACING.
11. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS INCLUDING ENCROACHMENT PERMIT FROM THE **CITY** PRIOR TO ANY WORK IN THE PUBLIC RIGHT-OF-WAY.
12. TRAFFIC CONTROL SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST "MANUAL OF TRAFFIC CONTROLS" PUBLISHED BY THE CALIFORNIA DEPARTMENT OF TRANSPORTATION. THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE **CITY** FOR APPROVAL PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OPERATIONS.
13. CONTRACTOR TO BE AWARE OF AND PROTECT ALL OVERHEAD LINES AT ALL TIMES, SO AS NOT TO DISTURB THEM.
14. WATER SHALL BE PROVIDED ONSITE BY THE CONTRACTOR AND USED TO CONTROL DUST DURING CONSTRUCTION OPERATIONS.
15. OUTDOOR NOISE-GENERATING CONSTRUCTION ACTIVITIES (INCLUDING BUT NOT LIMITED TO RAPID IMPACT COMPACTION (RIC) GRADING, TRENCHING, CONCRETE PLACEMENT, SAWING AND HAMMERING) SHALL BE LIMITED TO THE HOURS BETWEEN 7AM. AND 5PM, MONDAY THROUGH FRIDAY. FOR QUESTIONS REGARDING CONSTRUCTION HOURS AND/OR RELATED NOISE, PLEASE CONTACT _____.
16. CONTRACTOR SHALL COMPLY FULLY WITH THE REQUIREMENTS OF ASSEMBLY BILL 2040, DAVIS, ASBESTOS.
17. IF SIGNIFICANT CULTURAL MATERIALS ARE EXPOSED OR DISCOVERED DURING EITHER SITE CLEARING OR SUBSURFACE CONSTRUCTION, ALL OPERATIONS SHOULD STOP WITHIN 25 FEET OF THE FIND AND A QUALIFIED PROFESSIONAL ARCHAEOLOGIST CONTACTED FOR FURTHER REVIEW AND RECOMMENDATIONS. POTENTIAL RECOMMENDATIONS COULD INCLUDE EVALUATION, COLLECTION, RECORDATION, ANALYSIS, ETC. OF ANY SIGNIFICANT CULTURAL MATERIALS FOLLOWED BY PREPARATION OF A PROFESSIONAL REPORT. THE CONTRACTOR SHALL NOTIFY THE **CITY** AND THE OTHER GOVERNING JURISDICTION OF ANY DISCOVERIES.
18. SIGNIFICANT PREHISTORIC CULTURAL RESOURCES ARE DEFINED AS HUMAN BURIALS, FEATURES OR OTHER CLUSTERING OF FINDS MADE, MODIFIED OR USED BY NATIVE AMERICAN PEOPLES IN THE PAST. THE PREHISTORIC AND PROTOHISTORIC INDICATORS OF PRIOR CULTURAL OCCUPATION BY NATIVE AMERICANS INCLUDE ARTIFACTS AND HUMAN BONE, AS WELL AS SOIL DISCOLORATION, SHELL, ANIMAL BONE, SANDSTONE COBBLES, ASHY AREAS, AND BAKED OR VITRIFIED CLAYS.
19. IF, AT ANY TIME DURING GRADING OPERATIONS, ANY UNFAVORABLE GEOLOGICAL CONDITIONS ARE ENCOUNTERED, GRADING IN THAT AREA WILL STOP UNTIL APPROVED CORRECTIVE MEASURES ARE OBTAINED.
20. ALL DEBRIS, EXCESS, AND FOREIGN MATERIAL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT APPROVED DISPOSAL SITES AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL OBTAIN NECESSARY PERMITS FOR THE TRANSPORTATION OF MATERIAL TO AND FROM THE SITE.
21. ALL FILL SOILS OR SOILS DISTURBED OR OVER-EXCAVATED DURING CONSTRUCTION SHALL BE COMPACTED PER THE REQUIREMENTS OF THE SOIL REPORT BUT NOT LESS THAN 90% MAXIMUM DENSITY AS DETERMINED BY A.S.T.M. SOIL COMPACTION TEST D-1557.
22. THE PROPOSED GRADE AS SHOWN IN THE DRAWINGS IS THE FINISH GRADE AND NOT THE ROUGH GRADE. THE CONTRACTOR SHALL BE RESPONSIBLE TO ACCOMMODATE FOR THE THICKNESS OF THE TOP SECTIONS (ROADWAY, CONCRETE, TOPSOIL, ETC.) TO ARRIVE AT THE ROUGH GRADE ELEVATION. THE CONTRACTOR IS RESPONSIBLE FOR ANY ADDITIONAL ADJUSTMENTS TO ACCOMMODATE TRENCH OR FOUNDATION SPOILS, OR ITEMS AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
23. STRAIGHT GRADE SHALL BE MAINTAINED BETWEEN CONTOUR LINES AND SPOT ELEVATIONS UNLESS OTHERWISE SHOWN ON THE PLANS.
24. ALL RAMPS AND OTHER ACCESSIBILITY ACCOMMODATIONS ARE INTENDED TO COMPLY WITH THE CURRENT STANDARDS UNDER THE AMERICANS WITH DISABILITIES ACT. THE CONTRACTOR SHALL NOTIFY THE CIVIL ENGINEER IF ANY PROPOSED IMPROVEMENTS ARE NOT CONSISTENT WITH THE STANDARDS.
25. ALL STREETS SHALL BE SWEPT AND KEPT CLEAN AT THE END OF EACH DAY AND SHALL COMPLY WITH ALL APPLICABLE RWQCB REQUIREMENTS FOR THE DURATION OF THE PROJECT WORK.
26. CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS, INCLUDING NPDES, FROM THE APPROPRIATE JURISDICTIONAL AGENCIES FOR DISCHARGE OF GROUNDWATER THAT MAY BE NECESSARY TO ACCOMPLISH WORK SHOWN ON THESE PLANS.
27. THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT (800-227-2600) A MINIMUM OF 48 HOURS PRIOR TO EXCAVATION.
28. THE CONTRACTOR SHALL OBTAIN AN O.S.H.A. PERMIT FROM THE CALIFORNIA DIVISION OF INDUSTRIAL SAFETY PRIOR TO THE CONSTRUCTION OF TRENCHES OR EXCAVATIONS WHICH ARE 5' OR DEEPER. ALL TRENCHES 5' IN DEPTH OR GREATER SHALL BE SHORED AND BRACED ACCORDING TO STATE LAW.
29. UTILITIES AS SHOWN CONFORM TO AVAILABLE RECORD DATA. THE EXISTENCE, LOCATION AND CHARACTERISTICS OF UNDERGROUND UTILITY INFORMATION SHOWN ON THESE PLANS HAVE BEEN OBTAINED FROM A REVIEW OF AVAILABLE RECORD DATA. NO REPRESENTATION IS MADE AS TO THE ACCURACY OR COMPLETENESS OF SAID UTILITY INFORMATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY LOCATION AND DEPTHS BY POTHOLING OF ALL UTILITIES WITH APPROPRIATE AGENCIES, AND TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. ANY CONFLICTS SHALL BE REPORTED IMMEDIATELY TO THE AGENCY AND TO THE CIVIL ENGINEER.
30. IT SHALL BE THE PAVING CONTRACTOR'S RESPONSIBILITY TO RESTORE STREET AND SIDEWALK SUBGRADES DISTURBED DURING UNDERGROUND UTILITY CONSTRUCTION. ALL EXISTING STREET IMPROVEMENTS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED IN CONFORMANCE WITH **CITY** OF BERKELEY STANDARD CONSTRUCTION PLANS AND SPECIFICATIONS AND TO THE SATISFACTION OF THE **CITY** ENGINEER, AND SHALL MEET ANY ADDITIONAL REQUIREMENTS OF THE ENCROACHMENT PERMIT.
31. TRENCHES CUT THROUGH THE PAVEMENT OF PUBLIC STREETS SHALL BE FULLY REPLACED TO THE SATISFACTION OF THE **CITY** ENGINEER. THE LIMITS AND DETAILS OF THE TRENCH RESTORATION SHALL BE OUTLINED ON THE IMPROVEMENT PLANS. ANY STREET TRENCH CUT MORATORIUM ALREADY ESTABLISHED OR ESTABLISHED PRIOR TO COMMENCEMENT OF TRENCHING SHALL BE OBSERVED. THE **CITY** ENGINEER RETAINS THE RIGHT TO REQUIRE STREET REPAIR THAT INCLUDES THE GRINDING AND OVERLAY OF EXISTING PAVEMENT FOR THE FULL STREET WIDTH WITHIN THE VICINITY OF ANY TRENCHING IN ORDER TO MAINTAIN PAVEMENT INTEGRITY.
32. DIMENSIONS TO PIPELINES ARE TO CENTERLINE UNLESS OTHERWISE NOTED.
33. ALL WATER LINES SHALL BE INSTALLED WITH 36" MINIMUM COVER FROM TOP OF PIPE TO FINISHED GRADE, UNLESS OTHERWISE NOTED.
34. THRUST BLOCKS SHALL BE INSTALLED AT WATERLINE HORIZONTAL AND VERTICAL BENDS, TEES, CAPPED ENDS AND REDUCERS ACCORDING TO THE DETAILS PROVIDED ON THESE PLANS.
35. ALL METAL PIPES AND PIPE FITTINGS (E.G., VALVES, BOLTS, FLANGE JOINTS, JOINT HARNESSES, FLEXIBLE COUPLINGS, ETC.) SHALL BE PROTECTED AGAINST CORROSION.
36. MANHOLE FRAMES AND COVERS AND ALL OTHER UTILITY FRAMES AND COVERS LOCATED WITHIN PAVED AREAS SHALL BE BROUGHT TO FINISH GRADE AFTER PAVING. RIM GRADES, WHERE SHOWN, ARE APPROXIMATE. CONTRACTOR TO ADJUST RIM GRADE TO CONFORM WITH INSTALLED PAVING.
37. PIPE SLOPES AND DISTANCES SHOWN ON PLANS ARE FROM THE CENTER OF STRUCTURE TO CENTER OF STRUCTURE.
38. CONTRACTOR SHALL NOTIFY ENGINEER 48 HOURS PRIOR TO ANY NEED FOR FORMWORK REVIEW AND APPROVAL.
39. ASPHALT PAVEMENT SHALL BE CONSTRUCTED IN AT LEAST TWO LIFTS, AND THE SECOND LIFT SHALL BE A MINIMUM OF 2 INCHES AND SHALL BE PLACED ONLY AFTER THE CONSTRUCTION OF SITE IMPROVEMENTS AND BUILDING CONSTRUCTION HAVE BEEN SUBSTANTIALLY COMPLETED. THE FINAL PAVEMENT SURFACE SHALL BE FREE OF GOUGES, PATCHES, OR OTHER DEFECTS TO THE SATISFACTION OF THE ENGINEER PRIOR TO ACCEPTANCE OF SITE IMPROVEMENTS.
40. A.C. STREET AND DRIVEWAY STRUCTURAL SECTIONS ARE APPROXIMATE ONLY. EXACT SECTIONS WILL BE DETERMINED SUBSEQUENT TO ROUGH GRADING AND WILL BE BASED ON THE R-VALUE AS DETERMINED BY THE GEOTECHNICAL ENGINEER AND A.T.I. AS INDICATED ON TYPICAL SECTIONS. CONTRACTOR SHALL ALLOW TIME AFTER SUBGRADE IS EXPOSED FOR SAMPLES TO BE TAKEN AND AN R-VALUE TEST TO BE PERFORMED PRIOR TO FINAL SUBGRADE PREPARATION AND PAVEMENT SECTION CONSTRUCTION.
41. THE LOCATION OF SYMBOLS SHOWN ON THE DRAWINGS MAY NOT REPRESENT THE PRECISE LOCATION OF THE PROPOSED IMPROVEMENT. IF THE SYMBOL IS NOT ACCOMPANIED BY DIMENSIONS TO LOCATE THE PRECISE LOCATION OF THE PROPOSED IMPROVEMENT, REFER TO STANDARD DETAILS SHOWN WITHIN THE DRAWINGS OR APPROPRIATE AGENCY STANDARD DETAILS. NOTIFY THE ENGINEER.

# ABBREVIATIONS

| | | | |
|---|---|---|---|
| AB | AGGREGATE BASE | JT | JOINT TRENCH |
| AC | ASPHALT CONCRETE | LF | LINEAR FEET |
| BFP | BACKFLOW PREVENTER | NTS | NOT TO SCALE |
| CP | CONTROL POINT | PR | PROPOSED |
| DL | DAYLIGHT | RW | RIGHT OF WAY |
| DIP | DUCTILE IRON PIPE | SF | SQUARE FEET |
| EG | EXISTING GRADE | SW | SIDEWALK |
| EL | ELEVATION | TYP | TYPICAL |
| EP | EDGE OF PAVEMENT | UNO | UNLESS NOTED OTHERWISE |
| EX | EXISTING | VC | VERTICAL CURVE |
| FG | FINISH GRADE | VIF | VERIFY IN FIELD |
| FH | FIRE HYDRANT | WSP | WELDED STEEL PIPE |
| FL | FLOWLINE | | |
| FS | FINISH SURFACE | | |
| GB | GRADE BREAK | | |

# HATCHES

- PROTECT IN PLACE EX. ASPHALT PAVEMENT, TO REMAIN.
- GRIND AND OVERLAY. SEE SECTIONS ON SHEET C2.1
- ADA ACCESSIBLE PATHWAY WITH ACCESSIBLE STRIPING. 5% MAX RUNNING SLOPE AND 2% MAX CROSS SLOPE. SEE STRIPING ON DETAIL 2, SHEET C3.0
- NEW PREFABRICATED RAMP
- JOINT TRENCH. SEE CITY OF BERKELEY STD PLANS 8136

# SYMBOLS

| EXISTING | | PROPOSED |
|---|---|---|
| ● | BOLLARD | N/A |
| | SIGN | N/A |
| | LIGHT - POST MOUNTED | N/A |
| JP | JOINT POLE | N/A |
| SS | SANITARY SEWER - MANHOLE | N/A |
| | STORM DRAINAGE - TURNING STRUCTURE | N/A |
| SD | STORM DRAINAGE - MANHOLE | N/A |
| UTIL | VAULT - UTILITY | N/A |
| | FIRE DEPARTMENT CONNECTION | |
| | FIRE HYDRANT | N/A |
| WM | WATER METER | N/A |
| WV | WATER VALVE | WV |

# LINETYPES

| EXISTING | | PROPOSED |
|---|---|---|
| | RIGHT-OF-WAY | N/A |
| E | ELECTRICAL LINE | E |
| x x x x x | FENCE | N/A |
| F | FIRE WATER | F |
| G | GAS LINE | N/A |
| N/A | GRADEBREAK | |
| N/A | LIMITS OF CONSTRUCTION | |
| OH OH | OVERHEAD UTILITY | N/A |
| SS | SANITARY SEWER | N/A |
| SD | STORM DRAIN | N/A |
| W | WATER | N/A |
| N/A | WOOD HEADER | |

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No. 67892
CIVIL
STATE OF CALIFORNIA

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|---|---|---|
| | 01/17/23 | COMMENT RESPONSE 1 |
| | 04/21/23 | BID SET |
| | 11/06/23 | REVISED BID SET |

Issue Note:
BID SET

Project ID: BSC
File Name:
Drawn By:
Review By:
Plot Date: 10/10/23

Sheet Title:
NOTES, LEGEND, & ABBREVIATIONS

Sheet No.:
C1.0

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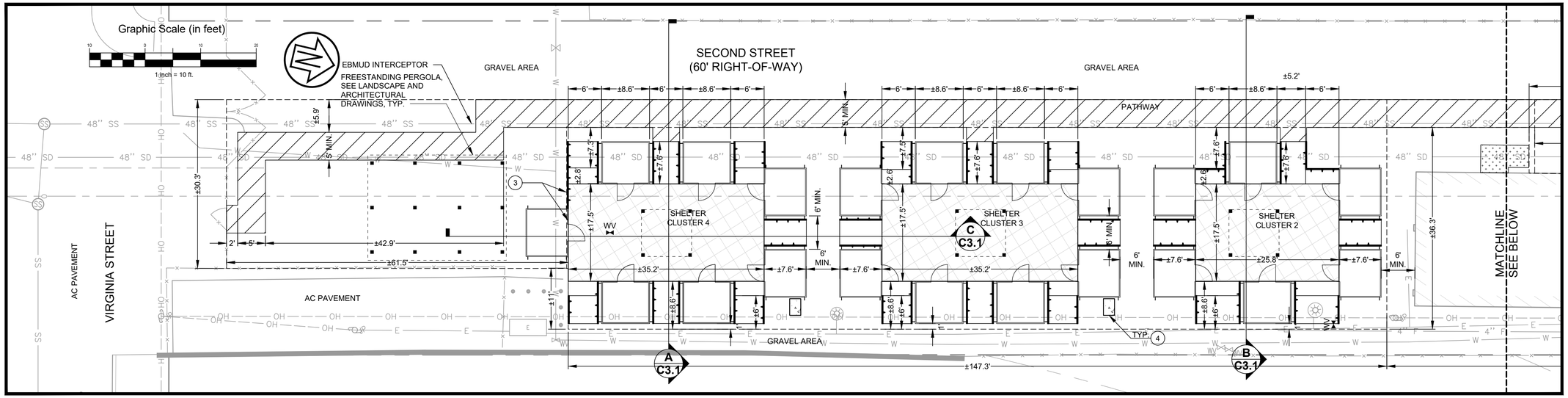
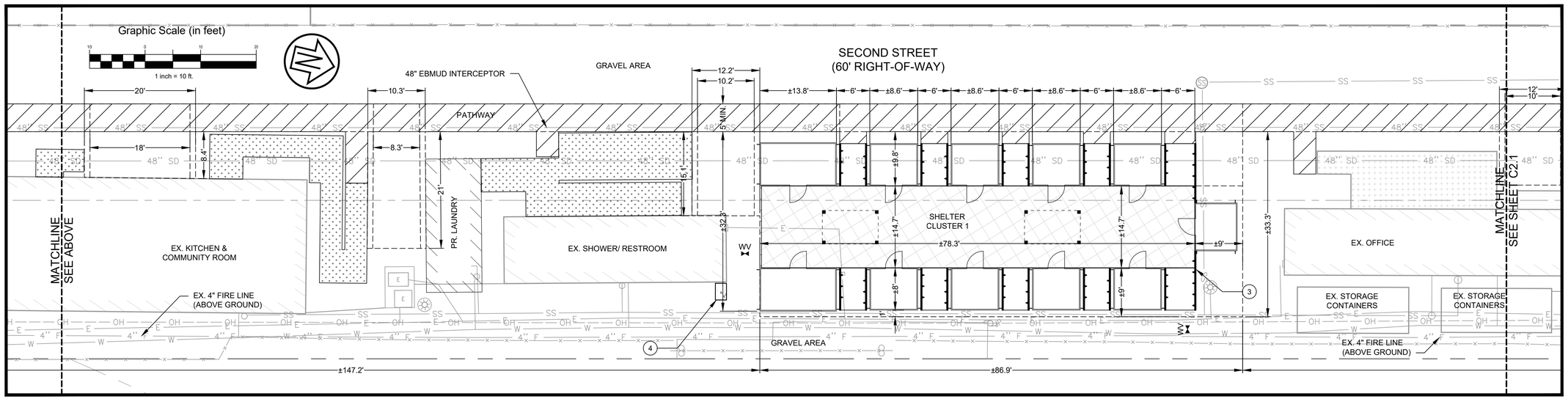



1 **PLAN VIEW- SHELTER CLUSTER 2 TO 4**
SCALE: 1" = 10'




2 **PLAN VIEW- SHELTER CLUSTER 1**
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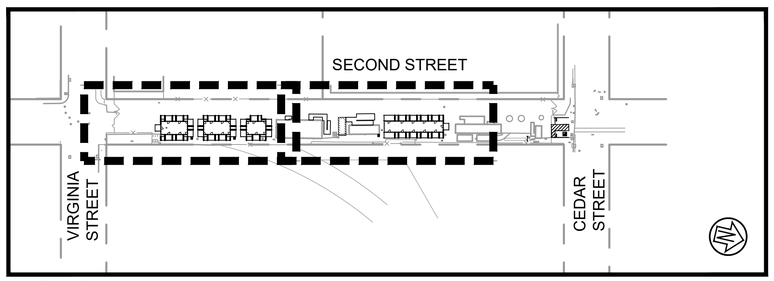


**KEYMAP**
SCALE: 1" = 100'

## KEYNOTES

1. ACCESSIBLE PARKING AREA. SEE DETAIL 2, SHEET C6.0
2. ADJUST EX. UTILITY TO GRADE
3. EDGE TREATMENT. SEE DETAIL 6, SHEET C6.0
4. CONCRETE PAD FOR ELECTRICAL PANEL. SEE ELECTRICAL PLANS.

## NOTES:

1. CONTRACTOR TO VERIFY 48" STORM DRAIN AND INTERCEPTOR PIPE DEPTHS PRIOR TO TRENCHING OR ANCHORING.
2. CONTRACTOR TO LAYOUT ALL SHELTER AND PERGOLA STAKING LOCATIONS AND COORDINATE WITH TRENCHING AND ANCHORING.

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Project ID: BSC
File Name:
Drawn By:
Review By:
Plot Date: 10/10/23

Sheet Title:
IMPROVEMENT PLAN

Sheet No.:
C2.0

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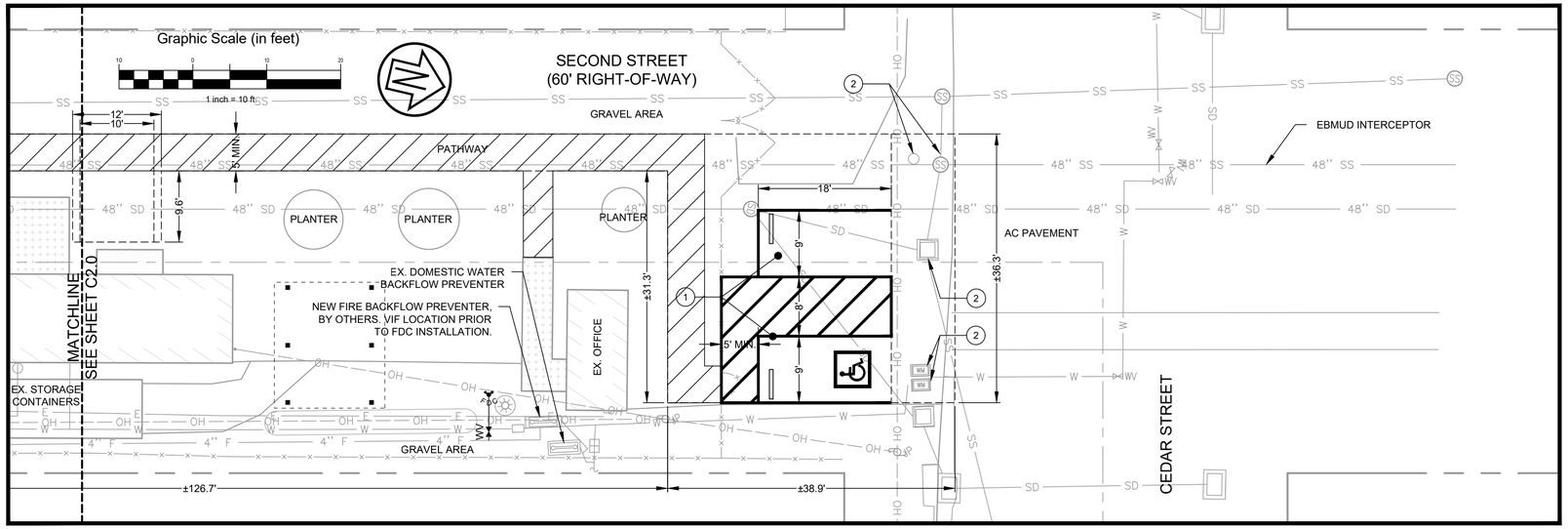
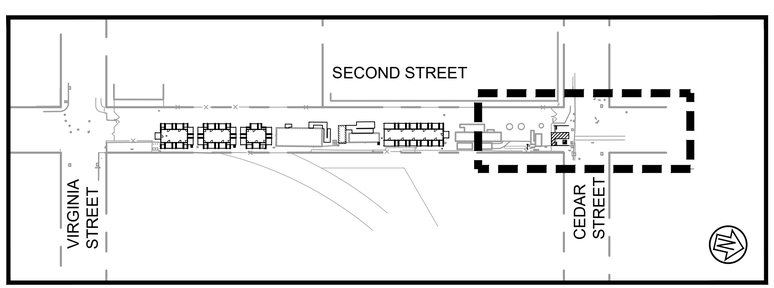



**3 PLAN VIEW- PARKING LOT**
SCALE: 1" = 10'




**KEYMAP**
SCALE: 1" = 100'

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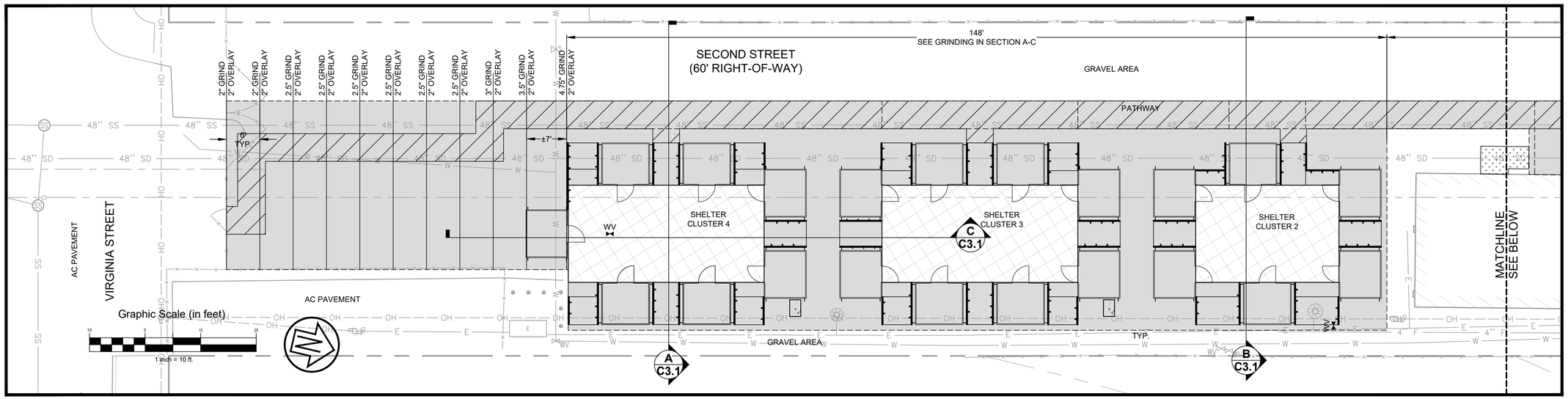
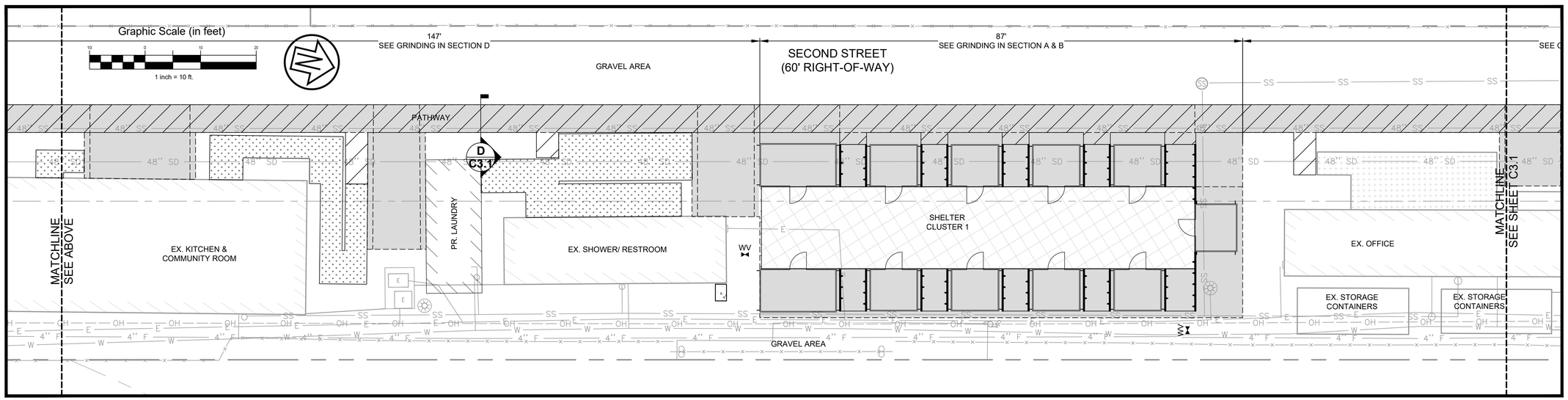



1 **PLAN VIEW- SHELTER CLUSTER 2 TO 4**
SCALE: 1" = 10'




2 **PLAN VIEW- SHELTER CLUSTER 1**
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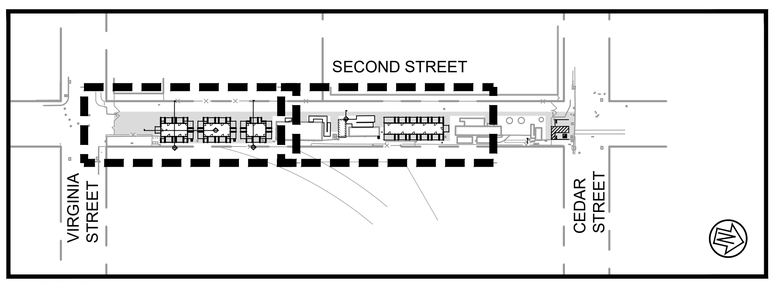


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Plot Date: 10/10/23

Sheet Title:

ASPHALT PLAN

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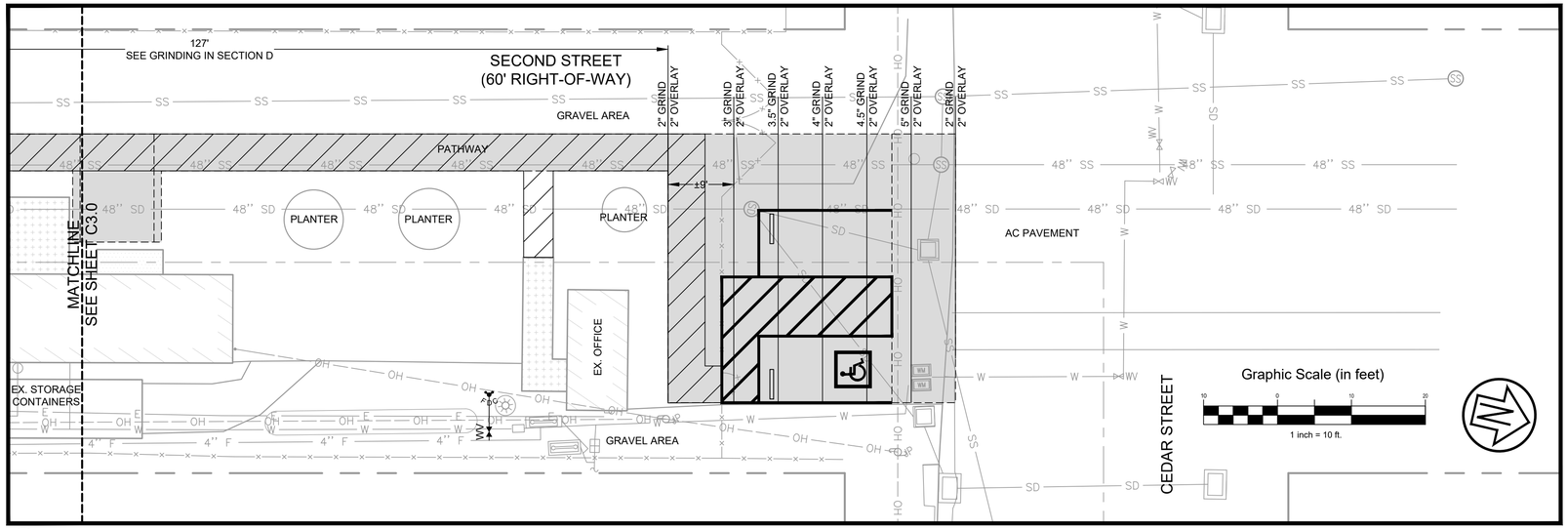
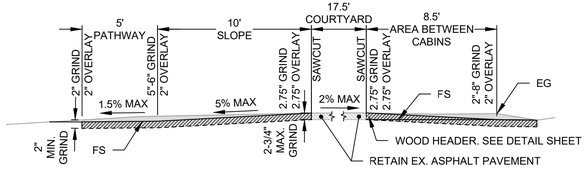



3 **PLAN VIEW- PARKING LOT**
SCALE: 1" = 10'

## SECTION LEGEND

- PROTECT IN PLACE EX. ASPHALT PAVEMENT, TO REMAIN
- GRIND EXISTING ASPHALT
- OVERLAY NEW ASPHALT

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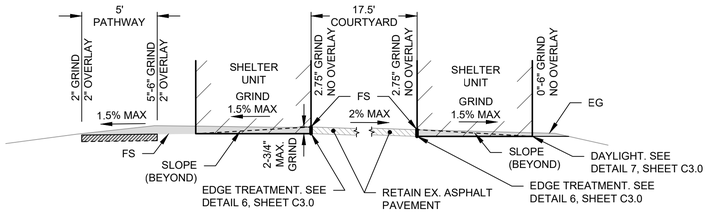


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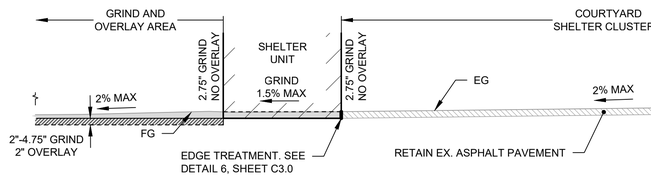


C TYP. HORIZONTAL COURTYARD SECTION
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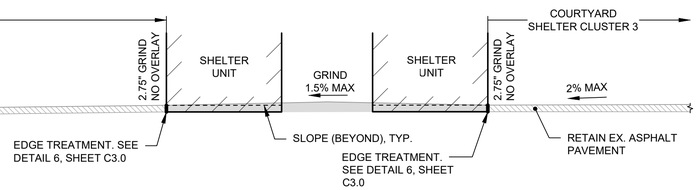
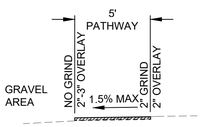
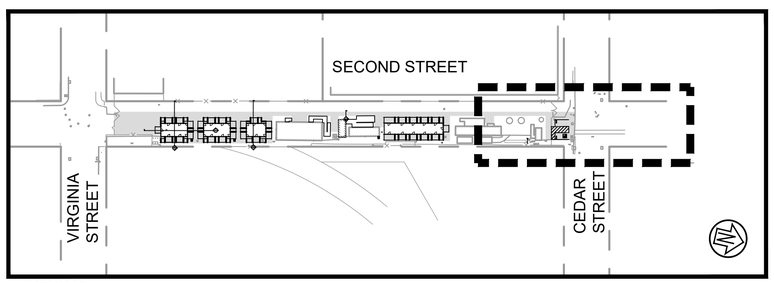



D PATH SECTION
SCALE: NTS




**KEYMAP**
SCALE: 1" = 100'

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Plot Date: 10/10/23

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ASPHALT PLAN

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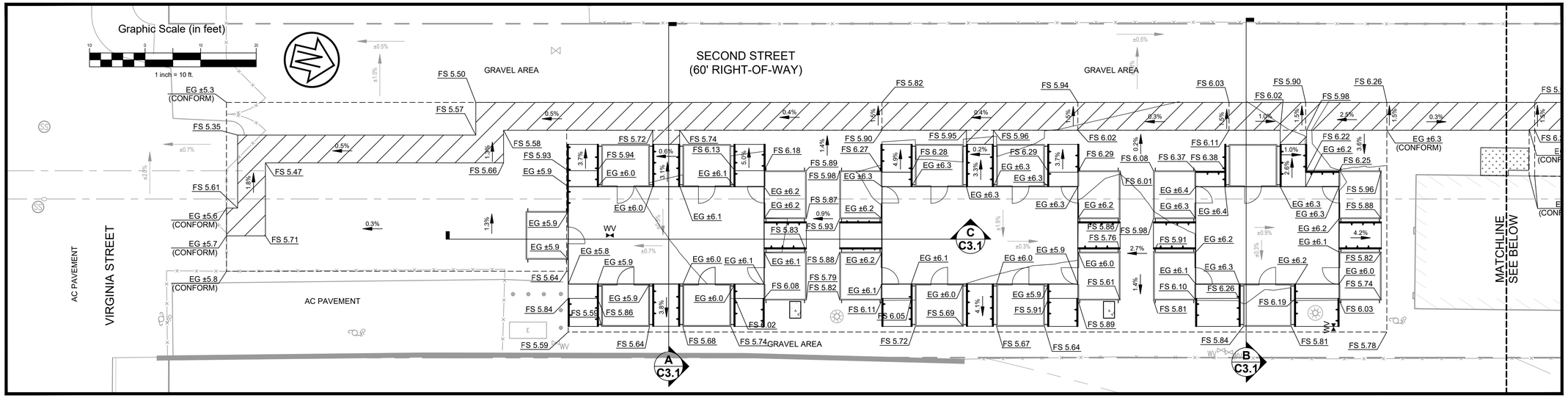
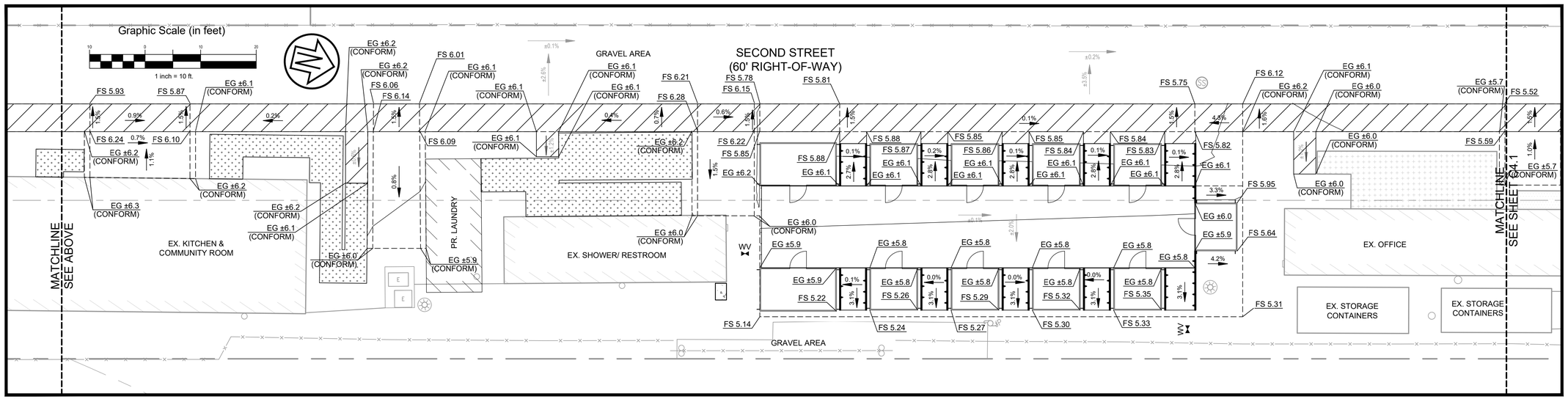
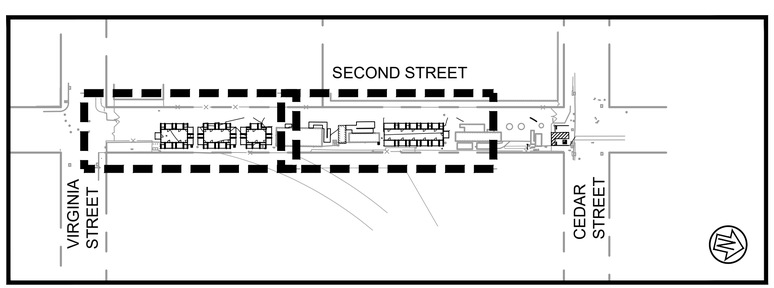



**1 PLAN VIEW- SHELTER CLUSTER 2 TO 4**
SCALE: 1" = 10'




**2 PLAN VIEW- SHELTER CLUSTER 1**
SCALE: 1" = 10'

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Plot Date: 10/10/23

Sheet Title:

GRADING AND DRAINAGE

Sheet No.:

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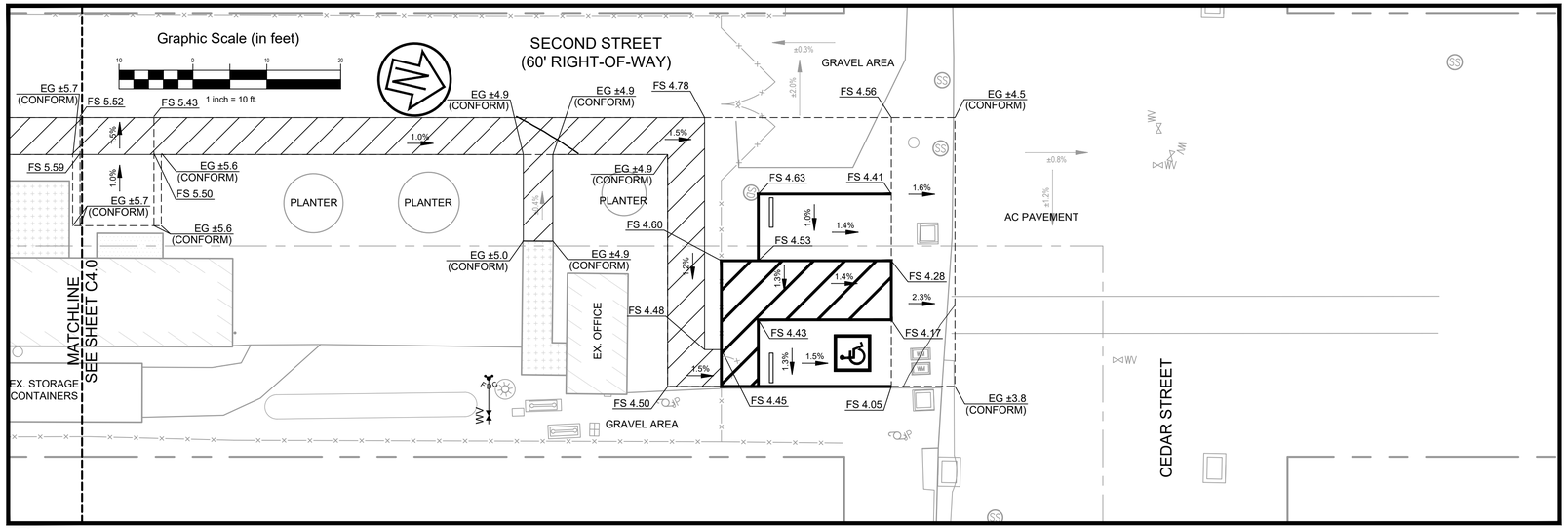
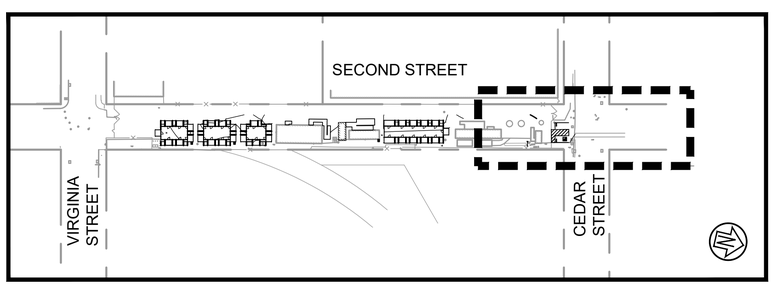



**3 PLAN VIEW- PARKING LOT**
SCALE: 1" = 10'

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REGISTERED PROFESSIONAL ENGINEER
RICHARD J. SOUZA
No. 67892
CIVIL
STATE OF CALIFORNIA

| No. | Date | Issue |
|---|---|---|
| | 04/21/23 | BID SET |
| | 11/06/23 | REVISED BID SET |

Issue Note:

BID SET

Project ID: BSC
File Name:
Drawn By:
Review By:
Plot Date: 10/10/23

Sheet Title:

GRADING AND DRAINAGE

Sheet No.:

C4.1

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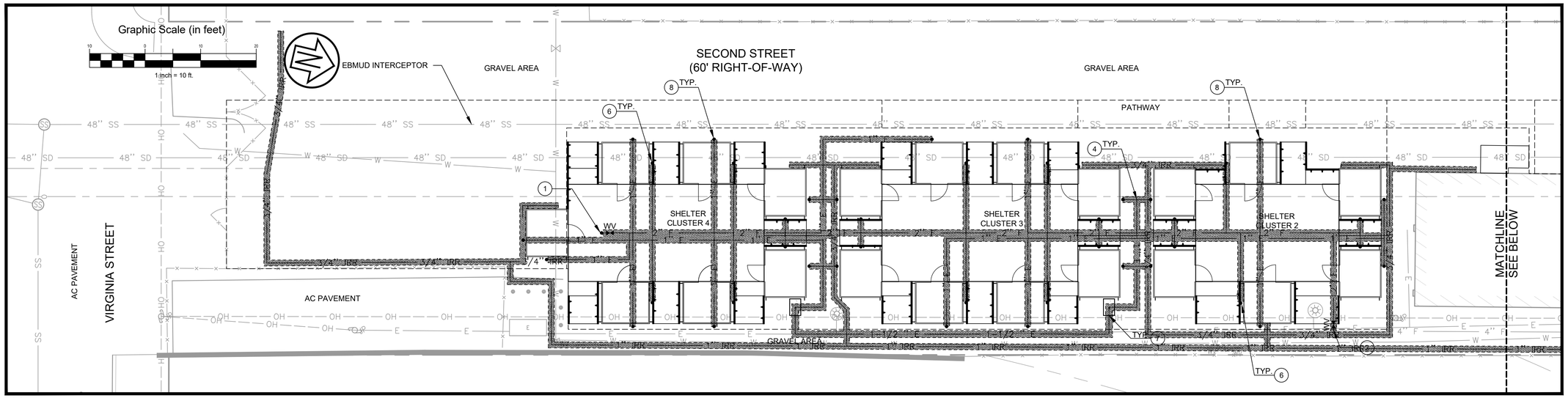
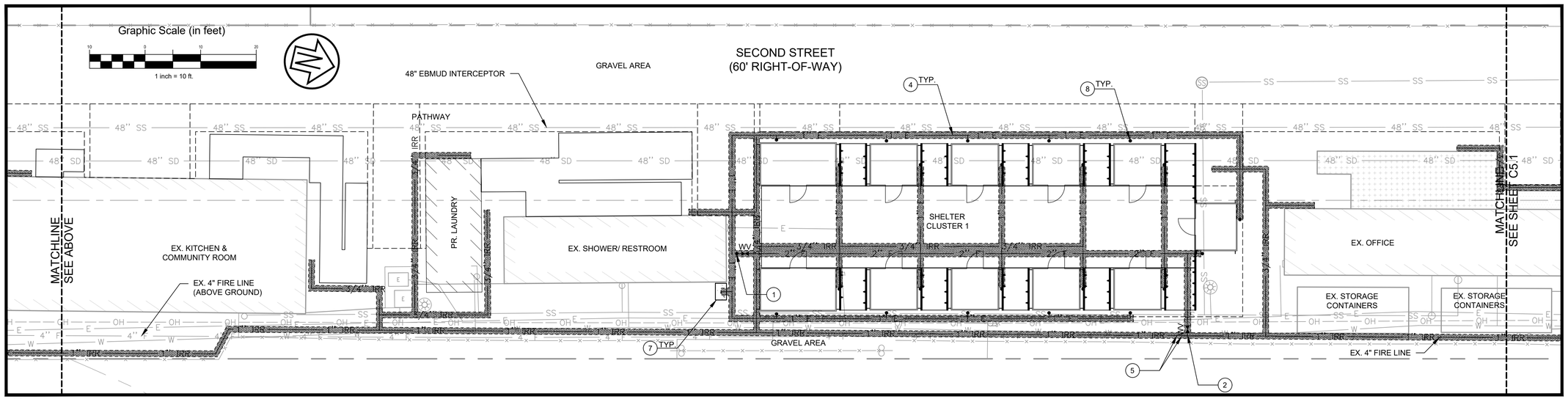
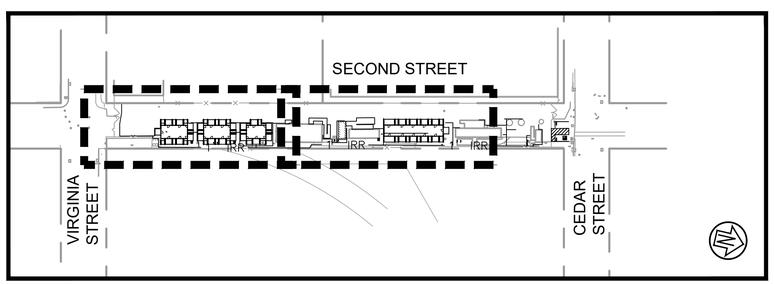



**1 PLAN VIEW- SHELTER CLUSTER 2 TO 4**
SCALE: 1" = 10'




**2 PLAN VIEW- SHELTER CLUSTER 1**
SCALE: 1" = 100'




**KEYMAP**
SCALE: 1" = 100'

## KEYNOTES

1. 2" BLOW-OFF ASSEMBLY. SEE DETAIL 3, SHEET C6.0
2. HOT TAP AND UNDERGROUND 2" LATERAL. SEE DETAIL 4, SHEET C6.0
3. INSTALL FDC. SEE DETAIL 1, SHEET C6.0
4. NEW ELECTRICAL SERVICE. SEE ELECTRICAL PLANS
5. CAP EX. 2" FIRE WATER LATERAL AT ABOVE GROUND WELDED STEEL TEE. CONTRACTOR TO CONFIRM LATERAL SIZE.
6. SPRINKLER RISER PIPE WITH CONTROL VALVE AT EACH SHELTER UNIT, TYP. SEE FIRE SPRINKLER PLANS.
7. CONCRETE PAD FOR ELECTRICAL PANEL. SEE ELECTRICAL PLANS.
8. WALL-MOUNTED JUNCTION BOX. SEE ELECTRICAL PLANS.

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

1601 SECOND STREET
BERKELEY, CA 94710

APN #: 57-2109


Design Firm:

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Plot Date: 10/10/23

Sheet Title:

UTILITY PLAN

Sheet No.:

C5.0

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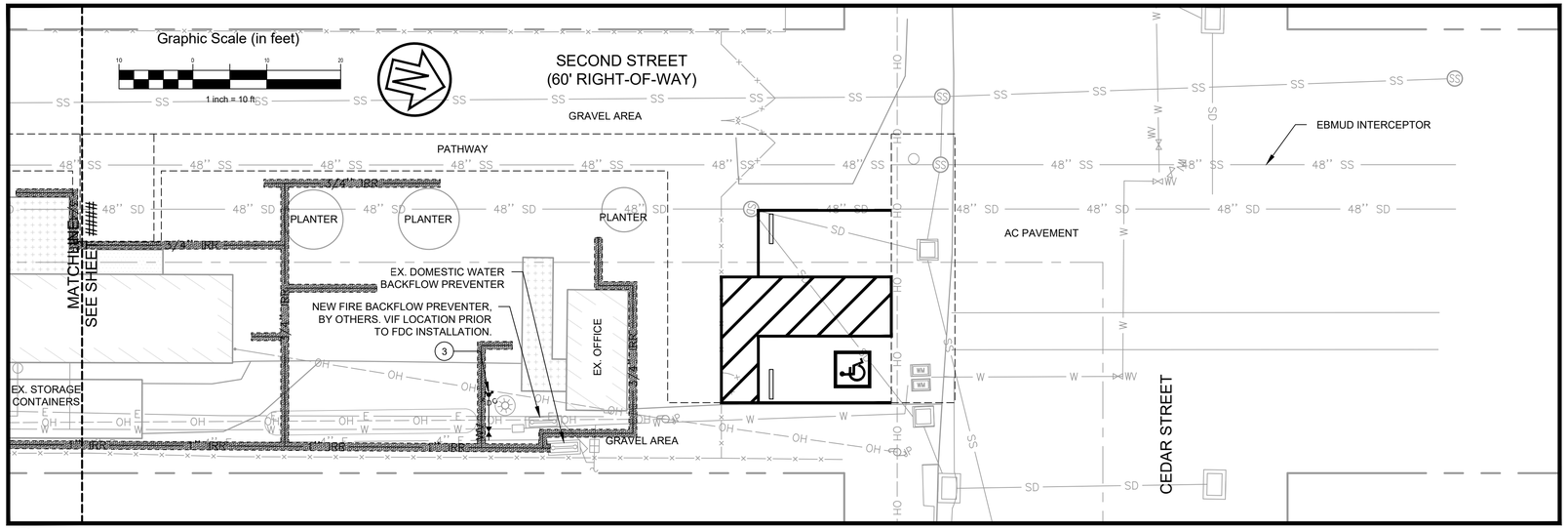
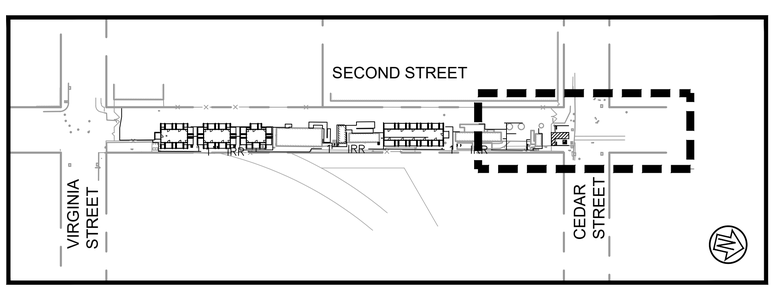



**3 PLAN VIEW- PARKING LOT**
SCALE: 1" = 10'




**KEYMAP**
SCALE: 1" = 100'

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| Review By: | |
| Plot Date: | 10/10/23 |

Sheet Title:
UTILITY PLAN

Sheet No.:
C5.1

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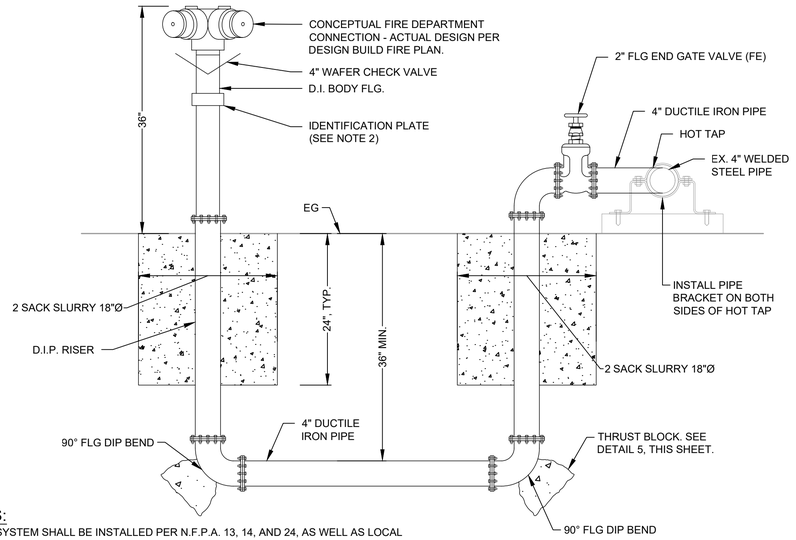
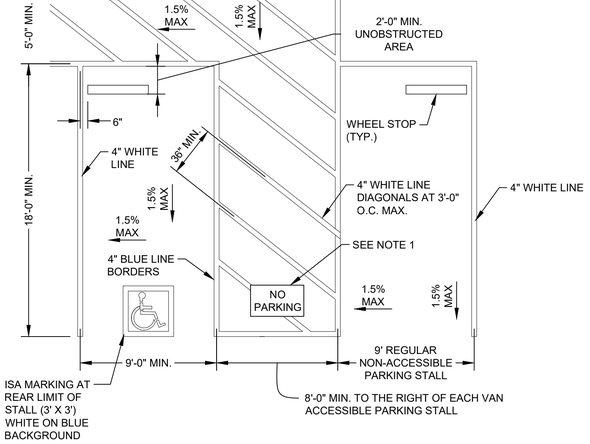



NOTES:

1. THE SYSTEM SHALL BE INSTALLED PER N.F.P.A. 13, 14, AND 24, AS WELL AS LOCAL FIRE DISTRICT STANDARDS.
2. IDENTIFICATION PLATE TO BE PROVIDED PER N.F.P.A. 24, SECTION 5.9.5.3
3. WRAP BURIED DIP WITH 2-LAYERS OF PIPE WRAP

## 1 FIRE DEPARTMENT CONNECTION (FDC) ASSEMBLY
SCALE: NTS



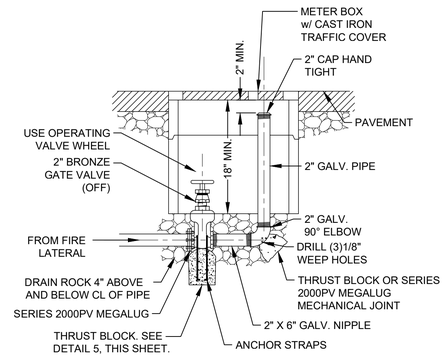

NOTES:

1. THE WORDS "NO PARKING", SHALL BE PAINTED IN WHITE LETTERS NO LESS THAN 1'-0" HIGH AND LOCATED SO THAT VISIBLE TO TRAFFIC ENFORCEMENT OFFICIALS. SEE REVISED CALTRANS STD. PLAN RSP A90B FOR DETAILS OF THE "NO PARKING" PAVEMENT MARKING.
2. WHERE A SINGLE (NON-VAN) ACCESSIBLE PARKING SPACE IS PROVIDED, THE LOADING AND UNLOADING ACCESS AISLE SHALL BE ON THE PASSENGER SIDE OF THE VEHICLE AS THE VEHICLE IS GOING FORWARD INTO THE PARKING SPACE.
3. A R100B (CA) SIGN SHALL BE POSTED IN A CONSPICUOUS PLACE AT EACH ENTRANCE TO OFF-STREET PARKING FACILITIES OR IMMEDIATELY ADJACENT TO AND VISIBLE FROM EACH STALL. THE SIGN SHALL INCLUDE THE ADDRESS WHERE THE TOWED VEHICLE MAY BE RECLAIMED AND THE TELEPHONE NUMBER OF THE LOCAL TRAFFIC LAW ENFORCEMENT AGENCY. (SEE PLAN FOR LOCATION)
4. ISA = INTERNATIONAL SYMBOL OF ACCESSIBILITY
5. INSTALL SIGN R99C (CA) ABOVE SIGN R7-8b ON CHAIN LINK FENCE. BOTTOM OF SIGN OR PLAQUE PANEL SHALL BE A MINIMUM OF 7' ABOVE THE SURROUNDING SURFACE.

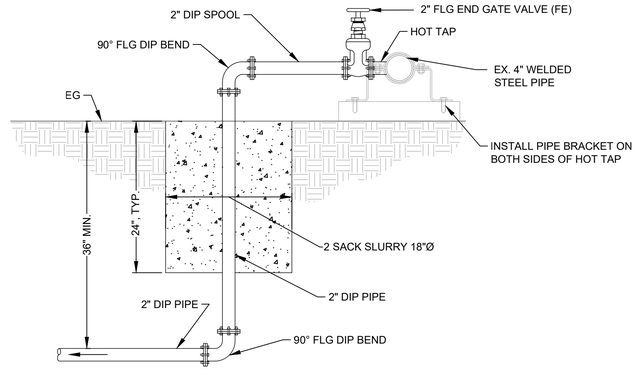
## 2 ACCESSIBLE PARKING STALL
SCALE: 1" = 5'

SIGN R99C (CA)
(NTS)

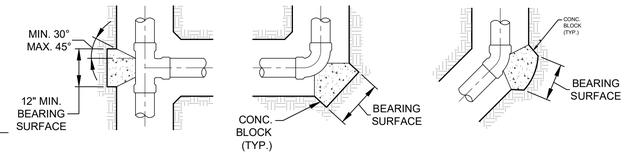
SIGN R7-8B (CA)
(NTS)



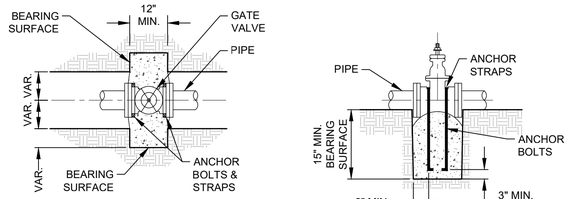

## 3 STANDARD 2" BLOW-OFF ASSEMBLY
SCALE: NTS




## 4 UNDERGOUNDING PIPE LATERAL WITH VALVE
SCALE: NTS

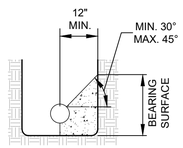



TEE 90° ELBOW 45° ELBOW




PLAN ELEVATION

VALVE ANCHORS



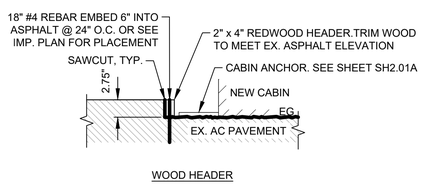

TYPICAL SECTION OF THRUST BLOCK

| THRUST BLOCK BEARING AREAS - S.F. | | | | | |
|---|---|---|---|---|---|
| MAIN SIZE | TEE * | BEND | | | |
| | | 90° | 45° | 22.5° | 11.25° |
| 2" - 4" | 3 | 4 | 2 | 2 | 2 |
| * INCLUDES TEES, PLUGS, CAPS, HYDRANTS & VALVES | | | | | |

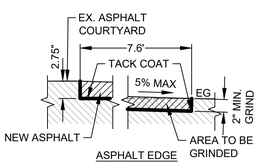
GENERAL NOTES:

1. THRUST BLOCKS TO BE CONSTRUCTED PER N.F.P.A. 24.
2. ALL THRUST/ANCHOR BLOCKS SHALL BEAR AGAINST UNDISTURBED SOIL.
3. CONCRETE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
4. ALL ANCHOR RODS AND ANCHOR BOLTS SHALL BE MINIMUM 5/8" DIA. & ANCHOR STRAPS SHALL BE 3" X 1/4".
5. THRUST BLOCK DESIGN IS BASED ON A WATER PRESSURE OF 200 P.S.I. AND A MINIMUM ALLOWABLE SOIL BEARING VALUE OF 2,000 P.S.F. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING SOIL BEARING VALUES AND THE POSITION AND SIZE OF BEARING AREAS BASED UPON N.F.P.A. 24.
6. THE HEIGHT OF THE BLOCK MUST BE LESS THAN HALF OF THE TOTAL DEPTH TO THE BOTTOM OF THE BLOCK.
7. THE RATIO OF WIDTH TO HEIGHT OF THRUST BLOCK SHALL NOT EXCEED 1.5 TO 1.

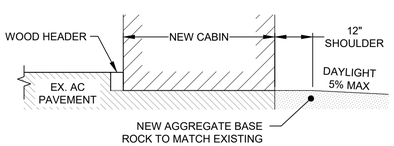
## 5 THRUST AND ANCHOR BLOCK DETAIL
SCALE: 1" = 2'




WOOD HEADER




ASPHALT EDGE




## 6 EDGE TREATMENT DETAIL
SCALE: 1" = 1'

## 7 SHOULDER DETAIL
SCALE: 1" = 1'

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Project ID: BSC
File Name:
Drawn By:
Review By:
Plot Date: 10/10/23

Sheet Title: CONSTRUCTION DETAILS

Sheet No.: C6.0

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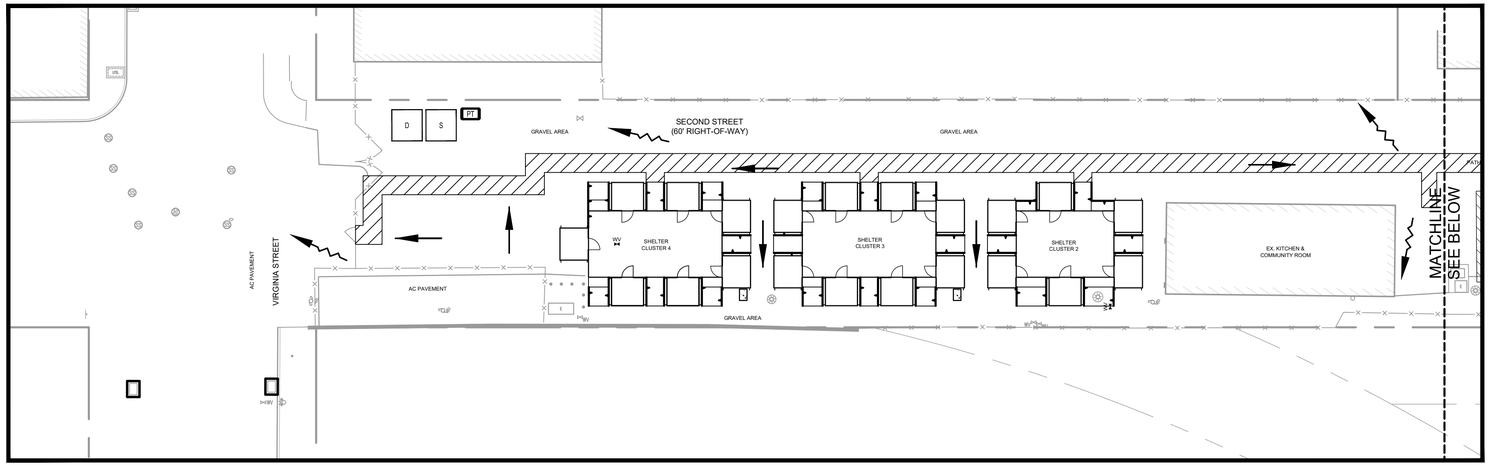


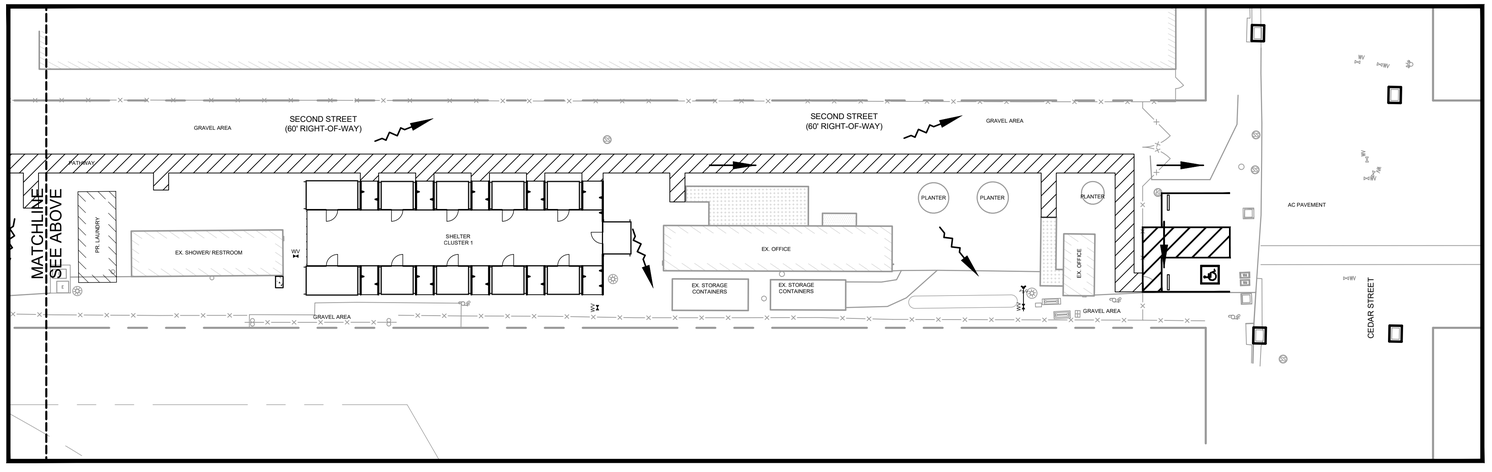


## EROSION CONTROL LEGEND

EXISTING

- DIRECTION OF FLOW OR SLOPE
- EXISTING DIRECTION OF FLOW OR SLOPE
- D — DELIVERY AREA
- S — NON HAZARDOUS STORAGE
- STORM INLET PROTECTION. INSERT GRAVEL BAG FILTERS AT INLETS.
- PT — PORTABLE TOILET WITH LINER

## POLLUTION CONTROL NOTES:

1. IF SIGNIFICANT SEDIMENT OR OTHER VISUAL SYMPTOMS OF IMPURITIES ARE NOTICED IN THE STORM WATER, CONTACT THE CITY ENGINEER IMMEDIATELY.
2. CONTRACTOR IS RESPONSIBLE FOR INSPECTION AND RESTORATION OF ALL ASPECTS OF THIS PLAN. SEDIMENT ON SIDEWALKS AND GUTTERS SHALL BE REMOVED BY SHOVEL AND/OR BROOM AND PLACED IN STOCKPILES.
3. ALL DUMPSTERS OR OTHER TRASH STORAGE ENCLOSURES SHALL BE UTILIZED SOLELY FOR NON-HAZARDOUS MATERIALS.
4. ALL EMPLOYEES, CONTRACTORS, AND SUBCONTRACTORS ARE RESPONSIBLE FOR CONFORMING TO THE ELEMENTS SHOWN ON THIS PLAN OR RELATED DOCUMENTS.
5. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS AND FILING ALL PLANS WITH RELATED AGENCIES ASSOCIATED WITH THEIR WORK. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, PERMITS FOR STORAGE OF HAZARDOUS MATERIALS, BUSINESS PLANS, PERMITS FOR STORAGE OF FLAMMABLE LIQUIDS, GRADING PERMITS, OR OTHER PLANS OR PERMITS REQUIRED BY ALAMEDA COUNTY, THE CITY OF BERKELEY, OR OTHER AGENCIES. ALL CONTRACTORS, OR SUBCONTRACTORS WORKING ON-SITE ARE INDIVIDUALLY RESPONSIBLE FOR OBTAINING AND SUBMITTING ANY BUSINESS PLANS OR PERMITS REQUIRED BY CITY, STATE OR LOCAL AGENCIES.
6. CONTRACTOR SHALL LOCATE STORAGE, DELIVERY, OR WASH-OUT AREAS, TO SUIT THEIR OPERATIONS. CONTRACTOR TO MAINTAIN SECONDARY CONTAINMENT AS NECESSARY TO PROHIBIT POLLUTION AND TOXIC MATERIALS FROM ENTERING STORM DRAIN.
7. CONTRACTOR SHALL UTILIZE SILT FILTERS DURING CONCRETE CONSTRUCTION NEAR EXISTING STORM DRAINAGE SYSTEM. AFTER COMPLETION OF THE SIDEWALK, DRIVEWAYS, CURB, GUTTER, AND PAVING, THE SILT FILTERS SHALL BE MODIFIED TO BURLAP SACKS FILLED WITH 3/4" DRAIN ROCK OR OTHER ACCEPTED BMP POSITIONED SURROUNDING EACH CATCH BASIN.

## EROSION CONTROL NOTES:

1. NO VEHICLES SHALL BE ALLOWED TO TRACK OR SPREAD SOIL FROM THE CONSTRUCTION AREAS ONTO EXISTING PAVED PUBLIC STREETS.
2. THE EROSION AND SEDIMENT CONTROL MEASURES WILL BE OPERABLE DURING THE RAINY SEASON, OCTOBER 1ST TO APRIL 15TH. NO GRADING WILL OCCUR BETWEEN OCTOBER 1ST AND APRIL 15TH, UNLESS AUTHORIZED BY THE CITY ENGINEER.
3. DURING THE RAINY SEASON, ALL PAVED AREAS WILL BE KEPT CLEAR OF EARTH MATERIAL AND DEBRIS. THE SITE WILL BE MAINTAINED SO THAT A MINIMUM OF SEDIMENT-LADEN RUNOFF ENTERS THE STORM DRAIN SYSTEM. THESE PLANS SHALL REMAIN IN EFFECT UNTIL THE TRACT IMPROVEMENTS ARE ACCEPTED BY THE CITY, AND ALL SLOPES ARE STABILIZED FROM EROSION.

## URBAN RUNOFF POLLUTION NOTES:

1. STABILIZE ALL DENUDED AREAS AND MAINTAIN EROSION CONTROL MEASURES CONTINUOUSLY FOR THE DURATION OF THE PROJECT.
2. REMOVE SPOILS PROMPTLY AND AVOID STOCKPILING OF FILL MATERIALS WHEN RAIN IS FORECAST. IF RAIN THREATENS, STOCK- PILED SOILS AND OTHER MATERIALS SHALL BE TARPED, AT THE REQUEST OF THE CITY ENGINEER.
3. STORE, HANDLE AND DISPOSE OF CONSTRUCTION MATERIALS AND WASTES SO AS TO PREVENT THEIR ENTRY TO THE STORM DRAIN SYSTEM. CONTRACTOR MUST NOT ALLOW CONCRETE, WASHWATERS, SLURRIES, PAINT OR OTHER MATERIALS TO ENTER CATCH BASINS OR TO ENTER SITE RUNOFF.
4. USE FILTRATION OR OTHER MEASURES TO REMOVE SEDIMENT FROM DEWATERING EFFLUENT.
5. NO CLEANING, FUELING OR MAINTAINING VEHICLES ON SITE SHALL BE PERMITTED IN ANY MANNER THAT ALLOWS DELETERIOUS MATERIALS TO ENTER CATCH BASINS OR TO ENTER SITE RUNOFF.
6. CONTRACTOR TO RELOCATE CONCRETE WASHDOWN, VEHICLE STORAGE DELIVERY, AND NON HAZARDOUS WASTE AREAS AS NECESSARY TO FACILITATE THEIR OPERATION AND PROMOTE POLLUTION CONTROL.

## BMP IMPLEMENTATION SCHEDULE:

1. BMP'S APPROPRIATE FOR THE WORK BEING DONE SHALL BE IN PLACE AT ALL TIMES.
2. PERIMETER CONTROL, EXISTING INLET PROTECTION, AND CONSTRUCTION ENTRANCE SHALL BE INSTALLED PRIOR TO ANY DEMOLITION.
3. ALL OTHER BMP'S SHALL BE INSTALLED AT COMPLETION OF CONSTRUCTION OF EACH INLET.

Graphic Scale (in feet)

20 0 20 40

1 inch = 20 ft.

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Sheet Title: EROSION CONTROL PLAN

Sheet No.: C7.0

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## GENERAL SYMBOLS & ABBREVIATIONS

| | |
|---|---|
| ——— | PROPERTY LINE |
| ℄ — – — – — | CENTER LINE |
| (E) | EXISTING |
| S.A.D. | SEE ARCHITECTURE DRAWINGS |
| S.C.D. | SEE CIVIL DRAWINGS |
| TYP. | TYPICAL |

## LANDSCAPE GENERAL NOTES

1. REFER TO GENERAL NOTES ON 5/G0.00.
2. 'TYP.' OR TYPICAL MEANS THAT THE CONDITION IS REPRESENTATIVE FOR SIMILAR CONDITIONS THROUGHOUT, UNLESS OTHERWISE NOTED. DETAILS ARE USUALLY NOTED 'TYP.' ONLY ONCE WHEN THEY FIRST OCCUR.
3. NOTES AND SYMBOLS ON ONE DRAWING APPLY TO OTHER SIMILAR DETAILS AND CONDITIONS.
4. DIMENSIONS ARE FROM OUTSIDE FACE OF BUILDING OR WALLS, UNLESS OTHERWISE NOTED, AND ARE TO BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION AND MAJOR EXCAVATION. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALING.
5. UNLESS OTHERWISE NOTED, ANGLES TO BE RIGHT ANGLES, ARCS WHICH APPEAR TANGENT AND UNIFORM ARE TO BE TANGENT AND UNIFORM, LINES WHICH APPEAR PARALLEL ARE TO BE PARALLEL, AND ITEMS WHICH APPEAR CENTERED TO BE CENTERED, MAINTAIN LINES TRUE, LEVEL, PLUMB, AND SQUARE.
6. REFER TO GRADING PLANS FOR GRADING AND DRAINAGE STRUCTURES PRIOR TO INSTALLATION OF WALKS, WALLS, FOOTINGS, AND OTHER STRUCTURES.
7. LANDSCAPE ARCHITECT TO APPROVE LAYOUT IN THE FIELD PRIOR TO INSTALLATION OF FORMS OR GRADING FOR LANDSCAPE WORK.
8. CAREFULLY REVIEW LANDSCAPE IRRIGATION PLANS AND NOTES TO IDENTIFY LOCATIONS WHERE PIPE, SLEEVES, SAND BED OR CONDUIT MUST BE PLACED PRIOR TO PLACEMENT OF FORMWORK FOR INSTALLATION OF CONCRETE, OTHER PAVING, OR WALLS.
9. QUANTITIES PROVIDED ARE FOR INFORMATION ONLY, VERIFY QUANTITIES AND NOTIFY OWNER OF DISCREPANCIES.

**SEE 3/G0.00 FOR THE LIST OF BID ALTERNATES**
**FOR THE LANDSCAPE SCOPE OF WORK.**

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Consultant:

PGAdesign
LANDSCAPE ARCHITECTS
tel 510.465.1284 url PGAdesign.com
444 17th Street Oakland CA 94612

LICENSED LANDSCAPE ARCHITECT
CHRISTOPHER W. KENT #6313
Signature
MAY 31, 2016
Renewal Date
OCT 9, 2023
Date
STATE OF CALIFORNIA

| No. | Date | Issue |
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| | 10/09/2023 | LANDSCAPE BID SET |
| | 02/12/2024 | BID SET |

Issue Note:

BID SET

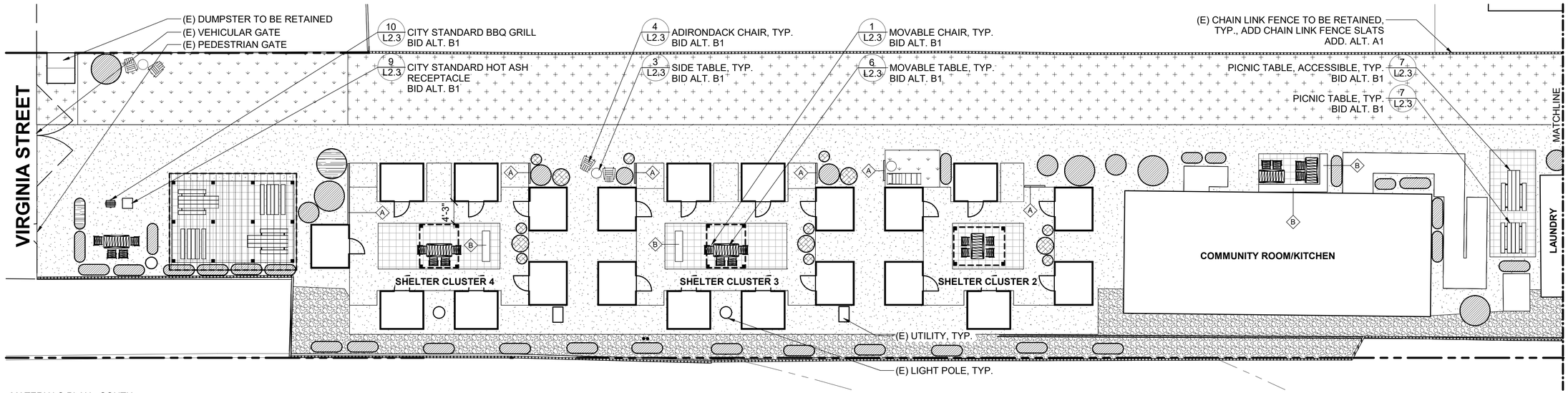
Project ID: BSC
File Name:
Drawn By: EL
Review By: CK
Plot Date:

Sheet Title:

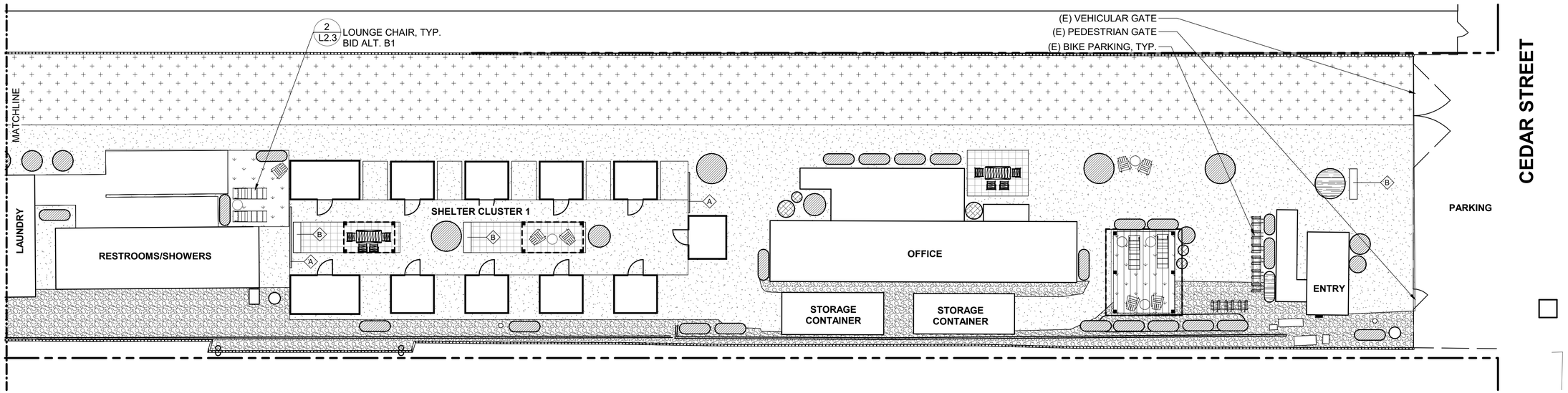
LEGEND AND NOTES

Sheet No.:

L1.1




MATERIALS PLAN - SOUTH
3/32" = 1'-0"




MATERIALS PLAN - NORTH
3/32" = 1'-0"

0 4 8 16 32ft N

## LANDSCAPE MATERIAL LEGEND

- (E) SOIL OR GRAVEL
- ASPHALT PAVING, S.C.D.
- ACCESS LANE, S.C.D.
- PATTERNED PAINTED ASPHALT (3 L2.2) **BID ALT. B3**
- ARTIFICIAL TURF (2 L2.1) (3 L2.1) **BID ALT. B4**
- RECLAIMED WOOD BEAM BENCH SEATING, 18" (2 L2.4) (8 L2.3) **BID ALT. B1**
- CHAIN LINK FENCE SLATS (1 L2.1) **ADD ALT. A1**
- PRIVACY SCREEN (6 L2.1) (3 L2.2) **BID ALT. B5**
- WEATHERPROOF FREESTANDING PERGOLA, S.A.D. **BID ALT. B7**
- FREESTANDING PERGOLA WITH SUNSHADE FABRIC **BID ALT. B6**
- CORRUGATED METAL PLANTERS, NEW AND EXISTING, SEE PLANTING PLAN, NOTES, AND CIVIL DRAWINGS (1 L2.4) (3 L2.4) **ADD. ALT. A1, BID ALT. B2**
- NEW PLANTER POTS, TERRACOTTA (2 L2.4) (2 L2.2) **BID ALT. B2**
- RELOCATED EXISTING PLANTERS, SEE PLANTING PLAN AND NOTES (1 L2.4) **ADD. ALT. A1, BID ALT. B2**

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

1601 SECOND STREET, BERKELEY, CA 94710

APN #: 57-2112-5

Design Firm:
SIEGEL & STRAIN Architects
6201 Doyle Street, Suite B
Emeryville, CA 94608
510 / 547-8092
info@siegelstrain.com
www.siegelstrain.com

Consultant:
PGAdesign
LANDSCAPE ARCHITECTS
tel 510.465.1284 url PGAdesign.com
444 17th Street Oakland CA 94612

LICENSED LANDSCAPE ARCHITECT
CHRISTOPHER W. KENT # 6467
Signature
MAY 31, 2018
Renewal Date
OCT 9, 2023
Date
STATE OF CALIFORNIA

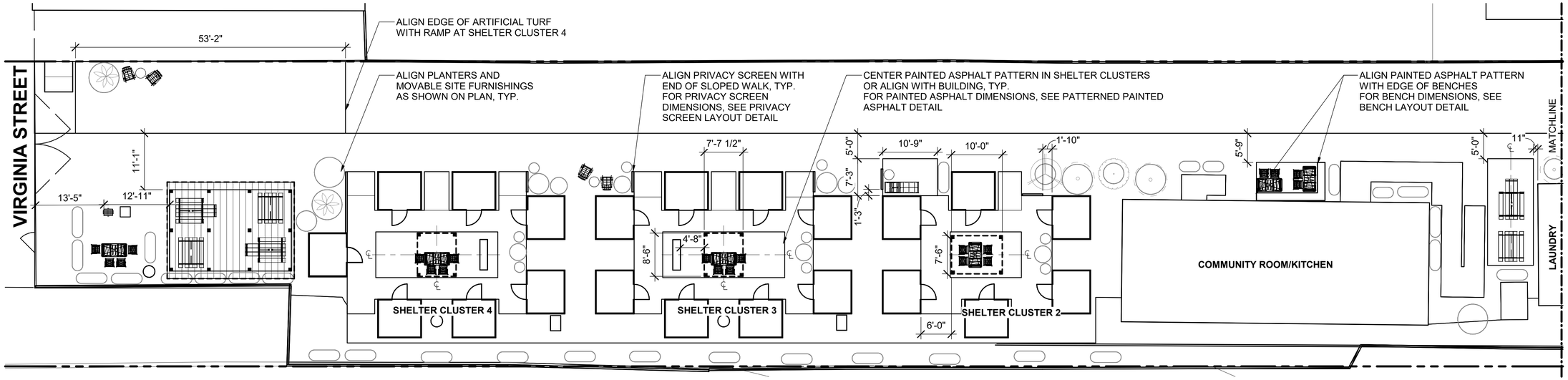
| No. | Date | Issue |
|---|---|---|
| | 10/09/2023 | LANDSCAPE BID SET |
| | 02/12/2024 | BID SET |

Issue Note:
BID SET

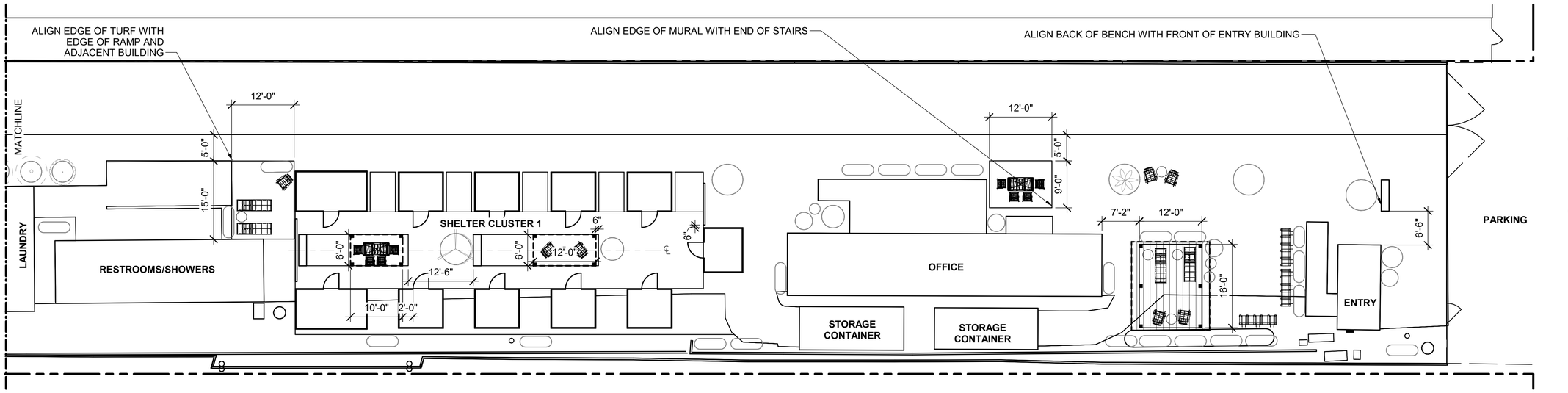
Project ID: BSC
File Name:
Drawn By: EL
Review By: CK
Plot Date:

Sheet Title:
MATERIALS PLAN

Sheet No.:
L1.2




LAYOUT PLAN - SOUTH
3/32" = 1'-0"




LAYOUT PLAN - NORTH
3/32" = 1'-0"

0 4 8 16 32ft N

Project Title:

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| | 02/12/2024 | BID SET |

Issue Note:

BID SET

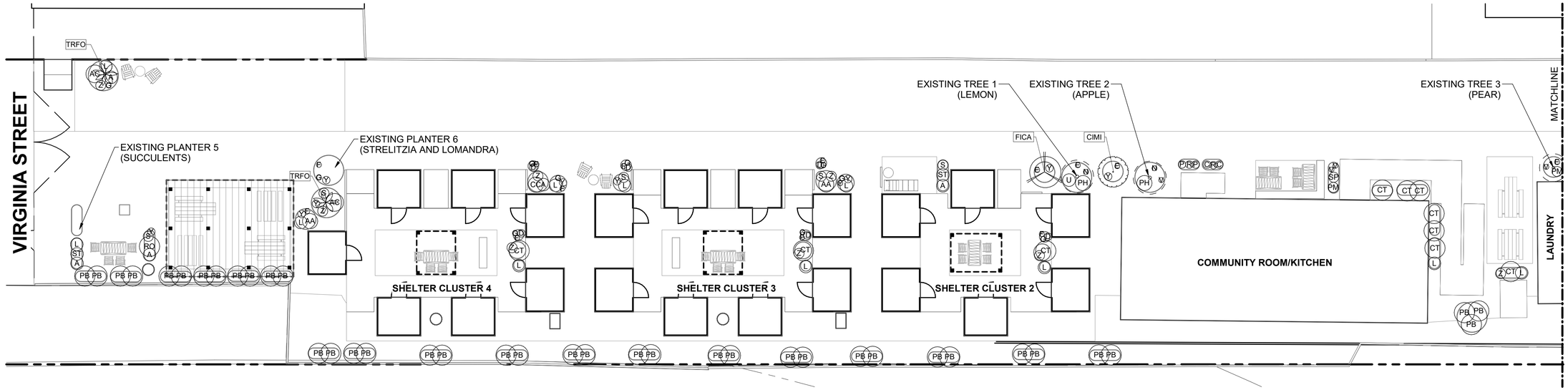
Project ID: BSC
File Name:
Drawn By: EL
Review By: CK
Plot Date:

Sheet Title:

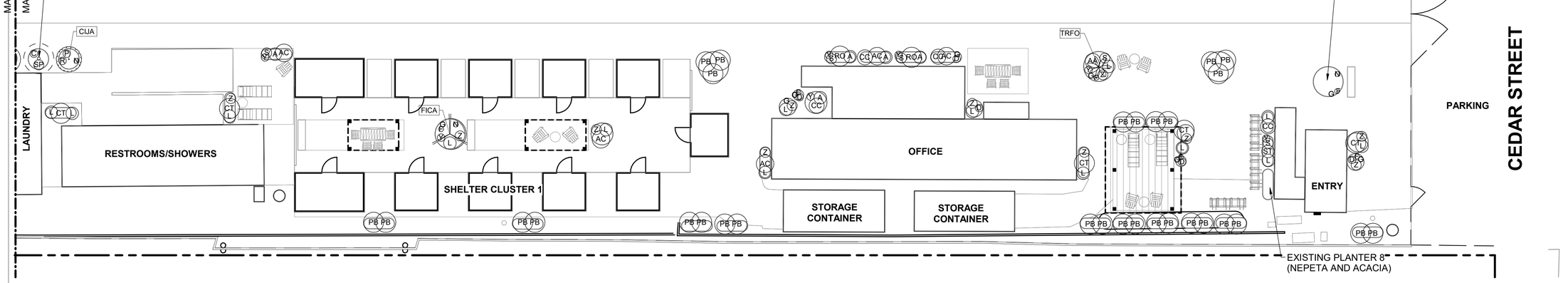
LAYOUT PLAN

Sheet No.:

L1.3




PLANTING PLAN - SOUTH
3/32" = 1'-0"




PLANTING PLAN - NORTH
3/32" = 1'-0"

## PLANT LEGEND

XXXX — PROPOSED TREE AND SPECIES ABBREVIATION, SEE PLANT LIST FOR SPECIES

XX XX XX — SHRUB OR GROUNDCOVER, SEE PLANT LIST FOR SPECIES

EXISTING TREE TO REMAIN, SEE EXISTING PLANTS AND PLANTERS SCHEDULE

0 4 8 16 32ft N

Project Title:

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Issue Note:

BID SET

Project ID: BSC
File Name:
Drawn By: EL
Review By: CK
Plot Date:

Sheet Title:

PLANTING PLAN

Sheet No.:

L1.4

## PLANTING NOTES

1. VERIFY LOCATION OF SUBSURFACE UTILITIES, PIPES AND STRUCTURES. SHOULD UTILITIES OR OTHER WORK NOT SHOWN ON THE PLANS BE FOUND DURING EXCAVATIONS, PROMPTLY NOTIFY OWNER'S REPRESENTATIVE. FAILURE TO DO SO WILL MAKE CONTRACTOR LIABLE FOR DAMAGE ARISING FROM HIS OPERATIONS SUBSEQUENT TO DISCOVERY OF UTILITIES NOT SHOWN ON PLANS.
2. KEEP PLANTING CLEAN AND FREE FROM ALL CONCRETE, ASPHALTIC WASTE, LUMBER AND OTHER SUCH MATERIALS. SOIL CONTAINING SUCH MATERIALS SHOULD BE REMOVED BY EXCAVATION OF THE SOIL AND REPLACED WITH CLEAN IMPORT TOP SOIL.
3. CLEAN ALL PLANTERS TO RECEIVE NEW PLANTING AND PREPARE SOIL PER SPECIFICATION.
4. DO NOT WORK SOIL WHEN WET TO AVOID COMPACTION.
5. NO PLANT SPECIES SUBSTITUTIONS WILL BE ACCEPTED, UNLESS OTHERWISE APPROVED BY THE LANDSCAPE ARCHITECT. WHEN PROPOSING SUBSTITUTIONS, ENSURE THAT THE PROPOSED VARIETY IS SIMILAR IN GROWTH HABIT AND SIZE TO THE SPECIFIED PLANT AND WATER USE IS THE SAME. EXAMPLE: ESCALLONIA 'TERRI' COULD SUB FOR 'RED ELF.' RHAPHIOLEPSIS CAN NOT SUBSTITUTE FOR ESCALLONIA AS THEY HAVE DIFFERENT WATER USE REQUIREMENTS. CERTIFICATES OF COMPLIANCE WILL NOT BE COMPLETED FOR PROJECTS WHICH EXCEED THE WATER USE OF SPECIFIED PLANT MATERIALS UNTIL CONFORMANCE WITH THE WATER EFFICIENT LANDSCAPE REQUIREMENTS IS ACHIEVED.
6. ALL PLANTS AND LAYOUT TO BE APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO PLANTING.
7. NOTIFY OWNER'S REPRESENTATIVE 36 HOURS PRIOR TO COMMENCEMENT OF WORK TO COORDINATE PROJECT OBSERVATION MEETINGS.
8. PLANT QUANTITIES ARE FOR INFORMATIONAL PURPOSES AND CONSTRUCTION DOCUMENT WATER USE CALCULATIONS ONLY. CONTRACTOR TO VERIFY THE QUANTITY AND USE THE GRAPHIC PLANS AS A BASIS FOR QUANTITY OF PLANTS.
9. SEE DETAILS AND SPECIFICATIONS FOR PROCEDURES, MATERIALS AND INSTALLATION REQUIREMENTS.
10. PROVIDE SOILS REPORTS FOR ALL IMPORTED SOILS, PER SPECIFICATIONS AND WELO CONFORMANCE. SUBMIT REPORTS TO OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL.
11. KEEP ADJACENT STREETS, SIDEWALKS AND OTHER AREAS FREE OF MUD, DIRT OR SIMILAR NUISANCES RESULTING FROM EARTHWORK OPERATIONS.
12. REPLACE TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE ANY DAMAGED OR DESTROYED LANDSCAPING.
13. FOR BEST RESULTS, NATIVE PLANT MATERIALS SHOULD NOT HAVE THEIR ROOTS DISTURBED. FOR PLASTIC CANS, REMOVE BOTTOM OF CAN, PLACE IN PLANT PIT AND CUT SIDES TO REMOVE. CUT METAL CANS IN THREE PLACES MINIMUM AND CAREFULLY SLIDE ROOT BALL INTO PLANT PIT, FOR LARGE MATERIAL, USE BOTTOM SUPPORT AS NECESSARY.

## PLANT LIST

| SYMBOL | QTY | BOTANICAL NAME | COMMON NAME | CONTAINER SIZE | WATER USE |
|---|---|---|---|---|---|
| GRASS | | | | | |
| CT | 15 | CHONDROPETALUM TECTORUM | CAPE RUSH | 5 GAL | LOW |
| L | 25 | LOMANDRA LONGIFOLIA 'BREEZE' | DWARF MAT RUSH | 1 GAL | LOW |
| PB | 69 | PHYLLOSTACHYS BISSETTII | BISSETT'S BAMBOO | 5 GAL | LOW |
| A | 10 | STIPA ARUNDINACEA | NEW ZEALAND WIND GRASS | 1 GAL | MODERATE |
| GROUNDCOVER | | | | | |
| SP | 2 | MENTHA SPICATA | SPEARMINT | 1 GAL | MODERATE |
| PM | 2 | MENTHA X PIPERITA | PEPPERMINT | 1 GAL | MODERATE |
| PH | 2 | PHYSALIS PERUVIANA | GROUND CHERRY | 1 GAL | MODERATE |
| Z | 19 | STACHYS BYZANTINA | LAMB'S EARS | 1 GAL | LOW |
| PERENNIAL | | | | | |
| Y | 16 | ACHILLEA MILLEFOLIUM 'TERRACOTTA' | YARROW | 1 GAL | LOW |
| V | 4 | ALLIUM TUBEROSUM | GARLIC CHIVES | 1 GAL | MODERATE |
| N | 5 | CALENDULA OFFICINALIS | CALENDULA | 4" CONT | LOW |
| E | 4 | ESCHSCHOLZIA CALIFORNICA | CALIFORNIA POPPY | 4" CONT | LOW |
| U | 1 | LUPINUS SUCCULENTUS | ARROYO LUPINE | 1 GAL | LOW |
| C | 3 | OCIMUM KILIMANDSCHARICUM X BASILICUM 'DARK OPAL' | AFRICAN BLUE BASIL | 1 GAL | MODERATE |
| S | 10 | SALVIA 'ELK BLUE NOTE' | ELK BLUE NOTE SALVIA | 1 GAL | LOW |
| P | 3 | SALVIA OFFICINALIS 'PURPUREA' | PURPLE SAGE | 1 GAL | LOW |
| SHRUB | | | | | |
| AC | 7 | ACACIA COGNATA 'COUSIN ITT' | LITTLE RIVER WATTLE | 5 GAL | LOW |
| CC | 5 | CALLIANDRA X SIERRA STARR | SIERRA STARR FAIRY DUSTER | 5 GAL | LOW |
| R | 3 | ROSMARINUS 'CHEF'S CHOICE' | CHEF'S CHOICE ROSEMARY | 1 GAL | LOW |
| RO | 3 | ROSMARINUS 'HUNTINGTON CARPET' | HUNTINGTON CARPET ROSEMARY | 5 GAL | LOW |
| ST | 3 | STRELITZIA REGINAE | BIRD OF PARADISE | 5 GAL | LOW |
| SUCCULENT | | | | | |
| AA | 3 | AGAVE ATTENUATA | FOXTAIL AGAVE | 5 GAL | VERY LOW |
| G | 18 | GRAPTOPETALUM PARAGUAYENSE | GHOST PLANT | 1 GAL | LOW |
| F | 16 | GRAPTOVERIA 'FRED IVES' | FRED IVES GRAPTOVERIA | 1 GAL | LOW |
| D | 11 | YUCCA DESMETIANA 'BLUE BOY' | BLUE BOY YUCCA | 1 GAL | VERY LOW |
| TREE | | | | | |
| CIJA | 1 | CITRUS JAPONICA 'NAGAMI' | KUMQUAT | 15 GAL | MODERATE |
| CIMI | 1 | CITRUS X MICROCARPA | CALAMANSI | 15 GAL | MODERATE |
| FICA | 2 | FICUS CARICA | COMMON FIG | 15 GAL | MODERATE |
| TRFO | 3 | TRACHYCARPUS FORTUNEI | WINDMILL PALM | 15 GAL | LOW |

## EXISTING PLANTS AND PLANTERS

| NUMBER | PLANTER | PLANTS | ACTION |
|---|---|---|---|
| 1 | 3' ROUND | LEMON TREE | TRANSPLANT |
| 2 | 3' ROUND | APPLE TREE | TRANSPLANT |
| 3 | 3' ROUND | PEAR TREE | TRANSPLANT |
| 4 | 4' ROUND | PLUM TREE | TRANSPLANT |
| 5 | 8' OVAL | SUCCULENTS | RELOCATE |
| 6 | 6' ROUND | STRELITZIA, LOMANDRA | RELOCATE |
| 7 | 6' ROUND | STRELITZIA, LOMANDRA | RELOCATE |
| 8 | 8' OVAL | NEPETA, ACACIA COUSIN ITT | RELOCATE |
| 9 | 4' ROUND | STRELITZIA, LOMANDRA | TRANSPLANT |
| 10 | 4' ROUND | LOMANDRA | TRANSPLANT |
| 11 | 4' ROUND | LOMANDRA | TRANSPLANT |
| 12 | 8' OVAL | LOMANDRA | TRANSPLANT |
| 13 | 8' OVAL | LOMANDRA | TRANSPLANT |
| 14 | 8' OVAL | ACACIA COUSIN ITT | TRANSPLANT |
| 15 | 8' OVAL | ACACIA COUSIN ITT | TRANSPLANT |

## TRANSPLANT AND RELOCATION NOTES

1. TRANSPLANT: EXISTING PLANTS TO BE PROTECTED IN EXISTING PLANTERS **(ADD. ALT. A1)**, THEN TRANSPLANTED AFTER FINAL LOCATION IS READY, TO LOCATION SHOWN ON PLANTING PLAN. EXISTING LOMANDRA, ACACIA COUSIN ITT, AND STRELITZIA TO BE USED WHERE PLANTS OF SAME SPECIES ARE SHOWN ON PLANTING PLAN. **(BID ALT. B2)**.
2. RELOCATE: EXISTING PLANTS TO BE PROTECTED IN EXISTING PLANTERS **(ADD. ALT. A1)**. AMEND SOIL IN EXISTING PLANTERS WITH COMPOST AND ADD SOIL AS NEEDED, RELOCATE TO LOCATION SHOWN ON PLANTING PLAN. **(BID ALT. B2)**.
3. SEE DEMO PLANS FOR LOCATIONS OF EXISTING PLANTS TO BE RELOCATED OR TRANSPLANTED. LANDSCAPE ARCHITECT TO VERIFY FINAL SELECTION IN THE FIELD **(ADD. ALT. A1)**.
4. EXISTING PLANTS TO BE EITHER RETAINED AND KEPT HEALTHY DURING CONSTRUCTION OR REPLACED IN KIND AT TIME OF PLANTING, TREES AS 24" BOX, SHRUBS AND PERENNIALS AS 5 GALLON **(ADD. ALT. A1)**
5. PREVENT DAMAGE AND DISEASE TO EXISTING PLANTS DURING TRANSPLANT.

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CHRISTOPHER W. KEHL #5011
Signature
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Issue Note:
BID SET

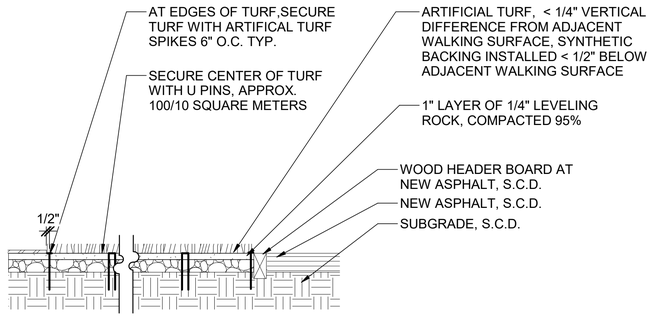
Project ID: BSC
File Name:
Drawn By: EL
Review By: CK
Plot Date:

Sheet Title:
PLANTING SCHEDULE AND NOTES

Sheet No.:
L1.5

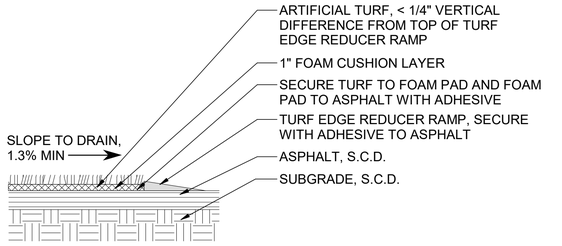
NOTES:
1. PRODUCT: NATURAL HEDGE 6000 SERIES FENCE SLATS; MANUFACTURER: FENPRO; CONTACT: PHONE (888) 313-6313, WEBSITE WWW.FENPRO.COM OR APPROVED EQUIVALENT
2. INSTALL PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS

1 L2.1 CHAIN LINK FENCE SLATS
NOT TO SCALE
**ADD. ALT . A1**




NOTES:
1. ARTIFICIAL TURF PRODUCT: TOTTURF PUP TURF SYNTHETIC TURF; MANUFACTURER: TOTTURF, WWW.ROBERSTONSURFACES.COM OR APPROVED EQUIVALENT
2. TURF SPIKES: 6" GALVANIZED ARTIFICIAL TURF SPIKES; MANUFACTURER: **TBD**
3. U PINS: 6" 9 GUAGE STEEL U PINS; MANUFACTURER: **TBD**
4. INSTALL PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS

2 L2.1 ARTIFICIAL TURF - ON PERMEABLE SUBGRADE
1" = 1'-0"
**BID ALT . B4**



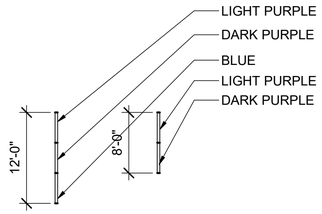

NOTES:
1. SLOPE TO DRAIN
2. ARTIFICIAL TURF PRODUCT: TOTTURF PRO PLAY SYNTHETIC TURF WITH 1" FOAM CUSHION LAYER; MANUFACTURER: TOTTURF, WWW.ROBERSTONSURFACES.COM OR APPROVED EQUIVALENT
3. ARTIFICIAL TURF ADHESIVE: TURF CLAW
4. TURF EDGE RAMP REDUCER: REDUCER 700 (1 1/2") TURFEDGE REDUCER RAMP, MANUFACTURER: SAFEPATH PRODUCTS, WWW.SAFEPATHPRODUCTS.COM OR APPROVED EQUIVALENT
5. TURF EDGE RAMP REDUCER AND FOAM CUSHION ADHESIVE: SIKASIL-728 SL; MANUFACTURER: SIKA, WWW.USA.SIKA.COM, OR APPROVED EQUIVALENT
6. INSTALL PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS
7. WHERE INSTALLATION IS OVER EXISTING ASPHALT, FILL CRACKS AND ENSURE LEVEL SURFACE BEFORE PROCEEDING

3 L2.1 ARTIFICIAL TURF - ON ASPHALT
1" = 1'-0"
**BID ALT. B4**

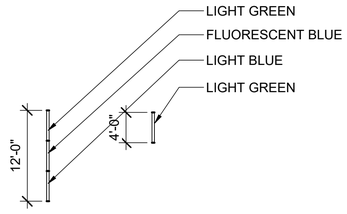
WITH SUNSHADE

NOTES:
1. PRODUCT: LINX PERGOLA KIT WITH 6"X6" STIX WOOD POSTS AND SUNSHADES; MANUFACTURER: LINX PERGOLA BY WILDHOG; WWW.LINXPERGOLA.COM
2. 8'-0" HEIGHT, SEE LAYOUT PLAN L1.3 FOR HORIZONTAL DIMENSIONS
3. SEE ARCHITECTURE DRAWINGS 1/A8.02 FOR ANCHORAGE DETAILS
4. INSTALL PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS
5. FINISH STIX POSTS WITH CLEAR WATER-BASED SEALER. FOLLOW STIX MANUFACTURER'S INSTRUCTIONS FOR BASE COAT AND MINIMUM 2 - 3 TOP COATS.

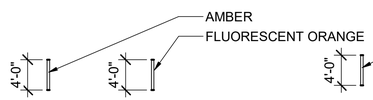
4 L2.1 FREESTANDING PERGOLA
NOT TO SCALE
**BID ALT. B6**



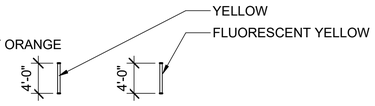

**SHELTER CLUSTER 1**




**SHELTER CLUSTER 4**




**SHELTER CLUSTER 2**

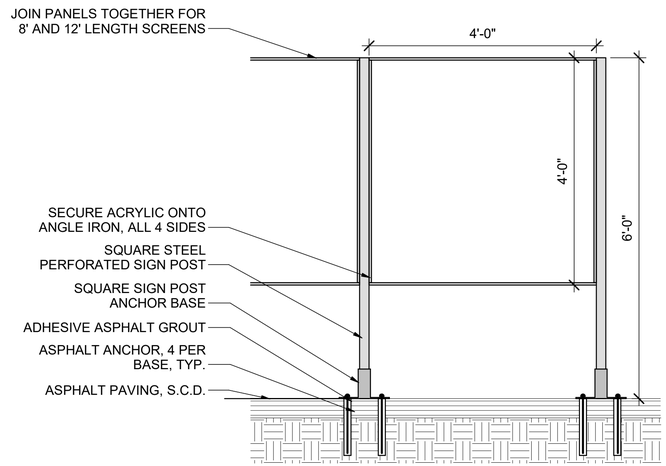



**SHELTER CLUSTER 3**

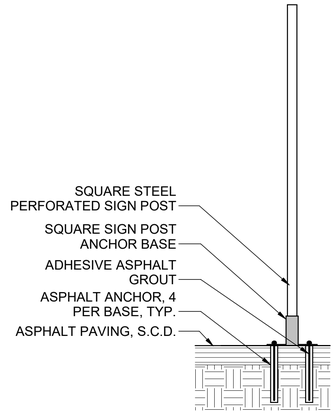
## ACRYLIC SHEETING COLOR SCHEDULE

| QTY | COLOR | LOCATION |
|---|---|---|
| 2 | LIGHT PURPLE | SHELTER CLUSTER 1 |
| 2 | DARK PURPLE | SHELTER CLUSTER 1 |
| 1 | BLUE | SHELTER CLUSTER 1 |
| 1 | AMBER | SHELTER CLUSTER 2 |
| 1 | FLUORESCENT ORANGE | SHELTER CLUSTER 2 |
| 1 | YELLOW | SHELTER CLUSTER 3 |
| 1 | FLUORESCENT YELLOW | SHELTER CLUSTER 3 |
| 2 | LIGHT GREEN | SHELTER CLUSTER 4 |
| 1 | FLUORESCENT BLUE | SHELTER CLUSTER 4 |
| 1 | LIGHT BLUE | SHELTER CLUSTER 4 |

5 L2.1 PRIVACY SCREEN LAYOUT
1" = 10'-0"
**BID ALT. B5**




**ELEVATION**




**SECTION**

NOTES:
1. ACRYLIC SHEETING: PRODUCT: 1/4" TRANSPARENT COLORED ACRYLIC SHEETS; COLORS: SEE PRIVACY SCREEN LAYOUT DETAIL; MANUFACTURER: EPLASTICS, ACME PLASTICS, OR APPROVED EQUIVALENT
2. MOUNTING FRAME AND HARDWARE:
   A. GALVANIZED STEEL ANGLE IRON: SIZE: 11 GUAGE THICK X 1" HEIGHT X 1" WIDTH X 4' LONG; MANUFACTURER: STEELWORKS OR APPROVED EQUIVALENT
   B. SQUARE GALVANIZED STEEL PERFORATED SIGN POST; SIZE: 6' TALL, 2"X2"; MANUFACTURER: **TBD**
   C. GALVANIZED STEEL ANCHOR BASE FOR 2" SQUARE POSTS; SIZE 10"X10"; MANUFACTURER: SAFETYSIGN.COM, WWW.SAFETYSIGN.COM OR APPROVED EQUIVALENT
   D. ASPHALT ANCHOR: BOLTHOLD SP12-38 ASPHALT ANCHOR; MANUFACTURER: ASPHALT ANCHORS CORP, WWW.ASPHALTANCHORS.COM OR APPROVED EQUIVALENT
   E. ANCHORING GROUT: EPX2 GROUT, MANUFACTURER: ASPHALT ANCHORS CORP, WWW.ASPHALTANCHORS.COM OR APPROVED EQUIVALENT
3. PAINT METAL IN FIELD TO MATCH ACRYLIC PANELS
   A. PRIMER: ULTRASHIELD GALVANIZED METAL PRIMER; MANUFACTURER: DUNN-EDWARDS, WWW.DUNNEDWARDS.COM OR APPROVED EQUIVALENT
   B. ACRYLIC PAINT: BEHR PREMIIUM SEMI-GLOSS DIRECT TO METAL INTERIOR/EXTERIOR PAINT; COLOR: **TBD, 4 COLORS, TO MATCH ADJACENT ACRYLIC PANELS**; MANUFACTURER: BEHR, WWW.BEHR.COM
   C. PRIME METAL PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS
4. WELD CORNERS OF ANGLE IRON, SECURELY BOLT OR WELD TO SIGN POST
5. SECURELY BOLT OR ADHERE ACRYLIC ONTO ANGLE IRON
6. SET SIGN POST ANCHOR BASE TO BE PLUMB, GROUT TO CREATE LEVEL SURFACE
7. INSTALL PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS
8. PROVIDE MEASURED SHOP DRAWINGS FOR LANDSCAPE ARCHITECT'S APPROVAL

6 L2.1 PRIVACY SCREENS
3/4" = 1'-0"
**BID ALT. B5**

Project Title:

# 2ND ST PATHWAYS STAIR CENTER
SITE IMPROVEMENTS AND SHELTER UNITS
1601 SECOND STREET, BERKELEY, CA 94710

APN #: 57-2112-5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LICENSED LANDSCAPE ARCHITECT
CHRISTOPHER W. KENT # 6264
Signature
MAY 31, 2018
Renewal Date
OCT 9, 2023
Date
STATE OF CALIFORNIA

| No. | Date | Issue |
|---|---|---|
| | 10/09/2023 | LANDSCAPE BID SET |
| | 02/12/2024 | BID SET |

Issue Note:
BID SET

Project ID: BSC
File Name:
Drawn By: EL
Review By: CK
Plot Date:

Sheet Title:
LANDSCAPE DETAILS - 1

Sheet No.:
L2.1

## SITE FURNISHINGS SCHEDULE

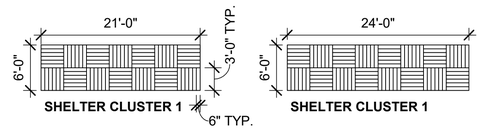
| QTY | PRODUCT | COLOR | MANUFACTURER | LOCATION |
|---|---|---|---|---|
| 4 | CHAIR 483 STEEL | BLUE | DUMOR | SHELTER CLUSTER 1 |
| 4 | CHAIR 483 STEEL | DEEP RED | DUMOR | SHELTER CLUSTER 2 |
| 4 | CHAIR 483 STEEL | SAFETY YELLOW | DUMOR | SHELTER CLUSTER 3 |
| 4 | CHAIR 483 STEEL | RECYCLE BLUE | DUMOR | SHELTER CLUSTER 4 |
| 4 | CHAIR 483 STEEL | RECYCLE GREEN | DUMOR | DINING AREAS |
| 4 | CHAIR 483 STEEL | HUNTER GREEN | DUMOR | DINING AREAS |
| 4 | CHAIR 483 STEEL | FOREST GREEN | DUMOR | DINING AREAS |
| 1 | 514 TABLE WITH SLOTTED STEEL TOP | BLUE | DUMOR | SHELTER CLUSTER 1 |
| 1 | 514 TABLE WITH SLOTTED STEEL TOP | DEEP RED | DUMOR | SHELTER CLUSTER 2 |
| 1 | 514 TABLE WITH SLOTTED STEEL TOP | SAFETY YELLOW | DUMOR | SHELTER CLUSTER 3 |
| 1 | 514 TABLE WITH SLOTTED STEEL TOP | RECYCLE BLUE | DUMOR | SHELTER CLUSTER 4 |
| 2 | 514 TABLE WITH SLOTTED STEEL TOP | RECYCLE GREEN | DUMOR | DINING AREAS |
| 1 | 514 TABLE WITH SLOTTED STEEL TOP | HUNTER GREEN | DUMOR | DINING AREAS |
| 1 | 514 TABLE WITH SLOTTED STEEL TOP | FOREST GREEN | DUMOR | DINING AREAS |
| 1 | 6' PICNIC TABLE | RECYCLE GREEN | DUMOR | DINING AREAS |
| 2 | 6' PICNIC TABLE | FOREST GREEN | DUMOR | DINING AREAS |
| 2 | 6' ADA PICNIC TABLE | HUNTER GREEN | DUMOR | DINING AREAS |
| 1 | 6' ADA PICNIC TABLE | FOREST GREEN | DUMOR | DINING AREAS |
| 2 | OVERSIZED ADIRONDACK CHAIR | DARK BLUE | ALLMODERN X POLYWOOD | SHELTER CLUSTER 1 |
| 3 | OVERSIZED ADIRONDACK CHAIR | GREEN | ALLMODERN X POLYWOOD | SEATING AREAS |
| 4 | OVERSIZED ADIRONDACK CHAIR | DARK GREEN | ALLMODERN X POLYWOOD | SEATING AREAS |
| 1 | LONG ISLAND 18" SIDE TABLE | PACIFIC BLUE | POLYWOOD | SHELTER CLUSTER 1 |
| 5 | LONG ISLAND 18" SIDE TABLE | LIME | POLYWOOD | SEATING AREAS |
| 3 | LONG ISLAND 18" SIDE TABLE | GREEN | POLYWOOD | SEATING AREAS |
| 5 | TATE OUTDOOR CHAISE LOUNGE | WHITE | ALLMODERN X POLYWOOD | SEATING AREAS |

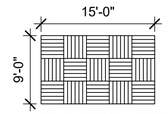
1 / L2.2 SITE FURNISHINGS SCHEDULE
NO SCALE
**BID ALT. B1**

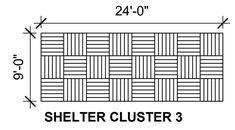
## PLANTER SCHEDULE

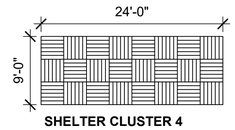
| QTY | PRODUCT | COLOR | DISTRIBUTOR/MANUFACTURER | LOCATION |
|---|---|---|---|---|
| 1 | 25"X23" FLAME POT - MEXICAN HANDPAINTED CLAY | RED | PLANTER & POTTERY OUTLET | SHELTER CLUSTER 2 |
| 1 | 25"X23" FLAME POT - MEXICAN HANDPAINTED CLAY | ORANGE | PLANTER & POTTERY OUTLET | SHELTER CLUSTER 3 |
| 1 | 25"X23" FLAME POT - MEXICAN HANDPAINTED CLAY | YELLOW | PLANTER & POTTERY OUTLET | SHELTER CLUSTER 3 |
| 2 | 25"X23" FLAME POT - MEXICAN HANDPAINTED CLAY | AQUA | PLANTER & POTTERY OUTLET | SHELTER CLUSTER 4 |
| 1 | 25"X23" FLAME POT - MEXICAN HANDPAINTED CLAY | GREEN | PLANTER & POTTERY OUTLET | OFFICE |
| 1 | 25"X23" FLAME POT - MEXICAN HANDPAINTED CLAY | YELLOW | PLANTER & POTTERY OUTLET | OFFICE |
| 1 | 22"X20.5" FLAME POT - MEXICAN HANDPAINTED CLAY | RED WITH BLACK | PLANTER & POTTERY OUTLET | SHELTER CLUSTER 2 |
| 1 | 22"X20.5" FLAME POT - MEXICAN HANDPAINTED CLAY | ORANGE | PLANTER & POTTERY OUTLET | SHELTER CLUSTER 2 |
| 1 | 22"X20.5" FLAME POT - MEXICAN HANDPAINTED CLAY | YELLOW | PLANTER & POTTERY OUTLET | SHELTER CLUSTER 3 |
| 2 | 22"X20.5" FLAME POT - MEXICAN HANDPAINTED CLAY | ORANGE | PLANTER & POTTERY OUTLET | SHELTER CLUSTER 3 |
| 1 | 22"X20.5" FLAME POT - MEXICAN HANDPAINTED CLAY | AQUA | PLANTER & POTTERY OUTLET | SHELTER CLUSTER 3 |
| 1 | 22"X20.5" FLAME POT - MEXICAN HANDPAINTED CLAY | AQUA | PLANTER & POTTERY OUTLET | SHELTER CLUSTER 4 |
| 1 | 22"X20.5" FLAME POT - MEXICAN HANDPAINTED CLAY | ORANGE | PLANTER & POTTERY OUTLET | SHELTER CLUSTER 4 |
| 1 | 22"X20.5" FLAME POT - MEXICAN HANDPAINTED CLAY | GREEN | PLANTER & POTTERY OUTLET | SHELTER CLUSTER 4 |
| 1 | 22"X20.5" FLAME POT - MEXICAN HANDPAINTED CLAY | AVOCADO GREEN | PLANTER & POTTERY OUTLET | OFFICE |
| 1 | 22"X20.5" FLAME POT - MEXICAN HANDPAINTED CLAY | GREEN | PLANTER & POTTERY OUTLET | SEATING AREA |
| 1 | 22"X20.5" FLAME POT - MEXICAN HANDPAINTED CLAY | YELLOW | PLANTER & POTTERY OUTLET | SEATING AREA |

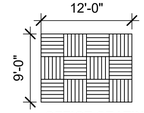
2 / L2.2 PLANTER SCHEDULE
NO SCALE
**BID ALT. B2**

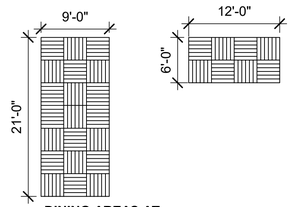


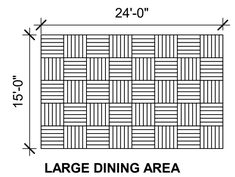




NOTES:
1. SEE PLAN FOR MURAL LOCATIONS AND ALIGNMENT
2. PAINT: SB120; COLORS: **TBD - UP TO 15 COLORS**; MANUFACTURER: STREETBOND, WWW.STREETBOND.COM, OR APPROVED EQUIVALENT
3. IN AREAS WHERE ASPHALT PATTERNS ARE TO BE PAINTED, WASH ASPHALT AND PATCH EXISTING ASPHALT WHERE NEEDED. APPLY ASPHALT PRIMER BEFORE PAINTING. APPLY CLEAR PROTECTIVE TOPCOAT AFTER PAINTING.
4. INSTALL PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS

3 / L2.2 PATTERNED PAINTED ASPHALT LAYOUT
1" = 10'-0"
**BID ALT. B3**

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LICENSED LANDSCAPE ARCHITECT
CHRISTOPHER W. KENT #6131
Signature
MAY 31, 2016
Renewal Date
OCT 9, 2023
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Issue Note:

BID SET

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|---|---|
| Project ID: | BSC |
| File Name: | |
| Drawn By: | EL |
| Review By: | CK |
| Plot Date: | |

Sheet Title:

LANDSCAPE DETAILS - 2

Sheet No.:

L2.2

NOTES:
1. PRODUCT: CHAIR 483 STEEL NO ARMS, 483-20HSNA; COLOR: VARIES, SEE SITE FURNISHINGS SCHEDULE; MANUFACTURER: DUMOR, WWW.DUMOR.COM OR APPROVED EQUIVALENT

1 L2.3 MOVABLE CHAIR
NOT TO SCALE
**BID ALT. B1**

NOTES:
1. PRODUCT: TATE OUTDOOR CHAISE LOUNGE; COLOR: BRUSH WHITE; MANUFACTURER: SUPPLIER ALLMODERN, WWW.ALLMODERN.COM OR APPROVED EQUIVALENT

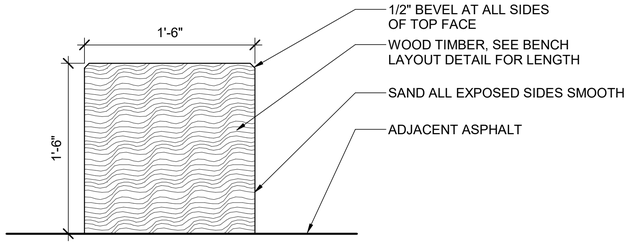
2 L2.3 LOUNGE CHAIR
NOT TO SCALE
**BID ALT. B1**

NOTES:
1. PRODUCT: LONG ISLAND 18" SIDE TABLE; COLOR: VARIES, SEE SITE FURNISHINGS SCHEDULE; MANUFACTURER: POLYWOOD, WWW.POLYWOOD.COM OR APPROVED EQUIVALENT

3 L2.3 SIDE TABLE
NOT TO SCALE
**BID ALT. B1**

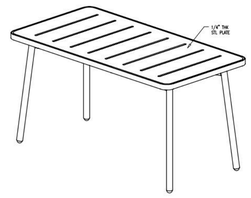
NOTES:
1. PRODUCT: ALLMODERN X POLYWOOD OVERSIZED ADIRONDACK CHAIR; COLOR: VARIES, SEE SITE FURNISHINGS SCHEDULE; MANUFACTURER: ALLMODERN OR APPROVED EQUIVALENT; CONTACT: WWW.ALLMODERN.COM

4 L2.3 ADIRONDACK CHAIR
NOT TO SCALE
**BID ALT. B1**



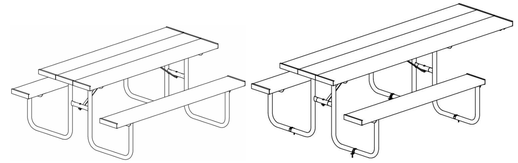

NOTES:
1. RECLAIMED EUCALYPTUS TO BE SOURCED FROM LOCAL TREE REMOVAL PROJECTS

5 L2.3 BENCH
1 1/2" = 1'-0"
**BID ALT. B1**



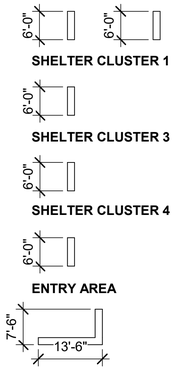

NOTES:
1. PRODUCT: 514 TABLE WITH SLOTTED STEEL TOP, 514-50HS; COLOR: VARIES, SEE SITE FURNISHINGS SCHEDULE; MANUFACTURER: DUMOR, WWW.DUMOR.COM, OR APPROVED EQUIVALENT

6 L2.3 MOVABLE TABLE
NOT TO SCALE
**BID ALT. B1**



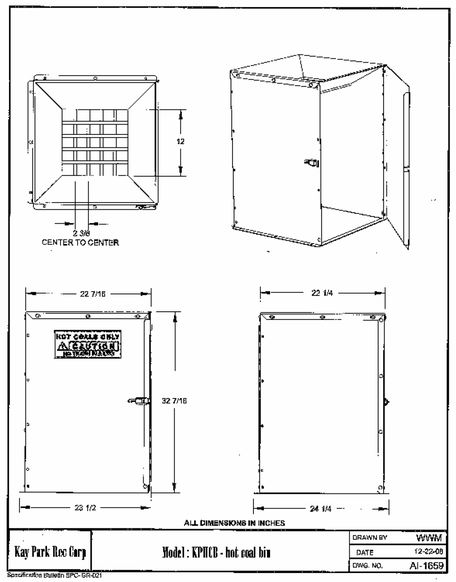

NOTES:
1. PRODUCTS: 6' TABLE 71, 71-60A; ACCESSIBLE TABLE, ADA PICNIC TABLE 71, 71-68-1A; MATERIAL: ALUMINUM; COLOR: POWDERCOAT, VARIES, SEE SITE FURNISHINGS SCHEDULE; MANUFACTURER: DUMOR, WWW.DUMOR.COM OR APPROVED EQUIVALENT

7 L2.3 PICNIC TABLE
NOT TO SCALE
**BID ALT. B1**



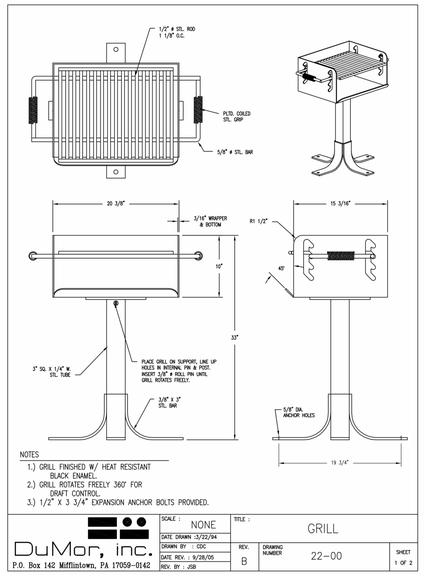

NOTES:
1. SEE PLAN FOR BENCH LOCATIONS AND ALIGNMENT

8 L2.3 BENCH LAYOUT
1/16" = 1'-0"
**BID ALT. B1**




NOTES:
1. PRODUCT: KPHCB - HOT COAL BIN; MANUFACTURER: KAY PARK REC CORP, WWW.KAYPARK.COM, OR APPROVED EQUIVALENT.
2. INSTALL PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

9 L2.3 CITY STANDARD HOT ASH RECEPTACLE
NOT TO SCALE
**BID ALT. B1**




NOTES:
1. PRODUCT: FREESTANDING GRILL 22-00; MANUFACTURER: DUMOR, INC., WWW.DUMOR.COM, OR APPROVED EQUIVALENT.
2. INSTALL PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

10 L2.3 CITY STANDARD BBQ GRILL
NOT TO SCALE
**BID ALT. B1**

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| Review By: | CK |
| Plot Date: | |

Sheet Title:

SITE FURNISHING DETAILS

Sheet No.:

L2.3

EXISTING OVAL PLANTER, TYP.

EXISTING ROUND PLANTER ~6', TYP.

EXISTING ROUND PLANTER ~4', TYP.

EXISTING ROUND PLANTER ~3', TYP.

NOTES:
1. SEE PLANTING PLANS FOR EXISTING PLANTERS AND PLANTS TO BE RETAINED
2. REMOVE EXISTING PLANT MATTER AND SOIL, WASH, AND PROTECT FOR INSTALLATION LATER
3. REMOVE AND REPLACE IN KIND ANY EXISTING PLANTERS WITH STRUCTURAL DAMAGE

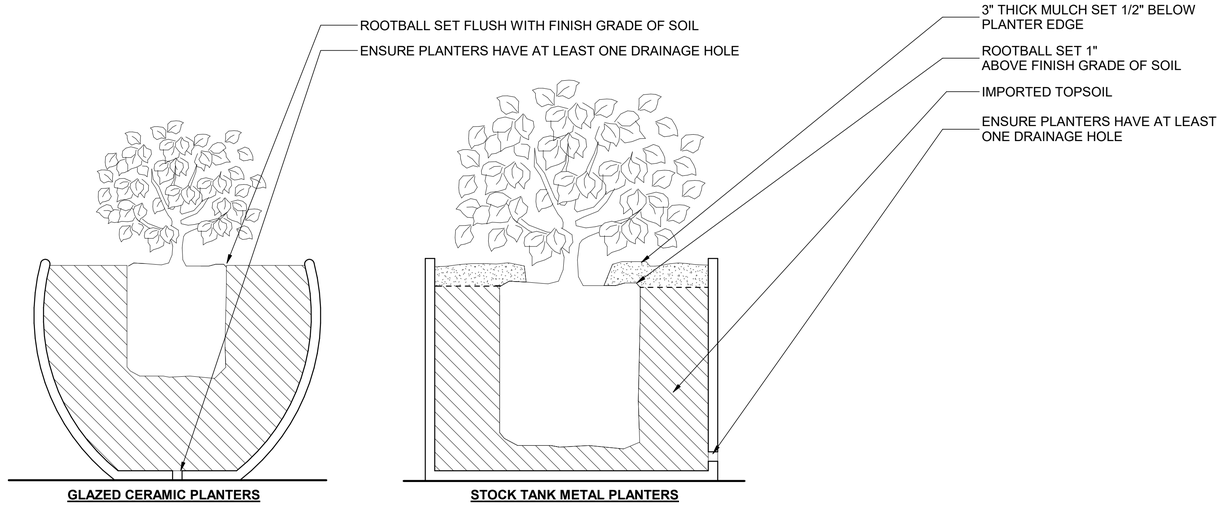
1 L2.4 EXISTING PLANTERS
NOT TO SCALE
**ADD. ALT. A1**

NOTES:
1. PRODUCT: MEXICAN HANDPAINTED CLAY FLAME POT; COLOR: VARIES, SEE PLANTER SCHEDULE; MANUFACTURER: PLANT AND POTTERY OUTLET OR APPROVED EQUIVALENT
2. SIZE: 25" DIAMETER X 23" H OR 22" DIAMETER X 20.5" H, SEE PLAN

2 L2.4 GLAZED CERAMIC PLANTERS
NOT TO SCALE
**BID ALT. B2**

NOTES:
1. PRODUCT: GALVANIZED STEEL STOCK TANK TO MATCH EXISTING; MANUFACTURER: BEHLEN COUNTRY OR APPROVED EQUIVALENT
2. SIZE, TO MATCH EXISTING PLANTERS:
   A. 8' L X 2' W X 2' H
   B. 4' L X 2' W X 2' H
   C. 6' DIAMETER ROUND X 2' H
   D. 4' DIAMETER ROUND X 2' H
   E. 3' DIAMETER ROUND X 2' H
3. INSTALL PER MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS

3 L2.4 STOCK TANK METAL PLANTERS
NOT TO SCALE
**BID ALT. B2**




**GLAZED CERAMIC PLANTERS**

**STOCK TANK METAL PLANTERS**

NOTES:
1. SET DRIP IRRIGATION TUBING 4" BELOW FINISH GRADE OF SOIL, NOTE THIS DEPTH DOES NOT INCLUDE MULCH DEPTH, SEE IRRIGATION PLANS.
2. ENSURE PLANTERS HAVE AT LEAST ONE DRAIN HOLE
3. STOCK TANK METAL PLANTERS TO HAVE DRAIN HOLE ON SIDE

4 L2.4 CONTAINER PLANTING
1 1/2" = 1'-0"
**BID ALT. B2**

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Issue Note:

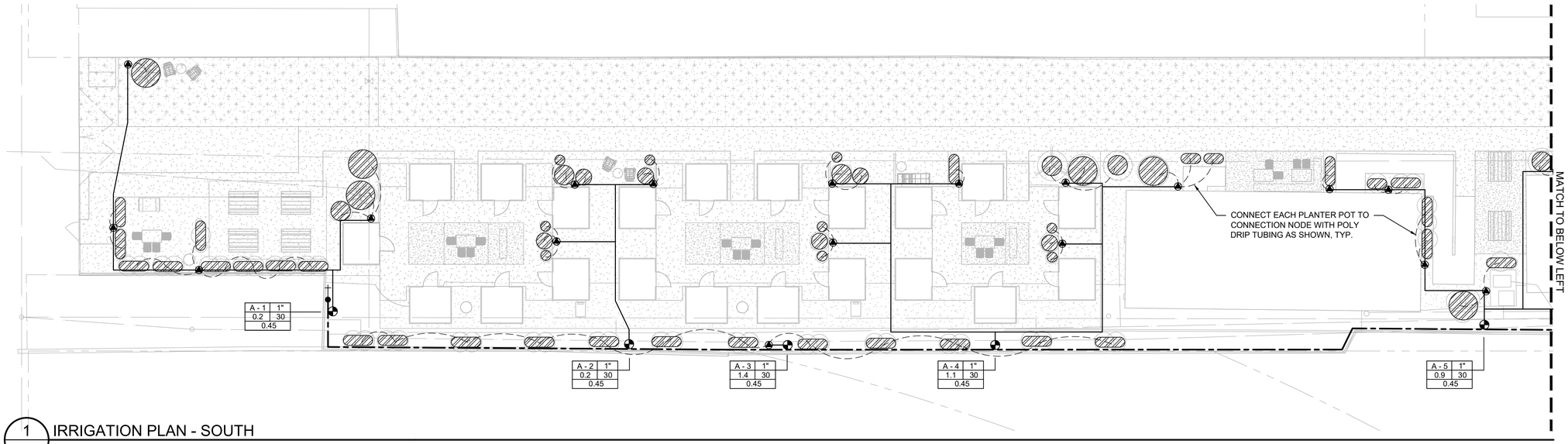
BID SET

Project ID: BSC
File Name:
Drawn By: EL
Review By: CK
Plot Date:
Sheet Title:

PLANTING DETAILS

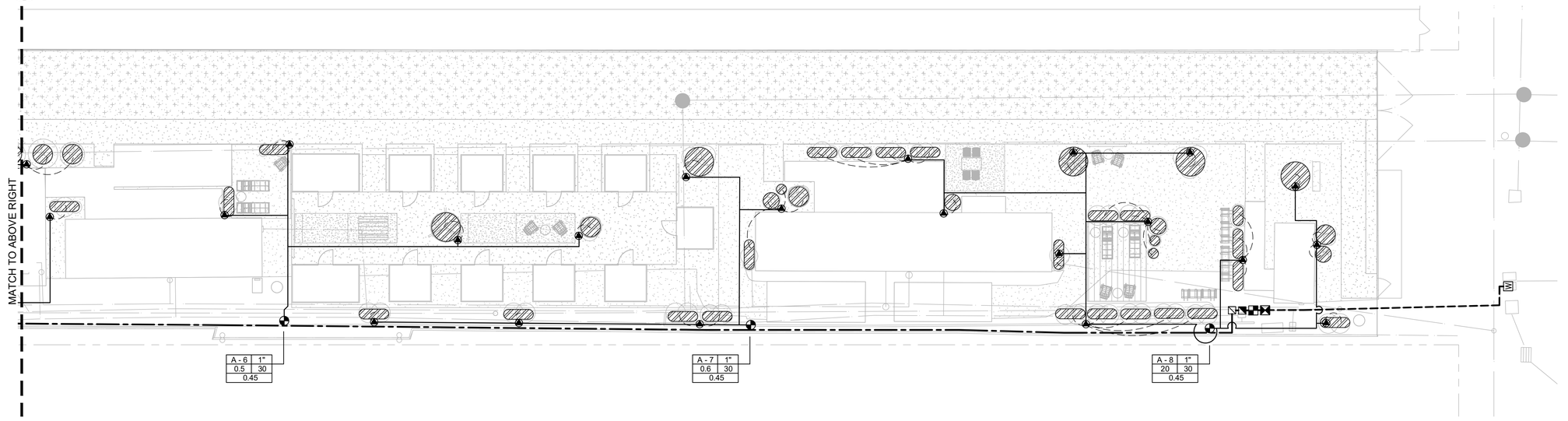
Sheet No.:

L2.4




1 L3.1 IRRIGATION PLAN - SOUTH

SCALE: 3/32" = 1'-0"




2 L3.2 IRRIGATION PLAN - NORTH

SCALE: 3/32" = 1'-0"

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LICENSED LANDSCAPE ARCHITECT
CHRISTOPHER W. KENT # 6369
Signature
MAY 31, 2024
Renewal Date
FEB 12, 2024
Date
STATE OF CALIFORNIA

| No. | Date | Issue |
|---|---|---|
| | 02/12/24 | BID SET |

Issue Note:

BID SET

02/12/24

Project ID: BSC

File Name:

Drawn By: BT

Review By: EM

Plot Date:

Sheet Title:

IRRIGATION PLAN

Sheet No.:

L3.1

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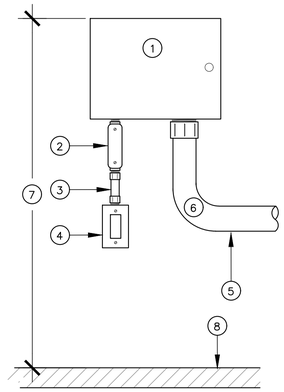
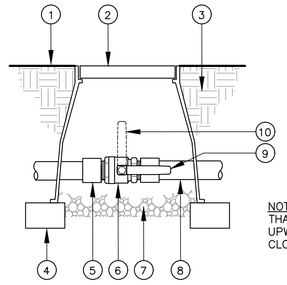



1. CONTROLLER
2. CONDUIT BODY TYPE L
3. EMT STEEL CONDUIT
4. 120 VOLT POWER SUPPLY WITH GFI POWER SWITCH
5. LOW VOLTAGE FIELD WIRING IN CONDUIT
6. LONG CONDUIT SWEEP
7. 5' OR AS DIRECTED
8. FINISH FLOOR

## 1 CONTROLLER - WALL MOUNT

SCALE: NTS

ADD. ALT. A1




1. FINISH GRADE
2. VALVE BOX
3. AMENDED PLANTER SOIL
4. BRICK, 2 REQ'D.
5. PVC MALE ADAPTER
6. BRONZE BALL VALVE
7. DRAIN ROCK
8. PVC MAINLINE
9. OPERATING HANDLE – OPEN POSITION
10. OPERATING HANDLE – CLOSED POSITION

NOTE: ORIENT BALL VALVE SUCH THAT OPERATING HANDLE POINTS UPWARD AS SHOWN WHEN IN CLOSED POSITION.

## 2 MAINLINE ISOLATION BALL VALVE

SCALE: NTS

ADD. ALT. A1

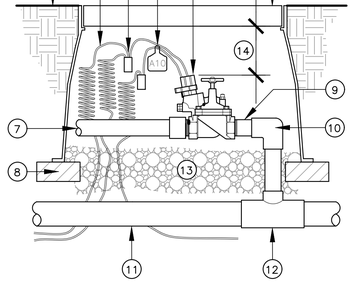
## IRRIGATION LEGEND

| | SYMBOL | MODEL | DESCRIPTION |
|---|---|---|---|
| ADD. ALT. A1 | Ⓐ | WTPRO3-C-H2O48-CWM | WEATHERTRAK ET PRO3 2-WIRE CONTROLLER, WALL MOUNT WITH CELLULAR COMMUNICATION AND ANTENNA |
| | | EXISTING | BACKFLOW PREVENTER TO REMAIN |
| ADD. ALT. A1 | | 2160 - 1" | GRISWOLD MASTER REMOTE CONTROL VALVE - NORMALLY OPEN |
| ADD. ALT. A1 | | WT-FS-100-CST | CST FLOW SENSOR |
| ADD. ALT. A1 | | 01002-00038 | AMIAD FILTER WITH STAINLESS STEEL 130 MICRON SCREEN |
| ADD. ALT. A1 | NOT SHOWN | T-585-70 | NIBCO FULL PORT BALL VALVE - LINE SIZE INSTALL ON MAINLINE SIDE OF EACH REMOTE CONTROL VALVE |
| ADD. ALT. A1 | | ICV-101 | HUNTER REMOTE CONTROL VALVE |
| ADD. ALT. A1 | | B401K | CHAMPION BENT NOSE GARDEN VALVE WITH REMOVABLE KEY - INSTALL ON STEEL POST |
| ADD. ALT. A1 | | | CONNECTION NODE FROM PVC LATERAL LINE TO POLYETHYLENE DRIP TUBING AT PLANTER CLUSTERS |
| ADD. ALT. A1 | | | MAINLINE: SCH 40 PVC SOLVENT WELD PIPE WITH SCH 40 PVC SOLVENT WELD FITTINGS-18" COVER, SIZE 1". |
| ADD. ALT. A1 | | | LATERAL LINE: SCH 40 PVC SOLVENT WELD PIPE WITH SCH 40 PVC SOLVENT WELD FITTINGS-12" COVER, SIZE 3/4". |
| BID ALT. B2 | | | POINT SOURCE DRIP IRRIGATION IN PLANTERS: 1/2" NOMINAL POLYETHYLENE TUBING WITH MATCHING COMPRESSION FITTINGS, HUNTER HE-10-B, 1 GPH EMITTERS, 1 EMITTER PER PLANT. |

CONTROLLER / STATION NUMBER
APPROXIMATE GPM THROUGH VALVE
APPROXIMATE PRECIPITATION RATE

| | |
|---|---|
| A - 1 | 1" |
| 20 | 30 |
| 0.25 | |

REMOTE CONTROL VALVE SIZE
DESIGN OPERATING PRESSURE



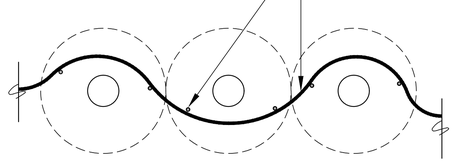

1. FINISH GRADE
2. CONTROL WIRES
3. WATERPROOF SPLICE
4. VALVE NUMBER TAG
5. REMOTE CONTROL VALVE
6. VALVE BOX
7. LATERAL LINE
8. BRICK, 4 REQ'D
9. SCH. 80 PVC NIPPLE, T.O.E.
10. SCH. 80 PVC ELL, SxT
11. MAINLINE
12. SCH. 40 PVC TEE OR ELL
13. DRAIN ROCK
14. 3" MINIMUM

NOTE: WRAP FILTER FABRIC AROUND AND UNDER VALVE BOX PRIOR TO INSTALLATION OF DRAIN ROCK.

## 3 REMOTE CONTROL VALVE

SCALE: NTS

ADD. ALT. A1




1. EMITTERS
2. DRIP LINE

NOTES:
1. INSTALL EMITTERS ON OPPOSITE SIDES OF ROOTBALLS OF EACH PLANT.
2. STAKE TUBING IN PLACE AND BURY AS NOTED IN SPECIFICATIONS.

## 4 DRIP EMITTERS

SCALE: NTS

BID ALT. B2

Project Title:

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SITE IMPROVEMENTS AND SHELTER UNITS

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IRRIGATION LEGEND & DETAILS

Sheet No.:

L3.2

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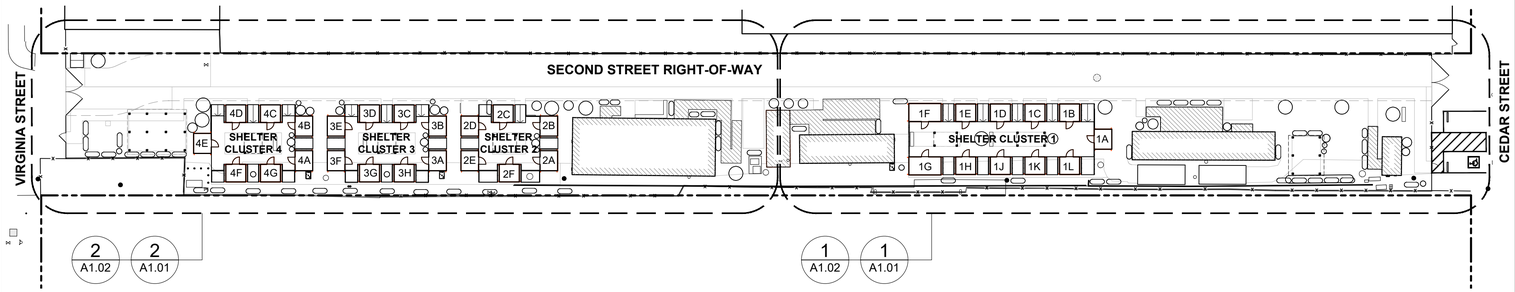


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## KEY PLAN

SCALE: N/A

| | |
|---|---|
| AB | ANCHOR BOLT; ABOVE |
| AC | ASPHALT CONCRETE |
| ACT | ACOUSTICAL CEILING TILE |
| ACOUS; ACST | ACOUSTIC |
| ADDL | ADDITIONAL |
| AFF | ABOVE FINISHED FLOOR |
| AFG | ABOVE FINISHED GRADE |
| AHD | AIR HAND DRYER |
| ALUM | ALUMINUM |
| APPROX | APPROXIMATE |
| ARCH | ARCHITECT |
| AV | AUDIO VISUAL |
| BB | BASEBOARD |
| BD | BOARD |
| BFP | BACK FLOW PREVENTER |
| BLDG | BUILDING |
| BO | BOTTOM OF |
| BOF | BOTTOM OF FIXTURE |
| BOT | BOTTOM |
| B PL | BASE PLATE |
| BTWN | BETWEEN |
| CAB | CABINET |
| CEM | CEMENTITIOUS |
| CER | CERAMIC |
| CJ | CONTROL JOINT |
| CL | CENTER LINE |
| CLG | CEILING |
| CLO | CLOSET |
| CLR | CLEAR |
| CMU | CONCRETE MASONRY UNIT |
| CNTR | COUNTER |
| COL | COLUMN |
| CONC | CONCRETE |
| CONT | CONTINUOUS |
| CONST | CONSTRUCTION |
| CPT | CARPET |
| CTR | CENTER |
| D | DRYER |
| DC | DIAPER CHANGING STATION |
| DET | DETAIL |
| DEMO | DEMOLITION |
| DF | DRINKING FOUNTAIN |
| DIA | DIAMETER |
| DIM | DIMENSION |
| DOUG FIR | DOUGLAS FIR |
| DG | DECOMPOSED GRANITE |
| DN | DOWN |
| DW | DISHWASHER |
| DWG | DRAWING |
| DS | DOWNSPOUT |
| E | EAST |
| (E)EXIST | EXISTING |
| EA | EACH |
| ECU | EVAPORATIVE COOLING UNIT |
| EJ | EXPANSION JOINT |
| EL | ELEVATION |
| ELEC | ELECTRICAL |
| EQ | EQUAL |
| EW | EACH WAY |
| EXP | EXPANSION |
| EXT | EXTERIOR |
| FE | FIRE EXTINGUISHER |
| FFE | FINISH FLOOR ELEVATION |
| FD | FLOOR DRAIN |
| FDC | FIRE DEPARTMENT CONNECTION |
| FHMS | FLAT HEAD METAL SCREW |
| FIN | FINISH |
| FIN FLR | FINISH FLOOR |
| FIXT | FIXTURE |
| FLASH | FLASHING |
| FLUOR | FLUORESCENT |
| FDTN | FOUNDATION |
| FO | FACE OF |
| FOC | FACE OF CONCRETE |
| FOF | FACE OF FINISH |
| FOS | FACE OF STUD |
| FLR | FLOOR |
| FPL | FIREPLACE |
| FRP | FIBERGLASS REINFORCED PLASTIC |
| FT | FOOT OR FEET |
| FTG | FOOTING |
| FURG | FURRING |
| GA | GAUGE |
| GALV | GALVANIZED |
| GB | GRAB BAR |
| GFCI | GROUND FAULT CIRCUIT INTERRUPTER |
| GL | GLASS |
| GLU LAM | GLUED LAMINATED LUMBER |
| GSM | GALVANIZED SHEET METAL |
| GYP BD | GYPSUM BOARD |
| HB | HOSE BIBB |
| HCWD | HOLLOW CORE WOOD DOOR |
| HD | HAND DRYER |
| HDR | HEADER |
| HDW | HARDWARE |
| HDWD | HARDWOOD |
| HMD | HOLLOW METAL DOOR |
| HORZ; HORIZ | HORIZONTAL |
| HR | HOUR |
| ID | INSIDE DIAMETER |
| INS; INSUL | INSULATION |
| INT | INTERIOR |
| ISO | ISOMETRIC |
| JAN CLO | JANITOR CLOSET |
| J-BOX | JUNCTION BOX |
| JT | JOINT |
| KIT | KITCHEN |
| KPL | KICK PLATE |
| LAM GL | LAMINATED GLASS |
| LAV | LAVATORY |
| LINO | LINOLEUM |
| LT | LIGHT |
| MAX | MAXIMUM |
| MC | MEDICINE CABINET |
| MECH | MECHANICAL |
| MEMB | MEMBRANE |
| MFR; MNFR | MANUFACTURER |
| MIN | MINIMUM |
| MIR | MIRROR |
| MISC | MISCELLANEOUS |
| MTD | MOUNTED |
| MTL | METAL |
| MW | MICROWAVE |
| N | NORTH |
| (N) | NEW |
| NA | NOT AVAILABLE |
| NIC | NOT IN CONTRACT |
| NOM | NOMINAL |
| NR | NOT RATED |
| NTS | NOT TO SCALE |
| O/ | OVER |
| OC | ON CENTER |
| OD | OUTSIDE DIAMETER |
| OPNG | OPENING |
| OPP | OPPOSITE |
| PERF | PERFORATED |
| PL | PROPERTY LINE |
| PLAS | PLASTER |
| PLAM | PLASTIC LAMINATE |
| PLBG | PLUMBING |
| PLYWD | PLYWOOD |
| PR | PAIR |
| PT | PRESSURE TREATED |
| PTD | PAPER TOWEL DISPENSER; PAINTED |
| PV | PHOTOVOLTAIC |
| R | RISER; RADIUS |
| RCP | REFLECTED CEILING PLAN |
| REC | RECOMMENDED |
| REQD | REQUIRED |
| REF | REFRIGERATOR |
| REV | REVERSE |
| RH | ROBE HOOK |
| RM | ROOM |
| RO | ROUGH OPENING |
| RWL | RAIN WATER LEADER |
| S | SOUTH |
| SC | SOLID CORE; SHOWER CURTAIN |
| SCD | SEE CIVIL DRAWINGS |
| SCHED | SCHEDULE |
| SD | SMOKE DETECTOR; SOAP DISPENSER |
| SED | SEE ELECTRICAL DRAWINGS |
| SF | SQUARE FOOT (FEET) |
| SFAD | SEE FIRE ALARM DRAWINGS |
| SFSD | SEE FOOD SERVICE DRAWINGS |
| SG | SAFETY GLAZING |
| SHT | SHEET |
| SIM | SIMILAR |
| SLD | SEE LANDSCAPE DRAWINGS |
| SMD | SEE MECHANICAL DRAWINGS |
| SND | SANITARY NAPKIN DISPENSER |
| SPD | SEE PLUMBING DRAWINGS |
| SPVD | SEE PHOTOVOLTAIC DRAWINGS |
| SQ | SQUARE |
| SR | SHOWER ROD |
| SS | SHOWER SEAT |
| SSD | SEE STRUCTURAL DRAWINGS |
| SST; SSTL | STAINLESS STEEL |
| STD | STANDARD |
| STL | STEEL |
| STRUCT | STRUCTURAL |
| SYMM | SYMMETRICAL |
| T | TREAD |
| TB | TOWEL BAR |
| TEL | TELEPHONE |
| THK | THICK |
| THRU | THROUGH |
| TO | TOP OF |
| TOS | TOP OF SLAB |
| TTD, | TOILET TISSUE DISPENSER |
| TS | TUBE STEEL |
| TYP | TYPICAL |
| T&G | TONGUE & GROOVE |
| TV | TELEVISION |
| UO | UNDERSIDE OF |
| UON | UNLESS OTHERWISE NOTED |
| UR | URINAL |
| UTIL | UTILITY |
| VAR | VARIES |
| VERT | VERTICAL |
| VG | VERTICAL GRAIN |
| VIF | VERIFY IN FIELD |
| W | WEST |
| W/ | WITH |
| WC | WATER CLOSET |
| W/IN | WITHIN |
| WO | WHERE OCCURS |
| W/O | WITHOUT |
| WD | WOOD |
| WDW | WINDOW |
| WH | WATER HEATER |
| WP | WATER PROOF; WATERPROOFING |
| WR | WASTE RECEPTACLE |
| WWM | WELDED WIRE MESH |

1 A0.00

## ABBREVIATIONS

SCALE: N/A

MATERIALS:

- WOOD BLOCKING OR SHIM
- WOOD CONTINUOUS FRAMING
- FINISH WOOD TRIM & FASCIA
- CONCRETE
- STEEL/ALUMINUM
- SOIL
- GRAVEL

3 A0.00

## MATERIALS SYMBOLS

SCALE: N/A

ARCHITECTURAL:

- ELEVATION: X= DRAWING NUMBER; XX.XX= SHEET NUMBER
- INTERIOR ELEVATION: X= DRAWING NUMBER; XX.XX= SHEET NUMBER
- SECTION: X= DRAWING NUMBER; XX.XX= SHEET NUMBER
- DETAIL: X= DRAWING NUMBER; XX.XX= SHEET NUMBER
- KEYNOTE NUMBER
- ELEVATION MARKER
- INDICATION OF SLOPE
- INDICATION OF FLOOR FINISH CHANGE
- DIMENSIONS: CENTERLINE
- DIMENSIONS: FACE OF FINISH; FOF
- DIMENSIONS: FACE OF STRUCTURE

2 A0.00

## GRAPHIC SYMBOLS

SCALE: N/A

Project Title:

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SITE IMPROVEMENTS AND SHELTER UNITS

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info@siegelstrain.com
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Consultant:

LICENSED ARCHITECT
MARJORIE SMITH
C 29241
08-31-25
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Issue Note:

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09/21/22

Project ID: BSC

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Drawn By:

Review By:

Plot Date:

Sheet Title:

ARCHITECTURAL COVER SHEET

Sheet No.:

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SHEET NOTES

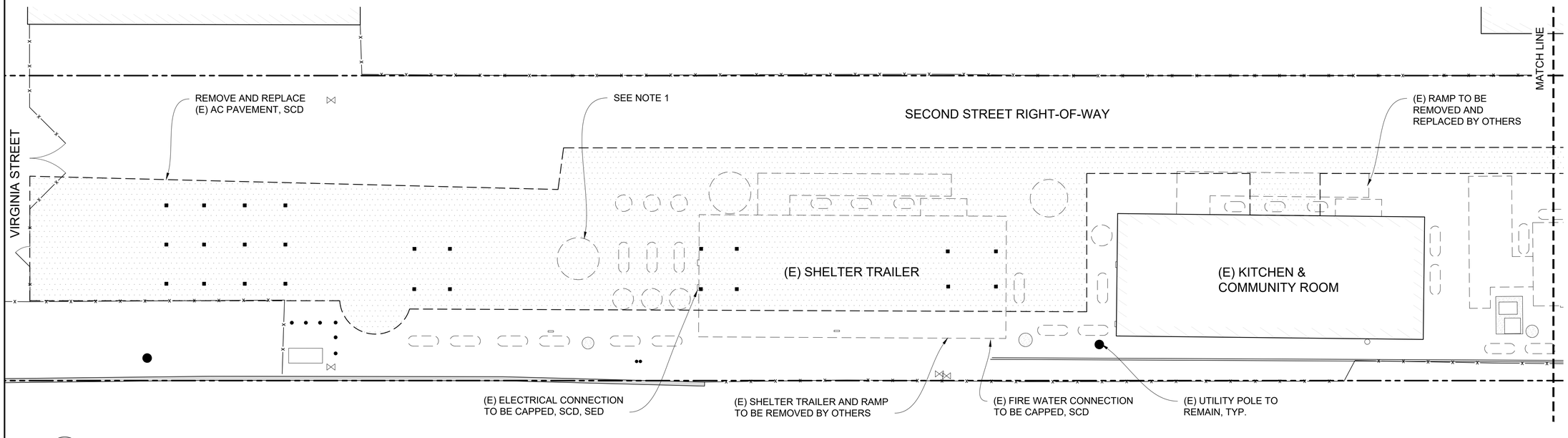
1. EXISTING PLANTERS TO BE SALVAGED AND REINSTALLED. SEE LANDSCAPE DRAWINGS FOR PLANTERS TO BE EMPTIED AND PLANTS TO BE RETAINED AND TRANSPLANTED. **ADD ALT. A1**

LEGEND

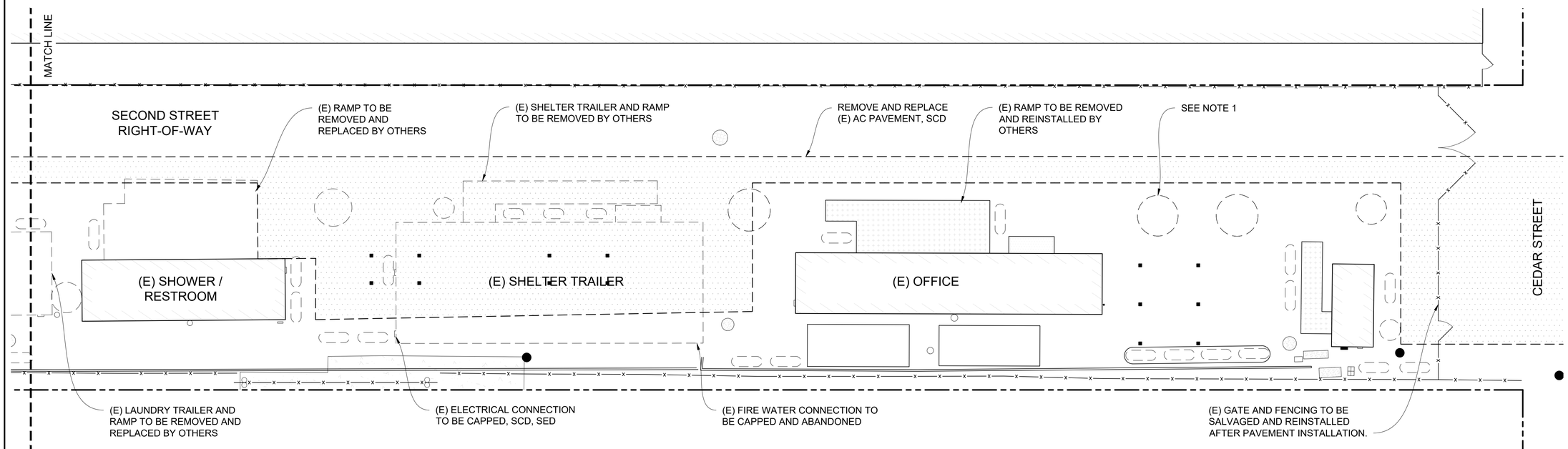
EXTENT OF AC PAVEMENT TO BE REMOVED AND REPLACED, SCD

Scale 8 16 24 ft.

N




2 A1.01 DEMO SITE PLAN - SOUTH
SCALE: 3/32" = 1'-0"




1 A1.01 DEMO SITE PLAN - NORTH
SCALE: 3/32" = 1'-0"

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09/21/22

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|---|---|
| Project ID: | BSC |
| File Name: | XA-SITE DEMO |
| Drawn By: | HL |
| Review By: | MS |
| Plot Date: | |

Sheet Title:

DEMO SITE PLAN

Sheet No.:

A1.01

10/10/2023 12:13:40 AM

SHEET NOTES (X)

1. (N) 64SF SHELTER, TYP., SEE SH2.01A AND GENERAL NOTE 1.
2. (N) 2-3/4" RAISED ASPHALT PAVING, SCD, TYP.
3. 1/4" MAX THRESHOLD AT SHELTERS, TYP., SEE 4/A8.01.
4. (N) LIGHT POLE, MATCH EXSTING
5. (E) LIGHT POLE
6. (N) ELECTRICAL PANEL ON CONCRETE PAD, SED
7. FREESTANDING PERGOLA WITH SUNSHADE, SLD. 8' HEIGHT, SEE PLAN FOR DIMENSIONS. SEE 1/A8.02 FOR ANCHORAGE DETAIL. **BID ALT. B6**
8. WEATHERPROOF FREESTANDING PERGOLA, SLD, A2.01 - A2.02, A8.02. **BID ALT. B7**.
9. RAMP OR STAIR BY OTHERS
10. (N) ACCESSIBLE ENTRANCE SIGN, SEE 1/A8.01.
11. (N) MONUMENTAL WAYFINDING SIGN, SEE 10/A8.01.
12. (N) ACCESSIBLE PARKING WARNING SIGN, SCD
13. (N) RAISED COURTYARD EDGE TREATMENT, SCD, TYP.
14. (N) AND (E) PLANTERS TYP. SEE LANDSCAPE DRAWINGS FOR TRANSPLANT AND RELOCATION NOTES. **ADD ALT A1, BID ALT B2.**

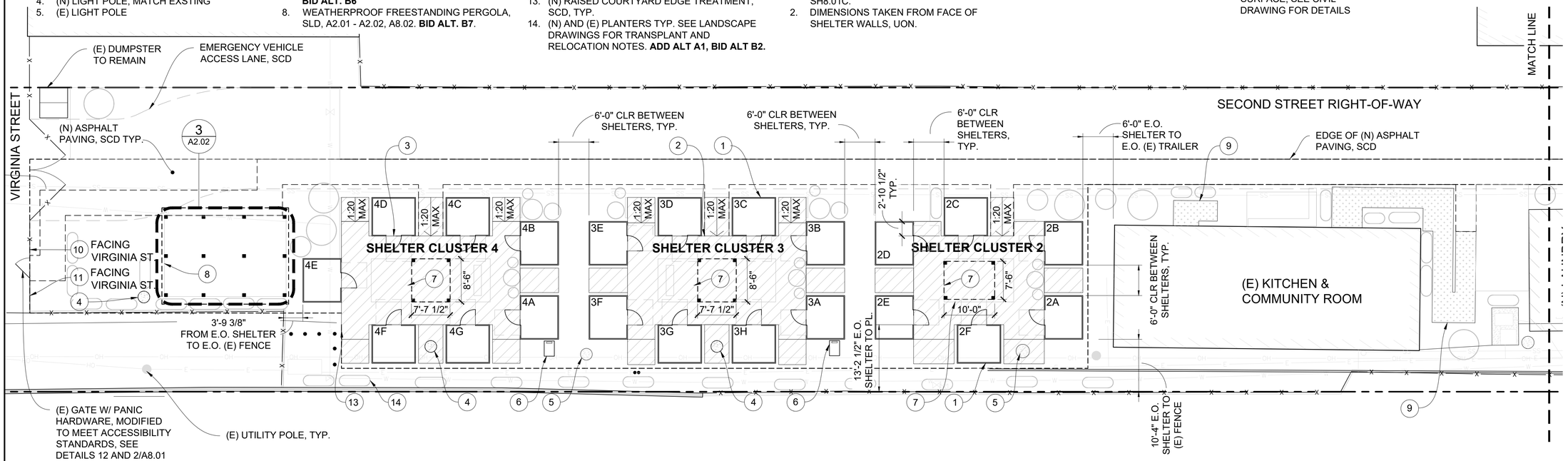
GENERAL NOTES

1. PALLET SHELTERS SECURED AT EACH CORNER WITH TIE DOWN ASPHALT ANCHOR #59367. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION DETAILS, SEE SH8.01C.
2. DIMENSIONS TAKEN FROM FACE OF SHELTER WALLS, UON.
3. CONTRACTOR TO LAYOUT ALL SHELTER STAKING LOCATIONS AND COORDINATE WITH EXISTING AND NEW UTILITIES, SCD.

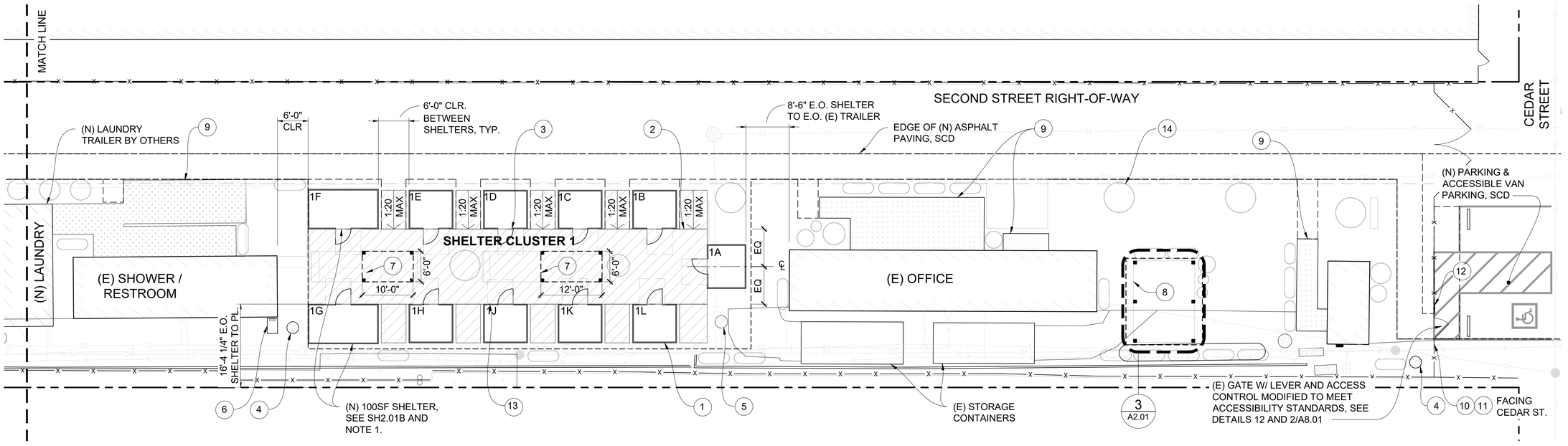
LEGEND

- MODULAR RAMP, BY OTHERS
- RAISED COURTYARD SURFACE, SEE CIVIL DRAWING FOR DETAILS

Scale 8 16 24 ft. N




2 A1.02 SITE PLAN - SOUTH
SCALE: 3/32" = 1'-0"




1 A1.02 SITE PLAN - NORTH
SCALE: 3/32" = 1'-0"

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09/21/22

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|---|---|
| Project ID: | BSC |
| File Name: | XA-SITE |
| Drawn By: | HL |
| Review By: | MS |
| Plot Date: | |

Sheet Title:

SITE PLAN

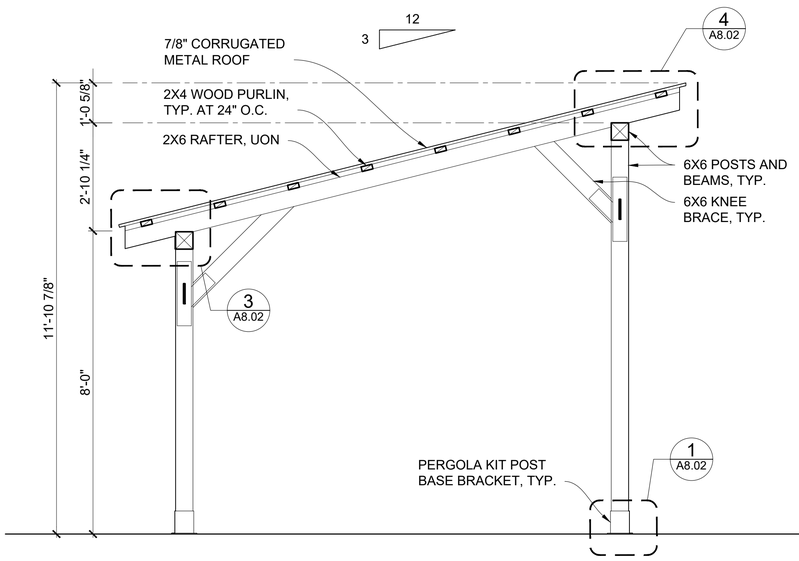
Sheet No.:

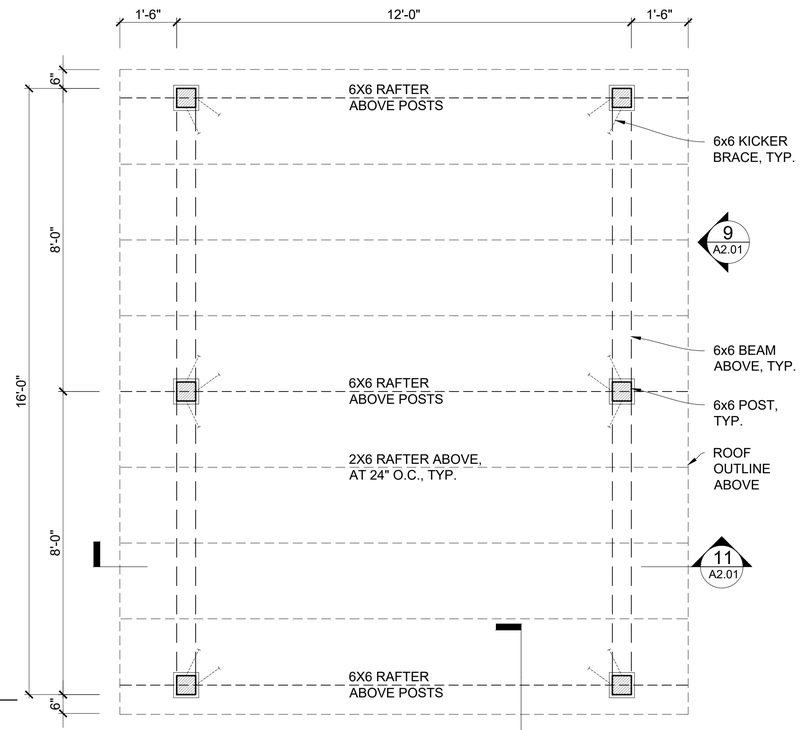
A1.02

2/9/2024 4:53:23 PM

SHEET NOTES

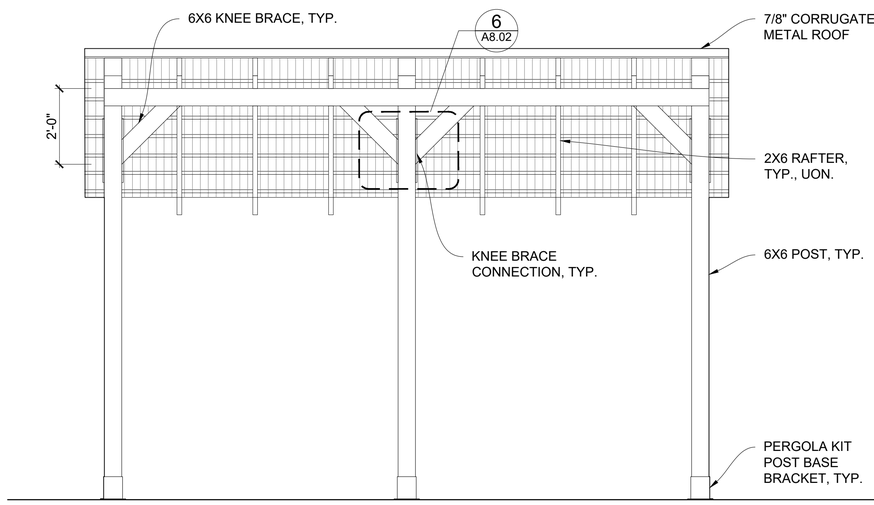
1. SEE A8.02 FOR ALL WEATHERPROOF FREESTANDING PERGOLAS SPECIFICATIONS.

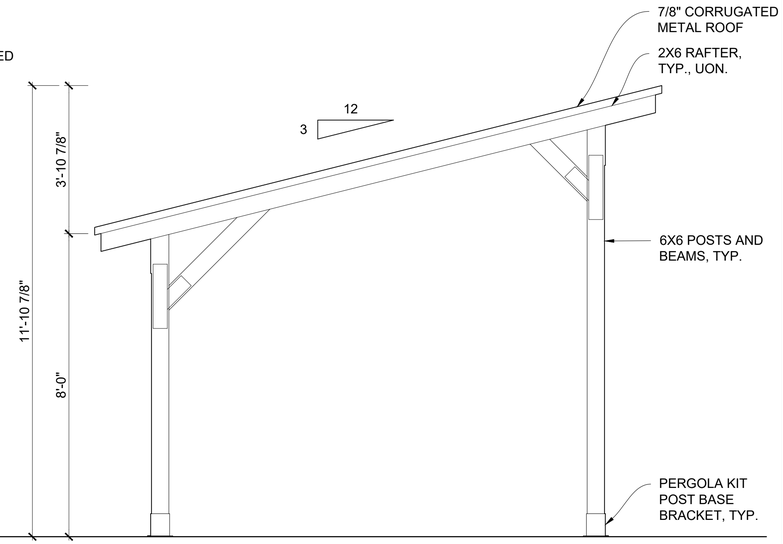



11 A2.01 SECTION - CEDAR ST PERGOLA
SCALE: 1/2" = 1'-0"

3 A2.01 FLOOR PLAN - CEDAR ST PERGOLA
SCALE: 1/2" = 1'-0"




9 A2.01 NORTH ELEVATION - CEDAR ST PERGOLA
SCALE: 1/2" = 1'-0"

1 A2.01 EAST ELEVATION - CEDAR ST PERGOLA
SCALE: 1/2" = 1'-0"

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

1601 SECOND STREET, BERKELEY, CA 94710

APN #: 57-2112-5


Design Firm:

SIEGEL & STRAIN Architects
6201 Doyle Street, Suite B
Emeryville, CA 94608
510 / 547-8092
info@siegelstrain.com
www.siegelstrain.com

Consultant:


LICENSED ARCHITECT
MARJORIE SMITH
C 29241
08-31-25
STATE OF CALIFORNIA

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |
| | 10/9/23 | BID SET |
| | 02/12/24 | BID SET |

Issue Note:

PERMIT SET

09/21/22

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| Project ID: | BSC |
| File Name: | XA-PLAN |
| Drawn By: | HL |
| Review By: | MS |
| Plot Date: | |

Sheet Title:

CEDAR ST PERGOLA - PLAN, SECTION, ELEVATIONS
**BID ALT. B7**

Sheet No.:

# A2.01

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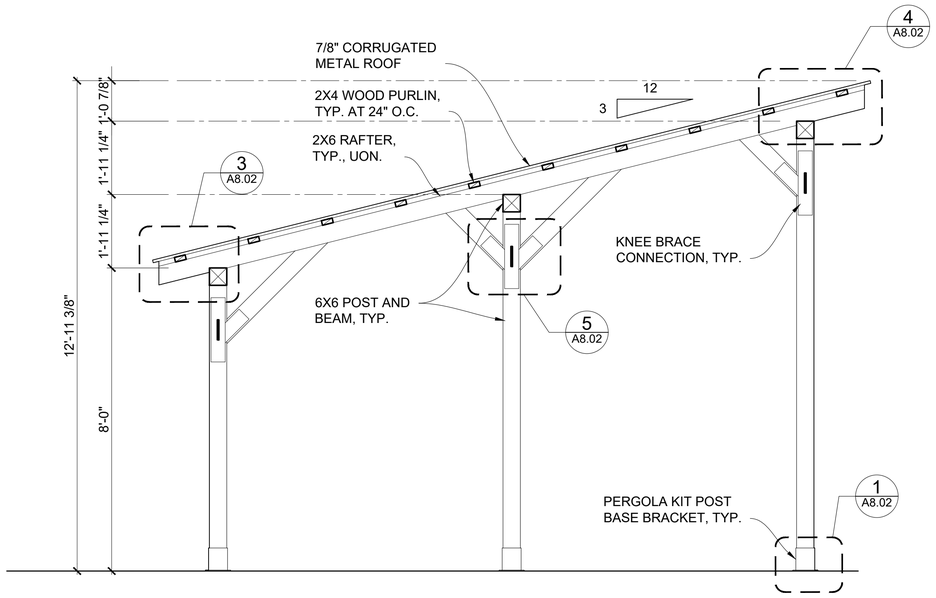
SHEET NOTES

1. SEE A8.02 FOR ALL WEATHERPROOF FREESTANDING PERGOLAS SPECIFICATIONS.




15 A2.02 SECTION - VIRGINIA ST PERGOLA
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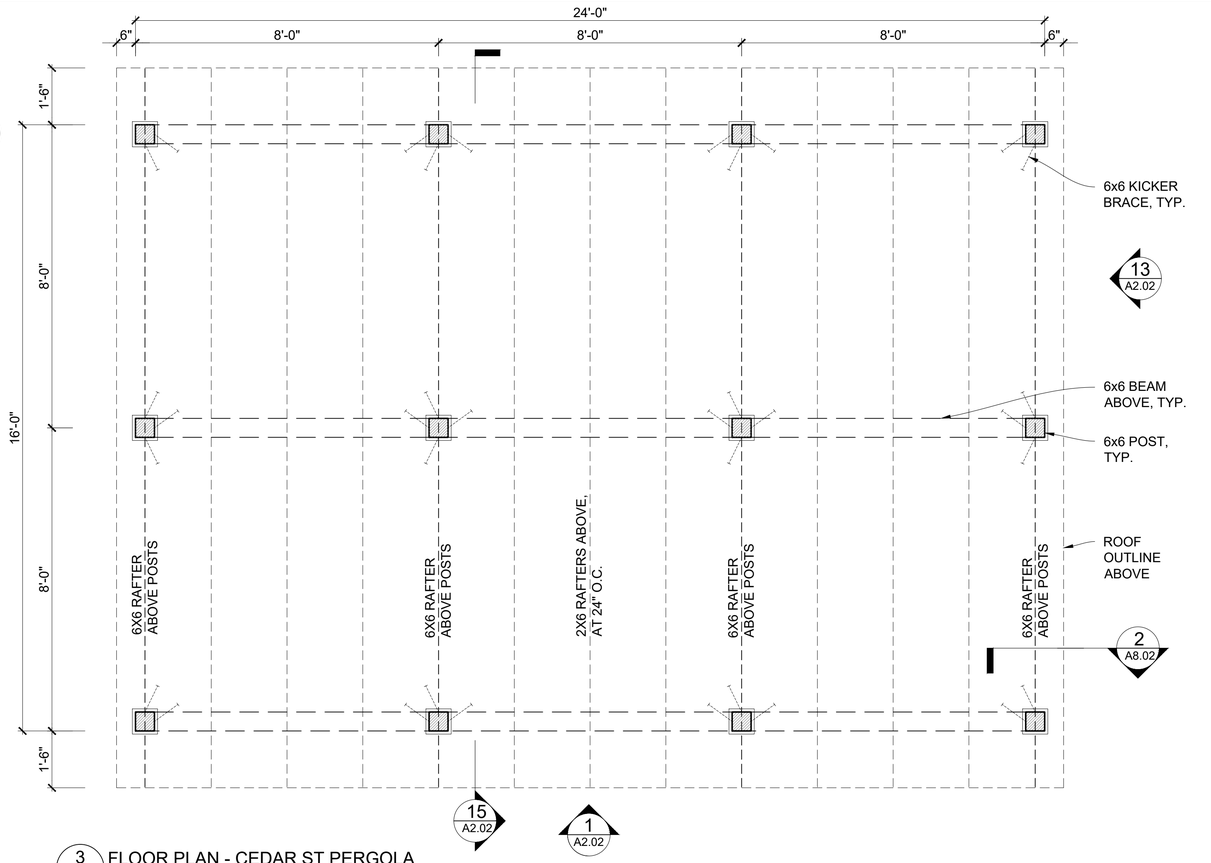


3 A2.02 FLOOR PLAN - CEDAR ST PERGOLA
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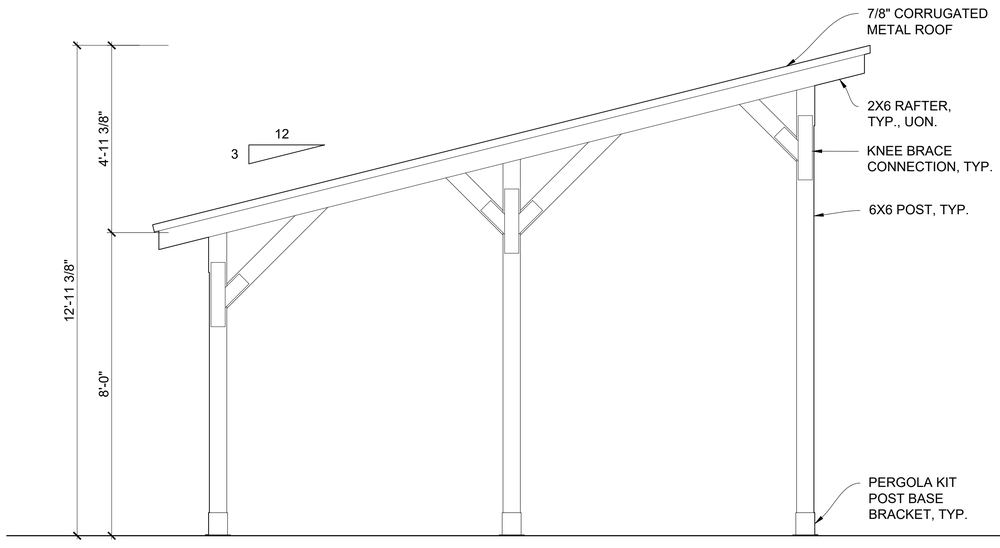


13 A2.02 NORTH ELEVATION - VIRGINIA ST PERGOLA
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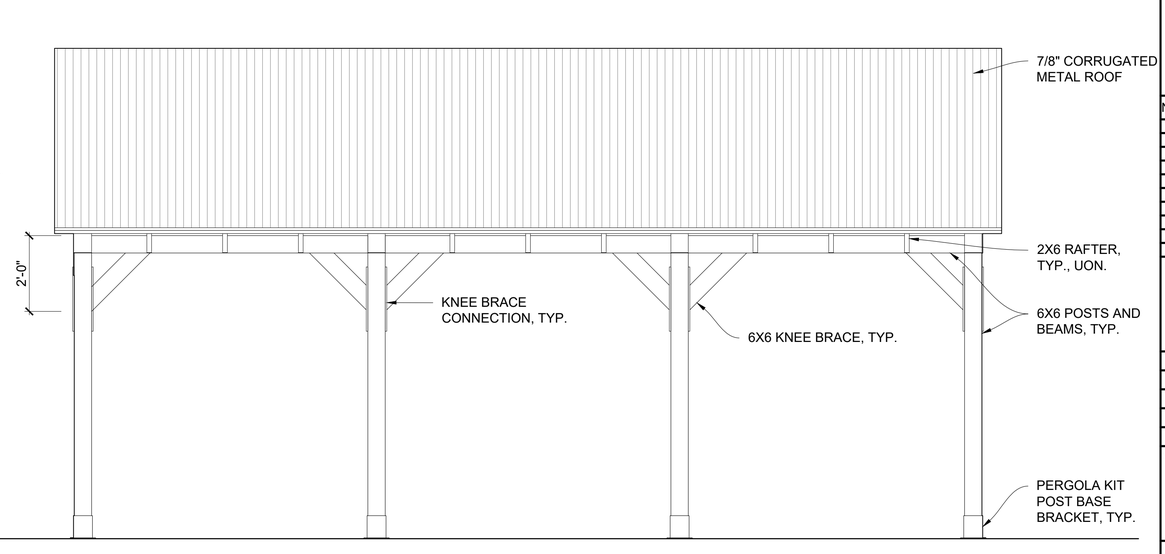


1 A2.02 EAST ELEVATION - VIRGINIA ST PERGOLA
SCALE: 1/2" = 1'-0"

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Issue Note:

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09/21/22

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| Project ID: | BSC |
| File Name: | XA-PLAN |
| Drawn By: | HL |
| Review By: | MS |
| Plot Date: | |

Sheet Title:

VIRGINIA ST PERGOLA - PLAN, SECTION, ELEVATIONS
**BID ALT. B7**

Sheet No.:

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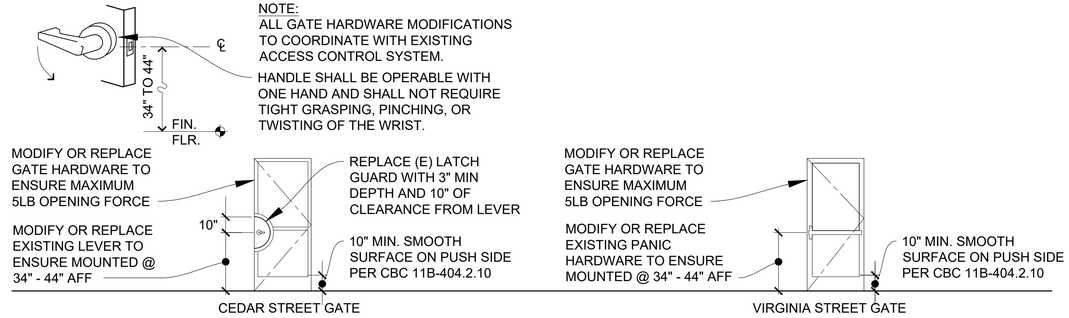


12 A8.01 GATE HARDWARE REQUIREMENTS
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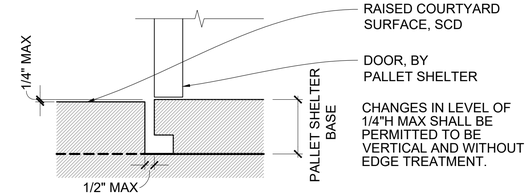


4 A8.01 THRESHOLD DETAIL
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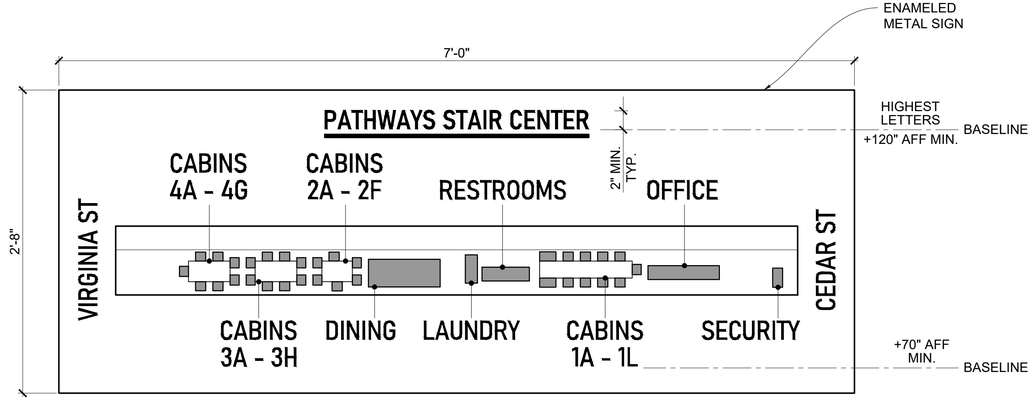


10 A8.01 WAYFINDING MONUMENT SIGNAGE
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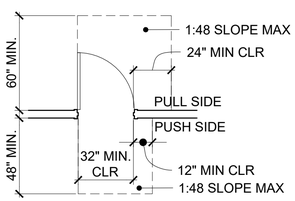
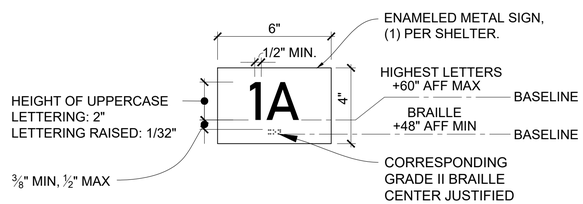



NOTES:
1. PROVIDE 36" WIDE GATES WITH 32" MIN. CLEAR OPENINGS AS MEASURED WITH THE GATE OPENED AT 90 DEGREES.
2. PROVIDE A LEVEL AND CLEAR AREA AT MANEUVERING CLEARANCES AT GATES.

2 A8.01 SWINGING GATE CLEARANCES
NO SCALE




5 A8.01 SHELTER IDENTIFICATION SIGNAGE
NO SCALE

1 A8.01 ACCESSIBLE ENTRANCE SIGNAGE
NO SCALE

Project Title:

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09/21/22

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| Drawn By: | HL |
| Review By: | MS |
| Plot Date: | |

Sheet Title:

SITE DETAILS

Sheet No.:

A8.01

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**NOTES - WEATHERPROOF FREESTANDING PERGOLA (BID ALT B7)**

**GENERAL NOTES**

1. BEAMS, JOISTS AND ANY OTHER STRUCTURAL ELEMENTS SHALL NOT BE CUT OR PENETRATED, EXCEPT AS SHOWN IN STRUCTURAL DETAILS OR AS APPROVED BY THE ARCHITECT AND THE STRUCTURAL ENGINEER.

2. THE CONTRACTOR SHALL FOLLOW ALL INSTRUCTIONS, RECOMMENDATIONS AND SAFETY PRECAUTIONS PROVIDED BY THE MANUFACTURER OR SUPPLIER OF ANY MATERIAL OR PRODUCT NOTED IN GENERAL NOTES OR DRAWINGS.

**DESIGN CRITERIA**

1. VERTICAL LOADS:
   - A. DEAD LOADS:
     ROOF DEAD LOAD: 5 PSF
   - B. LIVE LOADS:
     ROOF LIVE LOAD: 20 PSF

2. LATERAL LOADS:
   - A. WIND DESIGN LOADS – PER CBC SECTION 1609:
     BASIC WIND SPEED 92 MPH
     EXPOSURE CATEGORY B
   - B. SEISMIC DESIGN – PER CBC SECTION 1613
     RISK CATEGORY I
     SEISMIC DESIGN CATEGORY D
     SITE CLASS D
     FUNDAMENTAL PERIOD T = 8 SECONDS
     BASIC LATERAL FORCE RESISTING SYSTEM - TIMBER FRAME CANTILEVER COLUMN SYSTEM

| | |
|---|---|
| MAPPED SHORT PERIOD ACCELERATION | Ss = 21.91 g |
| SITE COEFFICIENT | Fa = 1.2 |
| DESIGN SHORT PERIOD ACCELERATION | SDS = 1.53 g |
| MAPPED ONE SECOND PERIOD ACCELERATION | S1 = 0.73 g |
| SITE COEFFICIENT | Fv = 1.57 |
| DESIGN ONE SECOND ACCELERATION | SD1 = 0.76 g |
| RESPONSE MODIFICATION FACTOR | R = 1.5 |
| IMPORTANCE FACTOR | I = 1.0 |

SEISMIC RESPONSE COEFFICIENT, (SDS*I/R)
Cs = 1.018 - JOHN ASH RESTAURANT (LRFD)

**TESTS, INSPECTIONS AND OBSERVATIONS NOTES**

1. TESTS AND INSPECTIONS SHALL BE PROVIDED FOR ALL ITEMS AS REQUIRED BY THE CALIFORNIA BUILDING CODE.

2. SEE STATEMENT OF SPECIAL INSPECTIONS, WHEN INCLUDED, FOR SPECIAL INSPECTION REQUIREMENTS.

3. THE FOLLOWING ITEMS SHALL HAVE SPECIAL INSPECTION.
   - A. CONCRETE PLACEMENT
   - B. POST INSTALLED ANCHORS IN CONCRETE/ ASPHALT-EXPANSION ANCHORS, EPOXY ANCHORS, ETC.

4. THE OWNER SHALL BE RESPONSIBLE FOR RETAINING AN INDEPENDENT TESTING AND INSPECTION LABORATORY TO PERFORM ALL REQUIRED TESTING AND INSPECTIONS.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE TESTING AND INSPECTION LABORATORY WITH CONSTRUCTION SCHEDULES TO ENSURE PROPER COORDINATION OF WORK.

THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OR INSPECTOR A MINIMUM OF 48 HOURS (EXCLUDING WEEKEND DAYS) PRIOR TO THE TIME OF A REQUIRED INSPECTION OR OBSERVATION.

**CARPENTRY NOTES**

1. FRAMING LUMBER: DOUGLAS FIR-LARCH, MANUFACTURED AND GRADED IN ACCORDANCE WITH THE WEST COAST LUMBER INSPECTION BUREAU "STANDARD GRADING RULES NO. 17", LATEST EDITION INCLUDING ALL SUPPLEMENTS.
   - STRUCTURAL LIGHT FRAMING: NO. 1, 2" TO 4" THICK
   - BEAMS: NO. 1, FREE OF HEART CENTER, 5" AND THICKER
   - POSTS: NO. 1

2. ALL FRAMING LUMBER SHALL HAVE A MAXIMUM MOISTURE CONTENT OF 19 PERCENT AT TIME OF INSTALLATION. LUMBER USED IN WALLS AND FLOORS SHALL HAVE A MAXIMUM MOISTURE CONTENT OF 19% AT THE TIME OF CLOSURE.

3. LAG SCREWS SHALL BE SCREWED (NOT DRIVEN) INTO PLACE. DRILL HOLES SAME DIAMETER AND DEPTH AS SHANK. THEN DRILL HOLE 60-70% OF DIAMETER AT BASE OF THREAD FOR THE THREADED PORTION. USE STEEL PLATE WASHERS AS REQUIRED FOR THE SAME BOLT SIZE.

4. BOLTS IN WOOD SHALL BE MACHINE BOLTS UNLESS OTHERWISE NOTED. ALL MACHINE BOLTS SHALL HAVE CUT THREADS.

5. BOLT HOLES IN WOOD AND STEEL SHALL BE THE DIAMETER OF THE BOLT PLUS 1/16".

6. PROVIDE PLATE WASHER UNDER HEAD AND NUT OF BOLT WHERE BEARING IS AGAINST WOOD. LENGTH OF THREAD SHALL BE SUCH THAT THREADS DO NOT BEAR AGAINST WOOD. ALL NUTS SHALL BE TIGHTENED WHEN PLACED AND RE-TIGHTENED AT COMPLETION OF THE JOB IMMEDIATELY BEFORE CLOSING WITH FINISH CONSTRUCTION.

7. CONNECTORS FOR WOOD CONSTRUCTION NOTED ON PLANS AND DETAILS SHALL BE SIMPSON COMPANY STRONG-TIE CONNECTORS OR APPROVED EQUAL.

8. ALL POSTS SHALL BE FULL HEIGHT FROM FOUNDATION TO ROOF.

9. FASTENERS PENETRATING PRESSURE-PRESERVATIVE TREATED AND FIRE-RETARDANT TREATED WOOD SHALL BE HOT-DIPPED GALVANIZED PER ASTM A153, CLASS D.

10. ALL CONNECTORS FOR PRESSURE-PRESERVATIVE TREATED AND FIRE-RETARDANT TREATED WOOD SHALL BE STAINLESS STEEL. ALL NAILS, SCREWS, BOLTS, ETC. FOR SUCH CONNECTORS SHALL BE STAINLESS STEEL.

11. ALL WOOD SHALL BE PRESSURE TREATED DOUGLAS FIR-LARCH

12. PRESSURE-TREATED DOUGLAS FIR FRAMING LUMBER SHALL MEET THE FOLLOWING REQUIREMENTS:
   - A. "NATUREWOOD" ALKALINE COPPER QUATERNARY (ACQ) CHEMICAL PRESERVATIVE.
   - B. NON-INCISED PRESSURE TREATMENT METHOD.
   - C. KILN-DRY AFTER TREATMENT OR PROVIDE TIME IN SCHEDULE FOR DRYING SUCH THAT MOISTURE LEVEL MEETS STAIN MANUFACTURER'S REQUIREMENTS PRIOR TO STAIN APPLICATION.
   - D. ALL CUTS AND END GRAIN TO BE FIELD TREATED WITH "NATUREWOOD" ACQ.
   - E. ALL PRESSURE TREATED WOOD DEBRIS TO BE CLEANED UP AND DISPOSED OFF-SITE.
   - F. COAT ALL EXPOSED PRESSURE-TREATED DOUGLAS FIR SURFACES WITH STAIN FINISH.

13. ALL FRAMING LUMBER SHALL BE FINISHED WITH A SEMI-TRANSPARENT STAIN
   - A. STAIN: BENJAMIN MOORE ARBORCOAT SEMI-TRANSPARENT STAIN, OR APPROVED EQUIVALENT.
   - B. COLOR: TBD
   - C. PREPARE SURFACE AND INSTALL PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

**STRUCTURAL STEEL NOTES**

1. STRUCTURAL STEEL SHALL BE ASTM A36 UNLESS OTHERWISE NOTED. ALL W AND WT SHAPES SHALL BE ASTM A992. ALL HOLLOW STEEL SECTIONS SHALL BE ASTM A1085. ALL STEEL PIPE SECTIONS SHALL BE ASTM A53 GRADE B.

2. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS, LATEST EDITION.

3. ALL BOLTED CONNECTIONS STEEL TO STEEL SHALL BE MADE WITH 1" DIAMETER HIGH-STRENGTH (A325-X) BOLTS UNLESS OTHERWISE NOTED. ANCHOR BOLTS SHALL BE ASTM F1554, Fy = 36 KSI. THREADED RODS SHALL BE PER ASTM A193 GRADE B7.

4. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS.

5. ALL TESTING AND INSPECTION OF SHOP AND FIELD WELDING OPERATIONS SHALL BE MADE BY A CERTIFIED WELDING INSPECTOR.

6. ALL WELDS SHALL BE TESTED AND INSPECTED IN ACCORDANCE WITH
   - A. THE SPECIFICATIONS
   - B. THE CALIFORNIA BUILDING CODE
   - C. AWS D1.1.

ALL WELDING ELECTRODES SHALL BE E70 SERIES. THE WELDING INSPECTOR SHALL CHECK THE WELDER'S CERTIFICATION, MATERIAL, EQUIPMENT, FIT UP AND PROCEDURES AS WELL AS THE WELDS. THE INSPECTOR SHALL USE ALL MEANS NECESSARY TO DETERMINE THE QUALITY OF THE WELDS, INCLUDING THE USE OF GAMMA RAY, MAGNAFLUX, TREPANNING, SONICS OR ANY OTHER AID TO VISUALLY INSPECT AND TO ASCERTAIN THE ADEQUACY OF THE WELDING. THE INSPECTOR SHALL FURNISH THE ARCHITECT AND THE STRUCTURAL ENGINEER WITH A REPORT VERIFYING THAT ALL WELDS HAVE BEEN DONE IN CONFORMITY WITH THE PLANS, SPECIFICATIONS, AWS D1.1 AND ANY APPLICABLE CODES. UNLESS NOTED OTHERWISE ON THE DRAWINGS, THE FABRICATION AND ERECTION REQUIREMENTS MAY DICTATE FIELD WELDING AND/OR SHOP WELDING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE METHOD OF WELDING TO FULFILL THESE REQUIREMENTS. ALL ASSOCIATED COSTS SHALL BE INCLUDED IN THE CONTRACT PRICE. ALL WELDS USED IN MEMBERS AND CONNECTIONS IN THE SEISMIC LOAD RESISTING SYSTEM AS DEFINED ON THE PLANS SHALL BE MADE WITH A FILLER METAL THAT CAN PRODUCE WELDS THAT HAVE A MINIMUM CHARPY V-NOTCH TOUGHNESS OF 20 FT-LB AT 0 DEGREES FAHRENHEIT AS DETERMINED BY THE APPROPRIATE AWS A5 CLASSIFICATION TEST METHOD OR MANUFACTURER CERTIFICATION.

7. SUBMIT SHOP DRAWINGS TO ARCHITECT FOR REVIEW PRIOR TO FABRICATION. SHOP DRAWINGS SHALL INCLUDE ITEMS REQUIRED BY THE SPECIFICATIONS AND THE FOLLOWING.

8. WHERE CLOSER THAN AISC TOLERANCES ARE NECESSARY, SUCH AS FOR ALIGNMENT OF STEEL STUDS, MULLIONS, GFRC PANELS, ETC., FIELD WELDING WILL BE REQUIRED TO MEET THE NECESSARY TOLERANCES WITH NO ADDITIONAL COSTS TO THE OWNER.

9. USE ONE TYPE OF WELDING ELECTRODE THROUGHOUT ANY ONE CONNECTION.

10. WELDING OF REINFORCING STEEL TO STRUCTURAL STEEL SHALL BE DONE BY STRUCTURAL STEEL SUB-CONTRACTOR.

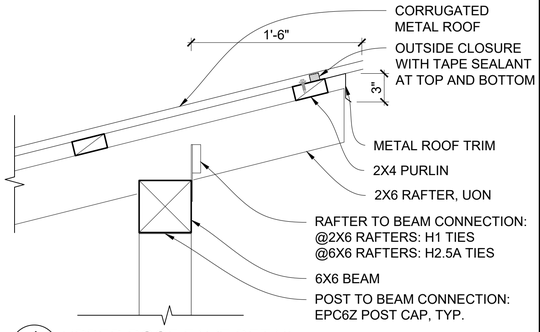
11. BOLT HOLES IN STEEL SHALL BE 1/16" OVERSIZE UNLESS OTHERWISE NOTED.

**METAL ROOF PANEL NOTES**

1. PROVIDE EXPOSED-FASTENER, LAP-SEAM, FACTORY-FORMED METAL PANELS MEETING THE FOLLOWING REQUIREMENTS:
   - A. PROFILE: 7/8" HEIGHT CORRUGATED PROFILE
   - B. THICKNESS: 22 GAUGE
   - C. FINISH: GALVALUME FINISH, ON BOTH SIDES OF PANEL

2. PROVIDE METAL ROOF FASTENERS AND INSTALL AT LOCATIONS AS RECOMMENDED BY METAL ROOF MANUFACTURER FOR WEATHERTIGHT CONSTRUCTION AND TO MEET DESIGN LOADS.

3. INCLUDE ACCESSORIES AS REQUIRED FOR WEATHERTIGHT INSTALLATION.




4 A8.02 UPPER ROOF EAVE DETAIL
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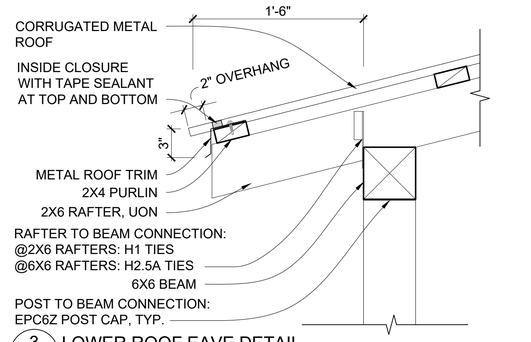


3 A8.02 LOWER ROOF EAVE DETAIL
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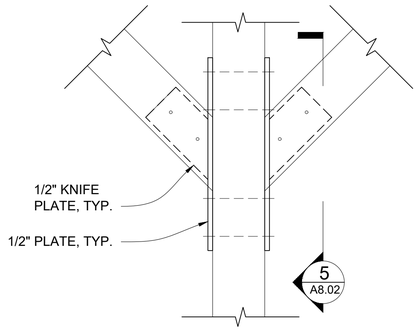


6 A8.02 TYPICAL KNIFE PLATE DETAIL
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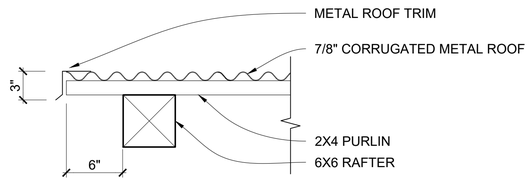


2 A8.02 ROOF RAKE DETAIL
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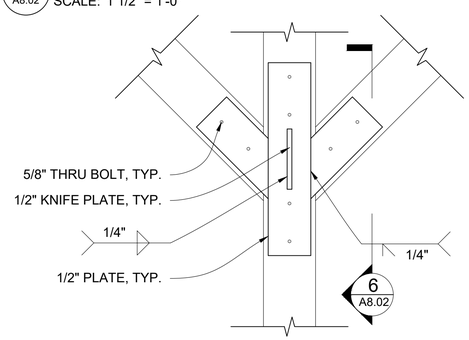


5 A8.02 TYPICAL KNIFE PLATE DETAIL
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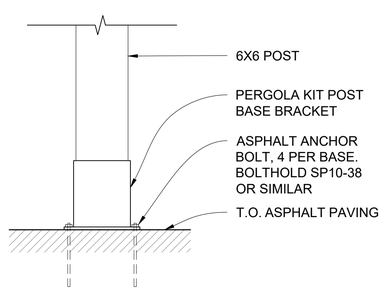


1 A8.02 BASE BRACKET DETAIL (BID ALT. B6 AND B7)
SCALE: 1 1/2" = 1'-0"

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| Review By: | MS |
| Plot Date: | |

Sheet Title:

PERGOLA DETAILS
**BID ALT. B7**

Sheet No.:

A8.02

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| REVISIONS | | | |
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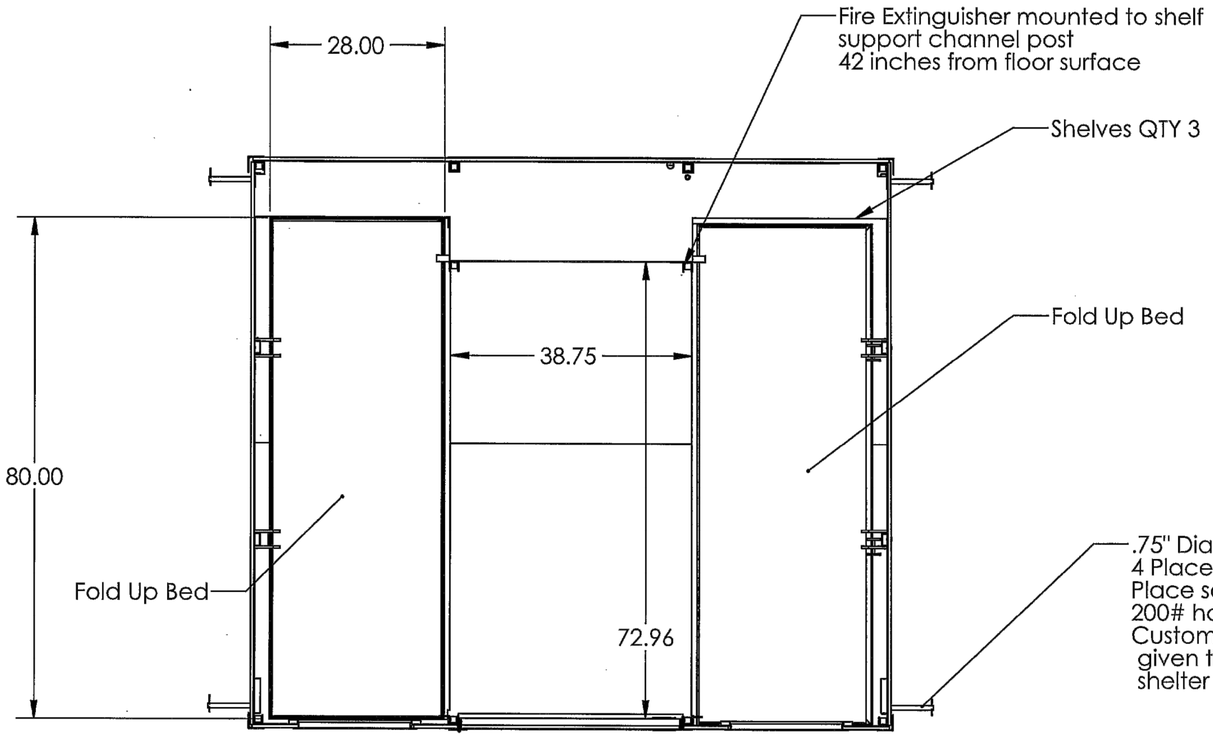
| | A | Original Release | 9/1/2020 |




Approved by Quality
Signature
Date

Approved by Production
Signature B. Mendez
Date 9-1-20

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TOLERANCES:
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ANGULAR: MACH ±1° BEND ±1°
TWO PLACE DECIMAL: ±.03
THREE PLACE DECIMAL: ±.01
DO NOT SCALE DRAWING

DRAWN BY: Don Bender
DATE: 9-1-2020

TITLE:
64 SQ FT Pallet Shelter
Plan View

Part Number
10368

REV
A

WEIGHT:

SHEET 1 OF 1

1 SH2.01A 64SF PALLET SHELTER SHOP DRAWINGS - PLAN
SCALE: N.T.S.

Project Title:

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SIEGEL & STRAIN Architects
6201 Doyle Street, Suite B
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Consultant:

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

Issue Note:
PERMIT SET
09/21/22

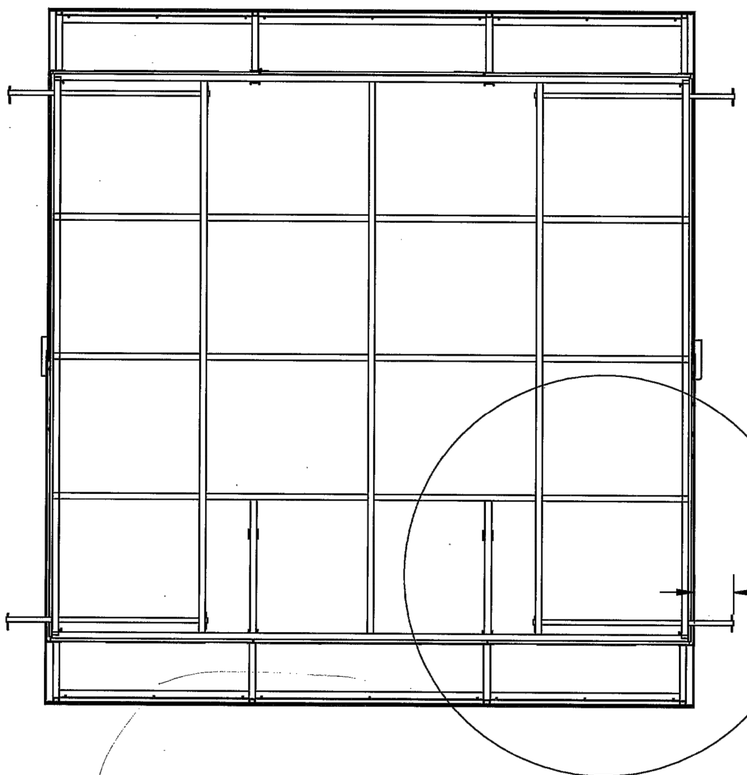
Project ID: BSC
File Name: XA-SHELTER
Drawn By:
Review By:
Plot Date:

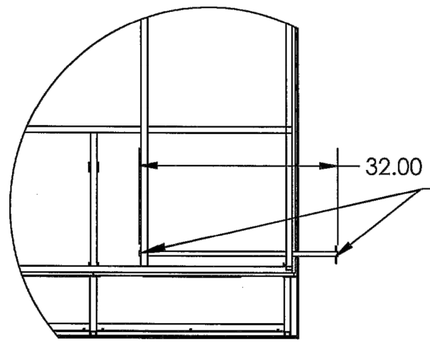
Sheet Title:
64 SF PALLET SHELTER
SHOP DRAWINGS - PLAN

Sheet No.:
SH2.01A

4/13/2023 4:33:59 PM

| REVISIONS | | | |
|---|---|---|---|
| ZONE | REV. | DESCRIPTION | DATE |
| | A | Original Release | 9/1/2020 |




DETAIL A

Approved by Quality
Signature
Date 9/1/20

Approved by Production
Signature
Date 9-1-20

Pallet

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TWO PLACE DECIMAL: ±.03
THREE PLACE DECIMAL: ±.01
DO NOT SCALE DRAWING

| | |
|---|---|
| DRAWN BY | Don Bender |
| DATE | 9-1-2020 |

TITLE:
Base Frame Bottom View
64 SQ FT Pallet Shelter

Part Number
10368

REV
A

WEIGHT:

SHEET 1 OF 1

1 SH2.02A 64SF PALLET SHELTER SHOP DRAWINGS - BOTTOM VIEW
SCALE: N.T.S.

Project Title:

2ND ST PATHWAYS STAIR CENTER
SITE IMPROVEMENTS AND SHELTER UNITS
1601 SECOND STREET, BERKELEY, CA 94710
APN #: 57-2112-5

Design Firm:
SIEGEL & STRAIN Architects
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| No. | Date | Issue |
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Issue Note:
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09/21/22

Project ID: BSC
File Name: XA-SHELTER
Drawn By:
Review By:
Plot Date:
Sheet Title:
64 SF PALLET SHELTER SHOP DRAWINGS - BOTTOM VIEW

Sheet No.:
SH2.02A

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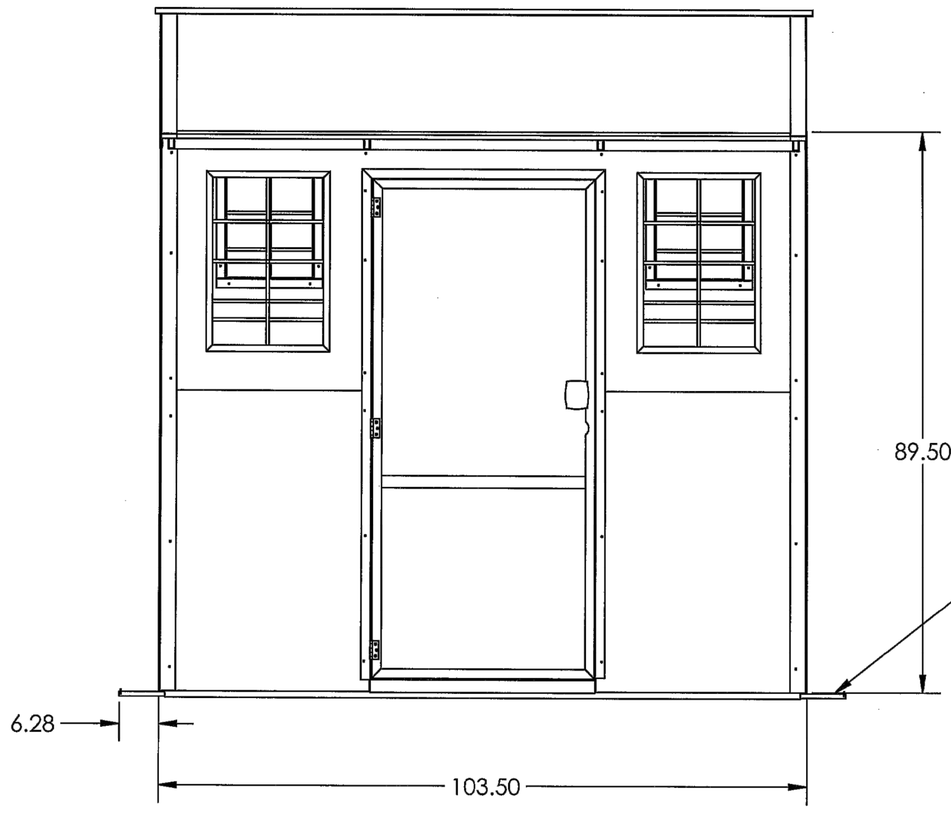


64 SQ FT Front View

.75" Dia. Steel Hold Down Rod
4 Places
Place sand bags or use mechanical anchors
200# hold down load required on each of four corners.
Customer responsible to determine best method
given the specific substrate that the
shelter unit is sitting on (soil, concrete, asphalt, etc)

From bottom of base frame to
door treshhold it is 2-7/8"

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Signature
Date 9/1/20

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Date 9-1-20

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TWO PLACE DECIMAL: ±.03
THREE PLACE DECIMAL: ±.01
DO NOT SCALE DRAWING

TITLE:
64 SQFT Pallet Shelter
Front View

| | | | |
|---|---|---|---|
| DRAWN BY | Don Bender | Part Number | REV |
| DATE | 9-1-2020 | 10368 | A |
| | | WEIGHT: | SHEET 1 OF 1 |

1 SH3.01A 64SF PALLET SHELTER SHOP DRAWINGS - FRONT ELEVATION
SCALE: N.T.S.

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

1601 SECOND STREET, BERKELEY, CA 94710

APN #: 57-2112-5

Design Firm:
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Consultant:

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|---|---|---|
| | 04/28/23 | BID SET |

Issue Note:
PERMIT SET
09/21/22

| | |
|---|---|
| Project ID: | BSC |
| File Name: | XA-SHELTER |
| Drawn By: | |
| Review By: | |
| Plot Date: | |

Sheet Title:
64 SF PALLET SHELTER
SHOP DRAWINGS - FRONT
ELEVATION

Sheet No.:
SH3.01A

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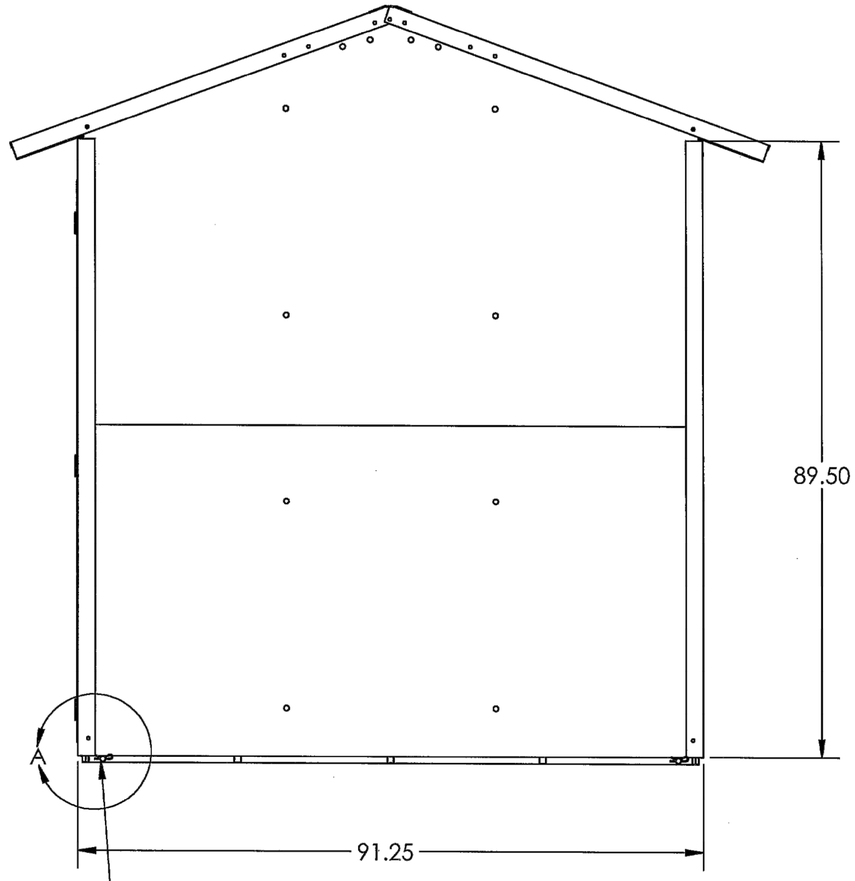
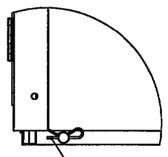



64 SQ FT End Wall View




DETAIL A
SCALE 1 : 10

.75" Dia. Steel Hold Down Rod
4 Places
Place sand bags or use mechanical anchors
200# hold down load required on each of four corners.
Customer responsible to determine best method
given the specific substrate that the
shelter unit is sitting on (soil, concrete, asphalt, etc)

Approved by Quality
Signature
Date 9/1/20

Approved by Production
Signature
Date 9-1-20

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THREE PLACE DECIMAL: ±.01
DO NOT SCALE DRAWING

| | |
|---|---|
| DRAWN BY | Don Bender |
| DATE | 9-1-2020 |

TITLE:
64 SQ FT Pallet Shelter
End Wall View

Part Number
10368

REV
A

WEIGHT:

SHEET 1 OF 1

1 SH3.02A 64SF PALLET SHELTER SHOP DRAWINGS - SIDE ELEVATION
SCALE: N.T.S.

Project Title:

2ND ST PATHWAYS STAIR CENTER
SITE IMPROVEMENTS AND SHELTER UNITS
1601 SECOND STREET, BERKELEY, CA 94710
APN #: 57-2112-5

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| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

Issue Note:
PERMIT SET
09/21/22

Project ID: BSC
File Name: XA-SHELTER
Drawn By:
Review By:
Plot Date:

Sheet Title:
64 SF PALLET SHELTER
SHOP DRAWINGS - SIDE
ELEVATION

Sheet No.:
SH3.02A

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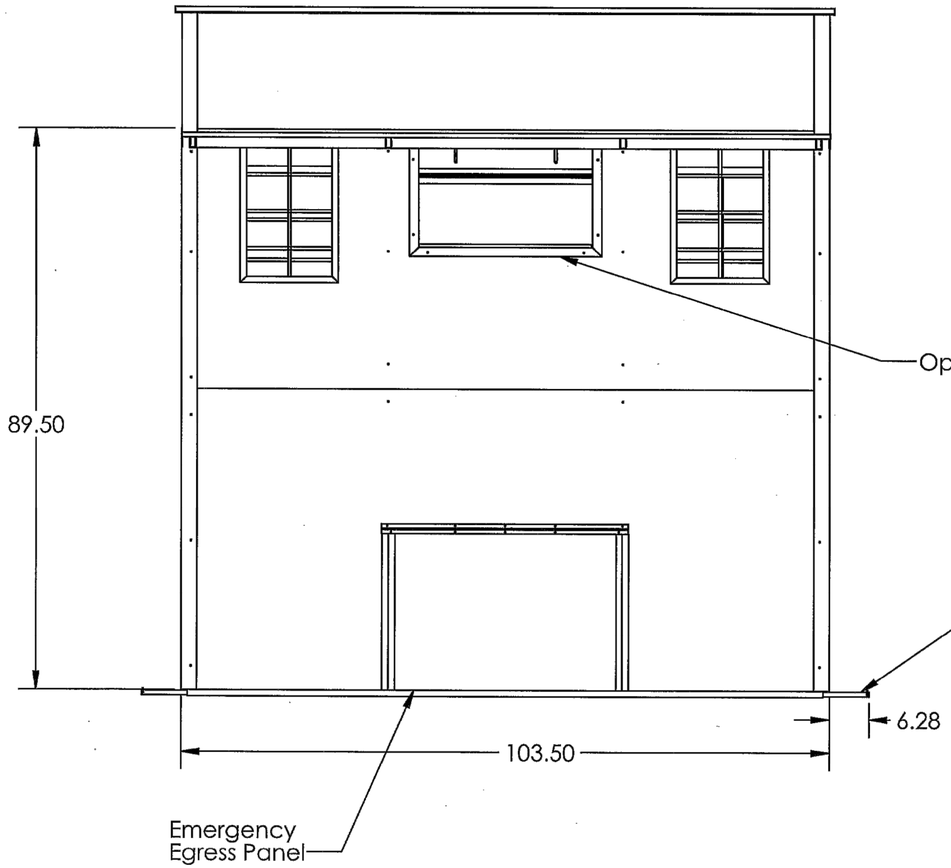
64 SQ FT Back Wall View

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Date

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Signature
Date 9-1-20

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THREE PLACE DECIMAL: ±.01
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| | |
|---|---|
| DRAWN BY | Don Bender |
| DATE | 9-2-2020 |

TITLE:
64 SQ FT Pallet Shelter
Back Wall View

Part Number 10368

REV A

WEIGHT:

SHEET 1 OF 1

1 SH3.03A 64SF PALLET SHELTER SHOP DRAWINGS - BACK ELEVATION
SCALE: N.T.S.

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

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| | 04/28/23 | BID SET |

Issue Note:
PERMIT SET
09/21/22

Project ID: BSC
File Name: XA-SHELTER
Drawn By:
Review By:
Plot Date:

Sheet Title:
64 SF PALLET SHELTER SHOP DRAWINGS - BACK ELEVATION

Sheet No.:
SH3.03A

4/13/2023 4:34:00 PM

Structural Calculations For:

# Pallet Shelter 64

Prepared for: Pallet Shelter

Job #: 11776-2018-01-00

Date: July 15th, 2020


STRUCTURAL ENGINEERING

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## Pallet Shelter 64

### General Building Narrative

The pallet shelter 64 is a roughly 64 square foot temporary shelter intended for rapid deployment. To facilitate this rapid deployment, the shelter is panelized, packaged, then shipped and assembled on site.

The general construction takes the form of an aluminum frame system utilizing light insulated "skin" of a plascore honeycomb floor, and an insulated Glasliner roof and wall system. Given the unique nature of construction and deployment, testing has been conducted to determine bolt/rivet shear capacity in the roof and wall systems to transmit the prescriptive lateral forces as outlined in the California Building Code appendix O of 15 pounds per square foot.

Given the lightweight nature of the fully assembled structure, utilizing the CBC to determine seismic demands assuming an R value of 1.0, the prescriptive lateral forces of appendix O are significantly higher than that required per the California Building Code. As such, the structure has been designed elastically to resist the prescriptive lateral values.

In addition to the testing undertaken to determine structural capacities, we are also utilizing testing data from both Plascore and Glasliner in determining capacities of the lightweight coverings to resist gravity loads of 40 pounds per square foot.

**3. Physical Properties - Typical Values** Glasliner Wall Panel Material

| 0.075in Nominal Thickness / 1000 Series | | |
|---|---|---|
| **Property** | **Value** | **Test Method** |
| Flexural Strength | 14,780 psi | ASTM D790 |
| Flexural Modulus | 7.0 x $10^5$ psi | ASTM D790 |
| Tensile Strength | 6,490 psi | ASTM D638 |
| Tensile Modulus | 7.70 x $10^5$ psi | ASTM D638 |

PP polypropylene honeycomb is specified as follows:

PP1 - 5.0 - N1 - 8 - 01 - T - N - 0.500 - 72.000 - 78.000

PP Used in Design: PP1-5.0-UV-8-30

Ellin width = 1800 # in^2

PP Honeycomb Core Mechanical Properties

| CORE | CELL SIZE | DENSITY | | FLATWISE COMPRESSION* | | | | | | | | FLATWISE SHEAR | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Nominal | Actual | Strength | | | Modulus | | | | | Strength | | | Modulus | | |
| | | | | Ultimate | Yield | Ultimate | Yield | Ultimate | Yield | Ultimate | Yield | Ultimate | Yield | Ultimate | Yield | Ultimate | Yield |
| | | pcf | pcf | psi | psi | MPa | MPa | ksi | ksi | GPa | GPa | psi | psi | MPa | MPa | ksi | ksi |
| PP1-5.0-T-N | 0.250 | 8 | 8.1 | 151 | 151 | 1.04 | 1.04 | 22 | 22 | 0.15 | 0.15 | 90 | 90 | 0.62 | 0.62 | 13 | 13 |
| PP1-5.0-T-N | 0.250 | 12 | 12.1 | 363 | 335 | 2.50 | 2.31 | 53 | 49 | 0.37 | 0.34 | 145 | 145 | 1.00 | 1.00 | 21 | 21 |
| PP1-5.0-T-N | 0.250 | 16 | 16.1 | 638 | 580 | 4.40 | 4.00 | 93 | 84 | 0.64 | 0.58 | 201 | 201 | 1.39 | 1.39 | 29 | 29 |
| PP1-5.0-T-N | 0.250 | 20 | 20.1 | 1,000 | 870 | 6.89 | 6.00 | 145 | 126 | 1.00 | 0.87 | 256 | 256 | 1.76 | 1.76 | 37 | 37 |
| PP1-5.0-T-N | 0.250 | 28 | 27.7 | 1,863 | 1,530 | 12.84 | 10.55 | 270 | 222 | 1.86 | 1.53 | 353 | 353 | 2.43 | 2.43 | 51 | 51 |

*Perpendicular to ribbon direction


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SWENSON SAY FAGET


DATE
PROJ. #
DESIGN
SHEET

## Seismic Design

ASCE 7-16, Seismic Analysis
Equivalent Lateral Force Procedure
CBC 2019

| | | |
|---|---|---|
| Risk Category | II | I, II, or III, or IV per Table 1.5-1 |
| Site Class | D | per soils report |
| | | (D assumed, without soils report) |

| | | |
|---|---|---|
| $I_E$ | 1 | |
| $S_S$ | 1.9 | 2% in 50 yr, Latitude & Longitude lookup |
| $S_1$ | 0.7 | 2% in 50 yr, Latitude & Longitude lookup |
| $h_n$ | 8 ft | |
| R | 1.00 | Other |
| $I_s$ | 1.0 | Table 1.5-2 |
| $C_d$ | 1 | |
| Ct | 0.02 | Table 12.8-2 |
| x | 0.75 | Table 12.8-2 |
| T | 0.10 (sec) | Eq. 12.8-7 |
| $T_a$ | 0.11 (sec) | |
| $T_s$ | 0.55 (sec) | |
| k | 1.000 | |
| Fa | 1.00 | Table 11.4-1 |
| Fv | 1.50 | Table 11.4-2 |
| $S_{MS}$ | 1.90 | Eq. 11.4-1 |
| $S_{M1}$ | 1.05 | Eq. 11.4-2 |
| $S_{DS}$ | 1.27 | Eq. 11.4-3 |
| $S_{D1}$ | 0.70 | Eq. 11.4-4 |
| Cs | 1.267 | Eq. 12.8-2 |
| | 7.358 | eq. 12.8-3 need not exceed, $I < I_L$ |
| | 0.350 | Eq. 12.8-5 or 12.8-6 minimum |
| Cs, design | 1.267 | |
| Bldg. Weight | 0.7 k | |
| V = $C_S$W | 0.9 k | Eq. 12.8-1, Strength Level Base Shear |
| V = $C_{Smin}$W | 1 k | Eq. 12.8-1 Allowable Stress Base Shear |

$T_a = C_t h_n^x$ Eq. 12.8.7

$S_{MS} = F_a S_S$ Eq. 11.4-1
$S_{M1} = F_v S_1$ Eq. 11.4-2
$S_{DS} = {}^2/_3 S_{MS}$ Eq. 11.4-3
$S_{D1} = {}^2/_3 S_{M1}$ Eq. 11.4-4

$C_S = \frac{S_{DS}}{(R/I_e)}$ Eq. 12.8-2
$C_S = \frac{S_{D1}}{T(R/I_e)}$ Eq. 12.8-3
$C_S = \frac{S_{D1} T_L}{T^2(R/I_e)}$ Eq. 12.8-4
$C_S \geq 0.044 S_{DS} I_e$ Eq. 12.8-5
$C_S \geq 0.01$ Eq. 12.8-5

$C_{VX} = w_x h_x^k / \sum_{i=1}^{n} w_i h_i^k$ Eq. 12.8-12

$F_{px} = \frac{\sum_{i=x}^{n} F_i}{\sum_{i=x}^{n} w_i} w_{px}$ Eq. 12.10-1
$F_{px} \geq 0.2 S_{DS} I_e w_{px}$ Eq. 12.10-2
$F_{px} \leq 0.4 S_{DS} I_e w_{px}$ Eq. 12.10-3

Vertical Distribution — ASD — $\rho$= 1.0

| Level | hx (ft) | Wx | $hx^k$ (ft) | $Wxhx^k$ | Cvx (%) | Fx (k) | ΣV (k) | $F_{px_{min}}$ | $F_{px_{max}}$ | $F_{px_{design}}$ | $\gamma = F_{px}/F_x$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| 1 | 8.0 | 0.7 | 8.0 | 5.6 | 1.000 | 0.6 | 0.6 | 0.62 | 0.12 | 0.25 | 0.25 | 0.40 |
| | Σ | 0.7 | | 5.6 | | 0.621 | | | | | |

Story Shear — ASD
Diaphragm Force (p not included)


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Project: Pallet Shelter — Date: 6/3/2020
Project #:
Design: ZFK
Sheet: 2

## Wind Design

ASCE 7-16, Method 2 - Analytical Procedure
CBC 2019

Wind Coefficients

| | | |
|---|---|---|
| Exposure | B | |
| V= | 110 | mph |
| $K_d$= | 0.85 | Table 26.6-1 |
| $I_w$= | 1 | Table 1.5-2 |
| G= | 0.85 | 26.9.4 |

Location and Building Dimensions

| | | |
|---|---|---|
| Calculate Kzt? | NO | |
| Kzt | 1 | |
| Roof Angle | 0 | degrees |
| Ground to top of roof | 8 | ft |
| Bottom of roof to top of roof (mean roof height) h | 7.835 | ft |

Pressure Coefficients from Figure 27.4-1:

| WIND FACE | $c_p$ |
|---|---|
| Windward Wall | 0.8 |
| Leeward Wall | -0.5 |
| Windward Roof | 0 |
| Leeward Roof | -0.7 |

*Note= Cp values are conservative worst case values

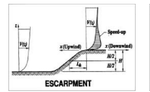
Pressures:

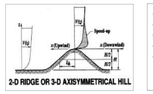
| Ht | $K_z$ | $q_z$ | $P_{net\ walls}$ | $P_{net\ roofs}$ | Strength $P_{walls}$ (psf) | Allowable $P_{walls}$ (psf) |
|---|---|---|---|---|---|---|
| 0-15 | 0.57 | 15.0 | 10.2 | 6.4 | 16.8 | 10.0 |

| $P_{net\ roof}$ | $P_{net\ roof}$ | Strength $P_{roof}$ (psf) | Allowable $P_{roof}$ (psf) |
|---|---|---|---|
| 0.00 | 8.93 | 8.93 | 5.36 |

Direction 1 - E: Escarpment upwind 212 1000 0 10
Direction 2 - W: Terrain= Escarpment Slope= upwind H= 212 Lh= 1000 x= 0 z= 10
Direction 3 - N: Terrain= Escarpment Slope= upwind H= 212 Lh= 1000 x= 0 z= 10
Direction 4 - S: Escarpment upwind 212 1000 0 10

x= 1.5
y= 2.5
K1 value =
K1= #VALUE!
K2= 1.00
K3= 0.98
H/Lh= 0.21
Kzt= #VALUE!




$K_{zt} = (1 + K_1 K_2 K_3)^2$
$K_1$ = Per Figure
$K_2 = (1 - |x|/\mu L_h)$
$K_3 = e^{-\gamma z/L_h}$
$K_{zt} = 1$, If H/Lh ≤ 0.2

PER FIGURE 26.8-1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Project: Pallet Shelter — Date: 6/3/2020
Project #:
Design: ZFK
Sheet: 3

PALLET (100)

ROOF PURLINS

w = 85.0 L = 7.5' R = 321#

M = 603'# $S_x$ = 0.332 $f_b = \frac{7.2}{0.332}$ = 21.5 ksi < 31.8 ksi OK

2x1 x 0.125 ALUM TUBE

TRUSS R

M = 603'# = 7.2" k

$S = \frac{.125(6)^2}{6} = 1.128$

$f_b$ = 6.4 < 31.8 OK

T = C = 603'# / 1.0" = 603#

1/8" RIVET

R 0.188 x

COLUMN

$\frac{KL}{r}$ = 186 $\sigma_{all} = 51352/\lambda^2 = 1.5$ ksi

$\frac{P}{A} = \frac{0.321}{0.531} = 0.604$ DCR = $\frac{.604}{1.5}$ = 0.4

OOP (c+t)

w = 11 psf x 2.5 = 27.5 L = 8'

$M_x$ = 220'# = 2.64'k

S = 0.229

$f_b$ = 11.5 < 23.6 DCR = 0.5

1.5" t=0.125

COMB.

$\frac{P}{P_c} + \frac{M_{ux}}{M_{cx}} \leq 1.0$ 0.4 + 0.5 = 0.9 < 1.0 OK


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PROJECT
3.13.18
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SIDE WALL

w = 11 psf x 2.5

b/t = 1.5/0.125 = 12 → F/Ω = 31.8 ksi

$M_w$ = 21k'# = 2.6"k

S = 0.129

$f_b$ = 20 ksi < 31.8 OK

1.5" t=1/8"

CHANNEL


STRUCTURAL ENGINEERING


PROJECT
DATE
PROJ. #
DESIGN
SHEET

LATERAL LOAD TRANSFER

ROOF PURLINS

ROOF CLIP

WALL BELOW

255# / 4 = 63.75

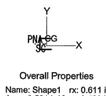
$M_u$ = 63.75 (9") = 573 in-#

$f_b$ = 3 ksi << 31.8 ksi 2x1 x0.125 OK


STRUCTURAL ENGINEERING


PALLET 64
PROJECT
DATE
PROJ. #
DESIGN
SHEET

ShapeBuilder 2.0
Swenson Say Faget
Thu. March 15, 2018




Overall Properties

Name: Shape1 rx: 0.611 in
Area: 0.531 in^2 ry: 0.480 in
CG: (-0.331,0.206) rp: 1.326 in
Ix: 0.198 in^4 Zx: 0.307 in^3
Iy: 0.123 in^4 Zy: 0.224 in^3
Ixy: 0 in^4 PNA: (-0.441,0.206)
Ipolar: 0.321 in^4 J: 0.003 in^4
Sx: 0.264 in^3 Cw: 0.041 in^6
Sy left: 0.224 in^3 SC: (-1.405,0.206)
Sy right: 0.129 in^3

ShapeBuilder 2.0
Swenson Say Faget
Wed. March 14, 2018

Overall Properties

Name: Shape1 rx: 0.695 in
Area: 0.688 in^2 ry: 0.391 in
Ix: 0.332 in^4 rp: 0.797 in
Iy: 0.105 in^4 Zx: 0.426 in^3
Ixy: 0 in^4 Zy: 0.254 in^3
Ipolar: 0.437 in^4 J: 0.245 in^4
Sx: 0.332 in^3
Sy: 0.210 in^3

1 SH8.01A — 64SF PALLET SHELTER - STRUCTURAL CALCULATIONS
SCALE: N.T.S.

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

1601 SECOND STREET, BERKELEY, CA 94710

APN #: 57-2112-5


Design Firm:

SIEGEL & STRAIN Architects
6201 Doyle Street, Suite B
Emeryville, CA 94608
510 / 547-8092
info@siegelstrain.com
www.siegelstrain.com

Consultant:


| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

Issue Note:

PERMIT SET

09/21/22

Project ID: BSC
File Name: XA-SHELTER
Drawn By:
Review By:
Plot Date:

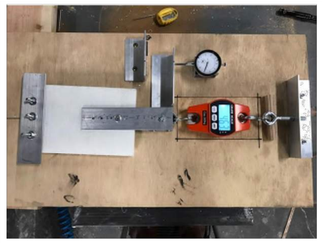
Sheet Title:

64 SF PALLET SHELTER - STRUCTURAL CALCULATIONS

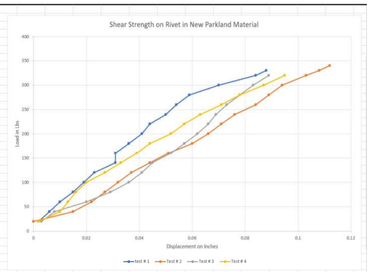
Sheet No.:

SH8.01A

4/13/2023 4:34:00 PM



| Load | Test 1 Disp | Test 2 Disp | Test 3 Disp | Test 4 Disp |
|---|---|---|---|---|
| 20 | 0.002 | 0 | 0.003 | 0.002 |
| 40 | 0.006 | 0.015 | 0.006 | 0.01 |
| 60 | 0.01 | 0.022 | 0.02 | 0.013 |
| 80 | 0.015 | 0.027 | 0.029 | 0.016 |
| 100 | 0.019 | 0.032 | 0.036 | 0.02 |
| 120 | 0.023 | 0.037 | 0.041 | 0.027 |
| 140 | 0.031 | 0.044 | 0.045 | 0.033 |
| 160 | 0.031 | 0.051 | 0.052 | 0.039 |
| 180 | 0.036 | 0.06 | 0.057 | 0.044 |
| 200 | 0.041 | 0.066 | 0.062 | 0.052 |
| 220 | 0.044 | 0.071 | 0.066 | 0.057 |
| 240 | 0.05 | 0.076 | 0.069 | 0.063 |
| 260 | 0.054 | 0.084 | 0.073 | 0.071 |
| 280 | 0.059 | 0.089 | 0.078 | 0.078 |
| 300 | 0.07 | 0.094 | 0.083 | 0.087 |
| 320 | 0.094 | 0.103 | 0.089 | 0.095 |
| 330 | 0.088 | 0.108 | | |
| 340 | | 0.112 | | |

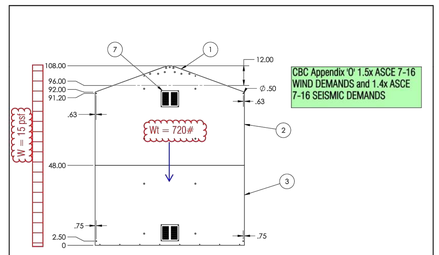



Stress Strain Curves for (4) Representative Test Samples

Average first yield occurs at 300#. Applying a factor of safety of 2 to the rivets provides and allowable capacity of 150# per rivet.

STRUCTURAL ENGINEERING
2124 Third Avenue - Suite 100 - Seattle, WA 98121
p: 206.443.6212 ssfengineers.com

| | | | |
|---|---|---|---|
| Project Title: Pallet Shelter | | Date | SSF project no. |
| | | Design | |
| Sheet Title: | | Drawn | Sheet |




CBC Appendix 'O' 1.5x ASCE 7-16 WIND DEMANDS and 1.4x ASCE 7-16 SEISMIC DEMANDS

Tributary Wall Reaction = 15psf * 4' Trib = 60plf *8.5ft/2 wall lines = 255#

Per CBC Appendix 'O'

Rivet Allowable Capacity = 150# based on testing and a factor of safety of 2.0

255# / 7.5' wall length = 34plf --> Rivet @ 3'-0" oc MAX

Overturning = 15*8*8.5*4/7.5 = 544#
0.6DL Resist = 720*0.6/2 = 220#
Net Uplift = 324# per wall line (270# with increased lever arm from rod)--> 200# sandbag or equivalent at each corner of structure with 3/4" dia. rod

Sliding = 910#
Sliding Resist = 720+200*4 = 1520*0.6 = 912# --> OK

Assumed coeff. of friction


(c) 206.443.6212
(c) 253.284.9470
2124 Third Ave, Suite 100, Seattle, WA 98121
634 Broadway, Suite 100, Tacoma, WA 98402
SEATTLE TACOMA


STRUCTURAL ENGINEERING

| | | |
|---|---|---|
| Pallet Shelter 64 | | 6-3-20 DATE |
| | | PROJ. # JK DESIGN |
| | | SHEET |

**Zane Kanyer**

**From:** Mike Niemerski <mike.niemerski@plascore.com>
**Sent:** Wednesday, March 07, 2018 1:42 PM
**To:** Zane Kanyer
**Subject:** RE: Phone call follow up

Ok per our phone call, I added the Yield Pt at a theoretical failure still using the same 4" wide x Span panel size.
My standard on the glass tensile strength is 20,000 psi. I have test data that shows 35,000 psi.

| Span | Panel T | Deflection | Bending E-Mod | Yield Pt |
|---|---|---|---|---|
| inches | inches | inches | psi | lbf |
| 12 | 0.32 | 0.13 | 635,300 | 140 |
| 24 | 0.32 | 0.86 | 761,000 | 75 |
| 36 | 0.32 | 2.8 | 788,100 | 50 |
| | | | | |
| 12 | 0.5 | 0.06 | 392,700 | 225 |
| 24 | 0.5 | 0.35 | 515,800 | 120 |
| 36 | 0.5 | 1.12 | 542,510 | 75 |
| | | | | |
| 12 | 0.75 | 0.03 | 216,000 | 325 |
| 24 | 0.75 | 0.16 | 321,500 | 170 |
| 36 | 0.75 | 0.5 | 347,100 | 115 |

Sufficient to resist 40psf floor live load

Panel Type:
.02"T 0-90 Glass-PP both sides
5 pcf PP Honeycomb core
Load and panel condition: 4" wide, 25 lbs, 3 pt bend
Yield Pt determined at 4" wide
Glass facing at 20,000 psi Tensile Strength
(Testing shows to 35,000 psi)
Calculated values for indicative performance

I have data from a user of these panel types using a ¼" dia Aluminum Pop Rivet through the front facing of the panel only at:
28 lbs Pull out Strength
44 lbs Shear Strength

Hope that makes sense and helps.

Let me know.

**Michael Niemerski**
**Market Dev. Eng. Manager**
**Plascore, Inc.**

TEL: (616) 748-2246 | FAX: (616) 772-1289
www.plascore.com

1

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

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Consultant:

MITRAS Materials GmbH Donnerstag, 4. Juni 2020

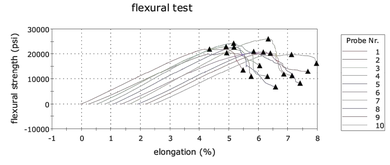
Materialbeschreibung
Polydet Performance Plus

Prüfmethode
Biegeversuch nach ASTM D 790-15, Procedure A

Allgemeine Angaben

| | |
|---|---|
| Prüfer | SB |
| Temperatur [°C] | 23,5 |
| Feuchte [%] | 50,5 |
| Dateiname | C:\Labor\2020\Optiplan\b20-092 ASTM |
| Prüfgeschwindigkeit [in/min] | 0,042 |
| Prüfgeschwindigkeit [mm/min] | 0,830 |

Diagramm 2




Ergebnistabelle

| | flexural strength (psi) | maximum strength (lbf) | flexural strain (%) | E-modulus (0,05 % - 0,25 %) (psi) | support span (in) | width (in) | thickness (in) |
|---|---|---|---|---|---|---|---|
| 1 | 22048,1 | 16,0 | 4,33 | 479378,1 | 1,0 | 0,503 | 0,047 |
| 2 | 20583,9 | 15,3 | 4,64 | 460505,8 | 1,0 | 0,501 | 0,047 |
| 3 | 23043,0 | 17,0 | 4,34 | 525046,1 | 1,0 | 0,502 | 0,047 |
| 4 | 24361,8 | 17,2 | 4,32 | 543960,8 | 1,0 | 0,500 | 0,046 |
| 5 | 22849,3 | 16,1 | 4,06 | 534891,5 | 1,0 | 0,501 | 0,046 |
| 6 | 20892,3 | 14,7 | 4,78 | 500106,7 | 1,0 | 0,500 | 0,046 |
| 7 | 26115,9 | 18,5 | 4,67 | 579242,5 | 1,0 | 0,501 | 0,046 |
| 8 | 21118,9 | 14,9 | 3,90 | 489546,0 | 1,0 | 0,500 | 0,046 |
| 9 | 20431,1 | 14,5 | 4,19 | 526250,6 | 1,0 | 0,502 | 0,046 |
| 10 | 19929,5 | 14,7 | 4,63 | 495825,3 | 1,0 | 0,500 | 0,047 |
| average value | 22137,4 | 15,9 | 4,39 | 513475,3 | 1,0 | 0,501 | 0,046 |
| standard deviation | 1969,17 | 1,32 | 0,29 | 35026,45 | 0,00 | 0,00 | 0,00 |
| minimum | 19929,5 | 14,5 | 3,90 | 460505,8 | 1,0 | 0,500 | 0,046 |
| maximum | 26115,9 | 18,5 | 4,78 | 579242,5 | 1,0 | 0,503 | 0,047 |
| Mittel + 2 SA | 26075,7 | 18,5 | 4,96 | 583528,2 | 1,0 | 0,503 | 0,047 |
| Mittel - 2 SA | 18199,0 | 13,2 | 3,81 | 443422,4 | 1,0 | 0,499 | 0,045 |



MITRAS Materials GmbH Donnerstag, 4. Juni 2020

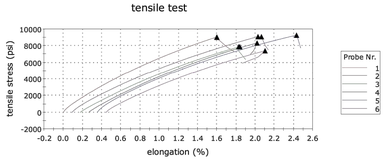
Materialbeschreibung
Polydet Performance Plus

Prüfmethode
Zugprüfung nach ASTM D 638-14

Allgemeine Angaben

| | |
|---|---|
| Dateiname | C:\Labor\2020\Optiplan\z20-092 ASTM |
| Prüfer | SB |
| Temperatur [°C] | 23,6 |
| Feuchte [%] | 50,0 |
| Prüfgeschwindigkeit [in/min] | 0,2 |
| Genauigkeitsklasse der Prüfmaschine | Klase 0.5 nach ISO 7500-1 / Klasse 1 Nach ISO 9513 |
| Probenanmerkung | |

Diagramm 2




Ergebnistabelle

| | | tensile strength (psi) | E-Modul (0,05-0,25%) (psi) | elongation at break (%) | maximum stress (lbf) | width (in) | thickness (in) |
|---|---|---|---|---|---|---|---|
| | 1 | 9045,0 | 769918,2 | 1,60 | 219 | 0,513 | 0,047 |
| | 2 | 9093,1 | 678416,8 | 1,97 | 220 | 0,513 | 0,047 |
| | 3 | 7892,1 | 610762,5 | 1,65 | 190 | 0,513 | 0,047 |
| | 4 | 8339,6 | 643891,7 | 1,75 | 202 | 0,513 | 0,047 |
| | 5 | 9260,0 | 687026,2 | 2,07 | 223 | 0,513 | 0,047 |
| | 6 | 7403,4 | 601451,5 | 1,66 | 178 | 0,512 | 0,047 |
| average value | | 8505,5 | 665244,5 | 1,78 | 205 | 0,513 | 0,047 |
| standard deviation | | 751,52 | 61803,42 | 0,19 | 18,57 | 0,00 | 0,00 |
| maximum | | 9260,0 | 769918,2 | 2,07 | 223 | 0,513 | 0,047 |
| minimum | | 7403,4 | 601451,5 | 1,60 | 178 | 0,512 | 0,047 |



ALUMINUM STRUCTURAL NOTES

(The following notes apply for aluminum alloy load-carrying members)

CRITERIA

1. STRUCTURAL ALUMINUM DESIGN, FABRICATION, AND ERECTION SHALL BE BASED ON THE LATEST EDITIONS OF THE ASTM SPECIFICATIONS AND THE CALIFORNIA BUILDING CODE.

2. ALUMINUM FOR STRUCTURAL ELEMENTS SHALL AT ALL TIMES BE SEGREGATED OR OTHERWISE HANDLED IN THE FABRICATORS'S PLANT SO THAT THE SEPARATE ALLOYS AND TEMPERS ARE POSITIVELY IDENTIFIED, AND AFTER COMPLETION OF FABRICATION, SHALL BE MARKED TO IDENTIFY THE ALLOY AND TEMPER. SUCH MARKINGS SHALL BE AFFIXED TO COMPLETE MEMBERS AND ASSEMBLIES OR TO BOXED OR BUNDLED SHIPMENTS OF MULTIPLE UNITS PRIOR TO SHIPMENT FROM THE FABRICATOR'S PLANT.

3. CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY BRACING AND FASTENING STRUCTURAL ALUMINUM TO RESIST DEAD, WIND, AND ERECTION LOADS DURING CONSTRUCTION.

4. STRUCTURAL ALUMINUM SHALL BE 6061-SERIES ALLOY UNLESS NOTED OTHERWISE.

5. VERIFICATION SHALL BE PROVIDED TO SHOW THAT THE CHOICE OF THE FILLER METAL FOR GENERAL PURPOSE WELDING IS APPROPRIATE.

6. FASTENING SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

   A. BOLTS AND OTHER FASTENERS SHALL BE ALUMINUM, STAINLESS STEEL OR ALUMINIZED, HOT-DIP GALVANIZED OR ELECTROGALVANIZED STEEL. DOUBLE CADMIUM-PLATED 'AN' STEEL BOLTS MAY ALSO BE USED. STEEL RIVETS SHALL NOT BE USED EXCEPT WHERE ALUMINUM IS TO BE JOINED TO STEEL OR WHERE CORROSION RESISTANCE OF THE STRUCTURE IS NOT A REQUIREMENT OR WHERE THE STRUCTURE IS TO BE PROTECTED AGAINST CORROSION.

   B. ALUMINUM USED FOR RIVETS AND BOLTS SHALL CONFORM TO THE FOLLOWING:
      1. NUTS FOR 1/4" BOLTS AND SMALLER SHALL BE 2024-T4.
      2. NUTS FOR BOLTS LARGER THAN 1/4" SHALL BE 6061-T6 OR 6262-T9.
      3. FLAT WASHERS SHALL BE ALCLAD 2024-T4.
      4. SPRING LOCK WASHERS SHALL BE ALLOY 7075-T6.
      5. FOR IMPROVED CORROSION RESISTANCE, A 0.0002-INCH MINIMUM THICKNESS ANODIC COATING MAY BE APPLIED TO ALLOY 2024 BOLTS.

7. HOLE CENTERS MAY BE CENTER PUNCHED AND CUTOFF LINES MAY BE PUNCHED OR SCRIBED. CENTER PUNCHING AND SCRIBING SHALL NOT BE USED WHERE SUCH MARKS WOULD REMAIN ON FABRICATED MATERIAL.

8. CUTTING OF ALUMINUM SHALL CONFORM TO THE FOLLOWING:

   A. MATERIAL MAY BE SHEARED, SAWED, CUT WITH A ROUTER OR ARC CUT. ALL EDGES WHICH HAVE BEEN CUT BY THE ARC PROCESS MUST BE PLANED TO REMOVE EDGE CRACKS.

   B. CUT EDGES SHALL BE TRUE, SMOOTH AND FREE FROM EXCESSIVE BURRS OR RAGGED BREAKS.

   C. RE-ENTRANT CUTS SHALL BE AVOIDED WHEREVER POSSIBLE. IF USED, THEY SHALL BE FILLETED BY DRILLING PRIOR TO CUTTING.

   D. OXYGEN CUTTING SHALL NOT BE PERMITTED.

9. STRUCTURAL MATERIAL SHALL NOT BE HEATED EXCEPT TO A TEMPERATURE NOT EXCEEDING 400 DEGREES FAHRENHEIT FOR A PERIOD NOT EXCEEDING 30 MINUTES IN ORDER TO FACILITATE BENDING. SUCH HEATING SHALL BE DONE ONLY WHEN PROPER TEMPERATURE CONTROLS AND SUPERVISION ARE PROVIDED TO INSURE THAT THE LIMITATIONS ON TEMPERATURE AND TIME ARE CAREFULLY OBSERVED.

10. PUNCHING, DRILLING, AND REAMING SHALL CONFORM TO THE FOLLOWING:

   A. RIVET OR BOLT HOLES MAY BE EITHER PUNCHED OR DRILLED. PUNCHING SHALL NOT BE USED IF THE METAL THICKNESS IS GREATER THAN THE HOLE DIAMETER. THE AMOUNT BY WHICH THE DIAMETER OF A SUB-PUNCHED HOLE IS LESS THAN THAT OF THE FINISHED HOLE SHALL BE AT LEAST ONE FOURTH THE THICKNESS OF THE PIECE AND IN NO CASE LESS THAN 1/32 INCH.

   B. THE FINISHED DIAMETER OF HOLES FOR COLD-DRIVEN RIVETS SHALL NOT BE MORE THAN 4 PERCENT GREATER THAN THE NOMINAL DIAMETER OF THE RIVET.

   C. THE FINISHED DIAMETER OF HOLES FOR HOT-DRIVEN RIVETS SHALL NOT BE MORE THAN 7 PERCENT GREATER THAN THE NOMIMAL DIAMETER OF THE RIVET.

   D. THE FINISHED DIAMETER OF HOLES FOR BOLTS SHALL NOT BE MORE THAN 1/16 INCH LARGER THAN THE NOMINAL BOLT DIAMETER.

   E. IF ANY HOLES MUST BE ENLARGED TO ADMIT THE RIVETS OR BOLTS, THEY SHALL BE REAMED. POOR MATCHING OF HOLES SHALL BE CAUSE FOR REJECTION. HOLES SHALL NOT BE DRIFTED IN SUCH A MANNER AS TO DISTORT THE METAL. ALL CHIPS LODGED BETWEEN CONTACTING SURFACES SHALL BE REMOVED BEFORE ASSEMBLY.

11. RIVETING SHALL CONFORM TO THE FOLLOWING:

   A. THE DRIVEN HEAD OF ALUMINUM ALLOY RIVETS SHALL BE OF THE FLAT OR THE CONE-POINT TYPE WITH DIMENSIONS AS FOLLOWS:

      1. FLAT HEADS SHALL HAVE A DIAMETER NOT LESS THAN 1.4 TIMES THE NOMINAL RIVET DIAMETER AND A HEIGHT NOT LESS THAN 0.4 TIMES THE NOMINAL RIVET DIAMETER.

      2. CONE-POINT HEADS SHALL HAVE A DIAMETER NOT LESS THAN 1.4 TIMES THE NOMINAL RIVET DIAMETER AND A HEIGHT TO THE APEX OF THE CONE NOT LESS THAN 0.65 TIMES THE NOMINAL RIVET DIAMETER. THE INCLUDED ANGLE AT THE APEX OF THE CONE SHALL BE APPROXIMATELY 127 DEGREES.

   B. RIVETS SHALL FILL HOLES COMPLETELY. RIVET HEADS SHALL BE CONCENTRIC WITH THE RIVET HOLES AND SHALL BE IN PROPER CONTACT WITH THE SURFACE OF THE METAL.

   C. DEFECTIVE RIVETS SHALL BE REMOVED BY DRILLING.

12. SURFACE PAINTING SHALL BE DONE IN THE FOLLOWING INSTANCES:

   A. THE ALUMINUM ALLOY PARTS ARE IN CONTACT WITH, OR ARE FASTENED TO, STEEL MEMBERS OR OTHER DISSIMILAR MATERIALS.

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

Issue Note:

PERMIT SET

09/21/22

| | |
|---|---|
| Project ID: | BSC |
| File Name: | XA-SHELTER |
| Drawn By: | |
| Review By: | |
| Plot Date: | |

Sheet Title:

64 SF PALLET SHELTER - STRUCTURAL CALCULATIONS

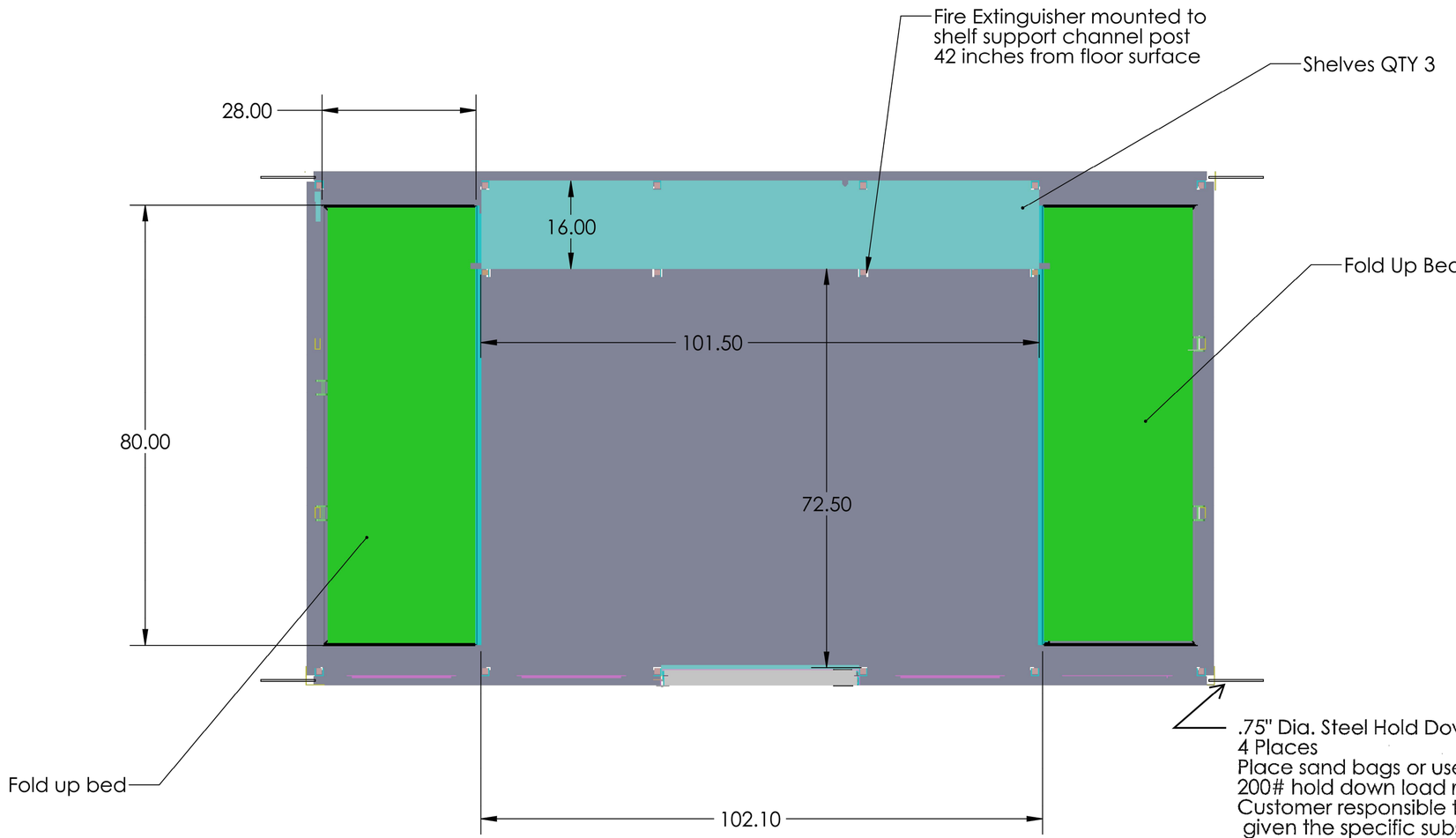
Sheet No.:

SH8.02A

4/13/2023 4:34:01 PM

1 SH8.02A 64SF PALLET SHELTER - STRUCTURAL CALCULATIONS
SCALE: N.T.S.

| REVISIONS | | | |
|---|---|---|---|
| ZONE | REV. | DESCRIPTION | DATE |




REGISTERED PROFESSIONAL ENGINEER
DAN JOSEPH SAY
No. 3459
Exp. 3/31/21
STRUCTURAL
STATE OF CALIFORNIA

Structural Only
9/17/20

Approved by Quality
Signature
Date

Approved by Production
Signature
Date

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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ±1/32
ANGULAR: MACH ±1° BEND ±1°
TWO PLACE DECIMAL: ±.03
THREE PLACE DECIMAL: ±.01
**DO NOT SCALE DRAWING**

TITLE:
100 SqFT Pallet Shelter
Plan View

| | |
|---|---|
| DRAWN BY | Don Bender |
| DATE | 7-27-2020 |

Part Number
10370

REV
A

WEIGHT:

SHEET 1 OF 1

1 SH2.01B 100SF PALLET SHELTER SHOP DRAWINGS - PLAN
SCALE: N.T.S.

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

1601 SECOND STREET, BERKELEY, CA 94710

APN #: 57-2112-5

Design Firm:
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info@siegelstrain.com
www.siegelstrain.com

Consultant:

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

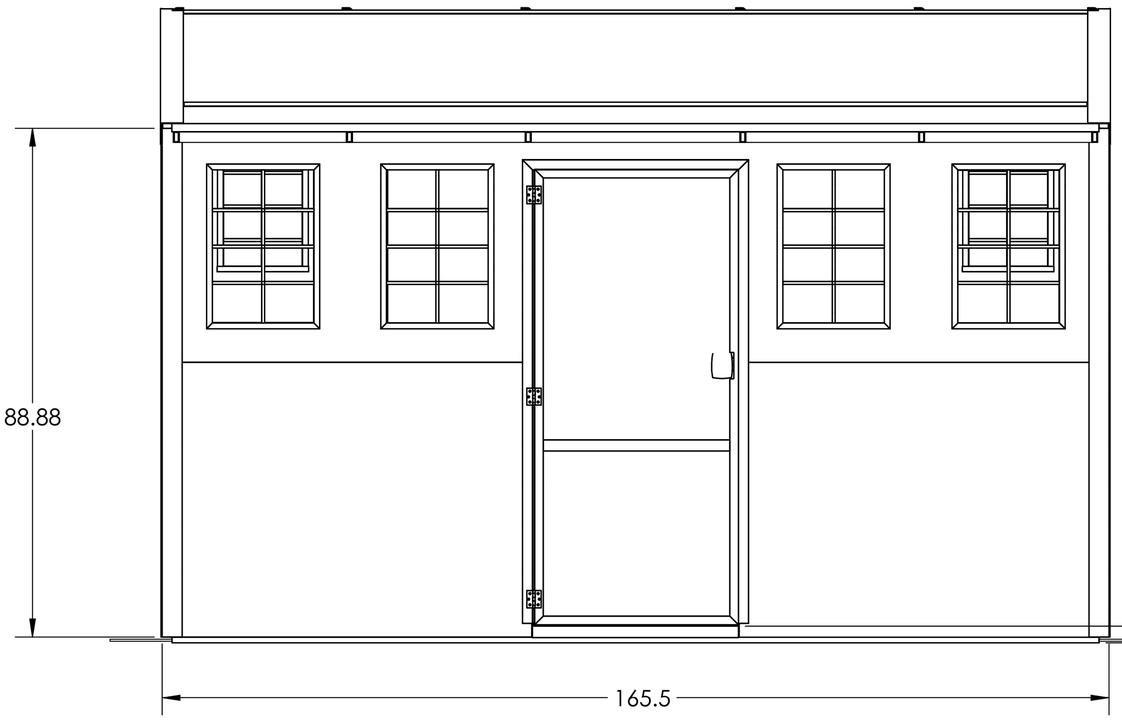
Issue Note:
PERMIT SET
09/21/22

Project ID: BSC
File Name: XA-SHELTER
Drawn By:
Review By:
Plot Date:
Sheet Title:
100 SF PALLET SHELTER
SHOP DRAWINGS - PLAN

Sheet No.:
SH2.01B

4/13/2023 4:33:59 PM

| REVISIONS | | | |
|---|---|---|---|
| ZONE | REV. | DESCRIPTION | DATE |
| | A | Original Release | 7/27/2020 |




100 Sq FT Front View

From bottom of base frame to
door treshhold it is 2-7/8"

REGISTERED PROFESSIONAL ENGINEER
DAN JOSEPH SAY
No. 3459
Exp. 3/31/21
STRUCTURAL
STATE OF CALIFORNIA

Structural Only
9/17/20

Approved by Quality

Signature _____

Date _____

Approved by Production

Signature _____

Date _____

Pallet

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DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL 1/32
ANGULAR: MACH 1 BEND 1
TWO PLACE DECIMAL: .03
THREE PLACE DECIMAL: .01
**DO NOT SCALE DRAWING**

| | |
|---|---|
| DRAWN BY | Don Bender |
| DATE | 7-27-2020 |

TITLE:
100 SQFT Pallet Shelter
Front View

Part Number
10370

REV
A

WEIGHT:

SHEET 1 OF 1

1 SH3.01B 100SF PALLET SHELTER SHOP DRAWINGS - FRONT ELEVATION
SCALE: N.T.S.

Project Title:

2ND ST PATHWAYS STAIR CENTER
SITE IMPROVEMENTS AND SHELTER UNITS
1601 SECOND STREET, BERKELEY, CA 94710
APN #: 57-2112-5


Design Firm:
SIEGEL & STRAIN Architects
6201 Doyle Street, Suite B
Emeryville, CA 94608
510 / 547-8092
info@siegelstrain.com
www.siegelstrain.com


Consultant:

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

Issue Note:
PERMIT SET
09/21/22

Project ID: BSC
File Name: XA-SHELTER
Drawn By:
Review By:
Plot Date:

Sheet Title:
100 SF PALLET SHELTER SHOP DRAWINGS - FRONT ELEVATION

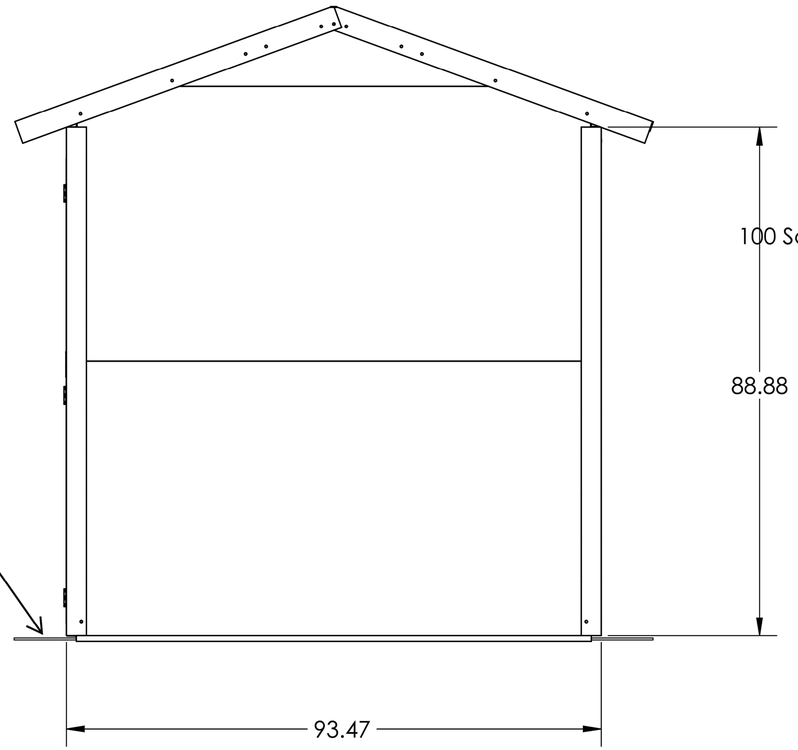
Sheet No.:
SH3.01B

4/13/2023 4:34:00 PM

| REVISIONS | | | |
|---|---|---|---|
| ZONE | REV. | DESCRIPTION | DATE |

REGISTERED PROFESSIONAL ENGINEER
DAN JOSEPH SAY
No. 3459
Exp. 3/31/21
STRUCTURAL
STATE OF CALIFORNIA

Structural Only
9/17/20




.75" Dia. Steel Hold Down Rod
4 Places
Place sand bags or use mechanical anchors
200# hold down load required on each of four corners.
Customer responsible to determine best method
given the specific substrate that the
shelter unit is sitting on (soil, concrete, asphalt, etc)

Approved by Quality
Signature
Date

Approved by Production
Signature
Date

**PROPRIETARY AND CONFIDENTIAL**
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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ±1/32
ANGULAR: MACH ±1° BEND ±1°
TWO PLACE DECIMAL: ±.03
THREE PLACE DECIMAL: ±.01
**DO NOT SCALE DRAWING**

| | |
|---|---|
| DRAWN BY | Don Bender |
| DATE | 7-27-2020 |

TITLE:
100 Sq FT Pallet Shelter
End Wall View

Part Number
10370

REV
A

WEIGHT:

SHEET 1 OF 1

1 / SH3.02B 100SF PALLET SHELTER SHOP DRAWINGS - SIDE ELEVATION
SCALE: N.T.S.

Project Title:

2ND ST PATHWAYS STAIR CENTER
SITE IMPROVEMENTS AND SHELTER UNITS
1601 SECOND STREET, BERKELEY, CA 94710
APN #: 57-2112-5

Design Firm:

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Consultant:

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

Issue Note:
PERMIT SET
09/21/22

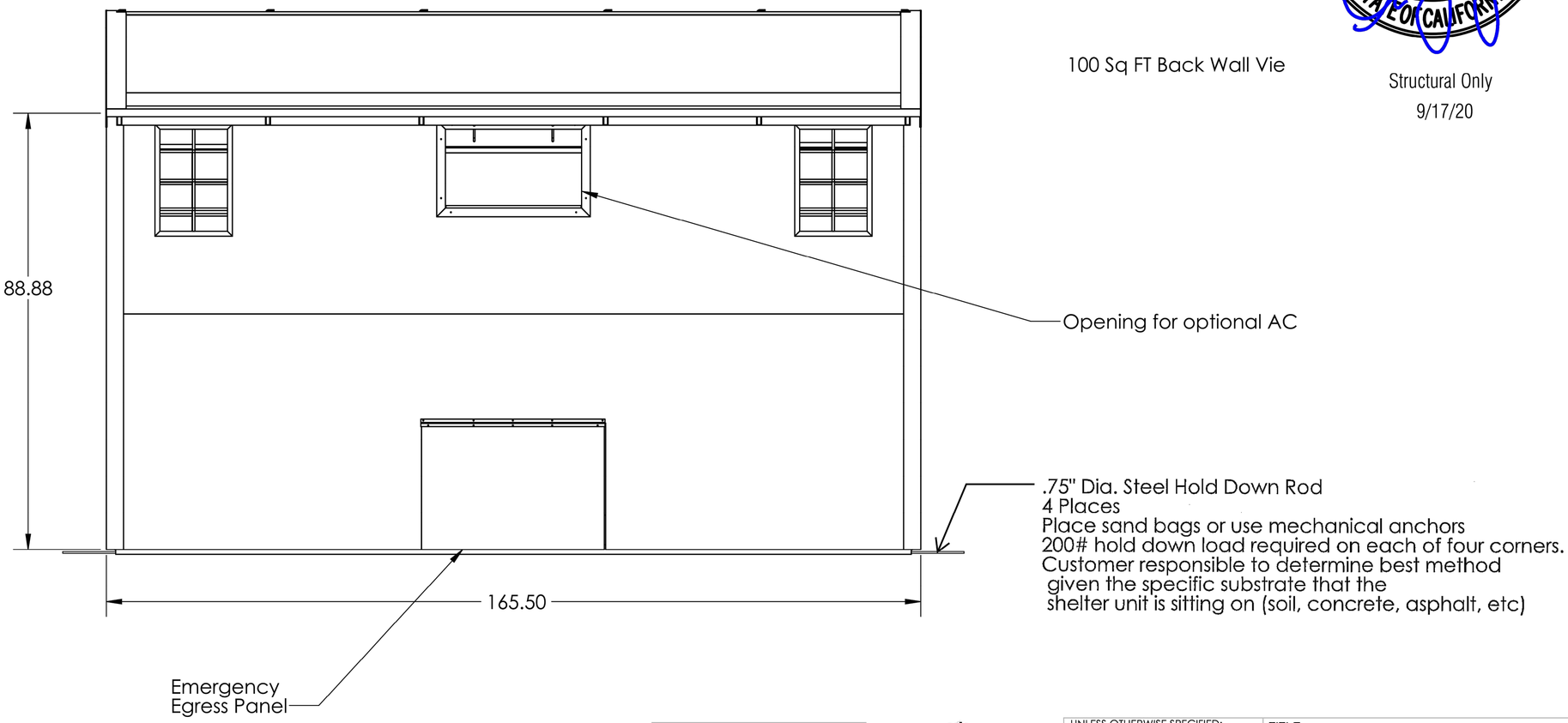
Project ID: BSC
File Name: XA-SHELTER
Drawn By:
Review By:
Plot Date:

Sheet Title:
100 SF PALLET SHELTER SHOP DRAWINGS - SIDE ELEVATION

Sheet No.:
SH3.02B

4/13/2023 4:34:00 PM

| REVISIONS | | | |
|---|---|---|---|
| ZONE | REV. | DESCRIPTION | DATE |




100 Sq FT Back Wall Vie

REGISTERED PROFESSIONAL ENGINEER
DAN JOSEPH SAY
No. 3459
Exp. 3/31/21
STRUCTURAL
STATE OF CALIFORNIA

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9/17/20

Approved by Quality

Signature _____

Date _____

Approved by Production

Signature _____

Date _____

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TOLERANCES:
FRACTIONAL ±1/32
ANGULAR: MACH ±1° BEND ±1°
TWO PLACE DECIMAL: ±.03
THREE PLACE DECIMAL: ±.01
**DO NOT SCALE DRAWING**

| | |
|---|---|
| DRAWN BY | Don Bender |
| DATE | 7-27-2020 |

TITLE:
100 Sq FT Pallet Shelter
Back Wall View

Part Number
10370

REV
A

WEIGHT:

SHEET 1 OF 1

1 SH3.03B 100SF PALLET SHELTER SHOP DRAWINGS - BACK ELEVATION
SCALE: N.T.S.

Project Title:

2ND ST PATHWAYS STAIR CENTER
SITE IMPROVEMENTS AND SHELTER UNITS
1601 SECOND STREET, BERKELEY, CA 94710
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|---|---|---|
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Issue Note:

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09/21/22

| | |
|---|---|
| Project ID: | BSC |
| File Name: | XA-SHELTER |
| Drawn By: | |
| Review By: | |
| Plot Date: | |

Sheet Title:

100 SF PALLET SHELTER SHOP DRAWINGS - BACK ELEVATION

Sheet No.:

SH3.03B

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Structural Calculations For:

# Pallet Shelter 100

Prepared for: Pallet Shelter

Job #: 11776-2018-01-00

Date: March 2nd, 2020


STRUCTURAL ENGINEERING

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## Pallet Shelter 100

General Building Narrative

The pallet shelter 100 is a roughly 100 square foot temporary shelter intended for rapid deployment. To facilitate this rapid deployment, the shelter is panelized, packaged, then shipped and assembled on site.

The general construction takes the form of an aluminum frame system utilizing light insulated "skin" of a plascore honeycomb floor covering, and an insulated Glasliner wall and roof system. Given the unique nature of construction and deployment, testing has been conducted to determine bolt/rivet shear capacity in the roof and wall systems to transmit the prescriptive lateral forces as outlined in the California Building Code appendix O of 15 pounds per square foot.

Given the lightweight nature of the fully assembled structure, utilizing the CBC to determine seismic demands assuming an R value of 1.0, the prescriptive lateral forces of appendix O are significantly higher than that required per the California Building Code. As such, the structure has been designed elastically to resist the prescriptive lateral values.

In addition to the testing undertaken to determine structural capacities, we are also utilizing testing data from both Plascore and Glasliner in determining capacities of the lightweight coverings to resist gravity loads of 40 pounds per square foot.

**3. Physical Properties - Typical Values** Glasliner Wall Panel Material

| 0.075in Nominal Thickness / 1000 Series | | |
|---|---|---|
| **Property** | **Value** | **Test Method** |
| Flexural Strength | 14,780 psi | ASTM D790 |
| Flexural Modulus | 7.0 x $10^5$ psi | ASTM D790 |
| Tensile Strength | 6,490 psi | ASTM D638 |
| Tensile Modulus | 7.70 x $10^5$ psi | ASTM D638 |

**PP polypropylene honeycomb is specified as follows:**

PP1 - 5.0 - N1 - 8 - 01 - T - N - 0.500 - 72.000 - 78.000

PP Used in Design: PP1-5.0-UV-8-30

Ell/in width = 1800 # in^2

**PP Honeycomb Core Mechanical Properties**

| CORE | CELL SIZE | DENSITY | | FLATWISE COMPRESSION* | | | | | | PLATE SHEAR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lbs/ft³ | Kg/m³ | Strength | Modulus | Strength | Modulus | Strength | Modulus | Strength | Modulus | Strength | Modulus |
| | | | | psi | psi | psi | psi | psi | psi | psi | psi | psi | psi |
| PP1-3.0-T-N | 0.250 | 3 | 48.1 | 125 | 2,500 | 90 | 1,800 | 55 | 1,100 | 60 | 1,200 | 35 | 700 |
| PP1-5.0-T-N | 0.250 | 5 | 80.1 | 435 | 8,700 | 290 | 5,800 | 175 | 3,500 | 90 | 1,800 | 55 | 1,100 |
| PP1-8.0-T-N | 0.250 | 8 | 128.2 | 1,860 | 37,200 | 1,240 | 24,800 | 745 | 14,900 | 145 | 2,900 | 90 | 1,800 |
| PP1-10.0-T-N | 0.250 | 10 | 160.2 | 3,000 | 60,000 | 2,000 | 40,000 | 1,200 | 24,000 | 180 | 3,600 | 110 | 2,200 |

*Flatwise Compression Test Method ASTM C365 — Flatwise Compression Modulus Test Method ASTM C365

**Plate Shear Test Method ASTM C273 — Plate Shear Modulus Test Method ASTM C273


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DATE
PROJ. #
DESIGN
SHEET

## Seismic Design

ASCE 7-16, Seismic Analysis
Equivalent Lateral Force Procedure
CBC 2019

Risk Category: II
Site Class: D

I, II, or III, or IV per Table 1.5-1
per soils report
(D assumed, without soils report)

| | | |
|---|---|---|
| $I_E$ | 1 | |
| $S_S$ | 1.9 | 2% in 50 yr, Latitude & Longitude lookup |
| $S_1$ | 0.7 | 2% in 50 yr, Latitude & Longitude lookup |
| $h_n$ | 8 ft | |
| R | 1.00 | Other |
| $I_s$ | 1.0 | Table 1.5-2 |
| $C_d$ | 1 | |
| Ct | 0.02 | Table 12.8-2 |
| x | 0.75 | Table 12.8-2 |
| T | 0.10 (sec) | Eq. 12.8-7 |
| $T_o$ | 0.11 (sec) | |
| $T_s$ | 0.55 (sec) | |
| k | 1.000 | |
| Fa | 1.00 | Table 11.4-1 |
| Fv | 1.50 | Table 11.4-2 |
| $S_{MS}$ | 1.90 | Eq. 11.4-1 |
| $S_{M1}$ | 1.05 | Eq. 11.4-2 |
| $S_{DS}$ | 1.27 | Eq. 11.4-3 |
| $S_{D1}$ | 0.70 | Eq. 11.4-4 |
| Cs | 1.267 | Eq. 12.8-2 |
| | 7.358 | eq. 12.8-3 need not exceed, $I < I_L$ |
| | 0.350 | Eq. 12.8-5 or 12.8-6 minimum |
| Cs, design | 1.267 | |
| Bldg. Weight | 0.7 k | |
| V = $C_sW$ | 0.9 k | Eq. 12.8-1, Strength Level Base Shear |
| $V = C_{s,max}W$ | 1 k | Eq. 12.8-1 Allowable Stress Base Shear |

$T_a = C_t h_n^x$ Eq. 12.8.7

$S_{MS} = F_a S_S$ Eq. 11.4-1
$S_{M1} = F_v S_1$ Eq. 11.4-2
$S_{DS} = {}^2/_3 S_{MS}$ Eq. 11.4-3
$S_{D1} = {}^2/_3 S_{M1}$ Eq. 11.4-4

$C_S = \frac{S_{DS}}{(R/I_e)}$ Eq. 12.8-2
$C_S = \frac{S_{D1}}{T(R/I_e)}$ Eq. 12.8-3
$C_S = \frac{S_{D1} T_L}{T^2(R/I_e)}$ Eq. 12.8-4
$C_S \geq 0.044 S_{DS} I_e$ Eq. 12.8-5
$C_S \geq 0.01$ Eq. 12.8-5

$C_{VX} = w_x h_x^k / \sum_{i=1}^{n} w_i h_i^k$ Eq. 12.8-12

$F_{px} = \frac{\sum_{i=x}^{n} F_i}{\sum_{i=x}^{n} w_i} w_{px}$ Eq. 12.10-1
$F_{px} \geq 0.2 S_{DS} I_e w_{px}$ Eq. 12.10-2
$F_{px} \leq 0.4 S_{DS} I_e w_{px}$ Eq. 12.10-3

Vertical Distribution
ASD

$\rho$= 1.0

| Level | hx (ft) | Wx | $hx^k$ (ft) | $Wxhx^k$ | Cvx (%) | Fx (k) | ΣV (k) | $F_{PX,min}$ | $F_{PX,max}$ | $F_{PX,design}$ | $\gamma = F_{PX}/F_X$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| | | | | 0.0 | 0.000 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | - |
| 1 | 8.0 | 0.7 | 8.0 | 5.6 | 1.000 | 0.6 | 0.6 | 0.62 | 0.12 | 0.25 | 0.25 | 0.40 |
| | Σ | 0.7 | | 5.6 | | 0.621 | | | | | |

Diaphragm Force (p not included)
ASD


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Project: Pallet Shelter
Project #:
Design: ZFK
Sheet: 2
Date: 6/3/2020

## Wind Design

ASCE 7-16, Method 2 - Analytical Procedure
CBC 2019

Wind Coefficients

| | | |
|---|---|---|
| Exposure | B | |
| V= | 110 | mph |
| $K_d$= | 0.85 | Table 26.6-1 |
| $I_w$= | 1 | Table 1.5-2 |
| G= | 0.85 | 26.9.4 |

Location and Building Dimensions

| | | |
|---|---|---|
| Calculate Kzt? | NO | |
| Kzt | 1 | |
| Roof Angle | 0 | degrees |
| Ground to top of roof | 8 | ft |
| Bottom of roof to top of roof | 0.33 | ft |
| (mean roof height) h | 7.835 | ft |

Pressure Coefficients from Figure 27.4-1:

| WIND TAGS | $c_p$ |
|---|---|
| Windward Wall | 0.8 |
| Leward Wall | -0.5 |
| Windward Roof | 0 |
| Leward Roof | -0.7 |

*Note= Cp values are conservative worst case values

Pressures:

| Ht | $K_z$ | $q_z$ | $P_{net,walls}$ | $P_{nets}$ | Strength $P_{walls}$ (psf) | Allowable $P_{walls}$ (psf) |
|---|---|---|---|---|---|---|
| 0-15 | 0.57 | 15.0 | 10.2 | 6.4 | 16.8 | 10.8 |

| $P_{net\ roof}$ | $P_{fe\ roof}$ | $P_{roof}$ (psf) | $P_{roof}$ (psf) |
|---|---|---|---|
| 0.00 | 8.93 | 8.93 | 5.36 |

Direction 1 - E: Escarpment upwind 212 1000 0 10
Direction 2 - W: Terrain= Escarpment Site= upwind Hi= 212 Lh= 1000 x= 0 s= 10
Direction 3 - N: Terrain= Escarpment Site= upwind Hi= 212 Lh= 1000 x= 0 s= 10
Direction 4 - S: Escarpment upwind 212 1000 0 10

γ= 1.5
γ= 2.5

K1 value =
K1= #VALUE!
K2= 1.00
K3= 0.08
H/Lh= 0.21
Kzt= #VALUE!

$K_{zt} = (1 + K_1 K_2 K_3)^2$
$K_1$ = Per Figure
$K_2 = (1 - |x|/\mu L_h)$
$K_3 = e^{-\gamma z/L_h}$
$K_{zt} = 1$, If H/Lh ≤ 0.2

PER FIGURE 26.8-1


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Project: Pallet Shelter
Project #:
Design: ZFK
Sheet: 3
Date: 6/3/2020

PALLET (100)

ROOF PURLINS

w = 85.0 L = 7.5' R = 321#

M = 603'# $S_x$ = 0.332 $f_b = \frac{7.2}{0.332}$ = 21.5 ksi < 31.8 ksi

2x1 x 0.125 ALUM TUBE OK

TRUSS R

M = 603'# = 7.2" k

$S = \frac{.125(6)^2}{6} = 1.128$

$f_b$ = 6.4 < 31.8 OK

T = C = 603'# / 1.0" = 603#

1/8" RIVET

R 0.188 x 1/8" x 2"

COLUMN

$\frac{KL}{r}$ = 186 $\sigma_{all} = 51352/\lambda^2 = 1.5$ ksi

$\frac{P}{A} = \frac{0.321}{0.531} = 0.604$ DCR = .604 / 1.5 = 0.4

OOP (c+t)

w = 11 psf x 2.5 = 27.5 L = 8'

$M_x$ = 220'# = 2.64'k

S = 0.289

$f_b$ = 11.5 < 23.6 DCR = 0.5

1.5" x 1.5" x t=0.125

COMB.

$\frac{P}{P_c} + \frac{M_{ux}}{M_{cx}} \leq 1.0$ 0.4 + 0.5 = 0.9 < 1.0 OK

PALLET
PROJECT
3.13.18
DATE
PROJ. #
DESIGN
SHEET

SIDE WALL

w = 11 psf x 2.5

b/t = 1.5/0.125 = 12 → F/Ω = 31.8 ksi

$M_w$ = 216#'# = 2.6"k

S = 0.129

$f_b$ = 20 ksi < 31.8 OK

1.5" x 1.5" x t=1/8" CHANNEL

PROJECT
DATE
PROJ. #
DESIGN
SHEET

LATERAL LOAD TRANSFER

ROOF PURLINS

ROOF CLIPS

WALL BELOW

255# / 4 = 63.75

$M_w$ = 63.75 (9") = 573 in-#

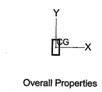
$f_b$ = 3 ksi << 31.8 ksi 2x1 x0.125 OK

PALLET 64
PROJECT
DATE
PROJ. #
DESIGN
SHEET

ShapeBuilder 2.(
Swenson Say Faget
Thu. March 15, 2018

Overall Properties
Name: Shape1 rx: 0.611 in
Area: 0.531 in^2 ry: 0.480 in
CG: (-0.331,0.206) rp: 1.326 in
Ix: 0.198 in^4 Zx: 0.307 in^3
Iy: 0.123 in^4 Zy: 0.224 in^3
Ixy: 0 in^4 PNA: (-0.441,0.206)
Ipolar: 0.321 in^4 J: 0.003 in^4
Sx: 0.264 in^3 Cw: 0.041 in^6
Sy left: 0.224 in^3 SC: (-1.405,0.206)
Sy right: 0.129 in^3

ShapeBuilder 2.(
Swenson Say Faget
Wed. March 14, 2018




Overall Properties
Name: Shape1 rx: 0.695 in
Area: 0.688 in^2 ry: 0.391 in
Ix: 0.332 in^4 rp: 0.797 in
Iy: 0.105 in^4 Zx: 0.426 in^3
Ixy: 0 in^4 Zy: 0.254 in^3
Ipolar: 0.437 in^4 J: 0.245 in^4
Sx: 0.332 in^3
Sy: 0.210 in^3

1 SH8.01B — 100SF PALLET SHELTER - STRUCTURAL CALCULATIONS
SCALE: N.T.S.

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

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Issue Note:

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09/21/22

| | |
|---|---|
| Project ID: | BSC |
| File Name: | XA-SHELTER |
| Drawn By: | |
| Review By: | |
| Plot Date: | |

Sheet Title:

100 SF PALLET SHELTER - STRUCTURAL CALCULATIONS

Sheet No.:

SH8.01B

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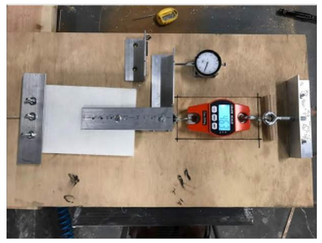
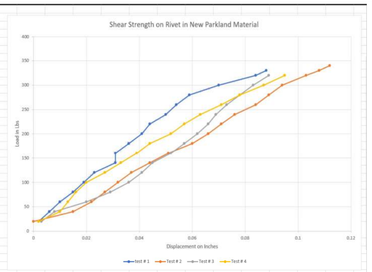


| Load | Test 1 Disp | Test 2 Disp | Test 3 Disp | Test 4 Disp |
|---|---|---|---|---|
| 20 | 0.002 | 0 | 0.003 | 0.002 |
| 40 | 0.006 | 0.015 | 0.006 | 0.01 |
| 60 | 0.01 | 0.022 | 0.02 | 0.013 |
| 80 | 0.015 | 0.027 | 0.029 | 0.016 |
| 100 | 0.019 | 0.032 | 0.036 | 0.02 |
| 120 | 0.023 | 0.037 | 0.041 | 0.027 |
| 140 | 0.031 | 0.044 | 0.045 | 0.033 |
| 160 | 0.031 | 0.051 | 0.052 | 0.039 |
| 180 | 0.036 | 0.06 | 0.057 | 0.044 |
| 200 | 0.041 | 0.066 | 0.062 | 0.052 |
| 220 | 0.044 | 0.071 | 0.066 | 0.057 |
| 240 | 0.05 | 0.076 | 0.069 | 0.063 |
| 260 | 0.054 | 0.084 | 0.073 | 0.071 |
| 280 | 0.059 | 0.089 | 0.078 | 0.078 |
| 300 | 0.07 | 0.094 | 0.083 | 0.087 |
| 320 | 0.094 | 0.103 | 0.089 | 0.095 |
| 330 | 0.088 | 0.108 | | |
| 340 | | 0.112 | | |




Stress Strain Curves for (4) Representative Test Samples

Average first yield occurs at 300#. Applying a factor of safety of 2 to the rivets provides and allowable capacity of 150# per rivet.

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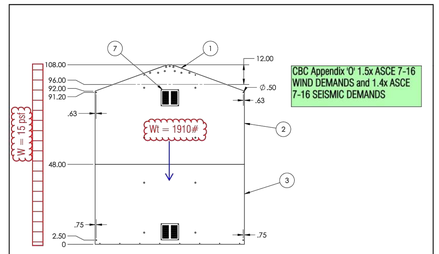
| | | | |
|---|---|---|---|
| Project Title: Pallet Shelter | | Date | SSF project no. |
| | | Design | |
| Sheet Title: | | Drawn | Sheet |




CBC Appendix 'O' 1.5x ASCE 7-16 WIND DEMANDS and 1.4x ASCE 7-16 SEISMIC DEMANDS

Tributary Wall Reaction = 15psf * 4' Trib = 60plf *13.5ft/2 wall lines = 405#

Per CBC Appendix 'O'

Rivet Allowable Capacity = 150# based on testing and a factor of safety of 2.0

405# / 7.5' wall length = 54plf --> Rivet @ 2'-9" oc MAX

Overturning = 15*8*13.5*4/7.5 = 864#
0.6DL Resist = 1950*0.6/2 = 585#
Net Uplift = 280# per wall line --> 200# sandbag or equivalent at each corner of structure with 3/4" dia. rod

Sliding = 910#
Sliding Resist = 1910+200*4 = 2710*0.4 = 1084# --> OK

Assumed coeff. of friction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O 253.284.9470
ssfengineers.com


STRUCTURAL ENGINEERING

| | | |
|---|---|---|
| Pallet Shelter 100 | | 6-3-20 DATE |
| | | PROJ. # JK DESIGN |
| | | SHEET |

**Zane Kanyer**

**From:** Mike Niemerski <mike.niemerski@plascore.com>
**Sent:** Wednesday, March 07, 2018 1:42 PM
**To:** Zane Kanyer
**Subject:** RE: Phone call follow up

Ok per our phone call, I added the Yield Pt at a theoretical failure still using the same 4" wide x Span panel size.
My standard on the glass tensile strength is 20,000 psi. I have test data that shows 35,000 psi.

| Span | Panel T | Deflection | Bending E-Mod | Yield Pt |
|---|---|---|---|---|
| inches | inches | inches | psi | lbf |
| 12 | 0.32 | 0.13 | 635,300 | 140 |
| 24 | 0.32 | 0.86 | 761,000 | 75 |
| 36 | 0.32 | 2.8 | 788,100 | 50 |
| | | | | |
| 12 | 0.5 | 0.06 | 392,700 | 225 |
| 24 | 0.5 | 0.35 | 515,800 | 120 |
| 36 | 0.5 | 1.12 | 542,510 | 75 |
| | | | | |
| 12 | 0.75 | 0.03 | 216,000 | 325 |
| 24 | 0.75 | 0.16 | 321,500 | 170 |
| 36 | 0.75 | 0.5 | 347,100 | 115 |

Sufficient to resist 40psf floor live load

Panel Type:
.02"T 0-90 Glass-PP both sides
5 pcf PP Honeycomb core
Load and panel condition: 4" wide, 25 lbs, 3 pt bend
Yield Pt determined at 4" wide
Glass facing at 20,000 psi Tensile Strength
(Testing shows to 35,000 psi)
Calculated values for indicative performance

I have data from a user of these panel types using a ¼" dia Aluminum Pop Rivet through the front facing of the panel only at:
28 lbs Pull out Strength
44 lbs Shear Strength

Hope that makes sense and helps.

Let me know.

**Michael Niemerski**
**Market Dev. Eng. Manager**
**Plascore, Inc.**
TEL: (616) 748-2246 | FAX: (616) 772-1289
www.plascore.com



Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

1601 SECOND STREET, BERKELEY, CA 94710

APN #: 57-2112-5

Design Firm:


SIEGEL & STRAIN Architects
6201 Doyle Street, Suite B
Emeryville, CA 94608
510 / 547-8092
info@siegelstrain.com
www.siegelstrain.com


Consultant:

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

Issue Note:

PERMIT SET

09/21/22

Project ID: BSC
File Name: XA-SHELTER
Drawn By:
Review By:
Plot Date:
Sheet Title:

100 SF PALLET SHELTER - STRUCTURAL CALCULATIONS

Sheet No.:

SH8.02B

4/13/2023 4:34:01 PM

MITRAS Materials GmbH Donnerstag, 4. Juni 2020

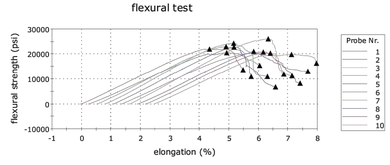
Materialbeschreibung
Polydet Performance Plus

Prüfmethode
Biegeversuch nach ASTM D 790-15, Procedure A

Allgemeine Angaben

| | |
|---|---|
| Prüfer | SB |
| Temperatur [°C] | 23,5 |
| Feuchte [%] | 50,5 |
| Dateiname | C:\Labor\2020\Optiplan\b20-092 ASTM |
| Prüfgeschwindigkeit [in/min] | 0,042 |
| Prüfgeschwindigkeit [mm/min] | 0,830 |

Diagramm 2




Ergebnistabelle

| | flexural strength (psi) | maximum strength (lbf) | flexural strain (%) | E-modulus (0,05 % - 0,25 %) (psi) | support span (in) | width (in) | thickness (in) |
|---|---|---|---|---|---|---|---|
| 1 | 22048,1 | 16,0 | 4,33 | 479378,1 | 1,0 | 0,503 | 0,047 |
| 2 | 20583,9 | 15,3 | 4,64 | 460505,8 | 1,0 | 0,501 | 0,047 |
| 3 | 23043,0 | 17,0 | 4,34 | 525046,1 | 1,0 | 0,502 | 0,047 |
| 4 | 24361,8 | 17,2 | 4,32 | 543960,8 | 1,0 | 0,500 | 0,046 |
| 5 | 22849,3 | 16,1 | 4,06 | 534891,5 | 1,0 | 0,501 | 0,046 |
| 6 | 20892,3 | 14,7 | 4,78 | 500106,7 | 1,0 | 0,500 | 0,046 |
| 7 | 26115,9 | 18,5 | 4,67 | 579242,5 | 1,0 | 0,501 | 0,046 |
| 8 | 21118,9 | 14,9 | 3,90 | 489546,0 | 1,0 | 0,500 | 0,046 |
| 9 | 20431,1 | 14,5 | 4,19 | 526250,6 | 1,0 | 0,502 | 0,046 |
| 10 | 19929,5 | 14,7 | 4,63 | 495825,3 | 1,0 | 0,500 | 0,047 |
| average value | 22137,4 | 15,9 | 4,39 | 513475,3 | 1,0 | 0,501 | 0,046 |
| standard deviation | 1969,17 | 1,32 | 0,29 | 35026,45 | 0,00 | 0,00 | 0,00 |
| minimum | 19929,5 | 14,5 | 3,90 | 460505,8 | 1,0 | 0,500 | 0,046 |
| maximum | 26115,9 | 18,5 | 4,78 | 579242,5 | 1,0 | 0,503 | 0,047 |
| Mittel + 2 SA | 26075,7 | 18,5 | 4,96 | 583528,2 | 1,0 | 0,503 | 0,047 |
| Mittel - 2 SA | 18199,0 | 13,2 | 3,81 | 443422,4 | 1,0 | 0,499 | 0,045 |



MITRAS Materials GmbH Donnerstag, 4. Juni 2020

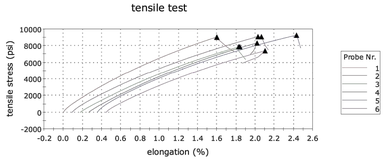
Materialbeschreibung
Polydet Performance Plus

Prüfmethode
Zugprüfung nach ASTM D 638-14

Allgemeine Angaben

| | |
|---|---|
| Dateiname | C:\Labor\2020\Optiplan\z20-092 ASTM |
| Prüfer | SB |
| Temperatur [°C] | 23,6 |
| Feuchte [%] | 50,0 |
| Prüfgeschwindigkeit [in/min] | 0,2 |
| Genauigkeitsklasse der Prüfmaschine | Klase 0.5 nach ISO 7500-1 / Klasse 1 Nach ISO 9513 |
| Probenanmerkung | |

Diagramm 2




Ergebnistabelle

| | tensile strength (psi) | E-Modul (0,05-0,25%) (psi) | elongation at break (%) | maximum stress (lbf) | width (in) | thickness (in) |
|---|---|---|---|---|---|---|
| 1 | 9045,0 | 769918,2 | 1,60 | 219 | 0,513 | 0,047 |
| 2 | 9093,1 | 678416,8 | 1,97 | 220 | 0,513 | 0,047 |
| 3 | 7892,1 | 610762,5 | 1,65 | 190 | 0,513 | 0,047 |
| 4 | 8339,6 | 643891,7 | 1,75 | 202 | 0,513 | 0,047 |
| 5 | 9260,0 | 687026,2 | 2,07 | 223 | 0,513 | 0,047 |
| 6 | 7403,4 | 601451,5 | 1,66 | 178 | 0,512 | 0,047 |
| average value | 8505,5 | 665244,5 | 1,78 | 205 | 0,513 | 0,047 |
| standard deviation | 751,52 | 61803,42 | 0,19 | 18,57 | 0,00 | 0,00 |
| maximum | 9260,0 | 769918,2 | 2,07 | 223 | 0,513 | 0,047 |
| minimum | 7403,4 | 601451,5 | 1,60 | 178 | 0,512 | 0,047 |



ALUMINUM STRUCTURAL NOTES

(The following notes apply for aluminum alloy load-carrying members)

CRITERIA

1. STRUCTURAL ALUMINUM DESIGN, FABRICATION, AND ERECTION SHALL BE BASED ON THE LATEST EDITIONS OF THE ASTM SPECIFICATIONS AND THE CALIFORNIA BUILDING CODE.

2. ALUMINUM FOR STRUCTURAL ELEMENTS SHALL AT ALL TIMES BE SEGREGATED OR OTHERWISE HANDLED IN THE FABRICATORS'S PLANT SO THAT THE SEPARATE ALLOYS AND TEMPERS ARE POSITIVELY IDENTIFIED, AND AFTER COMPLETION OF FABRICATION, SHALL BE MARKED TO IDENTIFY THE ALLOY AND TEMPER. SUCH MARKINGS SHALL BE AFFIXED TO COMPLETE MEMBERS AND ASSEMBLIES OR TO BOXED OR BUNDLED SHIPMENTS OF MULTIPLE UNITS PRIOR TO SHIPMENT FROM THE FABRICATOR'S PLANT.

3. CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY BRACING AND FASTENING STRUCTURAL ALUMINUM TO RESIST DEAD, WIND, AND ERECTION LOADS DURING CONSTRUCTION.

4. STRUCTURAL ALUMINUM SHALL BE 6061-SERIES ALLOY UNLESS NOTED OTHERWISE.

5. VERIFICATION SHALL BE PROVIDED TO SHOW THAT THE CHOICE OF THE FILLER METAL FOR GENERAL PURPOSE WELDING IS APPROPRIATE.

6. FASTENING SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

   A. BOLTS AND OTHER FASTENERS SHALL BE ALUMINUM, STAINLESS STEEL OR ALUMINIZED, HOT-DIP GALVANIZED OR ELECTROGALVANIZED STEEL. DOUBLE CADMIUM-PLATED 'AN' STEEL BOLTS MAY ALSO BE USED. STEEL RIVETS SHALL NOT BE USED EXCEPT WHERE ALUMINUM IS TO BE JOINED TO STEEL OR WHERE CORROSION RESISTANCE OF THE STRUCTURE IS NOT A REQUIREMENT OR WHERE THE STRUCTURE IS TO BE PROTECTED AGAINST CORROSION.

   B. ALUMINUM USED FOR RIVETS AND BOLTS SHALL CONFORM TO THE FOLLOWING:
      1. NUTS FOR 1/4" BOLTS AND SMALLER SHALL BE 2024-T4.
      2. NUTS FOR BOLTS LARGER THAN 1/4" SHALL BE 6061-T6 OR 6262-T9.
      3. FLAT WASHERS SHALL BE ALCLAD 2024-T4.
      4. SPRING LOCK WASHERS SHALL BE ALLOY 7075-T6.
      5. FOR IMPROVED CORROSION RESISTANCE, A 0.0002-INCH MINIMUM THICKNESS ANODIC COATING MAY BE APPLIED TO ALLOY 2024 BOLTS.

7. HOLE CENTERS MAY BE CENTER PUNCHED AND CUTOFF LINES MAY BE PUNCHED OR SCRIBED. CENTER PUNCHING AND SCRIBING SHALL NOT BE USED WHERE SUCH MARKS WOULD REMAIN ON FABRICATED MATERIAL.

8. CUTTING OF ALUMINUM SHALL CONFORM TO THE FOLLOWING:

   A. MATERIAL MAY BE SHEARED, SAWED, CUT WITH A ROUTER OR ARC CUT. ALL EDGES WHICH HAVE BEEN CUT BY THE ARC PROCESS MUST BE PLANED TO REMOVE EDGE CRACKS.

   B. CUT EDGES SHALL BE TRUE, SMOOTH AND FREE FROM EXCESSIVE BURRS OR RAGGED BREAKS.

   C. RE-ENTRANT CUTS SHALL BE AVOIDED WHEREVER POSSIBLE. IF USED, THEY SHALL BE FILLETED BY DRILLING PRIOR TO CUTTING.

   D. OXYGEN CUTTING SHALL NOT BE PERMITTED.

9. STRUCTURAL MATERIAL SHALL NOT BE HEATED EXCEPT TO A TEMPERATURE NOT EXCEEDING 400 DEGREES FAHRENHEIT FOR A PERIOD NOT EXCEEDING 30 MINUTES IN ORDER TO FACILITATE BENDING. SUCH HEATING SHALL BE DONE ONLY WHEN PROPER TEMPERATURE CONTROLS AND SUPERVISION ARE PROVIDED TO INSURE THAT THE LIMITATIONS ON TEMPERATURE AND TIME ARE CAREFULLY OBSERVED.

10. PUNCHING, DRILLING, AND REAMING SHALL CONFORM TO THE FOLLOWING:

   A. RIVET OR BOLT HOLES MAY BE EITHER PUNCHED OR DRILLED. PUNCHING SHALL NOT BE USED IF THE METAL THICKNESS IS GREATER THAN THE HOLE DIAMETER. THE AMOUNT BY WHICH THE DIAMETER OF A SUB-PUNCHED HOLE IS LESS THAN THAT OF THE FINISHED HOLE SHALL BE AT LEAST ONE FOURTH THE THICKNESS OF THE PIECE AND IN NO CASE LESS THAN 1/32 INCH.

   B. THE FINISHED DIAMETER OF HOLES FOR COLD-DRIVEN RIVETS SHALL NOT BE MORE THAN 4 PERCENT GREATER THAN THE NOMINAL DIAMETER OF THE RIVET.

   C. THE FINISHED DIAMETER OF HOLES FOR HOT-DRIVEN RIVETS SHALL NOT BE MORE THAN 7 PERCENT GREATER THAN THE NOMIMAL DIAMETER OF THE RIVET.

   D. THE FINISHED DIAMETER OF HOLES FOR BOLTS SHALL NOT BE MORE THAN 1/16 INCH LARGER THAN THE NOMINAL BOLT DIAMETER.

   E. IF ANY HOLES MUST BE ENLARGED TO ADMIT THE RIVETS OR BOLTS, THEY SHALL BE REAMED. POOR MATCHING OF HOLES SHALL BE CAUSE FOR REJECTION. HOLES SHALL NOT BE DRIFTED IN SUCH A MANNER AS TO DISTORT THE METAL. ALL CHIPS LODGED BETWEEN CONTACTING SURFACES SHALL BE REMOVED BEFORE ASSEMBLY.

11. RIVETING SHALL CONFORM TO THE FOLLOWING:

   A. THE DRIVEN HEAD OF ALUMINUM ALLOY RIVETS SHALL BE OF THE FLAT OR THE CONE-POINT TYPE WITH DIMENSIONS AS FOLLOWS:

      1. FLAT HEADS SHALL HAVE A DIAMETER NOT LESS THAN 1.4 TIMES THE NOMINAL RIVET DIAMETER AND A HEIGHT NOT LESS THAN 0.4 TIMES THE NOMINAL RIVET DIAMETER.

      2. CONE-POINT HEADS SHALL HAVE A DIAMETER NOT LESS THAN 1.4 TIMES THE NOMINAL RIVET DIAMETER AND A HEIGHT TO THE APEX OF THE CONE NOT LESS THAN 0.65 TIMES THE NOMINAL RIVET DIAMETER. THE INCLUDED ANGLE AT THE APEX OF THE CONE SHALL BE APPROXIMATELY 127 DEGREES.

   B. RIVETS SHALL FILL HOLES COMPLETELY. RIVET HEADS SHALL BE CONCENTRIC WITH THE RIVET HOLES AND SHALL BE IN PROPER CONTACT WITH THE SURFACE OF THE METAL.

   C. DEFECTIVE RIVETS SHALL BE REMOVED BY DRILLING.

12. SURFACE PAINTING SHALL BE DONE IN THE FOLLOWING INSTANCES:

   A. THE ALUMINUM ALLOY PARTS ARE IN CONTACT WITH, OR ARE FASTENED TO, STEEL MEMBERS OR OTHER DISSIMILAR MATERIALS.

1 100SF PALLET SHELTER - STRUCTURAL CALCULATIONS
SH8.02B SCALE: N.T.S.

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• TESTING • INSPECTION

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email: info@RADCOInc.com

**RADCO TEST REPORT**
Test Report: RAD-4961
Project No: F10581

# Tie Down Engineering, Inc.
# Asphalt Anchor

Prepared For:

**Tie Down Engineering, Inc.**
255 Villanova Drive SW
Atlanta, GA 30336

By:

**RADCO**
Resources, Applications, Designs and Controls, Inc.
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Prepared By:

Philip L. Witherington, P.E.
Staff Engineer

Issued: August 16, 2011

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NEBB-TLAT-0
NEBB-QA104

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8.0 CONCLUSIONS ---- 4
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### 1.0 INTRODUCTION

On May 5, 2011, at the request of Tie Down Engineering, Inc., Philip Witherington P.E. witnessed structural load testing of the Tie Down Engineering of the Asphalt Anchor for compliance with the Federal Manufactured Home Construction and Safety Standards (The Standards). The objective of the tests was to determine the ultimate design capacity of the use of this anchor when installed in asphalt.

### 2.0 DESCRIPTION

The Tie Down Engineering Asphalt Anchor, part number 59367, is a painted black three-quarter inch diameter steel rod with two sets of 'wing plates' welded to the rod and a double-headed anchor head at the top. Drawings shown at the bottom of the installation instructions are provided for clarification. The tip of the steel rod is angled approximately 45-degrees to allow for ease of penetration into the asphalt when driving the rod into the ground. Beginning at 16.16-inches from the top of the anchor head, the first pair of wing plates begin to flare out to a 1-inch wide winglet on each side of the anchor at 13.16 inches from the top of the anchor head. A larger pair of wing plates begin to flare out 10.41-inches from the anchor head out to a 3-inch wide winglet on each side of the anchor at 4.41-inches from the top of the anchor head. Each winglet has an 8 Gage thickness. Located 0.50-inches from the top of the rod is a flared ring to keep the double-headed swivel anchor head in place.

### 3.0 TEST SETUP

Testing took place in the parking lot at the Tie Down Engineering, Inc. manufacturing facilities located at 5901 Wheaton Drive, Atlanta, Georgia. The asphalt of the parking lot measured 3-inches thick atop a compacted base.
Three ground anchors were hammered vertically in to the asphalt a minimum of 4-feet away from each other so as to not have the results of one anchor test affect another. Picture 1 shows layout of ground anchors.
Picture 2 shows how the test equipment was set up. A steel cable winch was secured from a blocked in place Ford F-250 pickup to one side of a steel strut. The steel strut was pinned at the base to a steel base that was braced to prevent sliding of the strut during testing. Another cable was secured to the other side of the angled steel strut on one end, and to the top of a Dillon dynamometer at the other. A steel cable was connected from the dynamometer to the anchor head of the asphalt anchor. The setup was arranged to allow for a 30 to 45-degree angle of pull cable from the anchor upward to the strut.



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### 4.0 ANCHOR INSTALLATION

Asphalt anchors are hammered vertically into asphalt parking lot foundations. Atop each anchor is a swivel anchor head in which slotted bolts are fitted through to fasten steel foundation strapping from the building to the anchor at an approximate 45-degree angle. Use of these anchors is not intended for pure vertical anchorage.

### 5.0 MEASUREMENTS

A vertical displacement of 3-inches and horizontal displacement of 2-inches is allowed for anchorage per The Standards, however, ultimate loading occurred before maximum displacements took place. Once the anchors reached about an inch in the vertical and horizontal planes, the ultimate load would be achieved. Once the ultimate load was achieved, the load applied by the winch would drop off considerably. Any further attempt to apply load pressure would pull the anchor out of the ground, but at lower load pressure.

### 6.0 TEST LOADS

Load was applied in 1000-pound increments until failure. Each load increment was held for 5-seconds before the next load increment was applied. Three tests yielded ultimate loads of 3000, 2600 and 2900-pounds.

### 7.0 TEST RESULTS

Tensile loads applied at 30 to 45 degrees above the horizontal were applied to the asphalt ground anchors without failure to the anchors themselves. Failure occurred when the maximum load the asphalt could withstand took place, at which point, the asphalt continued to fail as the asphalt ground anchors were pulled out of the ground without further deformation of the anchors.

### 8.0 CONCLUSIONS

Testing has proven that the Tie Down Engineering Asphalt Anchors, part number 59367 has proven itself capable of withstanding an ultimate load of 2833-pounds and a design load of 1889-pounds with a safety factor of 1.5 when installed in accordance with Tie Down Engineering, Inc.'s installation instructions.



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### 9.0 CONDITIONS

Use of the Tie Down Engineering, Inc. Asphalt Anchor shall be limited to the following conditions:

- Anchor shall be installed in asphalt only.
- Asphalt shall be a minimum of 3-inches deep with compacted base underneath
- Connecting strapping angle must be no more than 45-degrees above grade.
- Anchor shall be installed as set forth in the Installation Instructions.



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Tie Down Engineering, Inc. Asphalt Anchor
Test Load Chart (Part No. 59367)

| | Test Number | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Load Increment | 1000 | 1000 | 1000 |
| | 2000 | 2000 | 2000 |
| | 3000 | 2600 | 2900 |

**INDUSTRIAL SCALES OF GA.**
**P.O. BOX 46**
**MABLETON, GA. 30126**
SALES-SERVICE

TELEPHONE: (770) 941-8879
Fax: (770) 941-8879

## SCALE INSPECTION CERTIFICATE

OWNER: Tie Down Engineering
LOCATION: Wheaton Drive
Atlanta Ga

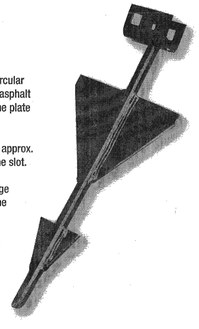
MAKE Dillon MODEL DIAL SERIAL# 12413 TYPE Dyna

*THIS IS TO CERTIFY,* WE HAVE THIS DAY 4-13-11
TESTED AND INSPECTED THIS SCALE USING 7000 LBS. OF STANDARD TEST WEIGHTS AND A STRAIN LOAD OF 20,000 LBS. LEAVING SCALE WITHIN *NATIONAL BUREAU OF STANDARDS* TOLERANCE.
SIMULATOR LINEARITY TESTING TO N/A LBS.

BY: Larry Waddell State Insp. 88

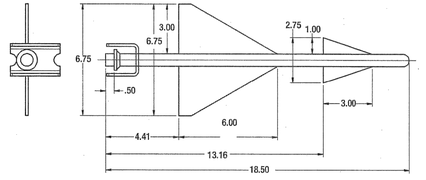


# Asphalt Anchor
## Installation Instructions
## #59367



1. Using a masonry or cut off blade with a circular saw, cut a slot 8" long x 1 ½" deep in the asphalt where the anchor is to be installed with the plate on the anchor parallel to the structure.
2. Using a 5/8" hammer drill, pre-drill a hole approx. 12" through the asphalt in the center of the slot.
3. Drive anchor into the asphalt using a sledge hammer or hammer drill until the top of the anchor plate is 1" under the asphalt.

For horizontal anchorage at a maximum of 50 degrees, not for vertical anchorage.




Instruction Sheet #08147

TIE DOWN ENGINEERING • 255 Villanova Drive SW • Atlanta, GA 30336
www.tiedown.com (404) 344-0000 Fax (404) 349-0401

1 SH8.01C TIE DOWN ANCHOR - TEST REPORT
SCALE: N.T.S.

Project Title:

2ND ST PATHWAYS STAIR CENTER
SITE IMPROVEMENTS AND SHELTER UNITS
1601 SECOND STREET, BERKELEY, CA 94710
APN #: 57-2112-5

Design Firm:

SIEGEL & STRAIN Architects
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Emeryville, CA 94608
510 / 547-8092
info@siegelstrain.com
www.siegelstrain.com

Consultant:

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

Issue Note:

PERMIT SET

09/21/22

| | |
|---|---|
| Project ID: | BSC |
| File Name: | XA-SHELTER |
| Drawn By: | |
| Review By: | |
| Plot Date: | |

Sheet Title:

TIE DOWN ANCHOR - TEST REPORT

Sheet No.:

SH8.01C

4/13/2023 4:34:01 PM

# ELECTRICAL SYMBOL LIST

NOTE: This is a standard symbol list and not all items listed may be used.

## Abbreviations

| | |
|---|---|
| (E) | EXISTING |
| (X) | DEMOLISH |
| A | AMPERES, AMBER |
| AFF | ABOVE FINISHED FLOOR |
| AHJ | AUTHORITY HAVING JURISDICTION |
| AIC | AVAILABLE INTERRUPTING CAPACITY |
| ANSI | AMERICAN NATIONAL STANDARDS INSTITUTE |
| AWG | AMERICAN WIRE GAUGE |
| C | CONDUIT, CLOSE, CONTROL |
| CU | COPPER |
| dB | DECIBEL |
| DIA | DIAMETER |
| DIM | DIMENSION |
| DIV | DIVISION |
| DTL | DETAIL |
| DWG | DRAWING |
| EA | EACH |
| FBO | FURNISHED BY OTHERS |
| FT | FOOT, FEET |
| G, GND | GROUND |
| GFCI | GROUND FAULT CIRCUIT INTERRUPTER |
| ID | IDENTIFICATION |
| IN | INCH, INCHES |
| KV | KILOVOLT |
| KVA | KILOVOLT AMPERES |
| KW | KILOWATT |
| MCA | MINIMUM CIRCUIT AMPS |
| MIN | MINIMUM |
| MISC | MISCELLANEOUS |
| MOCP | MAXIMUM OVERCURRENT PROTECTION |
| MT, MTD | MOUNT, MOUNTED |
| N.I.C. | NOT IN CONTRACT |
| N/A | NOT APPLICABLE |
| N | NEUTRAL |
| NEC | NATIONAL ELECTRIC CODE |
| NEMA | NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION |
| NESC | NATIONAL ELECTRIC SAFETY CODE |
| NTS | NOT TO SCALE |
| OC | ON CENTER |
| PH | PHASE |
| PNL | PANEL |
| PWR | POWER |
| QTY | QUANTITY |
| REQD | REQUIRED |
| RM | ROOM |
| SHT | SHEET |
| STD | STANDARD |
| SWBD | SWITCHBOARD |
| TBD | TO BE DETERMINED |
| TYP | TYPICAL |
| UL | UNDERWRITERS LABORATORIES |
| UON | UNLESS OTHERWISE NOTED |
| V | VOLTS, VOLTAGE |
| W | WEATHERPROOF |
| XFMR | TRANSFORMER |

## Connections / Equipment

- PULL BOX
- WALL-MOUNTED JUNCTION BOX
- UTILITY TRANSFORMER
- UTILITY METER BASE

## General

- DEMOLISH
- EXISTING WORK
- NEW WORK
- DETAIL NUMBER AND SHEET LOCATION
- KEYED NOTE

## Miscellaneous

- BRANCH CIRCUIT WIRING. ARROW INDICATES HOME RUN TO PANEL WITH CIRCUITS AS NOTED. WIRE SIZE IS #12 AWG MINIMUM UNLESS NOTED OTHERWISE. SHORT TICK MARKS INDICATE PHASE CONDUCTORS. LONG TICK MARKS INDICATE NEUTRAL CONDUCTORS. A SINGLE CURVED TICK MARK INDICATES INSULATED GREEN GROUND CONDUCTOR. SECOND CURVED TICK MARK INDICATES "ISOLATED GROUND" (GREEN INSULATION WITH YELLOW STRIPE) CONDUCTOR.
- BRANCH PANEL
- CIRCUIT BREAKER
- DISTRIBUTION BOARD / MAIN SWITCHBOARD

## Raceways

- CONDUIT CONCEALED IN WALL OR CEILING SPACE
- CONDUIT ROUTED BELOW FLOOR / GRADE
- CONDUIT ELLED DOWN
- CONDUIT ELLED UP
- CONDUIT/WIRING CONTINUATION
- CONDUIT/WIRING STUBBED OUT WITH END CAP OR INSULATED PLASTIC BUSHING

# GENERAL ELECTRICAL NOTES

A. DO NOT COMMENCE INSTALLATION OF ELECTRICAL SYSTEMS AND EQUIPMENT WITHOUT RELATED SHOP DRAWING APPROVALS.

B. ELECTRICAL CIRCUITS SHALL BE INTERRUPTED ONLY WITH PRIOR WRITTEN CONSENT. SUCH INTERRUPTIONS SHALL BE PRECEDED BY ALL POSSIBLE PREPARATIONS BY THE CONTRACTOR WHICH ARE NECESSARY TO KEEP THE ELECTRICAL CIRCUITS OFF FOR A MINIMUM PERIOD IN AN EXPEDITIOUS MANNER PURSUANT WITH GOOD WORKMANSHIP. THIS INCLUDES CIRCUIT TRACING TO IDENTIFY THE ELECTRICAL LOAD BEING SERVED AND THE ORIGIN OF THE CIRCUIT.

C. COORDINATE WITH OWNER SO THAT WORK CAN BE SCHEDULED NOT TO INTERRUPT OPERATIONS, NORMAL ACTIVITIES, BUILDING ACCESS, ACCESS TO DIFFERENT AREAS. THE OWNER WILL COOPERATE TO THE BEST OF THEIR ABILITY TO ASSIST IN A COORDINATED SCHEDULE BUT WILL REMAIN THE FINAL AUTHORITY AS TO TIME OF WORK PERMITTED.

D. COORDINATE THE EXACT LOCATION OF EXISTING UTILITIES AND EQUIPMENT PRIOR TO COMMENCEMENT OF WORK. COMPENSATE THE OWNER FOR DAMAGES CAUSED BY THE FAILURE TO LOCATE AND PRESERVE UTILITIES. REPLACE DAMAGED ITEMS WITH NEW MATERIAL TO MATCH EXISTING.

E. MAINTAIN ELECTRICAL CONTINUITY OF EXISTING SYSTEMS. REMOVE OR RELOCATE ELECTRICAL BOXES, CONDUIT, WIRING, EQUIPMENT, LUMINAIRES, AND THE LIKE, AS REQUIRED IN REMOVED OR REMODELED AREAS IN THE EXISTING CONSTRUCTION AFFECTED BY THIS WORK.

F. REMOVE AND RESTORE WIRING WHICH SERVES USABLE EXISTING OUTLETS CLEAR OF THE CONSTRUCTION OR DEMOLITION.

G. PROVIDE TEMPORARY SUPPORT FOR ELECTRICAL SYSTEMS THAT REMAIN IN PLACE.

H. VERIFY EXACT LOCATION AND NUMBER OF EXISTING ELECTRICAL PANELS IN THE FIELD. LOCATIONS OF ITEMS SHOWN ON DRAWINGS AS EXISTING ARE PARTIALLY BASED ON RECORD AND OTHER DRAWINGS WHICH MAY CONTAIN ERRORS. VERIFY THE ACCURACY OF THE INFORMATION SHOWN PRIOR TO BIDDING AND PROVIDE SUCH LABOR AND MATERIAL AS IS NECESSARY TO ACCOMPLISH THE INTENT OF THE CONTRACT DOCUMENTS.

I. REMOVE ABANDONED WIRING TO LEAVE SITE CLEAN.

J. MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS WHICH REMAIN ACTIVE.

K. WHERE DRAWINGS INDICATE EXISTING ELECTRICAL EQUIPMENT OR DEVICES TO BE RELOCATED AND/OR REUSED, REFURBISH THEM. THOROUGHLY CLEAN SUCH ITEMS. NOTIFY ARCHITECT OF ANY DEFECTS IN SUCH INSTALLATIONS. REPAIR ANY DAMAGE CAUSED BY DEMOLITION OR CONSTRUCTION PERFORMED UNDER THIS CONTRACT.

L. PROVIDE UPDATED PANEL SCHEDULES AND DIRECTORIES THAT IDENTIFY EXISTING CIRCUITS AND NUMBER OF SPARE CIRCUITS AVAILABLE UPON COMPLETION OF DEMOLITION WORK.

M. OFFER REMOVED WIRING DEVICES, PANELBOARDS AND EQUIPMENT TO THE OWNER. IF OWNER CHOOSES TO RETAIN THESE ITEMS, RETURN SUCH ITEMS TO OWNER. CAREFULLY REMOVE AND DISPOSE OF ITEMS REJECTED BY OWNER FROM PROJECT SITE AND IN A LEGAL MANNER.

N. PROVIDE SUITABLE ANCHORAGE AND SUPPORT FOR ELECTRICAL EQUIPMENT. MOUNT DEVICES AND RACEWAYS IN ACCORDANCE WITH ESTABLISHED CODES AND SPECIFICATIONS.

O. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

P. DRAWINGS AND SPECIFICATIONS COMPLEMENT EACH OTHER. REQUIREMENT BY EITHER INFERS REQUIREMENT BY BOTH.

Q. CONNECT EQUIPMENT AND DEVICES FURNISHED UNDER OTHER DIVISIONS OF THIS CONTRACT, BY OWNER OR BY OTHER CONTRACTS.

R. UNLESS OTHERWISE NOTED, PROVIDE CONCEALED AND FLUSH MOUNTED INSTALLATION OF DEVICES AND EQUIPMENT IN AREAS.

S. PROVIDE SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN 120 VOLT, MULTI-WIRE CIRCUITS.

T. FOR 120 VOLT, 20 AMP CIRCUITS, WHERE CIRCUIT DISTANCE FROM PANELBOARD TO FARTHEST DEVICE/FIXTURE EXCEEDS 70 FEET, PROVIDE #10 SIZE CONDUCTOR. WHERE CIRCUIT DISTANCE FROM PANELBOARD TO FARTHEST DEVICE/FIXTURE EXCEEDS 100 FEET, PROVIDE #8 SIZE CONDUCTOR.

U. BRACE ELECTRICAL EQUIPMENT TO RESIST A HORIZONTAL FORCE THAT ACT IN ANY DIRECTION. COMPLY WITH TITLE 24 REQUIREMENTS.

V. INSTALL COMPLETE SYSTEM OF CONDUCTORS IN RACEWAY SYSTEM THROUGHOUT BUILDING FOR FEEDERS, BRANCH CIRCUITS, ETC.

W. DESIGN OF TEMPORARY POWER FOR CONSTRUCTION SHALL BE THE CONTRACTOR'S RESPONSIBILITY. REMOVE TEMPORARY POWER PRIOR TO COMPLETION OF PROJECT.

X. ALL WORK ON SERVICE CONDUCTORS, FEEDERS, AND OTHER SUCH EQUIPMENT SHALL BE DONE ONLY WHEN SUCH CONDUCTORS, FEEDERS, AND EQUIPMENT ARE DE-ENERGIZED. THE CONTRACTOR SHALL HAVE AN "ELECTRICAL SAFETY AND LOCK-OUT/TAG-OUT PROCEDURE" IN PLACE PRIOR TO COMMENCEMENT OF WORK.

Y. COORDINATE ALL CONDUIT TRENCHING WITH OTHER DISCIPLINES TO AVOID CONFLICT.

Z. MINIMUM SIZE FOR EXTERIOR BELOW GRADE CONDUIT SHALL BE 1".

AA. ALL AIC RATINGS SHOWN ARE MINIMUM REQUIREMENTS. COORDINATE AND UPGRADE RATINGS FOR ALL DISTRIBUTION EQUIPMENT AS PER SHORT CIRCUIT ANALYSIS RECOMMENDATIONS.

AB. HIRE THIRD PARTY TESTING AGENCY TO PERFORM THE FOLLOWING, AS PART OF A DEFERRED SUBMITTAL IN CONSTRUCTION FOR REVIEW AND APPROVAL BY THE ENGINEER OF RECORD:

1. SHORT CIRCUIT STUDY, ARC FLASH STUDY & LABELS, AND OVERCURRENT PROTECTIVE STUDY.
2. ACCEPTANCE TESTING IN ACCORDANCE WITH SPECIFICATIONS.

AC. PROVIDE TESTING REPORTS TO ENGINEER FOR REVIEW UPON COMPLETION OF INSTALLATION FOR THE FOLLOWING, AS PART OF A DEFERRED SUBMITTAL IN CONSTRUCTION FOR REVIEW AND APPROVAL BY THE ENGINEER OF RECORD:

1. TORQUE TEST REPORTS PRIOR TO EQUIPMENT ENERGIZATION.

# SHEET INDEX


| | |
|---|---|
| E0.1 | SYM. LIST, GEN. NOTES, SHEET INDEX, PART. SINGLE LINE DIAGRAM - ELECTRICAL |
| E0.2 | TITLE 24 COMPLIANCE FORMS & SCHEDULES - POWER |
| E1.0 | OVERALL SITE PLAN - POWER |
| ED2.0 | ENLARGED DEMOLITION SITE PLANS - POWER |
| E2.0 | ENLARGED SITE PLANS - POWER |
| E3.0 | SPECIFICATIONS - ELECTRICAL |
| E3.1 | SPECIFICATIONS - ELECTRICAL |


# FEEDER SCHEDULE

**Key**

C,S — C = Conduit only; S = Service secondary

10004 — 3 SETS OF (4 - 400 KCMIL CU, 1 #2/0 CU GND., IN 3" C.)

1000CS — (3) - 5"C PER PG&E RULES, AND REGULATIONS, AND STANDARDS.

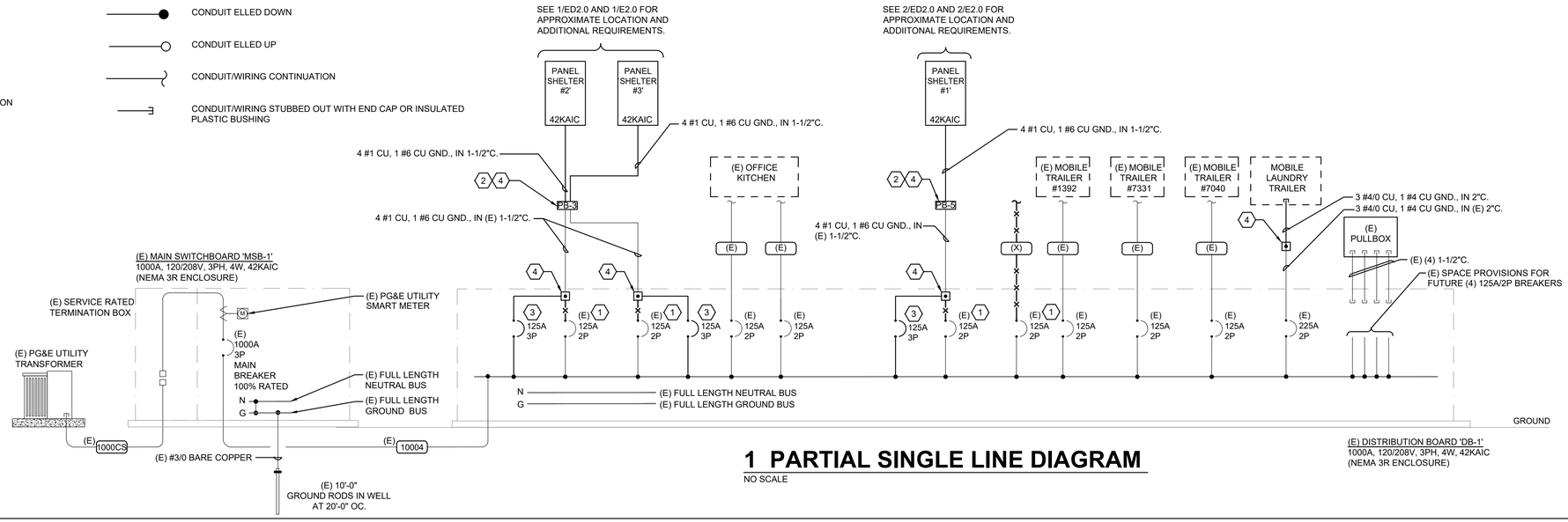
# SHEET KEYNOTES

1 EXISTING BREAKER TO BECOME SPARE AFTER DEMOLITION WORK.

2 SEE SHEET E2.0 FOR APPROXIMATE LOCATION AND ADDITIONAL INFORMATION.

3 PROVIDE NEW BREAKER AS INDICATED. NEW BREAKER TO MATCH EXISTING MANUFACTURER TYPE AND AIC RATING. FIELD VERIFY.

4 INTERCEPT, EXTEND AND CONNECT COMPLETE AS REQUIRED TO PLACE INTO SERVICE. FIELD VERIFY EXISTING CONDITIONS AND LOCATIONS.




## 1 PARTIAL SINGLE LINE DIAGRAM

NO SCALE

Project Title:

2ND ST PATHWAYS STAIR CENTER
SITE IMPROVEMENTS AND SHELTER UNITS
1601 SECOND STREET, BERKELEY, CA 94710
APN #: 57-2109


Design Firm:
SIEGEL & STRAIN Architects
6201 Doyle Street, Suite B
Emeryville, CA 94608
510 / 547-8092
info@siegelstrain.com
www.siegelstrain.com

Consultant:
INTERFACE ENGINEERING
PROJECT 2021-1134
CONTACT Westley Anastasio
1999 Harrison Street, Suite 550
Oakland, CA 94612
TEL 415.489.7240
www.interfaceengineering.com


REGISTERED PROFESSIONAL ENGINEER — WESTLEY C. ANASTASIO — No. E22875 Exp:09/30/23 — ELECTRICAL — STATE OF CALIFORNIA

Signed: 4/21/23

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

Issue Note: PERMIT SET 09/21/22

Project ID: BSC
File Name:
Drawn By: DM
Review By: WA
Plot Date:

Sheet Title: **SYM. LIST, GEN. NOTES, SHEET INDEX, PART. SINGLE LINE DIAGRAM - ELECTRICAL**

Sheet No.: E0.1

4/21/2023 11:20:59 AM

STATE OF CALIFORNIA
## Electrical Power Distribution
NRCC-ELC-E — CALIFORNIA ENERGY COMMISSION

**CERTIFICATE OF COMPLIANCE** — **NRCC-ELC-E**

*This document is used to demonstrate compliance with mandatory requirements in §130.5, for electrical systems in newly constructed nonresidential, high-rise residential and hotel/motel occupancies. Additions and alterations to electrical service systems in these occupancies will also use this document to demonstrate compliance per §141.0(a) or §141.0(b)2P for alterations..*

| | | | |
|---|---|---|---|
| **Project Name:** | 2nd Street Pathways STAIR Center | **Report Page:** | **(Page 1 of 4)** |
| **Project Address:** | 2nd St right of way between Cedar St and Virginia St | **Date Prepared:** | 2022-05-11T18:37:01-04:00 |

### A. GENERAL INFORMATION

| | | |
|---|---|---|
| 01 | Project Location (city) | Berkeley |
| 02 | Occupancy Types Within Project: | |

● All Other Occupancies: Shelter Trailers

### B. PROJECT SCOPE

*This table includes electrical systems that are within the scope of the permit application.*

| 01 | 02 | 03 | 04 | 05 |
|---|---|---|---|---|
| Electrical Service Designation/Description | Scope of Work[1] | Rating (KVA) | Utility Provided Metering System Exception to §130.5(a) [2] | System subject to CA Elec Code Article 517 Exception to §130.5(a)and (b) |
| No New Electrical Service | Add/Alt to feeders and branch circuits only | | ☐ | ☐ |
| 06 Demand Response Controls | Where required, demand response controls must be specified which are capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal. Sections §120.2, §130.1 and §130.3 and compliance documents NRCC-MCH, NRCC-LTI and NRCC-LTS will indicate when demand response controls are required. | | | |

*[1] FOOTNOTES: Adding only new feeders and branch circuits triggers Voltage Drop 130.5(c), no other requirements from 130.5 are required.*
*[2] Applicable if the utility company is providing a metering system that indicates instantaneous kW demand and kWh for a utility-defined period.*

### C. COMPLIANCE RESULTS

*Results in this table are automatically calculated from data input and calculations in Tables F through I. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.*

| 01 | | 02 | | 03 | | 04 | 05 |
|---|---|---|---|---|---|---|---|
| Service Electrical Metering §130.5(a) (See Table F) | AND | Separation for Monitoring §130.5(b) (See Table G) | AND | Voltage Drop §130.5(c) (See Table H) | AND | Controlled Receptacles §130.5(d) (See Table I) | |
| | AND | | AND | Yes | AND | | COMPLIES |

Registration Number: — Registration Date/Time: — Registration Provider: Energy Code Ace

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance — Report Version: 2019.1.003 Schema Version: nrv 20200601 — Report Generated: 2022-05-11 15:37:00

STATE OF CALIFORNIA
## Electrical Power Distribution
NRCC-ELC-E — CALIFORNIA ENERGY COMMISSION

| | | | |
|---|---|---|---|
| **CERTIFICATE OF COMPLIANCE** | | | **NRCC-ELC-E** |
| **Project Name:** | 2nd Street Pathways STAIR Center | **Report Page:** | **(Page 2 of 4)** |
| **Project Address:** | 2nd St right of way between Cedar St and Virginia St | **Date Prepared:** | 2022-05-11T18:37:01-04:00 |

### D. EXCEPTIONAL CONDITIONS

*This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.*

### E. ADDITIONAL REMARKS

*This table is includes remarks made by the permit applicant to the Authority Having Jurisdiction.*

### F. SERVICE ELECTRICAL METERING

*This section does not apply to this project.*

### G. SEPARATION OF ELECTRICAL CIRCUITS FOR ENERGY MONITORING

*This section does not apply to this project.*

### H. VOLTAGE DROP

*This table includes entirely new or complete replacement electrical power distribution systems, or alterations that add, modify or replace both feeders and branch circuits to demonstrate compliance with §130.5(c). For alterations, only the altered circuits must demonstrate compliance per §141.0(b)2PIII*

| 01 | 02 | | | 03 | 04 | 05 | |
|---|---|---|---|---|---|---|---|
| Electrical Service Designation/Description | Combined Voltage Drop on Installed Feeder/Branch Circuit Conductors Compliance Method | | | Location of Voltage Drop Calculations[1] | Sheet Number for Voltage Drop Calculations in Construction Documents | Field Inspector | |
| | | | | | | Pass | Fail |
| No New Electrical Service | ☒ Voltage drop less than 5% | ☐ | Permitted by CA Elec Code (Exception to 130.5(c))* | In construction documents | - | ☐ | ☐ |

** NOTES: If "Permitted by CA Elec Code *" is selected under Compliance Method above, please indicate where the exception applies in the space provided below.*

*[1] FOOTNOTES: Voltage drop calculations may be attached to the permit application outside the construction documents if allowed by the Authority Having Jurisdiction. Select "attached" if applicable. If calculations will be the responsibility of the installing contractor, select "Contractor Responsible".*

### I.CIRCUIT CONTROLS FOR 120-VOLT RECEPTACLES AND CONTROLLED RECEPTACLES

*This section does not apply to this project.*

Registration Number: — Registration Date/Time: — Registration Provider: Energy Code Ace

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance — Report Version: 2019.1.003 Schema Version: nrv 20200601 — Report Generated: 2022-05-11 15:37:00

STATE OF CALIFORNIA
## Electrical Power Distribution
NRCC-ELC-E — CALIFORNIA ENERGY COMMISSION

| | | | |
|---|---|---|---|
| **CERTIFICATE OF COMPLIANCE** | | | **NRCC-ELC-E** |
| **Project Name:** | 2nd Street Pathways STAIR Center | **Report Page:** | **(Page 3 of 4)** |
| **Project Address:** | 2nd St right of way between Cedar St and Virginia St | **Date Prepared:** | 2022-05-11T18:37:01-04:00 |

### J. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

*Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/*

| Form/Title | Field Inspector | |
|---|---|---|
| | Pass | Fail |
| NRCI-ELC-01-E - Must be submitted for all buildings | ☐ | ☐ |

### K. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

*There are no Certificates of Acceptance applicable to electrical power distribution requirements.*

Registration Number: — Registration Date/Time: — Registration Provider: Energy Code Ace

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance — Report Version: 2019.1.003 Schema Version: nrv 20200601 — Report Generated: 2022-05-11 15:37:00

STATE OF CALIFORNIA
## Electrical Power Distribution
NRCC-ELC-E — CALIFORNIA ENERGY COMMISSION

| | | | |
|---|---|---|---|
| **CERTIFICATE OF COMPLIANCE** | | | **NRCC-ELC-E** |
| **Project Name:** | 2nd Street Pathways STAIR Center | **Report Page:** | **(Page 4 of 4)** |
| **Project Address:** | 2nd St right of way between Cedar St and Virginia St | **Date Prepared:** | 2022-05-11T18:37:01-04:00 |

### DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

**I certify that this Certificate of Compliance documentation is accurate and complete.**

| | |
|---|---|
| Documentation Author Name: Westley Anastasio | Documentation Author Signature: |
| Company: Interface Engineering | Signature Date: 2022-05-11 |
| Address: 1999 Harrison Street, Suite 550 | CEA/ HERS Certification Identification (if applicable): E22875 |
| City/State/Zip: Oakland CA 94612 | Phone: 415-489-3220 |

### RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

| | |
|---|---|
| Responsible Designer Name: Westley Anastasio | Responsible Designer Signature: |
| Company: Interface Engineering | Date Signed: 2022-05-11 |
| Address: 1999 Harrison Street, Suite 550 | License: E22875 |
| City/State/Zip: Oakland CA 94612 | Phone: 415-489-3220 |

Registration Number: — Registration Date/Time: — Registration Provider: Energy Code Ace

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance — Report Version: 2019.1.003 Schema Version: nrv 20200601 — Report Generated: 2022-05-11 15:37:00

2021-1134

## DISTRIBUTION BOARD 'DB-1'

| Load No. | Description / Location | Note | Load (VA) | Load Type |
|---|---|---|---|---|
| 1 | (E) 125A/2P SPARE BREAKER | | | |
| - | - | | | |
| - | EXISTING SPACE | | | |
| 2 | EXISTING SPACE | | | |
| - | (E) 125A/2P SPARE BREAKER | | | |
| - | - | | | |
| 3 | (E) MOBILE TRAILER #6158 - OFFICE KITCHEN | | 11,735 | G |
| - | EXISTING SPACE | | | |
| - | - | | 11,735 | G |
| 4 | (E) MOBILE TRAILER #6158 - OFFICE KITCHEN | | 11,735 | G |
| - | - | | 11,735 | G |
| - | EXISTING SPACE | | | |
| 5 | EXISTING SPACE | | | |
| - | (E) 125A/2P SPARE BREAKER | | | |
| - | - | | | |
| 6 | (E) 125A/2P SPARE BREAKER | | | |
| - | EXISTING SPACE | | | |
| - | - | | | |
| 7 | (E) MOBILE TRAILER #1392 | | 3,740 | G |
| - | - | | 3,740 | G |
| - | EXISTING SPACE | | | |
| 8 | EXISTING SPACE | | | |
| - | (E) MOBILE TRAILER #7331 | | 11,270 | G |
| - | - | | 11,270 | G |
| 9 | (E) MOBILE TRAILER #7040 | | 12,625 | G |
| - | EXISTING SPACE | | | |
| - | - | | 12,625 | G |
| 10 | (E) MOBILE LAUNDRY TRAILER | | 16,500 | G |
| - | - | | 16,500 | G |
| - | EXISTING SPACE | | | |
| 11 | PANEL'SHELTERS #1' | | 7,536 | G |
| - | | | 7,536 | G |
| - | | | 5,652 | G |
| 12 | PANEL'SHELTERS #2' | | 7,536 | G |
| - | | | 7,536 | G |
| - | | | 5,652 | G |
| 13 | PANEL 'SHELTERS #3' | | 7,536 | G |
| - | | | 5,652 | G |
| - | | | 5,652 | G |
| 14 | EXISTING SPACE | | | |
| - | | | | |
| - | | | | |

| | | | |
|---|---|---|---|
| Total Connected Load: | Ph A | 78,943 VA | 285 Amps |
| Total Connected Load: | Ph B | 63,969 VA | 231 Amps |
| Total Connected Load: | Ph C | 52,586 VA | 190 Amps |
| **Total Connected Load:** | | 236.8 **KVA** | 284.9 **Amps** |
| **Total Demand Load:** | | 195.5 **KVA** | 235.1 **Amps** |

2021-1134

## Panel 'Shelters #1'

120/208V, 3 Ph., 4 W.; 125A Bus with 125A Main Circuit Breaker Surface Mounted Panelboard

| Ckt. No. | Description / Location | Load (VA) | Type | C.B. A/Pole | Note | Ph. | Note | C.B. A/Pole | Load (VA) | Type | Description / Location | Ckt. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SHELTER TRAILER | 1,884 | G | 30/1 | | A | | 30/1 | 1,884 | G | SHELTER TRAILER | 2 |
| 3 | SHELTER TRAILER | 1,884 | G | 30/1 | | B | | 30/1 | 1,884 | G | SHELTER TRAILER | 4 |
| 5 | SHELTER TRAILER | 1,884 | G | 30/1 | | C | | 30/1 | 1,884 | G | SHELTER TRAILER | 6 |
| 7 | SHELTER TRAILER | 1,884 | G | 30/1 | | A | | 30/1 | 1,884 | G | SHELTER TRAILER | 8 |
| 9 | SHELTER TRAILER | 1,884 | G | 30/1 | | B | | 30/1 | 1,884 | G | SHELTER TRAILER | 10 |
| 11 | SHELTER TRAILER | 1,884 | G | 30/1 | | C | | | | | SPACE | 12 |
| 13 | SPACE | | | | | A | | | | | SPACE | 14 |
| 15 | SPACE | | | | | B | | | | | SPACE | 16 |
| 17 | SPACE | | | | | C | | | | | SPACE | 18 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total Connected Load: | Ph. A | 7,536 VA | 63 Amps | | Panel Connected Load: | 20.7 KVA | 57.5 Amps |
| Total Connected Load: | Ph. B | 7,536 VA | 63 Amps | | Sub-Fed Connected Load: | 0.0 KVA | 0.0 Amps |
| Total Connected Load: | Ph. C | 5,652 VA | 47 Amps | | **Total Demand Load:** | 20.7 **KVA** | 57.5 **Amps** |

2021-1134

## Panel 'Shelters #2'

120/208V, 3 Ph., 4 W.; 125A Bus with 125A Main Circuit Breaker Surface Mounted Panelboard

| Ckt. No. | Description / Location | Load (VA) | Type | C.B. A/Pole | Note | Ph. | Note | C.B. A/Pole | Load (VA) | Type | Description / Location | Ckt. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SHELTER TRAILER | 1,884 | G | 30/1 | | A | | 30/1 | 1,884 | G | SHELTER TRAILER | 2 |
| 3 | SHELTER TRAILER | 1,884 | G | 30/1 | | B | | 30/1 | 1,884 | G | SHELTER TRAILER | 4 |
| 5 | SHELTER TRAILER | 1,884 | G | 30/1 | | C | | 30/1 | 1,884 | G | SHELTER TRAILER | 6 |
| 7 | SHELTER TRAILER | 1,884 | G | 30/1 | | A | | 30/1 | 1,884 | G | SHELTER TRAILER | 8 |
| 9 | SHELTER TRAILER | 1,884 | G | 30/1 | | B | | 30/1 | 1,884 | G | SHELTER TRAILER | 10 |
| 11 | SHELTER TRAILER | 1,884 | G | 30/1 | | C | | | | | SPACE | 12 |
| 13 | SPACE | | | | | A | | | | | SPACE | 14 |
| 15 | SPACE | | | | | B | | | | | SPACE | 16 |
| 17 | SPACE | | | | | C | | | | | SPACE | 18 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total Connected Load: | Ph. A | 7,536 VA | 63 Amps | | Panel Connected Load: | 20.7 KVA | 57.5 Amps |
| Total Connected Load: | Ph. B | 7,536 VA | 63 Amps | | Sub-Fed Connected Load: | 0.0 KVA | 0.0 Amps |
| Total Connected Load: | Ph. C | 5,652 VA | 47 Amps | | **Total Demand Load:** | 20.7 **KVA** | 57.5 **Amps** |

2021-1134

## Panel 'Shelters #3'

120/208V, 3 Ph., 4 W.; 125A Bus with 125A Main Circuit Breaker Surface Mounted Panelboard

| Ckt. No. | Description / Location | Load (VA) | Type | C.B. A/Pole | Note | Ph. | Note | C.B. A/Pole | Load (VA) | Type | Description / Location | Ckt. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SHELTER TRAILER | 1,884 | G | 30/1 | | A | | 30/1 | 1,884 | G | SHELTER TRAILER | 2 |
| 3 | SHELTER TRAILER | 1,884 | G | 30/1 | | B | | 30/1 | 1,884 | G | SHELTER TRAILER | 4 |
| 5 | SHELTER TRAILER | 1,884 | G | 30/1 | | C | | 30/1 | 1,884 | G | SHELTER TRAILER | 6 |
| 7 | SHELTER TRAILER | 1,884 | G | 30/1 | | A | | 30/1 | 1,884 | G | SHELTER TRAILER | 8 |
| 9 | SHELTER TRAILER | 1,884 | G | 30/1 | | B | | 30/1 | 1,884 | G | SHELTER TRAILER | 10 |
| 11 | SPACE | | | | | C | | | | | SPACE | 12 |
| 13 | SPACE | | | | | A | | | | | SPACE | 14 |
| 15 | SPACE | | | | | B | | | | | SPACE | 16 |
| 17 | SPACE | | | | | C | | | | | SPACE | 18 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total Connected Load: | Ph. A | 7,536 VA | 63 Amps | | Panel Connected Load: | 18.8 KVA | 52.3 Amps |
| Total Connected Load: | Ph. B | 7,536 VA | 63 Amps | | Sub-Fed Connected Load: | 0.0 KVA | 0.0 Amps |
| Total Connected Load: | Ph. C | 3,768 VA | 31 Amps | | **Total Demand Load:** | 18.8 **KVA** | 52.3 **Amps** |

Project Title:

# 2ND ST PATHWAYS STAIR CENTER
SITE IMPROVEMENTS AND SHELTER UNITS
1601 SECOND STREET, BERKELEY, CA 94710
APN #: 57-2109

Design Firm:
SIEGEL & STRAIN Architects
6201 Doyle Street, Suite B
Emeryville, CA 94608
510 / 547-8092
info@siegelstrain.com
www.siegelstrain.com

Consultant:
INTERFACE ENGINEERING
PROJECT 2021-1134
CONTACT Westley Anastasio
1999 Harrison Street, Suite 550
Oakland, CA 94612
TEL 415.489.7240
www.interfaceengineering.com

REGISTERED PROFESSIONAL ENGINEER — WESTLEY ANASTASIO — No. E22875 Exp:09/30/23 — ELECTRICAL — STATE OF CALIFORNIA
Signed: 4/21/23

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

Issue Note:

PERMIT SET

09/21/22

Project ID: BSC
File Name:
Drawn By: DM
Review By: WA
Plot Date:

Sheet Title:
**TITLE 24 COMPLIANCE FORMS & SCHEDULES - POWER**

Sheet No.:
E0.2

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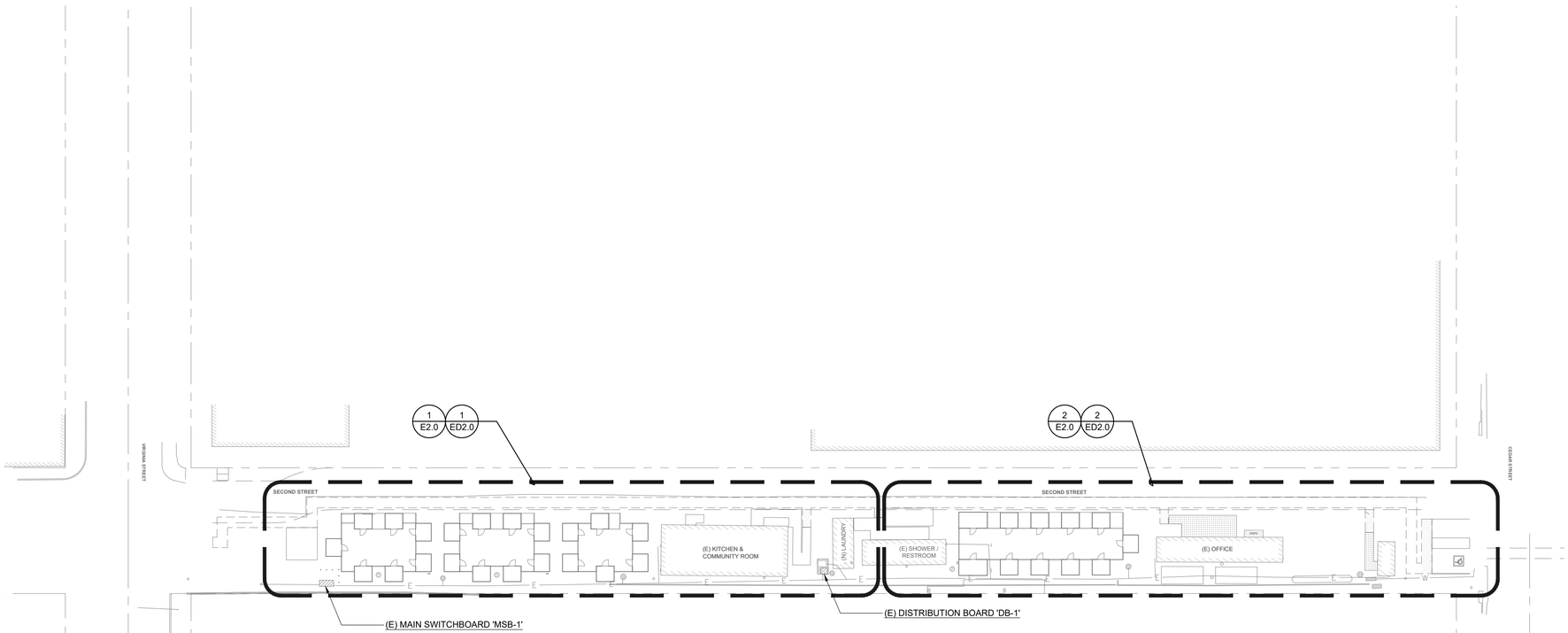


## 1 OVERALL SITE PLAN - POWER

0 16' 32' 64'

SCALE: 1/32"=1'-0"

# 2ND ST PATHWAYS STAIR CENTER

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| Project ID: | BSC |
| File Name: | |
| Drawn By: | DM |
| Review By: | WA |
| Plot Date: | |

Sheet Title:

**OVERALL SITE PLAN - POWER**

Sheet No.:

E1.0

8/30/2022 2:45:50 PM

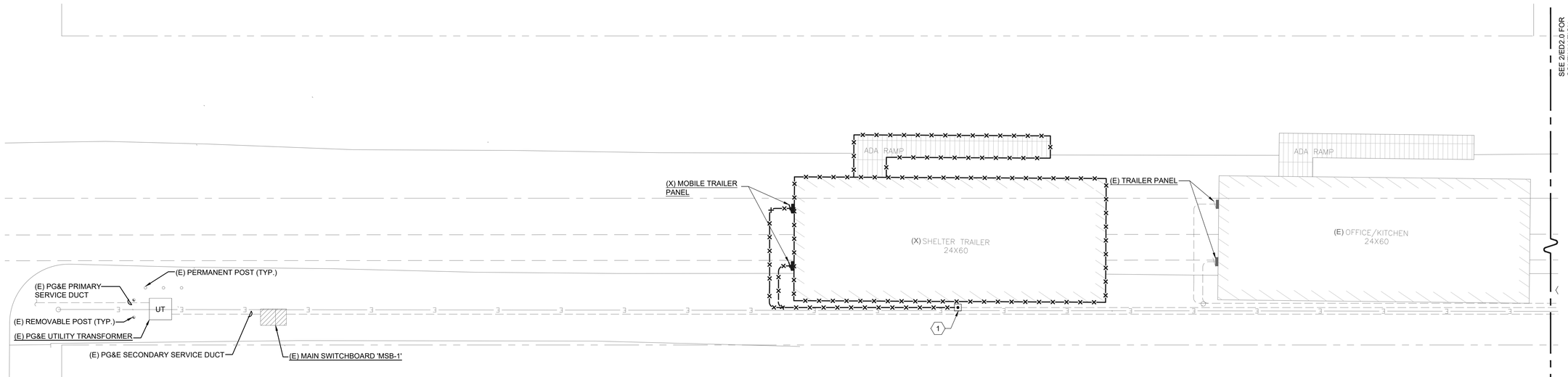
## GENERAL SHEET NOTES

A. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF WORK.

B. FIELD VERIFY AND COORDINATE EXACT ROUTING OF FEEDERS AND CONDUIT WITH CITY OF BERKELEY PRIOR TO INSTALLATION. COORDINATE ALL CONDUIT TRENCHING WITH EXISTING CONDUIT, PULLBOXES AND PIPING WITH THE CITY OF BERKELEY, ARCHITECT AND CIVIL TO AVOID CONFLICT. CONTRACTOR SHALL HIRE UNDERGROUND LOCATING SERVICE TO LOCATE ALL EXISTING UNDERGROUND UTILITIES WITHIN SCOPE PRIOR TO COMMENCEMENT OF WORK.

## SHEET KEYNOTES

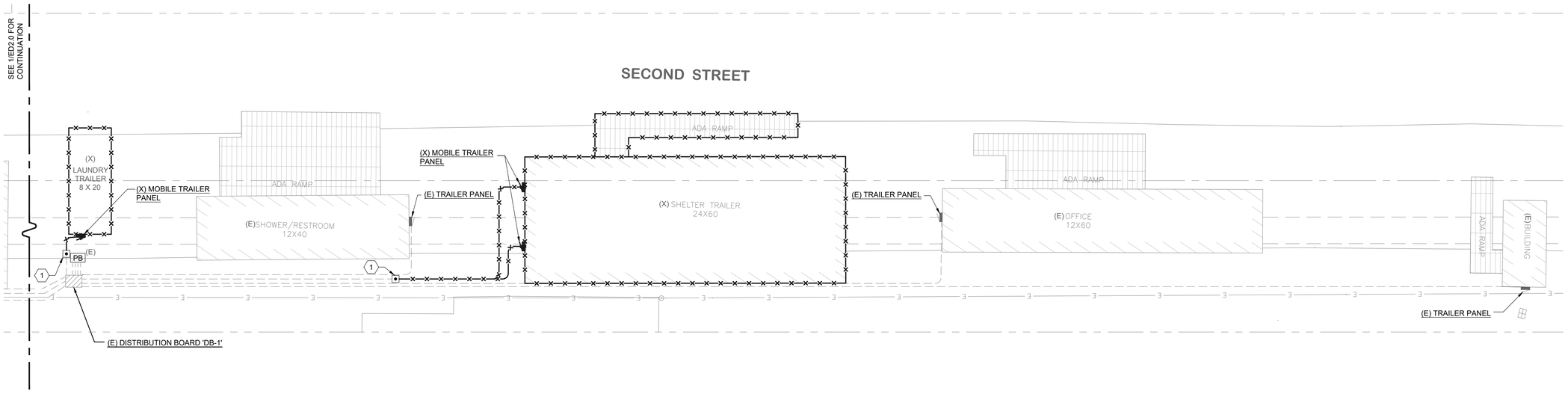
1 PROPOSED INTERCEPTION/CONNECTION POINT. SEE 1/E0.1 FOR ADDITIONAL REQUIREMENTS AND INFORMATION. FIELD VERIFY.




## 1 ENLARGED DEMOLITION SOUTH PLAN - POWER

0 8' 16' 24'

SCALE: 3/32"=1'-0"




## 2 ENLARGED DEMOLITION NORTH PLAN - POWER

0 8' 16' 24'

SCALE: 3/32"=1'-0"

Project Title:

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REGISTERED PROFESSIONAL ENGINEER WESTLEY ANASTASIO No. E22875 Exp:09/2023 ELECTRICAL STATE OF CALIFORNIA

Signed: 4/21/23

| No. | Date | Issue |
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| | 04/28/23 | BID SET |

Issue Note:

PERMIT SET

09/21/22

Project ID: BSC

File Name:

Drawn By: DM

Review By: WA

Plot Date:

Sheet Title:

**ENLARGED DEMOLITION SITE PLANS - POWER**

Sheet No.:

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# GENERAL SHEET NOTES

A. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF WORK.

B. FIELD VERIFY AND COORDINATE EXACT ROUTING OF FEEDERS AND CONDUIT WITH CITY OF BERKELEY PRIOR TO INSTALLATION. COORDINATE ALL CONDUIT TRENCHING WITH EXISTING CONDUIT, PULLBOXES AND PIPING WITH THE CITY OF BERKELEY, ARCHITECT AND CIVIL TO AVOID CONFLICT. CONTRACTOR SHALL HIRE UNDERGROUND LOCATING SERVICE TO LOCATE ALL EXISTING UNDERGROUND UTILITIES WITHIN SCOPE PRIOR TO COMMENCEMENT OF WORK.

# SHEET KEYNOTES

1 PROVIDE AND LOCATE ON UNISTRUTS AS REQUIRED. PROVIDE MINIMUM 3" THICK, 24" X 36" HOUSEKEEPING PAD. INSTALL PLUMB AND LEVEL. FIELD VERIFY AND COORDINATE EXACT LOCATION WITH CITY OF BERKELEY, ARCHITECT, CIVIL, AND SHELTER PANEL LOCATIONS PRIOR TO INSTALLATION. SEE SHEET E0.1 FOR ADDITIONAL INFORMATION.

2 PROVIDE CONCRETE PULLBOX COMPLETE WITH STEEL COVER, (2) EXTENSIONS, AND BASE. CHRISTY BOX # B24, OR APPROVED EQUAL. COORDINATE AND FIELD VERIFY EXACT LOCATION WITH CITY OF BERKELEY PRIOR TO INSTALLATION.

3 INTERCEPT AND EXTEND EXISTING CONDUIT TO NEW LAUNDRY TRAILER AS INDICATED AND CONNECT COMPLETE AS REQUIRED TO PLACE INTO SERVICE. COORDINATE EXACT STUB-UP LOCATION WITH TRAILER VENDOR AND CITY OF BERKELEY PRIOR TO INSTALLATION. FIELD VERIFY EXISTING CONDITIONS AND LOCATIONS. SEE SHEET E0.1 FOR ADDITIONAL INFORMATION.

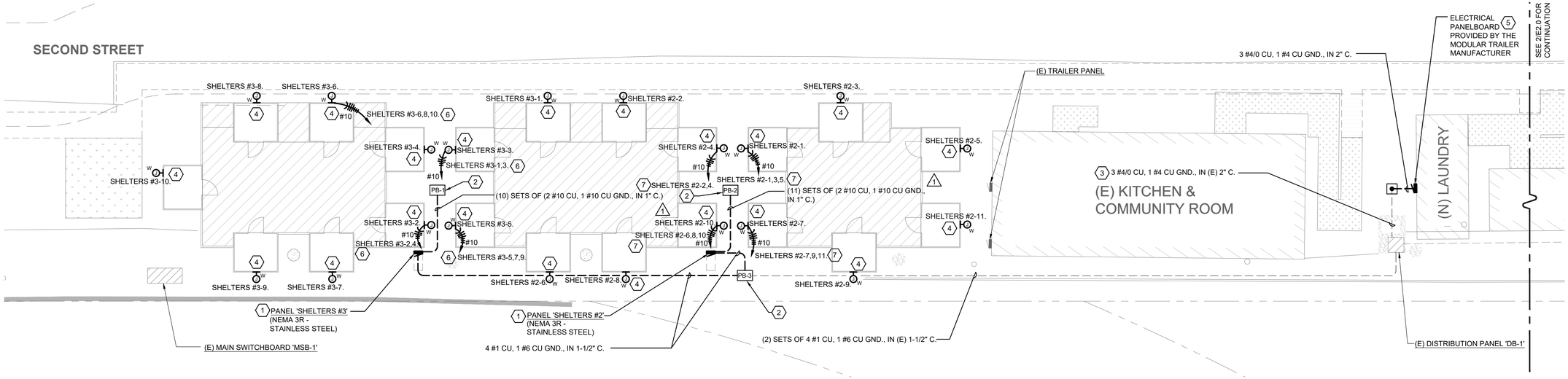
4 CONNECT COMPLETE TO INTEGRATED PANELBOARD AS REQUIRED TO PLACE INTO SERVICE. INTEGRATED PANELBOARD SHALL BE PROVIDED BY SHELTER VENDOR. COORDINATE EXACT LOCATION OF JUNCTION BOX WITH SHELTER VENDOR AND ARCHITECT PRIOR TO INSTALLATION.

5 CONNECT COMPLETE TO MOBILE TRAILER EXTERIOR PANEL. COORDINATE EXACT LOCATION AND ELECTRICAL REQUIREMENTS WITH VENDOR PRIOR TO INSTALLATION. PROVIDE ALL THE NECESSARY CONDUITS, WIRING, DEVICES, PULLBOXES ETC. AS REQUIRED FOR A COMPLETE INSTALLATION.

6 FIELD VERIFY AND ROUTE VIA PB-1.

7 FIELD VERIFY AND ROUTE VIA PB-2.

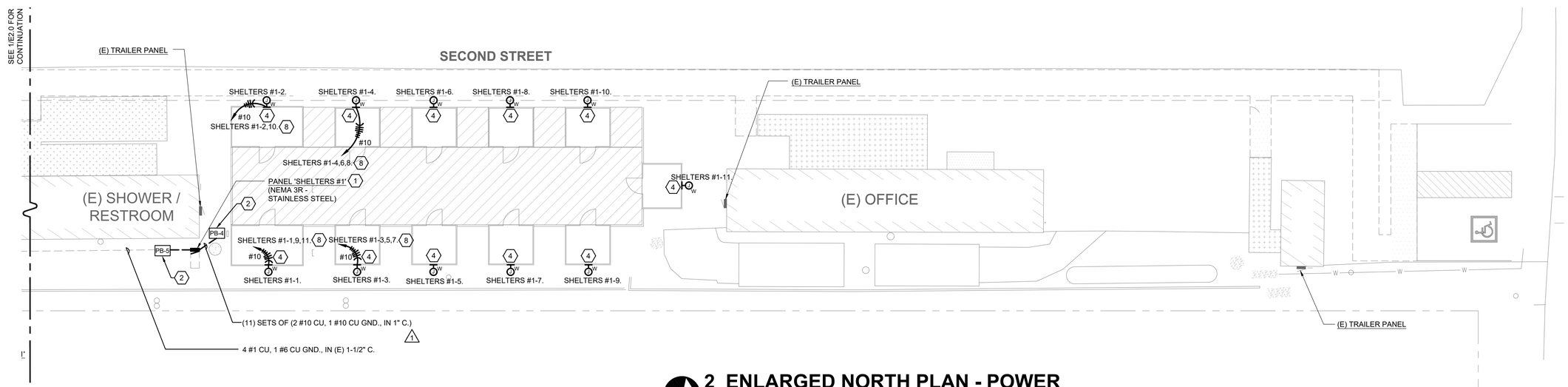
8 FIELD VERIFY AND ROUTE VIA PB-4.




## 1 ENLARGED SOUTH PLAN - POWER

0 8' 16' 24'

SCALE: 3/32"=1'-0"




## 2 ENLARGED NORTH PLAN - POWER

0 8' 16' 24'

SCALE: 3/32"=1'-0"

Project Title:

2ND ST PATHWAYS STAIR CENTER
SITE IMPROVEMENTS AND SHELTER UNITS
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STATE OF CALIFORNIA

Signed: 4/21/23

| No. | Date | Issue |
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| 1 | 01/17/23 | COMMENT RESPONSE 1 |
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Issue Note:

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| Review By: | WA |
| Plot Date: | |

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**ENLARGED SITE PLANS - POWER**

Sheet No.:

E2.0

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2021-1134 2ND STREET PATHWAYS

SECTION 260000 - ELECTRICAL

PART 1 - GENERAL

1.1 SUMMARY

A. ELECTRICAL SYSTEMS REQUIRED FOR THIS WORK INCLUDES LABOR, MATERIALS, EQUIPMENT, AND SERVICES NECESSARY TO COMPLETE INSTALLATION OF ELECTRICAL WORK SHOWN ON DRAWINGS, SPECIFIED HEREIN OR REQUIRED FOR A COMPLETE OPERABLE FACILITY AND NOT SPECIFICALLY DESCRIBED IN OTHER SECTIONS OF THESE SPECIFICATIONS. AMONG THE ITEMS REQUIRED ARE:
1. DISTRIBUTION EQUIPMENT SHOWN ON DRAWINGS.
2. FEEDERS TO DISTRIBUTION PANELS, OWNER-PROVIDED EQUIPMENT, AND OTHER EQUIPMENT AS DETAILED.
3. BRANCH CIRCUIT WIRING FROM THE DISTRIBUTION PANELS FOR CIRCUIT WIRING.
4. ARC-FLASH HAZARD ANALYSIS
5. SHORT CIRCUIT ANALYSIS

B. FEES:
1. OBTAIN AND PAY FOR ELECTRICAL PERMITS, PLAN REVIEW, AND INSPECTIONS FROM LOCAL AUTHORITY HAVING JURISDICTION (AHJ).

1.2 DEFINITIONS

A. FOLLOWING IS A LIST OF ABBREVIATIONS GENERALLY USED IN THIS DIVISION:
1. ADA AMERICANS WITH DISABILITIES ACT.
2. AHJ AUTHORITY HAVING JURISDICTION.
3. CBC CALIFORNIA BUILDING CODE.
4. CEC CALIFORNIA ELECTRICAL CODE.
5. CFC CALIFORNIA FIRE CODE.
6. CEC T24 CALIFORNIA ENERGY CODE TITLE 24.
7. IEEE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS.
8. NEMA NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION.
9. NFPA NATIONAL FIRE PROTECTION ASSOCIATION.
10. OSHA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.
11. UL UNDERWRITERS LABORATORIES INC.

B. PROVIDE: TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE.

C. FURNISH: SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNPACKING, ASSEMBLY AND INSTALLATION.

D. INSTALL: INCLUDES UNLOADING, UNPACKING, ASSEMBLING, ERECTING, INSTALLATION, APPLYING, FINISHING, PROTECTING, CLEANING AND SIMILAR OPERATIONS AT THE PROJECT SITE AS REQUIRED TO COMPLETE ITEMS OF WORK FURNISHED BY OTHERS.

1.3 SUBMITTALS

A. OPERATION AND MAINTENANCE DOCUMENTATION: PROVIDE COPIES OF CERTIFICATES OF CODE AUTHORITY ACCEPTANCE, TEST DATA, PRODUCT DATA, GUARANTEES, WARRANTIES, AND THE LIKE.

B. SUBMITTALS/SHOP DRAWINGS: PROVIDE PRODUCT SUBMITTALS AND SHOP DRAWINGS WHICH INCLUDE PHYSICAL CHARACTERISTICS, ELECTRICAL CHARACTERISTICS, DEVICE LAYOUT PLANS, WIRING DIAGRAMS, AND THE LIKE. PROVIDE PRODUCT SUBMITTALS AND SHOP DRAWINGS IN EITHER PAPER FORMAT OR ELECTRONIC FORMAT. ELECTRONIC FORMAT MUST BE SUBMITTED VIA EMAIL OR FTP SITE. FOR PAPER HARDCOPY, PROVIDE ONE COMPLETE BINDER WITH TABBED DIVIDERS CONTAINING A SEPARATE SUBMITTAL FOR EACH SPECIFICATIONS SECTION. FOR ELECTRONIC FORMAT, PROVIDE ONE ZIP FILE PER SPECIFICATION DIVISION CONTAINING A SEPARATE FILE FOR EACH SPECIFICATIONS SECTION. INDIVIDUAL SUBMITTALS SENT PIECEMEAL IN A PER SPECIFICATION SECTION METHOD WILL BE RETURNED WITHOUT REVIEW OR COMMENT. COPY ARCHITECT ON ALL SUBMISSIONS.
1. IDENTIFY EACH SUBMITTAL AND SHOP DRAWING IN DETAIL. NOTE WHAT DIFFERENCES, IF ANY, EXIST BETWEEN THE SUBMITTED ITEM AND THE SPECIFIED ITEM. FAILURE TO IDENTIFY THE DIFFERENCES WILL BE CONSIDERED CAUSE FOR DISAPPROVAL. IF DIFFERENCES ARE NOT IDENTIFIED AND/OR NOT DISCOVERED DURING THE SUBMITTAL REVIEW PROCESS, CONTRACTOR REMAINS RESPONSIBLE FOR PROVIDING EQUIPMENT AND MATERIALS THAT MEET THE SPECIFICATIONS AND DRAWINGS.
2. PROVIDE SAMPLES OF NFPA 70E COMPLIANT ARC FLASH HAZARD LABELING FOR ELECTRICAL EQUIPMENT.
3. ELECTRICAL EQUIPMENT ORDERED PRIOR TO SUBMITTAL OF POWER SYSTEM STUDIES ARE NOT COMPLIANT WITH THESE SPECIFICATIONS, AND ARE SUBJECT TO REMOVAL AND REPLACEMENT AT NO COST TO OWNER WHERE NOT IN COMPLIANCE WITH CODE AND CONTRACT DOCUMENTS FOR SELECTIVE COORDINATION. PROVIDE WRITTEN VERIFICATION WITH STAMP OR SEAL AND SIGNATURE OF PREPARING ENGINEER.
4. MAXIMUM OF TWO REVIEWS OF COMPLETE SUBMITTAL PACKAGE. ARRANGE FOR ADDITIONAL REVIEWS AND/OR EARLY REVIEW OF LONG-LEAD ITEMS; BEAR COSTS OF THESE ADDITIONAL REVIEWS AT ENGINEER'S HOURLY RATES. INCOMPLETE SUBMITTAL PACKAGES/SUBMITTALS WILL BE RETURNED TO CONTRACTOR WITHOUT REVIEW.

C. RECORD DRAWINGS: SHOW CHANGES AND DEVIATIONS FROM THE DRAWINGS. INCLUDE WRITTEN ADDENDUM AND CHANGE ORDER ITEMS. MAKE CHANGES TO DRAWINGS IN ELECTRONIC FORMAT. OBTAIN ELECTRONIC COPY FROM ARCHITECT, USE THE SAME VERSION OF AUTOCAD TO PREPARE RECORD DRAWINGS AS WAS USED BY THE ARCHITECT. PROVIDE ELECTRONIC COPY AND HARD COPY TO ARCHITECT FOR REVIEW.

1.4 QUALITY ASSURANCE

A. CONFORM TO THE LATEST ADOPTED VERSION OF THE CALIFORNIA ELECTRIC CODE (CEC), WITH LOCAL AMENDMENTS.

B. FURNISH PRODUCTS LISTED BY UNDERWRITERS LABORATORIES INC. (UL) OR OTHER TESTING FIRM ACCEPTABLE TO AHJ.

C. POWER SYSTEM STUDY REQUIREMENTS:
1. STUDY PREPARER QUALIFICATIONS: QUALIFIED ENGINEER OF SWITCHGEAR MANUFACTURER OR APPROVED PROFESSIONAL ENGINEER.
a. EXPERIENCED IN PREPARATION OF STUDIES OF SIMILAR TYPE AND MAGNITUDE.
b. FAMILIAR WITH SOFTWARE ANALYSIS PRODUCTS SPECIFIED.
2. COMPUTER SOFTWARE FOR STUDY PREPARATION: USE LATEST EDITION OF COMMERCIALLY AVAILABLE SOFTWARE UTILIZING SPECIFIED METHODOLOGIES.
a. ACCEPTABLE SOFTWARE PRODUCTS:
1) EASYPOWER
2) EDSA MICRO CORPORATION.
3) OPERATION TECHNOLOGY, INC; ETAP.
4) SKM SYSTEMS ANALYSIS, INC; POWER TOOLS FOR WINDOWS.
3. CONTRACTOR RESPONSIBILITY: PROVIDE PROJECT-RELATED DATA NEEDED BY STUDY PREPARER, INCLUDING EQUIPMENT, WIRE SIZES, INSULATION TYPES, CONDUIT TYPES, ACTUAL CIRCUIT LENGTHS AND AVAILABLE FAULT CURRENTS FROM UTILITY. PROVIDE INFORMATION IN A TIMELY MATTER TO ALLOW STUDIES TO BE COMPLETED PRIOR TO RELEASE OF EQUIPMENT.

1.5 SEQUENCING AND SCHEDULING

A. FOR THE PROPER EXECUTION OF THE WORK, COOPERATE WITH OTHER CRAFTS AND CONTRACTS AS NEEDED.

B. TO AVOID INSTALLATION CONFLICTS, THOROUGHLY EXAMINE THE COMPLETE SET OF CONTRACT DOCUMENTS. RESOLVE CONFLICTS PRIOR TO INSTALLATION.

C. GROUND ELECTRODE: COORDINATE PLACEMENT OF GROUND RODS AND GROUNDING ELECTRODE CONDUCTOR IN BASE OF BUILDING FOOTING PRIOR TO PLACEMENT OF CONCRETE. COORDINATE BONDING OF REBAR WITH REBAR INSTALLER PRIOR TO ROUGH-IN.

D. PRIOR TO INSTALLATION OF FEEDERS TO EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS, EXAMINE THE MANUFACTURER'S SHOP DRAWINGS, WIRING DIAGRAMS, PRODUCT DATA, AND INSTALLATION INSTRUCTIONS. VERIFY THAT THE ELECTRICAL CHARACTERISTICS DETAILED IN THE CONTRACT DOCUMENTS ARE CONSISTENT WITH THE ELECTRICAL CHARACTERISTICS OF THE ACTUAL EQUIPMENT BEING INSTALLED.

1.6 WARRANTY

A. GUARANTEE ELECTRICAL WORK AGAINST FAULTY MATERIAL OR WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL COMPLETION BY THE OWNER.

PART 2 - PRODUCTS

2.1 MATERIALS

A. BASE CONTRACT UPON FURNISHING MATERIALS AS SPECIFIED. MATERIALS AND EQUIPMENT USED FOR CONSTRUCTION ARE TO BE NEW, LATEST PRODUCTS AS LISTED IN MANUFACTURER'S PRINTED CATALOG DATA AND ARE TO BE UL APPROVED OR HAVE ADEQUATE APPROVAL OR BE ACCEPTABLE BY STATE, COUNTY, AND CITY AUTHORITIES. EQUIPMENT SUPPLIER IS RESPONSIBLE FOR OBTAINING STATE, COUNTY, AND CITY ACCEPTANCE ON EQUIPMENT NOT UL APPROVED OR NOT LISTED FOR INSTALLATION.

B. INCLUDE SPECIAL FEATURES, FINISHES, ACCESSORIES, AND OTHER REQUIREMENTS AS DESCRIBED IN THE CONTRACT DOCUMENTS REGARDLESS OF THE ITEM'S LISTED CATALOG NUMBER.

C. PROVIDE INCIDENTALS NOT SPECIFICALLY MENTIONED HEREIN OR NOTED ON DRAWINGS, BUT NEEDED TO COMPLETE THE SYSTEM OR SYSTEMS, IN A SAFE AND SATISFACTORY WORKING CONDITION.

2.2 RACEWAYS

A. RIGID METAL CONDUIT (RMC): HOT-DIP GALVANIZED AFTER THREAD CUTTING. MANUFACTURED IN CONFORMANCE WITH UL 6, ANSI C80.1. UNIFORM FINISH COAT WITH CHROMATE FOR ADDED PROTECTION. MANUFACTURERS: ALLIED TUBE & CONDUIT, BECK MANUFACTURING WL, PICOMA, OR APPROVED EQUIVALENT.

B. ELECTRICAL POLYVINYL CHLORIDE (PVC): SCHEDULE 40 RIGID PVC. MANUFACTURED IN CONFORMANCE WITH UL 651. MANUFACTURERS: AFC CABLE SYSTEMS INC., PW PIPE, INTERNATIONAL METAL HOSE, OR APPROVED EQUIVALENT.

C. CONDUIT FITTINGS:
1. BUSHINGS: INSULATED TYPE FOR THREADED RIGID, CONDUIT OR RACEWAY CONNECTORS WITHOUT FACTORY INSTALLED PLASTIC THROAT CONDUCTOR PROTECTION. MANUFACTURERS: THOMAS & BETTS 1222 SERIES, O-Z GEDNEY B SERIES, OR APPROVED EQUIVALENT.
2. GROUND BUSHINGS: INSULATED GROUNDING TYPE FOR THREADED RIGID, CONDUIT OR RACEWAY CONNECTORS. MANUFACTURERS: O-Z GEDNEY BLG SERIES OR APPROVED EQUIVALENT.
3. RACEWAY CONNECTORS AND COUPLINGS:
a. STEEL CONNECTORS, COUPLINGS, AND CONDUIT BODIES WITH ZINC ELECTROPLATE.
b. CONNECTOR LOCKNUTS ARE ZINC ELECTROPLATED STEEL, WITH THREADS MEETING ASTM TOLERANCES.
c. CONNECTOR THROATS HAVE FACTORY INSTALLED PLASTIC INSERTS PERMANENTLY INSTALLED. FOR NORMAL CABLE OR CONDUCTOR EXITING ANGLES FROM RACEWAY, THE CABLE JACKET OR CONDUCTOR INSULATION BEARS ONLY ON PLASTIC THROAT INSERT.

2.3 WIRES AND CABLES

A. COPPER, 600 VOLT RATED THROUGHOUT. CONDUCTORS 14AWG TO 10AWG, SOLID. CONDUCTORS 8AWG AND LARGER, STRANDED. PHASE COLOR TO BE CONSISTENT AT FEEDER TERMINATIONS; A-B-C, TOP TO BOTTOM, LEFT TO RIGHT, FRONT TO BACK. CONDUCTORS 3AWG AND LARGER, MINIMUM INSULATION RATING OF 75C. INSULATION TYPES THWN, THHN OR XHHW. MINIMUM INSULATION RATING OF 90C FOR BRANCH CIRCUITS. MANUFACTURERS: CAROL, GENERAL CABLE, OKONITE, SOUTHWIRE, OR APPROVED EQUIVALENT.

2.4 CONNECTORS

A. COPPER PADS: DRILLED AND TAPPED FOR MULTIPLE CONDUCTOR TERMINALS.

B. LUGS: COMPRESSION TYPE FOR USE WITH STRANDED BRANCH CIRCUIT OR CONTROL CONDUCTORS; MECHANICAL LUGS NOT ACCEPTABLE. MANUFACTURERS: ANDERSON, ILSCO, PANDUIT, THOMAS & BETTS, 3M, OR APPROVED EQUIVALENT.
1. COMMUNICATIONS BUSBARS SHALL REQUIRE DOUBLE HOLE AND IRREVERSIBLE CRIMP TYPE CONNECTORS WITH WINDOW FOR EQUIPMENT BONDING CONDUCTORS.

C. CONDUCTOR BRANCH CIRCUITS: WIRE NUTS WITH INTEGRAL SPRING CONNECTORS FOR CONDUCTORS 18 THROUGH 8AWG. PUSH-IN TYPE CONNECTORS WHERE CONDUCTORS ARE NOT REQUIRED TO BE TWISTED TOGETHER ARE NOT ACCEPTABLE. MANUFACTURERS: 3M, IDEAL, OR APPROVED EQUIVALENT.

2.5 BOXES

A. DEVICE OUTLET: INSTALLATION OF ONE OR TWO DEVICES AT COMMON LOCATION, MINIMUM 4-INCH SQUARE, MINIMUM 1-1/2 INCHES DEEP FOR NON-USB TYPE DEVICES. INSTALLATION OF ONE OR TWO DEVICES AT COMMON LOCATION, MINIMUM 4-INCH SQUARE, MINIMUM 2 INCHES DEEP FOR USB TYPE DEVICES. SINGLE- OR TWO-GANG FLUSH DEVICE RAISED COVERS. MANUFACTURER: HUBBELL, THOMAS & BETTS, OR APPROVED EQUIVALENT.

B. WEATHERPROOF OUTLET BOXES: CORROSION-RESISTANT CAST METAL WEATHERPROOF OUTLET WIRING BOXES, OF THE TYPE, SHAPE AND SIZE, INCLUDING DEPTH OF BOX, WITH THREADED CONDUIT ENDS, CAST METAL FACE PLATE WITH SPRING-HINGED WATERPROOF CAP SUITABLY CONFIGURED FOR EACH APPLICATION, INCLUDING FACE PLATE GASKET, BLANK PLUGS AND CORROSIONPROOF FASTENERS AND GRAY FINISH. MANUFACTURER: PASS AND SEYMOUR, BELL, RED DOT, CARLON, OR APPROVED EQUIVALENT.

C. JUNCTION AND PULL BOXES: ANSI 49 GRAY ENAMEL PAINTED SHEET STEEL JUNCTION AND PULL BOXES, WITH SCREW-ON COVERS; OF THE TYPE SHAPE AND SIZE, TO SUIT EACH RESPECTIVE LOCATION AND INSTALLATION; WITH WELDED SEAMS AND EQUIPPED WITH STEEL NUTS, BOLTS, SCREWS AND WASHERS. INSTALL JUNCTION BOXES AND PULL BOXES TO FACILITATE THE INSTALLATION OF CONDUCTORS AND LIMITING THE ACCUMULATED ANGULAR SUM OF BENDS BETWEEN BOXES, CABINETS AND APPLIANCES TO 270 DEGREES. MANUFACTURER: B-LINE, HOFFMAN, OR APPROVED EQUIVALENT.

2.6 SUPPORTING DEVICES

A. ANCHORS: CORROSION-RESISTANT MATERIALS OF SIZE AND TYPE ADEQUATE TO CARRY THE LOADS OF EQUIPMENT AND CONDUIT, INCLUDING WEIGHT OF WIRE IN CONDUIT. MANUFACTURERS: ANCHOR IT, EPCON SYSTEM, HILTI-HIT SYSTEM, POWER FAST SYSTEM, OR APPROVED EQUIVALENT.

B. CONCRETE INSERTS: CAST IN CONCRETE FOR SUPPORT FASTENERS FOR LOADS UP TO 800 LBS. MANUFACTURERS: B-LINE, KINDORF, SUPERSTRUT, UNISTRUT, OR APPROVED EQUIVALENT.

C. PIPE STRAPS: TWO-HOLE GALVANIZED OR MALLEABLE IRON.

2.7 ELECTRICAL IDENTIFICATION

A. NAMEPLATES: ENGRAVING STOCK MELAMINE OR LAMICOID PLASTIC LAMINATE, FEDERAL SPECIFICATION L-P-387, IN THE SIZE AND THICKNESSES INDICATED, ENGRAVED WITH ENGRAVER'S STANDARD LETTER STYLE, MINIMUM 1/2-INCH HIGH LETTERS, BLACK WITH WHITE CORE (LETTER COLOR), PUNCHED FOR MECHANICAL FASTENING EXCEPT WHERE ADHESIVE MOUNTING IS NECESSARY BECAUSE OF SUBSTRATE. PROVIDE 1/8-INCH THICK MATERIAL. USE SELF TAPPING STAINLESS STEEL SCREWS. MANUFACTURER: B&I NAMEPLATES, INTELLICUM, JBR ASSOCIATES, OR APPROVED EQUIVALENT.

B. LABELS: ADHESIVE TAPE WITH 18 POINT BLACK LETTERS ON CLEAR BACKGROUND. USE ONLY FOR IDENTIFICATION OF INDIVIDUAL WALL SWITCHES AND RECEPTACLES, CONTROL STATIONS, AND TELECOMMUNICATION OUTLETS. INDICATE DEVICE NAME, SOURCE PANEL, AND SOURCE CIRCUITS. DO NOT PROVIDE DYMO TAPE STYLE LABELS. MANUFACTURER: KROY, BRADY, OR APPROVED EQUIVALENT.

C. CONDUCTOR NUMBERS: VINYL-CLOTH SELF-ADHESIVE TYPE WIRE MARKERS. EACH CONDUCTOR AT PULLBOXES, PANELBOARDS, OUTLET BOXES, JUNCTION BOXES, AND EACH LOAD CONNECTION. BRANCH CIRCUIT OR FEEDER NUMBERS AS INDICATED ON DRAWINGS AND SOURCE PANEL. MANUFACTURER: BRADY, PANDUIT, SUMITOMO, OR APPROVED EQUIVALENT.

D. BRANCH CIRCUIT SCHEDULES: PROVIDE BRANCH CIRCUIT IDENTIFICATION SCHEDULES, TYPEWRITTEN, CLEARLY FILLED OUT, TO IDENTIFY LOAD CONNECTED TO EACH CIRCUIT AND LOCATION OF LOAD. NUMBERS TO CORRESPOND TO NUMBERS ASSIGNED TO EACH CIRCUIT BREAKER POLE POSITION.

E. UNDERGROUND UTILITIES MARKERS: 6_INCH WIDE INERT POLYETHYLENE PLASTIC TAPE, DETECTABLE TYPE, COLORED PER APWA RECOMMENDATIONS UNLESS OTHERWISE NOTED WITH SUITABLE WARING LEGEND DESCRIBING BURIED ELECTRICAL LINES. MANUFACTURER: ALLEN SYSTEMS, BRADY, OR APPROVED EQUIVALENT.

2.8 GROUNDING MATERIALS

A. EQUIPMENT GROUNDING CONDUCTOR: GREEN INSULATED, INSULATION TYPE TO MATCH THAT OF ASSOCIATED FEEDER OR BRANCH CIRCUIT WIRING, SIZE AS INDICATED ON DRAWINGS.

2.9 PANELBOARDS

A. MANUFACTURERS: GENERAL ELECTRIC/ABB, SIEMENS, SQUARE D, EATON ELECTRICAL OR APPROVED EQUIVALENT.

B. STANDARDS: COMPLY WITH REQUIREMENTS OF UL 891, NEMA PB2 AND CEC IN CONSTRUCTION OF SWITCHBOARDS. PROVIDE SHORT CIRCUIT CURRENT RATING (INTEGRATED EQUIPMENT RATING, IER) FOR PANELBOARDS.

C. LUGS: MECHANICAL TYPE.

D. PANELBOARDS:
1. ENCLOSURE: NEMA PB1, TYPE 3R AS INDICATED ON THE DRAWINGS. CIRCUIT BREAKER TYPE. MAXIMUM ENCLOSURE DEPTH FOR BRANCH CIRCUIT PANELBOARD: 6-INCHES SURFACE MOUNTED. MAXIMUM BRANCH CIRCUIT PANELBOARD ENCLOSURE WIDTH: 20 INCHES. PROVIDE GALVANIZED METAL FINISH.
2. INTERIOR: COPPER BAR WITH SUITABLE ELECTROPLATING (TIN) FOR CORROSION CONTROL AT CONNECTION. PROVIDE COPPER GROUND BUS TO ACCOMMODATE SPECIFIED TERMINAL LUGS. PREDRILL BUS FOR BOLT-ON TYPE CIRCUIT BREAKERS. PROVIDE DOUBLE LUGS AND/OR FEED-THROUGH LUGS FOR FEED THROUGH FEEDERS.
3. PROVIDE FULLY RATED INTEGRATED EQUIPMENT RATING GREATER THAN THE AVAILABLE FAULT CURRENT. SERIES RATED PANELBOARDS ARE NOT ACCEPTABLE. SEE DRAWINGS FOR AVAILABLE FAULT CURRENT. FINAL AIC RATING BASED ON THE PROTECTIVE DEVICE STUDY COMPLETED BY CONTRACTOR. PROVIDE THE MINIMUM AIC RATING AS FOLLOWS:
a. 120/208V PANELBOARDS UP TO 125 AMPS: 10KAIC.
4. BRANCH CIRCUIT BREAKERS:
a. THERMAL MAGNETIC TRIP CIRCUIT BREAKERS. BOLT-ON TYPE WITH COMMON TRIP HANDLE FOR POLES, UL LISTED. DO NOT USE TANDEM CIRCUIT BREAKERS.
b. UL LISTED TO ACCEPT SOLID OR STRANDED COPPER CONDUCTORS. LUGS SUITABLE FOR 90C RATED WIRE SIZED ACCORDING TO THE 75C TEMPERATURE RATING PER CEC.
c. UL LISTED FOR USE WITH THE FOLLOWING FACTORY INSTALLED ACCESSORIES, AS CALLED OUT ON DRAWINGS: ARC-FAULT CIRCUIT INTERRUPTION (AFCI), CLASS A GROUND FAULT CIRCUIT INTERRUPTION (GFCI).
d. UL LISTED WITH THE FOLLOWING RATINGS:
1) [CLASS A GROUND FAULT INTERRUPTER CIRCUIT BREAKERS WHERE SCHEDULED.
5. COVER: CONCEALED HINGED DOOR WITH DOOR_IN_DOOR CONSTRUCTION, METAL DIRECTORY FRAME WITH HEAVY CLEAR PLASTIC PROTECTOR, FLUSH LIFT LATCH AND LOCK, TWO KEYS PER PANEL. KEY BRANCH CIRCUIT PANELBOARDS ALIKE. MEDIUM LIGHT GREY FINISH SUITABLE FOR FIELD PAINTING TO MATCH WALL FINISH.
6. PROVIDE BOXES WITH REMOVABLE BLANK END WALLS AND INTERIOR MOUNTING STUDS. PROVIDE INTERIOR SUPPORT BRACKET FOR EASE OF INTERIOR INSTALLATION.

2.10 OVERCURRENT PROTECTIVE DEVICES

A. MOLDED CASE CIRCUIT BREAKERS:
1. ONE, TWO OR THREE-POLE BOLT ON, SINGLE HANDLE COMMON TRIP, AS INDICATED ON DRAWINGS.
2. OVER CENTER TOGGLE-TYPE MECHANISM, QUICK-MAKE, QUICK-BREAK ACTION. TRIP INDICATION IS BY HANDLE POSITION.
3. CALIBRATE FOR OPERATION IN 40C AMBIENT TEMPERATURE.
4. 15 TO 150 AMP BREAKERS: PERMANENT TRIP UNIT CONTAINING INDIVIDUAL THERMAL AND MAGNETIC TRIP ELEMENTS IN EACH POLE.
5. PROVIDE HANDLE MECHANISMS THAT ARE LOCKABLE IN THE OPEN (OFF) POSITION.
6. MANUFACTURERS: GENERAL ELECTRIC/ABB, EATON ELECTRICAL, SIEMENS, SQUARE D, OR APPROVED EQUIVALENT.

2.11 ELECTRICAL DISTRIBUTION SYSTEM STUDIES

A. GENERAL
1. ANALYZE SPECIFIC ELECTRICAL AND UTILIZATION EQUIPMENT (ACCORDING TO NEC DEFINITION), ACTUAL PROTECTIVE DEVICES TO BE USED, AND ACTUAL FEEDER LENGTHS TO BE INSTALLED.
a. SCOPE OF STUDIES: NEW AND EXISTING DISTRIBUTION WIRING AND EQUIPMENT, FROM PRIMARY SOURCE TO BUSES AND BRANCH CIRCUIT PANELBOARDS.
b. PRIMARY SOURCE, FOR PURPOSES OF STUDIES: UTILITY COMPANY PRIMARY PROTECTIVE DEVICES.
c. STUDY METHODOLOGY: COMPLY WITH REQUIREMENTS AND RECOMMENDATIONS OF NFPA 70, IEEE 399, AND IEEE 242.
d. REPORT: STATE METHODOLOGY AND RATIONALE EMPLOYED IN MAKING EACH TYPE OF CALCULATION; IDENTIFY COMPUTER SOFTWARE PACKAGE(S) USED.
2. ONE-LINE DIAGRAMS: PREPARE SCHEMATIC DRAWING OF ELECTRICAL DISTRIBUTION SYSTEM, WITH ELECTRICAL EQUIPMENT AND WIRING TO BE PROTECTED BY PROTECTIVE DEVICES; IDENTIFY NODES ON DIAGRAMS FOR REFERENCE ON REPORT THAT INCLUDES:
a. CALCULATED FAULT IMPEDANCE, X/R RATIOS, UTILITY CONTRIBUTION, AND SHORT CIRCUIT VALUES (ASYMMETRIC AND SYMMETRIC) AT MAIN SWITCHBOARD BUS AND DOWNSTREAM DEVICES CONTAINING PROTECTIVE DEVICES.
b. BREAKER AND FUSE RATINGS.
c. IDENTIFICATION OF EACH BUS, WITH VOLTAGE.
d. CONDUIT MATERIALS, FEEDER SIZES, ACTUAL LENGTHS, AND X/R RATIOS.

B. PROTECTIVE DEVICES
1. PROVIDE PROTECTIVE DEVICES OF RATINGS AND SETTINGS AS REQUIRED SO THAT PROTECTIVE DEVICE CLOSEST TO FAULT WILL OPEN FIRST.
2. REPLACE EXISTING PROTECTIVE DEVICES TO ACHIEVE SPECIFIED PERFORMANCE.
3. ANALYZE AND DETERMINE RATINGS AND SETTINGS OF PROTECTIVE DEVICES TO MINIMIZE DAMAGE CAUSED BY FAULT AND SO THAT PROTECTIVE DEVICE CLOSEST TO FAULT WILL OPEN FIRST.
a. REQUIRED RATINGS AND SETTINGS: DERIVE REQUIRED RATINGS AND SETTINGS OF PROTECTIVE DEVICES IN CONSIDERATION OF UPSTREAM PROTECTIVE DEVICE SETTINGS AND OPTIMIZE SYSTEM TO ENSURE SELECTIVE COORDINATION.
b. MOTORS WITH SOLID-STATE PROTECTIVE MODULES: SELECT SETTINGS FOR BEST POSSIBLE MOTOR PROTECTION, TAKING INTO CONSIDERATION ACTUAL INSTALLED MOTOR TORQUE AND CURRENT AND THERMAL CHARACTERISTICS.
c. IDENTIFY ANY EQUIPMENT THAT IS UNDERRATED AS SPECIFIED.
d. IDENTIFY SPECIFIED PROTECTIVE DEVICES THAT WILL NOT ACHIEVE REQUIRED PROTECTION OR COORDINATION BUT WITH MINOR CHANGES CAN BE MADE TO DO SO; PROVIDE SUCH MODIFIED DEVICES AT NO ADDITIONAL COST TO OWNER AND IDENTIFY THEM ON SUBMITTALS AS "REVISED IN ACCORDANCE WITH PROTECTIVE DEVICE COORDINATION STUDY"; MINOR CHANGES INCLUDE DIFFERENT TRIP SIZES IN SAME FRAME, TIME CURVE CHARACTERISTICS OF INDUCTION RELAYS, CT RANGES, ETC.
e. IDENTIFY SPECIFIED PROTECTIVE DEVICES THAT WILL NOT ACHIEVE REQUIRED PROTECTION OR COORDINATION AND CANNOT BE FIELD ADJUSTED TO DO SO, AND FOR WHICH ADEQUATE DEVICES WOULD INVOLVE CHANGE TO CONTRACT SUM.
f. IN ALL CASES WHERE ADEQUATE PROTECTION OR COORDINATION CANNOT BE ACHIEVED AT NO EXTRA COST TO OWNER, PROVIDE A DISCUSSION OF ALTERNATIVES AND LOGICAL COMPROMISES FOR BEST ACHIEVABLE COORDINATION.
g. DO NOT ORDER, FURNISH, OR INSTALL PROTECTIVE DEVICES THAT DO NOT MEET PERFORMANCE REQUIREMENTS UNLESS SPECIFICALLY APPROVED BY ENGINEER.
4. PROTECTIVE DEVICE RATING AND SETTING CHART: SUMMARIZE IN TABULAR FORMAT REQUIRED CHARACTERISTICS FOR EACH PROTECTIVE DEVICE BASED ON ANALYSIS; INCLUDE:
a. DEVICE IDENTIFICATION.
b. RELAY CT RATIOS, TAP, TIME DIAL, AND INSTANTANEOUS PICKUP.
c. CIRCUIT BREAKER SENSOR RATING, LONG-TIME, SHORT-TIME, AND INSTANTANEOUS SETTINGS, AND TIME BANDS.
d. FUSE RATING AND TYPE.
e. INPUT LEVEL AND EXPECTED RESPONSE TIME AT TWO TEST POINTS THAT ARE COMPATIBLE WITH COMMONLY AVAILABLE TEST EQUIPMENT AND RATINGS OF PROTECTIVE DEVICE.
f. HIGHLIGHT DEVICES THAT AS FURNISHED BY CONTRACTOR WILL NOT ACHIEVE REQUIRED PROTECTION.
5. SPECIFIED EQUIPMENT HAS BEEN DESIGNED AND SELECTED TO ACHIEVE SPECIFIED PERFORMANCE; ENSURE THAT EQUIPMENT ACTUALLY INSTALLED PROVIDES THAT PERFORMANCE.
6. IN ADDITION TO REQUIREMENTS SPECIFIED ELSEWHERE, PROVIDE OVERCURRENT PROTECTIVE DEVICES HAVING RATINGS AND SETTINGS IN ACCORDANCE WITH RESULTS OF SYSTEM STUDIES.

C. SHORT CIRCUIT STUDY
1. CALCULATE FAULT IMPEDANCE TO DETERMINE AVAILABLE 3-PHASE SHORT CIRCUIT AND GROUND FAULT CURRENTS AT EACH BUS AND PIECE OF EQUIPMENT DURING NORMAL CONDITIONS, ALTERNATE OPERATIONS, EMERGENCY POWER CONDITIONS, AND OTHER OPERATIONS THAT COULD RESULT IN MAXIMUM FAULT CONDITIONS.
a. SHOW FAULT CURRENTS AVAILABLE AT KEY POINTS IN SYSTEM DOWN TO FAULT CURRENT OF 1,000 A AT 208V.
b. INCLUDE MOTOR CONTRIBUTIONS IN DETERMINING MOMENTARY AND INTERRUPTING RATINGS OF PROTECTIVE DEVICES.

D. ARC FLASH HAZARD ANALYSIS
1. CALCULATE ARC-FLASH INCIDENT ENERGY (AFIE) LEVELS AND FLASH PROTECTION BOUNDARY DISTANCES TO DETERMINE REQUIRED LEVEL OF PERSONAL PROTECTIVE EQUIPMENT (PPE) AT EACH BUS AND PIECE OF EQUIPMENT DURING NORMAL CONDITIONS, EMERGENCY POWER CONDITIONS, AND OTHER OPERATIONS THAT COULD RESULT IN MAXIMUM ARC-FLASH INCIDENT ENERGY LEVELS.
a. SHOW FLASH PROTECTION BOUNDARY DISTANCE.
b. INCLUDE INCIDENT ENERGY LEVELS.
2. PROVIDE LABEL COMPLIANT WITH NFPA 70E GUIDELINES INDICATING PERSONAL PROTECTIVE EQUIPMENT (PPE) RECOMMENDED FOR SERVICING OF ELECTRICAL EQUIPMENT WHILE ENERGIZED, AS WELL AS CALCULATED INCIDENT ENERGY LEVELS AND ARC FLASH PROTECTIVE BOUNDARY DISTANCE.

PART 3 - EXECUTION

3.1 EXAMINATION

A. DRAWINGS ARE DIAGRAMMATIC WITH SYMBOLS REPRESENTING ELECTRICAL EQUIPMENT, OUTLETS AND WIRING. EXAMINE THE ENTIRE SET OF DRAWINGS TO AVOID CONFLICTS WITH OTHER SYSTEMS. DETERMINE EXACT ROUTE AND INSTALLATION OF ELECTRICAL WIRING AND EQUIPMENT WITH CONDITIONS OF CONSTRUCTION.

B. CLARIFICATION:
1. THE DRAWINGS GOVERN IN MATTERS OF QUANTITY, THE SPECIFICATION IN MATTERS OF QUALITY. IN EVENT OF CONFLICT ON DRAWINGS OR IN THE SPECIFICATIONS, THE GREATER QUANTITY AND THE HIGHER QUALITY APPLY.
2. SHOULD THE ELECTRICAL DOCUMENTS INDICATE A CONDITION CONFLICTING WITH THE GOVERNING CODES AND REGULATIONS, REFRAIN FROM INSTALLING THAT PORTION OF THE WORK UNTIL CLARIFIED BY ARCHITECT.

3.2 DEMOLITION

A. COORDINATE WITH OWNER SO THAT WORK CAN BE SCHEDULED NOT TO INTERRUPT OPERATIONS, NORMAL ACTIVITIES, BUILDING ACCESS, ACCESS TO DIFFERENT AREAS. THE OWNER WILL COOPERATE TO THE BEST OF THEIR ABILITY TO ASSIST IN A COORDINATED SCHEDULE BUT WILL REMAIN THE FINAL AUTHORITY AS TO TIME OF WORK PERMITTED.

B. COORDINATE THE EXACT LOCATION OF EXISTING UTILITIES AND EQUIPMENT PRIOR TO COMMENCEMENT OF WORK. COMPENSATE THE OWNER FOR DAMAGES CAUSED BY THE FAILURE TO LOCATE AND PRESERVE UTILITIES. REPLACE DAMAGED ITEMS WITH NEW MATERIAL TO MATCH EXISTING. VERIFY THAT ABANDONED WIRING AND EQUIPMENT SERVE ONLY ABANDONED FACILITIES.

C. EXECUTION:
1. REMOVE EXISTING ELECTRICAL EQUIPMENT AND DEVICES AND ASSOCIATED WIRING FROM SURFACES SCHEDULED FOR DEMOLITION UNLESS SHOWN AS RETAINED OR RELOCATED ON DRAWINGS.
2. PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN ELECTRICAL CONTINUITY OF EXISTING SYSTEMS DURING CONSTRUCTION. REMOVE OR RELOCATE ELECTRICAL BOXES, CONDUIT, WIRING, AND EQUIPMENT AS ENCOUNTERED IN REMOVED OR REMODELED AREAS I

F. CONDUIT FITTINGS:
4. USE SET SCREW TYPE FITTINGS ONLY IN DRY LOCATIONS. WHEN SET SCREW FITTINGS ARE UTILIZED, PROVIDE INSULATED CONTINUOUS EQUIPMENT GROUND CONDUCTOR IN CONDUIT, FROM OVER CURRENT PROTECTION DEVICE TO OUTLET.
5. USE COMPRESSION FITTINGS IN DRY LOCATIONS, DAMP AND RAIN-EXPOSED LOCATIONS. MAXIMUM SIZE PERMITTED IN DAMP LOCATIONS AND LOCATIONS EXPOSED TO RAIN IS 2 INCHES IN DIAMETER.
6. USE THREADED TYPE FITTINGS IN WET LOCATIONS AND DAMP OR RAIN-EXPOSED LOCATIONS WHERE CONDUIT SIZE IS GREATER THAN 2 INCHES.
7. PROVIDE CORROSION-RESISTANT PUNCHED-STEEL BOX KNOCKOUT CLOSURES, CONDUIT LOCKNUTS AND PLASTIC CONDUIT BUSHINGS OF THE TYPE AND SIZE TO SUIT EACH RESPECTIVE USE AND INSTALLATION.
8. USE INSULATED TYPE BUSHINGS WITH GROUND PROVISION AT PANELBOARDS, JUNCTION BOXES AND THE LIKE THAT HAVE FEEDERS 60 AMPERES AND GREATER.

G. WIRES AND CABLES:
1. CONDUCTOR INSTALLATION: INSTALL CONDUCTORS WITH CARE TO AVOID DAMAGE TO INSULATION. DO NOT APPLY GREATER TENSION ON CONDUCTORS THAN RECOMMENDED BY MANUFACTURER DURING INSTALLATION.
2. CONDUCTOR SIZE AND QUANTITY: INSTALL NO CONDUCTORS SMALLER THAN 12AWG UNLESS OTHERWISE SHOWN. PROVIDE REQUIRED CONDUCTORS FOR A FULLY OPERABLE SYSTEM.

H. BOXES:
1. KNOCKOUT CLOSURES: PROVIDE KNOCKOUT CLOSURES TO CAP UNUSED KNOCKOUT HOLES WHERE BLANKS HAVE BEEN REMOVED.
2. CODE COMPLIANCE: COMPLY WITH CEC AS APPLICABLE TO CONSTRUCTION AND INSTALLATION OF ELECTRICAL BOXES AND FITTINGS AND SIZE BOXES ACCORDING TO CEC, EXCEPT AS NOTED OTHERWISE.

I. SUPPORTING DEVICES:
1. SAFETY FACTOR OF 4 REQUIRED FOR EVERY FASTENING DEVICE OR SUPPORT FOR ELECTRICAL EQUIPMENT INSTALLED. SUPPORT TO WITHSTAND FOUR TIMES WEIGHT OF EQUIPMENT IT SUPPORTS. PROVIDE SEISMIC BRACING PER CBC REQUIREMENTS FOR THIS BUILDING LOCATION.
2. DO NOT FASTEN SUPPORTS TO PIPES OR CONDUIT.
3. DO NOT USE SUPPORTS OR FASTENING DEVICES TO SUPPORT OTHER THAN ONE PARTICULAR ITEM.
4. SUPPORT CONDUITS WITHIN 18 INCHES OF BOXES, PANELS, CABINETS AND DEFLECTIONS. MAXIMUM DISTANCE BETWEEN SUPPORTS NOT TO EXCEED 8 FOOT SPACING.
5. MAXIMUM DISTANCE BETWEEN SUPPORTS FOR RIGID PVC CONDUIT UNLESS OTHERWISE REQUIRED BY CEC AS FOLLOWS:
   a. ½-INCH TO 1-INCH CONDUIT: 3 FEET APART.
   b. 1-1/4 INCH TO 2-INCH CONDUIT: 4 FEET APART.
6. PROVIDE SEISMIC BRACING PER CBC REQUIREMENTS.

J. ELECTRICAL IDENTIFICATION:
1. UNDERGROUND UTILITIES MARKERS: INSTALL ONE CONTINUOUS TAPE PER UNDERGROUND RACEWAY AT 6 TO 8 INCHES BELOW FINISH GRADE. WHERE MULTIPLE UNDERGROUND RACEWAYS ARE BURIED IN A COMMON TRENCH AND EXCEEDS 16-INCH WIDTH OF LINES, INSTALL MULTIPLE TAPES NOT OVER 10-INCHES APART (EDGE TO EDGE) OVER THE ENTIRE GROUP OF UNDERGROUND RACEWAYS.
2. CONDUCTOR IDENTIFICATION: APPLY MARKERS ON EACH CONDUCTOR FOR POWER, CONTROL, SIGNALING AND COMMUNICATIONS CIRCUITS.
3. PROVIDE AN ENGRAVED LABEL ON EACH MAJOR UNIT OF ELECTRICAL EQUIPMENT INDICATING BOTH EQUIPMENT NAME AND CIRCUIT SERVING EQUIPMENT, INCLUDING BUT NOT LIMITED TO THE FOLLOWING ITEMS: BRANCH CIRCUIT AND PANELBOARDS
4. INSTALL LABEL ON OUTSIDE OF SURFACE PANEL.

K. GROUNDING:
1. PERFORMANCE REQUIREMENTS: SUPPLEMENT THE GROUNDED NEUTRAL OF THE SECONDARY DISTRIBUTION SYSTEM WITH AN EQUIPMENT GROUNDING SYSTEM TO PROPERLY SAFEGUARD THE EQUIPMENT AND PERSONNEL. INSTALL EQUIPMENT GROUNDING SUCH THAT METALLIC STRUCTURES, ENCLOSURES, RACEWAYS, JUNCTION BOXES, OUTLET BOXES, CABINETS, MACHINE FRAMES, PORTABLE EQUIPMENT AND OTHER CONDUCTIVE ITEMS IN CLOSE PROXIMITY WITH ELECTRICAL CIRCUITS OPERATE CONTINUOUSLY AT GROUND POTENTIAL AND PROVIDE A LOW IMPEDANCE PATH FOR POSSIBLE GROUND FAULT CURRENTS.
2. RACEWAY GROUNDING:
   a. GROUND METALLIC RACEWAY SYSTEMS. BOND TO GROUND TERMINAL WITH CODE SIZE JUMPER EXCEPT WHERE CODE SIZE OR LARGER GROUNDING CONDUCTOR IS INCLUDED WITH CIRCUIT, USE GROUNDING BUSHING WITH LAY-IN LUG.
   b. CONNECT METAL RACEWAYS, WHICH TERMINATE WITHIN AN ENCLOSURE BUT WITHOUT MECHANICAL CONNECTION TO THE ENCLOSURE, BY GROUNDING BUSHINGS AND GROUND WIRE TO THE GROUNDING BUS.
   c. WHERE EQUIPMENT SUPPLY CONDUCTORS ARE IN FLEXIBLE METALLIC CONDUIT, INSTALL STRANDED COPPER EQUIPMENT GROUNDING CONDUCTOR FROM OUTLET BOX TO EQUIPMENT FRAME.
   d. INSTALL EQUIPMENT GROUNDING CONDUCTOR, CODE SIZE MINIMUM IN METALLIC RACEWAY SYSTEMS.
3. BOXES, CABINETS, ENCLOSURES AND PANELBOARDS:
   a. BOND GROUNDING CONDUCTORS TO ENCLOSURE WITH SPECIFIED CONDUCTORS AND LUGS. INSTALL LUGS ONLY ON THOROUGHLY CLEANED CONTACT SURFACES.
   b. BOND SECTIONS OF SERVICE EQUIPMENT ENCLOSURE TO SERVICE GROUND BUS.

L. PANELBOARDS:
1. INSTALL EQUIPMENT COMPLETE AS DIRECTED BY MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. INSTALL EQUIPMENT IN CONFORMANCE WITH WORK SPACE REQUIREMENTS OF CEC. LOCATE EQUIPMENT IN ROOMS OR SPACES DEDICATED TO SUCH EQUIPMENT. 6-FEET 6-INCHES TO TOP OF PANELBOARD. COORDINATE WITH OTHER DIVISIONS OF WORK.
3. FEEDER CONDUCTORS TO ENTER DIRECTLY IN LINE WITH LUG TERMINALS WHEREVER PRACTICAL. FEEDER CONDUCTORS, EXCEPT GROUND AND NEUTRAL, NOT TO EXCEED 45 DEGREE DEFLECTION FROM RACEWAY ENTRY TO FEEDER PHASE LUGS.
4. PROVIDE FILLER PLATES FOR UNUSED SPACES IN PANELBOARDS.
5. PROVIDE TYPED CIRCUIT DIRECTORY FOR EACH PANELBOARD. INCLUDE ALL "SPACES" AND "SPARES". REVISE DIRECTORY TO REFLECT CIRCUITING CHANGES AND AS-INSTALLED CONDITIONS. USE FINAL OWNER DESIGNATED ROOM NAMES AND NUMBERS, AND NOT DESIGNATIONS SHOWN ON DRAWINGS.
6. PROVIDE ARC FLASH LABELS AND ENGRAVED PLASTIC NAMEPLATES ON ENCLOSURE COVERS.
7. MEASURE STEADY STATE LOAD CURRENTS AT EACH PANELBOARD FEEDER; REARRANGE CIRCUITS IN THE PANELBOARD TO BALANCE THE PHASE LOADS TO WITHIN 20 PERCENT OF EACH OTHER. MAINTAIN PROPER PHASING FOR MULTI-WIRE BRANCH CIRCUITS.
8. FOR BREAKERS ADDED TO EXISTING PANELBOARDS, COORDINATE BREAKER TYPE AND SHORT CIRCUIT RATING WITH EXISTING PANELBOARD. BREAKERS TO MATCH EXISTING IN MANUFACTURER'S TYPE AND AIC RATING. PROVIDE NEW TYPED PANELBOARD DIRECTORY.

M. SHORT CIRCUIT ANALYSIS STUDY.
1. PROVIDE COMPLETE SHORT CIRCUIT STUDY, EQUIPMENT INTERRUPTING AND WITHSTAND EVALUATION. STUDY TO INCLUDE COMPLETE ELECTRICAL DISTRIBUTION SYSTEM, INCLUDING SIMULTANEOUS CONTRIBUTIONS FROM NORMAL AND ALTERNATIVE SOURCES OF POWER. INCLUDE COMPLETE LOW VOLTAGE DISTRIBUTION SYSTEMS AS SPECIFIED IN THIS SECTION.
2. STUDY BASIS: THOROUGHLY COVER NORMAL AND ALTERNATIVE OPERATION MODES THAT CAN PRODUCE MAXIMUM FAULT CONDITIONS, INCLUDING SIMULTANEOUS MOTOR CONTRIBUTIONS.
3. PERFORM STUDY IN ACCORDANCE WITH APPLICABLE ANSI/IEEE STANDARDS.
4. STUDY INPUT DATA: UTILITY COMPANY SHORT CIRCUIT SINGLE AND THREE PHASE CONTRIBUTION, AND X/R RATIO; RESISTANCE AND REACTANCE COMPONENTS OF EACH FEEDER, BUSWAY AND BRANCH IMPEDANCE; MOTOR AND GENERATOR CONTRIBUTIONS; APPLICABLE CIRCUIT PARAMETERS AND CONTRIBUTE TO SHORT CIRCUIT DUTY.
5. CALCULATE SHORT CIRCUIT MOMENTARY DUTIES AND INTERRUPTING DUTIES ON BASIS OF MAXIMUM AVAILABLE FAULT CURRENT AT EACH SWITCHGEAR BUS, SWITCHBOARD, PANELBOARDS, OTHER SIGNIFICANT LOCATIONS THROUGHOUT SYSTEM AFFECTED BY AVAILABLE FAULT CURRENT.
6. PERFORM EQUIPMENT EVALUATION STUDY TO DETERMINE ADEQUACY OF OVERCURRENT PROTECTION DEVICES BY TABULATING AND COMPARING SHORT CIRCUIT RATINGS OF THESE DEVICES WITH AVAILABLE FAULT CURRENT. NOTIFY OWNER IN WRITING WHERE PROBLEM AREAS OR INADEQUACIES APPEAR IN ELECTRICAL EQUIPMENT.
7. STUDY REPORT: IN BOUND FINAL REPORT, INCLUDE SHEETS LISTING TABULATED INFORMATION FROM STUDY, INCLUDING FEEDER IMPEDANCES, MOTOR, UTILITY AND GENERATOR IMPEDANCES AND FAULT CONTRIBUTIONS, AND RESULTING SHORT CIRCUIT CURRENT INCLUDING ASYMMETRICAL, SYMMETRICAL, THREE, FIVE AND EIGHT CYCLE FAULT CURRENT LEVELS, AND LINE-TO-NEUTRAL AND THREE-PHASE-BOLTED-FAULT CURRENT LEVELS AT EACH CALCULATED POINT IN ELECTRICAL DISTRIBUTION SYSTEM.

N. ARC-FLASH RISK ASSESSMENT:
1. PERFORM ARC FLASH RISK ASSESSMENT WITH AID OF COMPUTER SOFTWARE INTENDED FOR THIS PURPOSE.
2. PERFORM ARC FLASH RISK ASSESSMENT IN CONJUNCTION WITH SHORT-CIRCUIT ANALYSIS AND TIME-CURRENT COORDINATION ANALYSIS.
3. SUBMIT RESULTS OF ASSESSMENT IN TABULAR FORM, AND INCLUDE DEVICE OR BUS NAME, BOLTED FAULT AND ARCING FAULT CURRENT LEVELS, FLASH PROTECTION BOUNDARY DISTANCES, PERSONAL-PROTECTIVE EQUIPMENT CLASSES AND AFIE LEVELS.
4. PERFORM ANALYSIS UNDER WORST-CASE ARC FLASH CONDITIONS, AND FINAL REPORT DESCRIBES, WHEN APPLICABLE, HOW THESE CONDITIONS DIFFER FROM WORST-CASE BOLTED FAULT CONDITIONS.
5. ARC FLASH RISK ASSESSMENT INCLUDES RECOMMENDATIONS FOR REDUCING AFIE LEVELS AND ENHANCING WORKER SAFETY.
6. PROPOSED VENDOR DEMONSTRATES EXPERIENCE WITH ARC FLASH RISK ASSESSMENT BY SUBMITTING NAMES OF AT LEAST TEN ACTUAL ARC FLASH RISK ASSESSMENTS IT HAS PERFORMED IN PAST YEAR.
7. PROPOSED VENDOR DEMONSTRATES CAPABILITIES IN PROVIDING EQUIPMENT, SERVICES, AND TRAINING TO REDUCE ARC FLASH EXPOSURE AND TRAIN WORKERS IN ACCORDANCE WITH NFPA 70E AND OTHER APPLICABLE STANDARDS.
8. PROPOSED VENDOR DEMONSTRATES EXPERIENCE IN PROVIDING EQUIPMENT LABELS IN COMPLIANCE WITH CEC AND ANSI Z535.4 TO IDENTIFY AFIE AND APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT CLASSES.

3.5 FIELD QUALITY CONTROL

A. TESTS: CONDUCT TESTS OF EQUIPMENT AND SYSTEMS TO DEMONSTRATE COMPLIANCE WITH REQUIREMENTS SPECIFIED IN THIS DIVISION. REFER TO INDIVIDUAL SPECIFICATION SECTIONS FOR REQUIRED TESTS. DOCUMENT TESTS AND INCLUDE IN CLOSEOUT DOCUMENTS. DURING SITE EVALUATIONS BY ARCHITECT PROVIDE AN ELECTRICIAN WITH TOOLS TO REMOVE AND REPLACE TRIMS, COVERS, DEVICES, AND THE LIKE, SO THAT A PROPER EVALUATION OF THE INSTALLATION CAN BE PERFORMED.

B. TEST CONDUCTOR INSULATION ON FEEDERS OF 100 AMP AND GREATER FOR CONFORMITY WITH 1000 VOLT MEGOHMMETER. USE INSULATED CABLE ENGINEERS ASSOCIATION TESTING PROCEDURES. MINIMUM INSULATION RESISTANCE ACCEPTABLE IS 1 MEGOHM FOR SYSTEMS 600 VOLTS AND BELOW. NOTIFY ARCHITECT IF INSULATION RESISTANCE IS LESS THAN 1 MEGOHM

C. VERIFY ELECTRICAL CHARACTERISTICS OF EQUIPMENT PRIOR TO INSTALLATION OF CONDUITS AND WIRING FOR EQUIPMENT.

D. ELECTRICAL DISTRIBUTION STUDY: PROVIDE SERVICES OF QUALIFIED FIELD ENGINEER AND NECESSARY TOOLS AND EQUIPMENT TO TEST, CALIBRATE, AND ADJUST INSTALLED PROTECTIVE DEVICES TO CONFORM TO REQUIREMENTS DETERMINED BY COORDINATION ANALYSIS. ADJUST INSTALLED PROTECTIVE DEVICES HAVING ADJUSTABLE SETTINGS TO CONFORM TO REQUIREMENTS DETERMINED BY COORDINATION ANALYSIS. SUBMIT REPORT SHOWING FINAL ADJUSTED SETTINGS OF PROTECTIVE DEVICES

3.6 CLEANING

A. REMOVE DIRT AND DEBRIS CAUSED BY THE EXECUTION OF THE ELECTRICAL WORK. LEAVE THE ENTIRE ELECTRICAL SYSTEM INSTALLED IN CLEAN, DUST-FREE AND PROPER WORKING ORDER.

B. THOROUGHLY CLEAN EXPOSED PORTIONS OF EQUIPMENT, REMOVING TEMPORARY LABELS AND TRACES OF FOREIGN SUBSTANCES. THROUGHOUT WORK, REMOVE CONSTRUCTION DEBRIS AND SURPLUS MATERIALS ACCUMULATED DURING WORK.

END OF ELECTRICAL SPECIFICATIONS

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

1601 SECOND STREET, BERKELEY, CA 94710

APN #: 57-2109


Design Firm:

SIEGEL & STRAIN Architects

6201 Doyle Street, Suite B
Emeryville, CA 94608
510 / 547-8092
info@siegelstrain.com
www.siegelstrain.com

Consultant:

INTERFACE ENGINEERING

PROJECT 2021-1134
CONTACT Nicole Verdisio
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REGISTERED PROFESSIONAL ENGINEER
No. E22875
Exp:09/22
ELECTRICAL
STATE OF CALIFORNIA

Signed: 4/21/23

| No. | Date | Issue |
|---|---|---|
| | 04/29/23 | BID SET |

Issue Note:

PERMIT SET

09/21/22

Project ID: BSC

File Name:

Drawn By: DM

Review By: WA

Plot Date:

Sheet Title:

**SPECIFICATIONS - ELECTRICAL**

Sheet No.:

E3.1

5/13/2022 10:24:25 AM

# FIRE PROTECTION SYMBOL LIST

NOTE: This is a standard symbol list and not all items listed may be used.

## General

- DEMOLISH
- EXISTING WORK
- UNDERGROUND PIPE
- ABOVE GROUND PIPE
- CONTINUATION
- DETAIL NUMBER AND SHEET LOCATION (X / X)
- EQUIPMENT IDENTIFICATION (XX-X / LOCATION)
- KEYED NOTE (X)
- POINT OF CONNECTION
- SECTION NUMBER AND SHEET LOCATION (A / XXX)

## Valves

- ALARM CHECK VALVE, ELEVATION VIEW
- ALARM CHECK VALVE, PLAN VIEW
- ANGLE VALVE
- CHECK VALVE
- INDICATING BUTTERFLY VALVE
- NON-RISING STEM VALVE
- SPRINKLER DOUBLE DETECTOR CHECK VALVE ASSEMBLY (DCVA)
- FIRE DEPARTMENT CONNECTION

## Miscellaneous

- ELEVATION ABOVE FINISHED FLOOR (14'-0")
- WET FIRE SPRINKLER RISER
- SCREWED CAP
- SCREWED PLUG
- HYDRAULIC NODE TAG (X)
- FIRE SPRINKLER PIPE HANGER
- BRANCH LINE RESTRAINT

# GENERAL FIRE PROTECTION NOTES

A. SCOPE OF WORK IS TO PROVIDE A WET PIPE FIRE SPRINKLER SYSTEM THROUGHOUT THE EMERGENCY SHELTER UNITS, FED BY THE EXISTING 4-INCH FIRE SERVICE LINE AT THE SITE. SEE CIVIL PLANS FOR LOCATIONS OF EXISTING SITE PIPING.

B. DESIGN AND INSTALLATION OF THE FIRE SPRINKLER SYSTEMS MUST BE IN ACCORDANCE WITH THE 2019 CALIFORNIA BUILDING CODE (CBC), 2019 CALIFORNIA FIRE CODE (CFC), AND 2016 NFPA 13D.

C. CONTRACTOR TO PREPARE SHOP DRAWINGS AND SUBMIT TO THE ARCHITECT AND AHJ FOR REVIEW AND APPROVAL. PLANS MUST BE APPROVED BY THE AHJ AND REVIEWED BY THE ARCHITECT PRIOR TO START OF INSTALLATION.

D. ALL MATERIALS MUST CONFORM TO THE REQUIREMENTS OF NFPA 13D AND BE LISTED FOR THEIR INTENDED FIRE PROTECTION APPLICATION.

E. ALL NEW FIRE SPRINKLER PIPING TO BE SCHEDULE 40 BLACK STEEL UNLESS INDICATED OTHERWISE.

F. EACH SHELTER UNIT TO HAVE A SEPARATE CONTROL VALVE PER NFPA 13D SECTION 6.2.3. FIRE PROTECTION SYSTEM CONTROL VALVES MUST BE LOCKED IN THE OPEN POSITION IN ACCORDANCE WITH NFPA 13D SECTION 7.1.2.

G. ALL SYSTEM PIPING MUST BE HYDROSTATICALLY TESTED AT 200 PSI OR 50 PSI IN EXCESS OF SYSTEM WORKING PRESSURE, WHICHEVER IS GREATER, FOR A PERIOD OF 2 HOURS IN ACCORDANCE WITH NFPA 13 SECTION 10.10.2.2.1, AS REFERENCED BY NFPA 13D SECTION 11.2.1.2.

## WATER FLOW INFORMATION

| | |
|---|---|
| **DATE OF REPORT/TEST** | 04/26/2022 |
| **LOCATION** | CEDAR ST. AND 2ND ST. |
| **MAIN SIZE** | 6-INCH |
| **STATIC PRESSURE** | 93 PSI |
| **RESIDUAL PRESSURE** | 84 PSI |
| **FLOW AT RESIDUAL** | 1000 GPM |

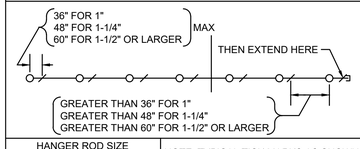
**COMMENTS:**
WATER FLOW INFORMATION OBTAINED FROM A MODEL PROVIDED BY EBMUD (BERKELEY).

## SPRINKLER HEAD LEGEND

| SYMBOL | DESCRIPTION | PART NO. | K-FACTOR | ORIFICE SIZE | FINISH | ESCUTCHEON | NO. OF SPRKS | TEMP | RESPONSE | COVERAGE | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ◎ | VK467 RESIDENTIAL UPRIGHT SPRINKLER | 19154 | 4.9 | 1/2 | WHITE | WHITE | 32 | 155 | QUICK | 16' X 16' PER LISTING | INSTALL WITH LISTED SPRINKLER GUARD |

| MAXIMUM DISTANCE BETWEEN HANGERS (FT-IN) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | NOMINAL PIPE SIZE (IN) | | | | | | | |
| | 3/4 | 1 | 1-1/4 | 1-1/2 | 2 | 2-1/2 | 3 | 4 | 6 |
| STEEL PIPE | N/A | 12-0 | 12-0 | 15-0 | 15-0 | 15-0 | 15-0 | 15-0 | 15-0 |
| THREADED LIGHTWALL | N/A | 12-0 | 12-0 | 12-0 | 12-0 | 12-0 | 12-0 | N/A | N/A |
| FOR STEEL PIPE, THE MAXIMUM LENGTH FOR UNSUPPORTED ARMOVER SHALL BE 2'-0". WHEN PRESSURE EXCEEDS 100 PSI, UNSUPPORTED LENGTH SHALL BE 1'-0". | | | | | | | | |

DISTANCE FROM SPRINKLER TO HANGER




| HANGER ROD SIZE | |
|---|---|
| PIPE SIZE | DIAM. OF ROD |
| UP TO AND INCLUDING 4" | 3/8" |
| 6" AND 8" | 1/2" |

NOTE: TYPICAL TICK MARKS AS SHOWN ON PIPING PLAN MAY NOT REFLECT ACTUAL FIELD INSTALLATION. FINAL HANGER INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13 2013 CHAPTER 9.

4/26/22, 3:17 PM EBMUD Fire Service Available Flow and Pressure

**EBMUD FIRE SERVICE AVAILABLE FLOW & PRESSURE INFORMATION**

**Contact Information:**
Marjorie Smith
Siegel & Strain Architects
6201 Doyle Street B
Emeryville, 94608

**Request Number: 7616**
**E-mail:** harry@siegelstrain.com
**Phone:** 5105478092x122
**Cell:**
**Fax:**

**Property Information**:
1601 2nd Street
BERKELEY, 94710

**Approximate Elevation (feet):** 7
**Connection Size (inches):** 4
**Assessor's Parcel Number:** 057-2109

The following available flow and pressure information is based on a Maximum Day Demand Hydraulic Model Analysis of EBMUD's water distribution system. This information should be used as a guideline of the approximate available flow. It is recommended that a design allowance be made for possible reductions in pressure and/or flow that could occur under other possible scenarios. Applicant understands that the District cannot guarantee any specific values for pressure and flow. If you have any questions, please contact us at nbo@ebmud.com or call (510)287-1008.

**Available flow and pressure at possible fire service connection for above property:**

**Possible Fire Service Connection #1**
Existing hydrant location, Hydrant No. 1539, located off of the 6-inch main (6CM41) in Cedar Street, on the north side of Cedar Street, approximately 20 feet west of 2nd Street.
**Pressure Zone:** Central (North)
**Connection Point Elevation (feet):** 10
**Connection Point Static Pressure (psi):** 93
**Residual Pressure at gpm (psi):**
**Residual Pressure at 0 gpm (psi):** 87
**Residual Pressure at 500 gpm (psi):** 86
**Residual Pressure at 1000 gpm (psi):** 84

**Possible Fire Service Connection #2**
Off of the 12-inch main (12SMH92) in 2nd Street, on the west side of 2nd Street, approximately 40 feet south of Cedar Street.
**Pressure Zone:** Central (North)
**Connection Point Elevation (feet):** 10
**Connection Point Static Pressure (psi):** 93
**Residual Pressure at gpm (psi):**
**Residual Pressure at 0 gpm (psi):** 87
**Residual Pressure at 750 gpm (psi):** 86
**Residual Pressure at 1500 gpm (psi):** 84

**Possible Fire Service Connection #3**
**Pressure Zone:** Central (North)
**Connection Point Elevation (feet):**
**Connection Point Static Pressure (psi):**
**Residual Pressure at gpm (psi):**
**Residual Pressure at 0 gpm (psi):**
**Residual Pressure at 750 gpm (psi):**
**Residual Pressure at 1500 gpm (psi):**

**Engineer's Comments:** The pressure and flow information stated is available at the street main connections in Cedar Street and 2nd Street. Available flow at connection #1 is limited to 1,000 gpm due to the dead-end 6-inch main. Offsite pipeline improvements, at the applicant's expense, may be required to meet fire flow requirements set by the local fire agency. Offsite pipeline improvements include, but are not limited to, replacement of existing water mains to the project site. Connection #1 is an existing public hydrant location and is a potential fire or water service connection to the property.

Flow and pressure data is valid for one year after the approval date. You will need to submit a new request and pay applicable fee after the expiration date.

**NBO:** CLEDOUX **Engineer:** JSWONG **Supervisor:** JMCGREGO **Date:** 2022-04-26 14:03:37.0



4/26/22, 3:17 PM EBMUD Fire Service Available Flow and Pressure

**STATEMENT OF DESIGN CRITERIA USED FOR FIRE SPRINKLER DESIGN**

**Request Number: 7616**

*I,_____, designer of the fire sprinkler system located at the property address referenced on the above Request Number, used the following flow information to design the fire sprinkler system:*

*Static Pressure (psi):_____*

*Flow (gpm): _____*

*Residual Pressure (psi):_____*

*Maximum total fire flow requirement (gpm):_____*

*The fire sprinkler design or underground fire plan has been approved by the _____(Fire Agency with Jurisdiction) Fire Marshal, and a copy of the signed and approved plan is attached.*

*The fire sprinkler design complies with EBMUD's standard backflow requirements, as described in the Private Fire Service pamphlet.*

*Please choose the service size from the list of Standard Fire Service Sizes shown below:*

- ○ 1-1/2 inch, maximum 100 GPM
- ○ 2 inch, maximum 160 GPM
- ○ 4 inch, maximum 600 GPM
- ○ 6 inch, maximum 1350 GPM
- ○ 8 inch, maximum 2340 GPM
- ○ 10 inch, maximum 4400 GPM
- ○ 12 inch, case-by-case

***NOTE: Service size chosen above must match size shown on plans.***

_____
*Fire Sprinkler Designer Signature and Date*

**Please return a copy of EBMUD's Fire Service Available Flow And Pressure Information results with the signed Statement of Design Criteria Used For Fire Sprinkler Design form when applying for a fire service.**



# SHEET INDEX


FP0.1 GENERAL NOTES, SYMBOL LIST & SHEET INDEX - FIRE PROTECTION

FP1.01 SITE PLAN - FIRE PROTECTION

FP2.01 ENLARGED PLANS - TYPICAL UNITS A, B, C, & H - FIRE PROTECTION
FP2.02 ENLARGED PLANS - TYPICAL UNITS D, E, F & G - FIRE PROTECTION
FP2.03 ENLARGED PLANS - TYPICAL 100 SQFT UNITS - FIRE PROTECTION

FP6.01 DETAILS - FIRE PROTECTION

FP8.01 SPECIFICATIONS - FIRE PROTECTION
FP8.02 SPECIFICATIONS - FIRE PROTECTION
FP8.03 SPECIFICATIONS - FIRE PROTECTION
FP8.04 SPECIFICATIONS - FIRE PROTECTION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www.interfaceengineering.com


REGISTERED PROFESSIONAL ENGINEER — KAI-CHEUNG LAU — No. M33910 Exp12/31/23 — MECHANICAL — STATE OF CALIFORNIA
Signed: 4/21/23

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

Issue Note:
PERMIT SET
09/21/22

Project ID: BSC
File Name:
Drawn By: NW
Review By: EB
Plot Date:

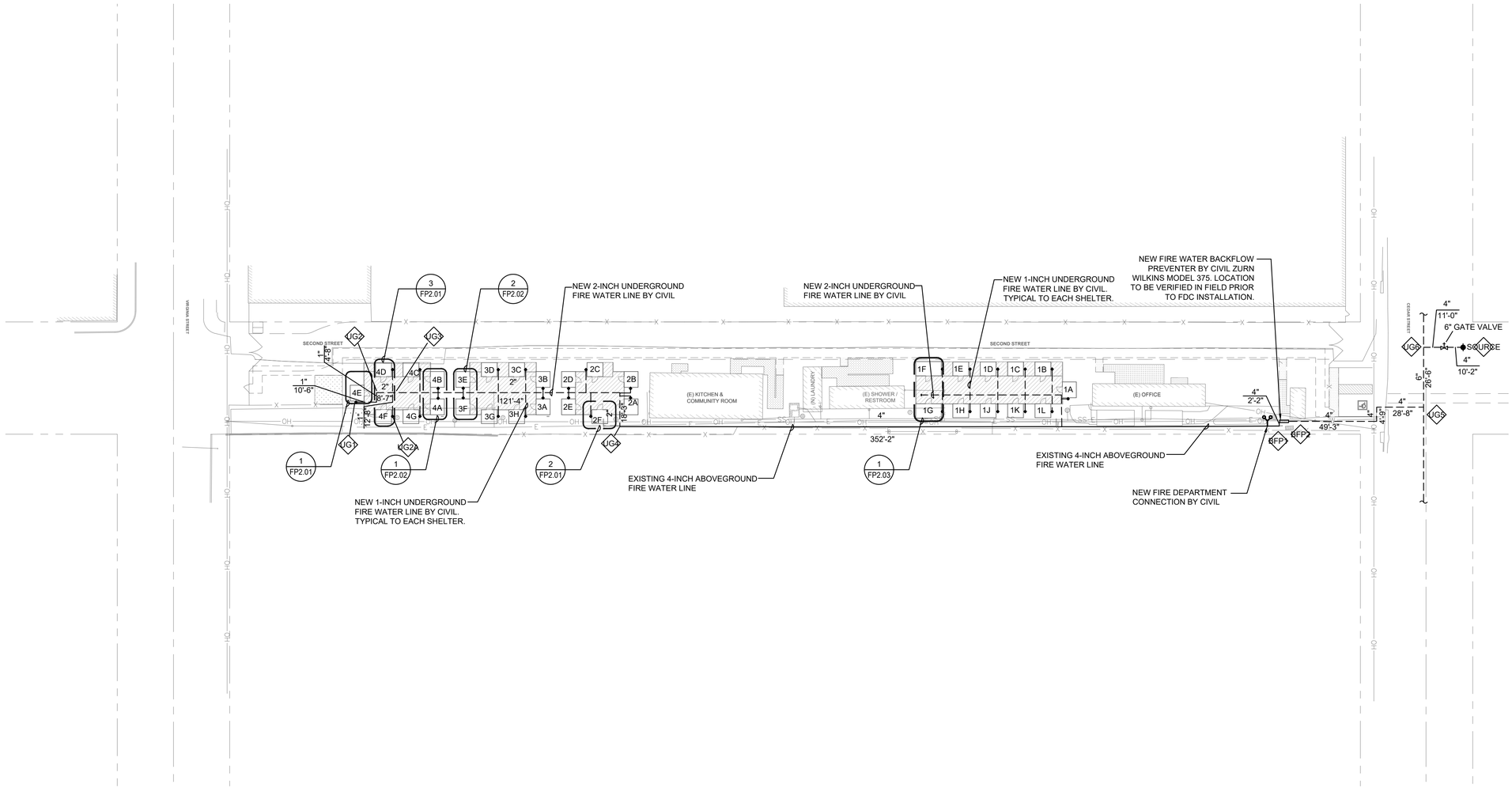
Sheet Title:
**GENERAL NOTES, SYMBOL LIST & SHEET INDEX - FIRE PROTECTION**

Sheet No.:
FP0.1

4/6/2023 6:18:41 AM

# GENERAL FIRE PROTECTION NOTES

A. FIRE PROTECTION SITE PLAN PROVIDED FOR HYDRAULIC CALCULATION NODES, VALVE AND RISER LOCATIONS, AND SITE REFERENCE ONLY. REFER TO CIVIL SITE PLANS FOR EXACT LOCATION OF UNDERGROUND PIPE, UTILITY AND CONNECTION INFORMATION.




## 1 SITE PLAN - FIRE PROTECTION

0 16' 32' 64'

SCALE: 1/32"=1'-0"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Project ID: BSC
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Plot Date:

Sheet Title:
**SITE PLAN - FIRE PROTECTION**

Sheet No.:

FP1.01

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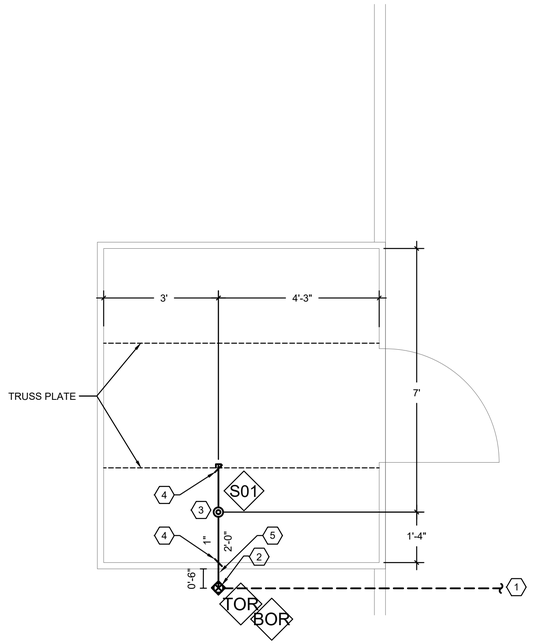



## 1 ENLARGED PLAN - TYPICAL UNIT A - FIRE PROTECTION

0 1' 2' 4'

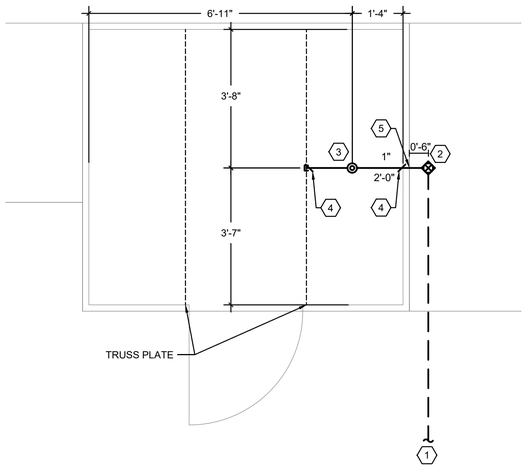
SCALE: 1/2"=1'-0"

### HYDRAULIC REMOTE AREA

| | |
|---|---|
| **REMOTE AREA** | REMOTE AREA 1 |
| **HAZARD** | LIGHT HAZARD |
| AREA OF APPLICATION | 100 SQ. FT. |
| **NO. OF SPRINKLERS** | 1 |
| **DENSITY** | .05 GPM/SQ. FT. |
| **SYSTEM DEMAND AT BASE OF RISER** | 28.1 GPM @ 27.07 PSI |
| **HOSE** | 0 GPM **INSIDE** / 0 GPM **OUTSIDE** |
| **COVERAGE PER SPRINKLER** | 100 SQ. FT. |

**COMMENTS**

NUMBER OF SPRINKLERS WITHIN DESIGN AREA SHALL BE ALL SPRINKLERS WITHIN A COMPARTMENT, UP TO A MAXIMUM OF TWO, PER NFPA 13D SECTION 10.2.1.




## GENERAL SHEET NOTES

A. ALL NEW FIRE SPRINKLER PIPING TO BE SCHEDULE 40 BLACK STEEL.

B. CAPACITY OF FIRE PROTECTION SYSTEM PIPING IN EACH SHELTER UNIT IS LESS THAN FIVE GALLONS. SYSTEMS WILL BE DRAINED BY REMOVAL OF PIPE CAP AT EACH UPRIGHT SPRINKLER SPRIG FITTING.

C. ALL REQUIRED PIPE HANGERS TO BE HUNG FROM TRUSS PLATES.

## SHEET KEYNOTES

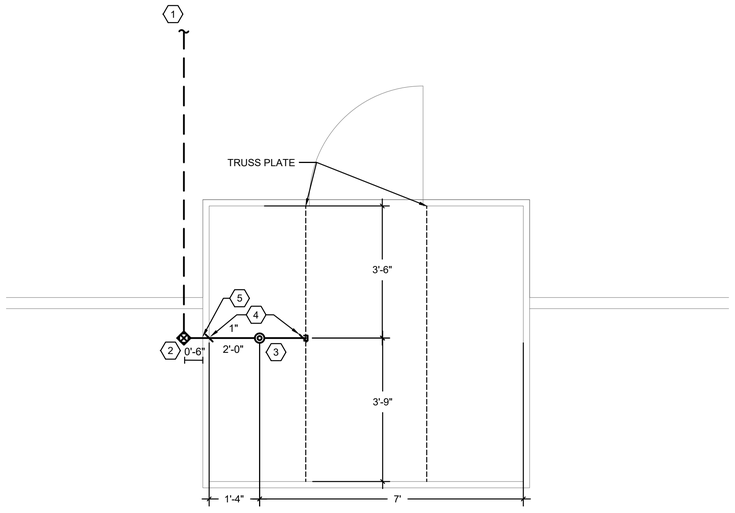
1 REFER TO CIVIL DRAWINGS FOR CONTINUATION AND ROUTING OF UNDERGROUND FIRE WATER LINES.

2 TYPICAL 1-INCH EXTERIOR FIRE SPRINKLER RISER. SEE DETAIL 1 ON SHEET FP6.01.

3 TYPICAL UPRIGHT SPRINKLER. SEE DETAIL 3 ON SHEET FP6.01.

4 FIRE SPRINKLER HANGER. SEE DETAIL 2 ON SHEET FP6.01. TYPICAL.

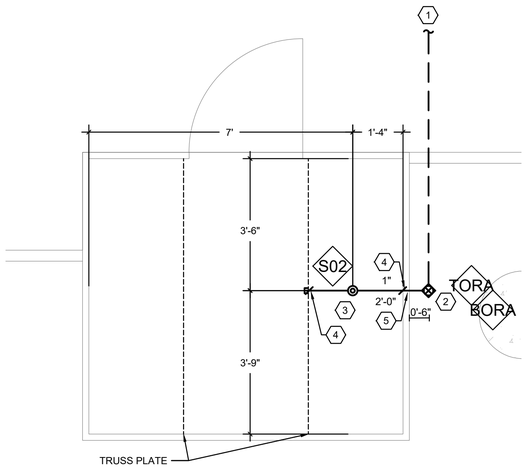
5 REFER TO DETAIL 4 ON SHEET FP6.01 FOR LOCATION OF PIPE PENETRATION.




## 2 ENLARGED PLAN - TYPICAL UNIT H - FIRE PROTECTION

0 1/2' 1' 2'

SCALE: 1"=1'-0"




## 3 ENLARGED PLAN - TYPICAL UNITS B & C - FIRE PROTECTION

0 1' 2' 4'

SCALE: 1/2"=1'-0"

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| Drawn By: | NW |
| Review By: | EB |
| Plot Date: | |

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**ENLARGED PLANS - TYPICAL UNITS A, B, C, & H - FIRE PROTECTION**

Sheet No.:

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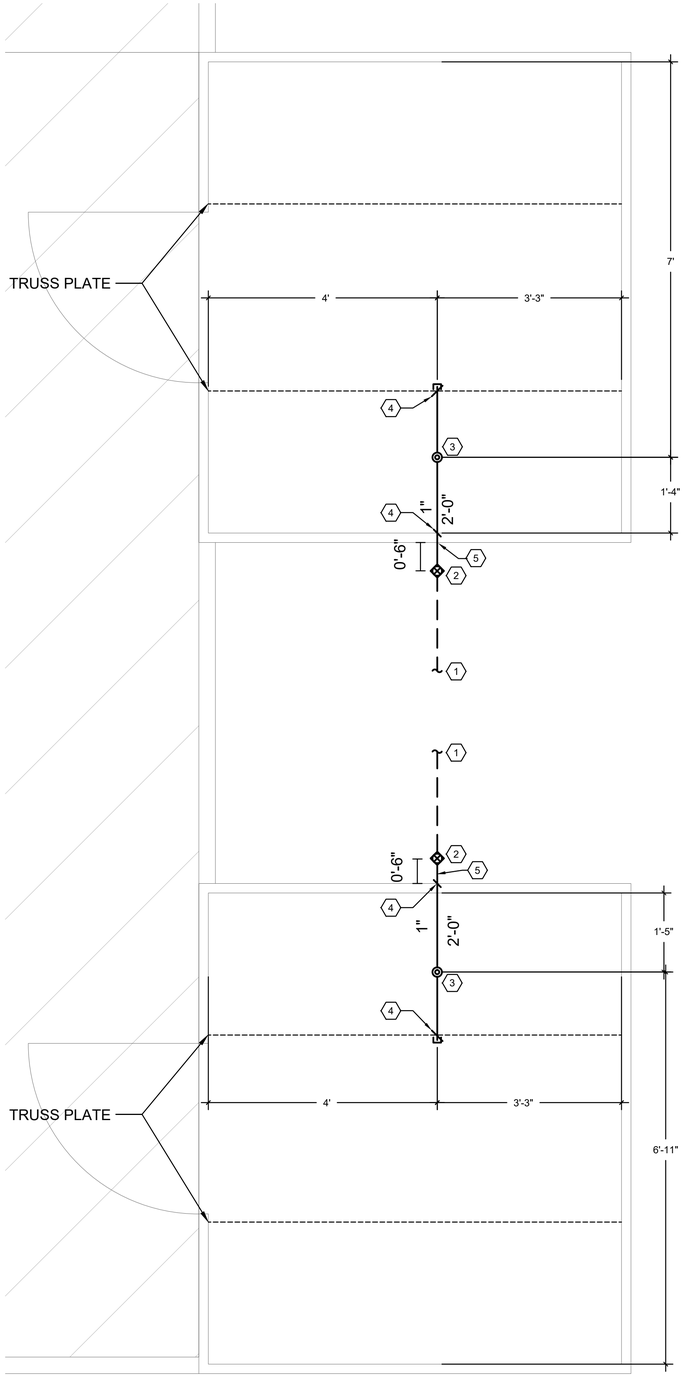


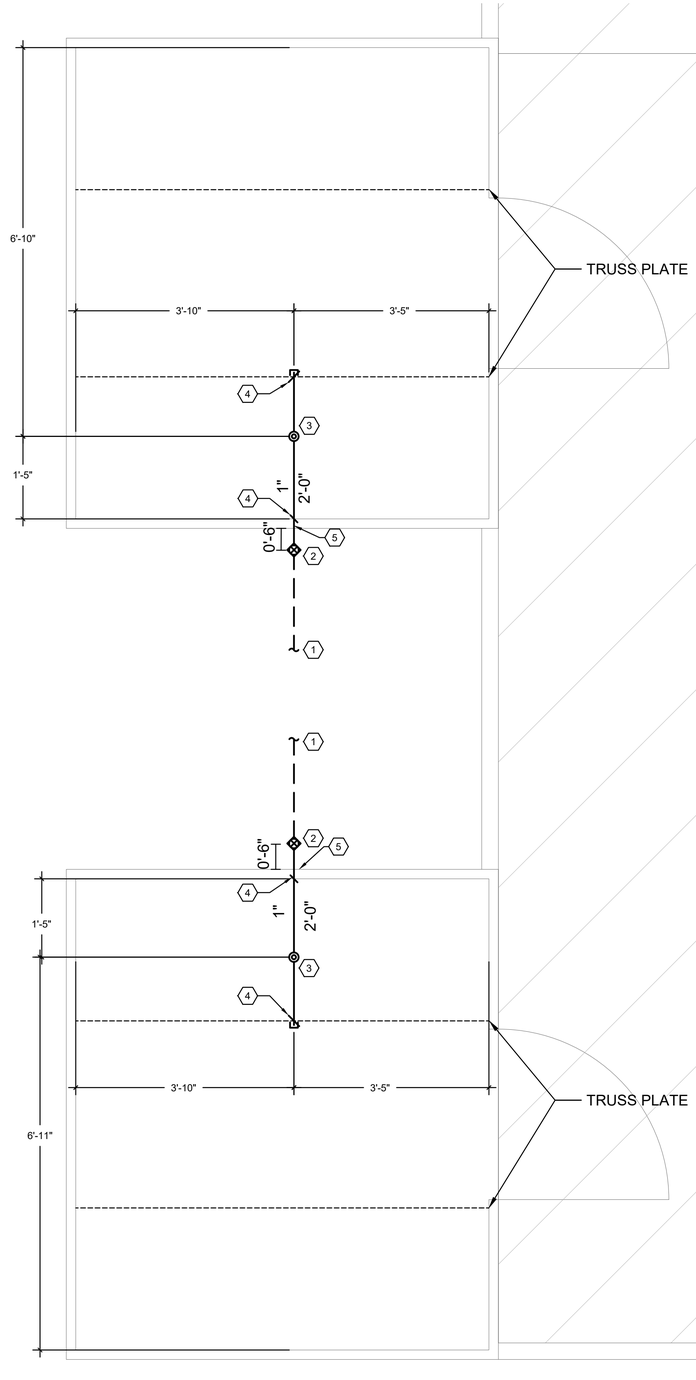


## GENERAL SHEET NOTES

A. ALL NEW FIRE SPRINKLER PIPING TO BE SCHEDULE 40 BLACK STEEL.

B. CAPACITY OF FIRE PROTECTION SYSTEM PIPING IN EACH SHELTER UNIT IS LESS THAN FIVE GALLONS. SYSTEMS WILL BE DRAINED BY REMOVAL OF PIPE CAP AT EACH UPRIGHT SPRINKLER SPRIG FITTING.

C. ALL REQUIRED PIPE HANGERS TO BE HUNG FROM TRUSS PLATES.

## SHEET KEYNOTES

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2 TYPICAL 1-INCH EXTERIOR FIRE SPRINKLER RISER. SEE DETAIL 1 ON SHEET FP6.01.

3 TYPICAL UPRIGHT SPRINKLER. SEE DETAIL 3 ON SHEET FP6.01.

4 FIRE SPRINKLER HANGER. SEE DETAIL 2 ON SHEET FP6.01. TYPICAL.

5 REFER TO DETAIL 4 ON SHEET FP6.01 FOR LOCATION OF PIPE PENETRATION.




## 1 ENLARGED PLAN - TYPICAL UNITS D & E - FIRE PROTECTION

0 1' 2' 3'

SCALE: 3/4"=1'-0"




## 2 ENLARGED PLAN - TYPICAL UNITS F & G - FIRE PROTECTION

0 1' 2' 3'

SCALE: 3/4"=1'-0"

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File Name:

Drawn By: NW

Review By: EB

Plot Date:

Sheet Title:

**ENLARGED PLANS - TYPICAL UNITS D, E, F & G - FIRE PROTECTION**

Sheet No.:

FP2.02

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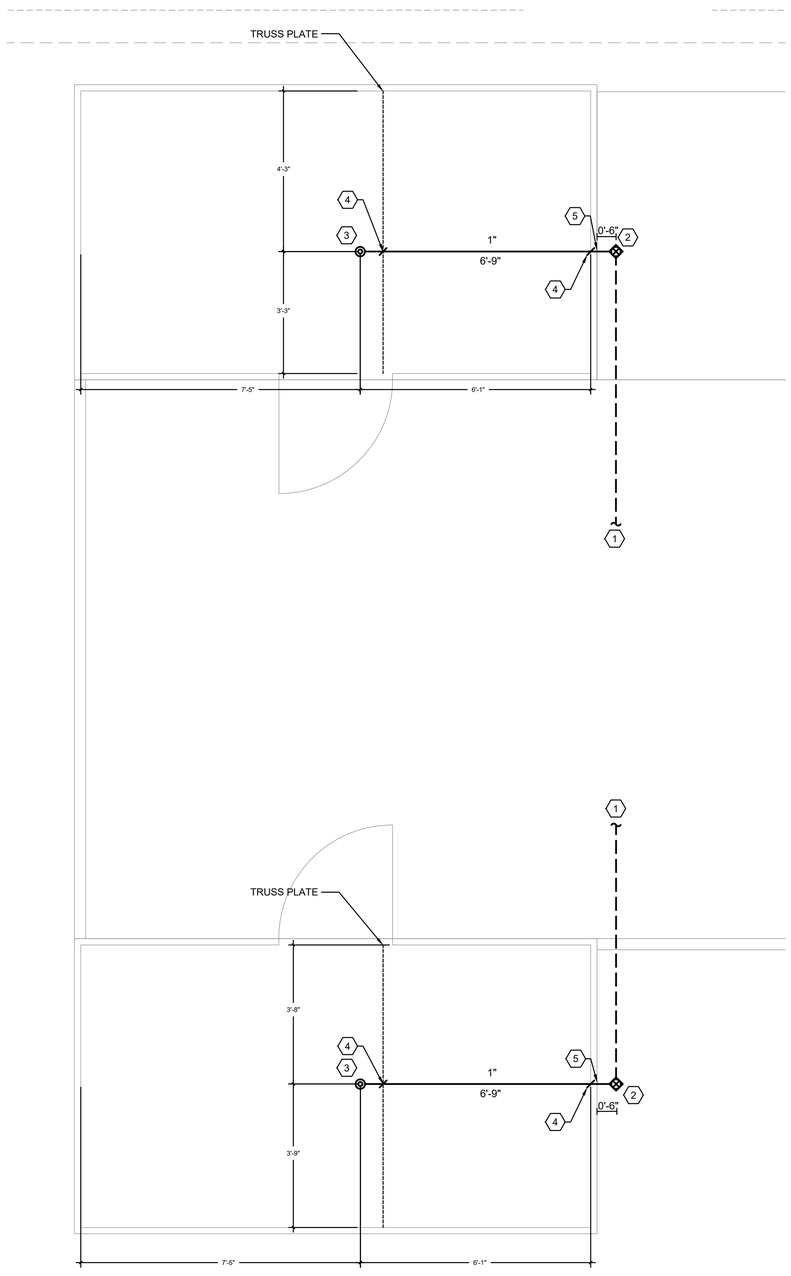


## 1 ENLARGED PLAN - TYPICAL 100 SQFT UNITS - FIRE PROTECTION

0 1' 2' 4'

SCALE: 1/2"=1'-0"

# GENERAL SHEET NOTES

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C. ALL REQUIRED PIPE HANGERS TO BE HUNG FROM TRUSS PLATES.

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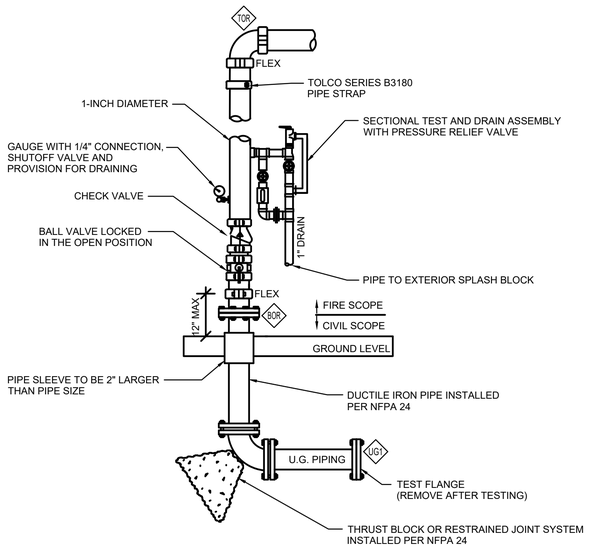
**ENLARGED PLANS - TYPICAL UNITS D, E, F & G - FIRE PROTECTION**

Sheet No.:

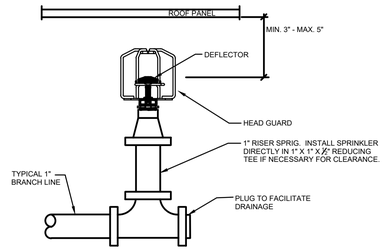
FP2.03

4/6/2023 6:18:19 AM



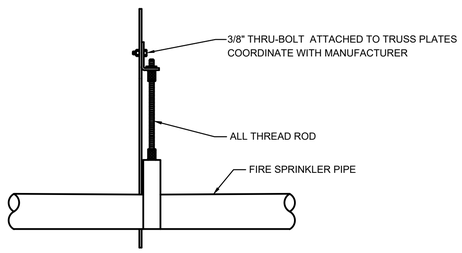

## 1 TYPICAL WET SPRINKLER RISER

NO SCALE



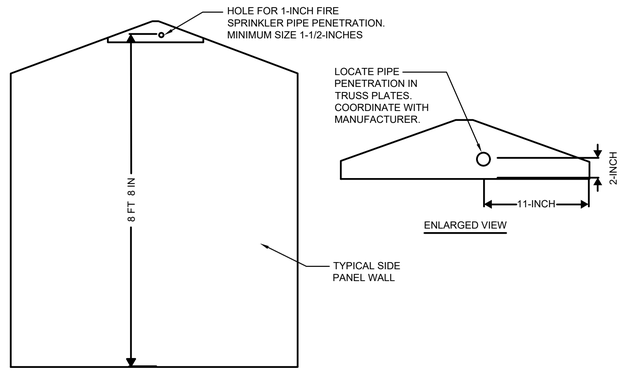

## 3 TYPICAL UPRIGHT HEAD ON SPRIG UP

NO SCALE




## 2 HANGER AT TRUSS PLATE

NO SCALE




## 4 TYPICAL FIRE SPRINKLER PIPE PENETRATION AT WALL PANEL

NO SCALE

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

1601 SECOND STREET, BERKELEY, CA 94710

APN #: 57-2109


Design Firm:

SIEGEL & STRAIN Architects

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Consultant:

INTERFACE ENGINEERING

PROJECT 2021-1134
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REGISTERED PROFESSIONAL ENGINEER
MECHEUNG LAU
No. M33910
Exp 12/31/23
MECHANICAL
STATE OF CALIFORNIA

Signed: 4/21/23

| No. | Date | Issue |
|---|---|---|
| | 04/28/23 | BID SET |

Issue Note:

PERMIT SET

09/21/22

Project ID: BSC

File Name:

Drawn By: NW

Review By: EB

Plot Date:

Sheet Title:

**DETAILS - FIRE PROTECTION**

Sheet No.:

FP6.01

4/6/2023 6:16:30 AM

## SECTION 21 0000 - FIRE SUPPRESSION BASIC REQUIREMENTS

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

A. WORK INCLUDED IN 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS APPLIES TO DIVISION 21, FIRE SUPPRESSION WORK TO PROVIDE MATERIALS, LABOR, TOOLS, PERMITS, INCIDENTALS, AND OTHER SERVICES TO PROVIDE AND MAKE READY FOR OWNER'S USE OF FIRE PROTECTION SYSTEMS FOR PROPOSED PROJECT.

B. CONTRACT DOCUMENTS INCLUDE, BUT ARE NOT LIMITED TO, SPECIFICATIONS INCLUDING DIVISION 00, PROCUREMENT AND CONTRACTING REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS, DRAWINGS, ADDENDA, OWNER/ARCHITECT AGREEMENT, AND OWNER/CONTRACTOR AGREEMENT. CONFIRM REQUIREMENTS BEFORE COMMENCEMENT OF WORK.

C. DEFINITIONS:

1. PROVIDE: TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.
2. FURNISH: SUPPLY AND DELIVER TO PROJECT SITE, READY FOR UNPACKING, ASSEMBLY AND INSTALLATION.
3. INSTALL: INCLUDES UNLOADING, UNPACKING, ASSEMBLING, ERECTING, INSTALLATION, APPLYING, FINISHING, PROTECTING, CLEANING AND SIMILAR OPERATIONS AT PROJECT SITE AS REQUIRED TO COMPLETE ITEM OF WORK FURNISHED.
4. APPROVED OR APPROVED EQUIVALENT: TO POSSESS THE SAME PERFORMANCE QUALITIES AND CHARACTERISTICS AND FULFILL THE UTILITARIAN FUNCTION WITHOUT ANY DECREASE IN QUALITY, DURABILITY OR LONGEVITY. FOR EQUIPMENT/PRODUCTS DEFINED BY THE CONTRACTOR AS "EQUIVALENT." SUBSTITUTION REQUESTS MUST BE SUBMITTED TO ENGINEER FOR CONSIDERATION, IN ACCORDANCE WITH DIVISION 01, GENERAL REQUIREMENTS, AND APPROVED BY THE ENGINEER PRIOR TO SUBMITTING BIDS FOR SUBSTITUTED ITEM.
5. AUTHORITY HAVING JURISDICTION (AHJ): INDICATES REVIEWING AUTHORITIES, INCLUDING LOCAL FIRE MARSHAL, OWNER'S INSURANCE UNDERWRITER, OWNER'S AUTHORIZED REPRESENTATIVE, AND OTHER REVIEWING ENTITY WHOSE APPROVAL IS REQUIRED TO OBTAIN SYSTEMS ACCEPTANCE.

**1.02 RELATED SECTIONS**

A. CONTENT OF SECTION APPLIES TO DIVISION 21, FIRE SUPPRESSION CONTRACT DOCUMENTS.

B. RELATED WORK:

1. ADDITIONAL CONDITIONS APPLY TO THIS DIVISION INCLUDING, BUT NOT LIMITED TO:
   a. SPECIFICATIONS INCLUDING DIVISION 00, PROCUREMENT AND CONTRACTING REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS.
   b. DRAWINGS
   c. ADDENDA
   d. OWNER/ARCHITECT AGREEMENT
   e. OWNER/CONTRACTOR AGREEMENT
   f. CODES, STANDARDS, PUBLIC ORDINANCES AND PERMITS

**1.03 REFERENCES AND STANDARDS**

A. REFERENCES AND STANDARDS PER DIVISION 00, PROCUREMENT AND CONTRACTING REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS, INDIVIDUAL DIVISION 21, FIRE SUPPRESSION SECTIONS AND THOSE LISTED IN THIS SECTION.

B. CODES TO INCLUDE LATEST ADOPTED EDITIONS, INCLUDING CURRENT AMENDMENTS, SUPPLEMENTS AND LOCAL JURISDICTION REQUIREMENTS IN EFFECT AS OF THE DATE OF THE CONTRACT DOCUMENTS, OF/FROM:

1. STATE OF CALIFORNIA:
   a. CBC - CALIFORNIA BUILDING CODE
   b. CEC - CALIFORNIA ELECTRICAL CODE
   c. CEC T24 - CALIFORNIA ENERGY CODE TITLE 24
   d. CFC - CALIFORNIA FIRE CODE
   e. CMC - CALIFORNIA MECHANICAL CODE
   f. CPC - CALIFORNIA PLUMBING CODE
   g. CSFM - CALIFORNIA STATE FIRE MARSHAL

C. REFERENCE STANDARDS AND GUIDELINES INCLUDE BUT ARE NOT LIMITED TO THE LATEST ADOPTED EDITIONS FROM:

1. ABA - ARCHITECTURAL BARRIERS ACT
2. ADA - AMERICANS WITH DISABILITIES ACT
3. AHRI - AIR-CONDITIONING HEATING & REFRIGERATION INSTITUTE
4. ANSI - AMERICAN NATIONAL STANDARDS INSTITUTE
5. ASCE - AMERICAN SOCIETY OF CIVIL ENGINEERS
6. ASCE-7 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
7. ASHRAE - AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS
8. ASHRAE GUIDELINE 0, THE COMMISSIONING PROCESS
9. ASME - AMERICAN SOCIETY OF MECHANICAL ENGINEERS
10. ASPE - AMERICAN SOCIETY OF PLUMBING ENGINEERS
11. ASSE - AMERICAN SOCIETY OF SANITARY ENGINEERING
12. ASTM - ASTM INTERNATIONAL
13. AWWA - AMERICAN WATER WORKS ASSOCIATION
14. CFR - CODE OF FEDERAL REGULATIONS
15. EPA - ENVIRONMENTAL PROTECTION AGENCY
16. ETL - ELECTRICAL TESTING LABORATORIES
17. FCC - FEDERAL COMMUNICATIONS COMMISSION
18. FM - FM GLOBAL
19. FM GLOBAL - FM GLOBAL APPROVAL GUIDE
20. IAPMO - INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIAL
21. ICC - INTERNATIONAL CODE COUNCIL
22. IEC - INTERNATIONAL ELECTROTECHNICAL COMMISSION
23. ICC-ESR - INTERNATIONAL CODE COUNCIL EVALUATION SERVICE REPORTS
24. HI - HYDRAULIC INSTITUTE STANDARDS
25. ISO - INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
26. MSS - MANUFACTURERS STANDARDIZATION SOCIETY
27. NEC - NATIONAL ELECTRIC CODE
28. NEMA - NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
29. NFPA - NATIONAL FIRE PROTECTION ASSOCIATION:
   a. NFPA 13 - STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS
   b. NFPA 13D - STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS IN ONE- AND TWO- FAMILY DWELLINGS AND MANUFACTURED HOMES
   c. NFPA 24 - STANDARD FOR INSTALLATION OF PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES
   d. NFPA 25 - STANDARD FOR INSPECTION, TESTING, AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS
   e. NFPA 70 - NATIONAL ELECTRICAL CODE
   f. NFPA 72 - NATIONAL FIRE ALARM AND SIGNALING CODE
30. NRCA - NATIONAL ROOFING CONTRACTORS ASSOCIATION
31. NSF - NATIONAL SANITATION FOUNDATION
32. OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
33. SMACNA - SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC.
34. TIMA - THERMAL INSULATION MANUFACTURERS ASSOCIATION
35. UL - UNDERWRITERS LABORATORIES INC.

D. SEE DIVISION 21, FIRE SUPPRESSION INDIVIDUAL SECTIONS FOR ADDITIONAL REFERENCES.

**1.04 SUBMITTALS**

A. SEE DIVISION 01, GENERAL REQUIREMENTS FOR SUBMITTAL PROCEDURES AS WELL AS SPECIFIC INDIVIDUAL DIVISION 21, FIRE SUPPRESSION SECTIONS.

B. PROVIDE DRAWINGS IN FORMAT AND SOFTWARE RELEASE EQUAL TO THE DESIGN DOCUMENTS. DRAWINGS TO BE THE SAME SHEET SIZE AND SCALE AS THE CONTRACT DOCUMENTS.

C. "NO EXCEPTION TAKEN" CONSTITUTES THAT REVIEW IS FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT EXPRESSED IN THE CONTRACT DOCUMENTS FOR THE LIMITED PURPOSE OF CHECKING FOR CONFORMANCE WITH INFORMATION GIVEN. ANY ACTION IS SUBJECT TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. CONTRACTOR IS RESPONSIBLE FOR THE DIMENSIONS AND QUANTITY AND WILL CONFIRM AND CORRELATE AT THE JOB SITE, FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATION OF THE WORK WITH THAT OF ALL OTHER TRADES, AND THE SATISFACTORY PERFORMANCE OF THE WORK.

D. PROVIDE PRODUCT SUBMITTALS AND SHOP DRAWINGS IN ELECTRONIC FORMAT ONLY. ELECTRONIC FORMAT MUST BE SUBMITTED VIA ZIP FILE VIA E-MAIL. FOR ELECTRONIC FORMAT, PROVIDE ONE FILE PER DIVISION CONTAINING ONE BOOKMARKED PDF FILE WITH EACH BOOKMARK CORRESPONDING TO EACH SPECIFICATION SECTION. ARRANGE BOOKMARKS IN ASCENDING ORDER OF SPECIFICATION SECTION NUMBER. INDIVIDUAL SUBMITTALS SENT PIECÉMEAL IN A PER SPECIFICATION SECTION METHOD WILL BE RETURNED WITHOUT REVIEW OR COMMENT. COPY ARCHITECT ON ALL TRANSMISSIONS/SUBMISSIONS.

E. SUBMIT SHOP DRAWINGS, CALCULATIONS AND PRODUCT DATA SHEETS AS ONE COMPLETE STAND-ALONE PACKAGE TO AHJ, OWNER'S INSURANCE UNDERWRITER AND ENGINEER.

F. PRODUCT DATA: PROVIDE MANUFACTURER'S DESCRIPTIVE LITERATURE FOR PRODUCTS SPECIFIED IN DIVISION 21, FIRE SUPPRESSION SECTIONS.

G. IDENTIFY/MARK EACH SUBMITTAL IN DETAIL. NOTE WHAT DIFFERENCES, IF ANY, EXIST BETWEEN THE SUBMITTED ITEM AND THE SPECIFIED ITEM. FAILURE TO IDENTIFY THE DIFFERENCES WILL BE CONSIDERED CAUSE FOR DISAPPROVAL. IF DIFFERENCES ARE NOT IDENTIFIED AND/OR NOT DISCOVERED DURING THE SUBMITTAL REVIEW PROCESS, CONTRACTOR REMAINS RESPONSIBLE FOR PROVIDING EQUIPMENT AND MATERIALS THAT MEET THE SPECIFICATIONS AND DRAWINGS.

1. LABEL SUBMITTAL TO MATCH NUMBERING/REFERENCES AS SHOWN IN CONTRACT DOCUMENTS. HIGHLIGHT AND LABEL APPLICABLE INFORMATION TO INDIVIDUAL EQUIPMENT OR CROSS OUT/REMOVE EXTRANEOUS DATA NOT APPLICABLE TO SUBMITTED MODEL. CLEARLY NOTE OPTIONS AND ACCESSORIES TO BE PROVIDED, INCLUDING FIELD INSTALLED ITEM, HIGHLIGHT CONNECTIONS BY/TO OTHER TRADES.
2. INCLUDE TECHNICAL DATA, INSTALLATION INSTRUCTIONS AND DIMENSIONED DRAWINGS FOR PRODUCTS, EQUIPMENT AND DEVICES INSTALLED, FURNISHED OR PROVIDED. REFERENCE DIVISION 21, FIRE SUPPRESSION SPECIFICATION SECTIONS FOR SPECIFIC ITEM REQUIRED IN PRODUCT DATA SUBMITTAL OUTSIDE OF THESE REQUIREMENTS.
3. PROVIDE PUMP CURVES, OPERATION CHARACTERISTICS, CAPACITIES, AMBIENT NOISE CRITERIA, ETC. FOR EQUIPMENT.
4. FOR VIBRATION ISOLATION OF EQUIPMENT, LIST MAKE AND MODEL SELECTED WITH OPERATING LOAD AND DEFLECTION. INDICATE FRAME TYPE WHERE REQUIRED. SUBMIT MANUFACTURER'S PRODUCT DATA.
5. SEE DIVISION 21, FIRE SUPPRESSION SECTIONS FOR ADDITIONAL SUBMITTAL REQUIREMENTS OUTSIDE OF THESE REQUIREMENTS.

H. MAXIMUM OF TWO REVIEWS PROVIDED OF COMPLETE SUBMITTAL PACKAGE. ARRANGE FOR ADDITIONAL REVIEWS AND/OR EARLY REVIEW OF LONG-LEAD ITEM; BEAR COSTS OF ADDITIONAL REVIEWS AT ENGINEER'S HOURLY RATES. INCOMPLETE SUBMITTAL PACKAGES/SUBMITTALS WILL BE RETURNED TO CONTRACTOR WITHOUT REVIEW.

I. RESUBMISSION REQUIREMENTS: MAKE CORRECTIONS OR CHANGES IN SUBMITTALS AS REQUIRED, AND IN CONSIDERATION OF ENGINEER'S COMMENTS. IDENTIFY ENGINEER'S COMMENTS AND PROVIDE AN INDIVIDUAL RESPONSE TO EACH OF THE ENGINEER'S COMMENTS. CLOUD CHANGES IN THE SUBMITTALS AND FURTHER IDENTIFY CHANGES WHICH ARE IN RESPONSE TO ENGINEER'S COMMENTS.

J. STRUCTURAL/SEISMIC: PROVIDE WEIGHTS, DIMENSIONS, MOUNTING REQUIREMENTS AND LIKE INFORMATION REQUIRED FOR MOUNTING, SEISMIC BRACING, AND SUPPORT. INDICATE MANUFACTURER'S INSTALLATION AND SUPPORT REQUIREMENTS TO MEET ASCE 7-16 REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS. PROVIDE ENGINEERED SEISMIC DRAWINGS AND EQUIPMENT SEISMIC CERTIFICATION. EQUIPMENT IMPORTANCE FACTOR AS SPECIFIED IN DIVISION 01 AND IN STRUCTURAL DOCUMENTS.

K. TRADE COORDINATION: INCLUDE PHYSICAL CHARACTERISTICS, ELECTRICAL CHARACTERISTICS, DEVICE LAYOUT PLANS, WIRING DIAGRAMS, AND CONNECTIONS AS REQUIRED PER DIVISION 21, FIRE SUPPRESSION COORDINATION DOCUMENTS. FOR EQUIPMENT WITH ELECTRICAL CONNECTIONS, FURNISH COPY OF APPROVED SUBMITTAL FOR INCLUSION IN DIVISION 26, ELECTRICAL AND DIVISION 28, ELECTRONIC SAFETY AND SECURITY SUBMITTALS.

L. MAKE PROVISIONS FOR OPENINGS IN BUILDING FOR ADMITTANCE OF EQUIPMENT PRIOR TO START OF CONSTRUCTION OR ORDERING OF EQUIPMENT.

M. SUBSTITUTIONS AND VARIATION FROM BASIS OF DESIGN:

1. THE BASIS OF DESIGN DESIGNATED PRODUCT ESTABLISHES THE QUALITIES AND CHARACTERISTICS FOR THE EVALUATION OF ANY COMPARABLE PRODUCTS BY OTHER LISTED ACCEPTABLE MANUFACTURERS IF INCLUDED IN THIS SPECIFICATION OR INCLUDED IN AN APPROVED SUBSTITUTION REQUEST AS JUDGED BY THE DESIGN PROFESSIONAL.
2. IF SUBSTITUTIONS AND/OR EQUIVALENT EQUIPMENT/PRODUCTS ARE BEING PROPOSED, IT IS THE RESPONSIBILITY OF PARTIES CONCERNED, INVOLVED IN, AND FURNISHING THE SUBSTITUTE AND/OR EQUIVALENT EQUIPMENT TO VERIFY AND COMPARE THE CHARACTERISTICS AND REQUIREMENTS OF THAT FURNISHED TO THAT SPECIFIED AND/OR SHOWN. IF GREATER CAPACITY AND/OR MORE MATERIALS AND/OR MORE LABOR IS REQUIRED FOR THE ROUGH-IN, CIRCUITRY OR CONNECTIONS THAN FOR THE ITEM SPECIFIED AND PROVIDED FOR, THEN PROVIDE COMPENSATION FOR ADDITIONAL CHARGES REQUIRED FOR THE PROPER ROUGH-IN, CIRCUITRY AND CONNECTIONS FOR THE EQUIPMENT BEING FURNISHED. NO ADDITIONAL CHARGES ABOVE THE BASE BID, INCLUDING RESULTING CHARGES FOR WORK PERFORMED UNDER OTHER DIVISIONS, WILL BE ALLOWED FOR SUCH REVISIONS. COORDINATE WITH THE REQUIREMENTS OF "SUBMITTALS". FOR ANY PRODUCT MARKED "OR APPROVED EQUIVALENT", A SUBSTITUTION REQUEST MUST BE SUBMITTED TO ENGINEER FOR APPROVAL PRIOR TO PURCHASE, DELIVERY OR INSTALLATION.

N. SHOP DRAWINGS:

1. PROVIDE COORDINATED SHOP DRAWINGS WHICH INCLUDE PHYSICAL CHARACTERISTICS OF ALL SYSTEMS, EQUIPMENT AND PIPING LAYOUT, PIPE LAYOUT, HANGER LAYOUT, SWAY BRACE LAYOUT, SEISMIC RESTRAINTS, SWAY BRACE CALCULATIONS, DRAINS, LOCATION OF DRAIN DISCHARGE, RISERS, VALVES, DETAILS, WATER TEST INFORMATION, PHYSICAL DEVICE LAYOUT PLANS, AND CONTROL WIRING DIAGRAMS. REFERENCE INDIVIDUAL DIVISION 21, FIRE SUPPRESSION SECTIONS FOR ADDITIONAL REQUIREMENTS FOR SHOP DRAWINGS OUTSIDE OF THESE REQUIREMENTS.
2. SHOP DRAWINGS AND HYDRAULICS CALCULATIONS, SWAY BRACE CALCULATIONS, TRAPEZE HANGER CALCULATIONS, AND THE LIKE, TO BE PREPARED UNDER THE DIRECT SUPERVISION AND CONTROL OF A PROFESSIONAL ENGINEER COMPETENT TO DO SUCH WORK AND LICENSED IN THE STATE OF CALIFORNIA. DRAWINGS AND CALCULATIONS TO BEAR THE SEAL AND WET SIGNATURE OF THE PROFESSIONAL ENGINEER.
3. PROVIDE SHOP DRAWINGS WHICH INDICATE INFORMATION REQUIRED BY NFPA 13. INCLUDE ROOM NAMES AND FIRE SPRINKLER OCCUPANCY HAZARD CLASSIFICATIONS.
4. PROVIDE SHOP DRAWINGS ILLUSTRATING INFORMATION FOR HYDRAULIC INFORMATION SIGN FOR EACH HYDRAULIC REMOTE AREA CALCULATED.
5. UTILIZING THE REFLECTED CEILING BACKGROUNDS, PROVIDE SHOP DRAWINGS ILLUSTRATING LOCATIONS OF FIRE SPRINKLERS AND PIPING.
6. UTILIZING THE STRUCTURAL BACKGROUNDS, PROVIDE SHOP DRAWINGS ILLUSTRATING LOCATIONS AND TYPES OF HANGERS AND SWAY BRACES.
7. PROVIDE SHOP DRAWINGS ILLUSTRATING EACH TYPE OF HANGER, INCLUDING FASTENERS TO STRUCTURE.
8. PROVIDE SHOP DRAWINGS ILLUSTRATING EACH TYPE OF BRANCHLINE RESTRAINT AND SWAY BRACE, INCLUDING LENGTH OF SWAY BRACE MEMBER, SWAY BRACE FITTINGS, MINIMUM AND MAXIMUM ANGLES FROM VERTICAL OF SWAY BRACE MEMBER, METHOD OF ATTACHMENT TO STRUCTURE, SIZE, LENGTH AND EMBEDMENT OF ATTACHMENT TO STRUCTURE AND SIZE AND TYPE OF STRUCTURAL MEMBER TO WHICH SWAY BRACE WILL BE ATTACHED. NUMBER EACH TYPE OF RESTRAINT AND SWAY BRACE. INDICATE ON DRAWINGS LOCATIONS OF EACH TYPE OF NUMBERED RESTRAINT AND SWAY BRACE.
9. PROVIDE DETAILS FOR ANY HANGER, ATTACHMENT, OR SWAY BRACE TO BE ATTACHED TO ANY I-JOIST, STRUCTURAL INSULATED PANELS (SIPS), CROSS LAMINATED TIMBER, AND SIMILAR ENGINEERED STRUCTURAL PRODUCTS ACCORDING TO THE SPECIFICATIONS OF THE ENGINEERED PRODUCT MANUFACTURER.
10. PROVIDE SHOP DRAWINGS ILLUSTRATING INFORMATION FOR SPRINKLER SYSTEM GENERAL INFORMATION SIGN.
11. SHOP DRAWINGS TO INCLUDE A CROSS-SECTIONAL VIEW THAT SHOWS THE SPRINKLER HEADS AND PIPING IN RELATION TO THE BUILDING'S ARCHITECTURAL AND STRUCTURAL INFORMATION. VIEW TO BE CHOSEN BASED ON A LOCATION THAT WILL DISPLAY THE MOST INFORMATION.
12. WHEN REQUIRED, PROVIDE COORDINATION DRAWINGS.
13. PROVIDE SHOP DRAWINGS INDICATING ACCESS PANEL LOCATIONS, SIZE AND ELEVATION FOR APPROVAL PRIOR TO INSTALLATION.
14. PROVIDE DETAILS OF HANGER, SWAY BRACING AND BRANCH LINE RESTRAINT ATTACHMENTS TO STRUCTURE AND TO PIPING. INCLUDE DETAILS ON THE SIZE AND LOAD CAPACITIES OF FASTENERS. PROVIDE VERIFICATION OF THE STRUCTURAL CAPACITY TO WITHSTAND SEISMIC LOAD.
15. PROVIDE SWAY BRACING CALCULATIONS ON DRAWINGS SHOWING HORIZONTAL SEISMIC DESIGN LOAD AND REQUIREMENTS, WITH INDICATION OF ZONE OF INFLUENCE FOR EACH BRACING LOCATION.
16. PROVIDE A SCHEDULE OF SWAY BRACING TYPE, SIZE, AND DESIGN CRITERIA, INCLUDING LENGTH, ANGLE FROM VERTICAL, AND LOAD CAPACITIES.
17. CLEARLY INDICATE THE ELEVATION OF THE HIGHEST SPRINKLER IN RELATION TO THE ELEVATION OF THE FLOW TEST PRESSURE GAUGE MONITOR HYDRANT.
18. PROVIDE A SCHEDULE OF FLEXIBLE SPRINKLER HOSE FITTING PER MANUFACTURER'S SCHEDULE OF EQUIVALENT FEET USED IN HYDRAULIC CALCULATIONS, SHOWING DEVICE LENGTH, MAXIMUM NUMBER OF 90-DEGREE BENDS AND EXPECTED RADIUS OF BENDS.
19. PROVIDE A SCHEDULE OF SIGNAGE TO BE INSTALLED AT EACH FLEXIBLE SPRINKLER HOSE FITTING.
20. ON THE DRAWINGS, PROVIDE A LIST OF NUMBER, MODEL, TEMPERATURE, SPRINKLER IDENTIFICATION NUMBER, MANUFACTURER'S CODE, ORIFICE SIZE, DEFLTR TYPE, THERMAL SENSITIVITY AND PRESSURE RATING, QUANTITY OF EACH TYPE TO BE CONTAINED IN THE SPARE SPRINKLER CABINET AND THE ISSUE DATE OR REVISION DATE OF THE LIST."
21. SPARE SPRINKLER HEAD CABINET SIZE INDICATING THE NUMBER OF SPARE SPRINKLER HEAD TO BE CONTAINED THEREIN.

O. SAMPLES: PROVIDE SAMPLES WHEN REQUESTED BY INDIVIDUAL SECTIONS.

P. RESUBMISSION REQUIREMENTS:

1. MAKE ANY CORRECTIONS OR CHANGE IN SUBMITTALS WHEN REQUIRED. PROVIDE SUBMITTALS AS SPECIFIED. THE ENGINEER WILL NOT BE REQUIRED TO EDIT AND/OR INTERPRET THE CONTRACTOR'S SUBMITTALS. INDICATE CHANGES FOR THE RESUBMITTAL IN A COVER LETTER WITH REFERENCE TO PAGE(S) CHANGED AND REFERENCE RESPONSE TO COMMENT. CLEARLY INDICATE CHANGES ON DRAWINGS AND CLOUD CHANGES IN THE SUBMITTALS.
2. RESUBMIT FOR REVIEW UNTIL REVIEW INDICATES NO EXCEPTIONS TAKEN OR MAKE "CORRECTIONS AS NOTED".

Q. OPERATION AND MAINTENANCE MANUALS/OWNER'S INSTRUCTIONS:

1. SUBMIT, AT ONE TIME, ELECTRONIC FILES (PDF FORMAT) OF MANUFACTURER'S OPERATION AND MAINTENANCE INSTRUCTION MANUALS AND PARTS LISTS FOR EQUIPMENT OR ITEM REQUIRING SERVICING. INCLUDE VALVE CHARTS. SUBMIT DATA WHEN WORK IS SUBSTANTIALLY COMPLETE AND IN SAME ORDER FORMAT AS SUBMITTALS. INCLUDE NAME AND LOCATION OF SOURCE PARTS AND SERVICE FOR EACH PIECE OF EQUIPMENT.
   a. INCLUDE COPIES OF CERTIFICATES OF CODE AUTHORITY ACCEPTANCE, CODE-REQUIRED ACCEPTANCE TESTS; TEST REPORTS AND CERTIFICATES.
   b. INCLUDE WARRANTY PER DIVISION 00, PROCUREMENT AND CONTRACTING REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS, SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS AND INDIVIDUAL SECTIONS.
   c. CATALOG DESCRIPTION OF EACH ITEM OF EQUIPMENT ACTUALLY INSTALLED ON JOB.
   d. INSTRUCTIONS FOR OPERATION AND MAINTENANCE OF FIRE SUPPRESSION SYSTEMS COMPOSED OF OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND MANUFACTURER'S LITERATURE AS FOLLOWS:
      1) TESTING AND MAINTENANCE SCHEDULE CHART: PROVIDE AN 8-1/2- BY 11-INCH TYPEWRITTEN LIST OF EACH ITEM OF INSTALLED EQUIPMENT REQUIRING TESTING INSPECTION , LUBRICATION OR SERVICE, DESCRIBING AND SCHEDULING PERFORMANCE OF MAINTENANCE.
      2) MANUFACTURER'S LITERATURE: PROVIDE COPIES OF MANUFACTURER'S INSTRUCTIONS FOR OPERATION AND MAINTENANCE OF FIRE SUPPRESSION EQUIPMENT, INCLUDING REPLACEMENT PARTS LIST WITH NAME AND ADDRESS OF NEAREST DISTRIBUTOR. MARK EACH COPY WITH EQUIPMENT IDENTIFICATION LABEL AS LISTED IN EQUIPMENT SCHEDULE, I.E. F-5 ETC.
   e. INCLUDE PRODUCT CERTIFICATES OF WARRANTIES AND GUARANTEES.
   f. INCLUDE RECORD DRAWINGS,
   g. INCLUDE COPY OF WATER SUPPLY FLOW TEST USED AS BASIS FOR HYDRAULIC CALCULATIONS.
   h. INCLUDE HYDRAULIC CALCULATIONS AND SWAY BRACE CALCULATIONS.
   i. INCLUDE CONTRACTOR'S MATERIAL AND TEST CERTIFICATES FOR ABOVEGROUND PIPING/UNDERGROUND PIPING.
   j. INCLUDE A COPY OF NFPA 25.
   k. INCLUDE A COPY OF VALVE CHARTS AND WHETHER NORMALLY OPEN OR NORMALLY CLOSED.
   l. INCLUDE A COPY OF DRAIN, AUXILIARY, AND LOW POINT DRAINS CHARTS.
   m. INCLUDE A COPY OF THE LIST TO BE INCLUDED IN THE SPARE SPRINKLER HEAD BOX.
   n. INCLUDE COPY OF APPROVED SUBMITTAL DATA ALONG WITH SUBMITTAL REVIEW LETTERS RECEIVED FROM ENGINEER. DATA TO CLEARLY INDICATE INSTALLED EQUIPMENT MODEL NUMBERS. DELETE OR CROSS OUT DATA PERTAINING TO OTHER EQUIPMENT NOT SPECIFIC TO THIS PROJECT.
2. INCLUDE COPY OF MANUFACTURER'S STANDARD OPERATIONS AND MAINTENANCE FOR EQUIPMENT. AT FRONT OF EACH TAB, PROVIDE ROUTINE MAINTENANCE DOCUMENTATION FOR SCHEDULED EQUIPMENT. INCLUDE MANUFACTURER'S RECOMMENDED MAINTENANCE SCHEDULE AND HIGHLIGHT MAINTENANCE REQUIRED TO MAINTAIN WARRANTY. FURNISH LIST OF ROUTINE MAINTENANCE PARTS, INCLUDING PART NUMBERS, SIZES, AND QUANTITIES RELEVANT TO EACH PIECE OF EQUIPMENT: I.E. BELTS, MOTORS, LUBRICANTS, AND FILTERS.
   p. INCLUDE COPY OF COMPLETE PARTS LIST FOR EQUIPMENT. INCLUDE AVAILABLE EXPLODED VIEWS OF ASSEMBLIES AND SUB-ASSEMBLIES.
   q. INCLUDE COPY OF STARTUP AND TEST REPORTS SPECIFIC TO EACH PIECE OF EQUIPMENT.
   r. ENGINEER WILL RETURN INCOMPLETE DOCUMENTATION WITHOUT REVIEW. ENGINEER WILL PROVIDE ONE SET OF REVIEW COMMENTS IN SUBMITTAL REVIEW FORMAT. CONTRACTOR MUST ARRANGE FOR ADDITIONAL REVIEWS; CONTRACTOR TO BEAR COSTS FOR ADDITIONAL REVIEWS AT ENGINEER'S HOURLY RATES.
2. THOROUGHLY INSTRUCT OWNER IN PROPER OPERATION OF EQUIPMENT AND SYSTEMS. WHERE NOTED IN INDIVIDUAL SECTIONS, TRAINING WILL INCLUDE CLASSROOM INSTRUCTION WITH APPLICABLE TRAINING AIDS AND SYSTEMS DEMONSTRATIONS. FIELD INSTRUCTION PER SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS, ARTICLE TITLED "DEMONSTRATION".
3. COPIES OF CERTIFICATES OF CODE AUTHORITY INSPECTIONS, ACCEPTANCE, CODE REQUIRED ACCEPTANCE TESTS, LETTER OF CONFORMANCE AND OTHER SPECIAL GUARANTEES, CERTIFICATES OF WARRANTIES, SPECIFIED ELSEWHERE OR INDICATED ON DRAWINGS.

R. RECORD DRAWINGS:

1. MAINTAIN AT SITE AT LEAST ONE SET OF DRAWINGS FOR RECORDING "AS-CONSTRUCTED" CONDITIONS. INDICATE ON DRAWINGS CHANGES TO ORIGINAL DOCUMENTS BY REFERENCING REVISION DOCUMENT, AND INCLUDE BURIED ELEMENTS, LOCATION OF CLEANOUTS, AND LOCATION OF CONCEALED MECHANICAL ITEM. INCLUDE ITEMS CHANGED BY FIELD ORDERS, SUPPLEMENTAL INSTRUCTIONS, AND CONSTRUCTED CONDITIONS.
2. RECORD DRAWINGS ARE TO INCLUDE EQUIPMENT AND FIXTURE/CONNECTION SCHEDULES THAT ACCURATELY REFLECT "AS CONSTRUCTED OR INSTALLED" FOR PROJECT.
3. AT COMPLETION OF PROJECT, INPUT CHANGES TO ORIGINAL PROJECT ON CAD DRAWINGS AND MAKE ONE SET OF BLACK-LINE DRAWINGS CREATED FROM CAD FILES IN VERSION/RELEASE EQUAL TO CONTRACT DRAWINGS. SUBMIT CAD FILES AND DRAWINGS UPON SUBSTANTIAL COMPLETION.
4. INVERT ELEVATIONS AND DIMENSIONED LOCATIONS FOR WATER SERVICES AND DRAINAGE PIPING BELOW GRADE EXTENDING TO 5-FEET OUTSIDE BUILDING LINE.
5. RECORD DRAWINGS TO INCLUDE SITE INFORMATION OR REFERENCE SITE INFORMATION FOR COMPLETE UNDERSTANDING OF THE FIRE PROTECTION SYSTEM BETWEEN THE BUILDING AND THE POINT OF CONNECTION TO THE WATER SUPPLY AND LOCATION OF FLOW TEST PRESSURE HYDRANTS.
6. SEE DIVISION 21, FIRE SUPPRESSION INDIVIDUAL SECTIONS FOR ADDITIONAL ITEMS TO INCLUDE IN RECORD DRAWINGS.

S. CALCULATIONS: SUBMIT HYDRAULIC AND THE LIKE CALCULATIONS.

1. HYDRAULIC CALCULATIONS:
   a. INCLUDE FRICTION LOSSES BETWEEN THE HYDRAULICALLY MOST REMOTE DESIGN AREA AND THE HYDRANT FLOW TEST PRESSURE HYDRANT.
   b. HYDRAULIC CALCULATIONS TO BE PERFORMED ON A NATIONALLY RECOGNIZED FIRE SPRINKLER HYDRAULIC CALCULATION COMPUTER PROGRAM, WITH COVER SHEETS IN THE FORMAT REQUIRED BY THE LATEST EDITION OF NFPA 13. HYDRAULIC CALCULATIONS PERFORMED "BY HAND" OR NOT ON A NATIONALLY RECOGNIZED FIRE SPRINKLER HYDRAULIC CALCULATIONS COMPUTER PROGRAM WILL BE RETURNED WITHOUT REVIEW BY ENGINEER.
   c. PROVIDE ONE OR MORE HYDRAULIC CALCULATIONS FOR EACH HYDRAULICALLY MOST REMOTE AREA.
   d. WHERE IT IS NOT OBVIOUS WHICH AREA IS MOST HYDRAULICALLY REMOTE, PERFORM AND SUBMIT FOR REVIEW ADDITIONAL HYDRAULIC CALCULATIONS PROVING THE HYDRAULICALLY MOST REMOTE AREA.
   e. FOR GRID SYSTEMS, EITHER PROVIDE "PEAKED" HYDRAULIC CALCULATIONS, OR PROVIDE TWO ADDITIONAL SETS OF HYDRAULIC CALCULATIONS FOR EACH HYDRAULICALLY MOST REMOTE AREA.
   f. INCLUDE PRESSURE LOSSES BETWEEN THE HIGHEST SPRINKLER AND THE ELEVATION OF THE PRESSURE GAUGE MONITOR HYDRANT OF THE FLOW TEST.
   g. INCLUDE FRICTION LOSS FOR FLEXIBLE BRANCH LINE CONNECTORS PER MANUFACTURER'S SCHEDULE OF EQUIVALENT FEET FOR DEVICE LENGTH, MAXIMUM NUMBER OF BENDS AND EXPECTED RADIUS OF BENDS.
   h. WHEN FLEXIBLE SPRINKLER HOSE FITTINGS ARE ADDED TO AN EXISTING SYSTEM, PROVIDE HYDRAULIC CALCULATIONS VERIFYING THE DESIGN FLOW RATE WILL BE ACHIEVED."
   i. FOR FUTURE TENANT IMPROVEMENT SPACES: INCLUDE IN HYDRAULIC CALCULATIONS FRICTION LOSS ALLOWANCES FOR FUTURE INSTALLATION OF FLEXIBLE SPRINKLER HEAD CONNECTORS SO THAT FLEXIBLE CONNECTORS MAY BE INSTALLED IN THE FUTURE WITHOUT REVISIONS TO THE OVERHEAD SYSTEM.

**1.05 QUALITY ASSURANCE**

A. REGULATORY REQUIREMENTS: WORK AND MATERIALS INSTALLED TO CONFORM WITH ALL LOCAL, STATE AND FEDERAL CODES, AND OTHER APPLICABLE LAWS AND REGULATIONS. WHERE CODE REQUIREMENTS ARE AT VARIANCE WITH CONTRACT DOCUMENTS, MEET CODE REQUIREMENTS AS A MINIMUM REQUIREMENT AND INCLUDE COSTS NECESSARY TO MEET THESE IN CONTRACT. MACHINERY AND EQUIPMENT ARE

7. CUTTING, PATCHING AND REPAIRING FOR WORK SPECIFIED IN THIS DIVISION INCLUDING PLASTERING, MASONRY WORK, CONCRETE WORK, CARPENTRY WORK, AND PAINTING INCLUDED UNDER THIS SECTION WILL BE PERFORMED BY SKILLED CRAFTSMEN OF EACH RESPECTIVE TRADE IN CONFORMANCE WITH APPROPRIATE DIVISION OF WORK.
8. ADDITIONAL OPENINGS REQUIRED IN BUILDING CONSTRUCTION TO BE MADE BY DRILLING OR CUTTING. USE OF JACK HAMMER IS SPECIFICALLY PROHIBITED. PATCH OPENINGS IN AND THROUGH CONCRETE AND MASONRY WITH GROUT.
9. RESTORE NEW OR EXISTING WORK THAT IS CUT AND/OR DAMAGED TO ORIGINAL CONDITION. PATCH AND REPAIR SPECIFICALLY WHERE EXISTING ITEMS HAVE BEEN REMOVED. THIS INCLUDES REPAIRING AND PAINTING WALLS, CEILINGS, ETC. WHERE EXISTING CONDUIT AND DEVICES ARE REMOVED AS PART OF THIS PROJECT. WHERE ALTERATIONS DISTURB LAWNS, LANDSCAPING, PAVING, AND WALKS, SURFACES TO BE REPAIRED, REFINISHED AND LEFT IN CONDITION MATCHING EXISTING PRIOR TO COMMENCEMENT OF WORK.
10. REPAIR MUTILATION OF BUILDING AROUND PIPES, EQUIPMENT, HANGERS, AND BRACES.

**3.06 EQUIPMENT SELECTION AND SERVICEABILITY**

A. REPLACE OR REPOSITION EQUIPMENT WHICH IS TOO LARGE OR LOCATED INCORRECTLY TO PERMIT SERVICING AT NO ADDITIONAL COST TO OWNER.

**3.07 DELIVERY, STORAGE AND HANDLING**

A. CONFIRM REQUIREMENTS IN DIVISION 00, PROCUREMENT AND CONTRACTING REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS. IN ABSENCE OF SPECIFIC REQUIREMENTS, COMPLY WITH INDIVIDUAL DIVISION 21, FIRE SUPPRESSION SECTIONS AND THE FOLLOWING:
1. HANDLE MATERIALS DELIVERED TO PROJECT SITE WITH CARE TO AVOID DAMAGE AND DETERIORATION. STORE MATERIALS IN ORIGINAL CONTAINERS WHICH IDENTIFY MANUFACTURER, NAME, BRAND AND MODEL NUMBERS ON SITE INSIDE BUILDING OR PROTECTED FROM WEATHER, SUN, DIRT AND CONSTRUCTION DUST. INSULATION AND LINING THAT BECOMES WET FROM IMPROPER STORAGE AND HANDLING TO BE REPLACED BEFORE INSTALLATION. PRODUCTS AND/OR MATERIALS THAT BECOME DAMAGED DUE TO WATER, DIRT AND/OR DUST AS A RESULT OF IMPROPER STORAGE TO BE REPLACED BEFORE INSTALLATION.
2. PROTECT EQUIPMENT AND PIPE TO AVOID DAMAGE. CLOSE PIPE OPENINGS WITH CAPS OR PLUGS. KEEP MOTORS AND BEARINGS IN WATERTIGHT AND DUSTPROOF COVERS DURING ENTIRE COURSE OF INSTALLATION.
3. PROTECT BRIGHT FINISHED SHAFTS, BEARING HOUSINGS AND SIMILAR ITEM UNTIL IN SERVICE.

**3.08 DEMONSTRATION**

A. CONFIRM DEMONSTRATION REQUIREMENTS IN DIVISION 00, PROCUREMENT AND CONTRACTING REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS, SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS AND INDIVIDUAL DIVISION 21, FIRE SUPPRESSION SECTIONS.

B. UPON COMPLETION OF WORK AND ADJUSTMENT OF EQUIPMENT AND TEST SYSTEMS, DEMONSTRATE TO OWNER'S AUTHORIZED REPRESENTATIVE, ARCHITECT AND ENGINEER THAT EQUIPMENT FURNISHED AND INSTALLED OR CONNECTED UNDER PROVISIONS OF THESE SPECIFICATIONS FUNCTIONS IN MANNER REQUIRED. PROVIDE FIELD INSTRUCTION TO OWNER'S MAINTENANCE STAFF AS SPECIFIED IN DIVISION 01, GENERAL REQUIREMENTS, SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS AND INDIVIDUAL DIVISION 21, FIRE SUPPRESSION SECTIONS.

C. MANUFACTURER'S FIELD SERVICES: FURNISH SERVICES OF A QUALIFIED PERSON AT TIME APPROVED BY OWNER TO INSTRUCT MAINTENANCE PERSONNEL, CORRECT DEFECTS OR DEFICIENCIES, AND DEMONSTRATE TO SATISFACTION OF OWNER THAT ENTIRE SYSTEM IS OPERATING IN SATISFACTORY MANNER AND COMPLIES WITH REQUIREMENTS OF OTHER TRADES THAT MAY BE REQUIRED TO COMPLETE WORK. COMPLETE INSTRUCTION AND DEMONSTRATION PRIOR TO FINAL JOB SITE OBSERVATIONS.

D. PRIOR TO ACCEPTANCE OF WORK AND DURING TIME DESIGNATED BY ARCHITECT, PROVIDE NECESSARY QUALIFIED PERSONNEL TO OPERATE SYSTEM FOR A PERIOD OF TWO HOURS.

E. INSTRUCT THE OWNER IN THE OPERATION OF THE SPRINKLER SYSTEM, INCLUDING MAIN VALVE POSITION (OPEN OR CLOSED) RECOGNITION, SYSTEM DRAINAGE, SYSTEM TESTING, DRY PIPE VALVE RESET AND THE RELATION TO THE FIRE ALARM SYSTEM.

F. UPON COMPLETION OF WORK AND ADJUSTMENT OF EQUIPMENT, TEST SYSTEMS TO DEMONSTRATE TO OWNER'S AUTHORIZED REPRESENTATIVE AND ARCHITECT THAT EQUIPMENT IS FURNISHED AND INSTALLED OR CONNECTED UNDER PROVISIONS OF THESE SPECIFICATIONS.

**3.09 CLEANING**

A. CONFIRM CLEANING REQUIREMENTS IN DIVISION 00, PROCUREMENT AND CONTRACTING REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS, SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS AND INDIVIDUAL DIVISION 21, FIRE SUPPRESSION SECTIONS.

B. UPON COMPLETION OF INSTALLATION, EXCEPT FOR SPRINKLERS, THOROUGHLY CLEAN EXPOSED PORTIONS OF EQUIPMENT, REMOVING TEMPORARY LABELS AND TRACES OF FOREIGN SUBSTANCES. THROUGHOUT WORK, REMOVE CONSTRUCTION DEBRIS AND SURPLUS MATERIALS ACCUMULATED DURING WORK.

C. SPRINKLERS MAY NOT BE CLEANED EXCEPT FOR VACUUMING IN A MANNER IN WHICH NO PART OF THE SPRINKLER IS TOUCHED BY THE VACUUMING EQUIPMENT. REPLACE SPRINKLERS WHICH BEAR TRACES OF FOREIGN SUBSTANCES WITH SPRINKLERS OF SAME MODEL, TEMPERATURE, K-FACTOR, ORIFICE, FINISH, STYLE, ORIENTATION, AND THE LIKE.

**3.10 INSTALLATION**

A. CONFIRM INSTALLATION REQUIREMENTS IN DIVISION 00, PROCUREMENT AND CONTRACTING REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS, SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS AND INDIVIDUAL DIVISION 21, FIRE SUPPRESSION SECTIONS.

B. INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS, PLUMB AND LEVEL AND FIRMLY ANCHORED TO VIBRATION ISOLATORS. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES.

C. START-UP EQUIPMENT, IN ACCORDANCE WITH MANUFACTURER'S START-UP INSTRUCTIONS, IN THE PRESENCE OF MANUFACTURER'S REPRESENTATIVE. TEST CONTROLS AND DEMONSTRATE COMPLIANCE WITH REQUIREMENTS. REPLACE DAMAGED OR MALFUNCTIONING CONTROLS AND EQUIPMENT. PROVIDE PUMP IMPELLERS TO OBTAIN BASIS OF DESIGN DESIGN CAPACITIES.

D. PROVIDE MISCELLANEOUS SUPPORTS/METALS REQUIRED FOR INSTALLATION OF EQUIPMENT AND PIPING.

**3.11 PAINTING**

A. CONFIRM REQUIREMENTS IN DIVISION 01, GENERAL REQUIREMENTS AND DIVISION 09, FINISHES. IN ABSENCE OF SPECIFIC REQUIREMENTS, COMPLY WITH INDIVIDUAL DIVISION 21, FIRE SUPPRESSION SECTIONS AND THE FOLLOWING;
1. FERROUS METAL: AFTER COMPLETION OF FIRE PROTECTION WORK, THOROUGHLY CLEAN AND PAINT EXPOSED SUPPORTS CONSTRUCTED OF FERROUS METAL SURFACES, I.E., HANGERS, HANGER RODS, EQUIPMENT STANDS, WITH ONE COAT OF BLACK ASPHALT VARNISH FOR EXTERIOR OR BLACK ENAMEL FOR INTERIOR, SUITABLE FOR HOT SURFACES.
2. AFTER ACCEPTANCE BY AUTHORITY HAVING JURISDICTION (AHJ), IN A MECHANICAL ROOM, ON ROOF OR OTHER EXPOSED AREAS, MACHINERY AND EQUIPMENT NOT PAINTED WITH ENAMEL TO RECEIVE TWO COATS OF PRIMER AND ONE COAT OF RUSTPROOF ENAMEL, COLORS AS SELECTED BY ARCHITECT.
3. STRUCTURAL STEEL: REPAIR DAMAGE TO STRUCTURAL STEEL FINISHES OR FINISHES OF OTHER MATERIALS DAMAGED BY CUTTING, WELDING OR PATCHING TO MATCH ORIGINAL.
4. PIPING: CLEAN, PRIMER COAT AND PAINT EXPOSED PIPING ON ROOF OR AT OTHER EXTERIOR LOCATIONS WITH TWO COATS PAINT SUITABLE FOR METALLIC SURFACES AND EXTERIOR EXPOSURES. COLOR SELECTED BY ARCHITECT.
5. COVERS: COVERS SUCH AS VAULT COVERS AND THE LIKE WILL BE FURNISHED WITH FINISHES WHICH RESIST CORROSION AND RUST.

**3.12 ACCEPTANCE**

A. CONFIRM REQUIREMENTS IN DIVISION 00, PROCUREMENT AND CONTRACTING REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS. IN ABSENCE OF SPECIFIC REQUIREMENTS, COMPLY WITH INDIVIDUAL SECTIONS IN DIVISION 21, FIRE SUPPRESSION AND THE FOLLOWING:
1. SYSTEM CANNOT BE CONSIDERED FOR ACCEPTANCE UNTIL WORK IS COMPLETED AND DEMONSTRATED TO ARCHITECT THAT INSTALLATION IS IN STRICT COMPLIANCE WITH SPECIFICATIONS, DRAWINGS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS, PARTICULARLY IN REFERENCE TO FOLLOWING:
   a. TESTING REPORTS INCLUDING CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR UNDERGROUND PIPING, CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR ABOVEGROUND PIPING, CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR PRIVATE FIRE SERVICE MAINS, FIRE PUMP ACCEPTANCE TEST DATA REPORT, AND THE LIKE.
   b. CLEANING
   c. OPERATION AND MAINTENANCE MANUALS
   d. TRAINING OF OPERATING PERSONNEL
   e. RECORD DRAWINGS
   f. WARRANTY AND GUARANTY CERTIFICATES
   g. START-UP/TEST DOCUMENT AND COMMISSIONING REPORTS
   h. LETTER OF CONFORMANCE

**3.13 FIELD QUALITY CONTROL**

A. CONFIRM FIELD QUALITY CONTROL REQUIREMENTS IN DIVISION 00, PROCUREMENT AND CONTRACTING REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS, SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS AND INDIVIDUAL DIVISION 21, FIRE SUPPRESSION SECTIONS.

B. UPON COMPLETION OF INSTALLATION OF EQUIPMENT, SPRINKLERS, HOSE VALVES AND PIPING AND AFTER UNITS ARE WATER PRESSURIZED, TEST SYSTEM TO DEMONSTRATE CAPABILITY AND COMPLIANCE WITH REQUIREMENTS. WHEN POSSIBLE, CORRECT MALFUNCTIONING ITEM AT SITE, THEN RETEST TO DEMONSTRATE COMPLIANCE; OTHERWISE REMOVE AND REPLACE WITH NEW ITEM AND PROCEED WITH RETESTING.

C. INSPECT EACH INSTALLED ITEM FOR DAMAGE TO FINISH. IF FEASIBLE, RESTORE AND MATCH FINISH TO ORIGINAL, EXCEPT FIRE SPRINKLERS, AT SITE; OTHERWISE, REMOVE ITEM AND REPLACE WITH NEW ITEM. FEASIBILITY AND MATCH TO BE JUDGED BY ARCHITECT. REMOVE CRACKED OR DENTED ITEM AND REPLACE WITH NEW ITEM.

D. FIRE SPRINKLERS MAY NOT BE REUSED, OR CLEANED, EXCEPT FOR DUSTING. REPLACE DAMAGED, FIELD PAINTED, OVERSPRAYED, OVERCOATED OR FIELD COATED SPRINKLERS WITH NEW SPRINKLERS OF SAME MANUFACTURER, MODEL, FINISH, K-FACTOR AND PERFORMANCE CHARACTERISTICS. WHERE IDENTICAL REPLACEMENT SPRINKLERS ARE NOT AVAILABLE, PROVIDE SPRINKLERS OF SIMILAR FINISH, STYLE, K-FACTOR AND PERFORMANCE CHARACTERISTICS.

**3.14 LETTER OF CONFORMANCE**

A. PROVIDE LETTER OF CONFORMANCE AND COPIES OF MANUFACTURERS' WARRANTIES AND EXTENDED WARRANTIES WITH A STATEMENT THAT FIRE SUPPRESSION ITEMS WERE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, UL LISTINGS AND FM GLOBAL APPROVALS. INCLUDE LETTER OF CONFORMANCE, COPIES OF MANUFACTURERS' WARRANTIES AND EXTENDED WARRANTIES IN OPERATION AND MAINTENANCE MANUALS.

**3.15 ELECTRICAL INTERLOCKS**

A. WHERE EQUIPMENT MOTORS ARE TO BE ELECTRICALLY INTERLOCKED WITH OTHER EQUIPMENT FOR SIMULTANEOUS OPERATION, UTILIZE FIRE PROTECTION EQUIPMENT WIRING DIAGRAMS TO COORDINATE WITH ELECTRICAL SYSTEMS SO THAT PROPER WIRING OF EQUIPMENT INVOLVED IS AFFECTED.

**3.16 CONNECTIONS TO EXISTING**

A. PRIOR TO CONNECTION OF PIPING TO EXISTING PIPING OR UTILITIES, FIELD VERIFY EXISTING CONDITIONS AND EXACT SIZES AND LOCATIONS OF EXISTING PIPING. PROVIDE ADDITIONAL OFFSETS, TRANSITIONS, JOINTS, CUT-INS, AND REPLACE PORTIONS OF EXISTING AS REQUIRED TO FACILITATE CONNECTIONS OF NEW.

**END OF SECTION**

## SECTION 21 0500 - COMMON WORK RESULTS FOR FIRE SUPPRESSION

**PART 1 - GENERAL**

**1.01 SUMMARY**

A. WORK INCLUDED:
1. BURIED DUCTILE IRON PIPE AND FITTINGS
2. BURIED POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS
3. JOINT RESTRAINTS
4. ABOVEGROUND BLACK STEEL PIPE AND FITTINGS
5. WALL AND FLOOR PENETRATIONS AND SLEEVES
6. HANGERS AND SUPPORTS
7. STRUTS AND STRUT CLAMPS
8. SWAY BRACES AND RESTRAINTS
9. ANCHORS AND ATTACHMENTS
10. PIPE STANDS
11. GAUGES
12. VALVES
13. PIPE, VALVE, AND FIRE PROTECTION EQUIPMENT IDENTIFICATION
14. SIGNS
15. DRAINS

**1.02 RELATED SECTIONS**

A. CONTENTS OF DIVISION 21, FIRE SUPPRESSION AND DIVISION 01, GENERAL REQUIREMENTS APPLY TO THIS SECTION.

B. IN ADDITION, REFERENCE THE FOLLOWING:
1. DIVISION 22, PLUMBING
2. DIVISION 23, HEATING, VENTILATING AND AIR CONDITIONING
3. DIVISION 26, ELECTRICAL
4. DIVISION 28, ELECTRONIC SAFETY AND SECURITY
5. DIVISION 31, EARTHWORK
6. SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS
7. SECTION 21 13 00, FIRE SUPPRESSION SPRINKLER SYSTEMS

**1.03 REFERENCES AND STANDARDS**

A. REFERENCES AND STANDARDS AS REQUIRED BY SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS.

B. MEET REQUIREMENTS OF ASCE 7, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, BY AMERICAN SOCIETY OF CIVIL ENGINEERS, LATEST ADOPTED EDITION.

**1.04 SUBMITTALS**

A. SUBMITTALS AS REQUIRED BY SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS.

**1.05 QUALITY ASSURANCE**

A. QUALITY ASSURANCE AS REQUIRED BY SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS.

B. IN ADDITION, MEET THE FOLLOWING:
1. MATERIAL AND EQUIPMENT: LISTED FOR ITS INTENDED FIRE PROTECTION USE IN CURRENT UL FIRE PROTECTION EQUIPMENT DIRECTORY, OR UL ONLINE CERTIFICATIONS DIRECTORY FOR FIRE PROTECTION, FM GLOBAL APPROVAL GUIDE, AND INTERNATIONAL CODE COUNCIL EVALUATION SERVICE REPORTS. ALL MATERIAL AND EQUIPMENT TO BE NEW AND FROM A CURRENT MANUFACTURER.
2. PROVIDE PER AHJ REQUIREMENTS.
3. REFERENCES TO PRODUCT SPECIFICATIONS FOR MATERIALS ARE LISTED ACCORDING TO ACCEPTED ANSI, ASTM, ASME, AWWA AND OTHER BASE STANDARDS. MATERIALS TO MEET LATEST APPROVED VERSIONS OF THESE STANDARDS.
4. FIRE SUPPRESSION SCREW-THREAD CONNECTIONS: COMPLY WITH LOCAL FIRE DEPARTMENT/FIRE MARSHAL REGULATIONS FOR SIZES, THREADING AND ARRANGEMENT OF CONNECTIONS FOR FIRE DEPARTMENT EQUIPMENT TO FIRE DEPARTMENT CONNECTIONS.
5. MANUFACTURERS: UNLESS AN ITEM IS MARKED "NO SUBSTITUTIONS", SUBMIT SUBSTITUTION REQUEST FOR MATERIALS OF OTHER THAN NAMED MANUFACTURERS.
6. NOISE AND VIBRATION:
   a. INSTALL VIBRATION ISOLATORS AND MEASURES REQUIRED TO PREVENT NOISE AND VIBRATION FROM BEING TRANSMITTED TO OCCUPIED AREAS. SELECT EQUIPMENT TO OPERATE WITHIN NOISE COEFFICIENT (NC) DESIGN LEVEL FOR PARTICULAR TYPE OF INSTALLATION IN RELATION TO ITS LOCATION.
   b. AFTER INSTALLATION, MAKE PROPER ADJUSTMENTS TO REDUCE NOISE AND VIBRATION TO ACCEPTABLE LEVELS AS DEFINED BY ARCHITECT.
   c. IN ACOUSTICALLY SENSITIVE AREAS, DESIGN SYSTEM IN A MANNER THAT MINIMIZES THE NUMBER OF WALL PENETRATIONS.

**1.06 WARRANTY**

A. WARRANTY OF MATERIALS AND WORKMANSHIP AS REQUIRED BY SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS.

**1.07 FLOW TEST**

A. IF FLOW TEST INFORMATION PROVIDED BELOW HAS BEEN CONDUCTED LESS THAN 12 MONTHS PRIOR TO WORKING PLAN SUBMITTAL, UTILIZE FOR DESIGN OF NFPA 13 FIRE SPRINKLER AND NFPA 14 STANDPIPE SYSTEMS.

B. IF FLOW TEST INFORMATION PROVIDED BELOW HAS BEEN CONDUCTED GREATER THAN 12 MONTHS PRIOR TO WORKING PLAN SUBMITTAL, THE INFORMATION PROVIDED IS ADVISORY ONLY AND NOT TO BE USED FOR DESIGN. PROVIDE MATERIALS AND LABOR FOR A NEW WATER SUPPLY TEST ON THE CLOSEST NEARBY FIRE HYDRANTS PER NFPA 13 AND NFPA 291. UTILIZE NEW FLOW TEST RESULTS FOR DESIGN OF NFPA 13 FIRE SPRINKLER AND NFPA 14 STANDPIPE SYSTEMS.

C. FLOW TEST:
1. FLOW: 1000 GPM AT A RESIDUAL PRESSURE OF 84 PSI.
2. STATIC PRESSURE: 93 PSI.
3. LOCATION: CEDAR ST. AND 2ND ST..
4. DATE: 04/26/2022.
5. INFORMATION PROVIDED BY: EBMUD (BERKELEY).

**1.08 SYSTEM IMPAIRMENT**

A. WHEN RETURNING A WATER-BASED FIRE PROTECTION SYSTEM TO SERVICE AFTER IMPAIRMENT OR CONTROL VALVE CLOSURE, VERIFY THE SYSTEM IS IN WORKING ORDER BY PERFORMING A MAIN DRAIN TEST PER NFPA 25.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

A. BURIED DUCTILE IRON PIPE AND FITTINGS:
1. AMERICAN CAST IRON PIPE CO.
2. ATLANTIC STATES CAST IRON PIPE CO.
3. CLOW WATER SYSTEMS CO.
4. EBAA IRON, INC.
5. GRIFFIN PIPE PRODUCTS CO.
6. MCWANE CAST IRON PIPE CO.
7. PACIFIC STATES CAST IRON PIPE CO.
8. UNITED STATES PIPE & FOUNDRY CO.
9. STAR PIPE PRODUCTS
10. TYLER UNION
11. OR APPROVED EQUIVALENT.

B. BURIED PVC PIPE AND FITTINGS:
1. CERTAINTEED CORP.
2. JM EAGLE
3. NATIONAL PIPE AND PLASTICS INC.
4. OR APPROVED EQUIVALENT.

C. JOINT RESTRAINTS:
1. STAR PIPE PRODUCTS
2. TYLER PIPE CO.
3. EBAA IRON, INC.
4. UNI-FLANGE CORP.
5. UNION FOUNDRY CO.
6. UNITED STATES PIPE AND FOUNDRY CO.
7. OR APPROVED EQUIVALENT.

D. ABOVEGROUND BLACK STEEL PIPE AND FITTINGS:
1. PIPE:
   a. BULL MOOSE TUBE
   b. WHEATLAND TUBE CO.
   c. YOUNGSTOWN TUBE CO.
   d. TEX-TUBE CO.
   e. STATE PIPE AND SUPPLY, INC.
   f. OR APPROVED EQUIVALENT
2. FITTINGS, MECHANICAL AND GROOVED COUPLINGS:
   a. VICTAULIC
   b. GRUVLOK
   c. SHURJOINT PIPING PRODUCTS INC.
   d. SMITH-COOPER INTERNATIONAL
   e. TYCO FIRE & BUILDING PRODUCTS
   f. VIKING CORP.
   g. ALLIED RUBBER AND GASKET CO. INC., DBA ARGCO
   h. ANVIL INTERNATIONAL
   i. DIXON VALVE & COUPLING
   j. OR APPROVED EQUIVALENT.
3. FITTINGS, THREADED:
   a. WARD MFG.
   b. ANVIL INTERNATIONAL
   c. SMITH-COOPER INTERNATIONAL
   d. AEGIS TECHNOLOGIES
   e. OR APPROVED EQUIVALENT.
4. FITTINGS, RUBBER GASKETED:
   a. VICTAULIC
   b. ANVIL INTERNATIONAL
   c. ANVILSTAR
   d. EBAA IRON, INC.
   e. SHURJOINT PIPING PRODUCTS, INC.
   f. SMITH-COOPER INTERNATIONAL
   g. TYCO FIRE & BUILDING PRODUCTS
   h. VIKING CORP.
   i. WARD MFG.
   j. ALLIED RUBBER AND GASKET CO. INC., DBA ARGCO
   k. DIXON VALVE & COUPLING
   l. OR APPROVED EQUIVALENT.
5. FITTINGS, WELDED:
   a. ANVIL INTERNATIONAL
   b. SHURJOINT PIPING PRODUCTS INC.
   c. SMITH-COOPER INTERNATIONAL
   d. STATE PIPE & SUPPLY, INC.
   e. OR APPROVED EQUIVALENT.
6. FITTINGS, FLANGED:
   a. VICTAULIC
   b. UNITED BRAND FITTINGS
   c. U.S. PIPE
   d. ANVIL S.P.F.
   e. IOWA FITTINGS CO.
   f. TYCO FIRE PRODUCTS
   g. OR APPROVED EQUIVALENT.

E. WALL AND FLOOR PENETRATIONS AND SLEEVES:
1. ALLIED RUBBER AND GASKET CO., INC., DBA ARGCO
2. FIRE PROTECTION PRODUCTS INC. (FPPI)
3. OR APPROVED EQUIVALENT.

F. HANGERS AND SUPPORTS:
1. COOPER B-LINE TOLCO
2. ANVIL INTERNATIONAL
3. ITW BUILDEX SAMMYS
4. ERICO INTERNATIONAL
5. PHD MFG. INC.
6. OR APPROVED EQUIVALENT.

G. STRUTS AND STRUT CLAMPS:
1. COOPER B-LINE TOLCO
2. OR APPROVED EQUIVALENT.

H. SWAY BRACES AND RESTRAINTS:
1. COOPER B-LINE TOLCO
2. ANVIL INTERNATIONAL
3. ERICO INTERNATIONAL
4. PHD MFG. INC.
5. OR APPROVED EQUIVALENT.

I. ANCHORS AND ATTACHMENTS:
1. COOPER B-LINE TOLCO
2. ANVIL INTERNATIONAL
3. ELCO CONSTRUCTION PRODUCTS
4. ERICO INTERNATIONAL
5. ITW BUILDEX SAMMYS
6. OR APPROVED EQUIVALENT.

J. PIPE STANDS:
1. COOPER B-LINE TOLCO
2. ANVIL INTERNATIONAL
3. OR APPROVED EQUIVALENT.

K. GAUGES:
1. ASHCROFT
2. US GAUGE
3. BRECCO
4. RELIABLE AUTOMATIC SPRINKLER CO.
5. FIRE PROTECTION PRODUCTS, INC. (FPPI)
6. ALLIED RUBBER AND GASKET CO. INC., DBA ARGCO
7. WIKA INSTRUMENT CORP.
8. OR APPROVED EQUIVALENT.

L. VALVES:
1. OS&Y GATE:
   a. VICTAULIC
   b. NIBCO
   c. MUELLER
   d. OR APPROVED EQUIVALENT.
2. NRS GATE:
   a. NIBCO
   b. MUELLER
   c. VICTAULIC
   d. OR APPROVED EQUIVALENT.
3. SWING CHECK:
   a. VICTAULIC
   b. NIBCO
   c. MUELLER
   d. VIKING
   e. TYCO
   f. ANVILSTAR
   g. RELIABLE
   h. OR APPROVED EQUIVALENT.
4. WAFER CHECK:
   a. NIBCO
   b. MUELLER
   c. VIKING
   d. TYCO
   e. OR APPROVED EQUIVALENT.
5. BUTTERFLY VALVES:
   a. VICTAULIC
   b. NIBCO
   c. TYCO
   d. USE LUG BODY NEXT TO PUMPS; NIBCO.
   e. RELIABLE
   f. OR APPROVED EQUIVALENT.
6. PRESSURE RELIEF:
   a. WATTS
   b. UNITED BRASS WORKS
   c. AGF
   d. OR APPROVED EQUIVALENT.
7. AUTOMATIC BALL DRIP DRAIN VALVE:
   a. TYCO
   b. RELIABLE AUTOMATIC SPRINKLER CO.
   c. OR APPROVED EQUIVALENT.
8. THREE-WAY GAUGE VALVE:
   a. FIRE PROTECTION PRODUCTS INC. (FPPI)
   b. AGF MFG. INC.
   c. NIBCO
   d. OR APPROVED EQUIVALENT.
9. AUTOMATIC AIR RELEASE VALVE:
   a. POTTER ELECTRIC SIGNAL CO.
   b. OR APPROVED EQUIVALENT.
10. BALL VALVE:
   a. VICTAULIC
   b. APOLLO VALVES
   c. FIRE PROTECTION PRODUCTS INC. (FPPI)
   d. NIBCO
   e. OR APPROVED EQUIVALENT.

M. PIPE, VALVE, AND FIRE PROTECTION EQUIPMENT IDENTIFICATION:
1. FIRE PROTECTION PRODUCTS, INC. (FPPI)
2. ALLIED RUBBER AND GASKET CO., INC., DBA ARGCO
3. OR APPROVED EQUIVALENT.

N. SIGNS:
1. TYCO FIRE PRODUCTS
2. RELIABLE AUTOMATIC SPRINKLER
3. VIKING CORP.
4. ALLIED RUBBER AND GASKET CO., INC., DBA ARGCO
5. OR APPROVED EQUIVALENT.

O. DRAINS:
1. REFERENCE ABOVEGROUND BLACK STEEL PIPE AND FITTINGS.
2. AGF
3. VICTAULIC
4. OR APPROVED EQUIVALENT.

**2.02 BURIED DUCTILE IRON PIPE AND FITTINGS**

A. PIPE:
1. THICKNESS: CLASS 52 DUCTILE IRON, AWWA C151.
2. PRESSURE: 150 PSI OR 10.34 BAR.
3. CEMENT MORTAR LINED PER AWWA C104, FIELD ENCASED WITH 8 MIL POLYETHYLENE BAG PER AWWA C105. COAT ALL BOLTS, RESTRAINING RODS, AND THE LIKE WITH BITUMASTIC PRIOR TO ENCASEMENT IN THE POLYETHYLENE BAG.

B. FITTINGS: AWWA C110, 350 PSI OR 24.13 BAR. CEMENT MORTAR LINED PER AWWA C104, FIELD ENCASED WITH 8 MIL POLYETHYLENE BAG PER AWWA C105. COAT ALL BOLTS, RESTRAINING RODS, AND THE LIKE WITH BITUMASTIC PRIOR TO ENCASEMENT IN THE POLYETHYLENE BAG.

C. FITTINGS RESTRAINED WITH THRUST BLOCKS OR RESTRAINING RODS PER NFPA 24.

D. UNDERGROUND VALVES: FACTORY COATED WITH POWDERED EPOXY OR EQUIVALENT CORROSION RESISTANT COATING. BOLTS COATED WITH BITUMASTIC IN THE FIELD. ENCASE THE ENTIRE VALVE IN 8-MIL POLYETHYLENE BAG IN ACCORDANCE WITH AWWA C-105.

E. FLEXIBLE UNDERGROUND EXPANSION JOINTS:
1. AWWA C153, AWWA C116, AWWA C105.
2. EXPANSION JOINT DESIGNED AND CAST AS AN INTEGRAL PART OF A BALL AND SOCKET TYPE FLEXIBLE JOINT.
3. INTERNAL AND EXTERNAL EPOXY LINED.
4. SEALING GASKET: EPDM.
5. POLYETHYLENE SLEEVE.

**2.03 BURIED PVC PIPE AND FITTINGS**

A. PIPE: SDR-18, AWWA C900.

B. FITTINGS:
1. AWWA C907, CSA B137.2.
2. PVC FITTINGS RESTRAINED WITH THRUST BLOCKS PER NFPA 24.
3. DUCTILE IRON FITTINGS AND RESTRAINING RODS: AWWA C110, 350 PSI OR 24.13 BAR. CEMENT MORTAR LINED PER AWWA C104, FIELD ENCASED WITH 8 MIL POLYETHYLENE BAG PER AWWA C105. COAT ALL BOLTS, RESTRAINING RODS, AND THE LIKE WITH BITUMASTIC PRIOR TO ENCASEMENT IN THE POLYETHYLENE BAG.
4. UNDERGROUND VALVES: FACTORY COATED WITH POWDERED EPOXY OR EQUIVALENT CORROSION RESISTANT COATING. BOLTS COATED WITH BITUMASTIC IN THE FIELD. ENCASE THE ENTIRE VALVE IN 8-MIL POLYETHYLENE BAG IN ACCORDANCE WITH AWWA C-105.

C. INSTALL TRACER WIRE ON ALL NON-METALLIC UNDERGROUND WATER LINES. TYPE R.H.W., #10 A.W.G. STRANDED.

**2.04 JOINT RESTRAINTS**

A. MECHANICAL JOINT WEDGE ACTION FOR DUCTILE IRON PIPE.

B. GLAND: DUCTILE IRON.

C. WEDGES: DUCTILE IRON.

D. FULL RESTRAINT PRESSURE RATING OF PIPE WITH MINIMUM SAFETY FACTOR OF 2:1.

**2.05 ABOVEGROUND BLACK STEEL PIPE AND FITTINGS**

A. WET PIPE SYSTEMS:
1. PIPE SIZE 2-INCH DIAMETER AND SMALLER:
   a. ASTM A53, ASTM A135, OR ASTM A795; MINIMUM OF SCHEDULE 40 WHEN INSTALLED WITH THREADED FITTINGS, MINIMUM SCHEDULE 10 WHEN INSTALLED WITH GROOVED FITTINGS.
   b. 1-INCH DIAMETER PIPES TO BE SCHEDULE 40.
2. PIPE SIZE 2-1/2-INCH DIAMETER AND LARGER: ASTM A53, ASTM A135, OR ASTM A795; MINIMUM OF SCHEDULE 10.
3. EXPOSED PIPE 8-FEET OR LESS ABOVE FINISHED FLOOR: A MINIMUM OF SCHEDULE 40.

Project Title:

# 2ND ST PATHWAYS STAIR CENTER
SITE IMPROVEMENTS AND SHELTER UNITS
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REGISTERED PROFESSIONAL ENGINEER
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Exp 12/31/23
MECHANICAL
STATE OF CALIFORNIA
Signed: 4/21/23

| No. | Date | Issue |
|---|---|---|
| 1 | 01/17/23 | COMMENT RESPONSE 1 |
| 2 | 03/08/23 | PLAN CHECK 1 |
| | 04/28/23 | BID SET |

Issue Note:

PERMIT SET

09/21/22

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Review By: EB
Plot Date:

Sheet Title:
**SPECIFICATIONS - FIRE PROTECTION**

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B. JOINTS:
1. THREADED, FLANGED OR BEVEL WELDED.
2. PIPING INSTALLED IN PLENUMS OR SHAFTS TO HAVE WELDED JOINTS.

C. FITTINGS:
1. THREADED:
a. MALLEABLE IRON: CLASS 150 AND CLASS 300, ANSI B16.3.
b. CAST IRON: CLASS 125 AND 250, ANSI B16.3.
2. FLANGED:
a. CAST IRON; CLASS 125 AND 250, ASME B16.1.
b. RAISED GROUND FACE, BOLT HOLES SPOT FACED.
3. WELDED:
a. CARBON STEEL: LONG RADIUS, STANDARD WEIGHT OR EXTRA STRONG.
b. FACTORY WROUGHT STEEL BUTTWELD FITTINGS: ASME B16.9.
c. BUTTWELDING ENDS FOR PIPE, VALVES, FLANGES AND FITTINGS: ASME B16.25.
d. SPECIFICATION FOR PIPING FITTINGS OF WROUGHT CARBON STEEL AND ALLOY STEEL FOR MODERATE AND ELEVATED TEMPERATURES: ASTM A234.
e. STEEL PIPE FLANGES AND FLANGED FITTINGS: ASME B16.5.
f. FORGED STEEL FITTINGS, SOCKET WELDED AND THREADED: ASME B16.11.
4. MECHANICAL FITTINGS AND GROOVED COUPLINGS:
a. COUPLINGS: UL 213, AWWA C606, ASTM A536 DUCTILE IRON OR ASTM A47 MALLEABLE IRON, WITH ENAMEL FINISH AND GROOVES OR SHOULDERS DESIGNED TO ACCEPT GROOVED COUPLINGS. SYNTHETIC-RUBBER GASKET WITH CENTRAL-CAVITY, PRESSURE-RESPONSIVE DESIGN AND ASTM A183 CARBON-STEEL BOLTS AND NUTS.
b. FM GLOBAL APPROVED.

D. ANTI-MICROBIAL COATING: FACTORY-APPLIED COATING TO INHIBIT CORROSION FROM MICROBIOLOGICAL ORGANISMS.

**2.06 WALL AND FLOOR PENETRATIONS AND SLEEVES**

A. BELOW GRADE AND HIGH WATER TABLE AREAS: WATERPROOF ELASTOMERIC COMPOUND.

**2.07 HANGERS AND SUPPORTS**

A. GENERAL: SELECT SIZE OF HANGERS AND SUPPORTS TO EXACTLY FIT PIPE SIZE FOR BARE PIPING.

B. HANGERS: FERROUS.

C. HANGER RODS: ZINC ELECTROPLATED CARBON STEEL.

D. FINISHES: USE HANGERS AND SUPPORTS WITH GALVANIZED METALLIC COATINGS FOR PIPING AND EQUIPMENT THAT WILL NOT HAVE FIELD-APPLIED FINISH.

E. MATERIALS:
1. USE CARBON STEEL PIPE HANGERS AND SUPPORTS, METAL TRAPEZE PIPE HANGERS AND ATTACHMENTS FOR GENERAL SERVICE APPLICATIONS.
2. USE STAINLESS STEEL HANGERS, RODS AND ATTACHMENTS FOR CORROSIVE ENVIRONMENT APPLICATIONS. EXAMPLES OF CORROSIVE ENVIRONMENT APPLICATIONS INCLUDE, BUT ARE NOT LIMITED TO: SWIMMING POOLS AND SPAS, POOL AND SPA EQUIPMENT ROOMS AND ADJACENT AREAS, CHEMICAL ROOMS, KIDNEY DIALYSIS AREAS, MARINE AND BEACH ENVIRONMENTS, COMMERCIAL LAUNDRIES AND THE LIKE.

**2.08 STRUTS AND STRUT CLAMPS**

A. ELECTRO-GALVANIZED STEEL.

B. DESIGNED FOR SUPPORTING PIPE RUNS FROM STRUT SUPPORTS.

C. STAINLESS STEEL FOR CORROSIVE ENVIRONMENT APPLICATIONS. EXAMPLES OF CORROSIVE ENVIRONMENT APPLICATIONS INCLUDE, BUT ARE NOT LIMITED TO: SWIMMING POOLS AND SPAS, POOL AND SPA EQUIPMENT ROOMS AND ADJACENT AREAS, CHEMICAL ROOMS, KIDNEY DIALYSIS AREAS, MARINE AND BEACH ENVIRONMENTS, COMMERCIAL LAUNDRIES AND THE LIKE.

**2.09 SWAY BRACES AND RESTRAINTS**

A. SWAY BRACING: FROM A SINGLE MANUFACTURER AND COMPATIBLE WITH SWAY BRACE CALCULATION PROGRAM.

B. STAINLESS STEEL FOR CORROSIVE ENVIRONMENT APPLICATIONS. EXAMPLES OF CORROSIVE ENVIRONMENT APPLICATIONS INCLUDE, BUT ARE NOT LIMITED TO: SWIMMING POOLS AND SPAS, POOL AND SPA EQUIPMENT ROOMS AND ADJACENT AREAS, CHEMICAL ROOMS, KIDNEY DIALYSIS AREAS, MARINE AND BEACH ENVIRONMENTS, COMMERCIAL LAUNDRIES, AND THE LIKE.

**2.10 ANCHORS AND ATTACHMENTS**

A. GENERAL: ANCHOR SUPPORTS TO MASONRY, CONCRETE AND BLOCK WALLS PER ANCHORING SYSTEM MANUFACTURER'S RECOMMENDATIONS, OR AS MODIFIED BY PROJECT STRUCTURAL ENGINEER.

B. MATERIALS:
1. FERROUS.
2. STAINLESS STEEL FOR CORROSIVE ENVIRONMENT APPLICATIONS. EXAMPLES OF CORROSIVE ENVIRONMENT APPLICATIONS INCLUDE, BUT ARE NOT LIMITED TO: SWIMMING POOLS AND SPAS, POOL AND SPA EQUIPMENT ROOMS AND ADJACENT AREAS, CHEMICAL ROOMS, KIDNEY DIALYSIS AREAS, MARINE AND BEACH ENVIRONMENTS, COMMERCIAL LAUNDRIES, AND THE LIKE.

C. CAST IN PLACE ANCHORS FOR HANGERS: VERIFY LISTING IS FOR HANGERS, BRACES, OR BOTH.

D. ATTACHMENTS IN CONCRETE:
1. SUITABLE FOR HANGING AND BRACING FIRE PROTECTION SYSTEMS IN CONCRETE WHICH IS SUBJECT TO CRACKING IN A SEISMIC EVENT.
2. SEISMIC DESIGN AREAS C, D, E AND F:
a. COMPATIBLE WITH INTERNATIONAL CODE COUNCIL EVALUATION SERVICE ACCEPTANCE CRITERIA AC-193 AND AC308 FOR EXPANSION, SCREW AND ADHESIVE ANCHORS. MEET REQUIREMENTS OF ACI 355.2, QUALIFICATION OF POST-INSTALLED MECHANICAL ANCHORS IN CONCRETE AND COMMENTARY.
b. ALL MODELS OF HILTI HDI AND ITW RED HEAD MULTI-SET II ANCHORS ARE NOT APPROVED FOR ATTACHING FIRE PROTECTION SYSTEMS IN SEISMIC DESIGN AREAS C, D, E AND F. NO EXCEPTIONS.

E. ITW BUILDEX SAMMYS WITH FM APPROVAL ONLY ARE NOT ALLOWED IN CERTAIN SEISMIC ZONES. VERIFY WITH FM THAT FM APPROVAL IS EFFECTIVE IN PROJECT'S SEISMIC ZONE.

**2.11 PIPE STANDS**

A. ADJUSTABLE PIPE SADDLE SUPPORT WITH YOKE:
1. DESIGNED TO SUPPORT HORIZONTAL PIPE FROM FLOOR STANCHION.
2. U-BOLT AND HEX NUTS TO HOLD PIPE SECURELY TO SADDLE OR PIPE CLAMP TYPE.
3. ANSI/MSS SP-69; SP-58, TYPE 37.
4. STEEL PIPE WITH STEEL SADDLE.

B. BASE STAND:
1. STEEL PIPE WELDED TO STEEL BASE PLATE.
2. MEET REQUIREMENTS OF 12X ANCHOR DIAMETER HOLE SPACING FOR SEISMIC APPLICATIONS.

**2.12 GAUGES**

A. PRESSURE GAUGES: 3.5-INCH, DIAL TYPE, BRONZE BOURDON TUBE OR SPRING TYPE, STAINLESS STEEL CASE. 0 TO 300 PSI.

**2.13 VALVES**

A. OS&Y GATE:
1. 2-1/2-INCHES AND LARGER: IRON BODY.
2. 2-INCHES AND SMALLER: BRONZE BODY.

B. NRS GATE:
1. IRON BODY. NON-RISING STEM WITH INDICATOR POST.
2. UNDERGROUND BUTTERFLY VALVES: TELESCOPIC BARREL TYPE.

C. SWING CHECK: IRON BODY, RUBBER AND BRONZE FACED CHECKS.

D. WAFER CHECK: IRON BODY, RUBBER SEAT, SPRING ACTUATED.

E. BUTTERFLY VALVES: DUCTILE IRON BODY WITH FACTORY-INSTALLED TAMPER SWITCHES. USE LUG BODY NEXT TO PUMPS.

F. PRESSURE RELIEF: BRONZE BODY, STAINLESS STEEL SPRING.

G. AUTOMATIC BALL DRIP DRAIN VALVE: BRONZE, SPRING-TYPE.

H. THREE-WAY GAUGE VALVE: BRASS; RATED TO 300 PSI.

I. AUTOMATIC AIR-RELEASE VALVE FOR WET SYSTEMS:
1. RATED TO 175 PSI.
2. AUTOMATIC FLOAT-TYPE WITH SHUTOFF MOUNTED IN A WATER RETENTION PAN.
3. SINGLE SET 24VAC@2A FOR ELECTRONIC SUPERVISION.
4. BALL VALVE SWITCH WITH COVER TAMPER.

J. BALL VALVES: BRASS BODY, BRASS STEM; FORGED BRASS BALL DISC.

**2.14 PIPE, VALVE, AND FIRE PROTECTION EQUIPMENT IDENTIFICATION**

A. ENGRAVED PLASTIC LAMINATE OR CORROSION RESISTANT METAL SIGN OR PLASTIC EQUIPMENT MARKER.

B. CORROSION-RESISTANT CHAIN OR PERMANENT ADHESIVE.

**2.15 SIGNS**

A. ENGRAVED PLASTIC LAMINATE OR CORROSION RESISTANT METAL SIGN OR PLASTIC EQUIPMENT MARKER.

B. CORROSION-RESISTANT CHAIN OR PERMANENT ADHESIVE.

**2.16 DRAINS**

A. REFERENCE ABOVEGROUND BLACK STEEL PIPE AND FITTINGS.

**PART 3 - EXECUTION**

**3.01 GENERAL INSTALLATION REQUIREMENTS**

A. INSTALL IN CONFORMANCE WITH UL LISTING, FM APPROVAL OR ICC-ES REQUIREMENTS AND RESTRICTIONS.

**3.02 BURIED DUCTILE IRON PIPE AND FITTINGS**

A. PIPE SLEEVES:
1. LAY OUT WORK IN ADVANCE OF POURING CONCRETE AND FURNISH AND SET SLEEVES NECESSARY TO COMPLETE WORK.
2. FLOOR SLEEVES: PROVIDE SLEEVES ON PIPES PASSING THROUGH CONCRETE OR MASONRY CONSTRUCTION. EXTEND SLEEVE 1-INCH ABOVE FINISHED FLOOR. CAULK PIPES PASSING THROUGH FLOOR WITH NONSHRINKING FIRESTOPPING, SMOKESTOPPING AND WATER STOPPING GROUT OR APPROVED EQUIVALENT CAULKING COMPOUND.
3. WALL SLEEVES: PROVIDE SLEEVES ON PIPES PASSING THROUGH CONCRETE OR MASONRY CONSTRUCTION. PROVIDE SLEEVE FLUSH WITH FINISHED FACE OF WALL. CAULK PIPES PASSING THROUGH WALLS WITH NONSHRINKING CAULKING COMPOUND. CAULK/SEAL PIPING PASSING THROUGH FIRE-RATED BUILDING ASSEMBLIES WITH UL LISTED OR FM APPROVED FIRE-RATED FIRESTOPPING COMPOUND. PROVIDE FIRE-RATED ASSEMBLIES PER LOCAL AHJ REQUIREMENTS.
4. COORDINATE WITH TRADES FOR LOCATIONS OF PIPE SLEEVES IN REINFORCED CONCRETE AND STEEL BEAMS. PENETRATIONS MUST BE INDICATED ON STRUCTURAL SHOP DRAWINGS. SEE DRAWINGS AND SPECIFICATIONS FOR SPECIFIC SLEEVE LOCATION LIMITATIONS.

B. BURIED PIPE:
1. HYDRAULICALLY CALCULATED PIPE TO BE OF SUFFICIENT SIZE AS TO DELIVER THE REQUIRED FLOW WHILE NOT EXCEEDING A FLOW VELOCITY OF 15-FEET PER SECOND OR AS REQUIRED IN ACCORDANCE WITH THE WATER DEPARTMENT REQUIREMENTS, WHICHEVER IS LESS.
2. EXCAVATION AND BACKFILL:
a. GENERAL: PERFORM NECESSARY EXCAVATION AND BACKFILL REQUIRED FOR INSTALLATION OF MECHANICAL WORK. REPAIR PIPING OR OTHER WORK DAMAGED BY CONTRACTOR'S OPERATIONS.
b. WATER: KEEP EXCAVATIONS FREE OF STANDING WATER. RE-EXCAVATE AND FILL BACK EXCAVATIONS DAMAGED OR SOFTENED BY WATER OR FROST TO ORIGINAL LEVEL WITH SAND, CRUSHED ROCK OR OTHER APPROVED MATERIAL AT NO EXPENSE TO OWNER.
c. TESTS: DURING PROGRESS OF WORK FOR COMPACTED FILL, OWNER RESERVES RIGHT TO REQUEST COMPACTION TESTS MADE UNDER DIRECTION OF A TESTING LABORATORY.
d. TRENCH EXCAVATION: EXCAVATE TRENCHES TO NECESSARY DEPTH AND WIDTH, REMOVING ROCKS, UNSTABLE SOIL (I.E. MUCK, PEAT AND THE LIKE), ROOTS AND STUMPS. EXCAVATION MATERIAL IS CLASSIFIED AS "BASE FILL" AND "NATIVE." BASE FILL EXCAVATION MATERIAL CONSISTING OF PLACED CRUSHED ROCK MAY BE USED AS BACKFILL ABOVE "PIPE ZONE." REMOVE AND DISPOSE OFF SITE NATIVE EXCAVATION MATERIAL AT NO EXPENSE TO OWNER. ADEQUATE WIDTH OF TRENCH FOR PROPER INSTALLATION OF PIPING OR CONDUIT.
e. SUPPORT FOUNDATIONS:
1) FOUNDATIONS: EXCAVATE TRENCHES LOCATED IN UNSTABLE GROUND AREAS BELOW ELEVATION REQUIRED FOR INSTALLATION OF PIPING TO A DEPTH WHICH IS DETERMINED BY ARCHITECT AS APPROPRIATE FOR CONDITIONS ENCOUNTERED. PLACE AND COMPACT APPROVED FOUNDATION MATERIAL IN EXCAVATION UP TO "BEDDING ZONE." DEWATERING, PLACEMENT, COMPACTION AND DISPOSAL OF EXCAVATED MATERIALS TO CONFORM TO REQUIREMENTS CONTAINED IN OTHER SECTIONS OF SPECIFICATIONS OR DRAWINGS.
2) OVER-EXCAVATIONS: WHERE TRENCH EXCAVATION EXCEEDS REQUIRED DEPTHS, PROVIDE, PLACE AND COMPACT SUITABLE BEDDING MATERIAL TO PROPER GRADE OR ELEVATION AT NO ADDITIONAL COST TO OWNER.
3) FOUNDATION MATERIAL: WHERE NATIVE MATERIAL HAS BEEN REMOVED, PLACE AND COMPACT NECESSARY FOUNDATION MATERIAL TO FORM A BASE FOR REPLACEMENT OF REQUIRED THICKNESS OF BEDDING MATERIAL.
4) BEDDING MATERIAL: FULL BED SITE PIPING ON SAND, PEA GRAVEL OR 3/4-INCH MINUS CRUSHED ROCK. PLACE A MINIMUM 4-INCH DEEP LAYER OF SAND OR CRUSHED ROCK ON LEVELED TRENCH BOTTOM FOR THIS PURPOSE. REMOVE BEDDING TO NECESSARY DEPTH FOR PIPING BELLS AND COUPLINGS TO MAINTAIN CONTACT OF PIPE ON BEDDING FOR ITS ENTIRE LENGTH. PROVIDE ADDITIONAL BEDDING IN EXCESSIVELY WET, UNSTABLE, OR SOLID ROCK TRENCH BOTTOM CONDITIONS AS REQUIRED TO PROVIDE A FIRM FOUNDATION.
f. BACKFILLING:
1) FOLLOWING INSTALLATION AND SUCCESSFUL COMPLETION OF REQUIRED TESTS, BACKFILL PIPING IN LIFTS.
(a) IN "PIPE ZONE," PLACE BACKFILL MATERIAL AND COMPACT IN LIFTS NOT TO EXCEED 6-INCHES IN DEPTH TO A HEIGHT OF 12-INCHES ABOVE TOP OF PIPE. PLACE BACKFILL MATERIAL TO OBTAIN CONTACT WITH ENTIRE PERIPHERY OF PIPE, WITHOUT DISTURBING OR DISPLACING PIPE.
(b) PLACE AND COMPACT BACKFILL ABOVE "PIPE ZONE" IN LAYERS NOT TO EXCEED 12-INCHES IN DEPTH.
2) BACKFILL MATERIAL:
(a) BACKFILL MATERIAL IN "PIPE ZONE": 3/4-INCH MINUS CRUSHED ROCK, SAND OR PEA GRAVEL.
(b) CRUSHED ROCK, FILL SAND OR OTHER BACKFILL MATERIAL APPROVED ELSEWHERE IN SPECIFICATIONS MAY BE USED ABOVE "PIPE ZONE."
g. COMPACTION OF TRENCH BACKFILL:
1) WHERE COMPACTION OF TRENCH BACKFILL MATERIAL IS REQUIRED, USE ONE OF FOLLOWING METHODS OR COMBINATION THEREOF:
(a) MECHANICAL TAMPER,
(b) VIBRATORY COMPACTER, OR
(c) OTHER APPROVED METHODS APPROPRIATE TO CONDITIONS ENCOUNTERED.
2) ARCHITECT TO HAVE RIGHT TO CHANGE METHODS AND LIMITS TO BETTER ACCOMMODATE FIELD CONDITIONS. COMPACTION SUFFICIENT TO ATTAIN 95 PERCENT OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT UNLESS NOTED OTHERWISE ON DRAWINGS OR ELSEWHERE IN SPECIFICATIONS. WATER "PUDDLING" OR "WASHING" IS PROHIBITED.

C. KEEP PIPE OPENINGS CLOSED BY MEANS OF PLUGS OR CAPS TO PREVENT ENTRANCE OF FOREIGN MATTER. PROTECT PIPING AND FITTINGS AGAINST DIRTY WATER, CHEMICALS, AND MECHANICAL DAMAGE BOTH BEFORE AND AFTER INSTALLATION. RESTORE TO ORIGINAL CONDITION OR REPLACE DAMAGED PIPE AND FITTINGS PRIOR TO FINAL ACCEPTANCE OF WORK.

**3.03 BURIED PVC PIPE AND FITTINGS**

A. SECURELY FASTEN TRACER WIRE TO TOP OF WATER LINE AND PLACE ALONG THE OUTSIDE OF TRANSITION TO DUCTILE IRON PIPE WITH ONE FOOT OF SLACK PLACED ADJACENT TO DUCTILE IRON PIPE.

B. BURIED PIPE:
1. HYDRAULICALLY CALCULATED PIPE TO BE OF SUFFICIENT SIZE AS TO DELIVER THE REQUIRED FLOW WHILE NOT EXCEEDING A FLOW VELOCITY OF 15-FEET PER SECOND OR AS REQUIRED IN ACCORDANCE WITH THE WATER DEPARTMENT REQUIREMENTS, WHICHEVER IS LESS.
2. EXCAVATION AND BACKFILL:
a. GENERAL: PERFORM NECESSARY EXCAVATION AND BACKFILL REQUIRED FOR INSTALLATION OF MECHANICAL WORK. REPAIR PIPING OR OTHER WORK DAMAGED BY CONTRACTOR'S OPERATIONS.
b. WATER: KEEP EXCAVATIONS FREE OF STANDING WATER. RE-EXCAVATE AND FILL BACK EXCAVATIONS DAMAGED OR SOFTENED BY WATER OR FROST TO ORIGINAL LEVEL WITH SAND, CRUSHED ROCK OR OTHER APPROVED MATERIAL AT NO EXPENSE TO OWNER.
c. TESTS: DURING PROGRESS OF WORK FOR COMPACTED FILL, OWNER RESERVES RIGHT TO REQUEST COMPACTION TESTS MADE UNDER DIRECTION OF A TESTING LABORATORY.
d. TRENCH EXCAVATION: EXCAVATE TRENCHES TO NECESSARY DEPTH AND WIDTH, REMOVING ROCKS, UNSTABLE SOIL (I.E. MUCK, PEAT AND THE LIKE), ROOTS AND STUMPS. EXCAVATION MATERIAL IS CLASSIFIED AS "BASE FILL" AND "NATIVE." BASE FILL EXCAVATION MATERIAL CONSISTING OF PLACED CRUSHED ROCK MAY BE USED AS BACKFILL ABOVE "PIPE ZONE." REMOVE AND DISPOSE OFF SITE NATIVE EXCAVATION MATERIAL AT NO EXPENSE TO OWNER. ADEQUATE WIDTH OF TRENCH FOR PROPER INSTALLATION OF PIPING OR CONDUIT.
e. SUPPORT FOUNDATIONS:
1) FOUNDATIONS: EXCAVATE TRENCHES LOCATED IN UNSTABLE GROUND AREAS BELOW ELEVATION REQUIRED FOR INSTALLATION OF PIPING TO A DEPTH WHICH IS DETERMINED BY ARCHITECT AS APPROPRIATE FOR CONDITIONS ENCOUNTERED. PLACE AND COMPACT APPROVED FOUNDATION MATERIAL IN EXCAVATION UP TO "BEDDING ZONE." DEWATERING, PLACEMENT, COMPACTION AND DISPOSAL OF EXCAVATED MATERIALS TO CONFORM TO REQUIREMENTS CONTAINED IN OTHER SECTIONS OF SPECIFICATIONS OR DRAWINGS.
2) OVER-EXCAVATIONS: WHERE TRENCH EXCAVATION EXCEEDS REQUIRED DEPTHS, PROVIDE, PLACE AND COMPACT SUITABLE BEDDING MATERIAL TO PROPER GRADE OR ELEVATION AT NO ADDITIONAL COST TO OWNER.
3) FOUNDATION MATERIAL: WHERE NATIVE MATERIAL HAS BEEN REMOVED, PLACE AND COMPACT NECESSARY FOUNDATION MATERIAL TO FORM A BASE FOR REPLACEMENT OF REQUIRED THICKNESS OF BEDDING MATERIAL.
4) BEDDING MATERIAL: FULL BED SITE PIPING ON SAND, PEA GRAVEL OR 3/4-INCH MINUS CRUSHED ROCK. PLACE A MINIMUM 4-INCH DEEP LAYER OF SAND OR CRUSHED ROCK ON LEVELED TRENCH BOTTOM FOR THIS PURPOSE. REMOVE BEDDING TO NECESSARY DEPTH FOR PIPING BELLS AND COUPLINGS TO MAINTAIN CONTACT OF PIPE ON BEDDING FOR ITS ENTIRE LENGTH. PROVIDE ADDITIONAL BEDDING IN EXCESSIVELY WET, UNSTABLE, OR SOLID ROCK TRENCH BOTTOM CONDITIONS AS REQUIRED TO PROVIDE A FIRM FOUNDATION.
f. BACKFILLING:
1) FOLLOWING INSTALLATION AND SUCCESSFUL COMPLETION OF REQUIRED TESTS, BACKFILL PIPING IN LIFTS.
(a) IN "PIPE ZONE," PLACE BACKFILL MATERIAL AND COMPACT IN LIFTS NOT TO EXCEED 6-INCHES IN DEPTH TO A HEIGHT OF 12-INCHES ABOVE TOP OF PIPE. PLACE BACKFILL MATERIAL TO OBTAIN CONTACT WITH ENTIRE PERIPHERY OF PIPE, WITHOUT DISTURBING OR DISPLACING PIPE.
(b) PLACE AND COMPACT BACKFILL ABOVE "PIPE ZONE" IN LAYERS NOT TO EXCEED 12-INCHES IN DEPTH.
2) BACKFILL MATERIAL:
(a) BACKFILL MATERIAL IN "PIPE ZONE": 3/4-INCH MINUS CRUSHED ROCK, SAND OR PEA GRAVEL.
(b) CRUSHED ROCK, FILL SAND OR OTHER BACKFILL MATERIAL APPROVED ELSEWHERE IN SPECIFICATIONS MAY BE USED ABOVE "PIPE ZONE."
g. COMPACTION OF TRENCH BACKFILL:
1) WHERE COMPACTION OF TRENCH BACKFILL MATERIAL IS REQUIRED, USE ONE OF FOLLOWING METHODS OR COMBINATION THEREOF:
(a) MECHANICAL TAMPER,
(b) VIBRATORY COMPACTER, OR
(c) OTHER APPROVED METHODS APPROPRIATE TO CONDITIONS ENCOUNTERED.
2) ARCHITECT TO HAVE RIGHT TO CHANGE METHODS AND LIMITS TO BETTER ACCOMMODATE FIELD CONDITIONS. COMPACTION SUFFICIENT TO ATTAIN 95 PERCENT OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT UNLESS NOTED OTHERWISE ON DRAWINGS OR ELSEWHERE IN SPECIFICATIONS. WATER "PUDDLING" OR "WASHING" IS PROHIBITED.

A. KEEP PIPE OPENINGS CLOSED BY MEANS OF PLUGS OR CAPS TO PREVENT ENTRANCE OF FOREIGN MATTER. PROTECT PIPING AND FITTINGS AGAINST DIRTY WATER, CHEMICALS, AND MECHANICAL DAMAGE BOTH BEFORE AND AFTER INSTALLATION. RESTORE TO ORIGINAL CONDITION OR REPLACE DAMAGED PIPE AND FITTINGS PRIOR TO FINAL ACCEPTANCE OF WORK.

**3.04 JOINT RESTRAINTS**

A. INSTALL PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

B. REFERENCE 3.01, GENERAL INSTALLATION REQUIREMENTS.

**3.05 ABOVEGROUND BLACK STEEL PIPE AND FITTINGS**

A. PIPING ROUTING:
1. ORIENT HORIZONTAL ROUTES PARALLEL WITH WALLS AND BEAM LINES.
2. INSTALL PIPING AS SHOWN OR DESCRIBED BY DIAGRAMS, DETAILS AND NOTATIONS ON DRAWINGS OR, IF NOT INDICATED, INSTALL PIPING TO PROVIDE THE SHORTEST ROUTE WHICH DOES NOT OBSTRUCT USABLE SPACE OR BLOCK ACCESS FOR SERVICING THE BUILDING AND ITS EQUIPMENT.
3. INSTALL PIPING IN CONCEALED SPACES ABOVE FINISHED CEILINGS. PRIOR TO DESIGN AND INSTALLATION. OBTAIN PRE-APPROVAL BY ARCHITECT FOR EXPOSED PIPING.
4. IN OPEN-TO-STRUCTURE AREAS WHICH ARE OPEN TO PUBLIC VIEW, ROUTE EXPOSED PIPING TO MINIMIZE VISUAL IMPACT. OBTAIN ARCHITECT'S AND ENGINEER'S APPROVAL OF EXPOSED PIPING INSTALLATION.
5. COORDINATE INSTALLATION WITH OTHER TRADES. ROUTE PIPING AS REQUIRED TO AVOID BUILDING STRUCTURE, EQUIPMENT, PLUMBING PIPING, HVAC PIPING, DUCTWORK, LIGHTING FIXTURES, ELECTRICAL CONDUITS AND BUS DUCTS AND SIMILAR WORK. FINAL LOCATION OF LIGHTING WILL HAVE PRIORITY OVER FINAL SPRINKLER LOCATIONS. PROVIDE DRAINS TO TRAPPED SECTIONS OF SYSTEM WHICH RESULT FROM SUCH ROUTING. OTHER TRADES TAKE PRECEDENCE FOR INSTALLATION SPACE.
6. SUPPORT PIPING ADJACENT TO WALLS, OVERHEAD CONSTRUCTION, COLUMNS AND OTHER STRUCTURAL AND PERMANENT ENCLOSURE ELEMENTS OF THE BUILDING. LIMIT CLEARANCE TO 2-INCHES WHEREVER FURRING IS INDICATED FOR CONCEALMENT OF PIPING. ALLOW FOR INSULATION THICKNESS. LOCATE INSULATED PIPING TO PROVIDE MINIMUM 1-INCH CLEARANCE OUTSIDE INSULATION.
7. WHEREVER POSSIBLE IN FINISHED AND OCCUPIED SPACES, CONCEAL PIPING FROM VIEW BY LOCATING WITHIN COLUMN OR BEAM ENCLOSURES, HOLLOW WALL CONSTRUCTION, OR ABOVE SUSPENDED CEILINGS. DO NOT ENCASE HORIZONTAL ROUTES IN SOLID PARTITIONS, EXCEPT WHERE APPROVED.
8. GENERAL ELECTRICAL EQUIPMENT CLEARANCES: DO NOT ROUTE PIPING THROUGH ELECTRICAL ROOMS, TRANSFORMER VAULTS, ELEVATOR EQUIPMENT ROOMS AND OTHER ELECTRICAL OR ELECTRONIC EQUIPMENT SPACES AND ENCLOSURES. DO NOT ROUTE PIPING ABOVE ELECTRIC POWER OR LIGHTING PANEL, SWITCHGEAR, LOW VOLTAGE PANEL, OR SIMILAR ELECTRIC DEVICE.
9. ROOMS PROTECTED BY ALTERNATIVE SYSTEMS: ROUTE WATER FILLED AND DRY SYSTEM PIPING AROUND ROOMS PROTECTED BY PRE-ACTION SYSTEMS, CLEAN AGENT SYSTEMS, GASEOUS SUPPRESSION SYSTEMS AND OTHER ALTERNATIVE FIRE SUPPRESSION SYSTEMS.
10. INSTALL PIPE RUNS TO MINIMIZE OBSTRUCTION TO OTHER WORK.
11. PITCH ALL DRY AND PRE-ACTION SYSTEM PIPING 1/4-INCH PER 10-FEET FOR MAINS AND 1/2-INCH PER 10-FEET FOR BRANCH LINES, INCLUDING PIPE PASSING THROUGH BOTH WARM AND COLD AREAS.

B. COUPLINGS:
1. INSTALL WHERE INDICATED ON DRAWINGS AND ON EACH SIDE OF PIECES OF EQUIPMENT TO PERMIT EASY REMOVAL OF EQUIPMENT.
2. DEBURR CUT EDGES.

C. PIPE PENETRATIONS: WIRE PIPE CUTOUT COUPON AT POINT OF PIPE PENETRATION.

D. PIPE AND PIPE FITTINGS:
1. EXPANSION AND FLEXIBILITY: INSTALL WORK WITH DUE REGARD FOR EXPANSION AND CONTRACTION TO PREVENT DAMAGE TO THE PIPING, EQUIPMENT, BUILDING AND ITS CONTENTS. PROVIDE PIPING OFFSETS, LOOPS, APPROVED TYPE EXPANSION JOINTS, SWAY BRACING, WIRE RESTRAINTS, VERTICAL RESTRAINTS, FLEXIBLE COUPLINGS OR OTHER MEANS TO CONTROL PIPE MOVEMENT AND TO MINIMIZE PIPE FORCES.
2. COORDINATE SUPPORT OF PIPE 4-INCHES AND LARGER WITH STRUCTURAL ENGINEER.
3. PROVIDE CLEARANCES AROUND PIPING PER NFPA 13.
4. INSTALL DRY AND PRE-ACTION WELDED PIPE WITH WELDS FACING VERTICALLY UP, OR WHERE THIS IS NOT POSSIBLE, AS CLOSE AS POSSIBLE TO VERTICAL BETWEEN 46 DEGREES AND 234 DEGREES. INTENT IS TO MINIMIZE CORROSION CAUSED BY MOISTURE IN THE BOTTOM OF PIPES.

**3.06 WALL AND FLOOR PENETRATIONS AND SLEEVES**

A. ESCUTCHEONS: INSTALL ON EXPOSED PIPES PASSING THROUGH WALLS OR FLOORS.
1. PIPE SLEEVES: LAY OUT WORK IN ADVANCE OF POURING CONCRETE AND FURNISH AND SET SLEEVES NECESSARY TO COMPLETE WORK.
2. FLOOR SLEEVES: PROVIDE SLEEVES ON PIPES PASSING THROUGH CONCRETE OR MASONRY CONSTRUCTION. EXTEND SLEEVE 1-INCH ABOVE FINISHED FLOOR. CAULK PIPES PASSING THROUGH FLOOR WITH NONSHRINKING FIRE AND WATER RESISTANT GROUT OR APPROVED EQUIVALENT CAULKING COMPOUND. CAULK/SEAL PIPING PENETRATIONS THROUGH FIRE RATED BUILDING WALLS AND FLOORS WITH LISTED, FIRE-RATED ASSEMBLIES. PROVIDE FIRE-RATED ASSEMBLIES PER LOCAL AHJ REQUIREMENTS.
3. WALL SLEEVES: PROVIDE SLEEVES ON PIPES PASSING THROUGH CONCRETE OR MASONRY CONSTRUCTION. PROVIDE SLEEVE FLUSH WITH FINISHED FACE OF WALL. CAULK PIPES PASSING THROUGH WALLS WITH NON-SHRINKING CAULKING COMPOUND. CAULK/SEAL PIPING PENETRATIONS THROUGH FIRE RATED BUILDING WALLS AND FLOORS WITH LISTED, FIRE-RATED ASSEMBLIES. PROVIDE FIRE-RATED ASSEMBLIES PER LOCAL AHJ REQUIREMENTS.
4. BEAM SLEEVES:
a. COORDINATE WITH TRADES FOR LOCATIONS OF PIPE SLEEVES IN REINFORCED CONCRETE AND STEEL BEAMS. PENETRATIONS MUST BE INDICATED ON STRUCTURAL SHOP DRAWINGS. SEE DRAWINGS AND SPECIFICATIONS FOR SPECIFIC SLEEVE LOCATION LIMITATIONS. PIPE SLEEVE LOCATIONS MUST BE INDICATED ON REINFORCED CONCRETE AND STEEL BEAM SHOP DRAWINGS.
b. FIELD CUTTING OF BEAMS NOT ALLOWED WITHOUT WRITTEN APPROVAL OF STRUCTURAL ENGINEER. NO EXTRA COSTS ALLOWED FOR FAILURE TO COORDINATE BEAM PENETRATIONS PRIOR TO REINFORCED CONCRETE AND STEEL BEAM SHOP DRAWING SUBMITTAL.
5. PENETRATIONS IN FIRE-RATED WALL/FLOOR ASSEMBLIES:
a. REFERENCE DIVISION 07, THERMAL AND MOISTURE PROTECTION.
b. COORDINATE WITH DRAWINGS LOCATION OF FIRE RATED WALLS. CEILINGS AND FLOORS. WHEN THESE ASSEMBLIES ARE PENETRATED, SEAL AROUND PIPING AND EQUIPMENT WITH APPROVED FIRESTOPPING MATERIAL.
c. PROVIDE PROPER SIZING WHEN PROVIDING SLEEVES OR CORE-DRILLED HOLES TO ACCOMMODATE THE PENETRATION. FIRESTOP VOIDS BETWEEN SLEEVE OR CORE-DRILLED HOLE AND PIPE PASSING THROUGH TO MEET THE REQUIREMENTS OF ASTM E814 AND NFPA.
d. INSTALL FIRESTOPPING MATERIAL COMPLETE AS DIRECTED BY MANUFACTURER'S INSTALLATION INSTRUCTIONS. MEET REQUIREMENTS OF ASTM E814.

**3.07 HANGERS AND SUPPORTS**

A. INSTALLATION OF PIPE HANGERS, INSERTS AND SUPPORTS TO CONFORM TO NFPA 13. PROVIDE ADJUSTABLE HANGERS, INSERTS, BRACKETS, CLAMPS, SUPPLEMENTARY STEEL AND OTHER ACCESSORY MATERIALS REQUIRED FOR PROPER SUPPORT OF PIPE LINES AND EQUIPMENT. PROVIDE SUPPLEMENTARY MATERIALS FOR PROPER SUPPORT AND ATTACHMENT OF HANGERS.

**3.08 STRUTS AND STRUT CLAMPS**

A. INSTALL PER MANUFACTURER'S LISTED ORIENTATION.

**3.09 SWAY BRACES AND RESTRAINTS**

A. LOCATE PER ORIENTATION AND SPACING AS REQUIRED BY SWAY BRACE CALCULATIONS.

B. ATTACH SWAY BRACING DIRECTLY TO PIPE OR EQUIPMENT BEING BRACED.

C. DO NOT ATTACH SWAY BRACING TO BOTTOM OF TRUSS MEMBERS.

**3.10 ANCHORS AND ATTACHMENTS**

A. IN POST-TENSION CONSTRUCTION, DETERMINE LOCATION OF POST-TENSION CABLES AND INSTALL ANCHORS TO AVOID CONTACT OR INTERFERENCE WITH POST-TENSION CABLES. COORDINATE WITH STRUCTURAL.

B. DO NOT USE POWDER-DRIVEN ATTACHMENTS.

C. BUILDING ATTACHMENTS AND INSERTS: INSTALL BUILDING ATTACHMENTS WITHIN CONCRETE SLABS OR ATTACH TO STRUCTURAL STEEL. INSTALL ADDITIONAL ATTACHMENTS AT CONCENTRATED LOADS, INCLUDING VALVES AND FLANGES, FOR SIZES N

**1.05 QUALITY ASSURANCE**

A. QUALITY ASSURANCE AS REQUIRED BY SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS.

**1.06 WARRANTY**

A. WARRANTY OF MATERIALS AND WORKMANSHIP AS REQUIRED BY SECTION 21 00 00, FIRE SUPPRESSION BASIC REQUIREMENTS AND DIVISION 01, GENERAL REQUIREMENTS.

**1.07 SYSTEM DESCRIPTION**

A. PROVIDE COVERAGE FOR EACH SHELTER UNIT. FIELD VERIFY FIELD CONDITIONS PRIOR TO SUBMITTAL OF BID. ADJUST BID TO PROVIDE PROTECTION FEATURES IN ACCORDANCE WITH APPLICABLE CODES AND INTERPRETATIONS BY AHJ. PROVIDE DESIGN AND INSTALLATION BASED ON MORE STRINGENT REQUIREMENTS IF THIS SPECIFICATION AND AHJ REQUIREMENTS DIFFER FROM CODE.

B. SPRINKLER SYSTEM DESIGN TO INCLUDE A 10 PERCENT PRESSURE AND FLOW CUSHION BETWEEN SYSTEM DEMAND POINT AND AVAILABLE WATER SUPPLIES.

C. EXTEND HYDRAULIC CALCULATIONS FROM HYDRAULICALLY MOST REMOTE DESIGN AREA BACK TO LOCATION OF PRESSURE HYDRANT OF FLOW TEST OR EFFECTIVE POINT OF WATER SUPPLY WHERE CHARACTERISTICS OF WATER SUPPLY ARE KNOWN.

**1.08 EXTRA STOCK**

A. PROVIDE EXTRA SPRINKLERS PER CODE.

B. PROVIDE SUITABLE WRENCHES FOR EACH SPRINKLER TYPE AND METAL STORAGE CABINET IN RISER ROOM.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

A. SPRINKLERS:
   1. NONFINISHED AREAS:
      a. VICTAULIC
      b. VIKING
      c. TYCO
      d. RELIABLE
      e. GLOBE
      f. OR APPROVED EQUIVALENT.

B. RISER MANIFOLD:
   1. VIKING EASYPAC
   2. RELIABLE; MODEL CR.
   3. AGF; MODEL 8011.
   4. TYCO; MODEL RM-1
   5. OR APPROVED EQUIVALENT.

C. INSPECTOR'S TEST CONNECTION:
   1. COMBINATION TEST AND DRAIN:
      a. VICTAULIC; SERIES 720 TESTMASTER II ALARM TEST MODULE WITH PRESSURE RELIEF VALVE.
      b. AGF; MODEL 1011, 2511, 3011, WITH PRESSURE RELIEF VALVE.
      c. OR APPROVED EQUIVALENT.
   2. DRY SYSTEM INSPECTOR'S TEST CONNECTION:
      a. AGF; MODEL 3011.
      b. OR APPROVED EQUIVALENT.

D. SPRINKLER GUARDS:
   1. VICTAULIC
   2. VIKING
   3. TYCO
   4. RELIABLE
   5. GLOBE
   6. SENJU
   7. OR APPROVED EQUIVALENT.

**2.02 SPRINKLERS**

A. NONFINISHED AREAS:
   1. TYPE: GLASS-BULB
   2. RESPONSE: QUICK-RESPONSE
   3. FINISH: WHITE POLYESTER, OR AS DIRECTED BY ARCHITECT.

**2.03 RISER MANIFOLD**

A. WATER-FLOW ALARM, GAUGE, INTEGRAL PRESSURE RELIEF VALVE CONNECTED TO DRAIN, PRESSURE GAUGE WITH 3-WAY GAUGE CONTROL VALVE AND DRAIN VALVE, INTEGRAL PRESSURE RELIEF VALVE CONNECTED TO DRAIN, SIGHT GLASS, SMOOTH BORE ORIFICE UNION OF SAME SIZE AS SMALLEST ORIFICE SPRINKLER INSTALLED. PROVIDE COVER TAMPER SWITCH WHEN REQUIRED BY AHJ.

**2.04 INSPECTOR'S TEST CONNECTION**

A. COMBINATION TEST AND DRAIN: BRONZE BODY, BRASS STEM, IMPREGNATED TEFLON SEAT, CHROME COATED BRASS BALL, STEEL HANDLE WITH POSITIVE STOPS, TAMPER RESISTANT TEST ORIFICE, INTEGRAL TAMPER RESISTANT SIGHT GLASSES, TAPPED AND PLUGGED PORT FOR SYSTEM ACCESS, STEEL IDENTIFICATION PLATE. PROVIDE WITH PRESSURE RELIEF VALVE AND DRAINAGE PIPING WITH BRONZE BODY AND STAINLESS STEEL SPRING.

B. DRY SYSTEM INSPECTOR'S TEST CONNECTION: BRONZE, BRASS STEM, STEEL HANDLE, CHROME-PLATED BRONZE BALL, TEFLON VALVE SEAT, TAMPER AND CORROSION RESISTANT ORIFICE EQUIVALENT TO SMALLEST SPRINKLER ORIFICE, SIGHT FLOW CONNECTION.

**2.05 SPRINKLER GUARDS**

A. METAL.

B. LISTED FOR USE WITH SPRINKLER MODEL TO WHICH IT IS ATTACHED.

**PART 3 - EXECUTION**

**3.01 GENERAL INSTALLATION REQUIREMENTS**

A. INSTALL PER MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS.

**3.02 SPRINKLERS**

A. CENTER SPRINKLERS IN CENTER OR QUARTER POINTS OF SUSPENDED CEILING TILE.

B. ALIGN SPRINKLERS WITH ARCHITECTURAL COLUMN LINES, LIGHTING, DIFFUSERS AND OTHER CEILING FEATURES. IN UNFINISHED CEILINGS, ROUTE PIPING TO MINIMIZE VISUAL IMPACT. SPRINKLERS AND PIPING NOT SO ALIGNED ARE TO BE REMOVED AND REPLACED AT NO ADDITIONAL COST TO OWNER.

C. INSTALL DRY SPRINKLERS IN A MANNER WHICH DOES NOT TRAP WATER.

**3.03 RISER MANIFOLD**

A. INSTALL SO VALVES AND GAUGES ARE CONVENIENTLY AND ACCESSIBLY LOCATED WITH REFERENCE TO FINISHED BUILDING FOR REPAIRS, REMOVAL AND SERVICE.

B. PROVIDE CONNECTION TO DRAIN.

C. PIPE PRESSURE RELIEF VALVE TO DRAIN.

D. INSTALL WITH SUPERVISED CONTROL VALVE(S) AND CHECK VALVE.

**3.04 INSPECTOR'S TEST CONNECTION**

A. LOCATE WHERE FULL FLOW DISCHARGE OR PRESSURE RELIEF VALVE DISCHARGE WILL NOT DO DAMAGE, INCLUDING DAMAGE TO LANDSCAPING AND WILL NOT CAUSE DANGEROUS CONDITIONS TO WALKING SURFACES OR DISCOLORATION TO BUILDING SURFACES.

B. LOCATE WITHIN 5-FEET OF FINISHED FLOOR.

**3.05 SPRINKLER GUARDS**

A. INSTALL PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

END OF SECTION

Project Title:

# 2ND ST PATHWAYS STAIR CENTER

SITE IMPROVEMENTS AND SHELTER UNITS

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REGISTERED PROFESSIONAL ENGINEER
MECHELUNG LAO
No. M33910
Exp 12/31/23
MECHANICAL
STATE OF CALIFORNIA

Signed: 4/21/23

| No. | Date | Issue |
|---|---|---|
| 1 | 01/17/23 | COMMENT RESPONSE 1 |
| 2 | 03/08/23 | PLAN CHECK 1 |
| | 04/28/23 | BID SET |

Issue Note:

PERMIT SET

09/21/22

Project ID: BSC

File Name:

Drawn By: NW

Review By: EB

Plot Date:

Sheet Title:

**SPECIFICATIONS - FIRE PROTECTION**

Sheet No.:

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