Date: November 20, 2019

ADDENDUM NO. 1
To Project Bidding Documents for:

A#03-119686
New Student Services Building
Compton Community College District

tBP Project. No. 20987.00

tBP/ARCHITECTURE
4611 Teller Avenue
Newport Beach, CA 92660
(949) 673-0300

TO: PROSPECTIVE BIDDERS

This Addendum forms a part of the Contract Documents and modifies the original approved Bidding Drawings. Acknowledge receipt of this Addendum in space provided on the Bid Form. Failure to acknowledge may subject Bidder to disqualification.

CHANGES TO THE SPECIFICATIONS.

1. Spec 000110 - TABLE OF CONTENTS - Remove this section in its entirety and replace by the new section 000110 included in this addendum.

2. Spec 075400 -THERMOPLASTIC MEMBRANE ROOFING. Remove this section in its entirety and replace by the new section 075400 included in this addendum.

3. Spec 083326 - FOLDING SECURITY GRILLES. New specification issued with this addendum.

4. Spec 230923 - DIRECT DIGITAL CONTROL (DDC) SYSTEM FOR HVAC. Remove this section in its entirety and replace by the new section 230923 included in this addendum.

5. Spec 232113 - HYDRONIC PIPING. Remove this section in its entirety and replace by the new section 232113 included in this addendum.

6. Spec 232116 - HYDRONIC PIPING SPECIALTIES. Remove this section in its entirety and replace by the new section 232116 included in this addendum.

CHANGES TO DRAWINGS
This addendum revisions includes revised full-size sheets unless noted otherwise below.

1. Revised SHEET A0-1 1ST FLOOR CURB/ DEPRESSION PLAN

    a. Included electrical floor boxes as shown on Electrical ET-5 Telecom Plan in Rooms Conf 113, Comp 114, TRIO 130, and SRC 150.
    b. Relocated floor drain in Rooms Jan 102, Men 103, Women 104, Gndr. Ntrl.

Rest. Rm. 105, Staff Toilet-W 109, and Staff Toilet-M 110.
c. Revised curb dimension between Staff Toilet-W 109 and Staff Toilet-M 110.
d. Added electrical floor outlet symbol and seismic gap to Legend.
e. Included housekeeping pads in Room Elect. 107 as shown on 1/E0-3.

2. Revised SHEET A0-2 2nd FLOOR CURB/ DEPRESSION PLAN

a. Included electrical floor boxes as shown on Electrical ET-6 Telecom Plan in Rooms Conf. 211, Waiting 230A, Couns./ Car. & TRNSF/ FYE 266, CalWORKS 270, and COUNS. (FT) 286.
b. Dimension added to locate slab edge near gridline 3/B and 5.3/K.5.
c. Dimensions added to locate shaft opening in Rooms Conf. 211, Waiting 230A, VP of Student Services 240, and Foster & Kinship Care 290.
d. Revised curb dimension between Staff Toilet-W 207 and Staff Toilet-M 208.
e. Included housekeeping pads in Room Elect. 205 as shown on 2/E0-3.
f. Relocated floor drain in Rooms Men's 202, Women's 203, Staff Toilet-W 207, and Staff Toilet-M 208.
g. Included seismic gaps along Room Corridor 200 bridges as shown on Structural S3-1.
h. Added electrical floor outlet symbol and seismic gap to Legend.

3. Revised SHEET A1-1 1ST FLOOR PLAN

a. Revised chase dimension between Staff Toilet-W 109 and Staff Toilet-M 110.
b. Relocated floor drain in Rooms Jan 102, Men 103, Women 104, Gndr. Ntrl. Rest. Rm. 105, Staff Toilet-W 109, and Staff Toilet-M 110.
c. Added bulletin board and interior elevation 4 reference in Room Innovation Center 116.
d. Added bulletin board and interior elevation 3 reference in Room Stor/ Wk. 141.
e. Added bulletin board and interior elevation 3 reference in Room High Tech Lab 150F.
f. Added horizontal sliding security grille (mounted to ceiling track) at Room Financial Aid 170 and enlarged plan reference of pocket.

4. Revised SHEET A1-2 2ND FLOOR PLAN

a. Revised chase dimension between Staff Toilet-W 207 and Staff Toilet-M 208.
b. Relocated floor drain in Rooms Men's 202, Women's 203, Staff Toilet-W 207, and Staff Toilet-M 208.
c. Added 42" low wall at Room COUNS. (FT) 286.

5. Revised SHEET A2-1 REFLECTED CEILING PLAN – 1ST FLOOR

a. Added horizontal sliding security grille (mounted to ceiling track) at Room Financial Aid 170.

6. Revised SHEET A3-1 ROOF PLAN

a. Revised roof cricket design and location of roof drains.
b. Added roof finish surface elevations.

c. Included shaft locations for reference.
d. Revised walking pad locations near gridline 2/J.7.

7. Revised SHEET A4-1 EXTERIOR ELEVATIONS

   a. Added line of coping on East and North Exterior Elevations at plaster parapets with detail reference.

8. Revised SHEET A4-2 EXTERIOR ELEVATIONS

   a. Added line of coping on West and South Exterior Elevations at plaster parapets with detail reference.

9. Revised SHEET A6-4 WALL SECTIONS

   a. Wall Section 1/A6-4: Indicated eyebrow soffit framing, referenced Structural detail, and Structural beam location revised.

10. Revised SHEET A6-5 WALL SECTIONS

    a. Wall Section 2/A6-5: Structural beam location revised.

11. Revised SHEET A7-1 ENLARGED TOILET RM. PLANS & ELEVS. – 1ST FLR

    a. Enlarged Plan 1/A7-1:
       i. Relocated floor drain in Rooms Jan 102, Men 103, Women 104, Gndr. Ntrl. Rest. Rm. 105, Staff Toilet-W 109, and Staff Toilet-M 110.
       ii. Revised chase dimension between Staff Toilet-W 109 and Staff Toilet-M 110.
       iii. Added dimension for partition along gridline J.7.

12. Revised SHEET A7-2 ENLARGED TOILET RM. PLANS & ELEVS. – 2ND FLR

    a. Enlarged Plan 1/A7-2:
       i. Added chase dimension between Staff Toilet-W 207 and Staff Toilet-M 208.
       ii. Relocated floor drain in Rooms Men's 202, Women's 203, Staff Toilet-W 207, and Staff Toilet-M 208.

13. Revised SHEET A9-1 INTERIOR ELEVATIONS

    a. Computer Lab 114/A9-2 View 4:
       i. Removed (2) wall hung projectors.
    b. Computer Lab 114/A9-2 View 2:
       i. Removed (2) projection screens.
       ii. Added (2) monitors.
    c. Conference 113/A9-2 View 4:
       i. Revised note for white board.
    d. Corridor 100, 200/A9-1 View 3:
       i. Added dimensions for bulletin boards from finish floor.

e. Corridor 100, 200/A9-1 View 1:
f. Revised note for monitors.

14. Revised SHEET A9-2 INTERIOR ELEVATIONS

a. Tutor 151/A9-2: Revised note for monitor.
b. Stor. / Workroom 141: View 3 added.
c. SRC Open Office 150:
    i. View 1: Monitor note revised and backing added.
    ii. View 3: Added.
d. Trio Open Office 130:
    i. View 4: Relocate whiteboard and bulletin board.
    ii. View 2: Monitor note revised.
e. Testing Center 122/A9-2 View 4:
    i. Monitor note revised and backing added.
    ii. View name revised.
f. Innovation Center 116/A9-2 View 4 added.

15. Revised SHEET A9-3 INTERIOR ELEVATIONS

a. Counseling 266, Conference Room 211, Huddle 181, Huddle 171, 151/A9-2: Revised note for monitor.
b. Classroom 212: Removed projection screen.
c. Conference Room 211 View 4: Relocated whiteboard.

16. Revised SHEET A9-4 INTERIOR ELEVATIONS

a. CALWORKS 270: Revised note for monitor.

17. Revised SHEET A10-1 SIGNAGE PLANS

a. Comp 114 and SRC 150 @ 1st floor: Signage note S-6 added.

18. Revised SHEET 3.01 EXTERIOR WALL DETAILS

a. Detail 16: added flashing at roof drain penetration.

19. Revised SHEET 3.20 EXTERIOR COLUMNS

a. Details 5E, 11B, 11C, 11D, 12A, 19A, 19C, 19D, 19E, 20A, and 20B: eliminated gap between metal stud and column as per Structural.
b. Details 5A, 5B, 5C indicate size of furring channel.

20. Revised SHEET 4.03 INTERIOR METAL STUD PARTITION DETAILS

a. Detail 12 added for horizontal sliding security grille pocket.

21. Revised SHEET 6.02 CASEWORK DETAILS

a. Detail 11: Added note for gap between acoustic panel and door frame.

22. Revised SHEET 7.01 ROOF DETAILS

    a. Details 10B, 10C, 10D, and 10E: Revised parapet coping framing and flashing.

23. Revised SHEET 8.01 DOOR SCHEDULE

    a. Revised Remarks for Door #001.
    b. Revised Door Type C.

24. Revised SHEET 8.11 INTERIOR STOREFRONT DETAILS

    a. Details 2, 4, and 5: Revised ceiling edge to seismic clip.

25. Revised SHEET 8.20 WINDOW & CURTAIN WALL DETAILS

    a. Details 4, 9, & 10: Added weld symbol and revised note for metal stud framing at HSS.
    b. Detail 19: Revised note for sill metal stud framing.

26. Revised SHEET 8.21 STOREFRONT DETAILS

    a. Details 2 and 3: Revised note for metal stud framing.
    b. Details 6, 11, 12, and 16: Revised flashing.

27. Revised SHEET 8.22 CURTAIN WALL DETAILS

    a. Details 5, 6, 13, 14, and 15: Revised flashing.

28. Revised SHEET 11.01 SIGNAGE DETAILS

    a. Detail 7: Revised sign text.

29. Revised SHEET 13.01 STAIR DETAILS

    a. Detail 2: Added weld symbol.
    b. Detail 3 and 5: Indicated stringer finish.

30. Revised SHEET S-3.1 SECOND FLOOR FRAMING PLAN:

    a. Added mechanical shaft opening on northeast side of the 2nd floor.

31. Revised SHEET S-3.2 ROOF FRAMING PLAN:

    a. Added mechanical shaft opening on northeast side of the 2nd floor.
    b. Slightly revised size of openings for mechanical ducts.

32. Revised SHEET S5-0.2 FRAMING DETAILS:

    a. Added detail 16/s5-0.2 for cantilevered parapet.
    b. Added detail 14/s5-0.2 for interior security grill support.

33. Revised SHEET M1-1 MECHANICAL FIRST FLOOR PLAN

    a. Revised ductwork to better coordinate with structural members.

34. Revised SHEET M7-1 DETAILS

    a. Revised detail 11/M7-1.

35. Revised SHEET M7-2 DETAILS

    a. Edited detail notes for detail 2 & 7/M7-2.

36. Revised SHEET M7-4 DETAILS

    a. Edited detail notes for detail 1/M7-4.

37. Revised SHEET P-03 SITE PLAN

    a. Added North Arrow, scale.

38. Revised SHEET P1-1 PLUMBING FIRST FLOOR PLAN - GRAVITY

    a. Revised storm and overflow drain routing per revised roof drain layout.

39. Revised SHEET P2-1 PLUMBING SECOND FLOOR PLAN – GRAVITY

    a. Revised storm and overflow drain routing per revised roof drain layout.

40. Revised SHEET P2-2 PLUMBING SECOND FLOOR PLAN – PRESSURE

    a. Clarified water piping to sink at 2nd floor Lactation.

41. Revised SHEET P2-3 PLUMBING ROOF PLAN

    a. Revised storm and overflow drain locations per revised roof drain layout.

42. Revised SHEET P4-1 PLUMBING ENLARGED FLOOR PLANS

    a. Added waste piping from sink at 2nd floor Lactation.

43. Revised SHEET P4-2 PLUMBING ENLARGED FLOOR PLAN

    a. Added vent piping from sink at 2nd floor Lactation.

44. Revised SHEET E0-3 ENLARGED ELECTRICAL AND TELECOM ROOMS

    a. Add detail reference to “MBDH” at 1st

45. Revised SHEET E0-4 DETAILS

    a. Revise structural detail number for Detail #7 - Inverter Anchorage Detail.

46. Revised SHEET E0-5 DETAILS

    a. Revise structural detail number for Detail #2 - Typical Transformer Anchorage Detail.

47. Revised SHEET E0-7 LIGHTING FIXTURE SCHEDULE AND DETAILS

    a. Add detail #D – Pendant Mounted Light Fixture Detail.

48. Revised SHEET E2-1 FIRST FLOOR POWER PLAN

    a. Add Key Notes #25 and #26.
    b. Add power for Card Readers.
    c. Add power for Automatic Sliding Door at High Tech Lab 150F.
    d. Add power for new monitors at High Tech Lab 150F, Trio 130 and Testing Center 122.
    e. Relocate power for new location of monitors at Huddle 181 and Comp 114.
    f. Add floor box at Testing Center 122.

49. Revised SHEET E2-2 2ND FLOOR POWER PLAN

    a. Add Key Notes #25 and #26.
    b. Add power for Card Readers.
    c. Add power for Automatic Sliding Doors.
    d. Add power for new monitor at VP STU Services 242.
    e. Relocate power for new location of monitor at CalWorks 270.
    f. Relocate power at Comp/Print 279.

50. Revised SHEET E2-4 PANEL SCHEDULES

    a. Add circuit 27 at panel PP1D.
    b. Add circuits 28 and 30 at panel PP1F.

51. Revised SHEET E2-5 PANEL SCHEDULES

    a. Add circuits 32 and 34 at panel PP2B.
    b. Add circuits 14 and 23 at panel PP2D.

52. Revised SHEET ES-2 ENLARGED SITE ELECTRICAL PLAN

    a. Revise conduit routing.

53. Revised SHEET ET-5 1ST FLOOR TELECOM PLAN

    a. Add data and AV for new monitors at High Tech Lab 150F, Trio 130 and Testing Center 122.
    b. Relocate data and AV for new location of monitors at Huddle 181 and Comp 114.
    c. Add Card Readers.
    d. Add floor box at Testing Center 122.

54. Revised SHEET ET-6 2nd Floor Telecom Plan

a. Add data and AV for new monitor at VP STU Services 242.
b. Relocate data and AV for new location of monitor at CalWorks 270.
c. Relocate data and panic button at Comp/Print 279.
d. Delete outlets at Waiting Room 230A.
e. Delete outlet in shaft at Foster and Kinship Care 290.
f. Add Card Readers.

---End of Memorandum---

ATTACHMENTS

1. **Full Size Documents 30" x 42" Drawings: (Total 54)**

ARCHITECTURAL

A0-1	1ST FLOOR CURB/ DEPRESSION PLAN
A0-2	2nd FLOOR CURB/ DEPRESSION PLAN
A1-1	1ST FLOOR PLAN
A1-2	2ND FLOOR PLAN
A2-1	REFLECTED CEILING PLAN – 1ST FLOOR
A3-1	ROOF PLAN
A4-1	EXTERIOR ELEVATIONS
A4-2	EXTERIOR ELEVATIONS
A6-4	WALL SECTIONS
A6-5	WALL SECTIONS
A7-1	ENLARGED TOILET RM. PLANS & ELEVS. – 1ST FLR
A7-2	ENLARGED TOILET RM. PLANS & ELEVS. – 2ND FLR
A9-1	INTERIOR ELEVATIONS
A9-2	INTERIOR ELEVATIONS
A9-3	INTERIOR ELEVATIONS
A9-4	INTERIOR ELEVATIONS
A10-1	SIGNAGE PLANS
3.01	EXTERIOR WALL DETAILS
3.20	EXTERIOR COLUMNS
4.03	INTERIOR METAL STUD PARTITION DETAILS
6.02	CASEWORK DETAILS
7.01	ROOF DETAILS
8.01	DOOR SCHEDULE
8.11	INTERIOR STOREFRONT DETAILS
8.20	WINDOW & CURTAIN WALL DETAILS
8.21	STOREFRONT DETAILS
8.22	CURTAIN WALL DETAILS
11.01	SIGNAGE DETAILS
13.01	STAIR DETAILS

STRUCTURAL

S-3.1	SECOND FLOOR FRAMING PLAN
S-3.2	ROOF FRAMING PLAN
S5-0.2	FRAMING DETAILS

MECHANICAL

M1-1	MECHANICAL FIRST FLOOR PLAN
M7-1	DETAILS
M7-2	DETAILS
M7-4	DETAILS

PLUMBING

P-03	SITE PLAN
P1-1	PLUMBING FIRST FLOOR PLAN - GRAVITY
P2-1	PLUMBING SECOND FLOOR PLAN – GRAVITY
P2-2	PLUMBING SECOND FLOOR PLAN – PRESSURE
P2-3	PLUMBING ROOF PLAN
P4-1	PLUMBING ENLARGED FLOOR PLANS
P4-2	PLUMBING ENLARGED FLOOR PLAN

ELECTRICAL

E0-3	ENLARGED ELECTRICAL AND TELECOM ROOMS
E0-4	DETAILS
E0-5	DETAILS
E0-7	LIGHTING FIXTURE SCHEDULE AND DETAILS
E2-1	FIRST FLOOR POWER PLAN
E2-2	2ND FLOOR POWER PLAN
E2-4	PANEL SCHEDULES
E2-5	PANEL SCHEDULES
ES-2	ENLARGED SITE ELECTRICAL PLAN
ET-5	1ST FLOOR TELECOM PLAN
ET-6	2nd Floor Telecom Plan

REGISTERED PROFESSIONAL ENGINEER
STEPHEN R. ZAPACK
No. E 10372
Exp. 09-30-20
ELECTRICAL
STATE OF CALIFORNIA

2. Specifications

000110	TABLE OF CONTENTS-
075400	THERMOPLASTIC MEMBRANE ROOFING
083326	FOLDING SECURITY GRILLES
230923	DIRECT DIGITAL CONTROL (DDC) SYSTEM FOR HVAC
232113	HYDRONIC PIPING
232116	HYDRONIC PIPING SPECIALTIES

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FBA Job Number: 212.220

Hung Cheng

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REN. 4-30-21
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CAPITAL
ENGINEERING CONSULTANTS, INC.
LONG BEACH, CALIFORNIA

RH - TS/SL/DV	170822.00
PM - DESIGN TEAM	PROJECT NO.

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER V. MERCURIO
M 34011
EXPIRES 3/30/20
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STATE OF CALIFORNIA

DATE SIGNED: 08/16/19

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1ST FLOOR CURB/DEPRSSION PLAN 1

SCALE 1/8" = 1'-0"

LEGEND

- 6" HIGH CONCRETE CURB
- 2" DEPRESSED SLB
- 1/2" DEPRESSED SLB
- FLOOR DRAIN
- ELECTRICAL FLOOR OUTLET
- SEISMIC GAP

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COMPTON COLLEGE STUDENT SERVICES BLDG.

COMPTON COMMUNITY COLLEGE DISTRICT
1111 E. ARTESIA BLVD.
COMPTON, CA 90221

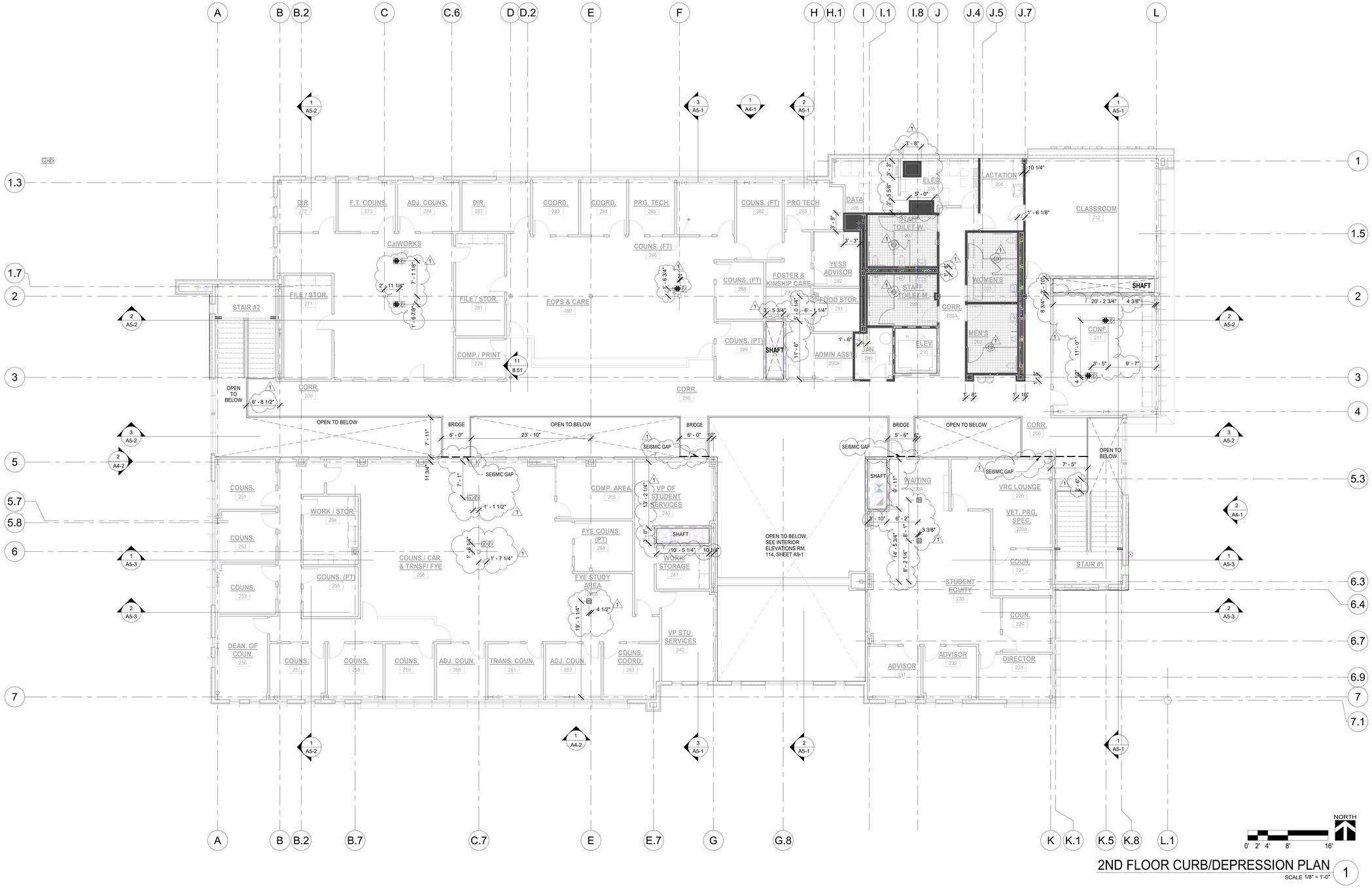
owner

tBP project number: 20987.00
file name: CC_SS_Central.RVT
drawn by: Z. WEN checked by: T. HALL
date: 9.3.2019

rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
1ST FLOOR
CURB/DEPRESSION PLAN

drawing no.:
A0-1
drawing of



2ND FLOOR CURB/DEPRESSION PLAN

SCALE 1/8" = 1'-0" (1)

LEGEND

- 6" HIGH CONCRETE CURB
- 2" DEPRESSED SLB
- 1/2" DEPRESSED SLB
- FLOOR DRAIN
- ELECTRICAL FLOOR OUTLET
- SEISMIC GAP

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rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
2ND FLOOR CURB/DEPRESSION PLAN

drawing no.:
A0-2
drawing of

GENERAL NOTES

1. PAINT ALL EXPOSED STEEL COLUMNS, BEAMS AND BRACES - REFER TO COLOR SCHEDULE, SHEET 9.02

LEGEND

NOTE: REFER TO SHEET T-2 FOR ADDITIONAL SYMBOLS

Room name
101 — RM. NO. — ROOM SYMBOL

Room name
4 — 101 — RM. NO.
A10X — ELEVATION NO.
3 — ELEVATION SHEET NO.
ROOM SYMBOL WITH INTERIOR ELEVATION DESIGNATIOND

A-4 — WALL TYPE, SEE SHEET 4.01

AL 101 — WINDOW TYPE, SEE SHEET 8.51 FOR INTERIOR, SEE SHEETS 8.52 AND 8.53 FOR EXTERIOR

000 — DOOR TYPE, SEE SHEET 8.01 DOOR SCHEDULE

HB — WALL-MOUNT HOSE BIBB, SEE PLUMBING DWGS.

FEC — SEMI-RECESSED FIRE EXTINGUISHER CABINET (12 / 4.02)

P.H. — PANIC HARDWARE, SEE SHEET 8.01 DOOR SCHEDULE

1 HR RATED WALL, SEE SHEET 9/4.01

1 HR SHAFT WALL, SEE SHEET 8/4.01

CEMENT PLASTER WALL SYSTEM (1 / 3.01)

METAL PANEL WALL SYSTEM (1 / 3.02)

BRICK VENEER WALL SYSTEM (20F / 3.01)

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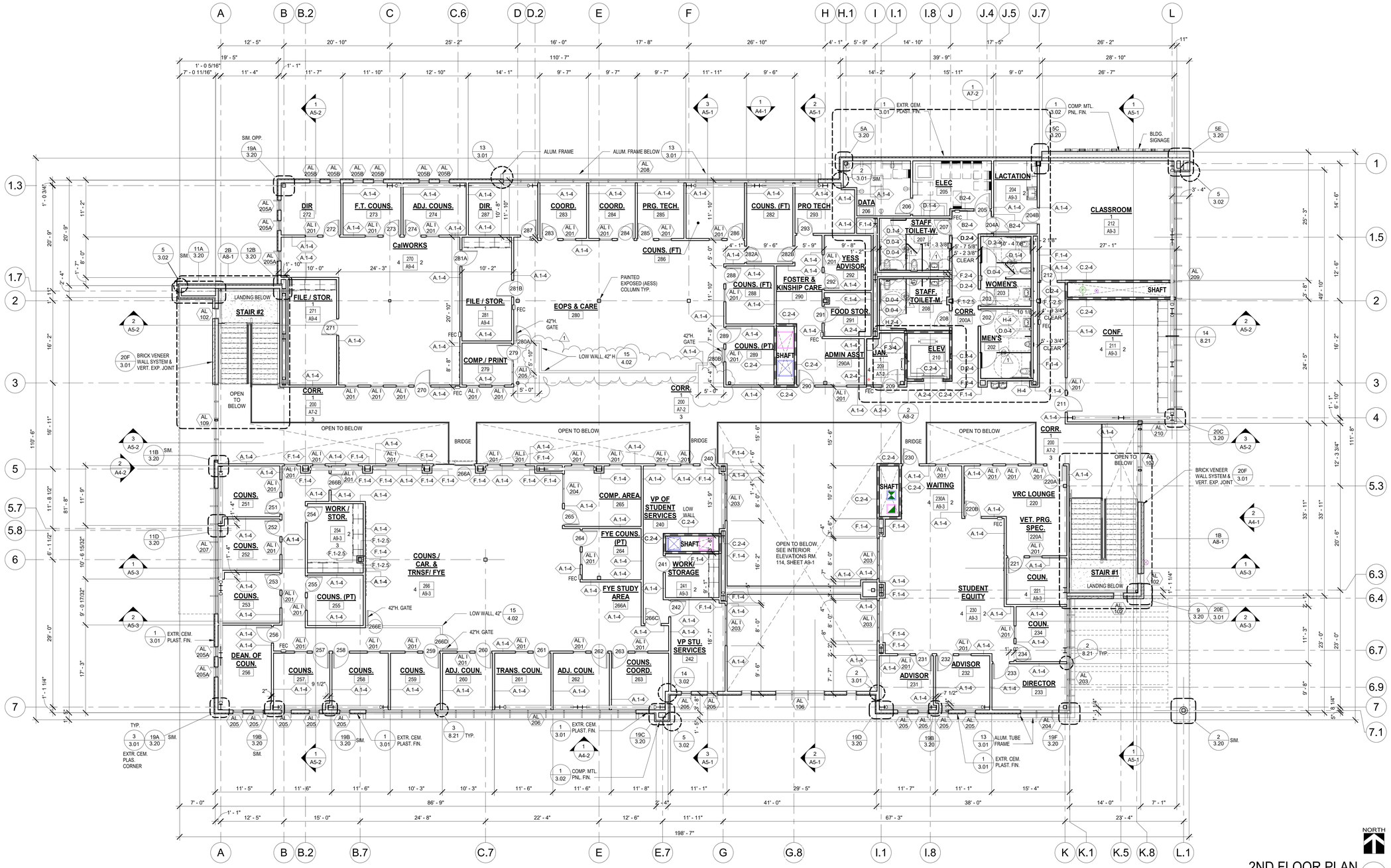
rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
1ST FLOOR PLAN

drawing no.:
A1-1
drawing of



2ND FLOOR PLAN

SCALE 1/8" = 1'-0"

0' 2' 4' 8' 16'

GENERAL NOTES

1. PAINT ALL EXPOSED STEEL COLUMNS, BEAMS AND BRACES - REFER TO COLOR SCHEDULE, SHEET 9.02

LEGEND

NOTE: REFER TO SHEET T-2 FOR ADDITIONAL SYMBOLS

- Room name / 101 — RM. NO. — ROOM SYMBOL
- Room name / 4 / 101 / A10-X / 3 — RM. NO., ELEVATION NO., ELEVATION SHEET NO. — ROOM SYMBOL WITH INTERIOR ELEVATION DESIGNATIOND
- A-4 — WALL TYPE, SEE SHEET 4.01
- AL 101 — WINDOW TYPE, SEE SHEET 8.51 FOR INTERIOR, SEE SHEETS 8.52 AND 8.53 FOR EXTERIOR
- 000 — DOOR TYPE, SEE SHEET 8.01 DOOR SCHEDULE
- HB — WALL-MOUNT HOSE BIBB, SEE PLUMBING DWGS.
- FEC — SEMI-RECESSED FIRE EXTINGUISHER CABINET 12 / 4.02
- P.H. — PANIC HARDWARE, SEE SHEET 8.01 DOOR SCHEDULE
- 1 HR RATED WALL, SEE SHEET 9/4.01
- 1 HR SHAFT WALL, SEE SHEET 8/4.01
- CEMENT PLASTER WALL SYSTEM 1 / 3.01
- METAL PANEL WALL SYSTEM 1 / 3.02
- BRICK VENEER WALL SYSTEM 20F / 3.01

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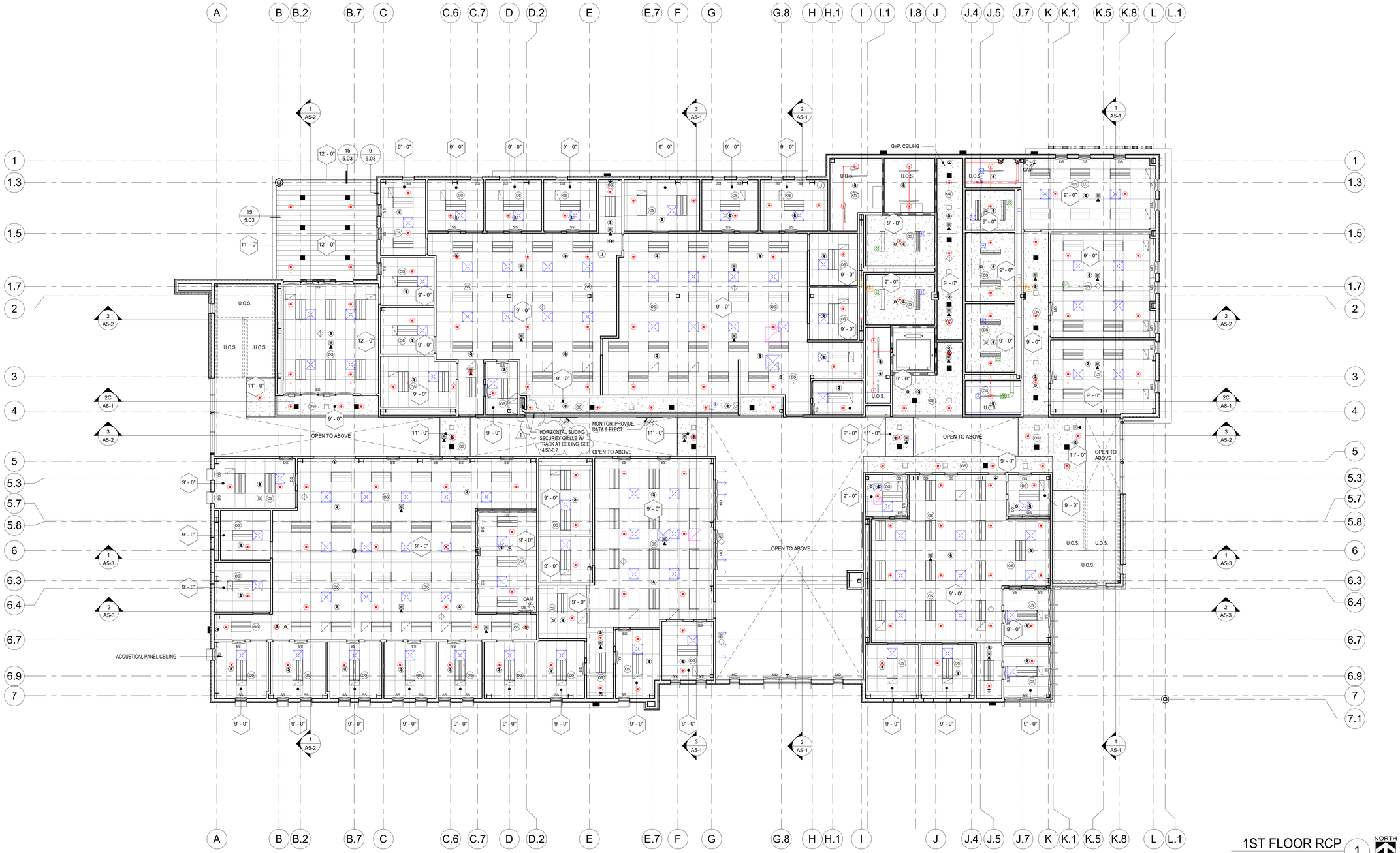
rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
2ND FLOOR PLAN

drawing no.:
A1-2
drawing of



1ST FLOOR RCP

SCALE 1/8" = 1'-0"

1

NORTH

0' 2' 4' 8' 16'

GENERAL NOTES

1. REFER TO SUSPENDED ACOUSTICAL CEILING PANEL NOTES AND TYPICAL DETAILS ON SHEET 5.01.
2. REFER TO SUSPENDED GYPSUM BOARD CEILING NOTES AND FRAMED CEILING TYPICAL DETAILS ON SHEET 5.02
3. REFER TO TYPICAL EXTERIOR CEILING DETAILS ON SHEET 5.03

LEGEND

- 12'-0" — CEILING HEIGHT ABOVE FINISH FLOOR SYMBOL
- 2x4 SUSP. ACOUST PANEL CLG. (1 / 5.01)
- PREFORMED MTL. PANEL CEILING (12 / 5.03)
- SUSPENDED GYPSUM BOARD CEILING OR FRAMED GYPSUM BOARD SOFFIT (7 / 5.02) (12 / 5.02) (13 / 5.02)
- U.O.S. — EXPOSED UNDERSIDE OF STRUCTURE
- FIRE SPRINKLER HEAD, SEE FIRE SPRINKLER PLANS (FS SHEETS)
- AIR SUPPLY DIFFUSER
- AIR RETURN DIFFUSER
- AIR EXHAUST DIFFUSER
- A.P. — ACCESS PANEL @ HARD LID CLG., VERIFY LOCATIONS W/ MECHANICAL, PLUMBING & ELECTRICAL DWGS. (19 / 5.02)
- EXIT SIGN (CEILING MOUNT), SEE ELECTRICAL LIGHTING PLANS
- EXIT SIGN (WALL MOUNT), SEE ELECTRICAL LIGHTING PLANS
- T.S. — TUBULAR SKYLIGHT TERMINATION @ GYP. BD. CLG. (20 / 7.02)
- CEILING RECESSED LIGHT FIXTURE, SEE ELECTRICAL LIGHTING PLANS
- PENDANT LIGHTS PER ELECTRICAL PLANS
- RECESSED EXTERIOR CEILING LIGHT FIXTURE, SEE ELECTRICAL LIGHTING PLANS
- CAM — SECURITY CAMERA, SEE ELECTRICAL PLANS

ROLLER SHADE NOTATIONS / ABBREVIATIONS:
- MR MOTORIZED SOLAR SHADE
- MS MANUAL SOLAR SHADE
- CS DUAL ROLLER SHADES W/ SOLAR & BLACKOUT SHADE COMBO

ROLLER SHADE ABBREVIATIONS
- DS DUAL ROLLER SHADES WITH SOLAR AND BLACKOUT SHADE COMBINATION
- SS SOLAR SHADES
- MD MOTORIZED DUAL ROLLER SHADES WITH SOLAR AND BLACKOUT SHADE COMBINATION

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owner

tBP project number: 20987.00

file name: CC_SS_Central.RVT

drawn by: Z. WEN checked by: T. HALL

date: 9.3.2019

rev:	date:	description:
1	11/20/19	Addendum 1

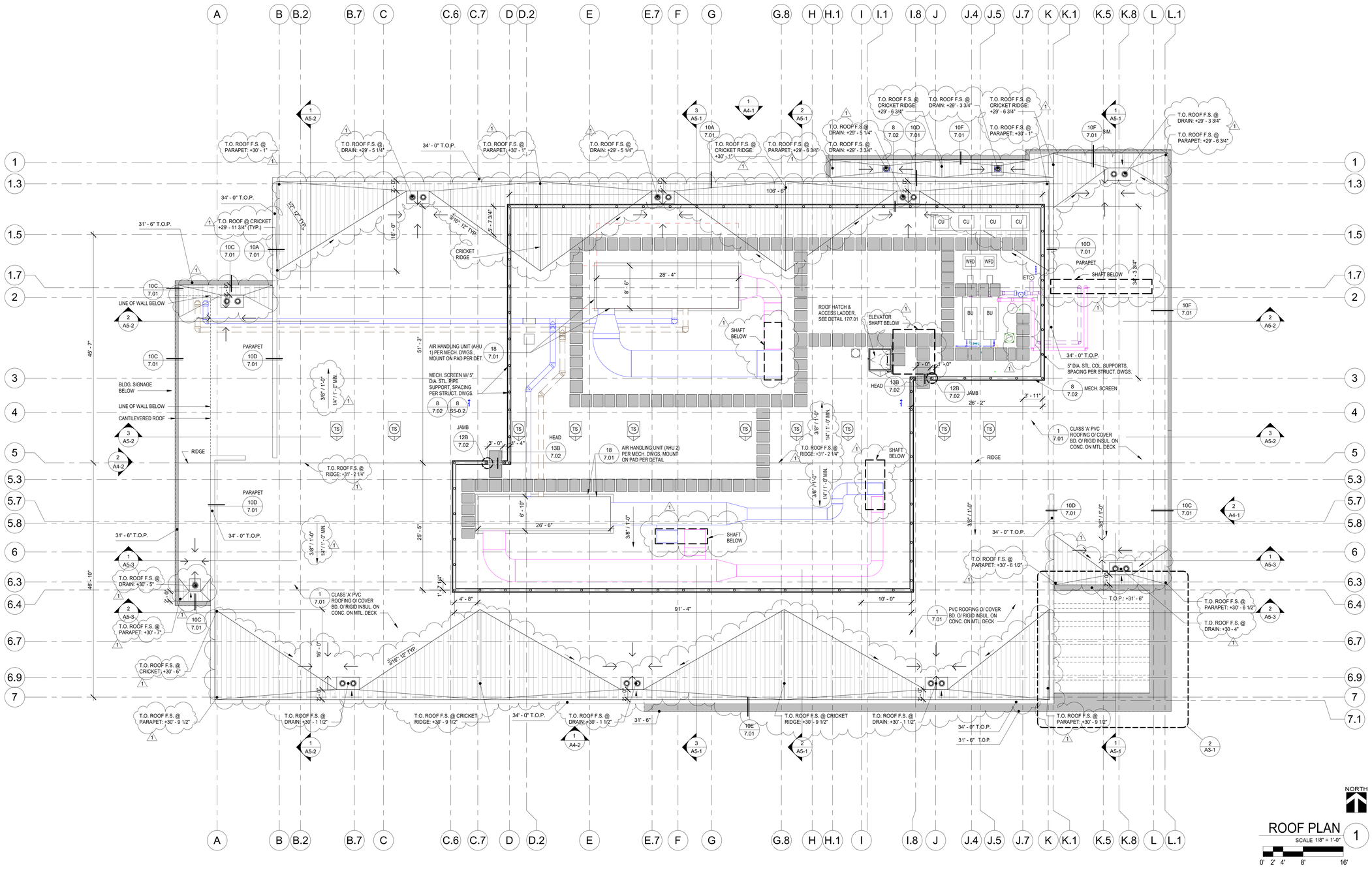
drawing title:

REFLECTED CEILING PLAN - 1ST FLOOR

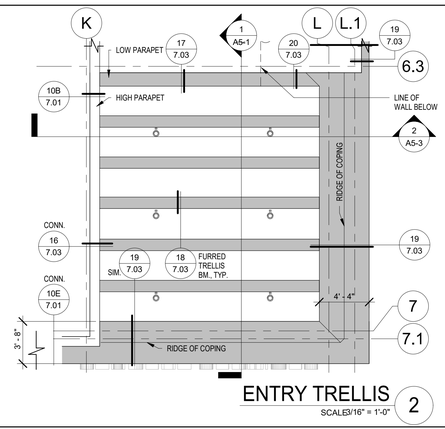
drawing no.:

A2-1

drawing of



ROOF PLAN 1
SCALE 1/8" = 1'-0"
0' 2' 4' 8' 16'



ENTRY TRELLIS 2
SCALE 3/16" = 1'-0"

LEGEND

NOTE: ALL ROOFING SHALL BE CLASS "A"
WHERE MULTIPLE PIPES OCCUR, PROVIDE CLEARANCE PER 14 7.01

ABBREVIATIONS
O.D. OVERFLOW DRAIN
R.D. ROOF DRAIN
T.O.P. TOP OF PARAPET
T.O.S. TOP OF STEEL; UNDERSIDE OF DECK (U.N.O.)

- EF — EXHAUST FAN PER MECH. DWGS., MOUNT PER 13 7.01, 11 M7-1 & 12 S0-1.6
- TS — TUBULAR SKYLIGHT, SEE 5 7.02
- ROOF AND OVERFLOW DRAIN 3 7.02, ROOF DRAIN 4 7.02
- CRICKET 2 7.01
- ROOF HATCH W/ LADDER & GUARDRAIL 17 7.01
- WALKING PAD
- CU — CONDENSING UNIT PER MECH. DWGS., MOUNT PER 19 7.01 AND 9 S0-1.6
- BU — BOILER UNIT PER MECH. & PLUMBING DWGS., MOUNT PER 9 M7-1
- ET — EXPANSION TANK PER MECH. DWGS., MOUNT PER 2 M7-2

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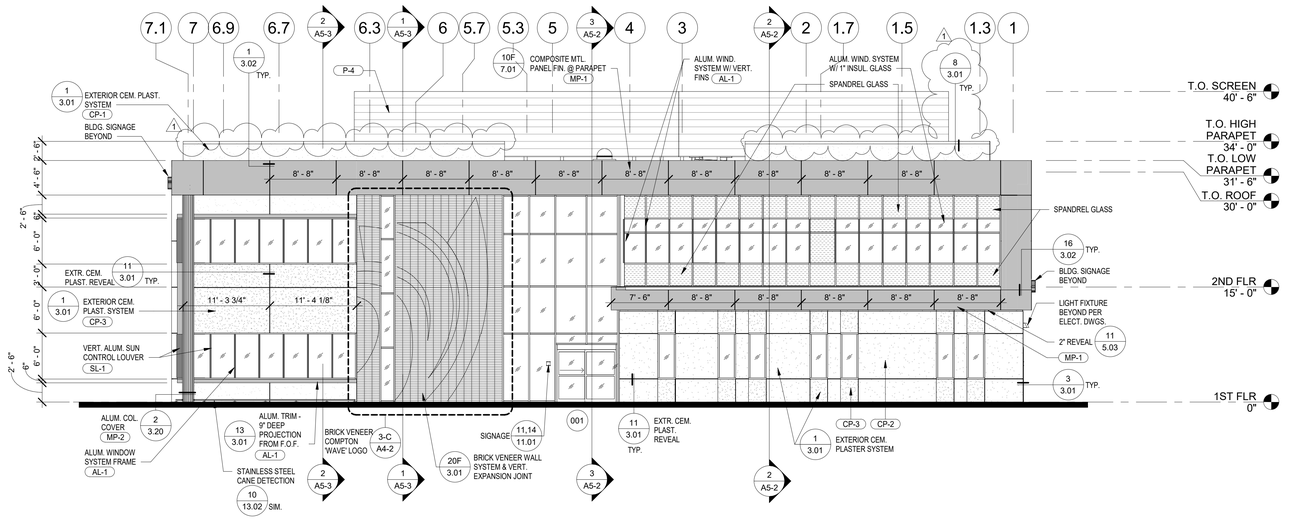
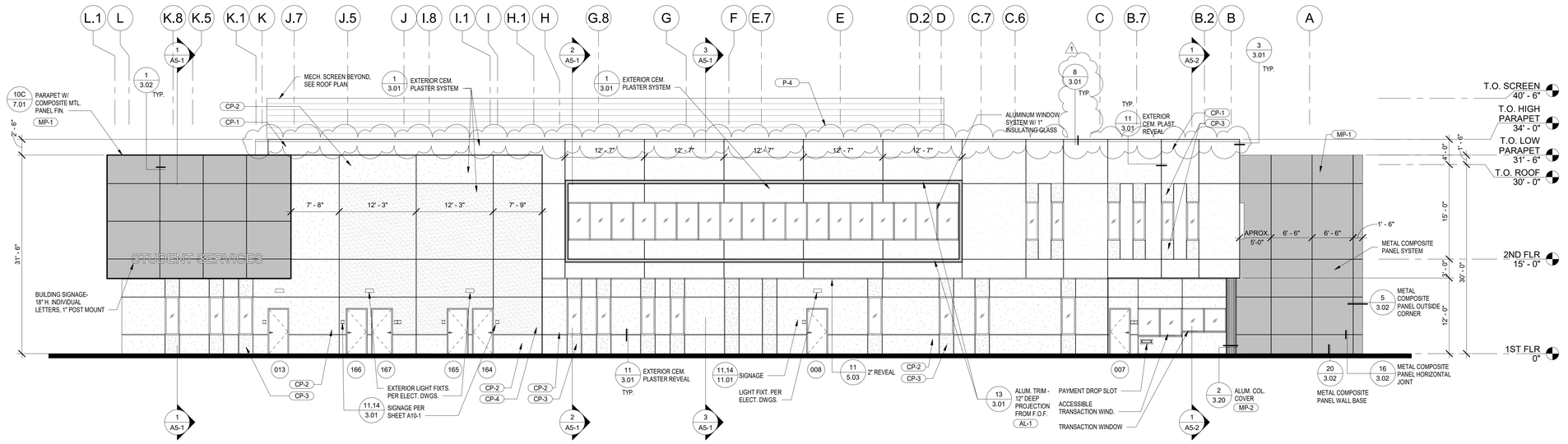
drawing title:
ROOF PLAN

drawing no.:
A3-1
drawing of



EAST ELEVATION 2

SCALE 1/8" = 1'-0"



NORTH ELEVATION 1

SCALE 1/8" = 1'-0"

GENERAL NOTES:
1. REFER TO COLOR SCHEDULE ON SHEET 9.02

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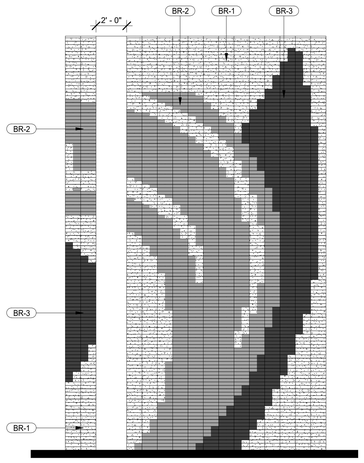
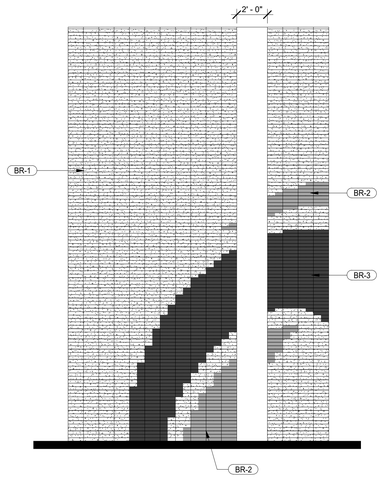
drawing title:
EXTERIOR ELEVATIONS

drawing no.:
A4-1
drawing of



A



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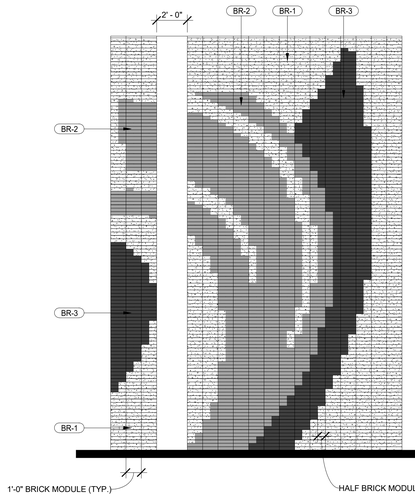
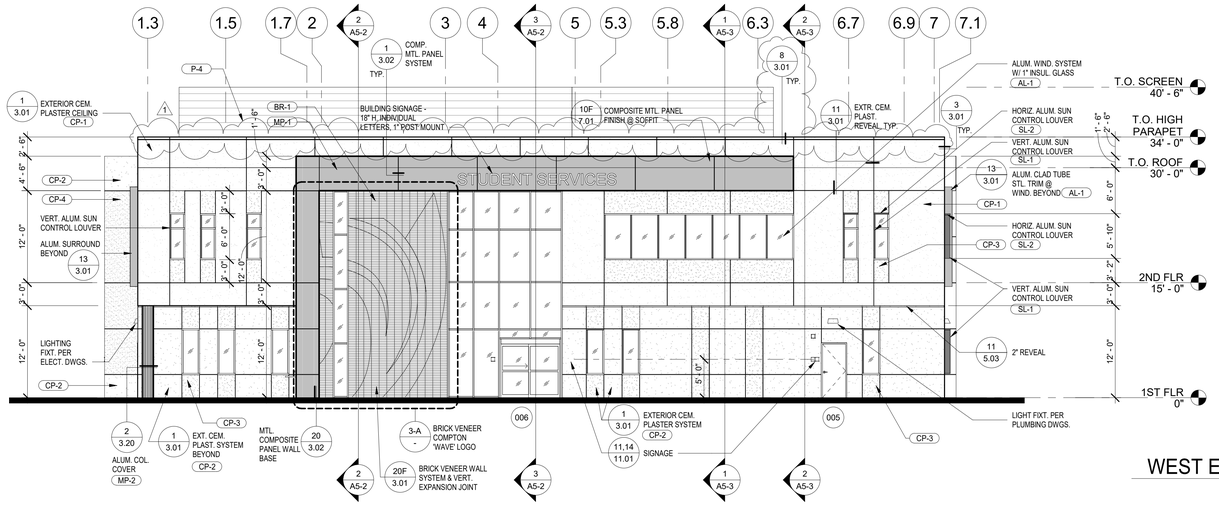


C

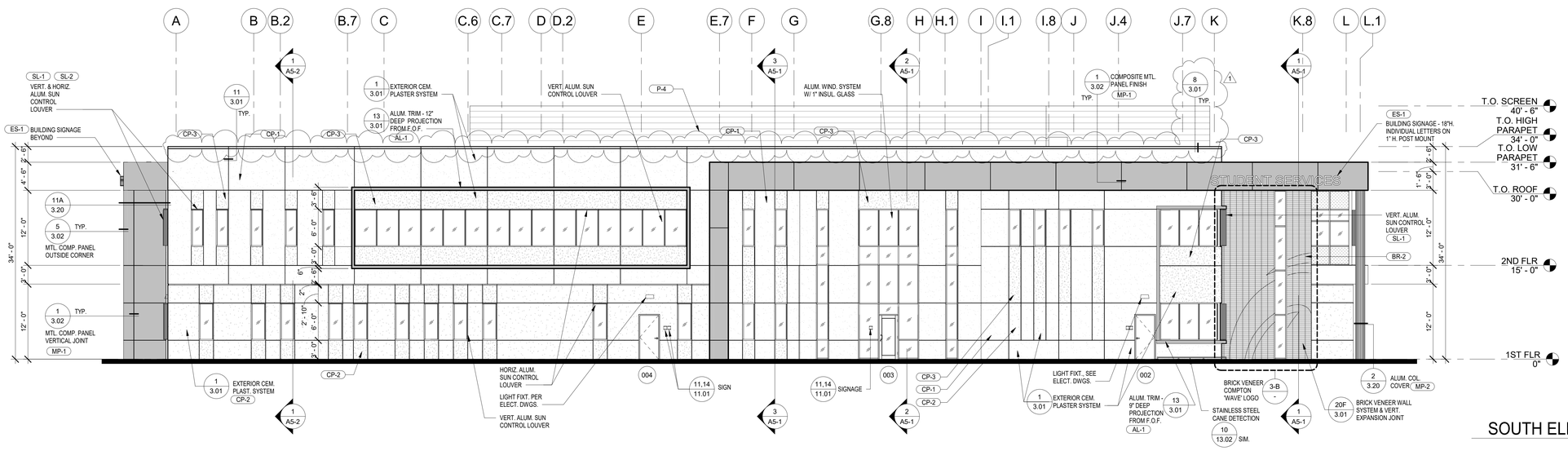
CCCD LOGO ON BRICK WALL

SCALE 1/4" = 1'-0" (3)



WEST ELEVATION

SCALE 1/8" = 1'-0" (2)



SOUTH ELEVATION

SCALE 1/8" = 1'-0" (1)

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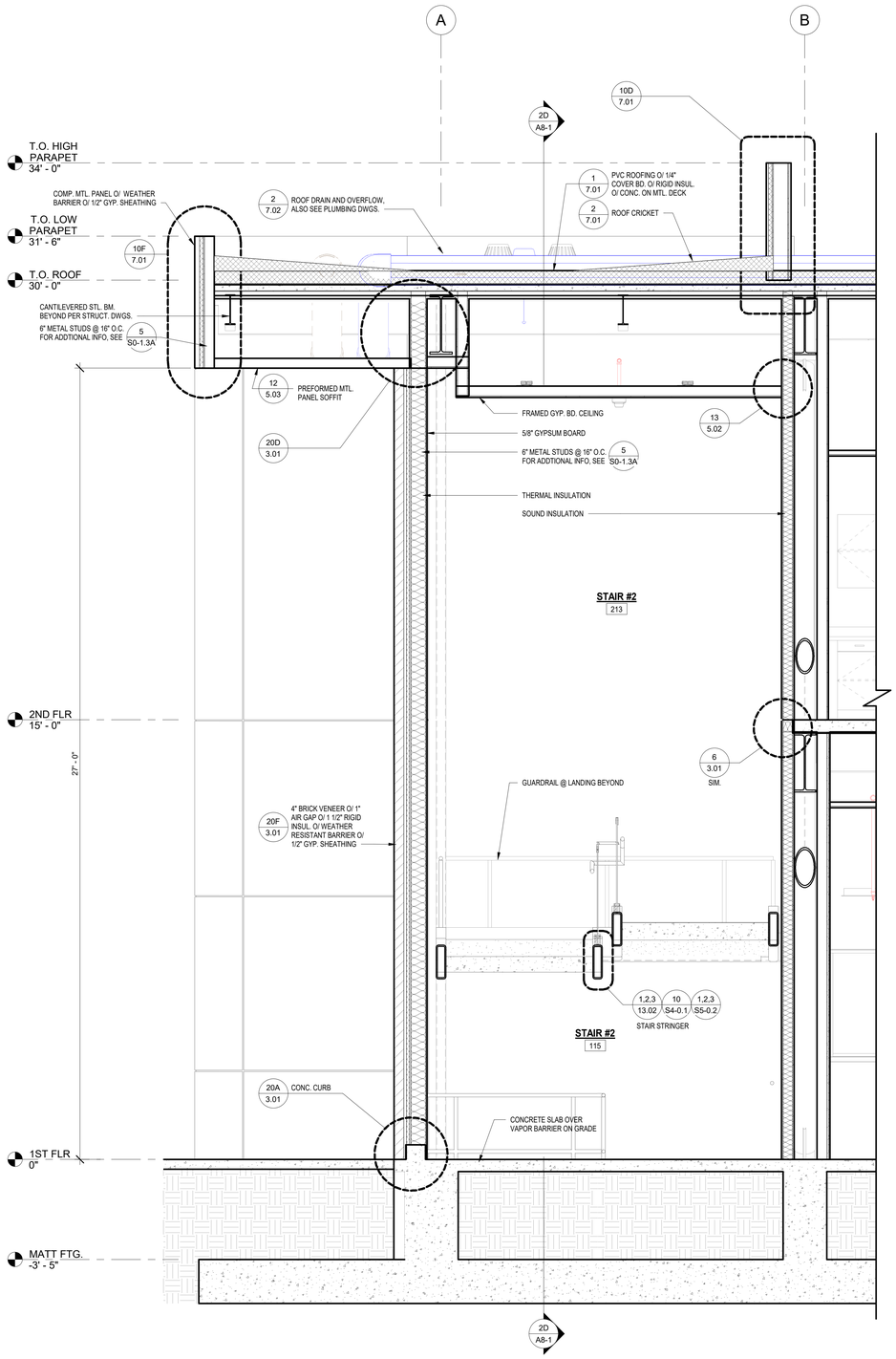
drawing title:

EXTERIOR ELEVATIONS

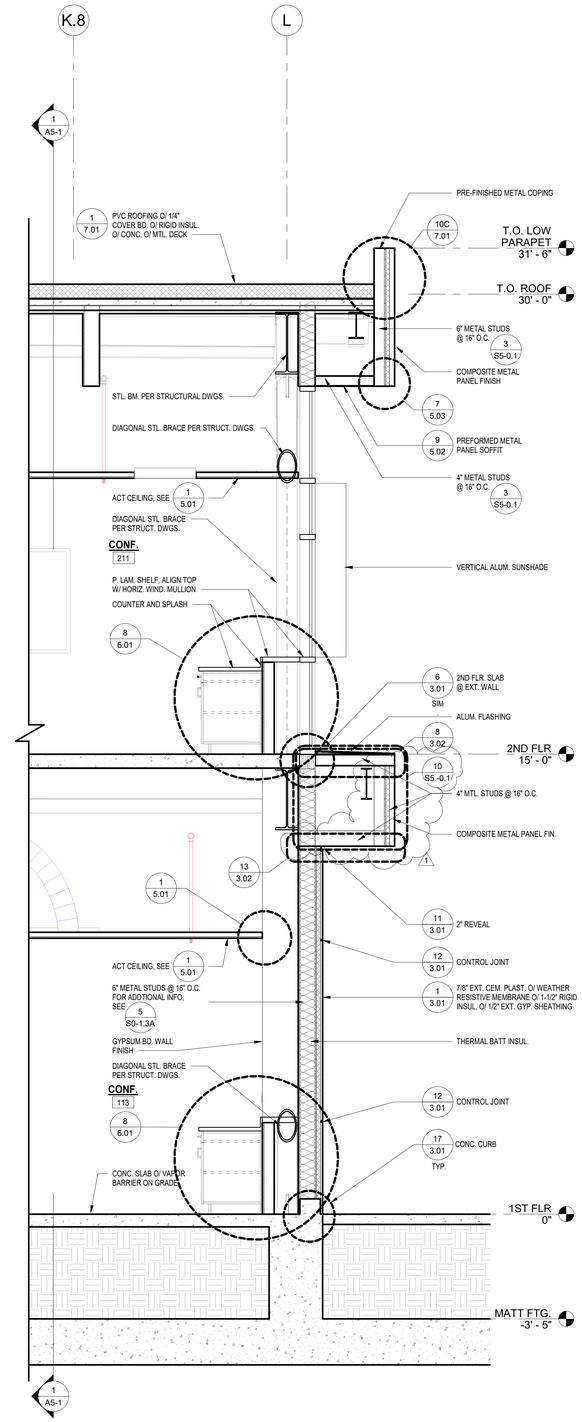
drawing no.:

A4-2

drawing of



WALL SECTION 10 (2)
SCALE 1/2" = 1'-0"



WALL SECTION 9 (1)
SCALE 1/2" = 1'-0"

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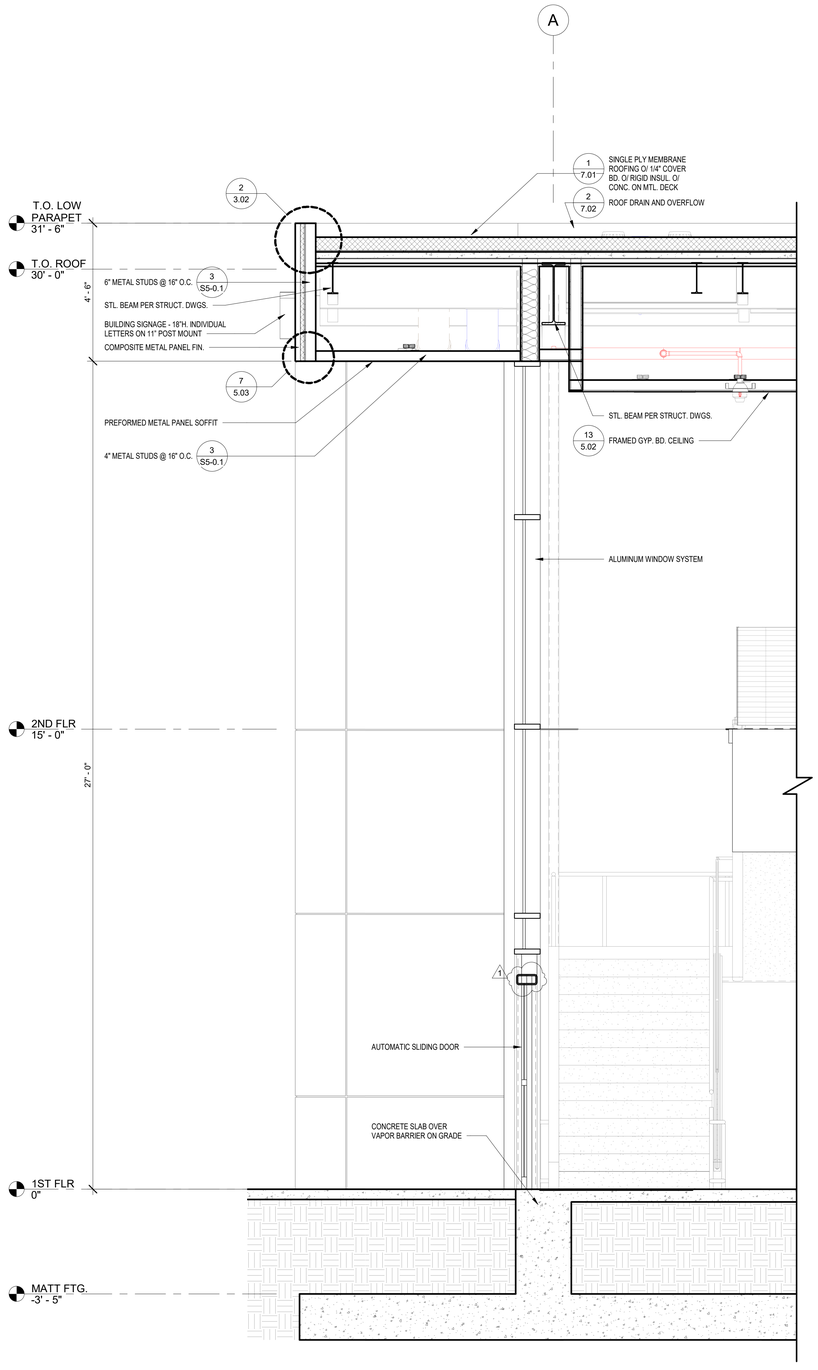
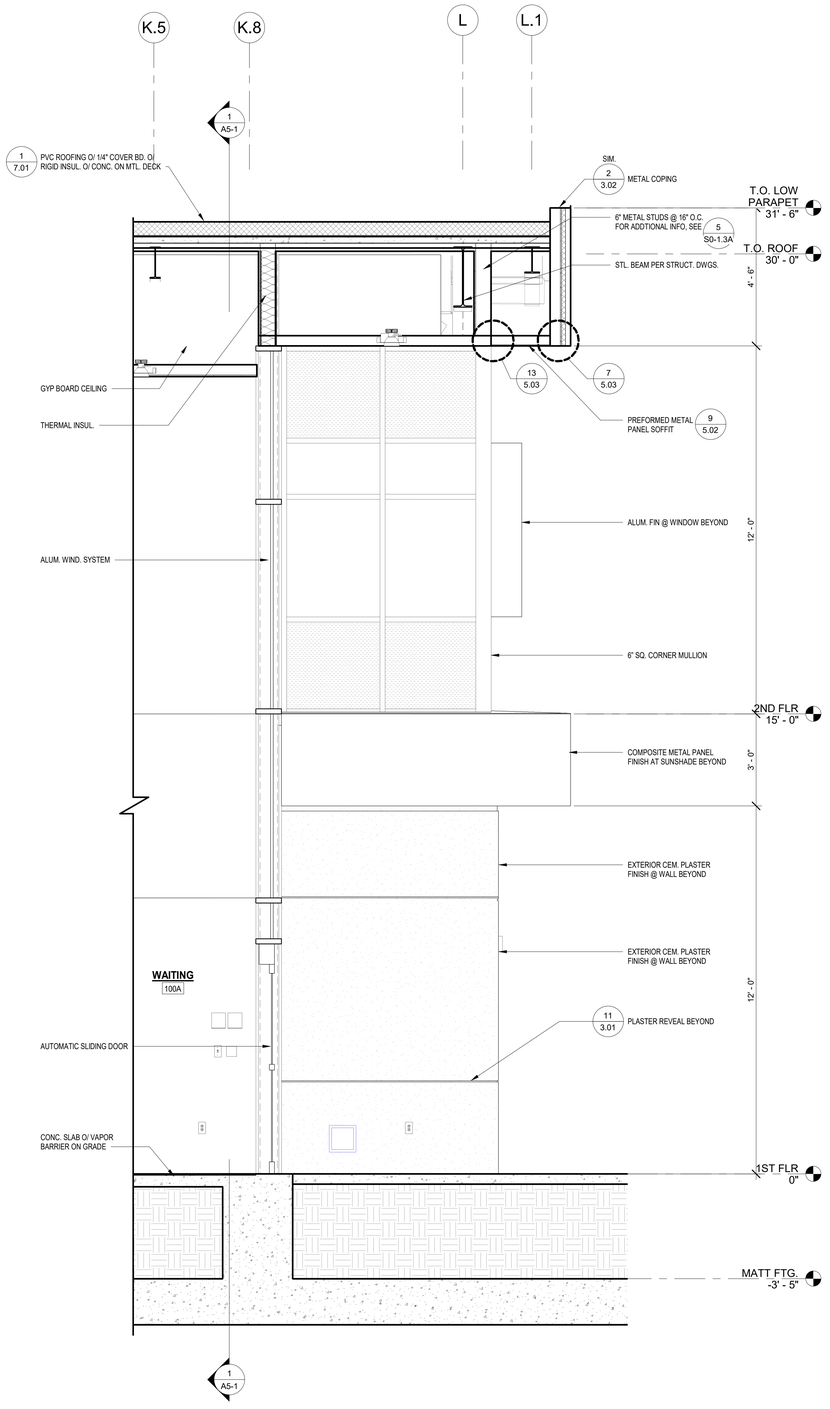
drawing title:
WALL SECTIONS

drawing no.:
A6-4
drawing of



WALL SECTION 12 (2)
SCALE 1/2" = 1'-0"



WALL SECTION 11 (1)
SCALE 1/2" = 1'-0"

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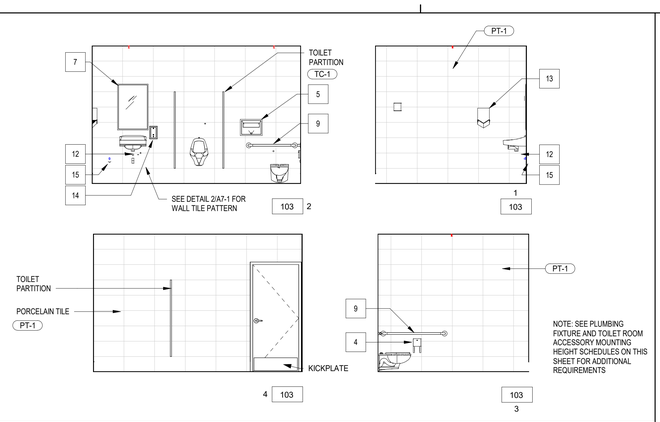
1	11/20/19	Addendum 1

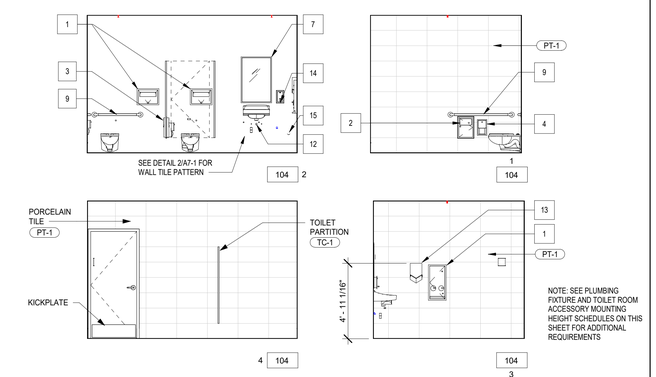
drawing title:
WALL SECTIONS

drawing no.:
A6-5

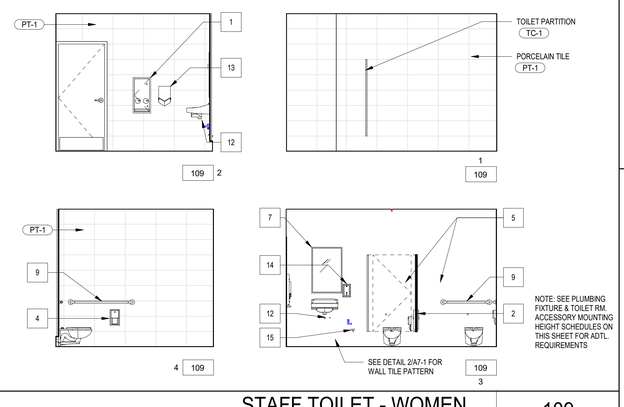
drawing of



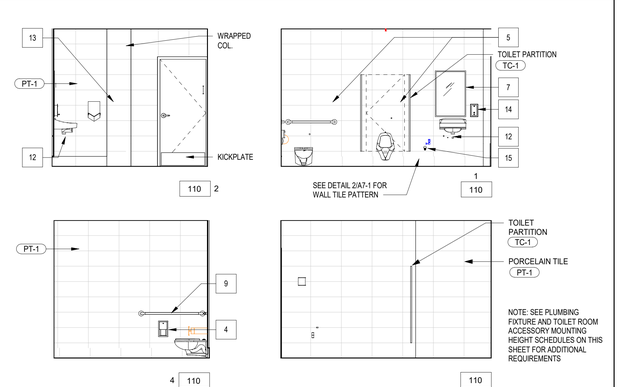
MEN'S RESTROOM 103
SCALE: 1/4"=1'-0"



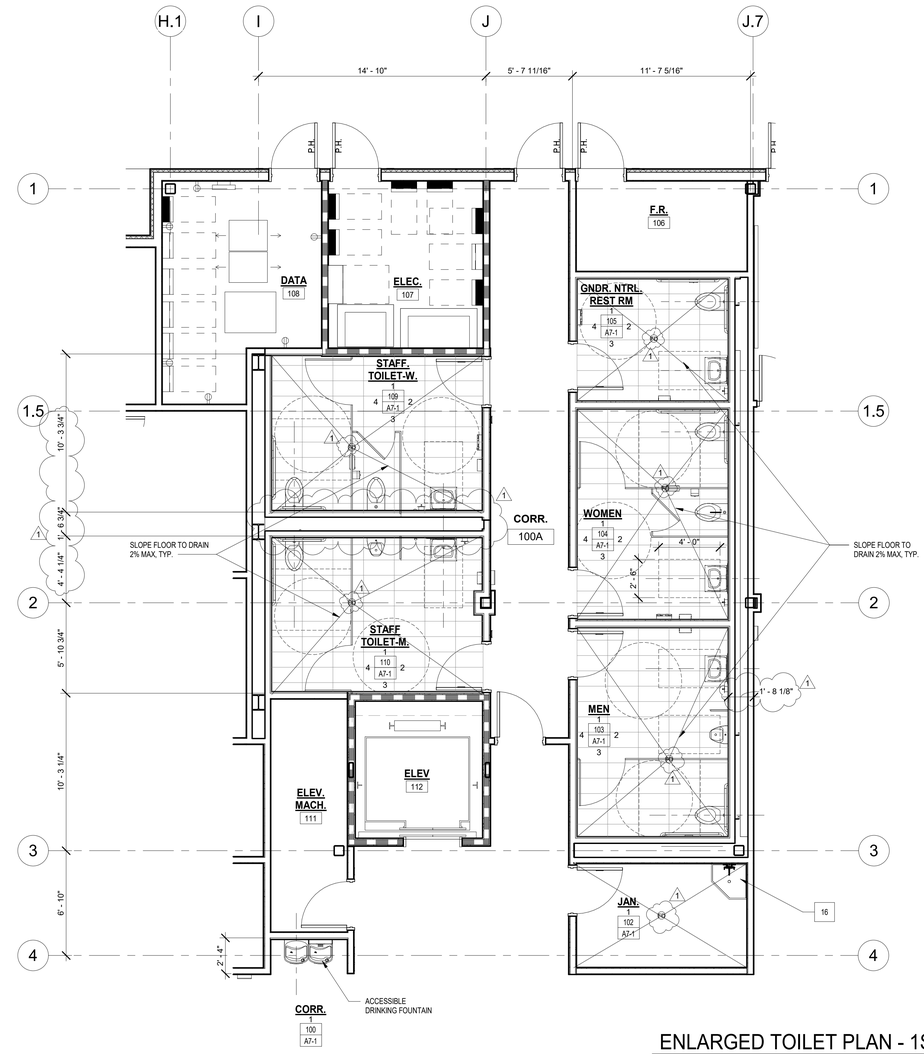
WOMEN'S RESTROOM 104
SCALE: 1/4"=1'-0"



STAFF TOILET - WOMEN 109
SCALE: 1/4"=1'-0"



STAFF TOILET - MEN 110
SCALE: 1/4"=1'-0"

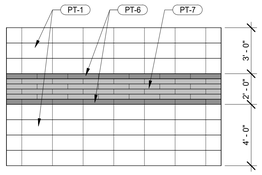


ENLARGED TOILET PLAN - 1ST FLR 1
SCALE 1/4" = 1'-0"

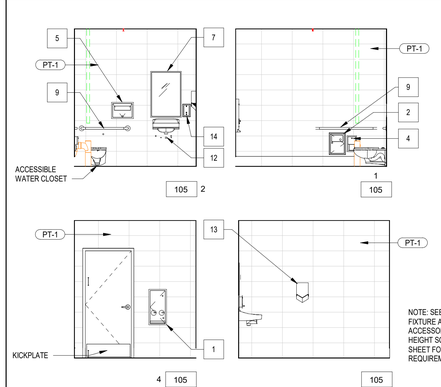
NOTES:

SEE PLUMBING FIXTURE & TOILET RM. ACCESSORY MOUNTING HEIGHT SCHEDULES ON THIS SHEET FOR ADTL. REQUIREMENTS

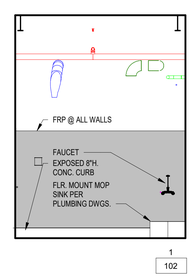
ALL DIMENSIONS IN RESTROOMS ARE TO FACE OF FINISH



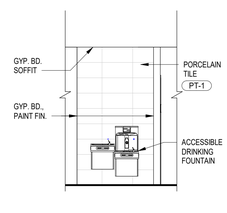
TOILET WALL PATTERN 3
SCALE 1/4" = 1'-0"



GENDER NEUTRAL RESTROOM 105
SCALE: 1/4"=1'-0"



JANITOR 102
SCALE: 1/4"=1'-0"

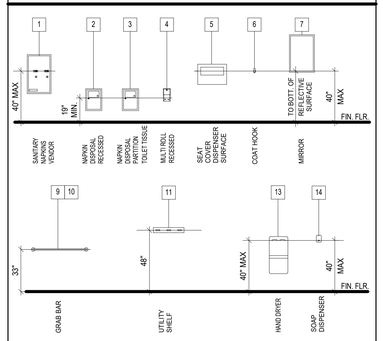


DRINKING FOUNTAIN 100
SCALE: 1/4"=1'-0"

TOILET ROOM ACCESSORY KEYNOTES

1	SANITARY NAPKIN VENDOR, 25 CENT COIN OPERATION, SEMI-RECESSED
2	SANITARY NAPKIN DISPOSAL, RECESSED
3	SANITARY NAPKIN DISPOSAL, PARTITION MOUNTED (SERVES 2 COMPARTMENTS)
4	TOILET TISSUE DISPENSER, RECESSED MULTI-ROLL
5	SEAT COVER DISPENSER, SURFACE MOUNTED
6	COAT HOOK
7	MIRROR, STAINLESS STEEL FRAMED, 24" X 36"
8	MIRROR, FULL WIDTH, FRAMELESS STAINLESS STEEL
9	GRAB BAR
10	GRAB BAR, L-SHAPED
11	UTILITY SHELF WITH MOP AND BROOM HOLDER
12	UNDERLAVATORY GUARDS: MOLDED VINYL COVERING FOR SUPPLY AND DRAIN PIPING WITH FLIP TOPS AT VALVE TO ALLOW SERVICE ACCESS WITHOUT REMOVING COVERINGS
13	ELECTRIC HAND DRYER
14	SOAP DISPENSER, VERTICAL TANK, SURFACE MOUNTED, OFCI
15	HOSE BIBB PER PLUMBING DRAWINGS
16	FLOOR MOUNTED SERVICE SINK PER PLUMBING DRAWINGS
17	GAS WATER HEATER PER PLUMBING DRAWINGS
18	ROOF ACCESS LADDER

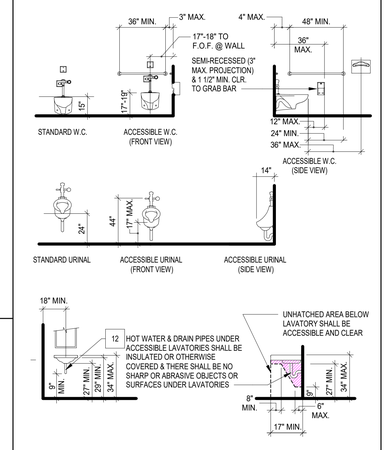
TOILET RM. ACCESSORY MOUNTING HEIGHTS



NOTES:

1. MOUNTING HEIGHTS SHOWN ARE TYPICAL, UNLESS OTHERWISE NOTED.
2. ALL ACCESSORIES SHALL BE ACCESSIBLE WITH A MAXIMUM REACH HEIGHT OF 40" ABOVE FINISH FLOOR.
3. SLOPE FLOORS 1/8" PER FOOT MINIMUM AND 1/4" PER FOOT MAXIMUM, UNLESS NOTED OTHERWISE.
4. SEE ENLARGED TOILET PLAN AND INTERIOR ELEVATION DRAWINGS FOR TOILET ACCESSORY LOCATIONS
5. OWNER FURNISHED ACCESSORIES SHALL BE CONTRACTOR INSTALLED
6. PROVIDE BACKING FOR GRAB BARS AND SHELVES PER 1 / 6.01

PLUMBING FIXTURE MOUNTING HEIGHTS



PLUMBING FIXTURE / ACCESSORIES CLEARANCES TO FINISHED SURFACE

	ADULT
TOILET CENTERLINE FROM WALL	18"
TOILET SEAT HEIGHT (AT SEAT LID)	17"-19"
GRAB BAR HEIGHT (SIDE)	33"
TOILET PAPER IN FRONT OF TOILET	12" MAX.
NAPKIN DISPOSAL IN FRONT OF TOILET	12" MAX.
DISPENSER OR MIRROR HEIGHT	40" MAX.
LAVATORY/SINK TOP HEIGHT	34" MAX.
LAVATORY/SINK KNEE CLEARANCE	29" MAX.
URINAL LIP HEIGHT	17" MAX.
URINAL FLUSH HANDLE HEIGHT	44" MAX.
DRINKING FOUNTAIN BUBBLER HEIGHT	36" MAX.
DRINKING FOUNTAIN KNEE CLEARANCE	27" MIN.
RAMP/STAIR HANDRAIL HEIGHT	34"-38"

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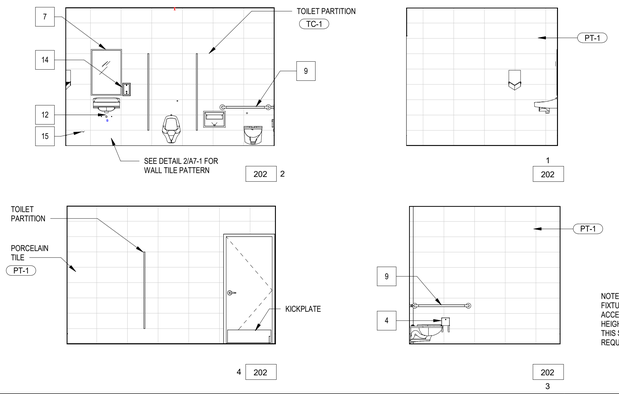
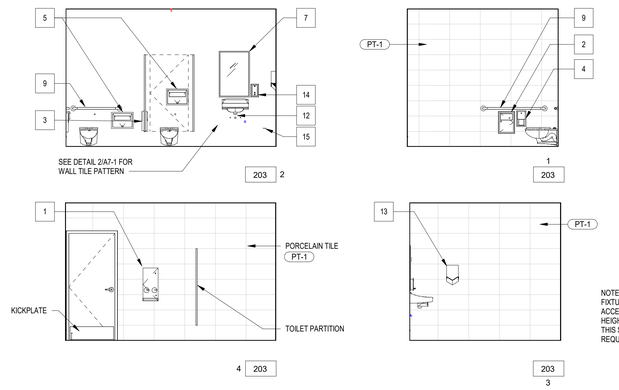
drawing title:
ENLARGED TOILET RM. PLANS & ELEVS. - 1ST FLR

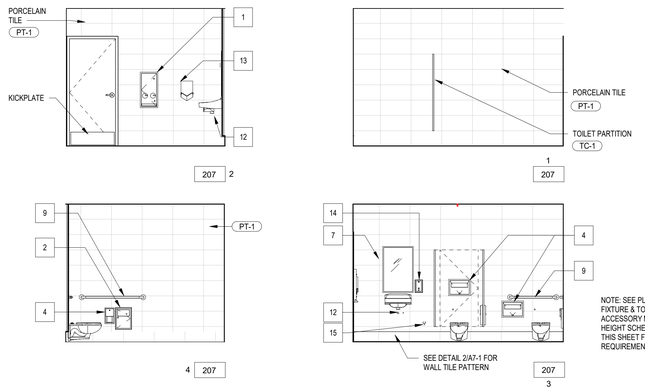
drawing no.:
A7-1
drawing of



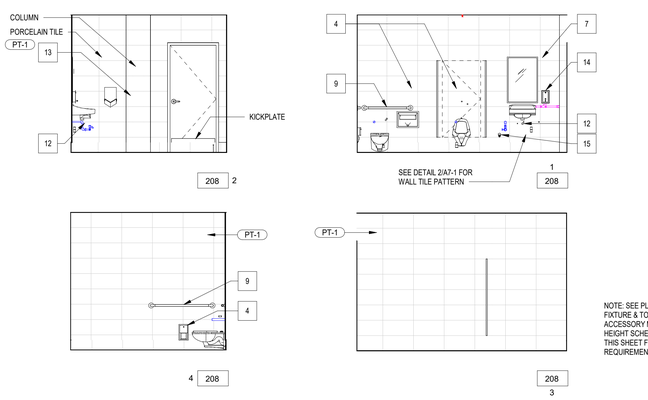
MEN'S RESTROOM
SCALE: 1/4"=1'-0" — 202



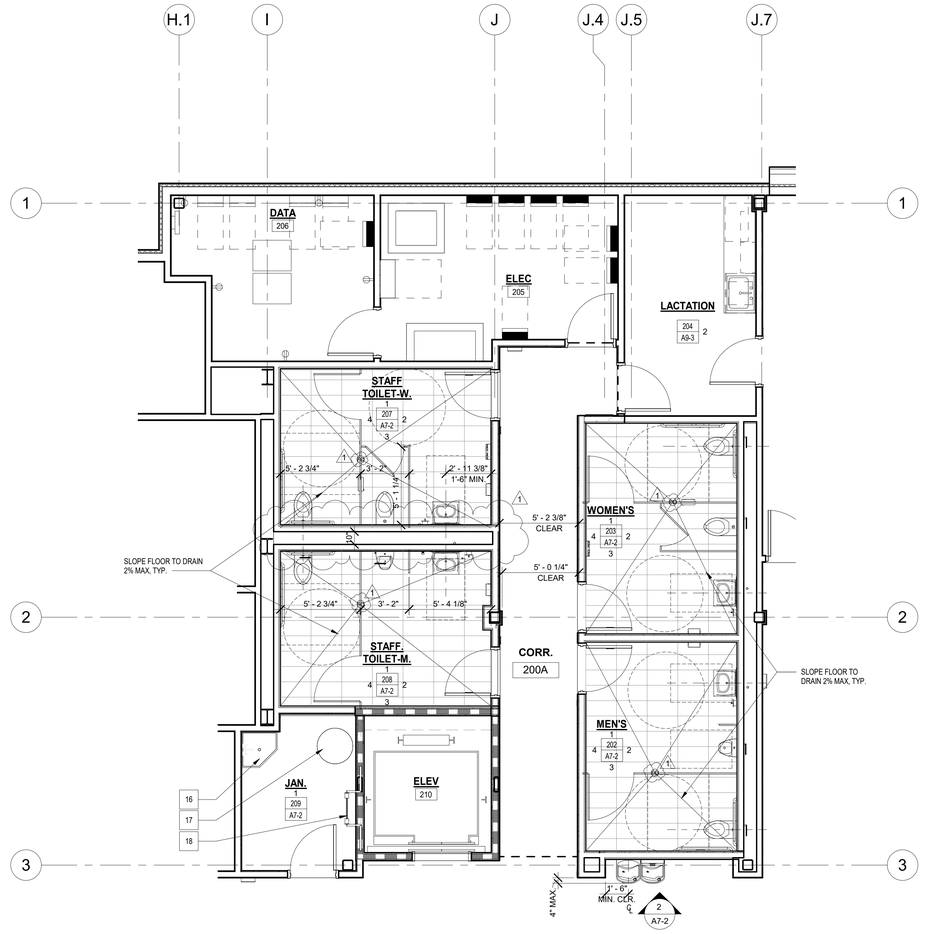
WOMEN'S RESTROOM
SCALE: 1/4"=1'-0" — 203



STAFF TOILET - WOMEN
SCALE: 1/4"=1'-0" — 207



STAFF TOILET - MEN
SCALE: 1/4"=1'-0" — 208



NOTES:

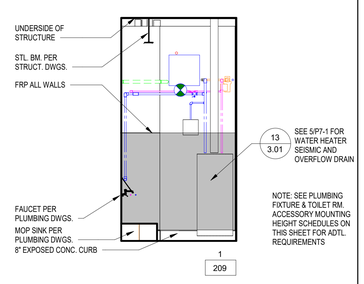
SEE PLUMBING FIXTURE & TOILET RM. ACCESSORY MOUNTING HEIGHT SCHEDULES ON THIS SHEET FOR ADTL. REQUIREMENTS

ALL DIMENSIONS IN RESTROOMS ARE TO FACE OF FINISH

NORTH

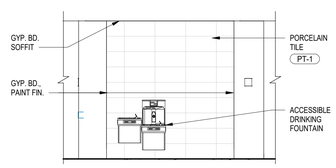
ENLARGED TOILET PLAN - 2ND FLR
SCALE 1/4" = 1'-0" — 1

0' 1' 2' 4' 8'



NOTE: SEE PLUMBING FIXTURE & TOILET RM. ACCESSORY MOUNTING HEIGHT SCHEDULES ON THIS SHEET FOR ADTL. REQUIREMENTS

JANITOR
SCALE: 1/4"=1'-0" — 209



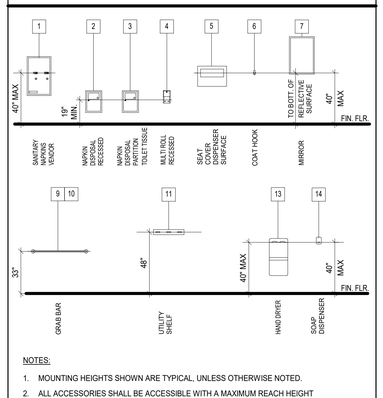
NOTE: SEE PLUMBING FIXTURE & TOILET RM. ACCESSORY MOUNTING HEIGHT SCHEDULES ON THIS SHEET FOR ADTL. REQUIREMENTS

CORRIDOR DRINKING FOUNTAIN
SCALE: 1/4"=1'-0" — 2

TOILET ROOM ACCESSORY KEYNOTES

1	SANITARY NAPKIN VENDOR, 25 CENT COIN OPERATION, SEMI-RECESSED
2	SANITARY NAPKIN DISPOSAL, RECESSED
3	SANITARY NAPKIN DISPOSAL, PARTITION MOUNTED (SERVES 2 COMPARTMENTS)
4	TOILET TISSUE DISPENSER, RECESSED MULTI-ROLL
5	SEAT COVER DISPENSER, SURFACE MOUNTED
6	COAT HOOK
7	MIRROR, STAINLESS STEEL FRAMED, 24" X 36"
8	MIRROR, FULL WIDTH, FRAMELESS STAINLESS STEEL
9	GRAB BAR
10	GRAB BAR, L-SHAPED
11	UTILITY SHELF WITH MOP AND BROOM HOLDER
12	UNDERLAVATORY GUARDS: MOLDED VINYL COVERING FOR SUPPLY AND DRAIN PIPING WITH FLIP TOPS AT VALVE TO ALLOW SERVICE ACCESS WITHOUT REMOVING COVERINGS ELECTRIC HAND DRYER
13	SOAP DISPENSER, VERTICAL TANK, SURFACE MOUNTED, OFCI
14	HOSE BIBB PER PLUMBING DRAWINGS
15	FLOOR MOUNTED SERVICE SINK PER PLUMBING DRAWINGS
16	GAS WATER HEATER PER PLUMBING DRAWINGS
17	ROOF ACCESS LADDER
18	

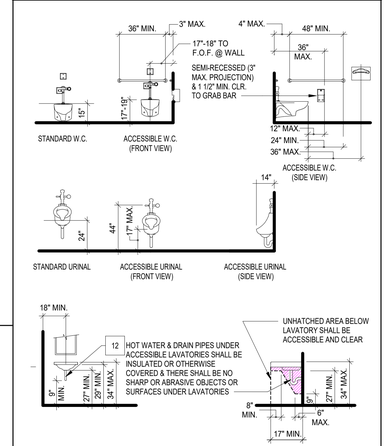
TOILET RM. ACCESSORY MOUNTING HEIGHTS



NOTES:

1. MOUNTING HEIGHTS SHOWN ARE TYPICAL, UNLESS OTHERWISE NOTED.
2. ALL ACCESSORIES SHALL BE ACCESSIBLE WITH A MAXIMUM REACH HEIGHT OF 40" ABOVE FINISH FLOOR.
3. SLOPE FLOORS 1/8" PER FOOT MINIMUM AND 1/4" PER FOOT MAXIMUM, UNLESS NOTED OTHERWISE.
4. SEE ENLARGED TOILET PLAN AND INTERIOR ELEVATION DRAWINGS FOR TOILET ACCESSORY LOCATIONS
5. OWNER FURNISHED ACCESSORIES SHALL BE CONTRACTOR INSTALLED
6. PROVIDE BACKING FOR GRAB BARS AND SHELVES PER 1/6.01

PLUMBING FIXTURE MOUNTING HEIGHTS



PLUMBING FIXTURE / ACCESSORIES CLEARANCES TO FINISHED SURFACE

	ADULT
TOILET CENTERLINE FROM WALL	18"
TOILET SEAT HEIGHT (AT SEAT LID)	17"-19"
GRAB BAR HEIGHT (SIDE)	33"
TOILET PAPER IN FRONT OF TOILET	12" MAX.
NAPKIN DISPOSAL IN FRONT OF TOILET	12" MAX.
DISPENSER OR MIRROR HEIGHT	40" MAX.
LAVATORY/SINK TOP HEIGHT	34" MAX.
LAVATORY/SINK KNEE CLEARANCE	29" MIN.
URINAL LIP HEIGHT	17" MAX.
URINAL FLUSH HANDLE HEIGHT	44" MAX.
DRINKING FOUNTAIN BUBBLER HEIGHT	36" MAX.
DRINKING FOUNTAIN KNEE CLEARANCE	27" MIN.
RAMP/STAIR HANDRAIL HEIGHT	34"-38"

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COMPTON, CA 90221
owner

tBP project number: 20987.00

file name: CC_SS_Central.RVT

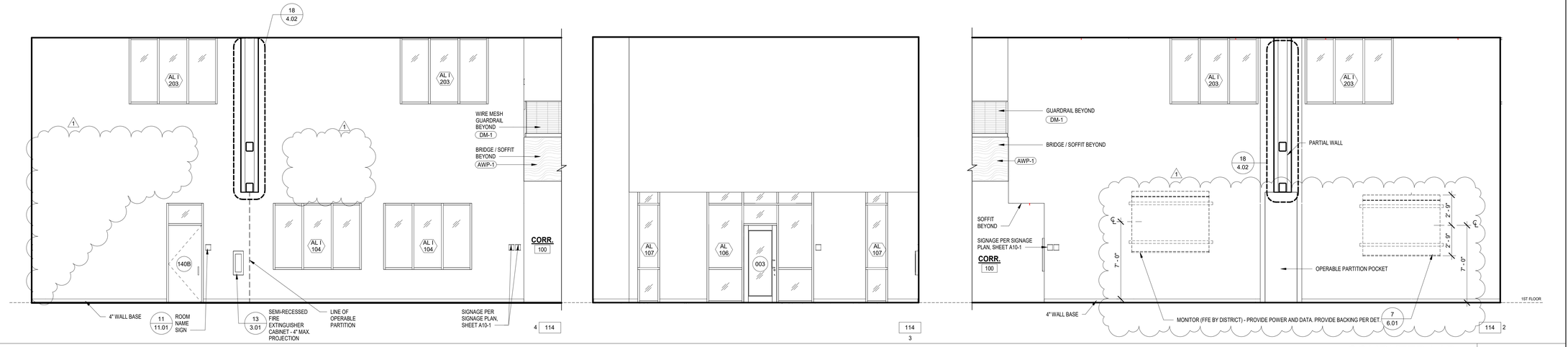
drawn by: Z. WEN checked by: T. HALL

date: 9.3.2019

rev:	date:	description:
1	11/20/19	Addendum 1

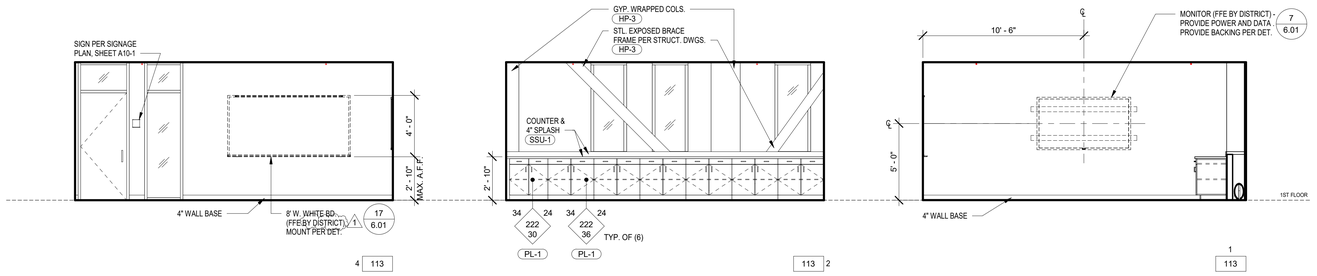
drawing title:
ENLARGED TOILET RM. PLANS & ELEVS. - 2ND FLR

drawing no.:
A7-2
drawing of



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

114



CONFERENCE
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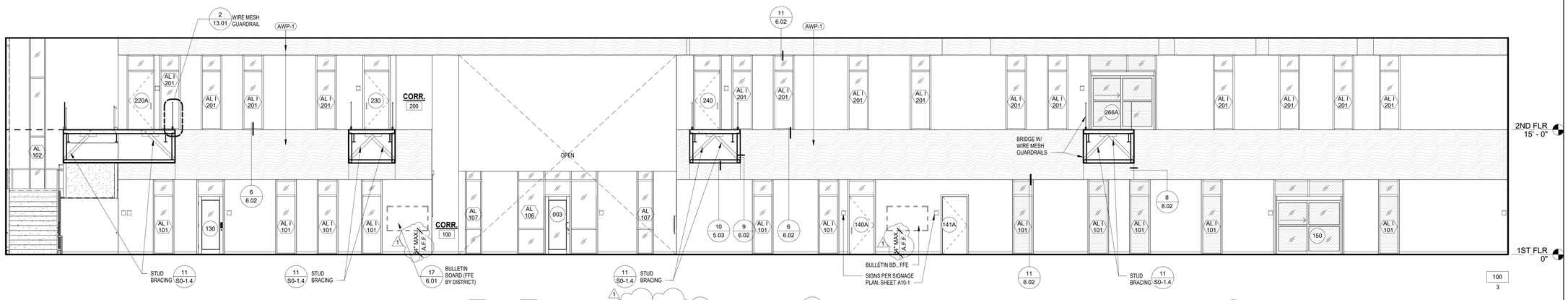
113



CORRIDOR
SCALE: 3/16"=1'-0"

100, 200

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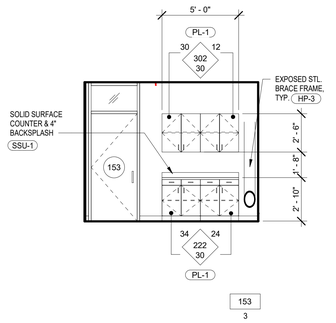
rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
INTERIOR ELEVATIONS

drawing no.:
A9-1
drawing of



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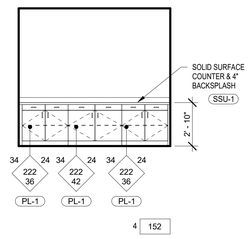

SUPPLY STOR.
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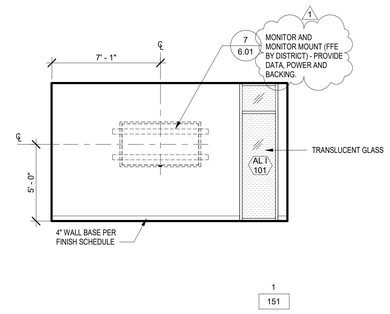

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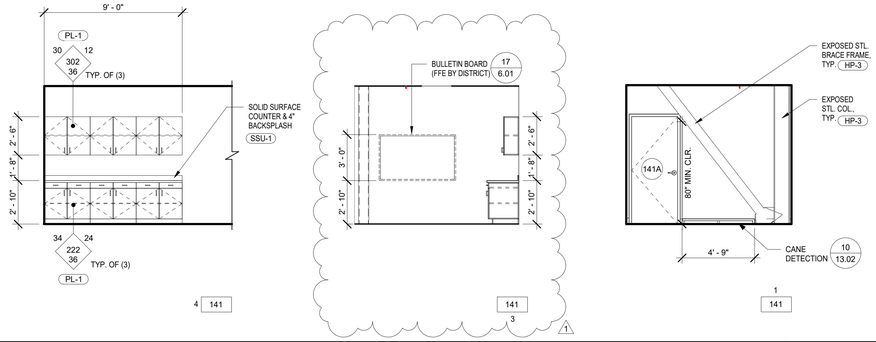

STOR. / WORKROOM
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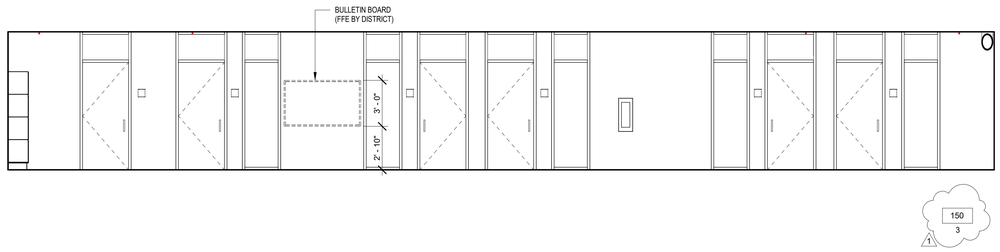

SRC OPEN OFFICE
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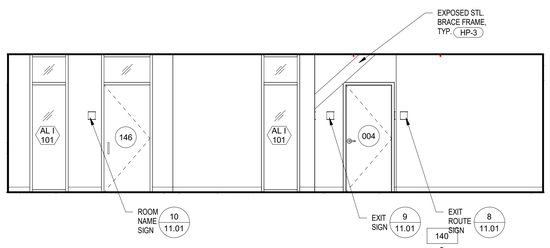

SSSP / WELCOME CENTER / OUTREACH
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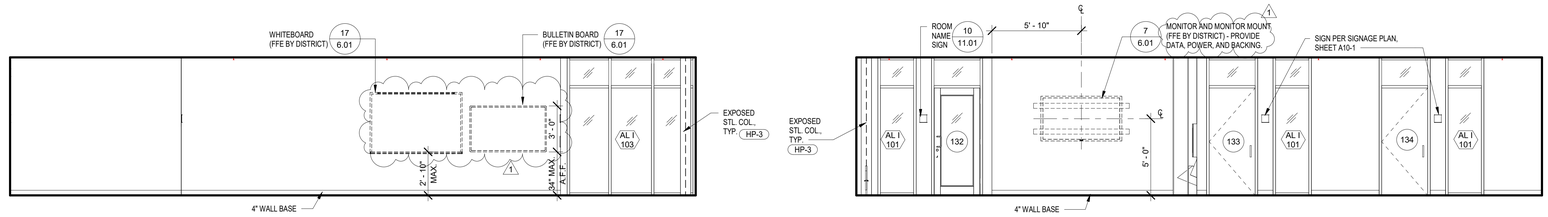

TRIO OPEN OFFICE
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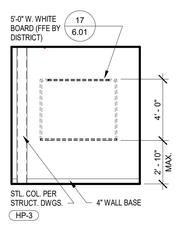

STUDY
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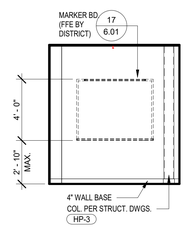

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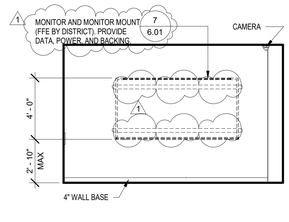

TESTING CENTER
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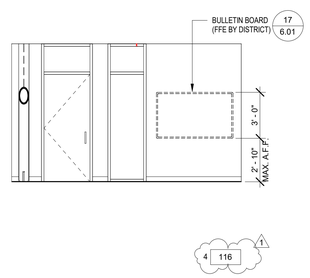

INNOVATION CENTER
SCALE: 1/4"=1'-0"
116

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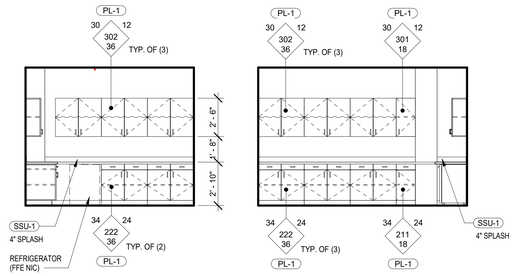
1	11/20/19	Addendum 1

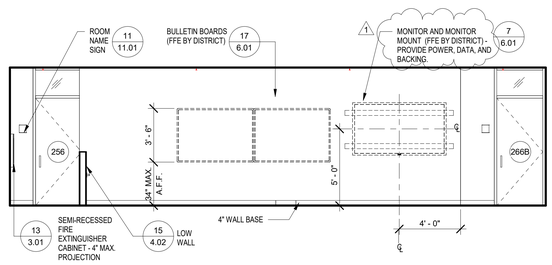
drawing title:
INTERIOR ELEVATIONS

drawing no.:
A9-2
drawing of



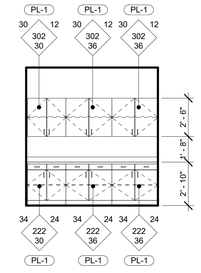
254 3 | 254 | 254 2

WORK/ STOR.
SCALE: 1/4"=1'-0" | 254



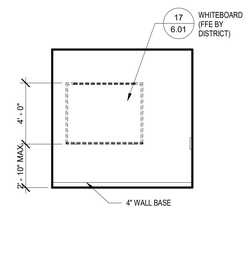
4 266

COUNSELING/ CAREER TRANSFER - OPEN OFFICE
SCALE: 1/4"=1'-0" | 266



241 2

WORK/ STOR.
SCALE: 1/4"=1'-0" | 241



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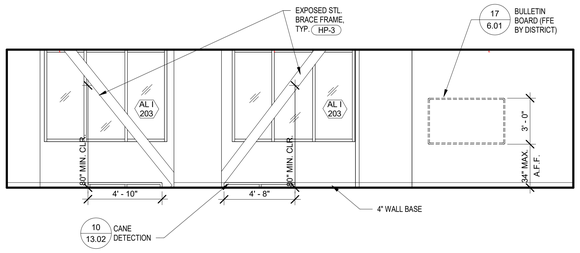
COUNS.
SCALE: 1/4"=1'-0" | 221



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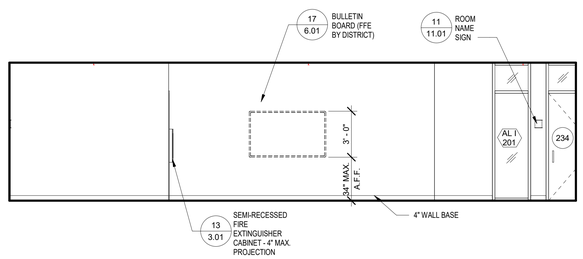
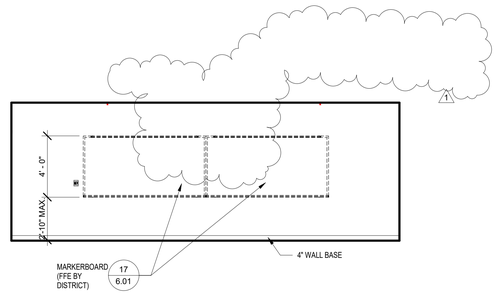


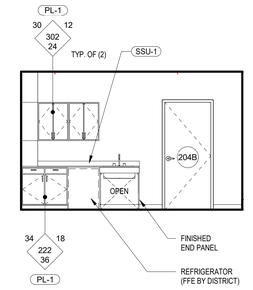
230 2

STUDENT EQUITY OPEN OFFICE
SCALE: 1/4"=1'-0" | 230



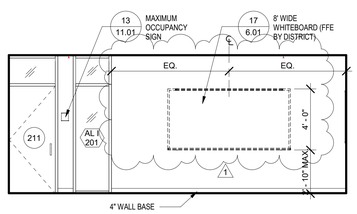
1 212

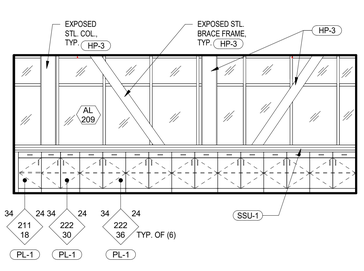
CLASSROOM
SCALE: 1/4"=1'-0" | 212

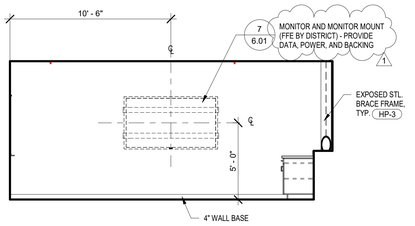


204 2

LACTATION
SCALE: 1/4"=1'-0" | 204

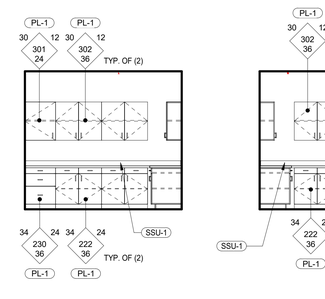






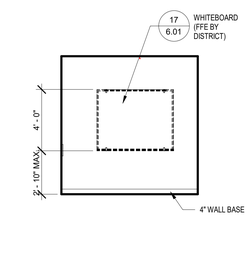
4 211 | 211 2 | 1 211

CONFERENCE ROOM
SCALE: 1/4"=1'-0" | 211



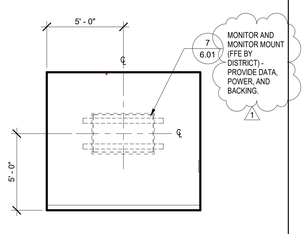
4 186 | 1 186

WORK/ STOR.
SCALE: 1/4"=1'-0" | 186



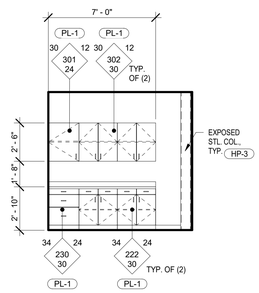
4 184

DIRECTOR
SCALE: 1/4"=1'-0" | 184



181 3

HUDDLE
SCALE: 1/4"=1'-0" | 181



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WORK/ STOR.
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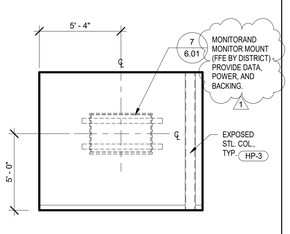
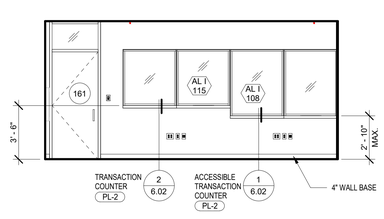
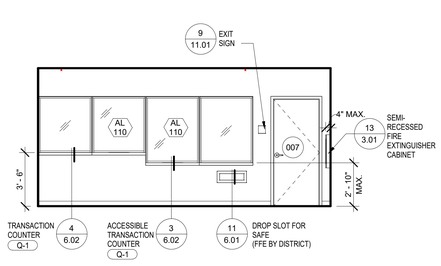


171 2

HUDDLE
SCALE: 1/4"=1'-0" | 171





161 3 | 1 161

BURSAR OPEN OFFICE
SCALE: 1/4"=1'-0" | 161

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COMPTON, CA 90221

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tBP project number: 20987.00

file name: CC_SS_Central.RVT

drawn by: Z. WEN checked by: T. HALL

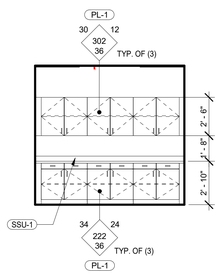
date: 9.3.2019

rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
INTERIOR ELEVATIONS

drawing no.:
A9-3

drawing of



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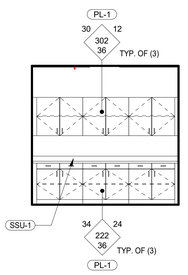
FILE/ STOR.
SCALE: 1/4"=1'-0"

281



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

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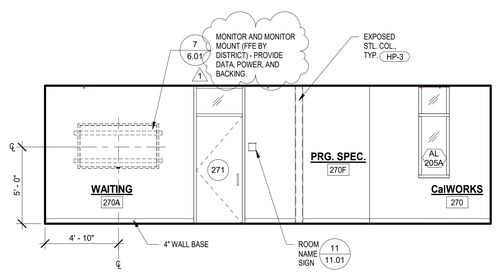

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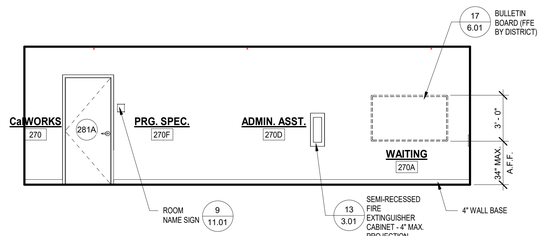

270 2

CALWORKS OPEN OFFICE
SCALE: 1/4"=1'-0"

270

DIVISION OF THE STATE ARCHITECT
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consultant

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STUDENT SERVICES BLDG.

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COMPTON, CA 90221

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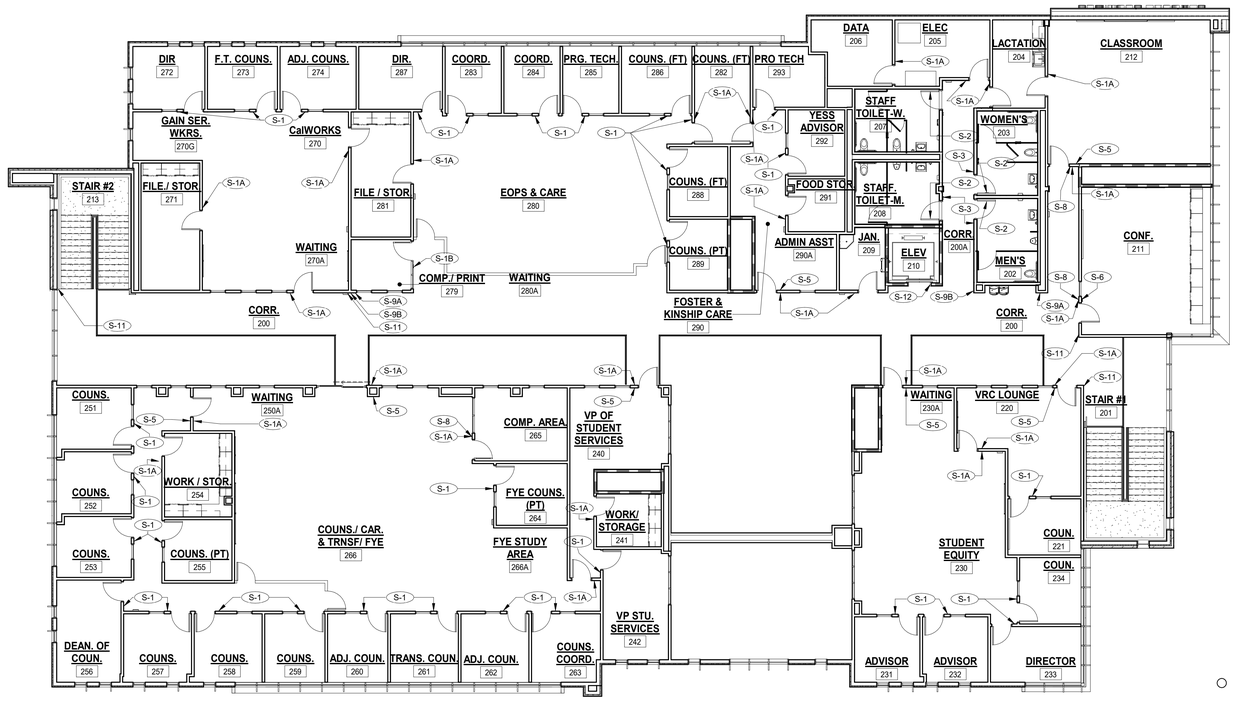
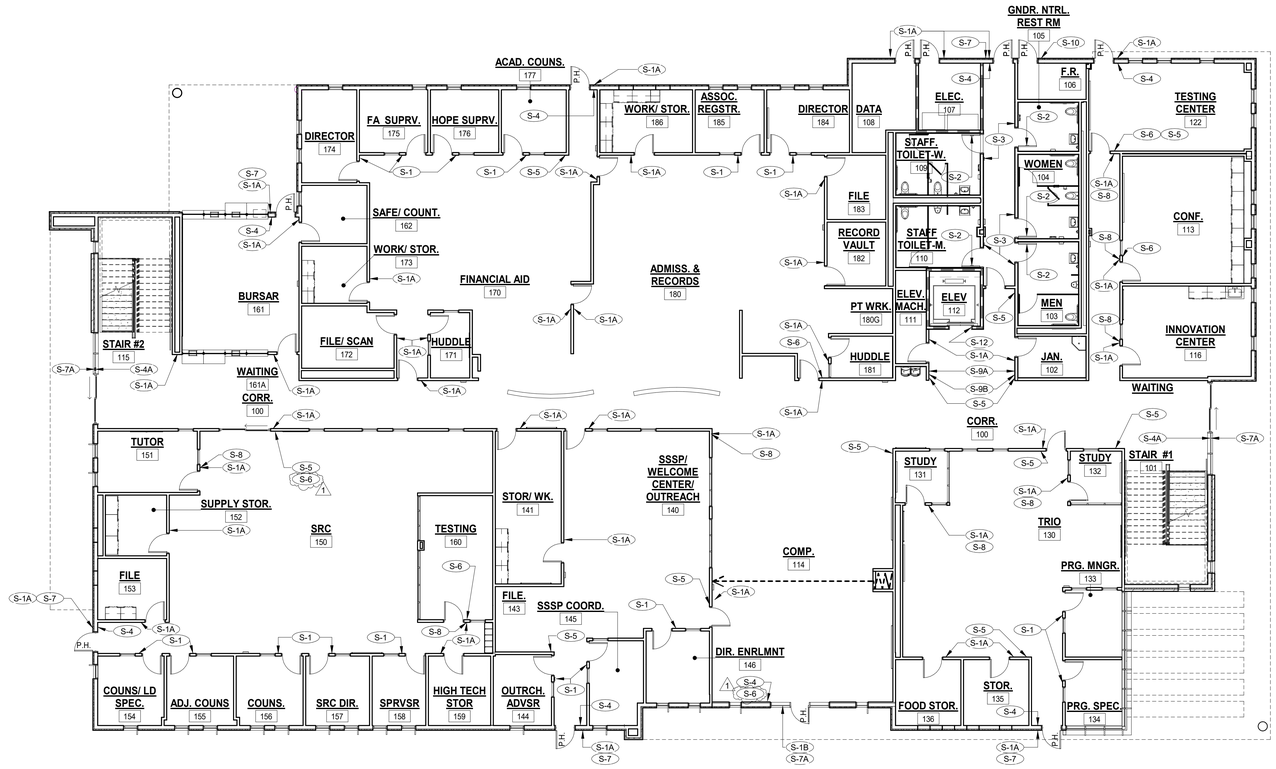
drawing no.:
A9-4
drawing of



2ND FLOOR SIGNAGE PLAN 2

SCALE 1" = 10'-0"



1ST FLOOR SIGNAGE PLAN 1

SCALE 1" = 10'-0"

GENERAL NOTES

1. REFER TO TYPICAL SIGNAGE LOCATION DETAIL 5/ 11.01.
2. REFER TO TYPICAL CHARACTER AND BRAILLE NOTES DETAIL 20/11.01.
3. REFER TO DETAILS 2, 3, 5/ 14.01 FOR ELEVATOR ENTRANCE AND ELEVATOR CAB SIGNAGE.
4. REFER TO DOOR SCHEDULE FOR ADDITIONAL SIGNAGE INFORMATION.

SIGNAGE LEGEND

- S-1 — ROOM NAME/ NUMBER SIGN WITH INSERT (WALL-MOUNT), SEE DOOR SCHEDULE AND 10/11.01
- S-1A — ROOM NAME/ NUMBER SIGN (WALL MOUNT), SEE DOOR SCHEDULE AND 11/11.01
- S-1B — ROOM NAME/ NUMBER SIGN (GLASS MOUNT), SEE DOOR SCHEDULE AND 11/11.01
- S-2 — TOILET ROOM SYMBOL (DOOR MOUNT), SEE DOOR SCHEDULE AND DETAILS 1/11.01, 2/11.01, 5/11.01, 6/11.01
- S-3 — TOILET ROOM SIGN (WALL MOUNT), SEE DOOR SCHEDULE AND DETAILS 3/11.01, 4/11.01, 7/11.01, 14/11.01
- S-4 — TACTILE "EXIT SIGN (INTERIOR) (WALL MOUNT), SEE 9/11.01
- S-4A — TACTILE "EXIT SIGN (INTERIOR), (GLASS MOUNT), SEE DET. 9/11.01
- S-5 — TACTILE "EXIT ROUTE" SIGN (INTERIOR), SEE 8/11.01
- S-6 — "MAXIMUM OCCUPANCY" SIGN (INTERIOR WALL MOUNT), SEE 13/11.01
- S-7 — ACCESSIBLE ENTRANCE SIGN (EXTERIOR) (WALL MOUNT), SEE 14/11.01
- S-7A — ACCESSIBLE ENTRANCE SIGN (EXTERIOR) (GLASS MOUNT), SEE 14/11.01
- S-8 — "ASSISTIVE LISTENING DEVICE" SIGN (INTERIOR WALL MOUNT), SEE 12/11.01
- S-9A — ELEVATOR DIRECTIONAL SIGN, SEE 19A/11.01
- S-9B — RESTROOM DIRECTIONAL SIGN, SEE 19B/11.01
- S-10 — "FIRE SPRINKLER RISER" SIGN (DOOR MOUNT), SEE 16/11.01
- S-11 — "EXIT STAIR DOWN" SIGN (WALL MOUNT), SEE 18/11.01
- S-12 — ELEVATOR SIGNAGE (JAMB MOUNT), SEE 3/14.01, 8/14.01, 14/14.01

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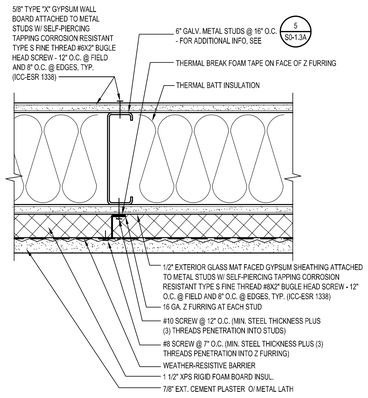
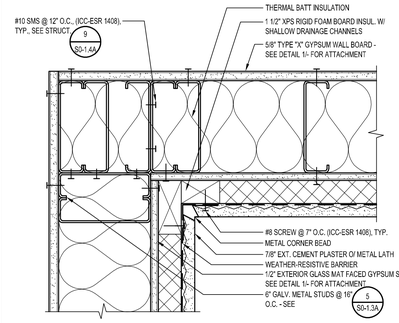
drawing no.:
A10-1
drawing of



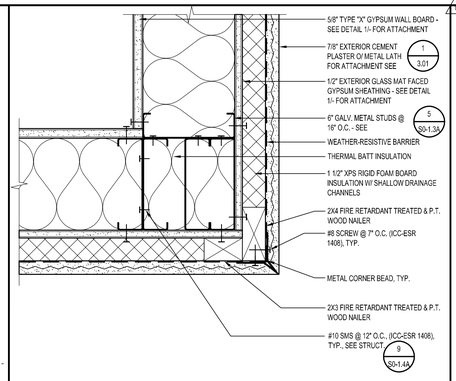
EXTERIOR CEMENT PLASTER WALL 1

SCALE: 3" = 1'-0"



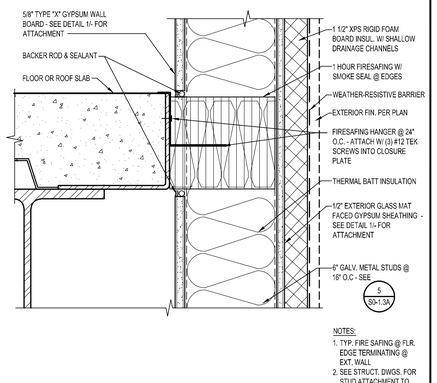
EXTERIOR PLASTER WALL - INSIDE CORNER 2

SCALE: 3" = 1'-0"



EXTERIOR PLASTER WALL - OUTSIDE CORNER 3

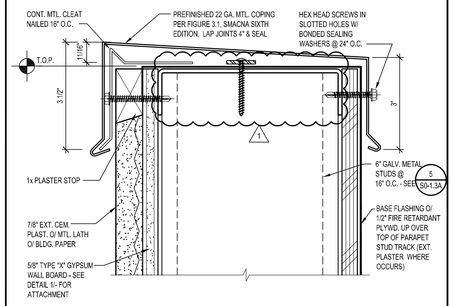
SCALE: 3" = 1'-0"



NOTES:
1. TYP. FIRE SAFING @ FLR. EDGE TERMINATING @ EXT. WALL
2. SEE STRUCT. DWGS. FOR STUD ATTACHMENT TO SLAB EDGE (15/S0-1.3A)

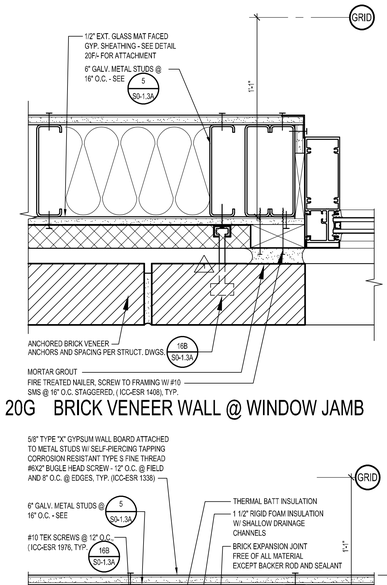
2ND. FLOOR SLAB @ EXT WALL 6

SCALE: 3" = 1'-0"

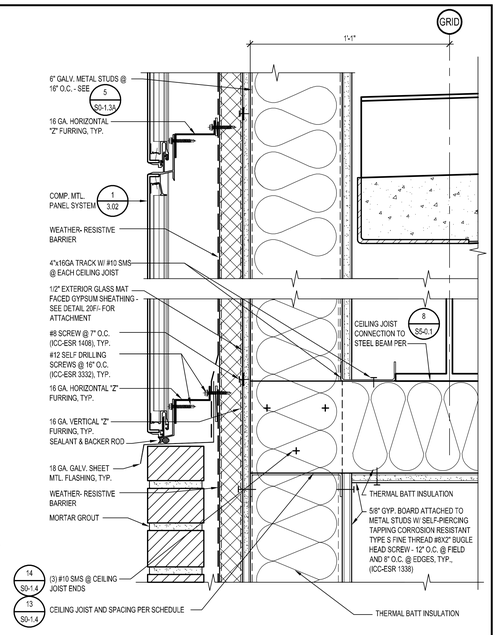


COPING - EXT. CEM. PLAST. PARAPET 8

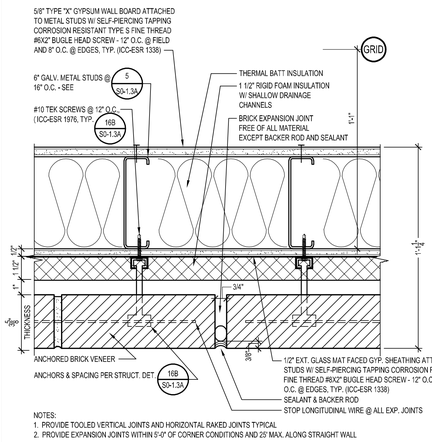
SCALE: HALF



20G BRICK VENEER WALL @ WINDOW JAMB

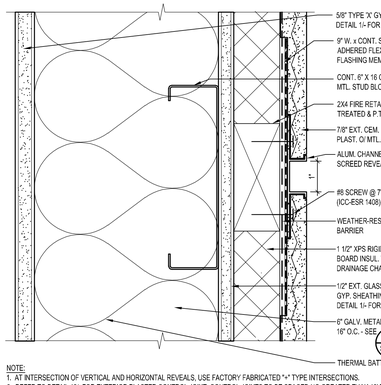


20D BRICK VENEER WALL @ METAL PANEL SOFFIT



NOTES:
1. PROVIDE TOOLED VERTICAL JOINTS AND HORIZONTAL RAKED JOINTS TYPICAL
2. PROVIDE EXPANSION JOINTS WITHIN 5'-0" OF CORNER CONDITIONS AND 25' MAX. ALONG STRAIGHT WALL

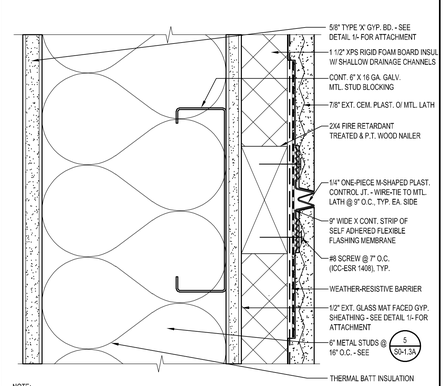
20F BRICK VENEER WALL SYSTEM @ VERT. EXPANSION JOINT



NOTE:
1. AT INTERSECTION OF VERTICAL AND HORIZONTAL REVEALS, USE FACTORY FABRICATED "•" TYPE INTERSECTIONS.
2. REFER TO DETAIL 12/- FOR EXTERIOR PLASTER CONTROL JOINT. CONTROL JOINTS TO BE SPACED NO GREATER THAN 18' BETWEEN REVEALS, AND PLASTER PANEL AREA BOUNDED BY CONTROL JOINTS TO NOT EXCEED 144 SQ. FT.

EXTERIOR PLASTER REVEAL 11

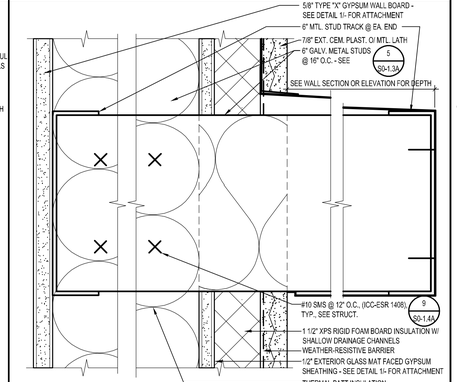
SCALE: 6" = 1'-0"



NOTE:
AT INTERSECTION OF VERTICAL AND HORIZONTAL REVEALS, USE FACTORY FABRICATED "•" TYPE INTERSECTIONS

EXTERIOR PLASTER CONTROL JOINT 12

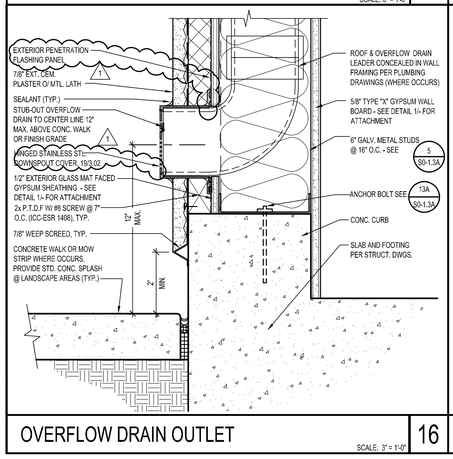
SCALE: 6" = 1'-0"



NOTE:
AT INTERSECTION OF VERTICAL AND HORIZONTAL REVEALS, USE FACTORY FABRICATED "•" TYPE INTERSECTIONS

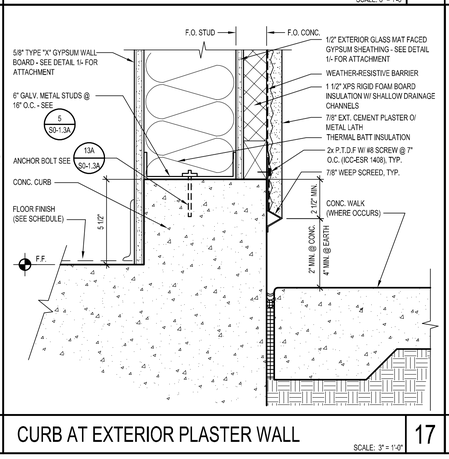
ALUM. TRIM 13

SCALE: 6" = 1'-0"



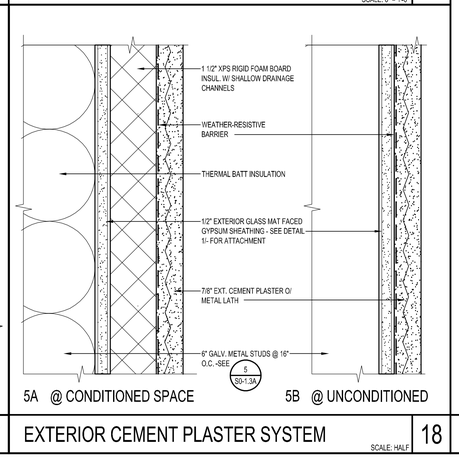
OVERFLOW DRAIN OUTLET

SCALE: 3" = 1'-0"



CURB AT EXTERIOR PLASTER WALL 17

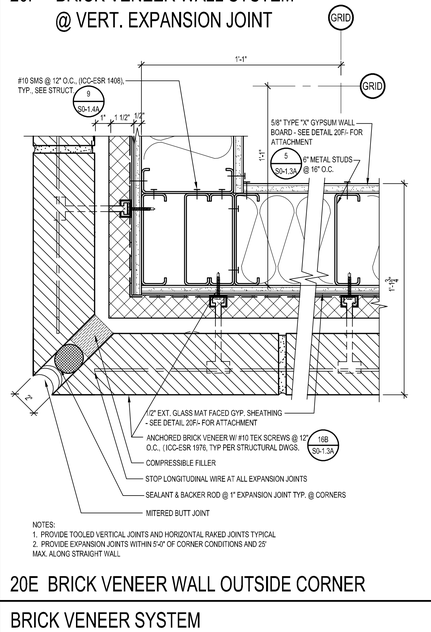
SCALE: 3" = 1'-0"



5A @ CONDITIONED SPACE 5B @ UNCONDITIONED

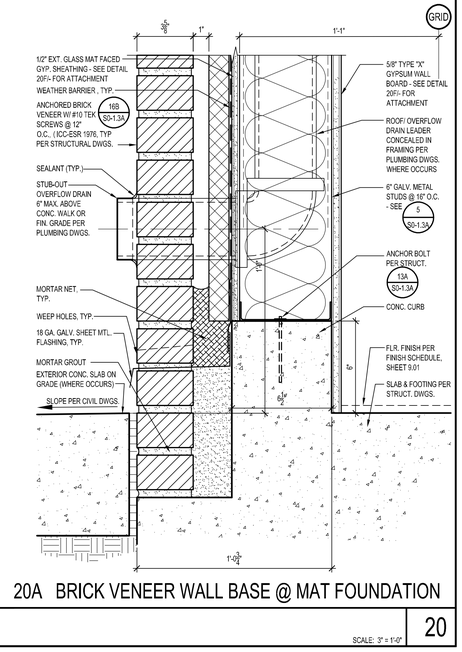
EXTERIOR CEMENT PLASTER SYSTEM 18

SCALE: HALF



NOTES:
1. PROVIDE TOOLED VERTICAL JOINTS AND HORIZONTAL RAKED JOINTS TYPICAL
2. PROVIDE EXPANSION JOINTS WITHIN 5'-0" OF CORNER CONDITIONS AND 25' MAX. ALONG STRAIGHT WALL

20E BRICK VENEER WALL OUTSIDE CORNER



20A BRICK VENEER WALL BASE @ MAT FOUNDATION

BRICK VENEER SYSTEM

SCALE: 3" = 1'-0"

20

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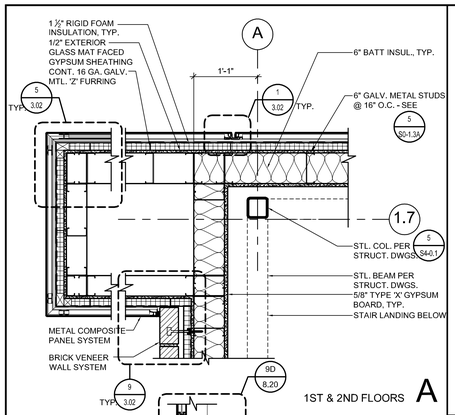
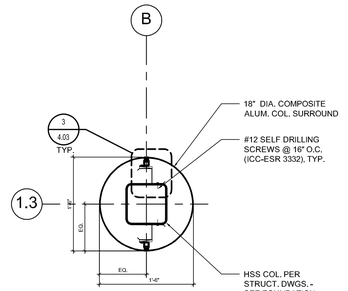
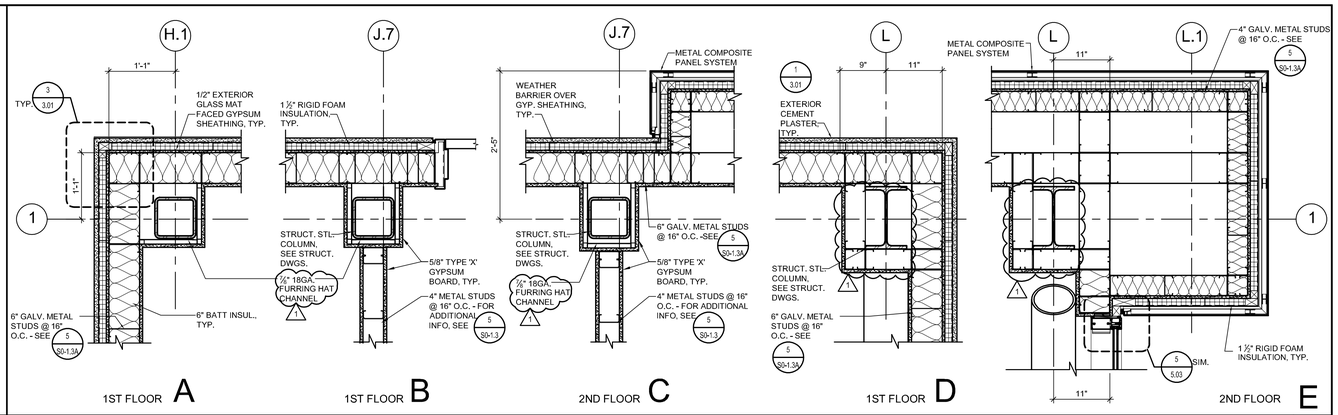
EXTERIOR WALL DETAILS

drawing no.:
3.01
drawing 61 of

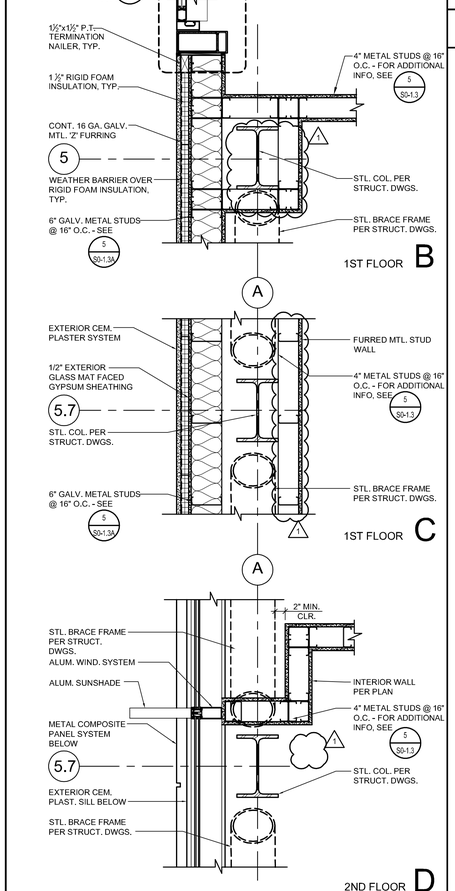




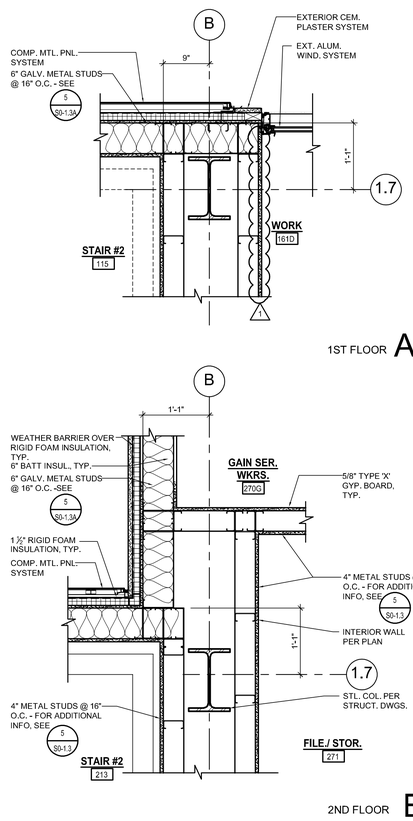
COL. B/1.3 (COL. L.1/7.1 SIM.) SCALE: 1" = 1'-0" | 2



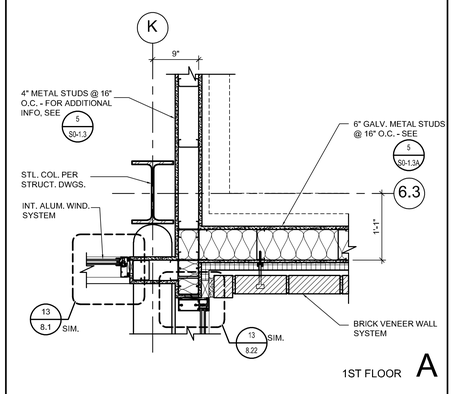
COLUMNS ALONG GRID 1 SCALE: 1" = 1'-0" | 5



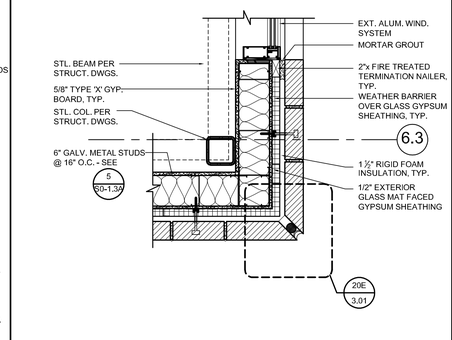
COLUMNS ALONG GRID A SCALE: 1" = 1'-0" | 11



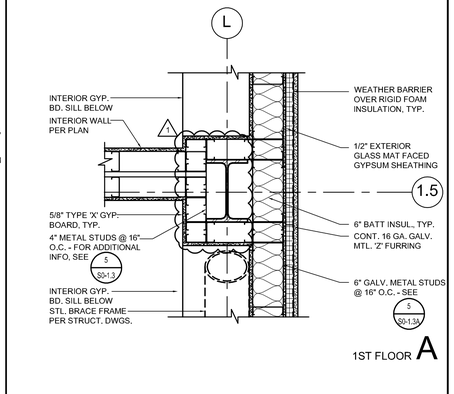
COLUMN B/1.7 SCALE: 1" = 1'-0" | 12

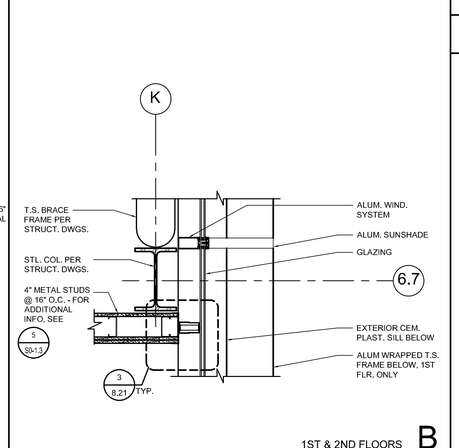


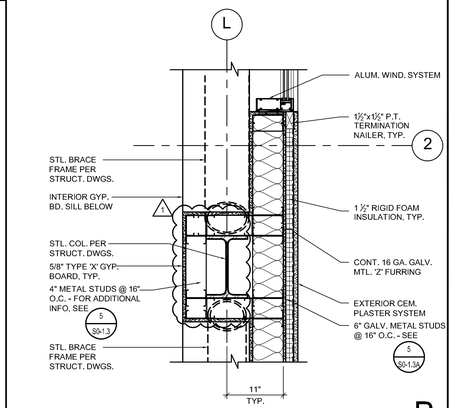
COLUMNS ALONG GRIDS K & K.7 SCALE: 1" = 1'-0" | 13

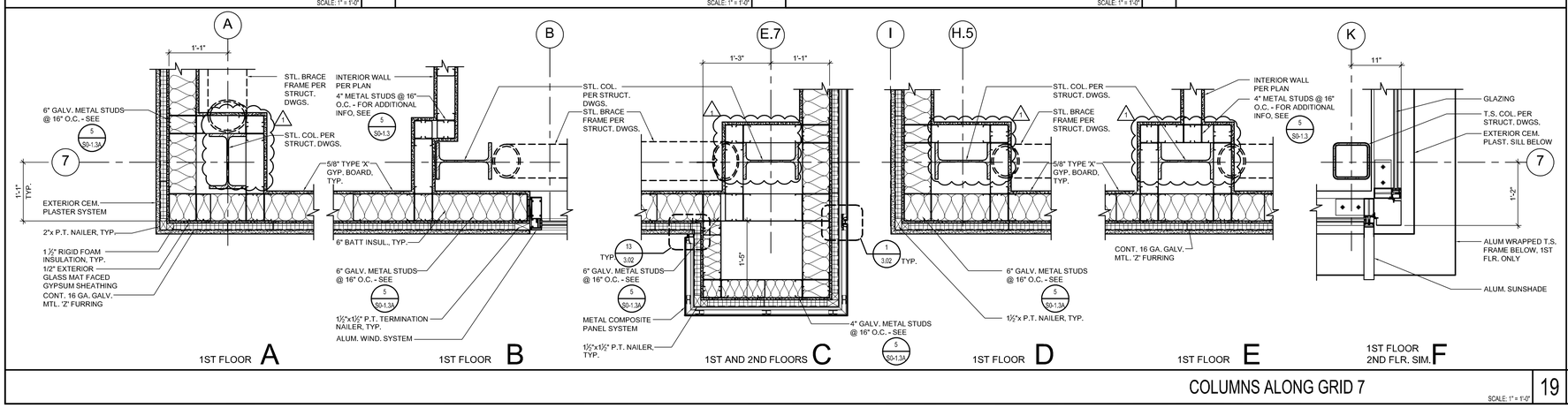


COLUMN @ GRIDS K.7/6.3 - 1ST/2ND FLRS. SCALE: 1" = 1'-0" | 9

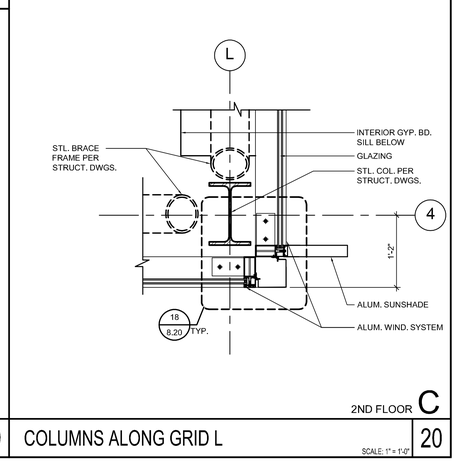








COLUMNS ALONG GRID 7 SCALE: 1" = 1'-0" | 19



COLUMNS ALONG GRID L SCALE: 1" = 1'-0" | 20

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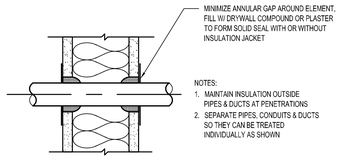
drawing title:

EXTERIOR COLUMNS

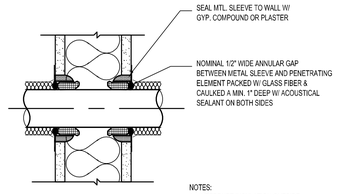
drawing no.:

3.20

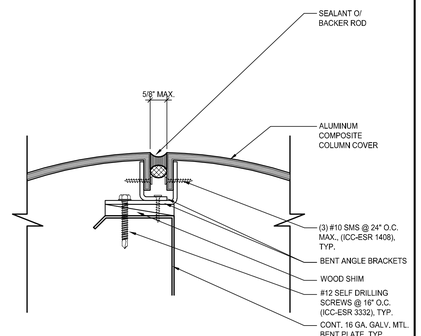
drawing of



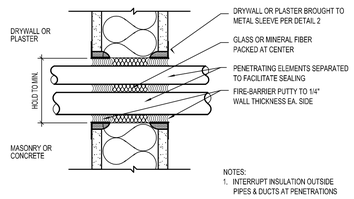
RIGIDLY SUPPORTED PIPE, CONDUIT OR DUCT THROUGH DRYWALL OR PLASTER | 1



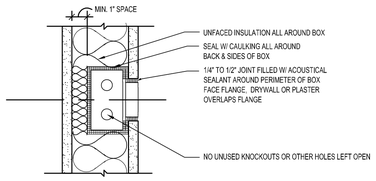
ALL RESILIENTLY SUPPORTED PIPES, DUCTS & CONDUITS THROUGH DRYWALL OR PLASTER | 2



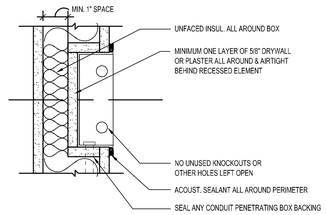
EXTERIOR COLUMN COVER DETAIL | 3
SCALE: 6" = 1'-0"



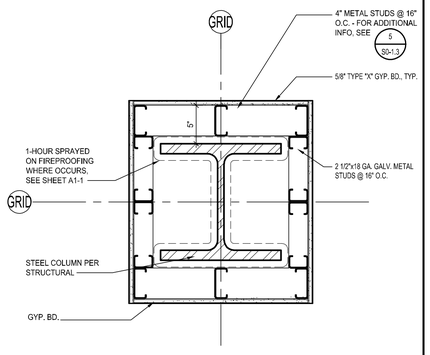
MULTIPLE PIPES OR CONDUITS THRU DRYWALL, PLASTER, MASONRY OR CONCRETE | 6



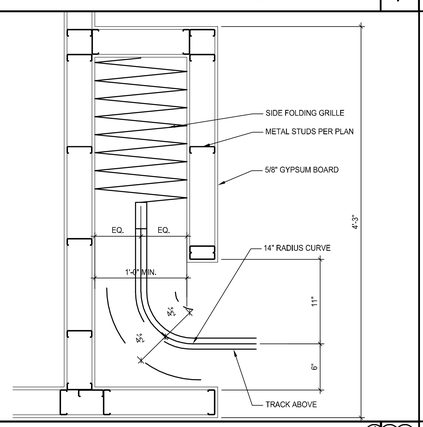
ELECTRICAL BOX UP TO 4" x 8" IN GYP. BD. OR PLASTER | 7



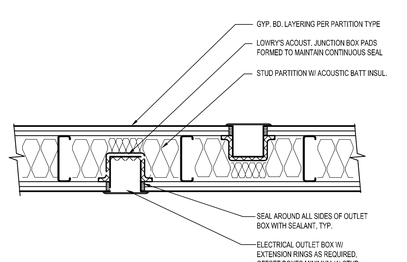
ELECTRICAL BOX OVER 4"x 8"
CABINET, FIXTURE, ACCESSORY IN DRYWALL OR PLASTER | 8



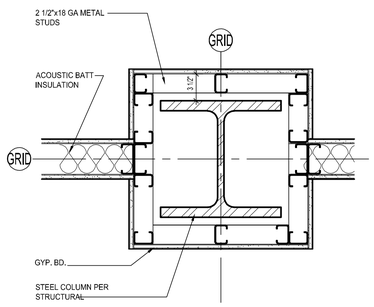
COLUMN DETAIL | 11
SCALE: 1 1/2" = 1'-0"



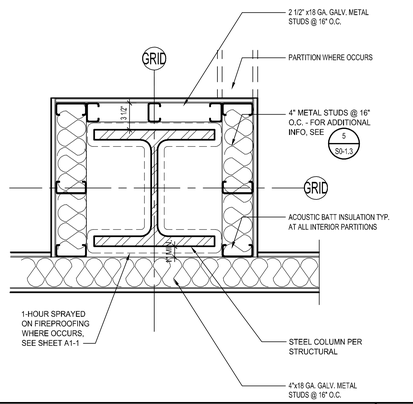
ENLARGED PLAN - SECURITY GRILLE POCKET | 12
SCALE: 1-1/2" = 1'-0"



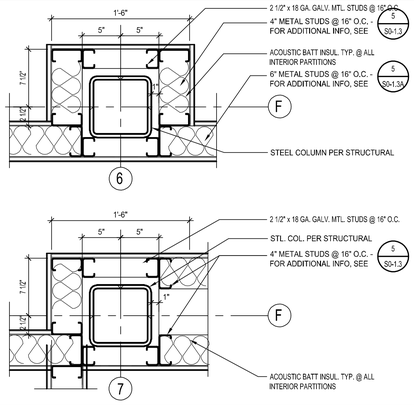
ELECTRICAL OUTLET PLAN DETAIL | 13
SCALE: 1-1/2" = 1'-0"



COLUMN DETAIL | 16
SCALE: 1 1/2" = 1'-0"



COLUMN DETAIL | 17
SCALE: 1 1/2" = 1'-0"



COLUMN DETAILS @ GRID LINE "F" | 18
SCALE: 1 1/2" = 1'-0"

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tBP project number : 20967.00
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drawn by: tBP checked by: T. HALL
date: 9.3.2019

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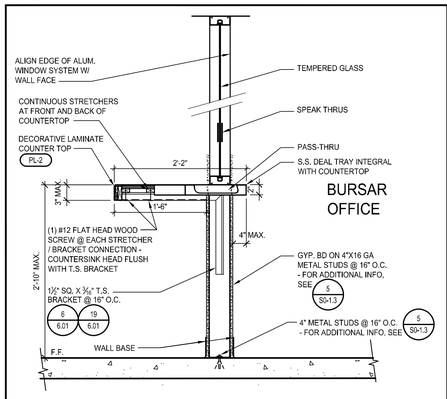
1	11/20/2019	ADDENDUM No. 1

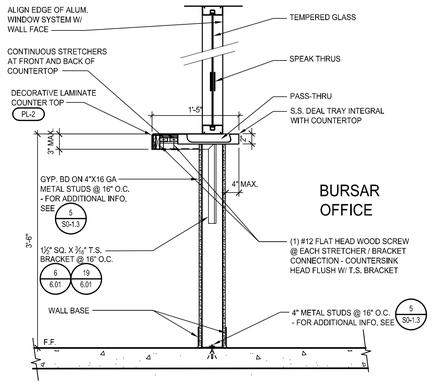
drawing title:
INTERIOR METAL STUD PARTITION DETAILS

drawing no.:
4.03
drawing of



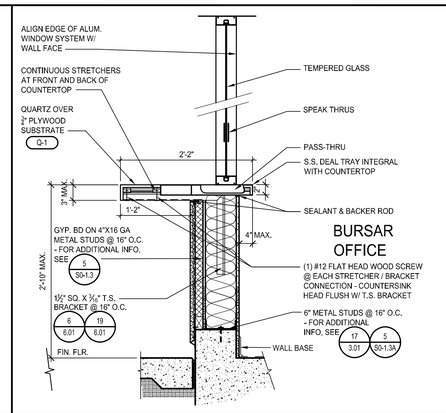
INT. ACCESSIBLE TRANSACTION COUNTER 1

SCALE: 1" = 1'-0"



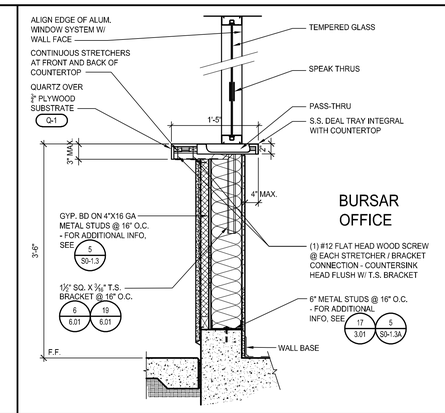
INT. NON- ACCESSIBLE TRANSACTION COUNTER 2

SCALE: 1" = 1'-0"



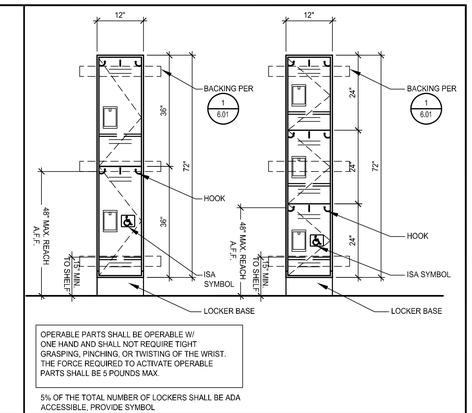
EXT. ACCESSIBLE TRANSACTION COUNTER 3

SCALE: 1" = 1'-0"



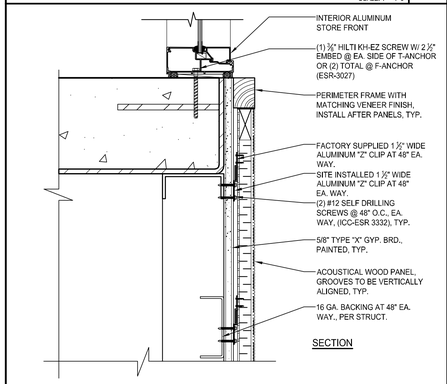
EXT. NON- ACCESSIBLE TRANSACTION COUNTER 4

SCALE: 1" = 1'-0"



LOCKERS ELEVATION 5

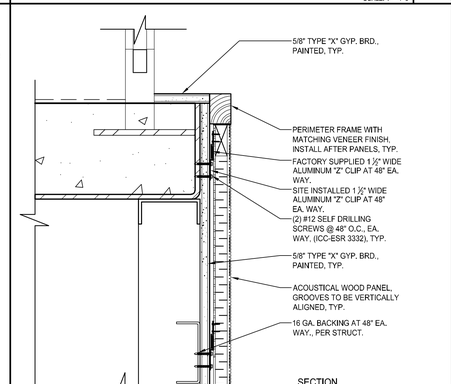
SCALE: 1-1/2" = 1'-0"



SECTION

INT. STOREFRONT - SILL 6

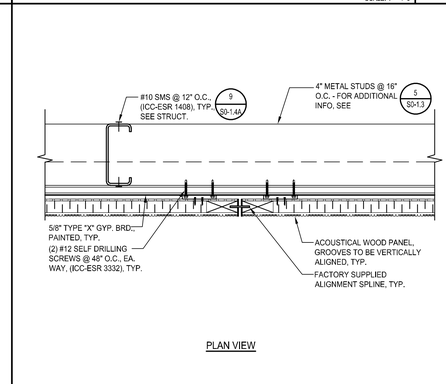
SCALE: 3" = 1'-0"



SECTION

WALL MOUNT. ACOUST. PANELS AT GUARDRAIL 7

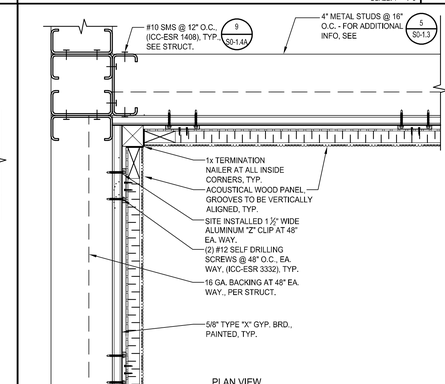
SCALE: 3" = 1'-0"



PLAN VIEW

ACOUSTIC PANELS AT VERTICAL JOINTS 8

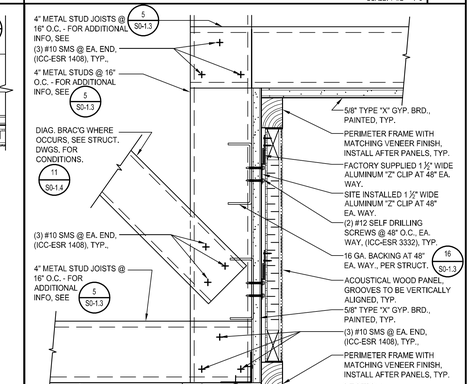
SCALE: 3" = 1'-0"



PLAN VIEW

WALL MOUNT. ACOUSTIC PANELS AT CORNERS 9

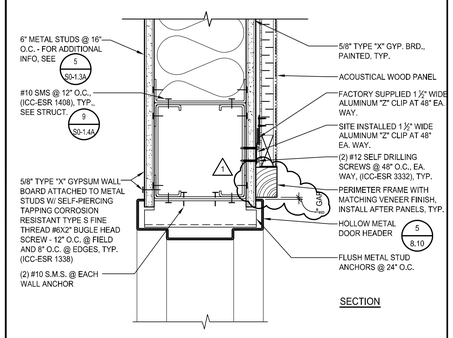
SCALE: 3" = 1'-0"



SECTION

WALL MOUNT. ACOUSTIC PANELS AT SOFFITS 10

SCALE: 3" = 1'-0"



SECTION

WALL MOUNT. ACOUSTIC PANELS AT HEADER 11

SCALE: 3" = 1'-0"

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tBP project number : 20967.00
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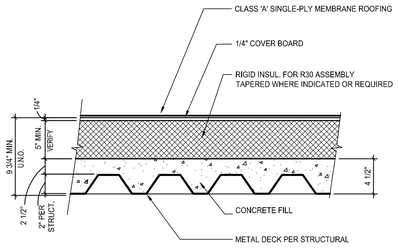
drawn by: tBP checked by: T. HALL
date: 9.3.2019

Rev:	date:	description:
1	11/20/2019	ADDENDUM No. 1

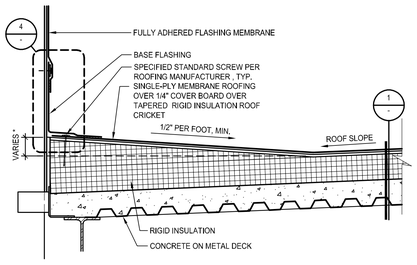
drawing title:
CASEWORK
DETAILS

drawing no.:
6.02
drawing of



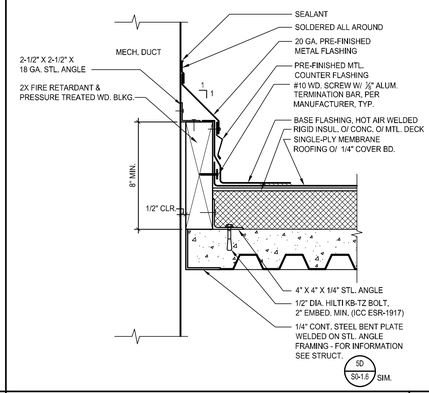
TYP. CONC. ON METAL DECK ROOF SECTION 1

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



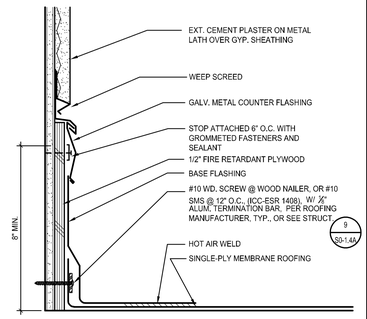
ROOF CRICKET 2

SCALE: 1" = 1'-0"



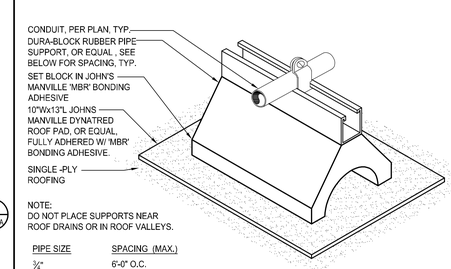
DUCT PENETRATION CURB 3

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



SINGLE PLY ROOFING AT WALL 4

SCALE: 3" = 1'-0"

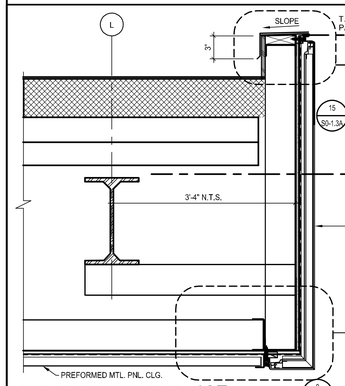


NOTE:
DO NOT PLACE SUPPORTS NEAR ROOF DRAINS OR IN ROOF VALLEYS.

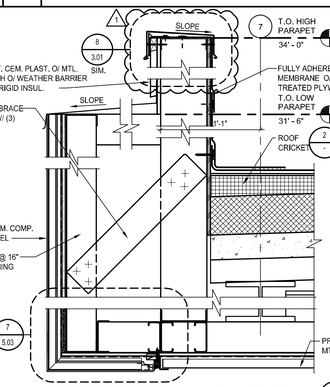
PIPE SIZE	SPACING (MAX.)
¾"	6'-0" O.C.
1" - 1 ¼"	7'-0" O.C.
1 ½"	8'-0" O.C.
2" - 4"	10'-0" O.C.

PIPE SUPPORT BLOCK 5

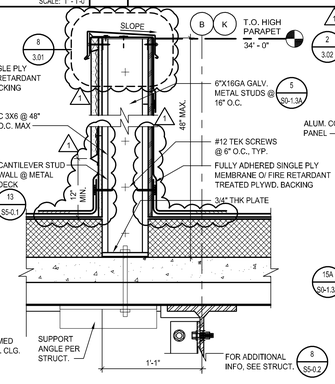
SCALE: 3" = 1'-0"



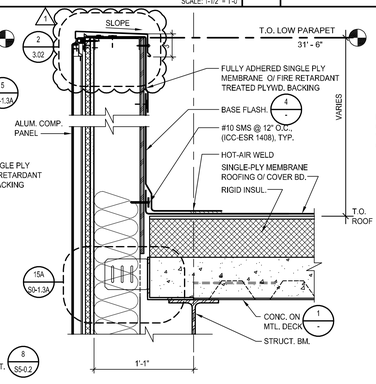
PARAPET W/ SOFFIT - 10F FOR ADDITIONAL INFO, SEE STRUCT. 6 S0-0.1



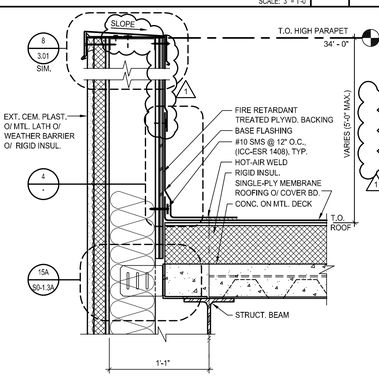
PARAPET W/ SOFFIT - 10E FOR ADDITIONAL INFO, SEE STRUCT. 3 S0-0.1



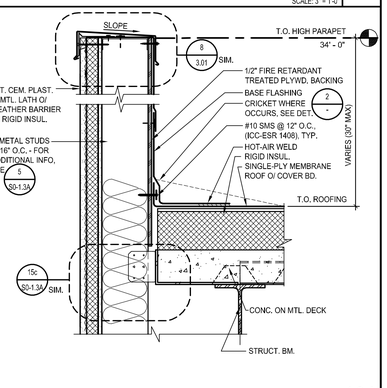
ROOFTOP PARAPET WALL - 10D



PARAPET - ALUM. COMPOSITE PNL. 10C



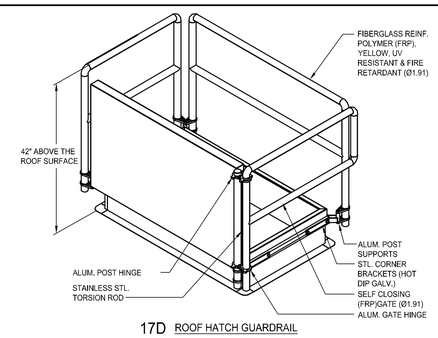
PARAPET @ PLASTER WALL 10B



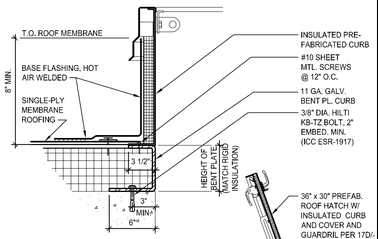
PARAPET @ PLASTER WALL 10A

ROOF PARAPETS 10

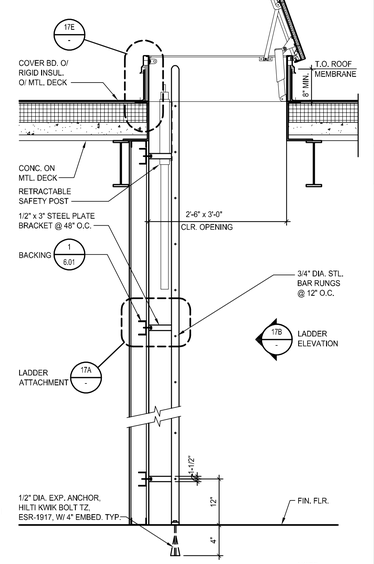
SCALE: 1-1/2" = 1'-0"



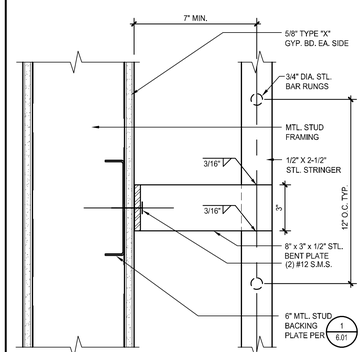
17D ROOF HATCH GUARDRAIL



17E ENLARGED SECTION

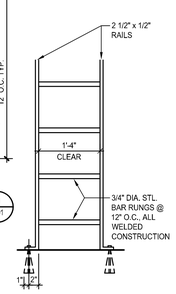


17C LADDER SECTION



NOTE:
SPACE CONNECTORS EVENLY ALONG LADDER NOT TO EXCEED 4'-0" O.C.

17A LADDER ATTACHMENT DETAIL

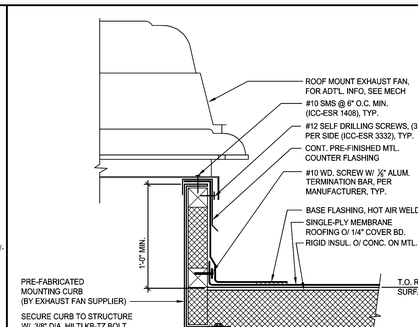


17B PARTIAL LADDER ELEVATION

NOTE
BASIS OF DESIGN: BABCOCK DAVIS

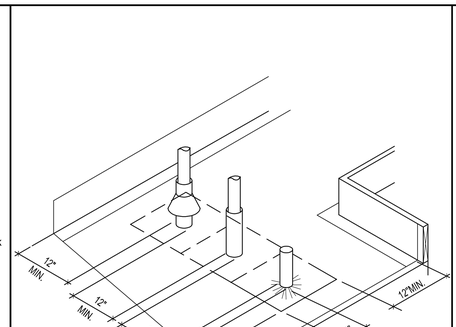
ROOF HATCH AND LADDER 17

SCALE: 3/4" = 1'-0"



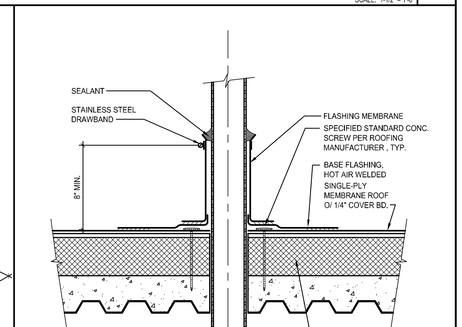
SELF-FLASHED EXHAUST CURB 13

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



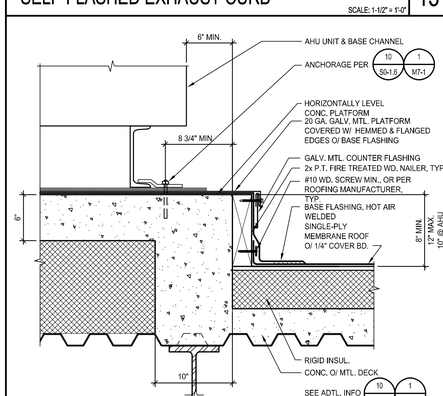
CLEARANCES FOR MULTIPLE PIPES 14

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



PIPE PENETRATION FLASHING

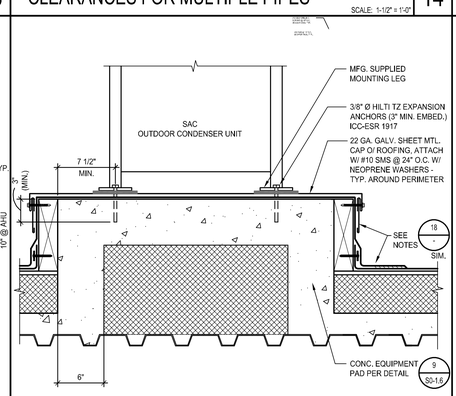
SCALE: 1-1/2" = 1'-0"



BASIS OF DESIGN: BABCOCK DAVIS

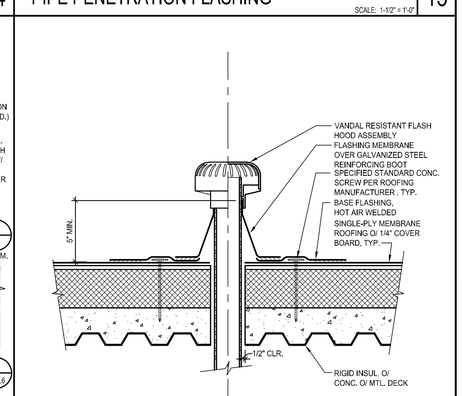
AIR HANDLING UNIT EQUIPMENT PAD 18

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



CONDENSER UNIT EQUIPMENT PAD 19

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



VENT PIPE W/ VANDAL RESISTANT HOOD 20

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

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tBP project number : 20967.00

file name: DTL-0701.DWG

drawn by: tBP checked by: T. HALL

date: 9.3.2019

Rev:	date:	description:
1	11/20/2019	ADDENDUM No. 1

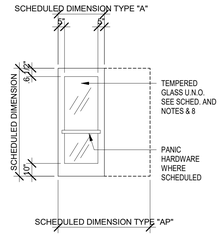
drawing title:
ROOF DETAILS

drawing no.:
7.01
drawing of

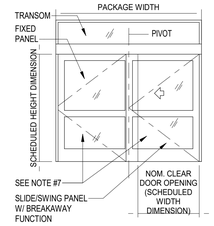
DOOR SCHEDULE

DOOR NO.	WIDTH	HEIGHT	TYPE	DOOR MATERIAL	DOOR FINISH	DOOR COLOR	FRAME MATERIAL	FRAME FINISH	DETAILS HEAD	DETAILS TRANSOM	DETAILS JAMB	DETAILS TRESHOLD	ASSEMBLY FIRE RATING	REMARKS	SIGNAGE TEXT	SIGNAGE DETAIL
Exterior																
001	8' - 0"	7' - 6"		ALUM / GL	F		ALUM / GL	F						CARD READER, EMERGENCY BREAKOUT DOOR AND SIDELIGHT		
002	3' - 0"	7' - 0"	D	HM	PSG		HM	PSG	3/8.10		8/8.10	19/8.10		CARD READER, PANIC HARDWARE	TRIO / EXIT	9 & 11/11.01
003	3' - 0"	7' - 0"	A	ALUM / GL	F		ALUM / GL	F								
004	3' - 0"	7' - 0"	D	HM	PSG		HM	PSG	3/8.10		8/8.10	19/8.10		CARD READER, PANIC HARDWARE	WELCOME CENTER, EXIT	9 & 11/11.01
005	3' - 0"	7' - 0"	D	HM	PSG		HM	PSG	3/8.10		8/8.10	19/8.10		CARD READER, PANIC HARDWARE	SRC, EXIT	9 & 11/11.01
006	6' - 0"	7' - 8"		ALUM / GL	F		ALUM / GL	F						CARD READER, EMERGENCY BREAKOUT DOOR AND SIDELIGHT		
007	3' - 0"	7' - 0"	D	HM	PSG		HM	PSG	3/8.10		8/8.10	19/8.10		CARD READER, PANIC HARDWARE	BURSAR / EXIT	9 & 11/11.01
008	3' - 0"	7' - 0"	D	HM	PSG		HM	PSG	3/8.10		8/8.10	19/8.10		CARD READER, PANIC HARDWARE	FINANCIAL AID, EXIT	9 & 11/11.01
009	3' - 0"	7' - 0"	D	HM	PSG		HM	PSG	3/8.10		8/8.10	19/8.10		CARD READER, PANIC HARDWARE	MDF ROOM	11/11.01
010	3' - 0"	7' - 0"	D	HM	PSG		HM	PSG	3/8.10		8/8.10	19/8.10		CARD READER	ELECTRICAL ROOM	11/11.01
011	3' - 0"	7' - 0"	D	HM	PSG		HM	PSG	3/8.10		8/8.10	19/8.10		CARD READER	RESTROOMS / EXIT	9 & 11/11.01
012	3' - 0"	7' - 0"	D	HM	PSG		HM	PSG	3/8.10		8/8.10	19/8.10		CARD READER	FIRE RISER	11/11.01
013	3' - 0"	7' - 0"	D	HM	PSG		HM	PSG	3/8.10		8/8.10	19/8.10		CARD READER, PANIC HARDWARE	TESTING CENTER / EXIT	9 & 11/11.01
164	3' - 0"	7' - 0"														
165	3' - 0"	7' - 0"														
166	3' - 0"	7' - 0"														
167	3' - 0"	7' - 0"														
Interior																
100	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER, HOLD OPEN	EXIT ROUTE	8/11.01
102	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				JANITOR	11/11.01
103	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		9/8.10	18/8.10			MEN'S RESTROOM	2 & 4/11.01
104	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		9/8.10	18/8.10			WOMEN'S RESTROOM	1 & 3/11.01
105	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		9/8.10	18/8.10			GENDER NEUTRAL RESTROOM	6 & 7/11.01
109	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		9/8.10	18/8.10		CARD READER	WOMEN'S RESTROOM	1 & 3/11.01
110	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		9/8.10	18/8.10		CARD READER	MEN'S RESTROOM	2 & 4/11.01
111	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				ELEVATOR MACHINE ROOM	11/11.01
113	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	CONFERENCE / EXIT ROUTE	8 & 11/11.01
116	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	INNOVATION CENTER/ EXIT ROUTE	8 & 11/11.01
122	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	TESTING CENTER / EXIT ROUTE	8 & 11/11.01
130	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	TRIO / EXIT ROUTE	8 & 11/11.01
131	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				STUDY / EXIT ROUTE	8 & 11/11.01
132	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				STUDY / EXIT ROUTE	8 & 11/11.01
133	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
134	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
135	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
136	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
140A	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	WELCOME CENTER / EXIT ROUTE	8 & 11/11.01
140B	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	WELCOME CENTER / EXIT ROUTE	8 & 11/11.01
141A	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10			CARD READER	STORAGE	11/11.01
141B	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
144	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
145	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
146	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
150	8' - 1"	7' - 0"		ALUM / GL	F		ALUM / GL	F						EMERGENCY BREAKOUT DOOR AND SIDELIGHT		
151	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				TUTOR / EXIT ROUTE	8 & 11/11.01
152	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
153	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
154	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
155	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
156	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
157	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
158	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
159	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
160	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				TESTING / EXIT	9 & 11/11.01
161	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	BURSAR / EXIT ROUTE	8 & 11/11.01
162	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	COUNTING	11/11.01
170	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	FINANCIAL AID / EXIT ROUTE	8 & 11/11.01
171	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
172	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				FILE / SCAN	11/11.01
173	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
174	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
175	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
176	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
177	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
180A	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	ADMISSIONS / EXIT ROUTE	8 & 11/11.01
180B	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				ADMISSIONS / FINANCIAL AID	11/11.01
180C	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				ADMISSIONS / FINANCIAL AID	11/11.01
181	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
182	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10			CARD READER	RECORD VAULT	11/11.01
183	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				FILE	11/11.01
184	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
185	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
186	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
202	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		9/8.10	18/8.10			WOMEN'S RESTROOM	1 & 3/11.01
203	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		9/8.10	18/8.10			MEN'S RESTROOM	2 & 4/11.01
204A	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				LACTATION	11/11.01
204B	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				LACTATION	11/11.01
205	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				ELECTRICAL ROOM	11/11.01
206	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				IDF ROOM	11/11.01
207	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		9/8.10	18/8.10		CARD READER	WOMEN'S RESTROOM	1 & 3/11.01
208	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		9/8.10	18/8.10		CARD READER	MEN'S RESTROOM	2 & 4/11.01
209	3' - 0"	7' - 0"	D	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				JANITOR	11/11.01
211	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	CONFERENCE / EXIT	9 & 11/11.01
212	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	CLASSROOM / EXIT	9 & 11/11.01
220A	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	VRC LOUNGE / EXIT ROUTE	8 & 11/11.01
220B	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				STUDENT EQUITY / EXIT ROUTE	8 & 11/11.01
221	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
230	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	STUDENT EQUITY / EXIT ROUTE	8 & 11/11.01
231	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
232	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
233	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
234	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
240	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	VP OF STUDENT SERVICES / EXIT ROUTE	8 & 11/11.01
241	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
242	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
251	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
252	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
253	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
254	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
255	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
256	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
257	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
258	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
259	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
260	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
261	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
262	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
263	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
264	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
265	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				COMPUTER ROOM	11/11.01
266A	7' - 10"	7' - 0"	B	ALUM / GL	F		ALUM / GL	F								
266B	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				COUNSELING / EXIT ROUTE	8 & 11/11.01
266C	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				COUNSELING / VP OF STUDENT SERVICES	11/11.01
266D	3' - 0"	3' - 6"	D	SCN	F	WD-1	HM	PSG			10/8.10				COUNSELING	11/11.01
266E	3' - 0"	3' - 6"	D	SCN	F	WD-1	HM	PSG			10/8.10				COUNSELING	11/11.01
270	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10			CARD READER	CAL WORKS / EXIT ROUTE	8 & 11/11.01
271	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
272	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
273	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
274	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
279	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10			CARD READER	COMPUTER / PRINT	11/11.01
280A	3' - 0"	3' - 6"	D	SCN	F	WD-1	HM	PSG			10/8.10				EOPS	11/11.01
280B	3' - 0"	3' - 6"	D	SCN	F	WD-1	HM	PSG			10/8.10				EOPS	11/11.01
281A	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
281B	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
282A	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
282B	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
283	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
284	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
285	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
286	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
287	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
288	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
289	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
290	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				FOSTER & KINSHIP CARE / EXIT ROUTE	8 & 11/11.01
291	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	10/8.10		10/8.10				STORAGE	11/11.01
292	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01
293	3' - 0"	7' - 0"	C	SCN	F	WD-1	HM	PSG	4/8.10	1/8.10	10/8.10				VERIFY W/ OWNER	10/11.01

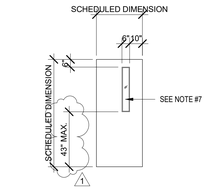
DOOR TYPES



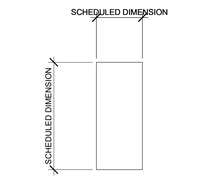
DOOR TYPE A



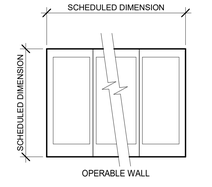
DOOR TYPE B



DOOR TYPE C



DOOR TYPE D



DOOR TYPE E

NOTES

1. DOORS SHALL BE 1-3/4" THICK UNLESS NOTED OTHERWISE.
2. THE LETTER 'P' FOLLOWING THE 'DOOR TYPE' DESIGNATION IN THE DOOR SCHEDULE INDICATES PAIR OF DOORS. BOTH LEAVES ARE THE SAME SIZE, UNLESS NOTED OTHERWISE.
3. THE LETTER 'X' FOLLOWING THE 'DOOR TYPE' LETTER IN THE DOOR SCHEDULE INDICATES A FIXED PANEL ABOVE DOOR LEAF. SCHEDULE DIMENSION INCLUDES PANEL, UNLESS NOTED OTHERWISE.
4. FIXED PANELS SHALL BE OF THE SAME MATERIAL, CONSTRUCTION AND THICKNESS AS DOOR LEAF, AND SHALL BE PROVIDED BY THE SAME MANUFACTURER, UNLESS NOTED OTHERWISE.
5. THE LETTER 'L' FOLLOWING 'DOOR TYPE' DESIGNATION IN THE DOOR SCHEDULE INDICATES DOORS WITH LOUVERS. SEE DOOR TYPE FOR SIZE OF LOUVER.
6. LOUVERS IN EXTERIOR DOORS SHALL BE VANDAL-PROOF, SECURITY TYPE.
7. ALL GLAZING TO BE TEMPERED SAFETY GLAZING.
8. EXTERIOR DOOR REQUIREMENTS:

   ALL EXTERIOR DOORS IN BUILDINGS, INCLUDING, BUT NOT LIMITED TO DOORS OF TOILETS AND STORAGE ROOMS, SHALL CONFORM WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE CALIFORNIA BUILDING CODE.

   a. EXIT DOOR SHALL BE OPERABLE FROM THE INSIDE WITHOUT THE USE OF A KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT.

   b. HAND ACTIVATED DOOR OPENING HARDWARE SHALL BE CENTERED BETWEEN 30" AND 44" ABOVE FINISH FLOOR.

   c. DEAD BOLTS ARE NOT PERMITTED UNLESS OPERABLE WITH A SINGLE EFFORT LEVER TYPE HARDWARE.

   d. ALL ROOMS SERVING AN OCCUPANCY LOAD OF 50 OR GREATER AND DOORS LOCATED ON THE DISCHARGE OF EXIT CORRIDORS ARE REQUIRED TO BE PROVIDED WITH PANIC HARDWARE (CBC 1008.1.10).

   e. ALL FIRE DOOR LABELS SHALL COMPLY WITH CBC 715.4.6

9. FIRE ASSEMBLIES REQUIRED TO HAVE A ONE-HOUR FIRE-PROTECTION RATING SHALL BE EITHER AUTOMATIC OR SELF-CLOSING FIRE ASSEMBLIES TO BE ACTIVATED BY AN INCREASE IN TEMPERATURE SHALL HAVE HEAT-ACTIVATING DEVICES INSTALLED ON EACH SIDE OF THE WALL AT THE CEILING HEIGHT WHERE THE CEILING IS MORE THAN 3 FEET ABOVE THE TOP OF THE OPENING OR BY A SINGLE FUSSIBLE LINK IN THE OPENING INCORPORATED IN THE CLOSING DEVICE.
10. ALL FIRE-RESISTIVE ASSEMBLIES FOR PROTECTED OPENING SHALL COMPLY WITH SECTION 713 CBC.
11. SEE SPECIFICATION SECTION 08 71 00 FOR DOOR HARDWARE INDEX AND DOOR HARDWARE SETS.
12. FINAL ROOM NUMBERS AND NAMES FOR SIGNAGE ARE TO BE COORDINATED WITH THE COLLEGE.
13. FOR CARD READER MOUNTING HEIGHT, SEE DETAIL 7/ 8.10

ABBREVIATIONS

AFP	ACCORDION TYPE PARTITION
ALUM	ALUMINUM
AS	ACID STAIN
ATFD	ACCORDION TYPE FIRE DOOR
DEM PART	DEMOUNTABLE PARTITION
(E)	EXISTING
EP	EPOXY PAINT
F	FACTORY FINISH
FFD	FOLDING FABRIC DOOR
FFP	FOLDING PANEL PARTITION
FFWD	FOLDING PANEL WOOD DOOR
GL	GLASS
HCN	HOLLOW CORE NATURAL FINISH
HCP	HOLLOW CORE PAINT FINISH
HM	HOLLOW METAL
LAQ	LACQUER FINISH
MCN	MINERAL CORE NATURAL FINISH
MCP	MINERAL CORE PAINT FINISH
PE	PAINT EGGSHELL
PF	PAINT FLAT
PG	PAINT GLOSS
PSG	PAINT SEMI-GLOSS
S	SEAL
SCN	SOLID CORE NATURAL FINISH
SCP	SOLID CORE PAINT FINISH
SCPL	SOLID CORE PLASTIC LAMINATE
STN	STAIN FINISH
SST	STAINLESS STEEL
STL	STL
UG	UNGLAZED
VF	VARNISH FINISH
W	WAX

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tBP project number: 20987.00

file name: CC_SS_Central.RVT

drawn by: Z. WEN checked by: T. HALL

date: 9.3.2019

rev:	date:	description:
1	11/20/19	Addendum 1

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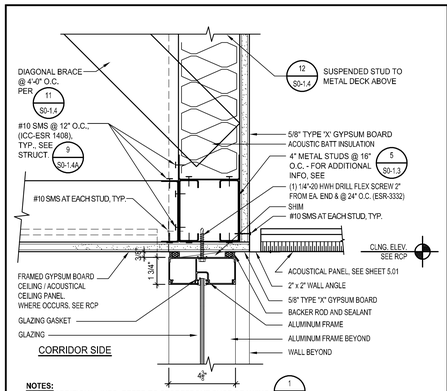
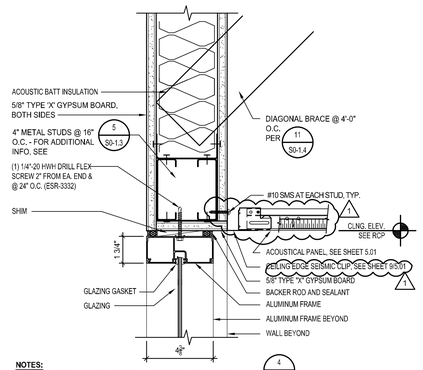


NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 1 CW 13.0
2. SEE REFLECTED CEILING PLAN FOR CEILING TYPE & HEIGHT

INT. STOREFRONT - HEAD 1

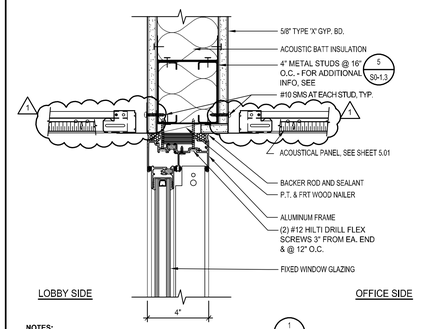
SCALE: 3" = 1'-0"



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 4 CW 13.01
2. SEE REFLECTED CEILING PLAN FOR CEILING TYPE & HEIGHT

INT. STOREFRONT - HEAD 2

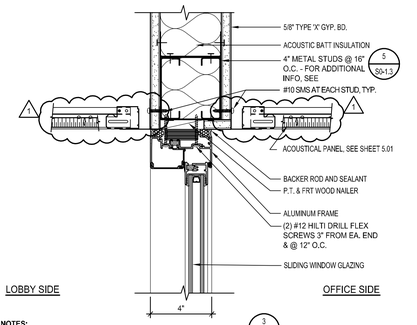
SCALE: 3" = 1'-0"



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 1 CW 11.02

INT. STOREFRONT HEAD @ FIXED TRANSACTION WINDOW 4

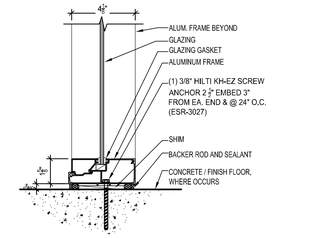
SCALE: 3" = 1'-0"



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 3 CW 11.02

INT. STOREFRONT HEAD @ SLIDING TRANSACT. WINDOW 5

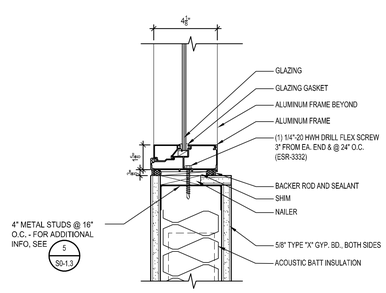
SCALE: 3" = 1'-0"



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 3 CW 13.01

INT. STOREFRONT - SILL 6

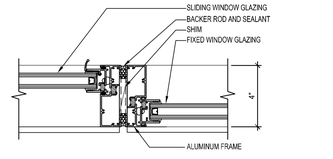
SCALE: 3" = 1'-0"



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 5 CW 13.01

INT. STOREFRONT - SILL 7

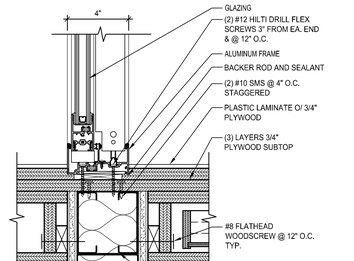
SCALE: 3" = 1'-0"



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 5 CW 12.01

INT. STOREFRONT - SLIDING WINDOW MULLION 8

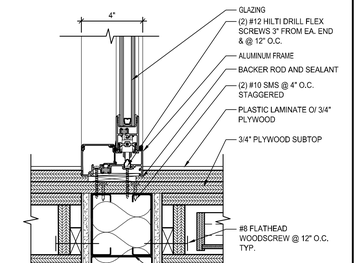
SCALE: 3" = 1'-0"



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 2 CW 11.02

INT. STOREFRONT SILL @ FIXED TRANSACTION WINDOW 9

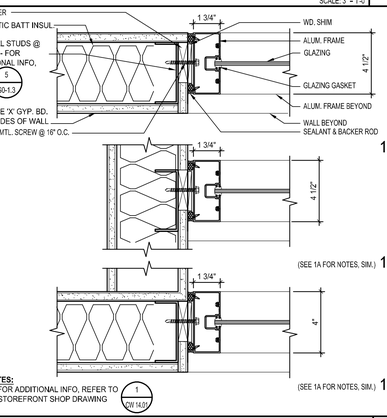
SCALE: 3" = 1'-0"



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 4 CW 11.02

INT. STOREFRONT SILL @ SLIDING TRANSACT. WINDOW 10

SCALE: 3" = 1'-0"



NOTES:
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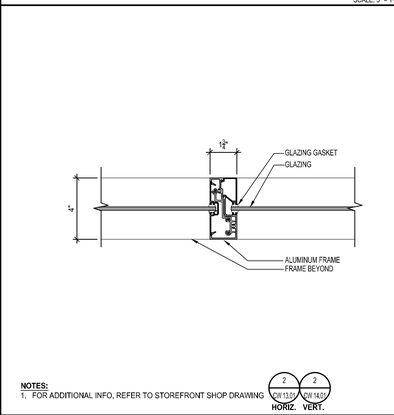
INT. STOREFRONT - JAMB 11

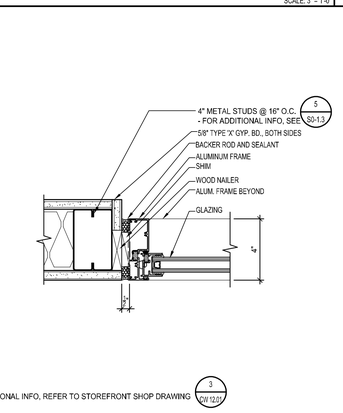
SCALE: 3" = 1'-0"



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 2 CW 13.01 HORIZ. 2 CW 14.01 VERT.

INT. STOREFRONT - VERTICAL/HORIZ. MULLION 12

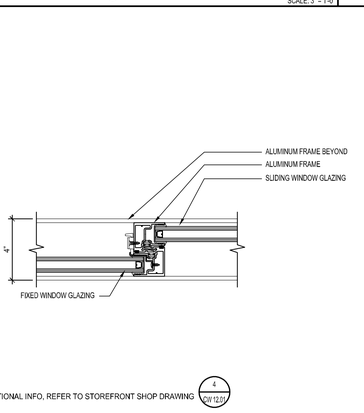
SCALE: 3" = 1'-0"



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 3 CW 12.01

INT. STOREFRONT JAMB @ FIXED TRANSACT. WINDOW 13

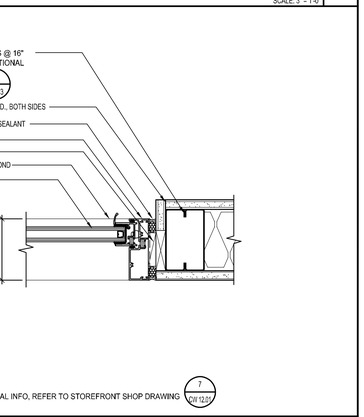
SCALE: 3" = 1'-0"



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 4 CW 12.01

INT. STOREFRONT - FIXED/SLIDING WINDOW JAMB 14

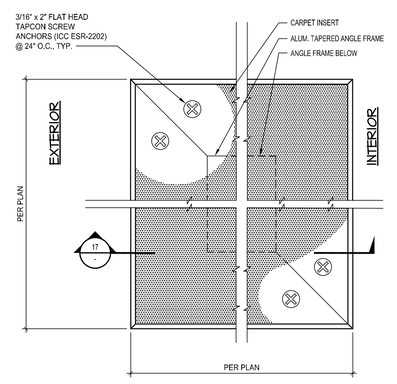
SCALE: 3" = 1'-0"



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 7 CW 12.01

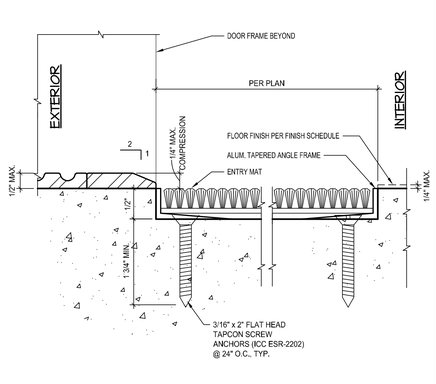
INT. STOREFRONT JAMB @ SLIDING TRANSACT. WINDOW 15

SCALE: 3" = 1'-0"



RECESSED FLOOR MAT - PLAN 16

SCALE: FULL



RECESSED FLOOR MAT @ THRESHOLD SECTION 17

SCALE: FULL

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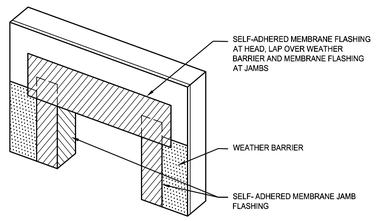
tBP project number : 20987.00
file name: DTL-0811.DWG
drawn by: tBP checked by: T. HALL
date: 9.3.2019

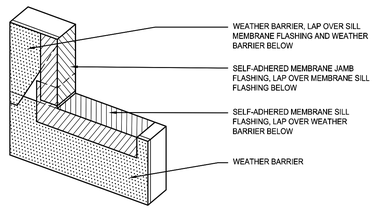
Rev:	date:	description:
1	11/20/2019	ADDENDUM No. 1

drawing title:
INTERIOR STOREFRONT DETAILS

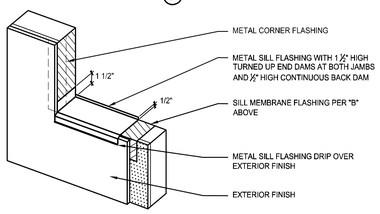
drawing no.:
8.11
drawing of



A MEMBRANE FLASHING AT HEAD

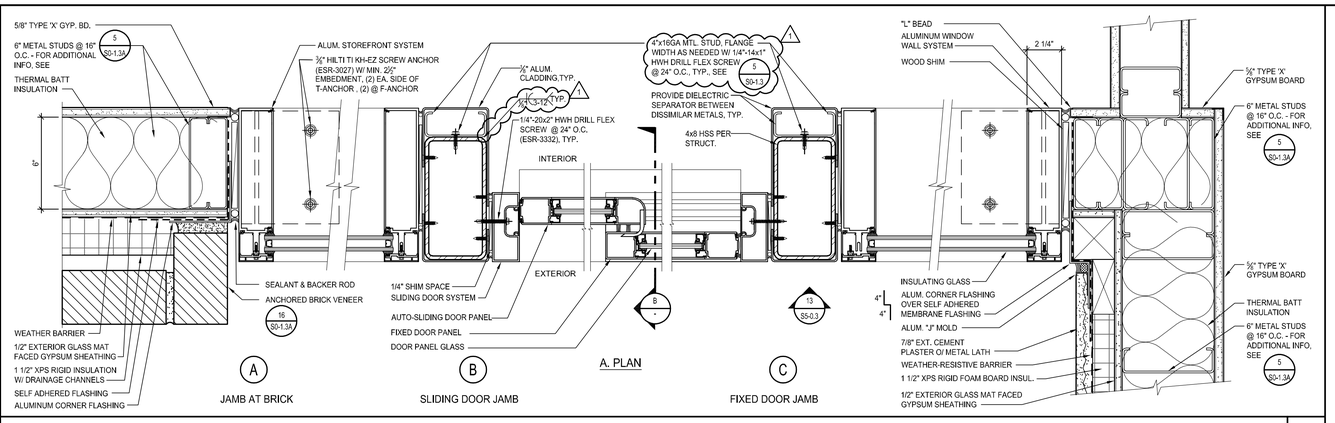


B MEMBRANE FLASHING AT SILL

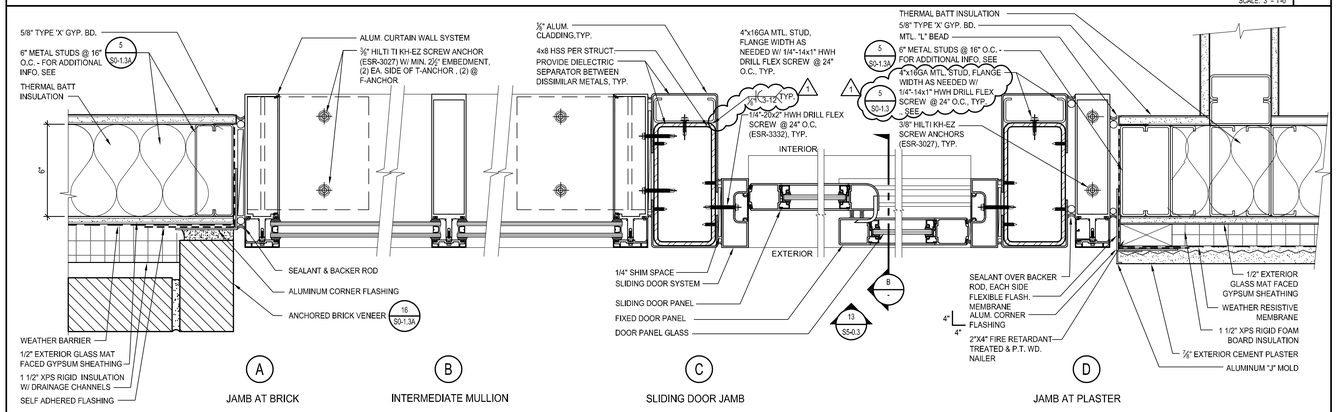


C METAL FLASHING AT SILL

TYPICAL FLASHING AT OPENINGS — SCALE: N.T.S. — 6

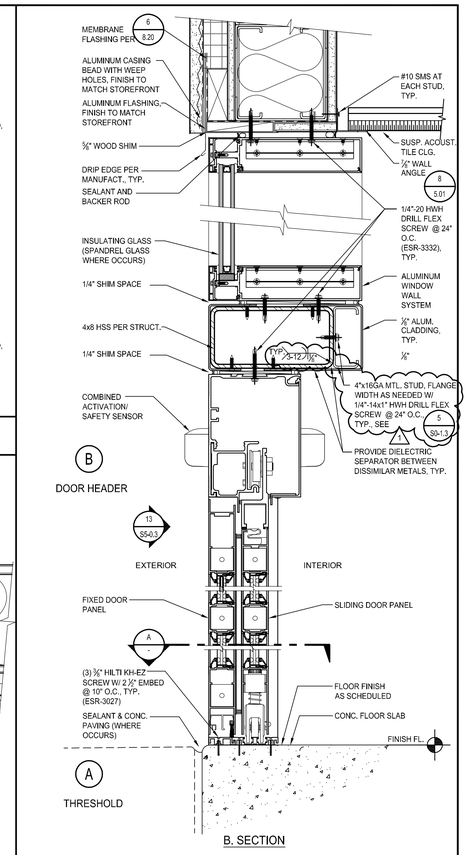


SLIDING INTERMEDIATE DOOR JAMB / CORNER - PLAN VIEW (AL 101) — SCALE: 3" = 1'-0" — 4

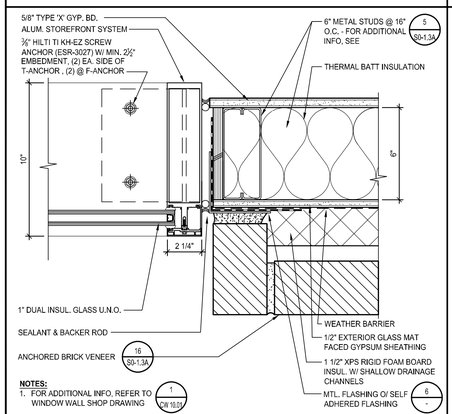


SCALE: 3" = 1'-0"

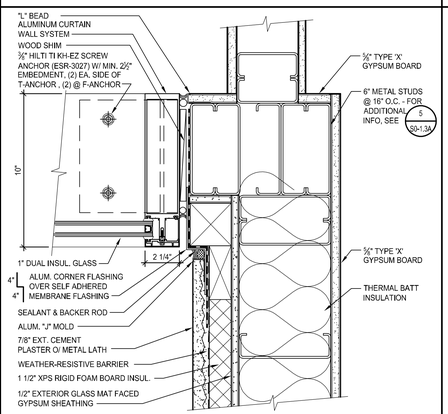
SLIDING INTERMEDIATE DOOR JAMB / CORNER - PLAN VIEW (AL 109) — SCALE: 3" = 1'-0" — 9



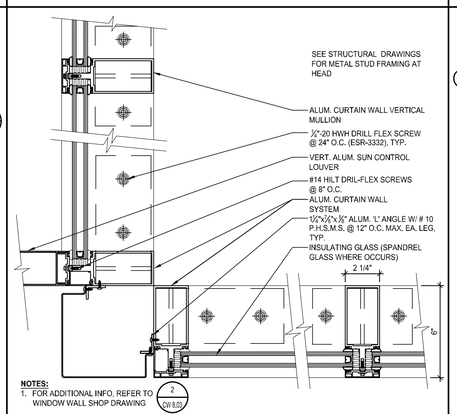
SLIDING DOOR SECTION (AL 101 & AL 109) — SCALE: 3" = 1'-0" — 10



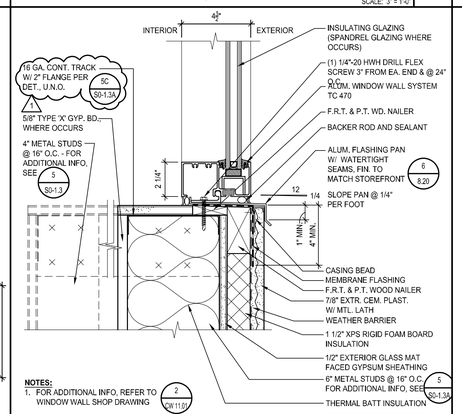
STOREFRONT JAMB @ BRICK VENEER — SCALE: 3" = 1'-0" — 16



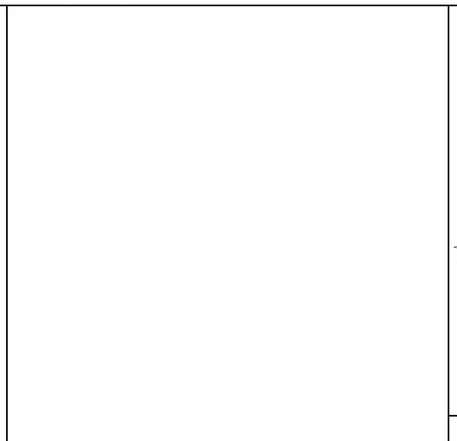
JAMB / CORNER - PLAN VIEW — SCALE: 3" = 1'-0" — 17



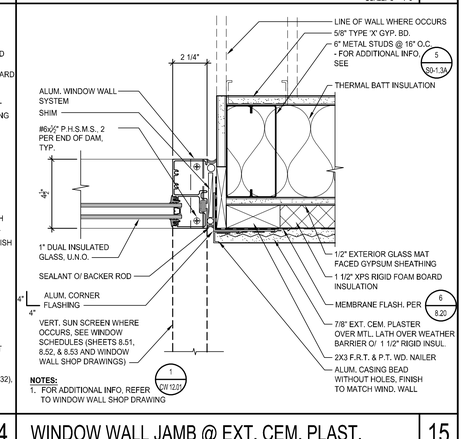
CURTAIN WALL CORNER — SCALE: 3" = 1'-0" — 18



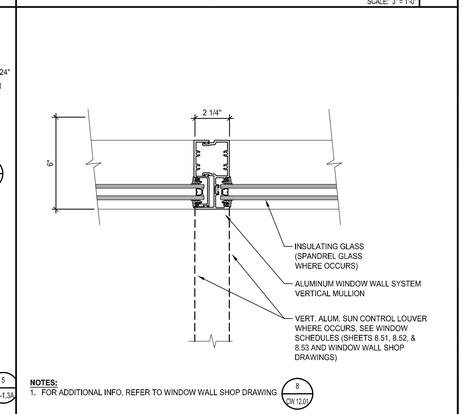
WINDOW WALL SILL @ EXT. CEM. PLAST. — SCALE: 3" = 1'-0" — 19



WINDOW WALL HEAD @ EXT. CEM. PLAST. — SCALE: 3" = 1'-0" — 14



WINDOW WALL JAMB @ EXT. CEM. PLAST. — SCALE: 3" = 1'-0" — 15



WINDOW WALL INTERMEDIATE VERTICAL MULLION — SCALE: 3" = 1'-0" — 20

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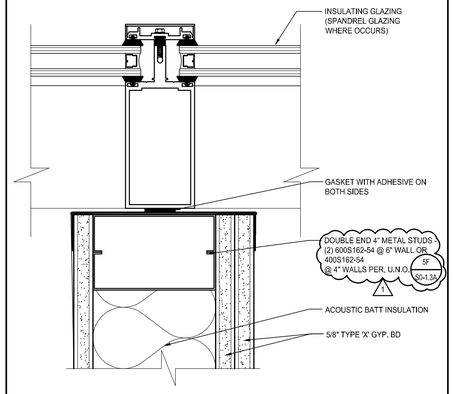
owner

tBP project number : 20967.00
file name: DTL-0820.DWG
drawn by: tBP checked by: T. HALL
date: 9.3.2019

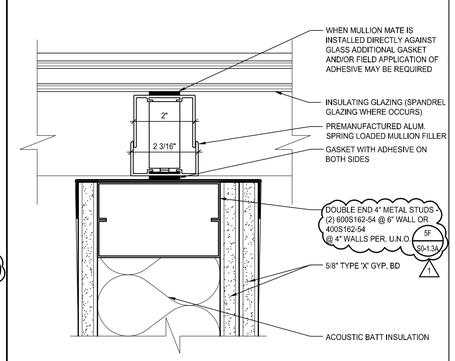
Rev:	date:	description:
1	11/20/2019	ADDENDUM No. 1

drawing title:
WINDOW & CURTAIN WALL DETAILS

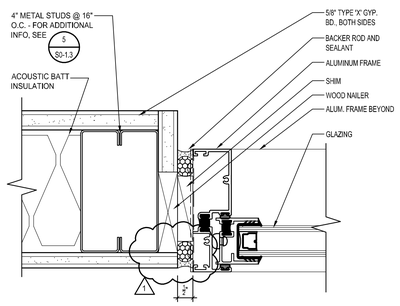
drawing no.:
8.20
drawing of



WALL @ MULLION - PLAN — SCALE: 6" = 1'-0" — 2

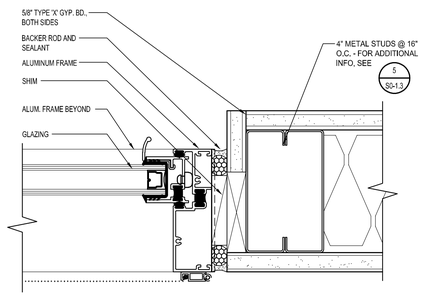


WALL @ MULLION MATE - PLAN — SCALE: 6" = 1'-0" — 3



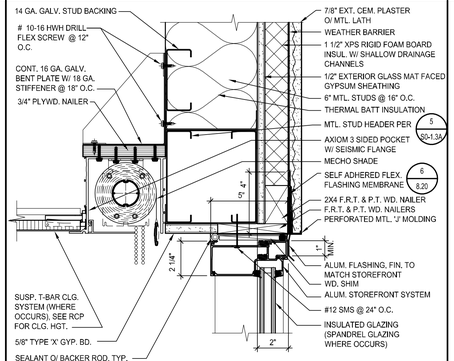
NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 3 / DW 12.01

STOREFRONT JAMB @ FIXED TRANSACTION WINDOW — SCALE: 6" = 1'-0" — 6

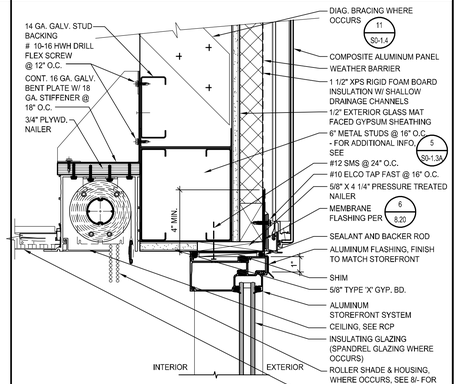


NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 7 / DW 12.01

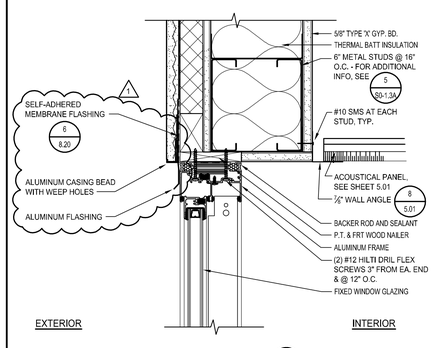
STOREFRONT JAMB @ SLIDING TRANSACTION WINDOW — SCALE: 6" = 1'-0" — 7



STOREFRONT HEAD @ EXT. CEM. PLASTER — SCALE: 3" = 1'-0" — 8

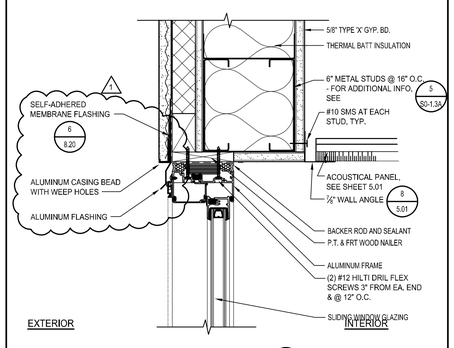


STOREFRONT HEAD @ ALUM. COMPOSITE PANEL — SCALE: 3" = 1'-0" — 10



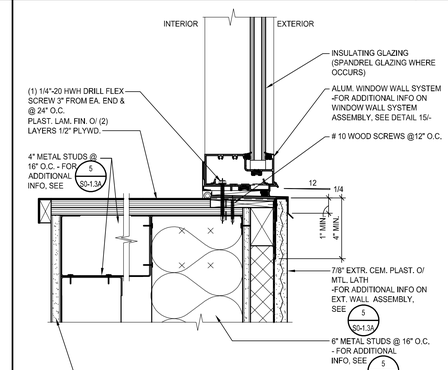
NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 1 / DW 11.02

STOREFRONT HEAD @ FIXED TRANSACTION WINDOW — SCALE: 3" = 1'-0" — 11

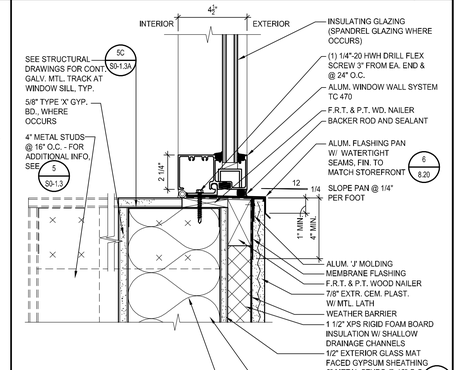


NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 3 / DW 11.02

STOREFRONT HEAD @ SLIDING TRANSACTION WINDOW — SCALE: 3" = 1'-0" — 12

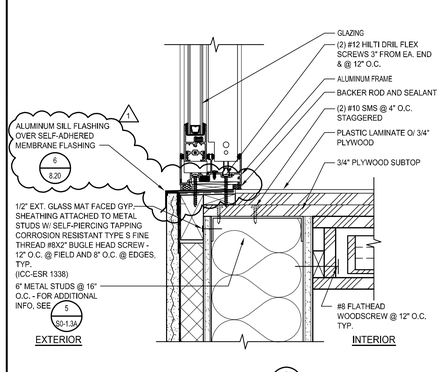


WINDOW WALL SILL/SHELF @ EXT. CEM. PLAST. — SCALE: 3" = 1'-0" — 14



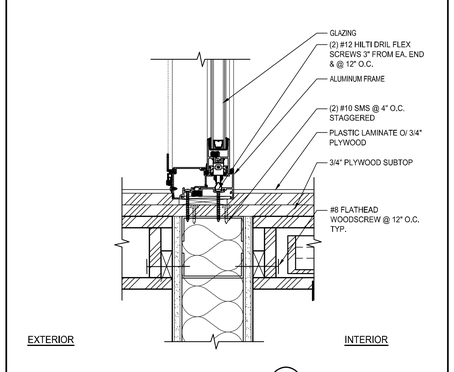
NOTES:
1. FOR ADDITIONAL INFO, REFER TO WINDOW WALL SHOP DRAWING 2 / DW 11.01

WINDOW WALL SILL @ EXT. CEM. PLAST. — SCALE: 3" = 1'-0" — 15



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 2 / DW 11.02

STOREFRONT SILL @ FIXED TRANSACTION WINDOW — SCALE: 3" = 1'-0" — 16



NOTES:
1. FOR ADDITIONAL INFO, REFER TO STOREFRONT SHOP DRAWING 4 / DW 11.02

STOREFRONT SILL @ SLIDING TRANSACTION WINDOW — SCALE: 3" = 1'-0" — 17

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tBP project number : 20987.00

file name: DTL-0821.DWG

drawn by: tBP checked by: T. HALL

date: 9.3.2019

Rev:	date:	description:
1	11/20/2019	ADDENDUM No. 1

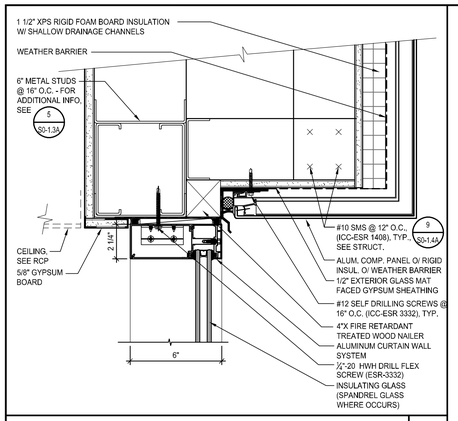
drawing title:

STOREFRONT DETAILS

drawing no.:

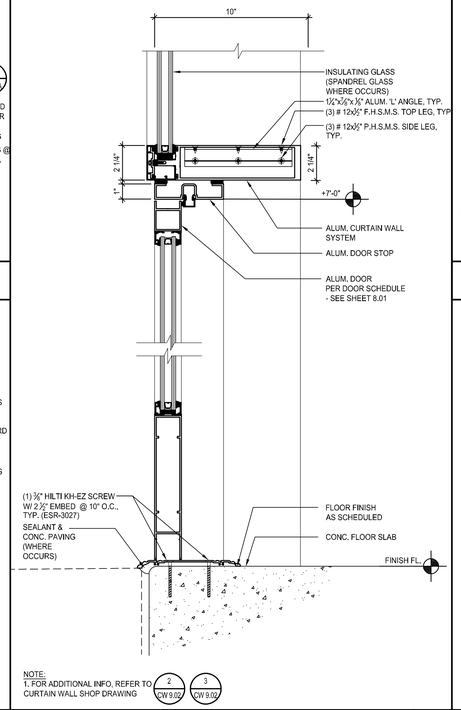
8.21

drawing of



CURTAIN WALL HEAD @ ALUM. COMP. PANEL SOFFIT 1

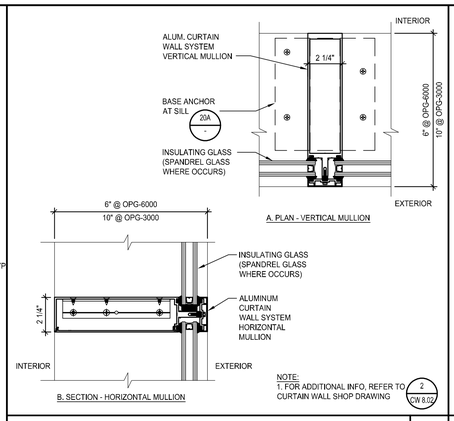
SCALE: 3" = 1'-0"



NOTE:
1. FOR ADDITIONAL INFO, REFER TO CURTAIN WALL SHOP DRAWING 2 CW 9.02 3 CW 9.02

CURTAIN WALL DOOR HEAD & SILL

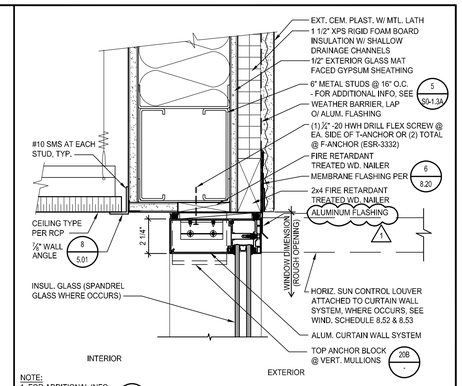
SCALE: 3" = 1'-0" 7



NOTE:
1. FOR ADDITIONAL INFO, REFER TO CURTAIN WALL SHOP DRAWING 4 CW 8.02

CURTAIN WALL VERTICAL / HORZ MULLION

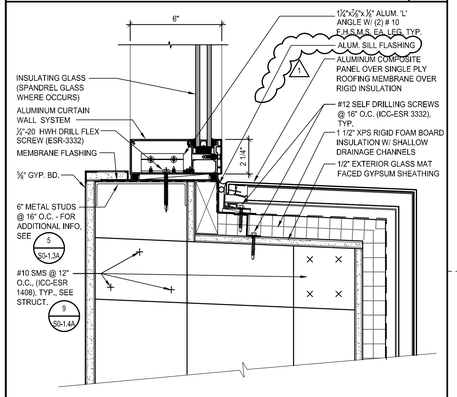
SCALE: 3" = 1'-0" 3



NOTE:
1. FOR ADDITIONAL INFO, REFER TO CURTAIN WALL SHOP DRAWING 1 CW 7.02

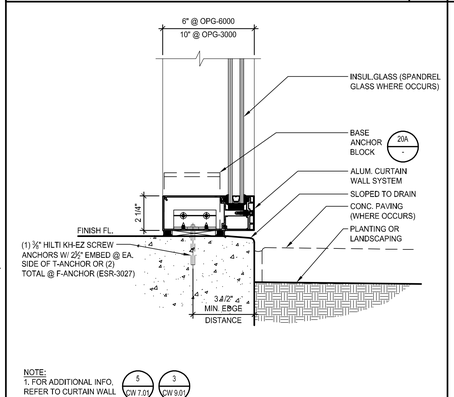
CURTAIN WALL HEAD @ EXT. CEMENT PLASTER

SCALE: 3" = 1'-0" 5



CURTAIN WALL SILL @ ALUM. COMP. PANEL

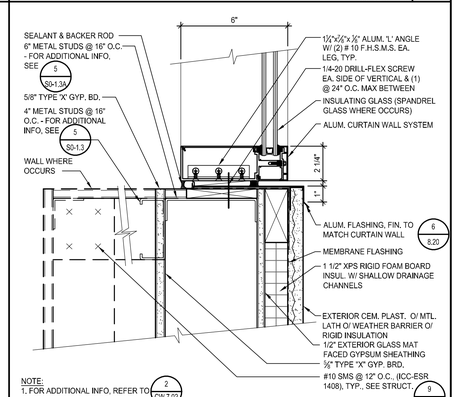
SCALE: 3" = 1'-0" 6



NOTE:
1. FOR ADDITIONAL INFO, REFER TO CURTAIN WALL SHOP DRAWING 5 CW 7.01 OPG-6000 3 CW 9.01 OPG-3000

CURTAIN WALL SILL @ SLAB EDGE

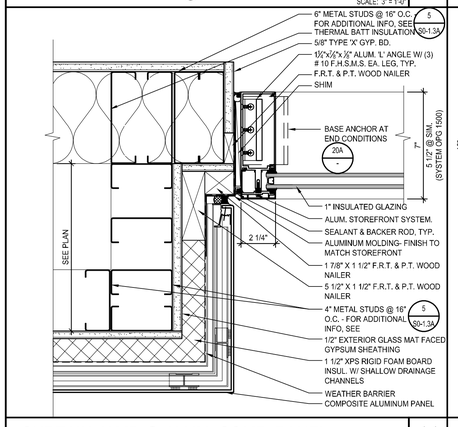
SCALE: 3" = 1'-0" 8



NOTE:
1. FOR ADDITIONAL INFO, REFER TO CURTAIN WALL SHOP DRAWING 2 CW 7.02

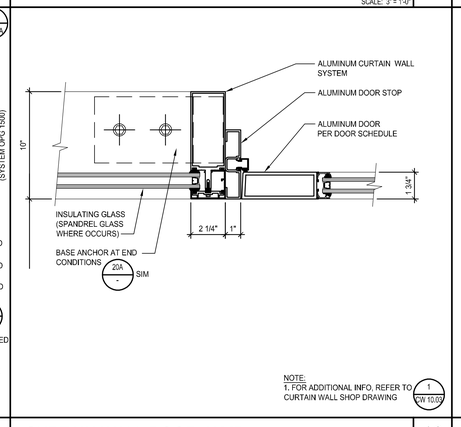
CURTAIN WALL SILL @ EXT. CEMENT PLASTER

SCALE: 3" = 1'-0" 10



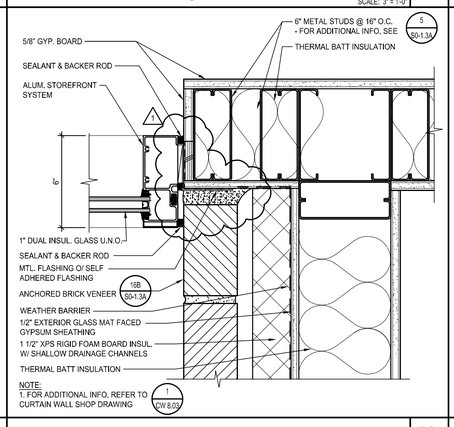
CURTAIN JAMB @ ALUM. COMP. PANEL

SCALE: 3" = 1'-0" 11



CURTAIN WALL DOOR JAMB

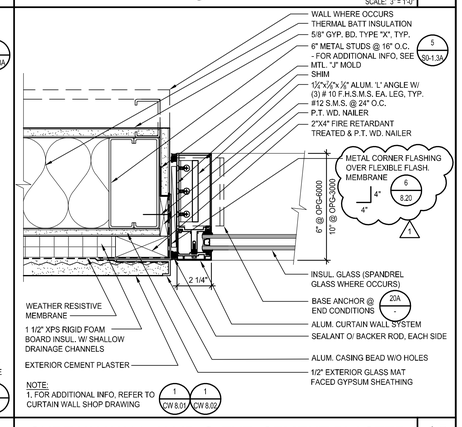
SCALE: 3" = 1'-0" 12



NOTE:
1. FOR ADDITIONAL INFO, REFER TO CURTAIN WALL SHOP DRAWING 1 CW 8.05

STOREFRONT JAMB @ BRICK VENEER

SCALE: 3" = 1'-0" 13



NOTES:
1. FOR ADDITIONAL INFO, REFER TO WINDOW WALL SHOP DRAWING 1 CW8.05

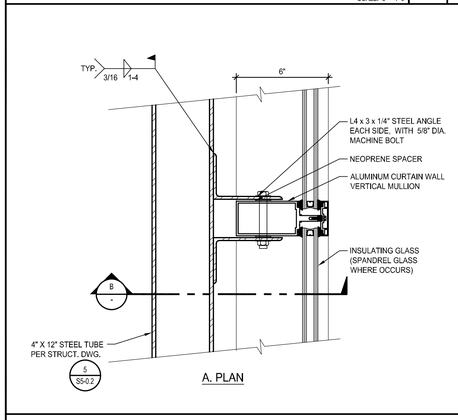
CURTAIN WALL JAMB @ BRICK VENEER

SCALE: 3" = 1'-0" 14

NOTE:
1. FOR ADDITIONAL INFO, REFER TO CURTAIN WALL SHOP DRAWING 1 CW 8.01 1 CW 8.02

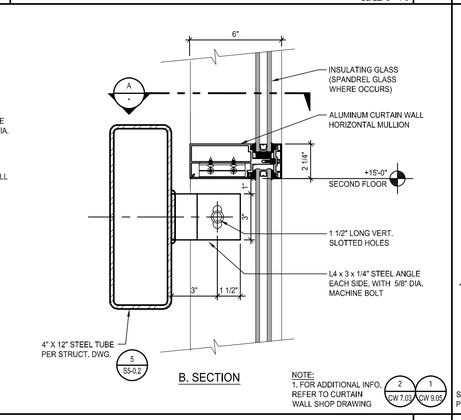
CURTAIN WALL JAMB @ EXT. CEMENT PLASTER

SCALE: 3" = 1'-0" 15



CURTAIN WALL MULLION AT STAIR LANDING SUPPORT

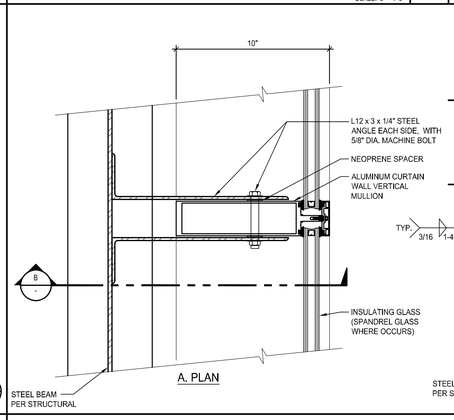
SCALE: 3" = 1'-0" 17

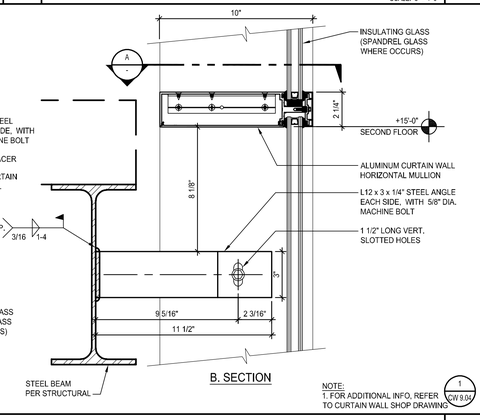


NOTE:
1. FOR ADDITIONAL INFO, REFER TO CURTAIN WALL SHOP DRAWING 2 CW 7.03 1 CW 9.05

CURTAIN WALL MULLION AT UPPER FLOOR

SCALE: 3" = 1'-0" 19

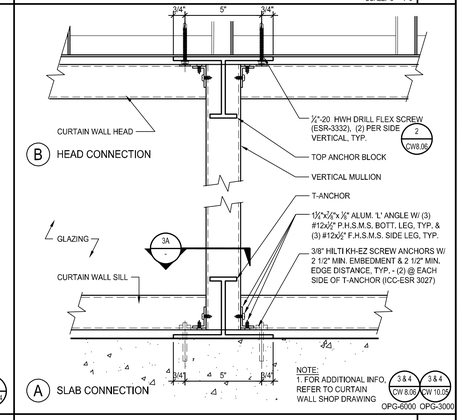




NOTE:
1. FOR ADDITIONAL INFO, REFER TO CURTAIN WALL SHOP DRAWING 1 CW 9.06

CURTAIN WALL ANCHORAGE

SCALE: 3" = 1'-0" 20



NOTE:
1. FOR ADDITIONAL INFO, REFER TO CURTAIN WALL SHOP DRAWING 3 & 4 CW 8.06 3 & 4 CW 10.05

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tBP project number : 20967.00

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drawn by: tBP checked by: T. HALL

date: 9.3.2019

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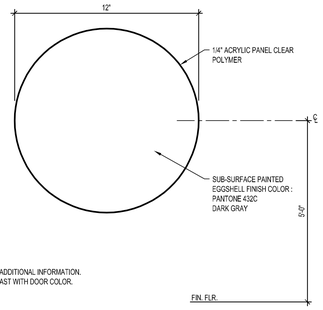
1	11/20/2019	ADDENDUM No. 1

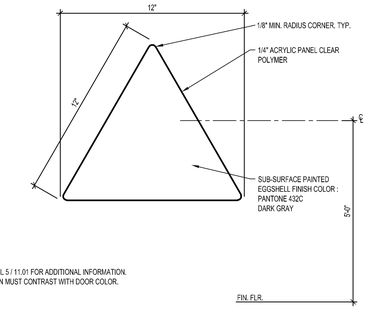
drawing title:
CURTAIN WALL DETAILS

drawing no.:
8.22
drawing of



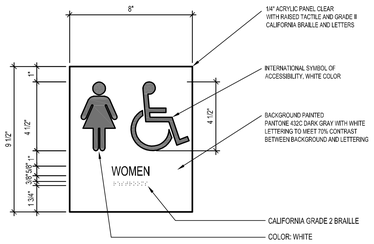
NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.

DOOR MNTD. TOILET ROOM SYMBOL (WOMEN) SCALE: 3" = 1'-0" **1**



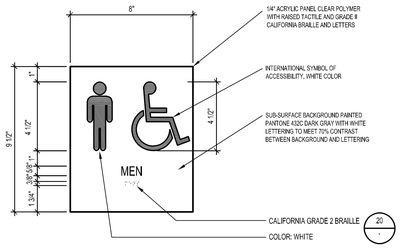
NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.

DOOR MNTD. TOILET ROOM SYMBOL (MEN) SCALE: 3" = 1'-0" **2**



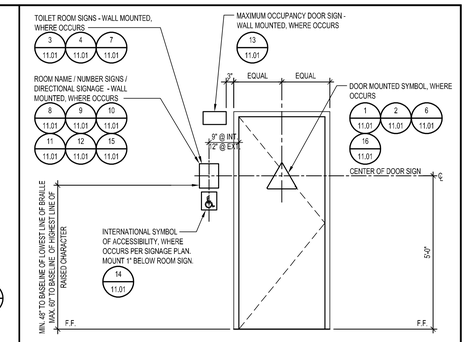
NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.
3. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.
4. CENTER TEXT AND CENTER BRAILLE UNDER TEXT (TYP.)

WALL-MOUNTED TOILET ROOM SIGNAGE SCALE: 3" = 1'-0" **3**



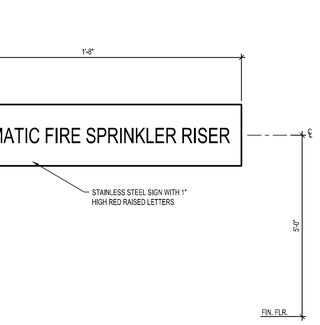
NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.
3. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.
4. CENTER TEXT AND CENTER BRAILLE UNDER TEXT (TYP.)

WALL-MOUNTED TOILET ROOM SIGNAGE SCALE: 3" = 1'-0" **4**



NOTES :
1. MOUNT SIGN ON THE WALL ADJACENT TO LATCH SIDE OF DOOR, AT HEIGHT NOTED IN DETAIL ABOVE. WHERE THERE IS NO WALL SPACE ON LATCH SIDE OF DOOR, PLACE SIGNS ON NEAREST ADJACENT WALL, PREFERABLY ON THE RIGHT.
2. REFER TO DETAIL 20/- FOR ADDITIONAL SIGNAGE REQUIREMENTS.

TYPICAL SIGNAGE LOCATION SCALE: 1/2" = 1'-0" **5**

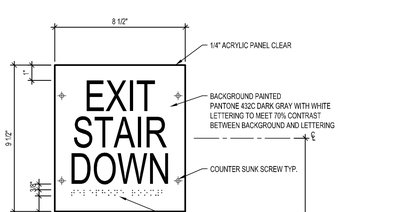


NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.

DOOR MOUNTED TOILET ROOM SIGN SCALE: 3" = 1'-0" **6**

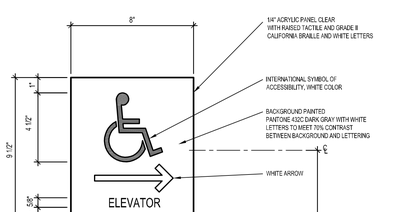
NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.
3. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.
4. CENTER TEXT AND CENTER BRAILLE UNDER TEXT (TYP.)

WALL MOUNTED TOILET ROOM SIGN SCALE: 3" = 1'-0" **7**



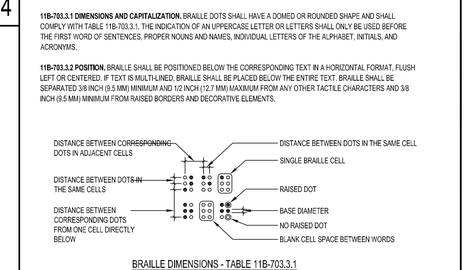
NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.
3. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.

TACTILE EXIT ROUTE SIGNAGE SCALE: HALF **8**



NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.
3. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.

TACTILE EXIT SIGNAGE SCALE: HALF **9**



NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.
3. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.
4. VERIFY TEXT W/ DOOR SCHEDULE, CONFIRM W/ OWNER.

ROOM NAME / NUMBER SIGN WITH INSERT SCALE: HALF **10**

NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.
3. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.
4. VERIFY TEXT W/ DOOR SCHEDULE, CONFIRM W/ OWNER.

ROOM NAME / NUMBER SIGN SCALE: HALF **11**

NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.

ASSISTIVE-LISTENING DEVICE SIGNAGE SCALE: 3" = 1'-0" **12**

NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.
3. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.

MAXIMUM OCCUPANCY SIGN SCALE: 3" = 1'-0" **13**

NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.
3. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.

INTERNATIONAL SYMBOL OF ACCESSIBILITY SCALE: HALF **14**

NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.
3. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.

FIRE SPRINKLER RISER SIGN SCALE: 3" = 1'-0" **16**

NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. DOOR SIGN MUST CONTRAST WITH DOOR COLOR.
3. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.

TACTILE EXIT ROUTE SIGNAGE SCALE: 3" = 1'-0" **18**

* SEE SIGNAGE PLAN FOR LOCATION
19A= ELEVATOR
19B=RESTROOM

NOTES :
1. SEE DETAIL 5 / 11.01 FOR ADDITIONAL INFORMATION.
2. FONT : FRUTIGER 55 ROMAN. OPEN LETTER SPACING TO MEET ADA VISUAL REQUIREMENTS.
3. DETAIL REFERENCE 15A IS FOR RESTROOM DIRECTIONAL ROUTE SIGNAGE - REFER TO SIGNAGE PLANS FOR LOCATION. LETTERING ON SIGN TO BE "RESTROOM".

DIRECTIONAL ROUTE SIGNAGE SCALE: 3" = 1'-0" **19**

SIGNAGE GENERAL NOTES

1. CHARACTER TYPE: CHARACTERS ON SIGN SHALL BE RAISED 1/32" MINIMUM AND SHALL BE SANS SERIF UPPERCASE CHARACTERS ACCOMPANIED BY GRADE 2 CONTRACTED BRAILLE.

2. CHARACTER SIZE: RAISED CHARACTERS SHALL BE A MINIMUM OF 5/8" AND A MAXIMUM OF 2" HIGH.

3. FINISH AND CONTRAST: CONTRAST BETWEEN CHARACTERS, SYMBOLS AND THEIR BACKGROUND MUST BE 70% MINIMUM AND HAVE A NON-GLARE FINISH. 11B-703.5.1

4. PROPORTIONS: CHARACTERS ON SIGNS SHALL HAVE A WIDTH-TO-HEIGHT RATIO OF BETWEEN 3:5 AND 1:1 AND A STROKE WIDTH-TO-HEIGHT RATIO OF BETWEEN 1:5 AND 1:10. 11B-703.5.4

ALL LETTERS MEASURED MUST BE UPPERCASE. AFTER CHOOSING A TYPESTYLE TO TEST, BEGIN BY PRINTING THE LETTERS I, X, AND O, AT 1" HIGH. PLACE THE TEMPLATE'S 1:1 SQUARE OVER THE X OR O, WHICHEVER IS NARROWER. IF THE CHARACTER IS NOT WIDER THAN 1" NOR NARROWER THAN THE 3:5 RECTANGLE, THE PROPORTIONS ARE CORRECT. USE THE 1:5 RECTANGLE TO DETERMINE IF THE STROKE OF THE I IS TOO BROAD, AND THE 1:10 RECTANGLE TO SEE IF IT IS TOO NARROW. IF ALL THE TESTS ARE PASSED, THE TYPESTYLE IS COMPLIANT WITH PROPORTION CODE.

BRAILLE

11B-703.3 BRAILLE BRAILLE SHALL BE CONTRACTED (GRADE 2) AND SHALL COMPLY WITH SECTIONS 11B-703.3 AND 11B-703.4.

11B-703.3.1 DIMENSIONS AND CAPITALIZATION. BRAILLE DOTS SHALL HAVE A DOMED OR ROUNDED SHAPE AND SHALL COMPLY WITH TABLE 11B-703.3.1. THE INDICATION OF AN UPPERCASE LETTER OR LETTERS SHALL ONLY BE USED BEFORE THE FIRST WORD OF SENTENCES, PROPER NOUNS AND NAMES, INDIVIDUAL LETTERS OF THE ALPHABET, INITIALS, AND ACRONYMS.

11B-703.3.2 POSITION. BRAILLE SHALL BE POSITIONED BELOW THE CORRESPONDING TEXT IN A HORIZONTAL FORMAT, FLUSH LEFT OR CENTERED. IF TEXT IS MULTI-LINED, BRAILLE SHALL BE PLACED BELOW THE ENTIRE TEXT. BRAILLE SHALL BE SEPARATED 3/8 INCH (9.5 MM) MINIMUM AND 1/2 INCH (12.7 MM) MAXIMUM FROM ANY OTHER TACTILE CHARACTERS AND 3/8 INCH (9.5 MM) MINIMUM FROM RAISED BORDERS AND DECORATIVE ELEMENTS.

BRAILLE DIMENSIONS - TABLE 11B-703.3.1

MEASUREMENT RANGE	MINIMUM IN INCHES MAXIMUM IN INCHES
DOT BASE DIAMETER	0.059 (1.5 MM) TO 0.063 (1.6 MM)
DISTANCE BETWEEN TWO DOTS IN THE SAME CELL	0.100 (2.5 MM)
DISTANCE BETWEEN CORRESPONDING DOTS IN ADJACENT CELLS	0.300 (7.6 MM)
DOT HEIGHT	0.025 (0.6 MM) TO 0.037 (0.9 MM)
DISTANCE BETWEEN CORRESPONDING DOTS FROM ONE CELL DIRECTLY BELOW	0.395 (10 MM) TO 0.400 (10.2 MM)

TYPICAL SIGNAGE NOTES SCALE: NONE **20**

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tBP project number : 20967.00
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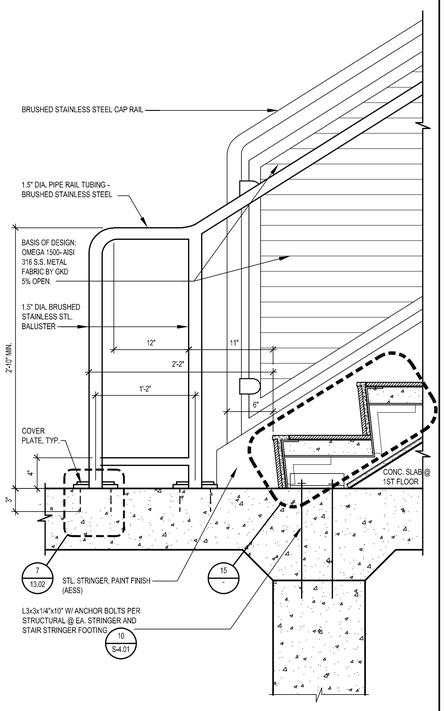
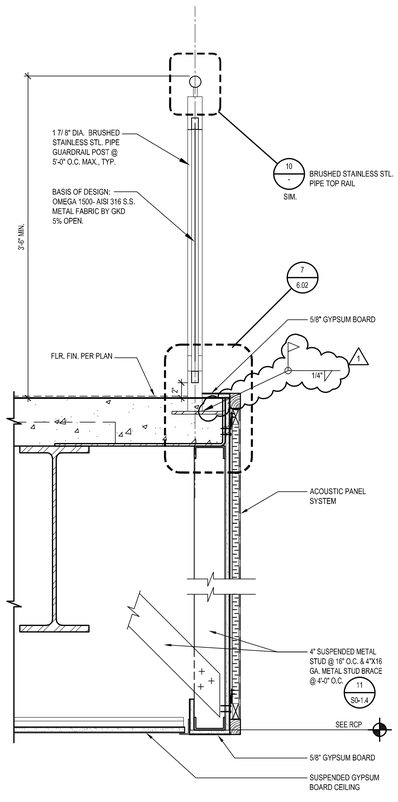
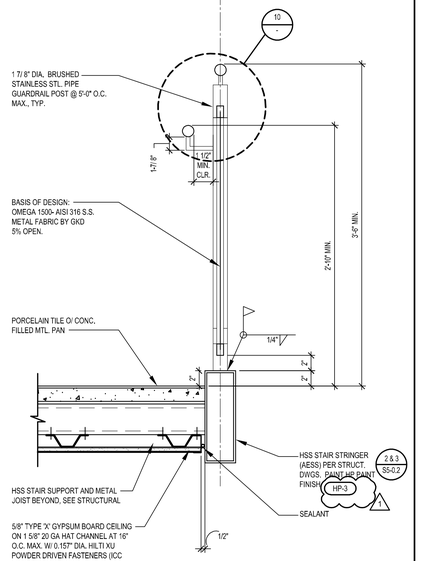


STAIR @ LOWER LANDING | 1

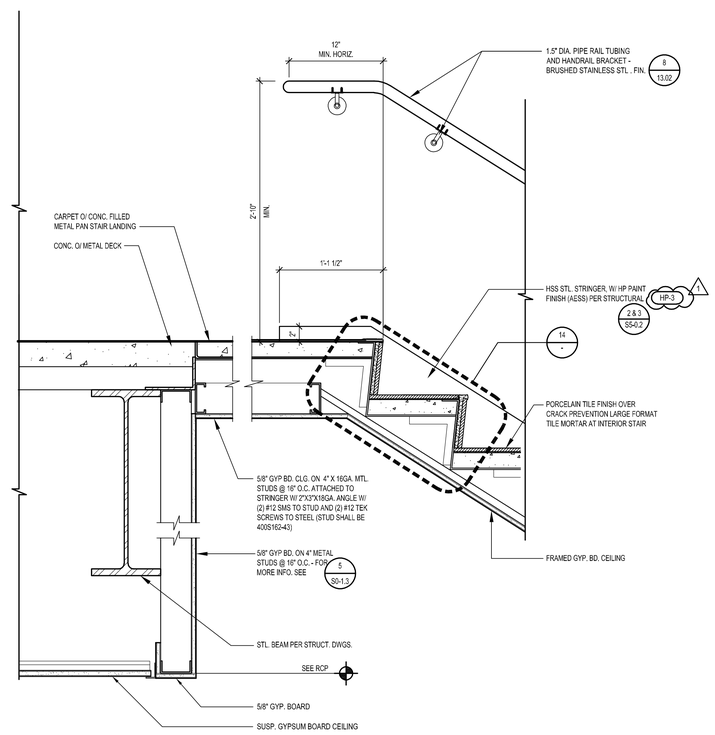


SECTION - STAIR UPPER GUARDRAIL | 2

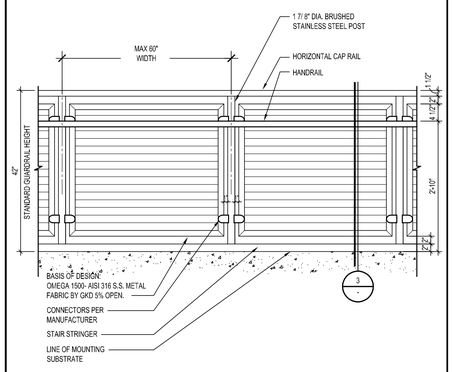


NOTES:
1. PAINT STRUCT. STL. AND METAL PAN

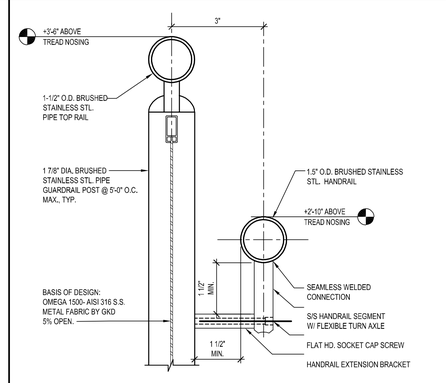
TYPICAL GUARDRAIL AND HANDRAIL @ LANDING | 3



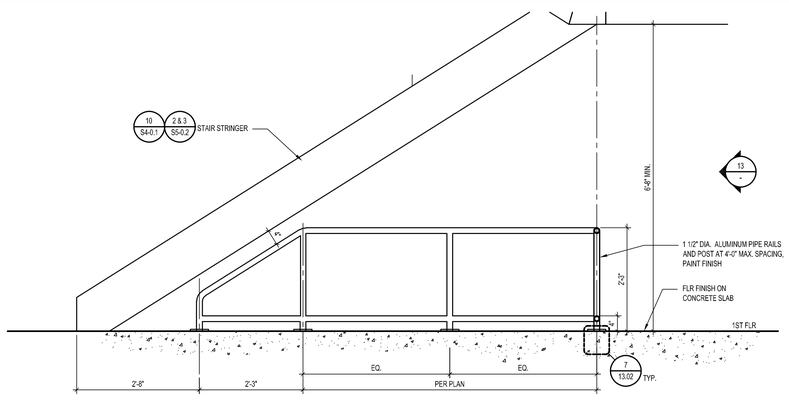
SECTION - STAIR #1 UPPER LANDING | 5



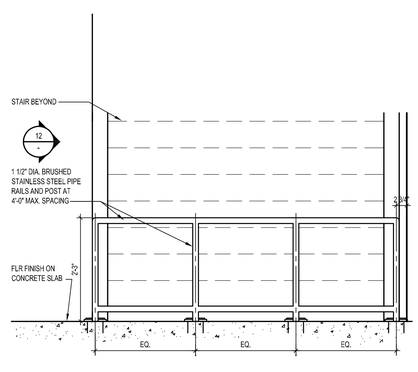
TYPICAL METAL MESH GUARDRAIL ELEVATION | 6



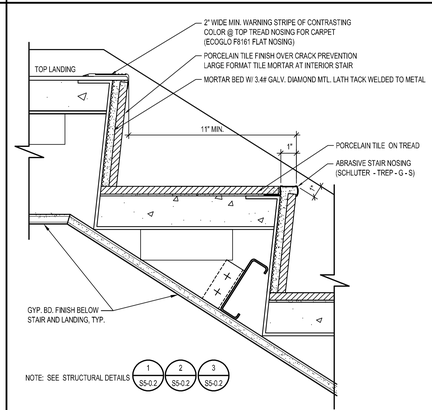
GUARDRAIL & HANDRAIL - SECTION | 10



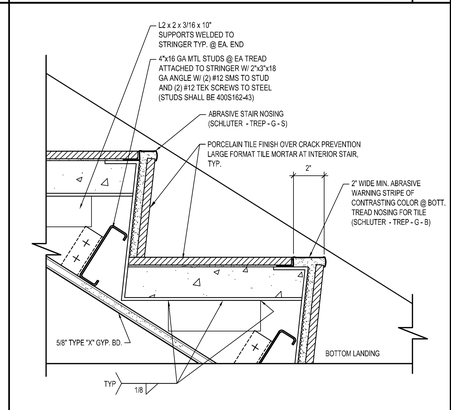
GUARDRAIL BARRIER BELOW STAIR - SIDE ELEVATION | 12



GUARDRAIL BARRIER BELOW STAIR - ELEVATION | 13



NOSING DETAIL @ TOP LANDING | 14



NOSING DETAIL @ BOTTOM LANDING | 15

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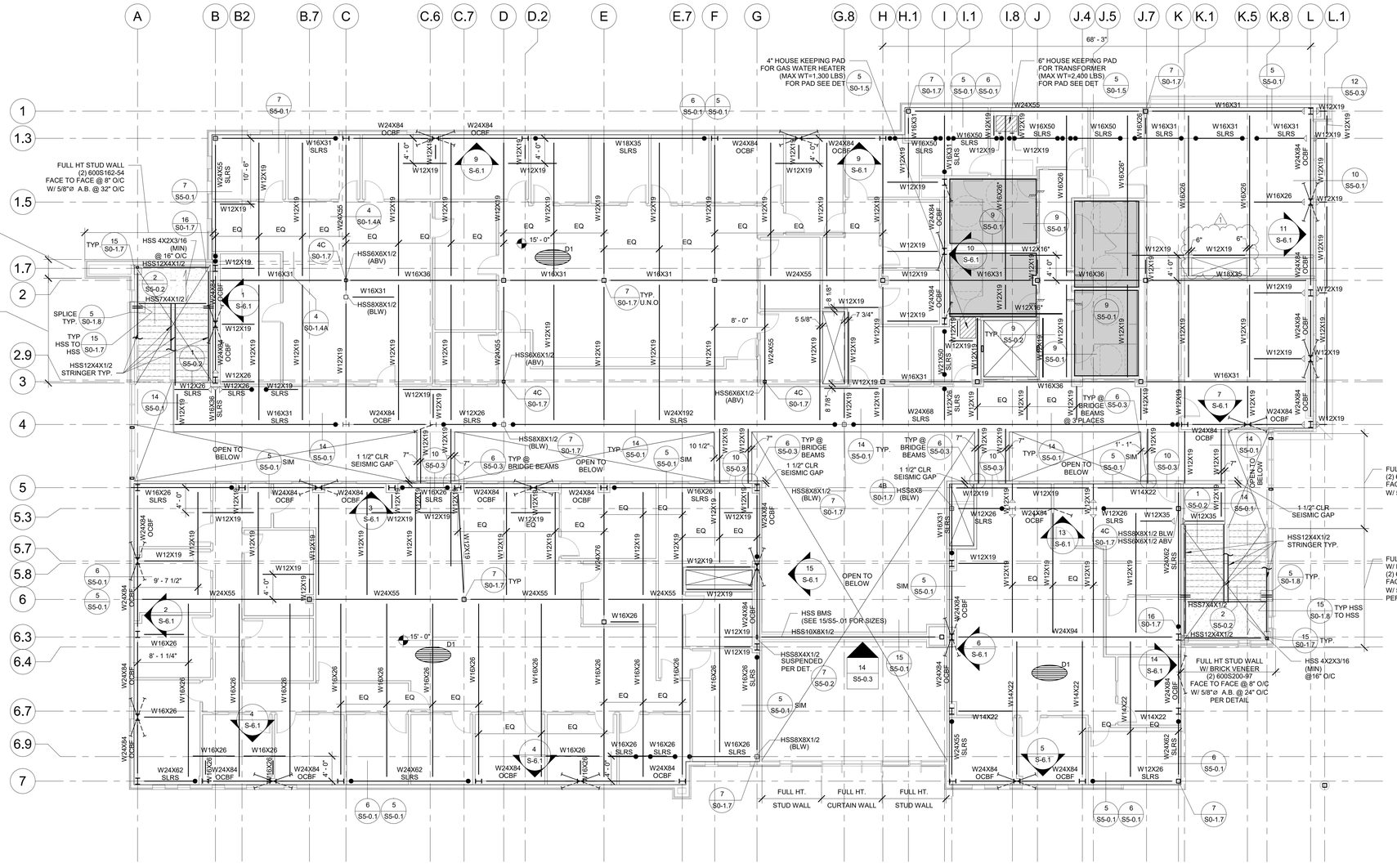

1 2ND FLOOR FRAMING PLAN

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

NORTH

FLOOR FRAMING NOTES:

1. FOR GENERAL NOTES, SEE S0-0.0 SERIES.
2. FOR TYPICAL DETAILS, SEE S0-1.0 SERIES.
3. ALL STEEL BEAMS SHALL HAVE WELDED STUDS, SEE DETAIL 8/S0-1.8
4. METAL DECK W/ LT. WT. CONC. SEE 5/S0-1.6 FOR ADDITIONAL INFORMATION.
5. TOS = 14'-6 1/2" TYP, UNO
6. FOR TYPICAL BEAM TO BEAM CONNECTIONS, SEE DETAIL 13/S0-1.7
7. CANTILEVER BEAM MOMENT CONNECTION SEE DETAIL 1/S0-1.8
8. HSS COLUMNS: SEE S-2.2 FOR SIZES NOT SHOWN.
9. BEAM SPLICE. SEE DETAIL 6/S0-1.8
10. INDICATES BOLT CONNECTION AT SLRS SEE DETAIL 12/S0-1.7
    INDICATES (3) ROWS OF A490SC, ●●●
    INDICATES (2) ROWS OF A490SC, ●●
    NDICATES (1) ROW OF A490SC, ●
11. INDICATES DEPRESSED SLAB. SEE DETAIL 3/S0-1.6 REFER TO ARCHT'L DRAWINGS FOR ADDITIONAL INFORMATION.
12. FOR BEAMS MARKED W/ "★" NEXT TO DESIGNATION, DENOTES DEPRESSED BEAM WITH WT SECTION ON TOP PER 8/S0-1.7
13. SHOWS ELEVATION OF STEEL FRAME
14. AT ALL SLRS BEAMS (DRAG BEAMS, SMRF BEAMS, OCBF BEAMS) PROVIDE BRACING PER 3/S0-1.8 @ 8'-0" O/C MAX
15. SEE ARCHT'L/MEP DRAWINGS FOR ACTUAL LOCATIONS AND SIZE OF OPENINGS.
16. SECONDARY BEAMS SHALL BE SPACED EQUALLY UNLESS NOTED OTHERWISE.
17. DENOTES OCBF BRACE ABOVE (DASHED DENOTES BELOW) SEE FRAME ELEVATIONS ON S-6.1 FOR ADDITIONAL INFO.

METAL DECK SCHEDULE

DECK MARK	TYPE	GAGE	I (IN4/FT)	S (TOP +) (IN3/FT)	S (BOT -) (IN3/FT)	TOTAL DEPTH(IN)	CONC FILL TYPE	REINF.	WELDED STUDS
D1	VERCO W3 IAPMO 0212	18	1.213	0.752	0.768	5 1/2"	LWC	#3@12"O/C E.W.	3/4 DIAM. X 5" LONG @12"O/C
D2	VERCO W2 IAPMO 0212	18	1.213	0.752	0.768	4 1/2"	LWC	#3@12"O/C E.W.	3/4 DIAM. X 4" LONG @12"O/C

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tBP project number: 20987.00
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drawn by: A.N. checked by: A.Q.
date: 9.3.2019

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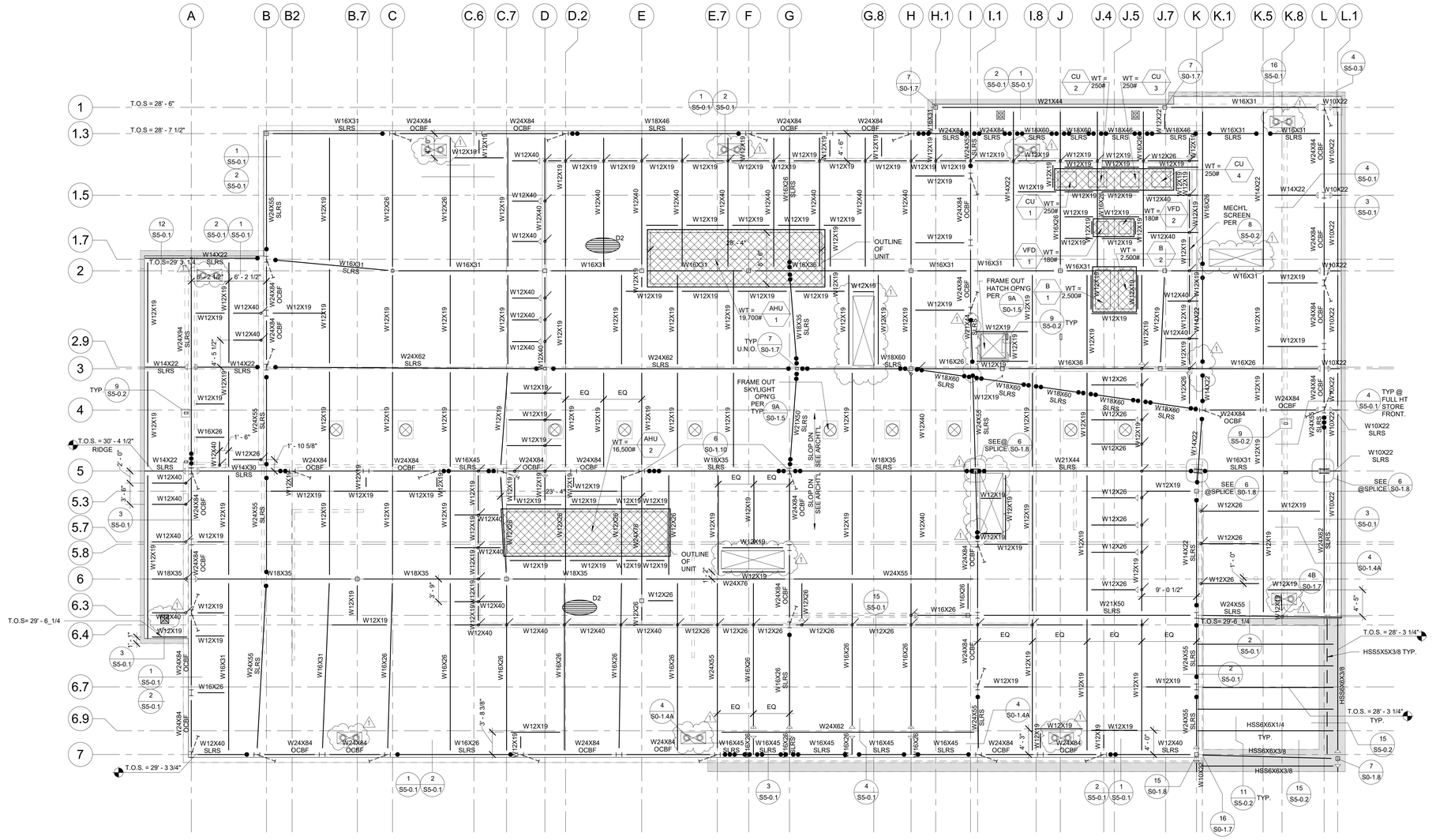
drawing title:
SECOND FLOOR FRAMING PLAN

drawing no.:
S-3.1
drawing of



1 ROOF FRAMING PLAN

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

NORTH

ROOF FRAMING NOTES:

1. FOR GENERAL NOTES, SEE S0-0.0 SERIES.
2. FOR TYPICAL DETAILS, SEE S0-1.0SERIES.
3. NOT USED
4. METAL DECK. SEE (1 / S0-1.5) FOR ADDITIONAL INFORMATION.
5. TOS = VARIES. SEE PLAN & VERIFY WITH ARCHT'L DRAWINGS REFER TO ARCHT'L FOR ROOF SLOPES
6. FOR TYPICAL BEAM TO BEAM CONNECTIONS, SEE DETAIL (13 / S0-1.7)
7. CANTILEVER BEAM MOMENT CONNECTION SEE DETAIL (1 / S0-1.8)
8. HSS COLUMNS: SEE S-2.2 FOR SIZES.
9. BEAM SPLICE. SEE DETAIL (6 / S0-1.8)
10. INDICATES BOLT CONNECTION AT SLRS SEE DETAIL (12 / S0-1.7)
    INDICATES (3) ROWS OF A490SC,
    INDICATES (2) ROWS OF A490SC,
    NDICATES (1) ROW OF A490SC,
11. INDICATES APPROXIMATE LOCATION OF MECH UNIT CONC PAD. SEE DET. (9 / S0-1.6) (10 / S0-1.6)
    REFER TO MECH AND ARCH DWGS FOR ADDITIONAL INFO.
12. FRAME OPENING IN ROOF FOR SKYLIGHTS,SOLAR TUBES & ROOF DRAINS,ETC
    PER DETAIL (9 / S0-1.5) U.N.O. SEE ARCHT'L/MEP DRAWINGS FOR ACTUAL LOCATIONS AND SIZE OF OPENINGS.
13. INDICATES PIPE @ MECH SCREEN SEE DETAIL (8 / S5-0.2)
14. ALL STEEL BEAMS SHALL HAVE WELDED STUDS, SEE DETAIL (8 / S0-1.8)
15. AT ALL SLRS BEAMS (DRAG BEAMS, SMRF BEAMS, OCBF BEAMS) PROVIDE BRACING
    PER (3 / S0-1.8) @ 8'-0" O/C MAX

METAL DECK SCHEDULE

DECK MARK	TYPE	GAGE	I (IN4/FT)	S.(TOP +) (IN3/FT)	S.(BOT -) (IN3/FT)	TOTAL DEPTH(IN)	CONC FILL TYPE	REINF.	WELDED STUDS
D1	VERCO W3 IAPMO 0212	18	1.213	0.752	0.768	5 1/2"	LWC	#3@12"O/C E.W.	3/4 DIAM. X 5" LONG @12"O/C
D2	VERCO W2 IAPMO 0212	18	1.213	0.752	0.768	4 1/2"	LWC	#3@12"O/C E.W.	3/4 DIAM. X 4" LONG @12"O/C

16. SECONDARY BEAMS SHALL BE SPACED EQUALLY UNLESS NOTED OTHERWISE.
17. DENOTES OCBF BRACE BELOW. SEE FRAME ELEVATIONS ON S-6.1 FOR ADDITIONAL INFO.
18. (# / #) DENOTES MECH'L UNTIL WITH MAX WEIGHT. SEE MEP DRAWINGS FOR ADDITIONAL INFORMATION (UNITS THAT WEIGHT LESS THAN 200 LBS SEE MECH'L DRAWINGS)

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ROOF FRAMING PLAN

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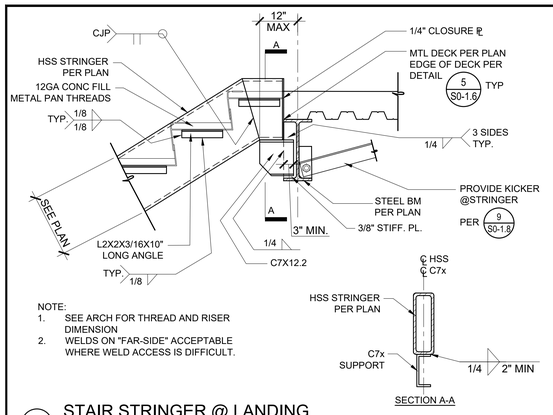
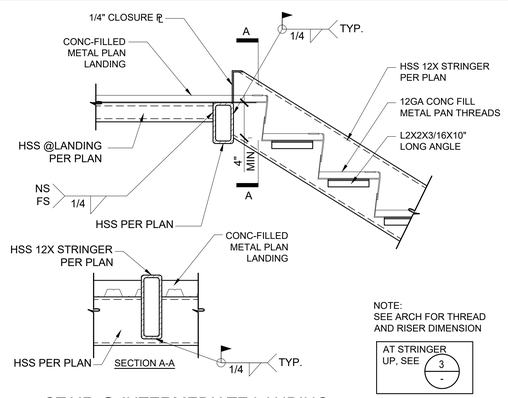
S-3.2
drawing of



NOTE:
1. SEE ARCH FOR THREAD AND RISER DIMENSION
2. WELDS ON "FAR-SIDE" ACCEPTABLE WHERE WELD ACCESS IS DIFFICULT.

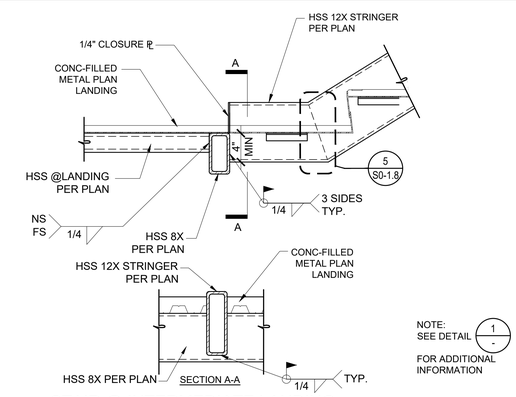
1 STAIR STRINGER @ LANDING
NTS



NOTE:
SEE ARCH FOR THREAD AND RISER DIMENSION

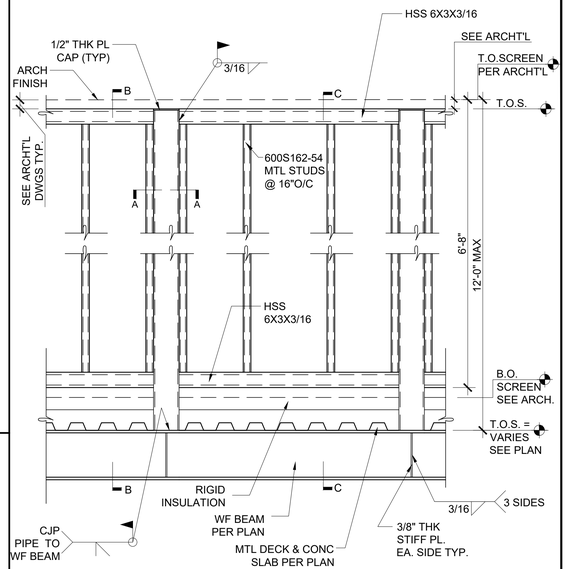
AT STRINGER UP, SEE 3 -

2 STAIR @ INTERMEDIATE LANDING
NTS

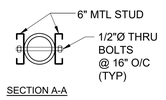


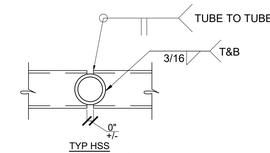
NOTE:
SEE DETAIL 1 -
FOR ADDITIONAL INFORMATION

3 STAIR @ INTERMEDIATE LANDING
NTS

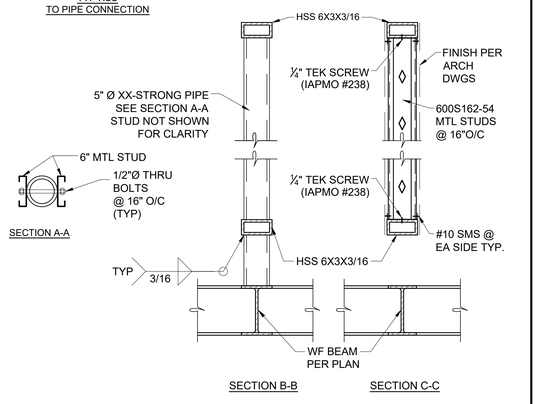


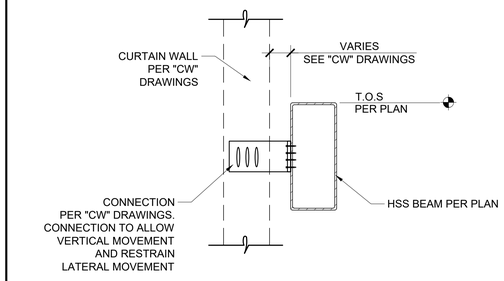
SEE DETAIL 11 S0-1.3 & 12 S0-1.3 FOR STUD BRACING REQUIREMENTS.





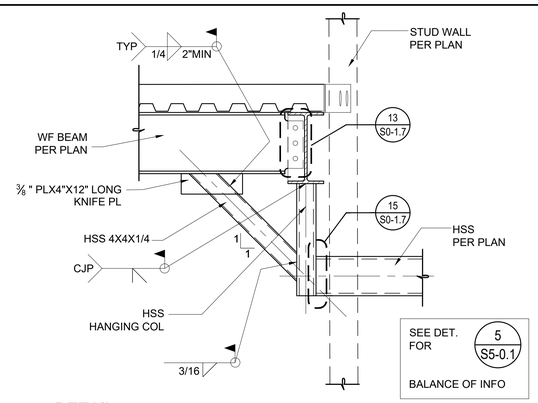
8 CANTILEVER WALL @ROOF
NTS





5 CURTAIN WALL TO HSS BEAM
NTS

6 NOT USED
NTS



7 DETAIL
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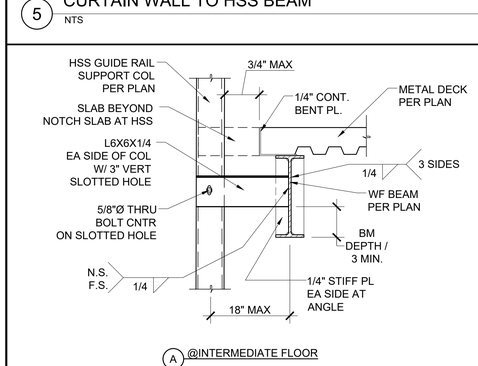
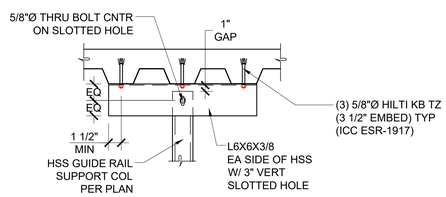
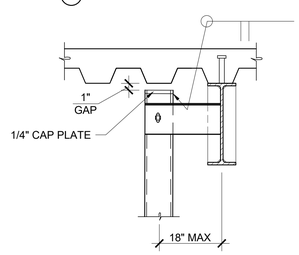


A @INTERMEDIATE FLOOR



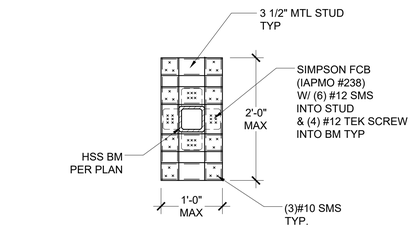
B @ROOF ATTACHMENT



C @ROOF ATTACHMENT NEAR STEEL BM (BALANCE OF INFO SEE A)

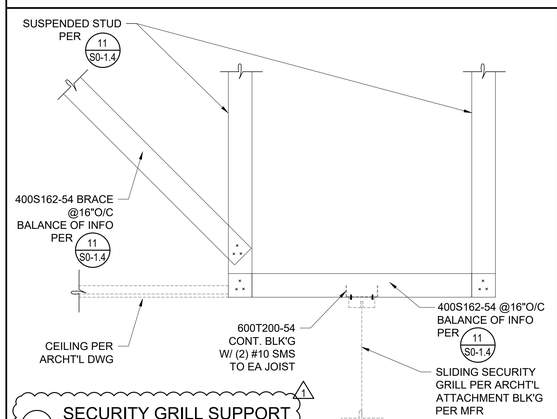
9 COL LATERAL SUPPORT
NTS

10 NOT USED
NTS

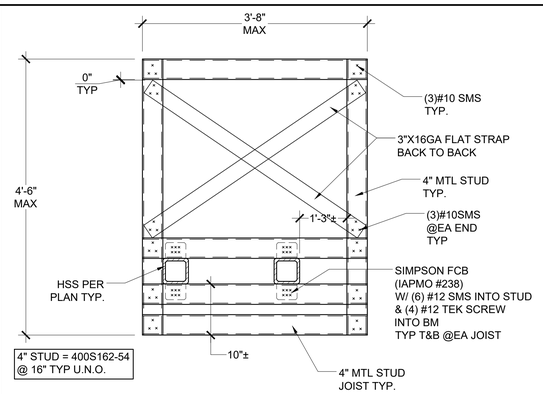


3 1/2" STUD = 450S162-43 @ 16" TYP U.N.O.

11 DETAIL
NTS

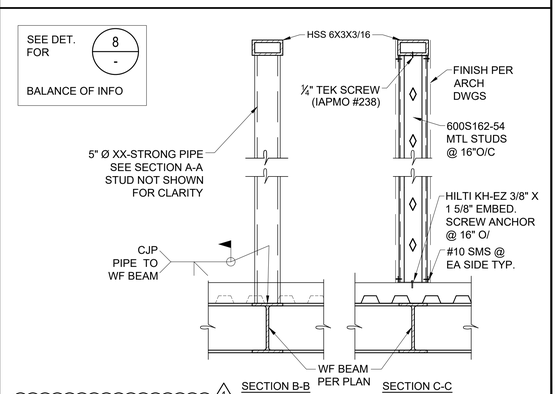


1
14 SECURITY GRILL SUPPORT
NTS



4" STUD = 400S162-54 @ 16" TYP U.N.O.

15 DETAIL
NTS



1
16 PARAPET @ ROOF
NTS

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COMPTON COLLEGE STUDENT SERVICES BLDG.

COMPTON COMMUNITY COLLEGE DISTRICT
1111 E. ARTESIA BLVD.
COMPTON, CA 90221

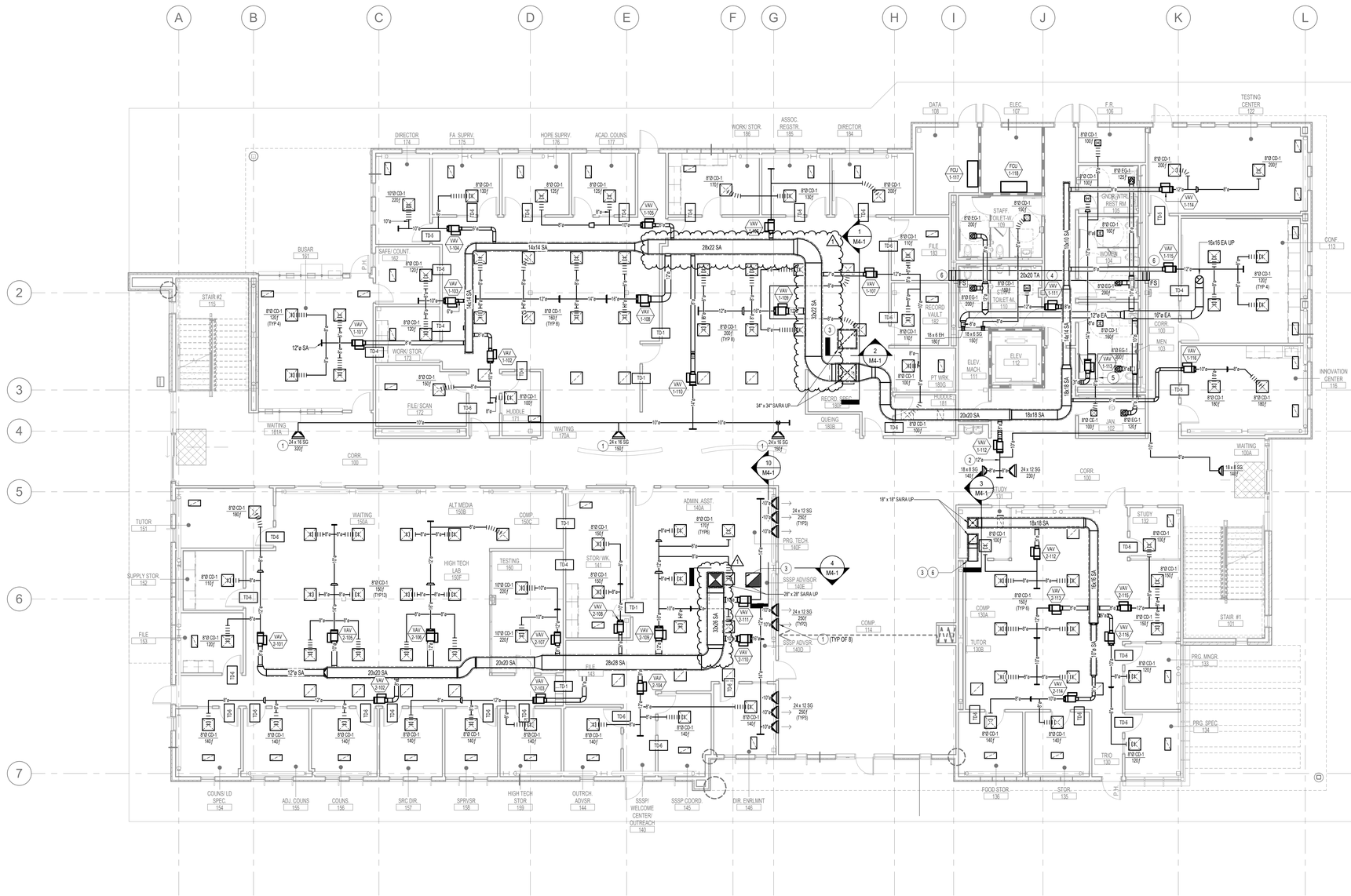
owner

tBP project number : 20987.00
file name:
drawn by: tBP checked by: T. HALL
date: 9.3.2019

Rev:	date:	description:
1	11-20-19	ADDENDUM #1

drawing title:
FRAMING DETAILS

drawing no.:
S5-0.2
drawing of



MECHANICAL FIRST FLOOR PLAN

SCALE 1/8" = 1'-0"

1

NORTH

GENERAL NOTES:

1. RETURN AIR SYSTEM IS A CEILING PLENUM. SOUND ELBOWS ARE TO BE INSTALLED AT ALL FULL HEIGHT WALLS. FOR RETURN PLENUM SEE SHEET M4-1.
2. FOR ROOM T-STATS SEE SHEET MP1-1
3. FOR TRANSFER DUCT SIZE SEE DETAIL 6/M7-1
4. MATERIALS EXPOSED WITHIN DUCTS OR PLENUMS SHALL BE NON-BOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX NOT TO EXCEED 25 AND A SMOKE DEVELOPED INDEX NOT TO EXCEED 50 WHERE TESTED AS A COMPOSITE PRODUCT IN ACCORDANCE WITH ASTM E84 OR UL 723; C.M.C.602.2.

KEY NOTES:

1. WALL MOUNTED SUPPLY REGISTER
2. DUCT ROUTED BELOW WALKWAY ABOVE.
3. RETURN AIR DUCT OPEN TO CEILING PLENUM.
4. 20" x 20" R.A. TRANSFER DUCT.
5. 24 x 24 ACCESS DOOR HATCH CEILING COLOR.
6. RETURN AIR WITH WIRE MESH SCREEN

MECHANICAL LEGEND:

- 24 x 12 RETURN GRILLE
- 24 x 24 RETURN GRILLE

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architect

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LONG BEACH, CALIFORNIA

RH - TS/SL/DV — PM - DESIGN TEAM
170822.00 — PROJECT NO.

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER D. PETRUTY
M 34011
EXPIRES 3/31/20
MECHANICAL
STATE OF CALIFORNIA

DATE SIGNED: 08/16/19

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tBP project number: 20987.00

file name: CECI_COMPTON CC STUDENT SERVICES_MP1B_CENTRAL.RVT

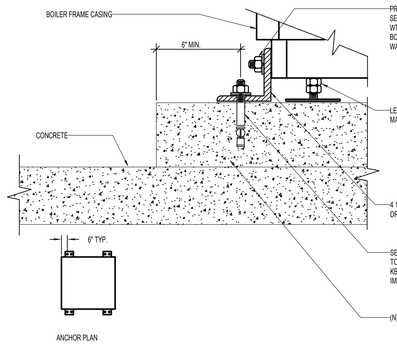
drawn by: CECI checked by: CM

date: 9.03.2019

rev:	date:	description:

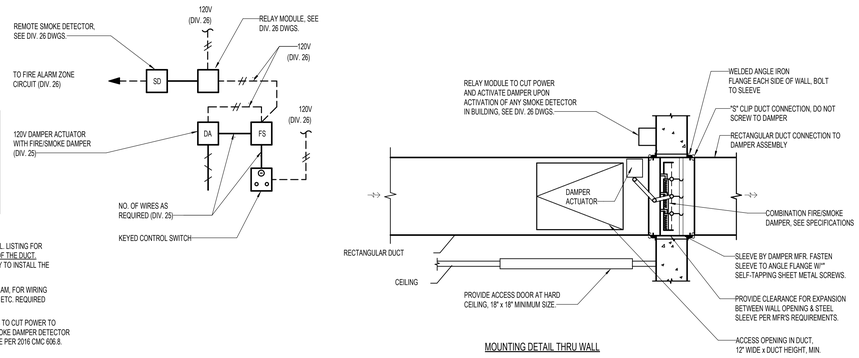
drawing title:
MECHANICAL FIRST FLOOR PLAN

drawing no.:
M1-1
drawing of



9 M7-1 BOILER MOUNTING

SCALE: 1" = 1'-0"



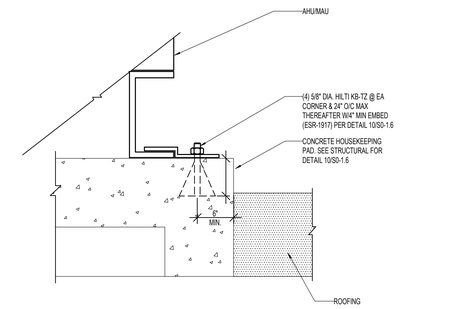
NOTES :

1. INSTALLATION SHALL BE PER THE DAMPER MANUFACTURER'S U.L. LISTING FOR DAMPER IN THE PLANE OF THE WALL AND ACTUATOR OUTSIDE OF THE DUCT. MANUFACTURER SHALL PROVIDE ALL COMPONENTS NECESSARY TO INSTALL THE DAMPERS PER THIS REQUIREMENT.
2. WIRE TO CLOSE DAMPER UPON SENSING OF SMOKE IN AIR STREAM, FOR WIRING DIAGRAM SEE ABOVE. PROVIDE ALL WIRING, CONDUIT, RELAYS, ETC. REQUIRED TO RENDER SYSTEM COMPLETE.
3. PROVIDE UNIT RELAY LISTED FOR USE WITH SMOKE DETECTORS TO CUT POWER TO UNIT CONTROLS TO SHUTDOWN FAN OPERATION WHEN FIRE/SMOKE DAMPER DETECTOR IN DUCT SERVED BY AC IS ENERGIZED, FAN SHUTDOWN SHALL BE PER 2016 CMC 606.8.

MOUNTING DETAIL THRU WALL

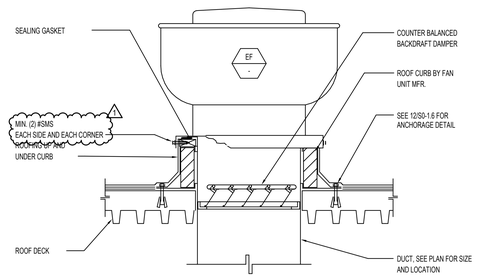
5 M7-1 COMBINATION FIRE/SMOKE DAMPER DETAIL

SCALE: NONE



1 M7-1 AHU MOUNTING DETAIL

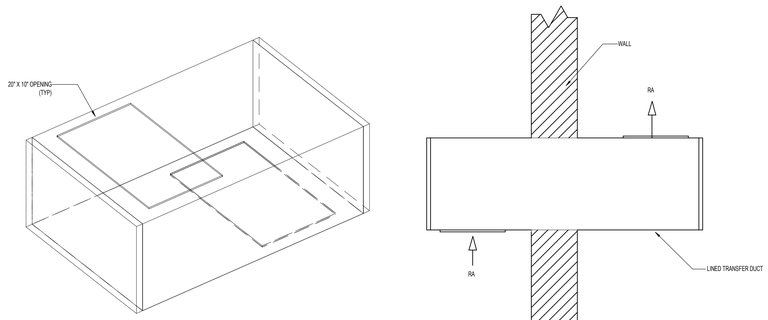
SCALE: NONE



11 M7-1 EXHAUST FANS MOUNTING

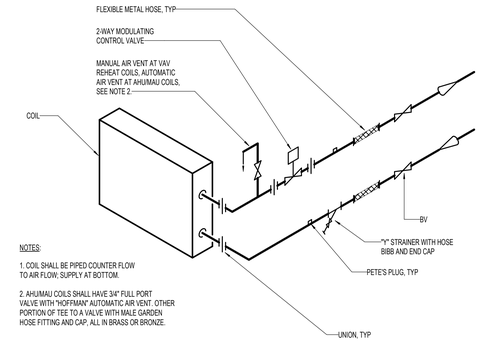
SCALE: NONE

TRANSFER DUCT SCHEDULE		
NAME	CFM	SIZE
TD-1	1200	20X20
TD-2	1000	18X18
TD-3	800	16X16
TD-4	600	14X14
TD-5	400	12X12
TD-6	200	8X8



6 M7-1 TRANSFER DUCT DETAIL

SCALE: NTS



NOTES:

1. COIL SHALL BE PIPED COUNTER FLOW TO AIR FLOW; SUPPLY AT BOTTOM.
2. AHUMAU COILS SHALL HAVE 3/4" FULL PORT VALVE WITH "HOFFMAN" AUTOMATIC AIR VENT. OTHER PORTION OF TEE TO A VALVE WITH MALE GARDEN HOSE FITTING AND CAP, ALL IN BRASS OR BRONZE.

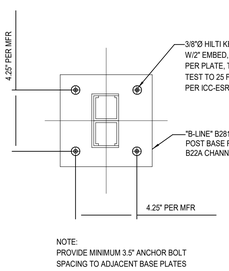
2 M7-1 CHW & HHW COIL PIPING DETAIL (2-WAY)

SCALE: NONE

NOTES REMOVED. SEE SEISMIC DESIGN CRITERIA BELOW, THIS SHEET.

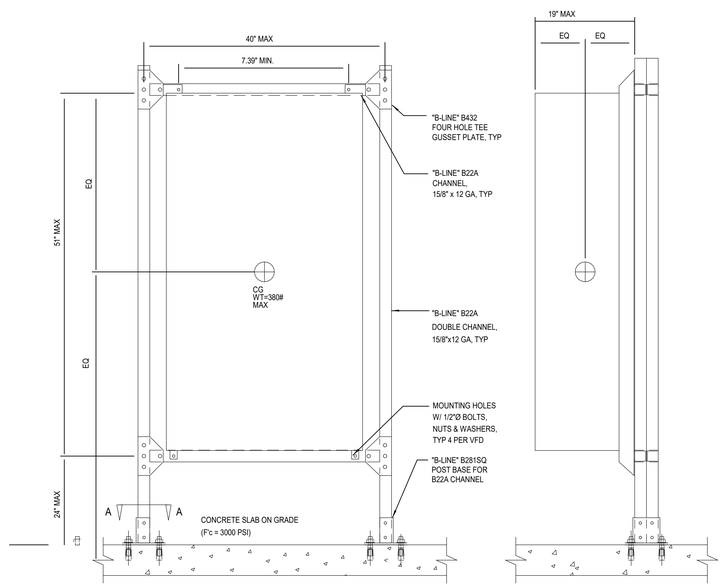
NOTES:

1. VERIFY ACTUAL MOUNTING & CLEARANCE REQUIREMENTS WITH EQUIPMENT MANUFACTURER.
2. MAINTAIN 42" MINIMUM CLEARANCE IN FRONT OF VFD.
3. DIMENSIONS AND WEIGHT ON DETAIL REPRESENT WORSE CASE SCENARIO BETWEEN EACH VFD.



NOTE:
PROVIDE MINIMUM 3.5" ANCHOR BOLT SPACING TO ADJACENT BASE PLATES

A-A

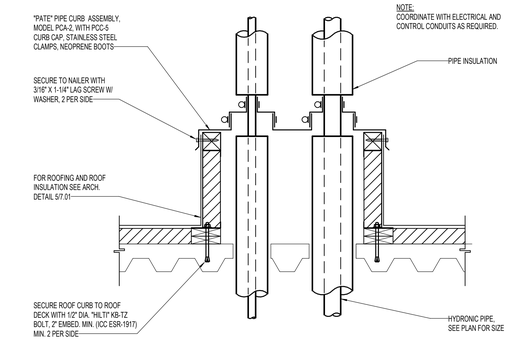


FRONT

SIDE

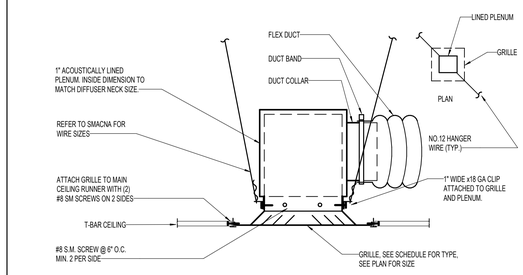
10 M7-1 SINGLE VFD MNTG

SCALE: 12" = 1'-0"



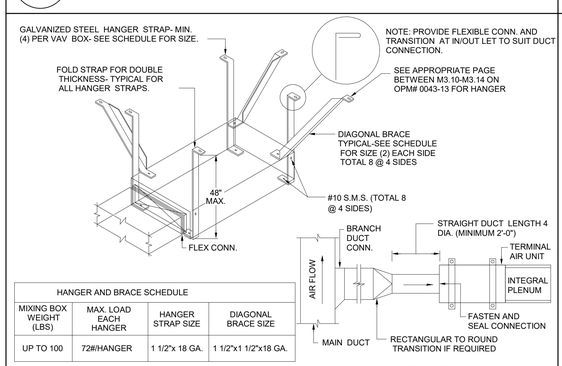
7 M7-1 PIPE THRU ROOF

SCALE: 1" = 1'-0"



3 M7-1 LAY-IN DIFFUSER/GRILLE MOUNTING

SCALE: NONE

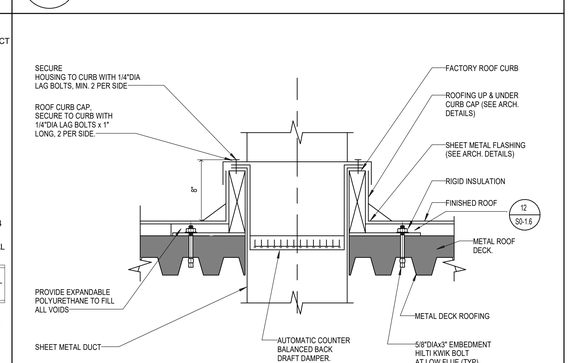


HANGER AND BRACE SCHEDULE			
MIXING BOX WEIGHT (LBS)	MAX. LOAD EACH HANGER	HANGER STRAP SIZE	DIAGONAL BRACE SIZE
UP TO 100	72#/HANGER	1 1/2"X 18 GA.	1 1/2"x1 1/2"x18 GA.

PLAN VIEW

8 M7-1 TERMINAL UNIT MOUNTING DETAIL

SCALE: NTS



4 M7-1 DUCT THROUGH ROOF

SCALE: NONE

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architect

CAPITAL ENGINEERING CONSULTANTS, INC.
LONG BEACH, CALIFORNIA

RH - TS/SL/DV — PM - DESIGN TEAM
170822.00 — PROJECT NO.

REGISTERED PROFESSIONAL ENGINEER — CHRISTOPHER D. PECK — M 34011 — EXPIRES 3/30/20 — MECHANICAL — STATE OF CALIFORNIA

DATE SIGNED: 08/16/19

consultant

COMPTON COLLEGE STUDENT SERVICES BLDG.

COMPTON COMMUNITY COLLEGE DISTRICT
1111 E. ARTESIA BLVD.
COMPTON, CA 90221

owner

tBP project number: 20987.00

file name: CECI_COMPTON CC STUDENT SERVICES_MP18_CENTRAL.RVT

drawn by: CECI checked by: CM

date: 9.03.2019

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drawing title:
DETAILS

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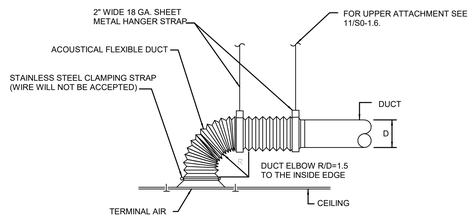
M7-1
drawing of

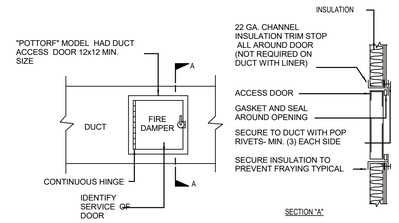


NOTES:

1. FLEXIBLE DUCT FOR DIFFUSER/GRILLE CONNECTION SHOWN. SIMILAR FOR TERMINAL UNIT CONNECTION.
2. FLEXIBLE DUCT SHALL NOT BE USE TO SERVE EXHAUST AIR SYSTEM. PROVIDE AND INSTALL RIGID DUCT MATERIAL.
3. FLEXIBLE DUCT MAX. LENGTH OF 5FT. & MAX. BEND OF ONE (1) 90 AIR DUCTS ONLY. HARD CONNECTION FOR RETURN & EXHAUST AIR DUCTS.

8 M7-2 **FLEXIBLE DUCT AND SUPPORT DETAIL**

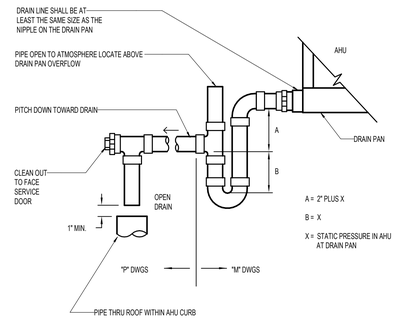
SCALE: NONE



SECTION "A"

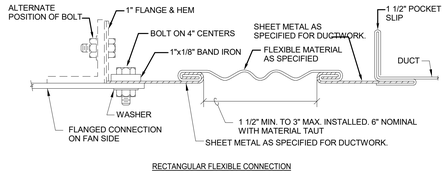
5 M7-2 **DUCT ACCESS DOOR DETAIL**

SCALE: NONE

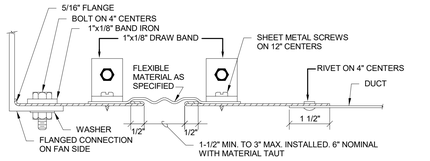


1 M7-2 **CONDENSATE DRAIN CONNECTION**

SCALE: NONE



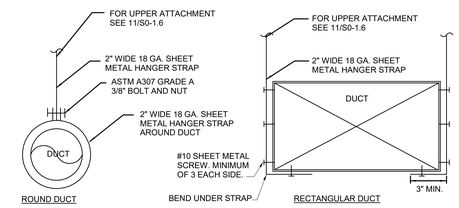
RECTANGULAR FLEXIBLE CONNECTION



ROUND FLEXIBLE CONNECTION

9 M7-2 **FLEXIBLE DUCT CONNECTION DETAIL**

SCALE: NONE

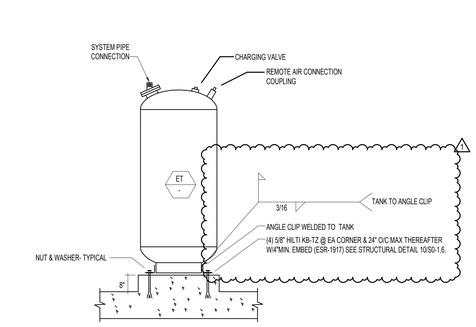


NOTE:
1. APPLICABLE FOR DUCTWORK LESS THAN 6 SQ.FT.

RETANGULAR DUCT			ROUND DUCT		
MAX. OF DUCT PERIMETER (INCH)	STRAP	MAX. LOAD EACH HANGER (LBS.)	DIAMETER (INCHES)	STRAP	MAX. LOAD EACH HANGER (LBS.)
P/2 =72	2"X 18 GA.	20	UP TO 20"	1"X 20 GA.	20
P/2 =96	2"X 16 GA.	30	21" TO 36"	1"X 18 GA.	30

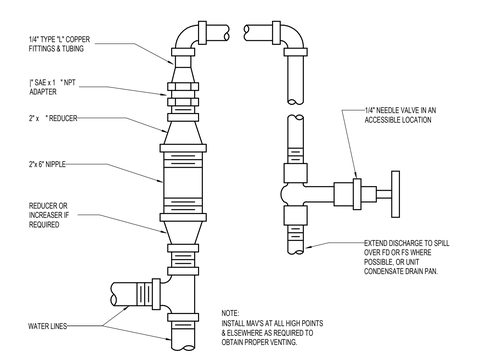
6 M7-2 **DUCT HANGER AND SUPPORT DETAIL**

SCALE: NONE



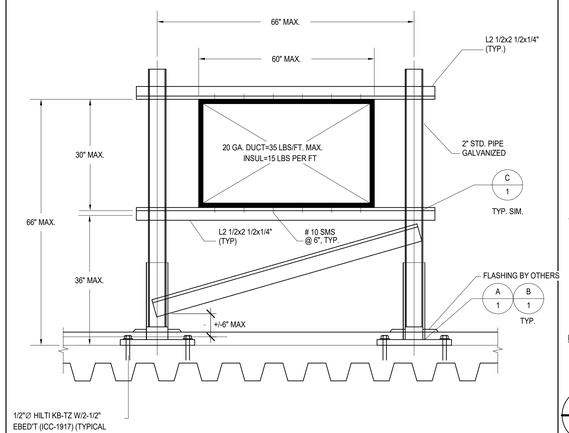
2 M7-2 **EXPANSION TANK MOUNTING DETAIL**

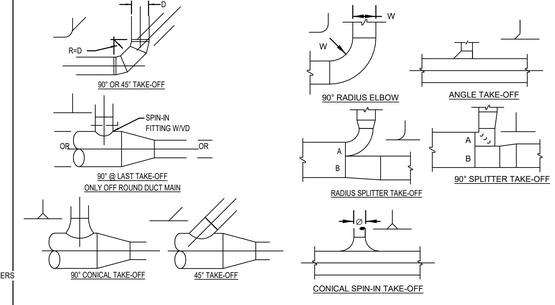
SCALE: NONE



10 M7-2 **AIR VENT DETAIL**

SCALE: NONE





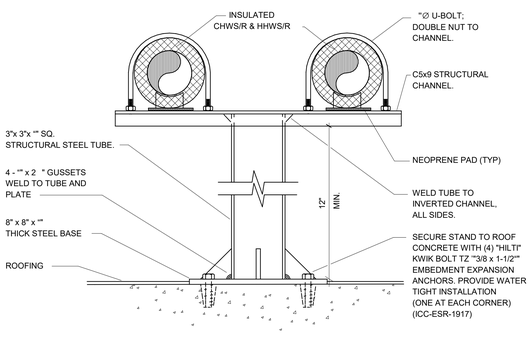
ROUND DUCT RECTANGULAR DUCT

NOTES:

1. SINGLE-LINE ILLUSTRATIONS ARE SYMBOLS USED ON DRAWINGS.
2. SIZE A & B DIMENSIONS IN PROPORTION TO AIR QUANTITIES IN EACH LEGS OF SPLIT UNLESS OTHERWISE NOTED.

3 M7-2 **BRANCH DUCT DETAIL**

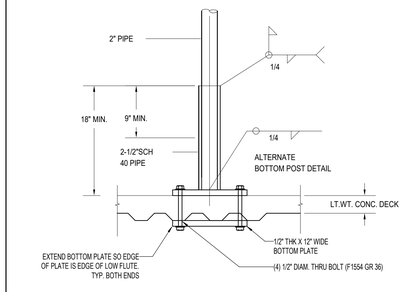
SCALE: NONE



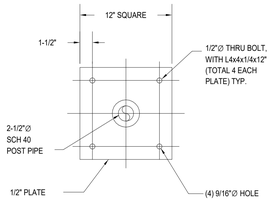
11 M7-2 **MECHANICAL PIPE ON ROOF SUPPORT**

SCALE: NONE

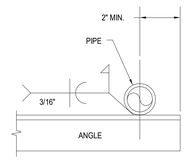
NOTE:
1. MAX. WEIGHT PER SUPPORT FRAME = 400 LBS.
2. 8' ON CENTER MAX. SUPPORT FRAME SPACING



DETAIL A : POST BOTTOM DETAIL



DETAIL B: BASE PLATE



DETAIL C: WELDING DETAIL

7 M7-2 **DUCT SUPPORT ON ROOF DETAIL**

SCALE: NONE

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DATE SIGNED: 08/16/19

consultant

COMPTON COLLEGE
STUDENT SERVICES BLDG.

COMPTON COMMUNITY COLLEGE DISTRICT
1111 E. ARTESIA BLVD.
COMPTON, CA 90221

owner

tBP project number: 20987.00

file name: CECI_COMPTON CC STUDENT SERVICES_MP18_CENTRAL.RVT

drawn by: CECI checked by: CM

date: 9.03.2019

rev:	date:	description:

drawing title:
DETAILS

drawing no.:
M7-2
drawing of

MASON INDUSTRIES, Inc.
Manufacturers of Vibration Control Products
350 Rabro Drive, Hauppauge, NY 11788, 516/348-0282, FAX 516/348-0279
2101 N. Crescent Ave., Suite D, Anaheim, CA 92801, 714/535-2727, FAX 714/535-5738

CERTIFIED FOR
JOB NAME: COMPTON COLLEGE
CUSTOMER: CAPITAL ENGINEERING
CUSTOMER P.O.: JOB NO.:
MASON E.O.: 31784 DWG. NO.: WF-31784-01
REQUIRED: (1) TAG: P-3

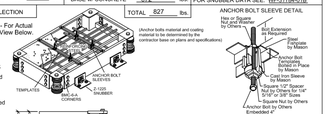
TYPE **BMK/ KSL** BOLTED MODULAR CONCRETE INERTIA BASE

MANUF. BELL & GOSSETT
SIZE 2.5X2 MODEL e-80
BASE NUMBER

PUMP TYPE / SUCTION
☐ CLOSE COUPLED — SIZE 1 — 1.5 MOTOR H.P.
☒ END SUCTION — 2.5" — SIZE 145T — FRAME SIZE
☐ DOUBLE SUCTION — SIZE 1800 R.P.M.

WEIGHTS: STEEL BASE 72 lbs. | EQUIPMENT 155 lbs. | BASE w/ CONCRETE 672 lbs. | TOTAL 827 lbs.
FOR SPRING MOUNT DATA SEE: WF-31784-01A
FOR SNUBBER DATA SEE: WF-31784-01B
2.0" SPECIFIED DEFLECTION

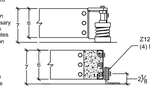
Typical Base Layout- For Actual Locations See Plan View Below.



ANCHOR BOLT SLEEVE DETAIL

ANCHOR BOLT INSTALLATION INSTRUCTIONS

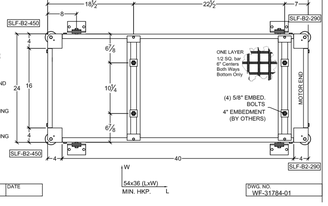
1. BMK Bases ordered with Anchor Bolt Templates are furnished with Templates already bolted in place.
2. The Mounting Carton contains the necessary number of cast iron sleeves and faceplates shown in position on the base drawing.
3. Fabricate Emb. Anchor Bolts and bolt in position in locations shown on the drawings before pouring concrete.



Anchorage Requirements:
(2) ⅝" Dia. Mason SAS Anchors
2 3/4" Nom. Embedment, 4" Edge Distance
3000 psi Stone Aggregate Concrete;
6" Thick min.
Installed per ICC ESR 3037
per Snubber

Supplied By MASON IND.

Yes	No	
■	☐	BASE
■	☐	TEMPLATE
■	☐	ANCHOR BOLT SLEEVES AND FISHPLATE
☐	■	LOOSE REINFORCING STEEL
■	☐	WELDED REINFORCING STEEL



DWN	CHKD	DATE
NR		
bmkslp		

DWG. NO. WF-31784-01

7 / M7-4 ISOLATION FOR P-3
SCALE: NTS

MASON INDUSTRIES, Inc.
Manufacturers of Vibration Control Products
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2101 N. Crescent Ave., Suite D, Anaheim, CA 92801, 714/535-2727, FAX 714/535-5738

CERTIFIED FOR
JOB NAME: COMPTON COLLEGE
CUSTOMER: CAPITAL ENGINEERING
CUSTOMER P.O.: JOB NO.:
MASON E.O.: 31784 DWG. NO.: WF-31784-01
REQUIRED: (2) TAG: P-1 & P-2

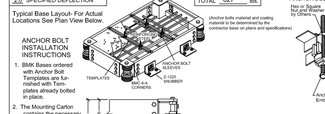
TYPE **BMK/ KSL** BOLTED MODULAR CONCRETE INERTIA BASE

MANUF. BELL & GOSSETT
SIZE 2.5X2 MODEL e-1510 2AD-eg
BASE NUMBER

PUMP TYPE / SUCTION
☐ CLOSE COUPLED — SIZE 1.5 — MOTOR H.P.
☒ END SUCTION — 2.5" — SIZE 145T — FRAME SIZE
☐ DOUBLE SUCTION — SIZE 1800 R.P.M.

WEIGHTS: STEEL BASE 72 lbs. | EQUIPMENT 155 lbs. | BASE w/ CONCRETE 672 lbs. | TOTAL 827 lbs.
FOR SPRING MOUNT DATA SEE: WF-31784-01A
FOR SNUBBER DATA SEE: WF-31784-01B
2.0" SPECIFIED DEFLECTION

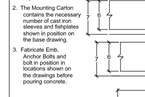
Typical Base Layout- For Actual Locations See Plan View Below.



ANCHOR BOLT SLEEVE DETAIL

ANCHOR BOLT INSTALLATION INSTRUCTIONS

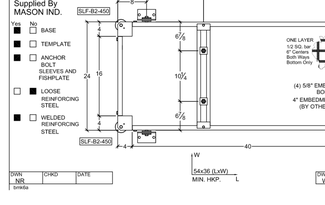
1. BMK Bases ordered with Anchor Bolt Templates are furnished with Templates already bolted in place.
2. The Mounting Carton contains the necessary number of cast iron sleeves and fishplates shown in position on the base drawing.
3. Fabricate Emb. Anchor Bolts and bolt in position in locations shown on the drawings before pouring concrete.



Anchorage Requirements:
(2) ⅝" Dia. Mason SAS Anchors
2 3/4" Nom. Embedment, 4" Edge Distance
3000 psi Stone Aggregate Concrete;
6" Thick min.
Installed per ICC ESR 3037
per Snubber

Supplied By MASON IND.

Yes	No	
■	☐	BASE
☐	■	TEMPLATE
■	☐	ANCHOR BOLT SLEEVES AND FISHPLATE
☐	■	LOOSE REINFORCING STEEL
■	☐	WELDED REINFORCING STEEL



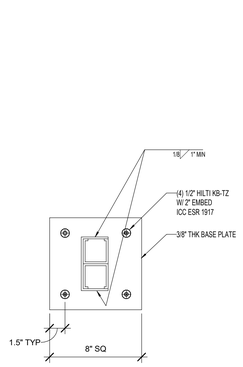
DWN	CHKD	DATE
NR		
bmkslp		

DWG. NO. WF-31784-01

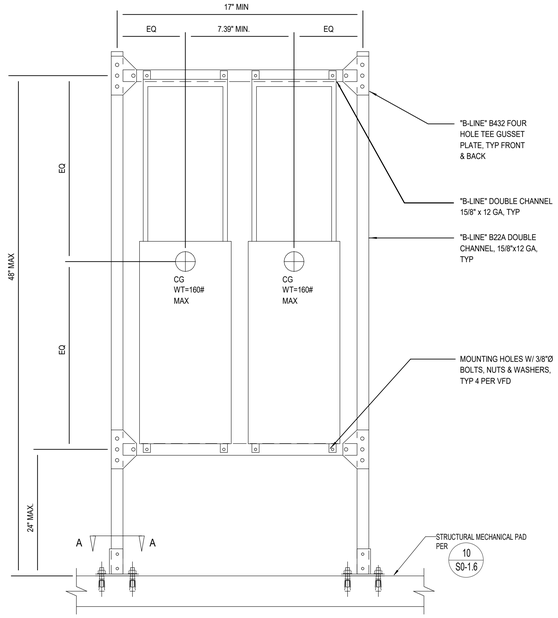
6 / M7-4 ISOLATION FOR P-1 & P-2
SCALE: NTS

NOTES:

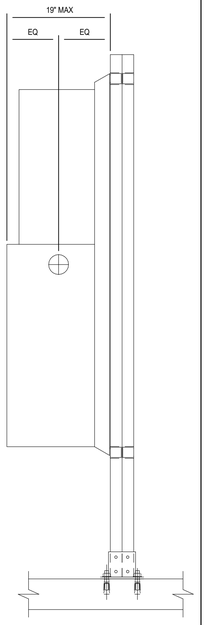
1. VERIFY ACTUAL MOUNTING & CLEARANCE REQUIREMENTS WITH EQUIPMENT MANUFACTURER.
2. MAINTAIN 42" MINIMUM CLEARANCE IN FRONT OF VFD.
3. DIMENSIONS AND WEIGHT ON DETAIL REPRESENT WORSE CASE SCENARIO BETWEEN EACH VFD.



A-A



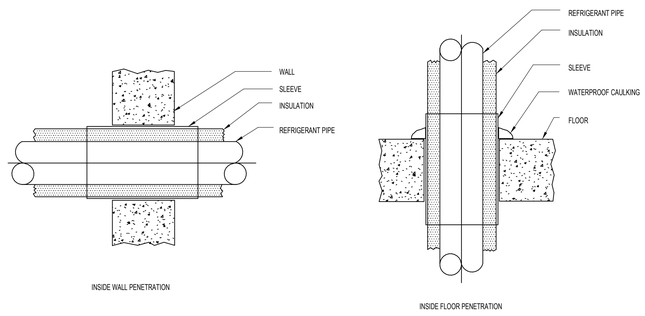
FRONT



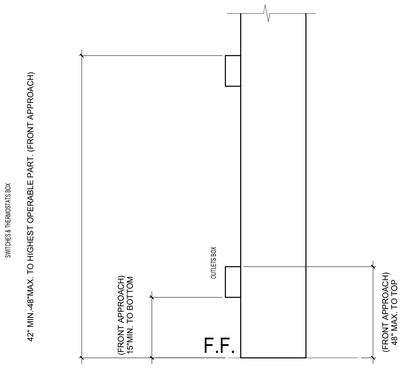
SIDE

NOTE:
CONDITION WITH RACK SUPPORTING ONLY ONE VFD IS SIMILAR.

1 / M7-4 MULTI VFD MOUNTING
SCALE: 12" = 1'-0"



5 / M7-4 REFRIGERENT PIPE PENETRATION
SCALE: NONE



2 / M7-4 ELECTRICAL MOUNTING HEIGHTS
SCALE: 12" = 1'-0"

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
APPL - 03-119686
AC FLS SS
DATE

DIVISION OF THE STATE ARCHITECT
WELLS FARGO CENTER - SOUTH TOWER
355 SOUTH GRAND AVENUE, SUITE 2100
LOS ANGELES, CA 90071
ph:(213) 897-3995 fx:(213) 897-3159/0726

agency

tBP architecture planning interiors

tBP/Architecture
4611 Teller Avenue
Newport Beach, CA 92660
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architect

CAPITAL ENGINEERING CONSULTANTS, INC.
LONG BEACH, CALIFORNIA
RH - TS/SL/DV — PM - DESIGN TEAM
170822.00 — PROJECT NO.

REGISTERED PROFESSIONAL ENGINEER — CHRISTOPHER D. MCCRACKEN — M 34011 — EXPIRES 3/2020 — MECHANICAL — STATE OF CALIFORNIA

DATE SIGNED: 08/16/19

consultant

COMPTON COLLEGE
STUDENT SERVICES BLDG.

COMPTON COMMUNITY COLLEGE DISTRICT
1111 E. ARTESIA BLVD.
COMPTON, CA 90221

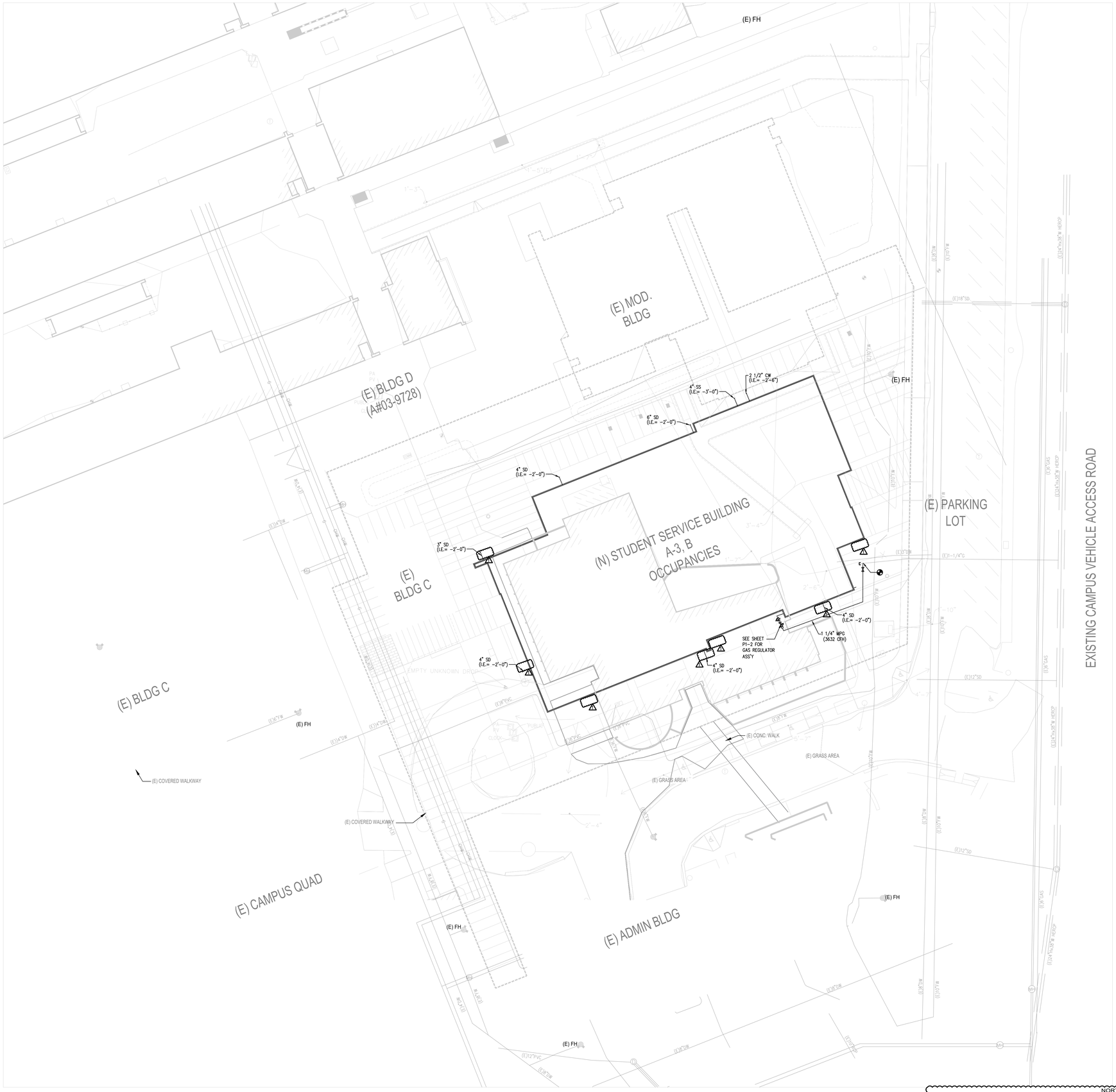
owner

tBP project number: 20987.00
file name: CECI_COMPTON CC STUDENT SERVICES_MP18_CENTRAL.RVT
drawn by: CECI checked by: CM
date: 9.03.2019

rev:	date:	description:

drawing title:
DETAILS

drawing no.:
M7-4
drawing of



PLUMBING SITE PLAN 1
SCALE 1" = 20'-0"

NORTH

GENERAL NOTES:

1. CONTRACTOR SHALL PERFORM FIELD INVESTIGATION OF EXISTING CONDITIONS BEFORE BEGINNING DEMOLITION WORKS AND SHALL INCLUDE IN THE BID THE COSTS OF FIELD INVESTIGATION, SELECTIVE DEMOLITION AND UTILITY LOCATION IN THE AREA OF DEMOLITION.
2. REMOVE ALL EXISTING PLUMBING FIXTURES, EQUIPMENT INSIDE THE EXISTING BUILDING.
3. REMOVE ALL EXISTING WATER, SEWER, STORM DRAIN AND FIRE LINES INCLUDING UNDERGROUND PIPING UP TO 5 FEET BEYOND BUILDING EXTERIOR.
4. REMOVE ALL EXISTING FIRE LINE UP INCLUDING UNDERGROUND PIPING UP TO 5 FEET BEYOND BUILDING EXTERIOR, SEE CIVIL DWG FOR CONT.
5. REMOVE ALL EXISTING GAS PIPING INCLUDING UNDERGROUND PIPING UP TO THE BUILDING EXTERIOR.

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
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DATE ____

DIVISION OF THE STATE ARCHITECT
335 SOUTH GRAND AVENUE, SUITE 2100
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CHRISTOPHER D. ALEXANDER
M 34011
EXPIRES 3/2020
MECHANICAL
STATE OF CALIFORNIA

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COMPTON COLLEGE
STUDENT SERVICES BLDG.

COMPTON COMMUNITY COLLEGE DISTRICT
1111 E. ARTESIA BLVD.
COMPTON, CA 90221

owner

tBP project number : 20987.00

file name:

drawn by: checked by:

date: 2.28.2019

Rev:	date:	description:
1	11/20/19	ADDENDUM #1

drawing title:
SITE PLAN

drawing no.:
P0-3
drawing of

PLUMBING FIRST FLOOR PLAN - GRAVITY

SCALE 1/8" = 1'-0" (1)

NORTH

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
APPL - 03-119686
AC ____ FLS ____ SS ____
DATE ____

DIVISION OF THE STATE ARCHITECT
WELLS FARGO CENTER - SOUTH TOWER
355 SOUTH GRAND AVENUE, SUITE 2100
LOS ANGELES, CA 90071
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CAPITAL ENGINEERING CONSULTANTS, INC.
LONG BEACH, CALIFORNIA

RH - TS/SL/DV — PM - DESIGN TEAM
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REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER D. MECHANICAL
M 34011
EXPIRES 3/2020
STATE OF CALIFORNIA

DATE SIGNED: 08/16/19

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STUDENT SERVICES BLDG.

COMPTON COMMUNITY COLLEGE DISTRICT
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COMPTON, CA 90221

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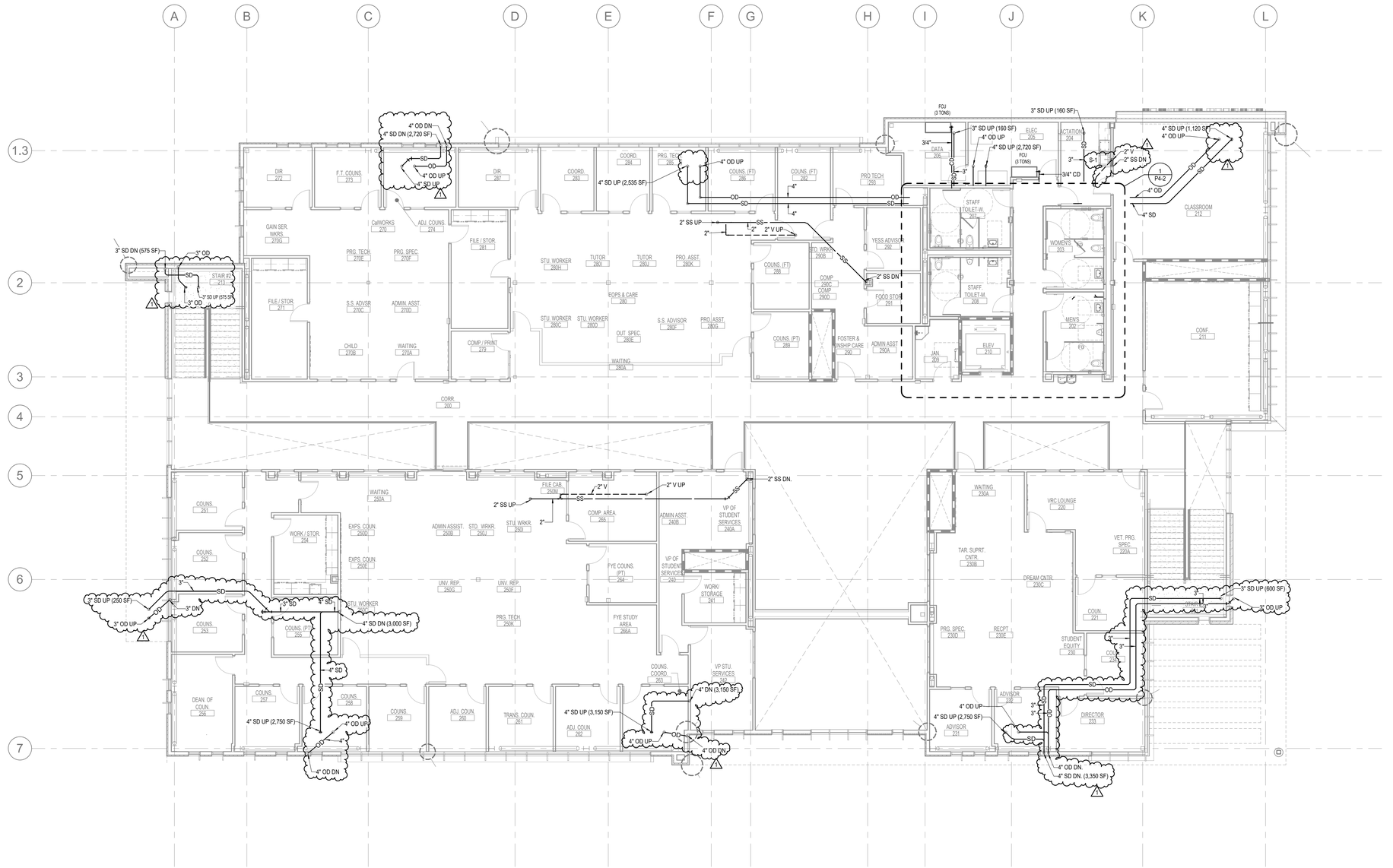
rev:	date:	description:
1	11/20/19	ADDENDUM #1

drawing title:
PLUMBING FIRST FLOOR PLAN - GRAVITY

drawing no.:
P1-1

drawing of



PLUMBING SECOND FLOOR PLAN - GRAVITY

SCALE 1/8" = 1'-0" (1)

NORTH

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
APPL - 03-119686
AC ____ FLS ____ SS ____
DATE ____

DIVISION OF THE STATE ARCHITECT
WELLS FARGO CENTER - SOUTH TOWER
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architect

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ENGINEERING CONSULTANTS, INC.
LONG BEACH, CALIFORNIA

RH - TS/SL/DV — PM - DESIGN TEAM
170822.00 — PROJECT NO.

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER D. MCCUTCHEON
M 34011
EXPIRES 3/2020
MECHANICAL
STATE OF CALIFORNIA

DATE SIGNED: 08/16/19

consultant

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STUDENT SERVICES BLDG.

COMPTON COMMUNITY COLLEGE DISTRICT
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rev:	date:	description:
1	11/20/19	ADDENDUM #1

drawing title:
PLUMBING SECOND FLOOR PLAN - GRAVITY

drawing no.:
P2-1

drawing of

PLUMBING SECOND FLOOR PLAN - PRESSURE (1)

SCALE 1/8" = 1'-0"

NORTH

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
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DIVISION OF THE STATE ARCHITECT
WELLS FARGO CENTER - SOUTH TOWER
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LONG BEACH, CALIFORNIA
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REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER D. DE LA CRUZ
M 34011
EXPIRES 3/2020
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COMPTON COMMUNITY COLLEGE DISTRICT
1111 E. ARTESIA BLVD.
COMPTON, CA 90221

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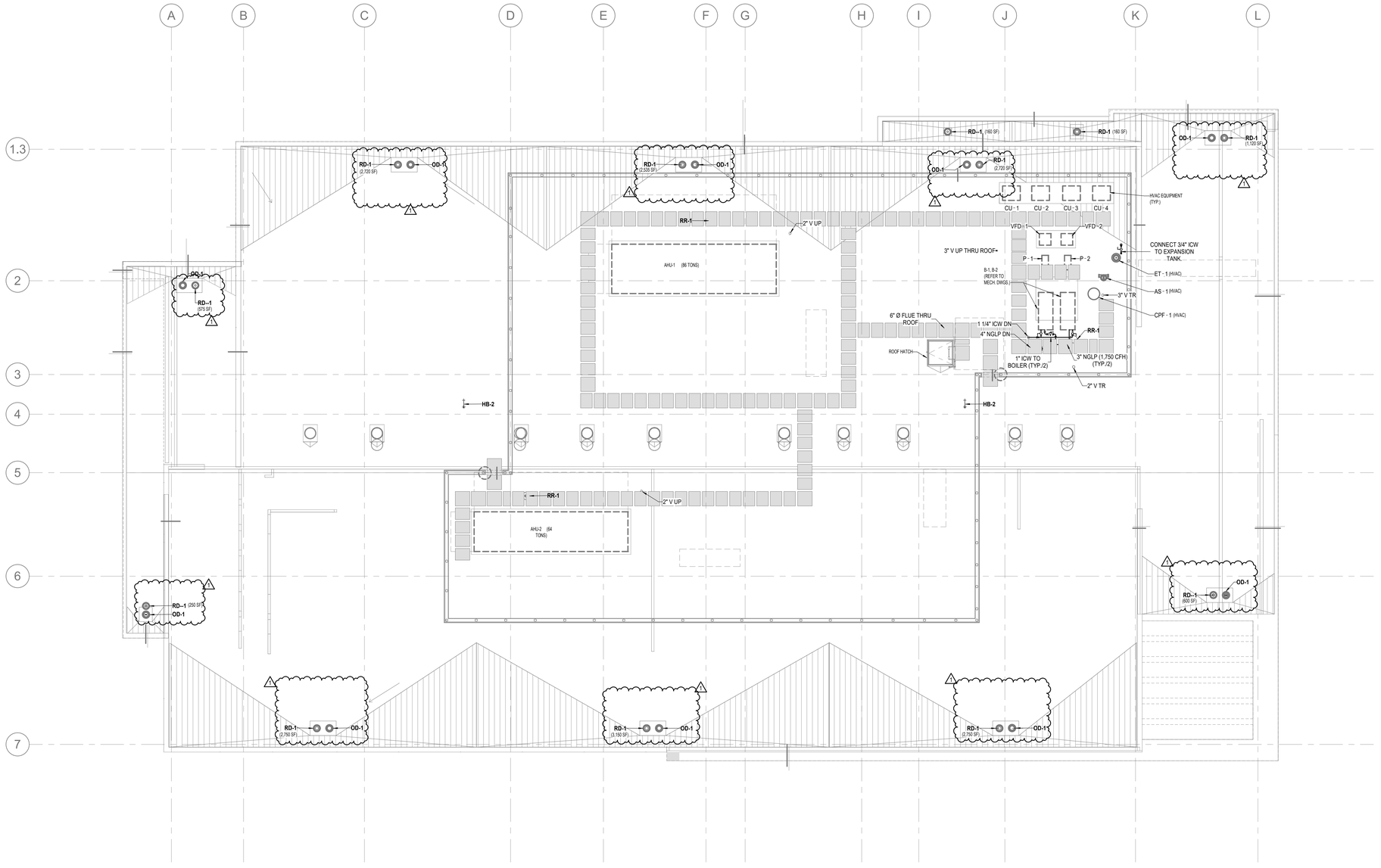
1	11/20/19	ADDENDUM #1

drawing title:
PLUMBING SECOND FLOOR PLAN - PRESSURE

drawing no.:
P2-2

drawing of



PLUMBING ROOF PLAN

SCALE 1/8" = 1'-0" (1)

NORTH

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES

APPL - 03-119686

AC _____ FLS _____ SS _____

DATE _____

DIVISION OF THE STATE ARCHITECT
WELLS FARGO CENTER - SOUTH TOWER
355 SOUTH GRAND AVENUE, SUITE 2100
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architect

CAPITAL
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LONG BEACH, CALIFORNIA

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REGISTERED PROFESSIONAL ENGINEER
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EXPIRES 3/31/20
MECHANICAL
STATE OF CALIFORNIA

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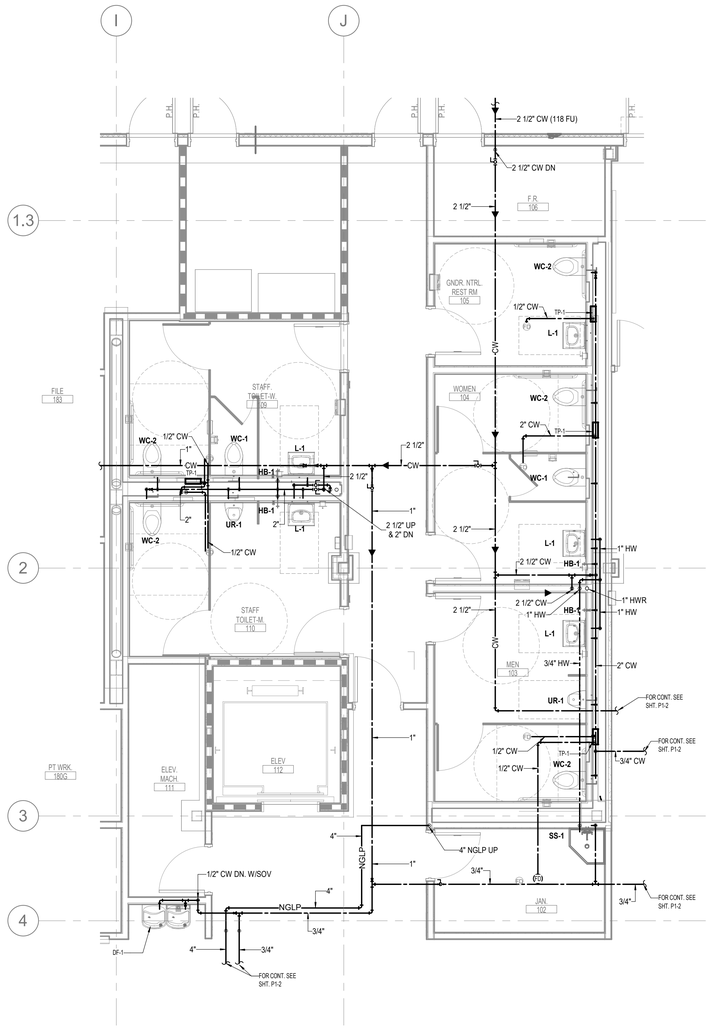
drawing title:
PLUMBING ROOF PLAN

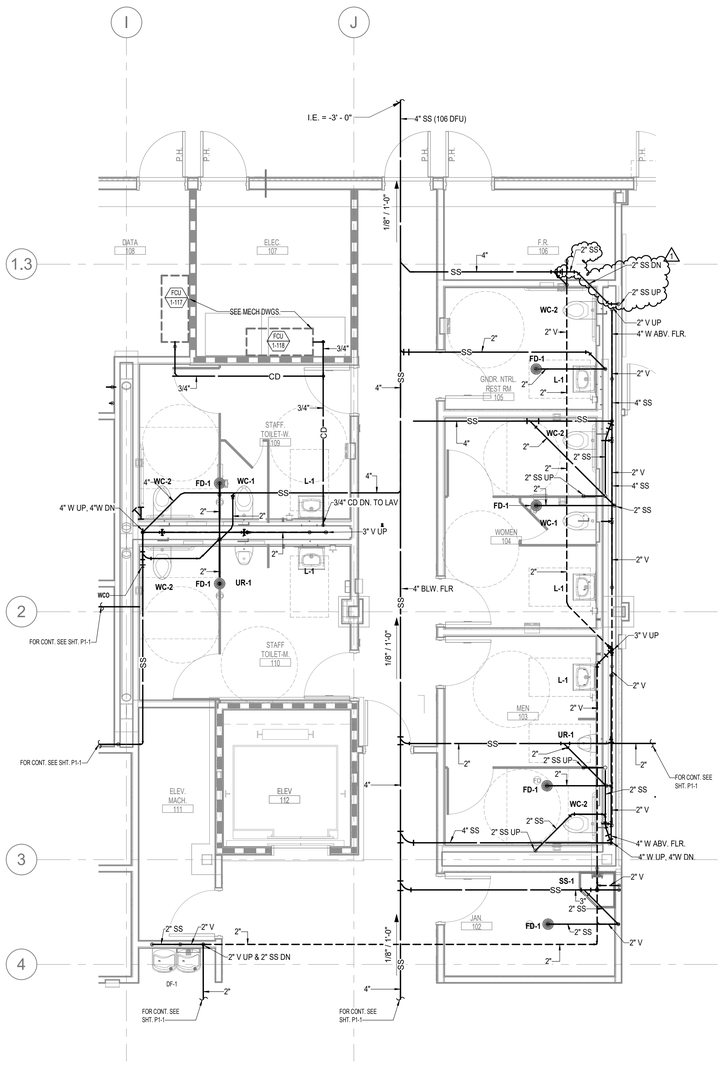
drawing no.:
P2-3

drawing of



ENLARGED FIRST FLOOR PLAN - RM 103, 104, 105, 109, 110 - PRESSURE

SCALE 1/4" = 1'-0" (2)



ENLARGED FIRST FLOOR PLAN - RM 103, 104, 105, 109, 110 - GRAVITY

SCALE 1/4" = 1'-0" (1)

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CHRISTOPHER V. DE LA CRUZ
M 34011
EXPIRES 3/2020
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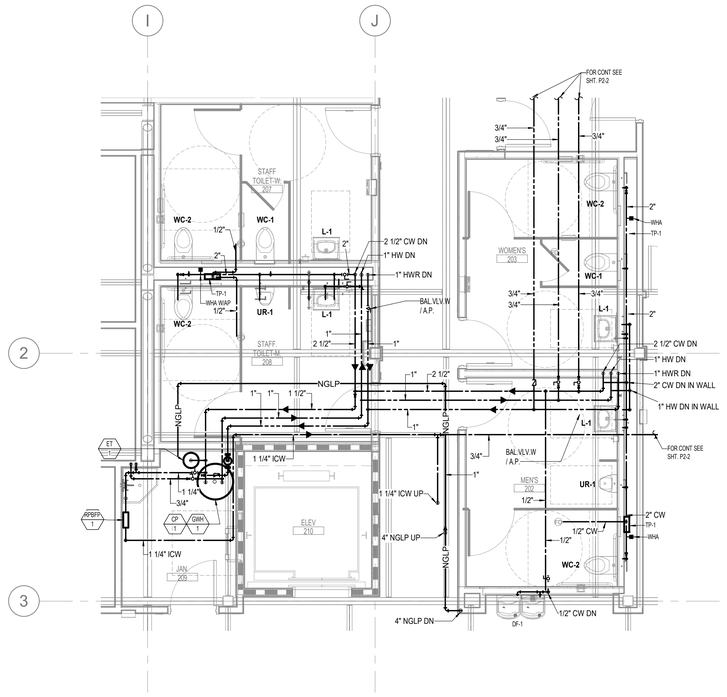
1	11/20/19	ADDENDUM #1

drawing title:
PLUMBING ENLARGED FLOOR PLANS

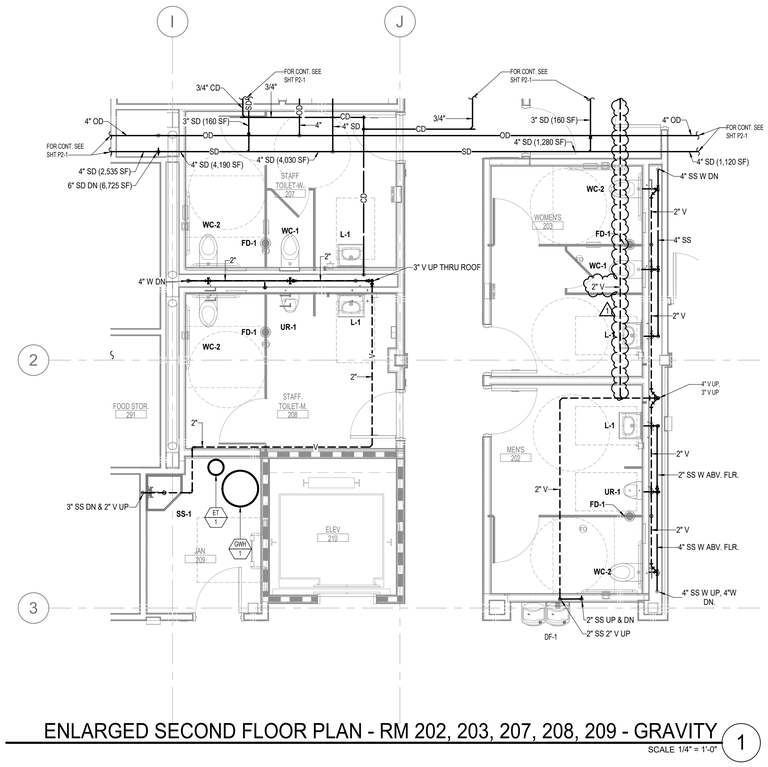
drawing no.:
P4-1

drawing of



ENLARGED SECOND FLOOR PLAN - RM 202, 203, 207, 208, 209 - PRESSURE

SCALE 1/4" = 1'-0" (2)



ENLARGED SECOND FLOOR PLAN - RM 202, 203, 207, 208, 209 - GRAVITY

SCALE 1/4" = 1'-0" (1)

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES

APPL - 03-119686

AC ____ FLS ____ SS ____

DATE ____

DIVISION OF THE STATE ARCHITECT
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architect

CAPITAL
ENGINEERING CONSULTANTS, INC.
LONG BEACH, CALIFORNIA

RH - TS/SL/DV — PM - DESIGN TEAM
170822.00 — PROJECT NO.

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER D. MCCURDY
M 34011
EXPIRES 3/31/20
MECHANICAL
STATE OF CALIFORNIA

DATE SIGNED: 08/16/19

consultant

COMPTON COLLEGE STUDENT SERVICES BLDG.

COMPTON COMMUNITY COLLEGE DISTRICT
1111 E. ARTESIA BLVD.
COMPTON, CA 90221

owner

tBP project number: 20987.00

file name: CECI_COMPTON CC STUDENT SERVICES_MP18_CENTRAL.RVT

drawn by: CECI checked by: CM

date: 9.03.2019

rev:	date:	description:
1	11/20/19	ADDENDUM #1

drawing title:
PLUMBING ENLARGED FLOOR PLANS

drawing no.:
P4-2

drawing of

PLAN NOTES:

1. PROVIDE PANIC HARDWARE FOR ELECTRICAL ROOM DOOR. SEE SHEET A1-1 AND DETAIL #010, SHEET 8.01 DOOR SCHEDULE.
2. ONE-HOUR FIRE RATED WALL. SEE SHEET A1-1 AND DETAILS #9 AND #16, SHEET 4.01.

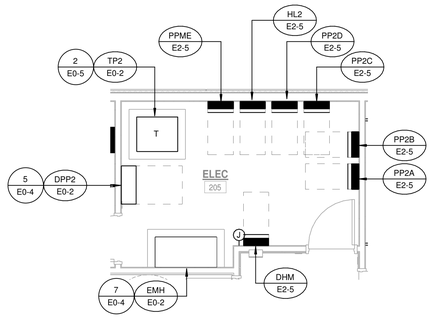
PROJECT NAME:COMPTON COLLEGE STUDENT SERVICE BLDG.								TRANSFORMER:"2T"					
COMPTON COMMUNITY COLLEGE DISTRICT								PRIMARY VOLTAGE(P-P): 480V 4160V			SECONDARY VOLTAGE(P-P):		480
SUBJECT:SHORT CIRCUIT CALCULATION AT 480 V PANELS								TRANS. Z= 4.5			TRANS. KVA=	750	
								TRANS. SEC. X=			0.01382		
								MOTOR CONTRIBUTION:100%			AIC AT SECON.	25058.6	
SOURCE PANEL	DESTINATION PANEL	FEEDER DESIG.	WIRE SIZE		R 1000'	X 1000'	FDR L	FDR R	FDR X	TOTAL R	TOTAL X	TOTAL Z	AIC AT PANEL
T-SS	MDBH	TF-SS	500MCM	4	0.007	0.010	80	0.0005	0.0008	0.0005	0.01460	0.015	18954.5
MDBH	HL1	MDBH2	1	1	0.150	0.046	15	0.0023	0.0007	0.0028	0.01529	0.016	17817.6
MDBH	DHM	MDBH3	350MCM	1	0.038	0.040	25	0.0010	0.0010	0.0015	0.01560	0.016	17671.5
MDBH	TP1	MDBH-4	1/O	1	0.120	0.044	15	0.0018	0.0007	0.0156	0.00066	0.016	17713.3
MDBH	CBP2	MDBH-5	2/O	1	0.100	0.043	25	0.0025	0.0011	0.0030	0.01568	0.016	17343.9
HL1	HL2	HL1-1	4	1	0.190	0.045	10	0.0019	0.0005	0.0047	0.01574	0.016	16861.8
MDBH	TP1	MDBH-4	1/O	1	0.120	0.044	15	0.0018	0.0007	0.0023	0.01526	0.015	17937.7

PROJECT NAME:COMPTON COLLEGE STUDENT SERVICE BLDG.								TRANSFORMER:"TP1"					
COMPTON COMMUNITY COLLEGE DISTRICT								PRIMARY VOLTAGE(P-P): 480V			SECONDARY VOLTAGE(P-P):		208
SUBJECT:SHORT CIRCUIT CALCULATION AT 208 V PANELS								TRANS. Z= 4.5			TRANS. KVA=	150	
								TRANS. SEC. X=			0.01298		
								MOTOR CONTRIBUTION:100%			AIC AT SECON.	11565.5	
SOURCE PANEL	DESTINATION PANEL	FEEDER DESIG.	WIRE SIZE		R 1000'	X 1000'	FDR L	FDR R	FDR X	TOTAL R	TOTAL X	TOTAL Z	AIC AT PANEL
TP1	DPP1	TP1-1	350MCM	2	0.019	0.020	10	0.0002	0.0002	0.0002	0.01318	0.013	9104.3
DPP1	PP1A*	DPP1-1	1/O	1	0.120	0.044	10	0.0012	0.0004	0.0014	0.01362	0.014	8765.6

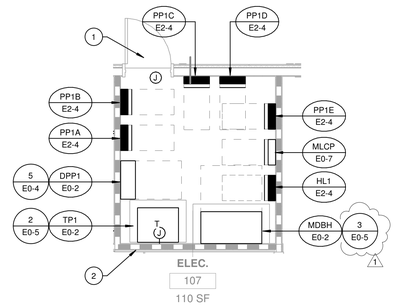
* TYPCAL FOR PANELS PP1B, PP1C, PP1D, PP1E AND PP1F

PROJECT NAME:COMPTON COLLEGE STUDENT SERVICE BLDG.								TRANSFORMER:"TP2"					
COMPTON COMMUNITY COLLEGE DISTRICT								PRIMARY VOLTAGE(P-P): 480V			SECONDARY VOLTAGE(P-P):		208
SUBJECT:SHORT CIRCUIT CALCULATION AT 208 V PANELS								TRANS. Z= 4.5			TRANS. KVA=	112.5	
								TRANS. SEC. X=			0.01731		
								MOTOR CONTRIBUTION:100%			AIC AT SECON.	8674.13	
SOURCE PANEL	DESTINATION PANEL	FEEDER DESIG.	WIRE SIZE		R 1000'	X 1000'	FDR L	FDR R	FDR X	TOTAL R	TOTAL X	TOTAL Z	AIC AT PANEL
TP2	DPP2	TP2-1	3/O	2	0.039	0.021	10	0.0004	0.0002	0.0004	0.01752	0.018	6849.4
DPP2	PP2A*	DPP1-1	1/O	1	0.120	0.044	10	0.0012	0.0004	0.0016	0.01796	0.018	6657.3

* TYPCAL FOR PANELS PP2B, PP2C, PP2D, PPME

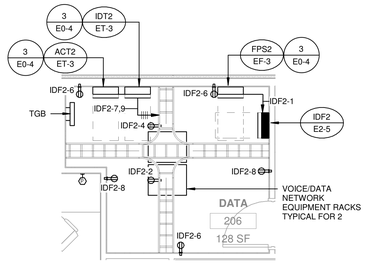


2ND FLOOR ENLARGED ELECTRICAL ROOM 2
SCALE 1/4" = 1'-0"

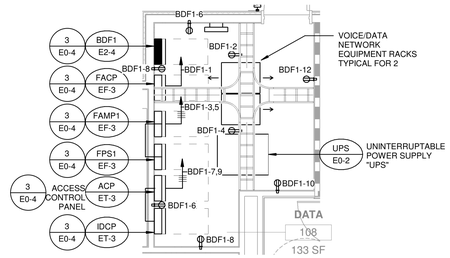


1ST FLOOR ENLARGED ELECTRICAL ROOM 1
SCALE 1/4" = 1'-0"

COMPTON COLLEGE STUDENT SERVICE BLDG			
MAIN SWITCHBOARD "MDBH" LOAD CALCULATION			
LOAD DESCRIPTION	**CONNECTED (KVA)**	**CONNECTED CURRENT(A)**	REMARKS
PANEL HL1	**23268**	**28**	
ELEVATOR	**34902**	**42**	
PANEL DHM	**147918**	**178**	
PANEL DPP1	**150411**	**181**	
PANEL DPP2	**237666**	**286**	
ADMIN BLDG BACKFEED, 9800 SF AT 15W/SF	**147000**	**176.9**	
TOTAL CONNECTED LOADS	741165	892	
DEMAND LOAD CALCULATION:			
ADMIN AND SS BLDGS AREAS(SF):	46800		
WATTS/SF:	15.84		
FIRST 3 WATTS AT 100%	140400		
3-20 WATTS AT 75%	450574		
TOTAL CONNECTED POWER(VA) :	590974		
TOTAL CONNECTED CURRENT(A):	711.16		



2ND FLOOR ENLARGED IDF ROOM 4
SCALE 1/4" = 1'-0"



1ST FLOOR ENLARGED BDF ROOM 3
SCALE 1/4" = 1'-0"

PROJECT:	COMPTON COLLEGE STUDENT SERVICE BLDG.										SUBJECT:	VOLTAGE DROP CALCULATION			
	212220.000										480/277 V				
DISTRIBUTION BOARD	DESTINATION PANEL	FEEDER DESIG.	WIRE SIZE		R (1000')	X (1000')	L(feet)	RL	XL	PHASE	V	I	COS(pf)	SIN	VD%
T-SS	MDBH	F1000	500MCM	3	0.0097	0.0160	80	0.0008	0.0013	3	277	1000	0.85	0.53	0.48
MDBH	ELEVATOR	F90/N	1	3	0.0533	0.0190	30	0.0016	0.0006	3	277	42	0.85	0.53	0.03
MDBH	HL1	F100	1	3	0.0533	0.0190	10	0.0005	0.0002	3	277	28	0.85	0.53	0.01
MDBH	DHM	F-400	3/O	2	0.0395	0.0260	120	0.0047	0.0031	3	277	30	0.85	0.53	0.06
MDBH	TP1	F250/N	250mcm	1	0.0540	0.0520	15	0.0008	0.0008	3	277	172	0.85	0.53	0.07
MDBH	TP2	F175/N	2/O	1	0.1000	0.0540	15	0.0015	0.0008	3	277	172	0.85	0.53	0.11

PROJECT:	COMPTON COLLEGE STUDENT SERVICE BLDG.										SUBJECT:	VOLTAGE DROP CALCULATION			
PROJECT NO:	212220.000										208/120 V				
DISTRIBUTION BOARD	FEEDER NO.	FEEDER DESIG.	WIRE SIZE		R (1000')	X (1000')	L(feet)	RL	XL	PHASE	V	I	COS(pf)	SIN	VD%
DPP1	DPP1-1	F-150	1/O	1	0.1200	0.0550	20	0.0024	0.0011	3	120	78	0.85	0.53	0.17
DPP1	DPP1-2	F-150	1/O	1	0.1200	0.0550	20	0.0024	0.0011	3	120	63	0.85	0.53	0.14
DPP1	DPP1-3	F-150	1	1	0.1600	0.0570	20	0.0032	0.0011	3	120	39	0.85	0.53	0.11
DPP1	DPP1-4	F-150	1/O	1	0.1200	0.0550	20	0.0024	0.0011	3	120	66	0.85	0.53	0.14
DPP1	DPP1-5	F-150	1/O	1	0.1200	0.0550	20	0.0024	0.0011	3	120	68	0.85	0.53	0.15
DPP1	DPP1-6	F-150	1/O	1	0.1200	0.0550	20	0.0024	0.0011	3	120	83	0.85	0.53	0.18
DPP2	DPP2-1	F-150	1/O	1	0.1200	0.0550	20	0.0024	0.0011	3	120	68	0.85	0.53	0.15
DPP2	DPP2-2	F-150	1/O	1	0.1200	0.0550	20	0.0024	0.0011	3	120	72	0.85	0.53	0.16
DPP2	DPP2-3	F-150	1/O	1	0.1200	0.0550	20	0.0024	0.0011	3	120	69	0.85	0.53	0.15
DPP2	DPP2-4	F-150	1/O	1	0.1200	0.0550	20	0.0024	0.0011	3	120	68	0.85	0.53	0.15
DPP2	DPP2-5	F-150	1	1	0.1600	0.0570	20	0.0032	0.0011	3	120	9	0.85	0.53	0.02

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STUDENT SERVICES BLDG.

COMPTON COMMUNITY COLLEGE DISTRICT
1111 E. ARTESIA BLVD.
COMPTON, CA 90221

owner

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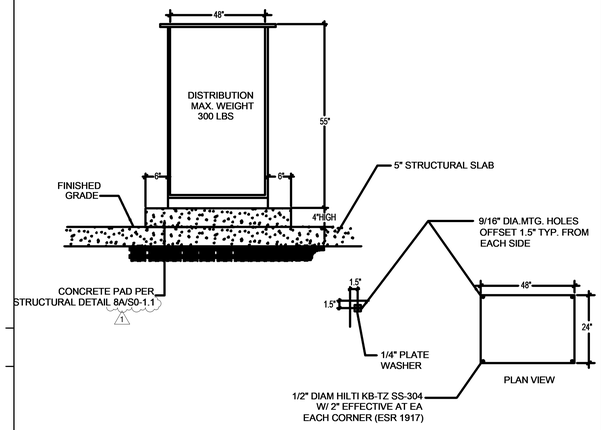
date: 9.03.2019

rev:	date:	description:
1	11/20/19	Addendum 1

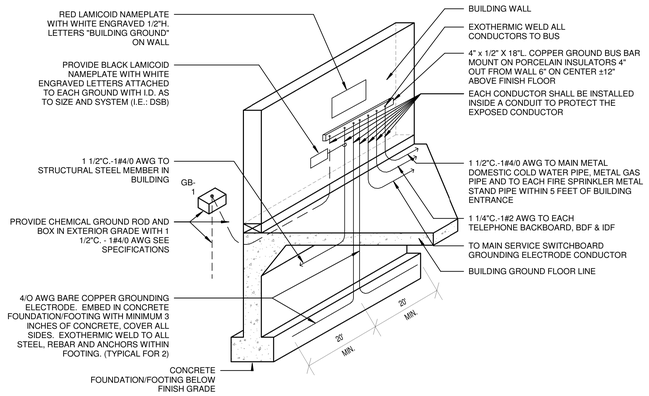
drawing title:
ENLARGED ELECTRICAL AND TELECOM ROOMS

drawing no.:
E0-3
drawing of



INVERTER ANCHORAGE DETAIL

SCALE N.T.S. | 7



BUILDING ELECTRICAL SERVICE GROUND BUS DETAIL

SCALE N.T.S. | 4

1. WALL ASSEMBLY -- THE 1 OR 2 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED THE MATERIALS AND IN THE MANNER SPECIFIED IN OF THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

   A. STUDS -- WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC. WHEN STEEL STUDS ARE USED AND THE DIAM OF OPENING EXCEEDS THE WIDTH OF STUD CAVITY, THE OPENING SHALL BE FRAMED ON ALL SIDES USING LENGTHS OF STEEL STUD INSTALLED BETWEEN THE VERTICAL STUDS AND SCREW-ATTACHED TO THE STEEL STUDS AT EACH END. THE FRAMED OPENING IN THE WALL SHALL BE 4 TO 6 IN. WIDER AND 4 TO 6 IN. HIGHER THAN THE DIAM. OF THE PENETRATING ITEM SUCH THAT WHEN THE PENETRATING ITEM IS INSTALLED IN THE OPENING, A 2 TO 3 IN. CLEARANCE IS PRESENT BETWEEN THE PENETRATING ITEM AND THE FRAMING ON ALL FOUR SIDES.

   B. GYPSUM BOARD* -- 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 30-1/4 IN. FOR STEEL STUD WALLS. MAX DIAM OF OPENING IS 14-1/2 IN. FOR WOOD STUD WALLS. THE F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE FIRE RATING OF THE WALL ASSEMBLY.

2. THROUGH-PENETRANTS -- ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE SHALL BE MIN 0 IN. TO MAX 2-1/4 IN. PIPE MAY BE INSTALLED WITH CONTINUOUS POINT CONTACT. PIPE, CONDUIT OR TUBING MAY BE INSTALLED AT AN ANGLE NOT GREATER THAN 45 DEGREES FROM PERPENDICULAR. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:

   A. STEEL PIPE -- NOM 30 IN DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

   B. IRON PIPE -- NOM 30 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.

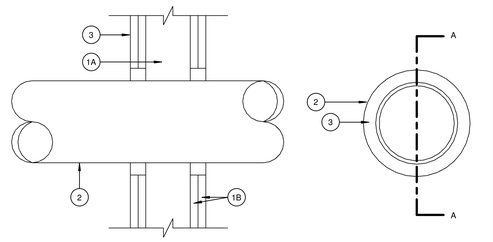
   C. CONDUIT -- NOM 4 IN DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR 6 IN. DIAM STEEL CONDUIT.

   D. COPPER TUBING -- NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

   E. COPPER PIPE -- NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. AT THE POINT OR CONTINUOUS CONTACT LOCATIONS BETWEEN PIPE AND WALL, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE WALL INTERFACE ON BOTH SURFACES OF WALL .

HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC -- FS-ONE SEALANT
*BEARING THE UL CLASSIFICATION MARK



SECTION A-A

System No. W-L-1054
F Ratings - 1 and 2 Hr (See Items 1 and 3)
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating At 400 F - 4 CFM/Sq Ft

RATED STUD WALL FIRE STOP DETAIL

SCALE N.T.S. | 1

NOTE:
MAINTAIN 30" X 48" CLEAR PARALLEL
APPROACH FLOOR AREA AND CONTROLS

MOUNTING HEIGHT OVER OBSTRUCTION

SCALE N.T.S. | 8

DISTRIBUTION PANELBOARD ANCHORAGE

SCALE N.T.S. | 5

1. FLOOR OR WALL ASSEMBLY MIN 4-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 32 IN.

2. METALLIC SLEEVE (OPTIONAL) NOM 32 IN. DIAM (OR SMALLER) SCHEDULE 40 (OR HEAVIER) STEEL SLEEVE CAST OR GROUTED INTO FLOOR OR WALL ASSEMBLY, FLUSH WITH FLOOR OR WALL SURFACES.

3. THROUGH-PENETRANT ONE METALLIC PIPE OR CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE OR CONDUIT AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 1-7/8 IN. PIPE MAY BE INSTALLED WITH CONTINUOUS POINT CONTACT. PIPE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR CONDUITS MAY BE USED:

   A. STEEL PIPE: NOM 30 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

   B. IRON PIPE: NOM 30 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.

   C. COPPER PIPE: NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

   D. COPPER TUBING: NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

   E. CONDUIT: NOM 6 IN. DIAM (OR SMALLER) STEEL CONDUIT.

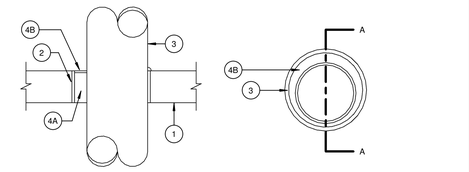
   F. CONDUIT: NOM 4 IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING (EMT).

4. FIRE STOP SYSTEM THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:

   A. PACKING MATERIAL MIN 4 IN. THICKNESS OF MIN 4 PCF MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.

   B. FILL, VOID OR CAVITY MATERIAL* -- SEALANT MIN 1/4 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR OR WITH BOTH SURFACES OF WALL. AT THE POINT OR CONTINUOUS CONTACT LOCATIONS BETWEEN PIPE AND CONCRETE. A MIN 1/4 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE/PIPE INTERFACE ON THE TOP SURFACE OF FLOOR AND ON BOTH SURFACES OF WALL.

HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC - FS-One Sealant
*Bearing the UL Classification Marking

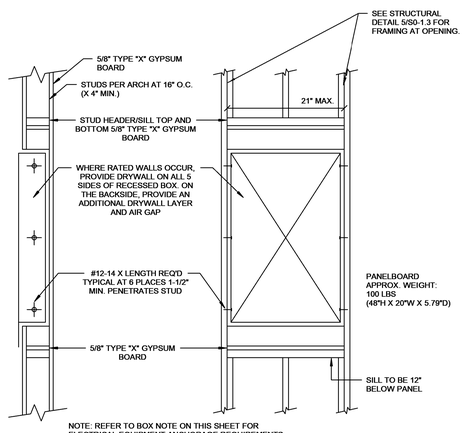


SECTION A-A

System No. C-AJ-1226
F RATING = 3-HR.
T RATING = 0-HR.
L Rating At Ambient - Less than 1 CFM/Sq Ft
L Rating At 400 F - 4 CFM/Sq Ft

RATED CONCRETE FLOOR/WALL SINGLE CONDUIT FIRE STOP DETAIL

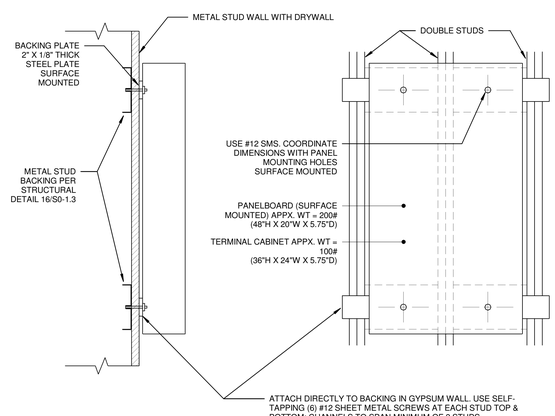
SCALE N.T.S. | 2



NOTE: REFER TO BOX NOTE ON THIS SHEET FOR ELECTRICAL EQUIPMENT ANCHORAGE REQUIREMENTS

PANELBOARD/TERMINAL CABINET ANCHORAGE - FLUSH

SCALE N.T.S. | 6



SURFACE MOUNTED PANELBOARD/TERMINAL CABINET ANCHORAGE

SCALE N.T.S. | 3

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FBA Job Number: 212.220
consultant

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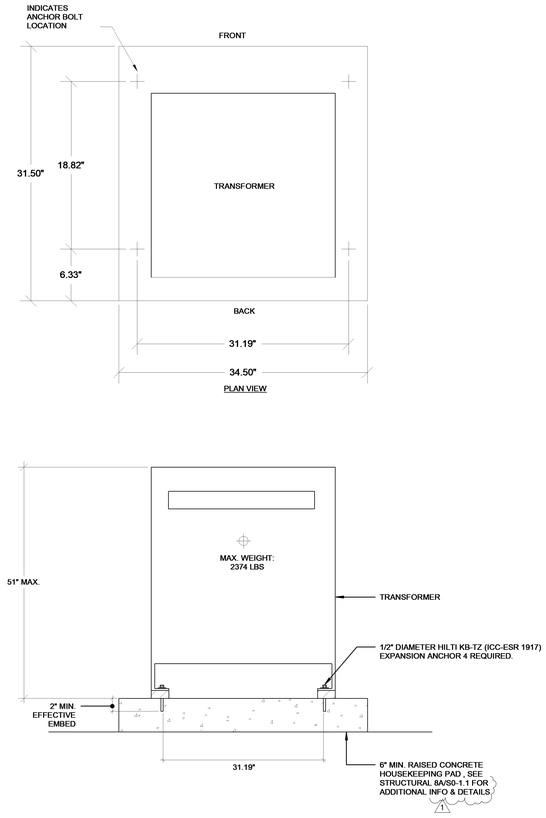
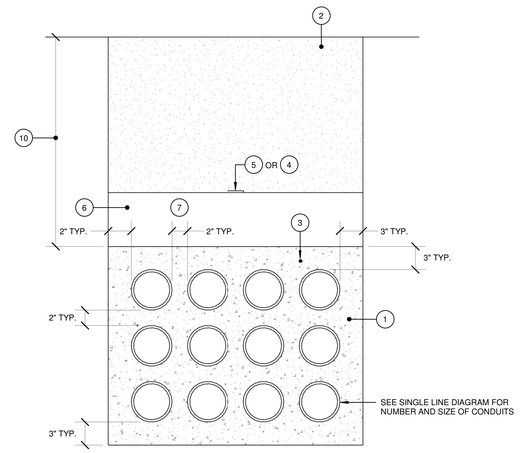
1	11/20/19	Addendum 1

drawing title:
DETAILS

drawing no.:
E0-4
drawing of



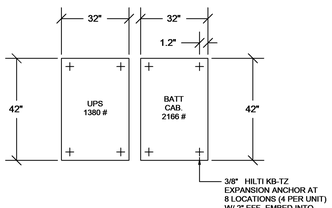
TYPICAL TRANSFORMER ANCHORAGE DETAIL | SCALE N.T.S. | 2



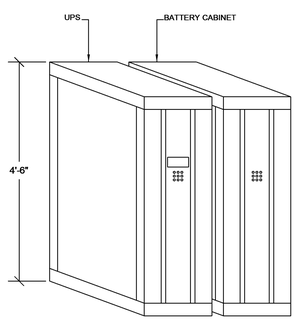
DRAWING SHEET PLAN NOTES

1. CAST-IN PLACE RED MIX CONCRETE CONTINUOUS ENTIRE LENGTH.CONCRETE COVERAGE NOT LESS THAN 3-INCH ALL SIDES OF CONDUIT DUCT BANK.
2. NATIVE SOIL BACKFILL.
3. CONTINUOUS 1#4/0 BARE COPPER DUCT BANK BONDING/GROUND CONDUCTOR.
4. CONTINUOUS 5 INCH CONDUIT AND 4160 VOLT CIRCUIT POWER CONDUCTORS.
5. 3" WIDE WARNING TAPE LOCATED 12" BELOW GRADE. TAPE SHALL INDICATE: "CAUTION BURIED ELECTRICAL CONDUIT".
6. DAMP SAND BACKFILL TO WITHIN 12" OF FINISH GRADE.
7. INTRA-CONDUIT SPACING 2 INCH.
8. HOMERUN AND CONNECT EQUIPMENT BOND CONDUCTOR TO BUILDING EQUIPMENT GROUND BUS - GB.
9. 1"C. - 1#8, CONNECT TO CABLE TRENCH EXPOSED METAL COVER/FRAME FOR CONTINUOUS BOND/GROUND OF EACH ISOLATED METAL COMPONENTS.
10. 36" IN TRAFFIC AREAS, 24" IN NON-TRAFFIC AREAS.

UNDERGROUND CONDUIT DUCT BANK DETAIL | SCALE N.T.S. | 1

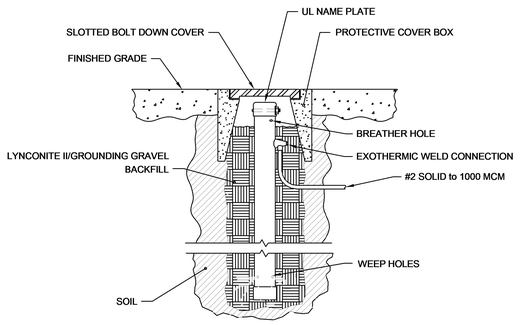


PLAN VIEW



FRONT VIEW

UPS ANCHORAGE DETAIL | SCALE N.T.S. | 5



LYNCOLE XIT GROUNDING SYSTEM

STRAIGHT SHAFT MODEL: INFORMATION & SPECIFICATIONS

A. Manufacturer: Lyncole XIT Grounding, 3547 Voyager St., Ste. 204 Torrance, CA 90503, Phone 800-962-2610. www.Lyncole.com

B. Shaft configuration: Straight. Standard lengths: 10', 12', 20' & 40', or custom.

C. UL and CSA Listing: 467.

D. Lynconite II and Grounding Gravel backfill meet ANSI/NSF Enviromental Standard 60.

E. Material: Type K Copper 0.083" nominal wall thickness.

F. Construction: Hollow tube, 2.125" O.D., filled with non-hazardous salts (Calsolyte).

G. Weight: 3.5 lbs per lineal foot.

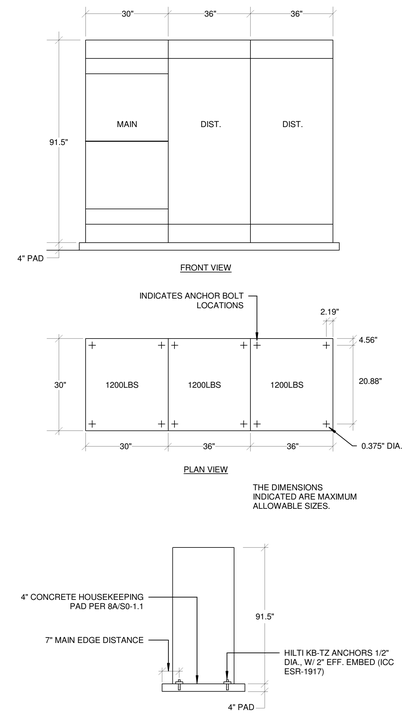
H. Ground Wire Termination: Exothermic connection to conductors from #2 solid AWG to 1000 MCM. U-bolt with pressure plate provided as test point.

I. Warranty: 30 years. Minimum Life Expectancy: 50 years.

J. Straight Shaft Model No: K2-10CS, K2-12CS, K2-20CS, K2-2-40CS (coupled 20 ft. sections)

K. GSA Contract pricing Available.

CHEMICAL GROUND ROD DETAIL | SCALE N.T.S. | 4



DISTRIBUTION SWITCHBOARD ANCHORAGE | SCALE N.T.S. | 3

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STUDENT SERVICES BLDG.

COMPTON COMMUNITY COLLEGE DISTRICT
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owner

tBP project number: 20987.00

file name: CC_SS_E_R18_Central.rvt

drawn by: FBA checked by: RR

date: 9.03.2019

rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
DETAILS

drawing no.:
E0-5
drawing of

LIGHTING FIXTURE SCHEDULE

FIXTURE TYPE	Count	Image	LIGHT FIXTURE DESCRIPTION	FIXTURE MAXIMUM TOTAL INPUT WATTS	FIXTURE MOUNTING	LAMP TYPE	LAMP COLOR TEMPERATURE K	LAMP CRI, NOT LESS THAN	TOTAL ALL LAMPS INITIAL MINIMUM LUMEN OUTPUT	LAMP QUANTITY	WEIGHT	MOUNTING DETAIL	CATALOG NUMBER
A1	306		LED 2X4 LUMINAIRE WITH STEEL HOUSING AND DIE FORMED WHITE PAINTED REFLECTOR; SINGLE PIECE DIFFUSED LENS WITH CONVEX WINGS; LUMINOUS CENTER SPLINE WITH WHITE TRIM. INTEGRAL 0-10V. DIMMABLE DRIVER(S).	53	RECESSED	LED	4000	80	5500		27.3 LBS	B/E0-7	FOCAL POINT "EQUATION 2" SERIES #FEQ2-24-MG-5500LH-40K-1C-UNV-LH1-G-WH. FINELITE, NC. HPR-A-2X4-SCO-H-LED1(LUTRON)-VOLT-SC-C1 OR EQUAL
B1	87		LED DOWNLIGHT; 6" APERTURE.	29	RECESSED/CEILING	LED	4000	80	2500		5 LBS		FOCAL POINT "ID +6" SERIES #FLC6D-RO-2500L-277-LH1-T-BH-LC6-RD-40K-DN-CD-NP V2 LIGHTING C3CP-N-Z(LED1 LUTRON)-30-83-40-40-S-XX-XX-WH OR EQUAL.
C1	13		LED STRIP LIGHT, LENSED, 4 FOOT LENGTH; INTEGRAL 0-10V. DIMMING BALLAST.	25	SURFACE	LED	4000	80	3186		8.2 LBS		METALUX "SNLED" SERIES #4SNLED-LD5-LN-UNV-L840-CD-1-AYC HE WILLIAMS, INC. 75R-4-L30/840-(2)VBY-3/PWU-DIM-UNV OR EQUAL.
D1	18		LED 1X4 LUMINAIRE WITH STEEL HOUSING AND DIE FORMED WHITE PAINTED REFLECTOR; SINGLE PIECE DIFFUSED LENS WITH CONVEX WINGS; LUMINOUS CENTER SPLINE WITH WHITE TRIM. INTEGRAL 0-10V. DIMMABLE DRIVER(S).	26	RECESSED	LED	4000	80	2500		19.4 LBS		FOCAL POINT "EQUATION 2" SERIES #FEQ2-14-AC-2500L-40K-1C-UNV-LH1-F-WH FINELITE, INC. HPR-A-1X4-DCO-S-LED1(LUTRON)-VOLT-SC-C1 OR EQUAL.
SL1	23		LED DOWNLIGHT; 6" APERTURE.	29	RECESSED/CEILING	LED	4000	80	2500		5 LBS		FOCAL POINT "ID +6" SERIES #FLC6D-RO-2500L-277-LH1-T-BH-LC6-RD-40K-DN-CD-NP HE WILLIAMS, INC. 6DR-TL-L30/840-ELDO ECO1-UNV-OW-OF-SG-N-F1 OR EQUAL.
SL2	7		LED SHARP CUT OFF WALL LIGHT; TRAPEZOIDAL SHAPE; INTEGRAL DRIVER; WET LOCATION.	27	WALL	LED	4000	80	2420		25.10 LBS	C/E0-7	WE-FE LIGHTING "OLV344 LED" SERIES #622-7721-40K-80-2420LM HE WILLIAMS, INC. VWPV-L30/740-T3-DBZ-CGL-DIM-UNV OR EQUAL.
SL3	13		LED DECORATIVE WALKWAY LIGHT; TYPE IV DISTRIBUTION; ON 12'-0", 4" DIAMETER, 7 GUAGE STEEL POLE; 120 LUXEON LED EMITTERS; ADVANCE DRIVER; INTERNAL WIRELESS LED CONTROLLER; OCCUPANCY SENSOR; FIXTURE AND POLE FINISH AS SELECTED BY ARCHITECTS; PROVIDE COMPLETE WITH ANCHOR BOLTS AND BOLT COVER.	140	POLE	LED	4000	82	5816		20 LBS	A/E0-7	FORMULA TECHNOLOGIES #SBMTL-2626-IV-120LED-208V-350MA 12'(4" ROUND) 7 GUAGE STRAIGHT STEEL POLE. FINISH AS SELECTED BY ARCHITECT.
SL4	6		LED DOWNLIGHT; 6" APERTURE. INTEGRAL DIMMING DRIVER. WET LOCATION LISTED.	44.1	WALL	LED	4000	80	3977.5				LITHONIA LIGHTING "LDN6CYL" SERIES #LDN6CYL-40K-40L-L06-AR-LSS-MVOLT-GZ10-WM-WL. V2 LIGHTING C4SS-D-V-W-40-83-40-51-XX OR EQUAL.
X1	22		LED EXIT SIGN, EDGE LIT, GREEN LETTERS, MIRRORED BACKING, WALL MOUNT.	3	CEILING	LED							ISOLITE "ELT-FT" SERIES #ELT-AC-G-1M-2M-WH-RC EMERGI-LITE WLX-42/43N-G-M-UA-2CKT OR EQUAL.

Grand total: 495

PERFORMANCE NOTES:

1. ALL LED DRIVERS SHALL BE DIMMABLE AND COMPATIBLE WITH THE SPECIFIED LIGHTING CONTROL SYSTEM.

LIGHTING CONTROL RELAY SCHEDULE "MLCP"

RELAY	CKT. NO.	SWITCH	MASTER SWITCH	AREA CONTROLLED
1	HL1-	P/T	-	BOLLARDS
2	HL1-	P/T	-	TREE UPLIGHTS
3	HL1-	P/T	-	WALKWAY LIGHTS
4	HL1-	P/T	-	TREE UPLIGHTS
5	HL1-	P/T	-	WALKWAY LIGHTS
6	HL1-	P/T	-	TREE UPLIGHTS
7	HL1-	P/T	-	WALKWAY LIGHTS
8	HL1-	P/T	-	TREE UPLIGHTS
9	HL1-	P/T	-	WALKWAY LIGHTS
10	HL1-	P/T	-	SEAT WALL LIGHTS
11	HL1-	P/T	-	SEAT WALL LIGHTS
12	HL1-	P/P	-	CANOPY/STAIR LIGHTS
13	HL1-	P/P	-	WALKWAY LIGHTS
14	HL1-	P/P	-	WALKWAY LIGHTS
15	HL1-	P/P	-	WALKWAY LIGHTS
16	HL1-	P/P	-	WALKWAY LIGHTS
17	HL1-	-	-	-
18	HL1-	-	-	-
19				SPARE
20				SPARE
21				SPARE
22				SPARE
23				SPARE
24				SPARE

P/P = PHOTOCELL ON / PHOTOCELL OFF

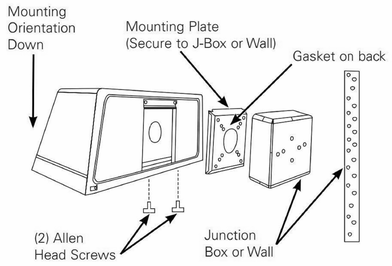
P/T = PHOTOCELL ON / TIMECLOCK OFF

T/T = TIMECLOCK ON / TIMECLOCK OFF

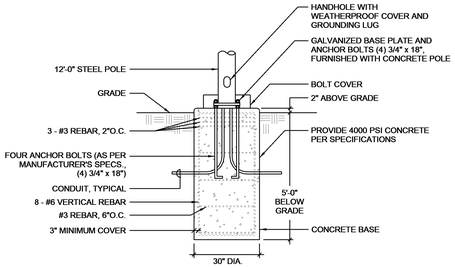
FIXTURE NOTES

(NOTE: REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. FIXTURES LOCATED OUTDOORS SHALL BE RATED FOR STARTING AND OPERATING TEMPERATURES BELOW 0-DEGREES FAHRENHEIT.
2. FIXTURES WITH THE SAME TYPE # SHALL BE THE PRODUCTS OF THE SAME MANUFACTURER, (I.E., TYPE #1, 1A, 1B, ETC., SHALL BE THE SAME MANUFACTURER).
3. THE CONTRACTOR SHALL VERIFY ACTUAL CEILING AND WALL CONSTRUCTION TYPE AS DEFINED ON THE ARCHITECTURAL DRAWINGS AND FURNISH LIGHTING FIXTURES WITH THE CORRECT AND COMPLETE MOUNTING HARDWARE AND MOUNTING DEVICES TO ACCOMMODATE BUILDING CONSTRUCTION AT EACH INSTALL LOCATION, WHETHER OR NOT SUCH VARIATIONS ARE INDICATED BY THE FIXTURE CATALOG NUMBER.
4. THE CONTRACTOR SHALL VERIFY DEPTH OF ALL RECESSED LIGHTING FIXTURES WITH ARCHITECTURAL DRAWINGS PRIOR TO ORDERING FIXTURES. ANY DISCREPANCIES THAT WILL CAUSE RECESSED FIXTURES NOT TO FIT INTO CEILING/WALL SPACES SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE PRIOR TO SUBMITTING SHOP DRAWINGS AND PRIOR TO ORDERING FIXTURES.
5. LIGHT FIXTURES RECESSED IN CEILING OR WALL WITH A ONE HOUR OR MORE FIRE RATING BUILDING CONSTRUCTION, EACH FIXTURE SHALL BE ENCLOSED IN A BOX WHICH HAS A FIRE RATING EQUAL TO THAT OF THE BUILDING CONSTRUCTION. PROVIDE MINIMUM OF 3" CLEAR FROM ALL SIDES AND TOP OF RECESSED LIGHT FIXTURES.
6. WALL AND CEILING INSULATION SHALL BE INSTALLED TO ALLOW 3" MINIMUM CLEARANCE FROM BOTTOM, SIDES AND TOP OF RECESSED LIGHT FIXTURES.
7. VERIFY MOUNTING HEIGHT OF ALL WALL MOUNTED FIXTURES WITH ARCHITECT PRIOR TO ROUGH-IN.
8. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS AND WALL ELEVATIONS FOR EXACT INSTALL LOCATION OF ALL FIXTURES.
9. VERIFY VOLTAGE BEING SUPPLIED TO FIXTURES PRIOR TO SUBMITTING SHOP DRAWINGS AND PRIOR TO ORDERING. FIXTURE VOLTAGE SHALL MATCH BRANCH CIRCUITS CONNECTING TO RESPECTIVE FIXTURE.
10. SUSPENDED MOUNT LIGHT FIXTURES THAT MAY STRIKE STRUCTURAL ELEMENTS, WALL OR MECHANICAL DUCT WORK IF SWIVELED AT +45-DEGREES SHALL BE SWAY BRACED WITH AIR CRAFT CABLE TO PREVENT STRIKING SAID APPURTENANCES DURING SEISMIC EVENTS, AS REQUIRED.
11. OCCUPANCY MOTION SENSOR SYSTEM SHALL BE PROVIDED IN EVERY ROOM/SPACE LOCATION THROUGHOUT THE FACILITY AND AS DESCRIBED IN THE SPECIFICATIONS, WHETHER SYMBOLS ARE SHOWN OR NOT SHOWN ON THE PLANS.
12. PROVIDE TESTING CERTIFICATION AND COMMISSIONING OF LIGHTING FIXTURES, INSTALLATION, LIGHTING CONTROL SYSTEM AND LIGHTING SYSTEM OPERATION.
13. CONTRACTOR SHALL COORDINATE INSTALLATION OF RECESSED LIGHTING FIXTURES IN HARD LID OR STUCCO CEILING AREAS WITH FRAMING CONTRACTOR.
14. ALL EDGE-LIT EXIT SIGNS SHALL HAVE MIRRORED BACKING.



WALL MOUNTED OUTDOOR LIGHT FIXTURE DETAIL | C



POLE BASE DETAIL - WALKWAY | A

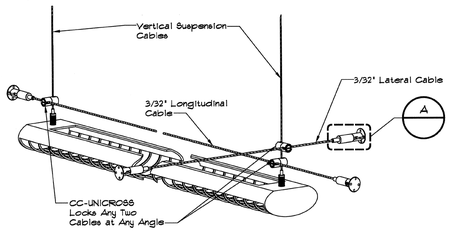
A. WHERE PENDANT MOUNTED LIGHT FIXTURES ARE TO BE INSTALLED IN AREAS WITH A SUSPENDED CEILING, THE CONSTRUCTION DOCUMENTS SHALL INCLUDE COMPLETE SUPPORT DETAILS COMPLYING WITH THIS IR AND DSA IR 16-9.

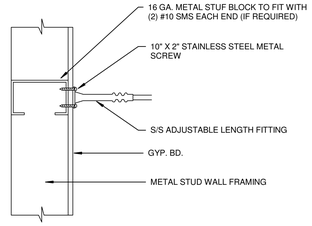
B. SUPPORT PENDANT MOUNTED LIGHT FIXTURES DIRECTLY FROM THE STRUCTURE ABOVE WITH HANGER WIRES OR CABLES PASSING THROUGH EACH PENDANT HANGER AND CAPABLE OF SUPPORTING TWO (2) TIMES THE WEIGHT OF THE FIXTURE.

C. IF A PENDANT MOUNTED LIGHT FIXTURE IS DIRECTLY AND INDEPENDENTLY BRACED BELOW THE CEILING (I.E., AIRCRAFT CABLES TO WALLS), THEN A BRACE ASSEMBLY IS NOT REQUIRED ABOVE THE CEILING.

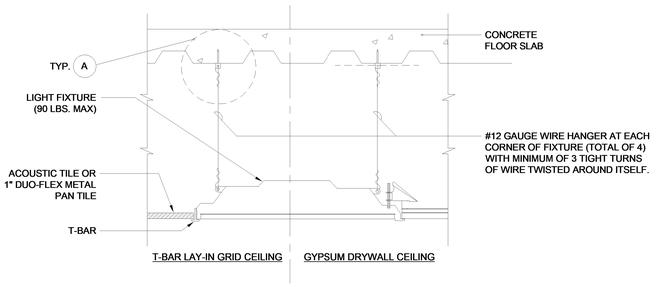
D. IF A PENDANT MOUNTED LIGHT FIXTURE IS FREE TO SWING 45 DEGREES FROM VERTICAL IN ALL DIRECTIONS, AND IS NOT DIRECTLY AND INDEPENDENTLY BRACED BELOW THE CEILING, THEN A BRACING ASSEMBLY IS ONLY REQUIRED WHERE THE PENDANT HANGER PENETRATES THE CEILING. SPECIAL DETAILS ARE REQUIRED TO ATTACH THE PENDANT HANGER TO THE BRACING ASSEMBLY TO TRANSMIT THE HHORIZONTAL AND VERTICAL FORCES. EXCEPTION: WHERE THE WEIGHT OF THE FIXTURE IS LESS THAN 20 POUNDS, THE VERTICAL COMPONENT OF THE BRACE FORCE NEED NOT BE CONSIDERED SO NO COMPRESSION STRUT/POST IS REQUIRED.

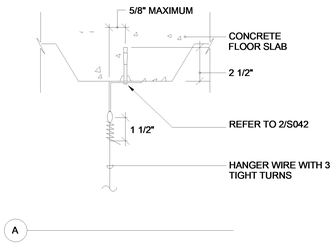
E. RIGID CONDUIT SHALL NOT BE USED FOR ATTACHMENT OF THE FIXTURES.





PENDANT MOUNTED LIGHT FIXTURE DETAIL | D





NOTE:
METHOD OF FIXTURE INSTALLATION SHALL COMPLY WITH REQUIREMENTS FOR EARTHQUAKE RESISTANT CONSTRUCTION OF THE STATE OF CALIFORNIA,SEE DSA IR 25-2, 10

POLE BASE DETAIL - WALKWAY | B

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owner

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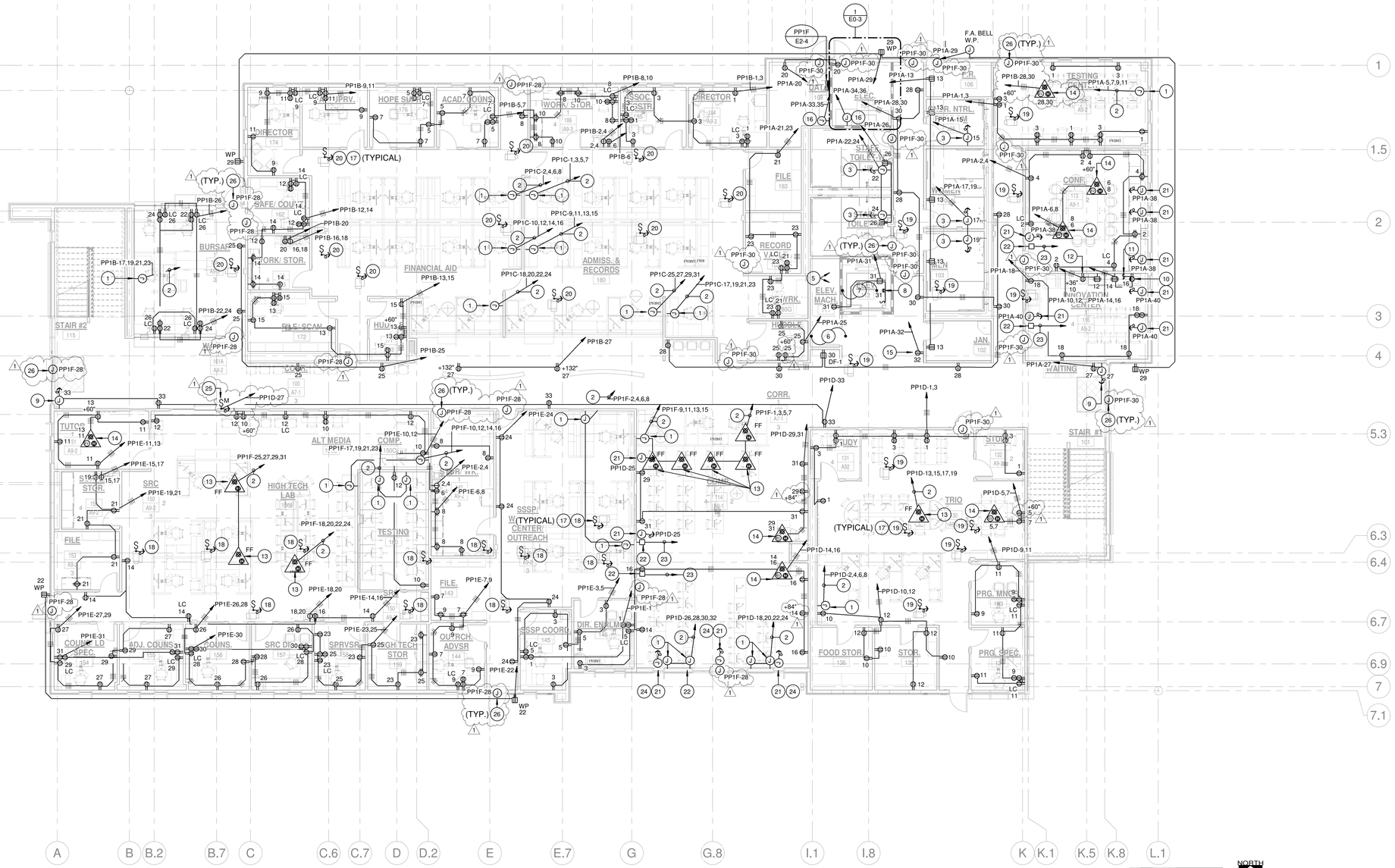
rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
LIGHTING FIXTURE SCHEDULE AND DETAILS

drawing no.:
E0-7
drawing of



1ST FLOOR POWER PLAN

SCALE 1/8" = 1'-0" (1)

KEY NOTES

1. PROVIDE SEAL-TITE FLEX CONNECTION TO ELECTRIFIED FURNITURE SYSTEM WIRING HARNESS. THE FURNITURE SYSTEM IS A "2 GENERAL PURPOSE + 2 ISOLATED CIRCUIT" SYSTEM. VERIFY EXACT POINT OF CONNECTION LOCATION WITH THE FURNITURE SYSTEMS DRAWINGS. INSTALL IN ACCORDANCE WITH THE FURNITURE SYSTEM MANUFACTURER'S WIRING REQUIREMENTS.
2. PROVIDE 4#10 (H.), 1#10 (COMMON NEUTRAL), 1#10 (ISOLATED NEUTRAL), 1# 10 (COMMON GROUND) AND 1#10 (ISOLATED GROUND)-1.25 IN. CONDUIT.
3. CONNECT TO ELECTRIC HAND DRYER IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS. REFER TO ARCHITECTURAL INTERIOR ELEVATIONS FOR LOCATIONS AND MOUNTING HEIGHTS OF HAND DRYERS.
4. CONNECT TO ELEVATOR SMOKE CURTAIN SYSTEM. INSTALL ALL ELECTRICAL IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION REQUIREMENTS.
5. CONNECT TO ELEVATOR CONTROLLER IN ACCORDANCE WITH THE ELEVATOR MANUFACTURER'S REQUIREMENTS.
6. PROVIDE AND INSTALL ALL ELECTRICAL DEVICES IN THE ELEVATOR MACHINE ROOM IN LOCATIONS IN ACCORDANCE WITH THE ELEVATOR MANUFACTURER'S SHOP DRAWINGS. PROVIDE ALL CODE REQUIRED CLEARANCES.
7. PROVIDE AND INSTALL ALL ELECTRICAL DEVICES IN THE ELEVATOR PIT IN ACCORDANCE WITH THE ELEVATOR MANUFACTURER'S SHOP DRAWINGS.
8. PROVIDE AND INSTALL 2'-0" LONG SURFACE MOUNTED LED LIGHTING FIXTURE IN ELEVATOR PIT IN ACCORDANCE WITH THE ELEVATOR MANUFACTURER'S REQUIREMENTS. LIGHTING FIXTURE SHALL BE METALUX #2VT2-LD4-DR100-UNV-L940-WL OR EQUAL BY LITHONIA, PHILIPS DAYBRITE.
9. CONNECT TO POWER ASSISTED DOOR IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS.
10. PROVIDE AND INSTALL RECEPTACLE BELOW SINK FOR CONNECTION TO DISPOSAL.
11. ENGRAVE SWITCH COVERPLATE TO READ: "DISPOSAL".
12. PROVIDE AND INSTALL RECEPTACLE FOR CONNECTION TO REFRIGERATOR, +36 IN. AFF.
13. PROVIDE AND INSTALL COMBINATION POWER/DATA FLOOR BOX, FLUSH IN FLOOR, WITH FURNITURE FEED COVER IN FINISH AS SELECTED BY ARCHITECT AND CONNECTION TO THE FURNITURE SYSTEM. PROVIDE SEAL-TITE FLEX CONDUIT CONNECTION, MINIMUM 1.0 IN. FOR POWER AND 1.25 IN. FOR TELECOM. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS.
14. PROVIDE AND INSTALL COMBINATION POWER/DATA/AV FLOOR BOX, FLUSH IN FLOOR, WITH IN USE COVERPLATE IN FINISH AS SELECTED BY ARCHITECT. PROVIDE 1.0 IN. MINIMUM POWER CONDUIT, 1.25 IN. MINIMUM VOICE/DATA CONDUIT AND 1.25 IN. MINIMUM AV CONDUIT FROM BELOW GRADE, UP INTO WALL TO ABOVE THE ACCESSIBLE CEILING. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS.
15. PROVIDE AND INSTALL RECEPTACLE FOR KWIKBOOST CHARGING STATION. INSTALL IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS.
16. CONNECT TO FCU/FAN COIL UNIT. INSTALL IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS.
17. PROVIDE CONNECTION TO VAV BOX.. INSTALL IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. VERIFY EXACT LOCATION AND QUANTITY WITH MECHANICAL DRAWINGS.
18. PROVIDE 2#12, 1#12 GRD - 3/4"C. CONNECT TO CIRCUIT "PP1F-26".
19. PROVIDE 2#12, 1#12 GRD - 3/4"C. CONNECT TO CIRCUIT "PP1D-21".
20. PROVIDE 2#12, 1#12 GRD - 3/4"C. CONNECT TO CIRCUIT "PP1C-26".
21. CONNECT TO MOTOR OPERATED SHADES IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS.
22. PROVIDE SHADE CONTROLLER IN FLUSH WALL OUTLET BOX, +45".
23. PROVIDE 3/4"C., WITH CONTROL WIRING IN ACCORDANCE WITH THE SHADE MANUFACTURER'S REQUIREMENTS.
24. CONNECT TO CIRCUIT "PP1D-23".
25. CONNECT TO AUTOMATIC SLIDING DOOR IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS.
26. CONNECT TO CARD READER IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS. COMBINE SAME CIRCUIT IN ONE HOMERUN.

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COMPTON COLLEGE STUDENT SERVICES BLDG.

COMPTON COMMUNITY COLLEGE DISTRICT
1111 E. ARTESIA BLVD.
COMPTON, CA 90221
owner

tBP project number: 20987.00

file name: CC_SS_E_R18_Central.rvt

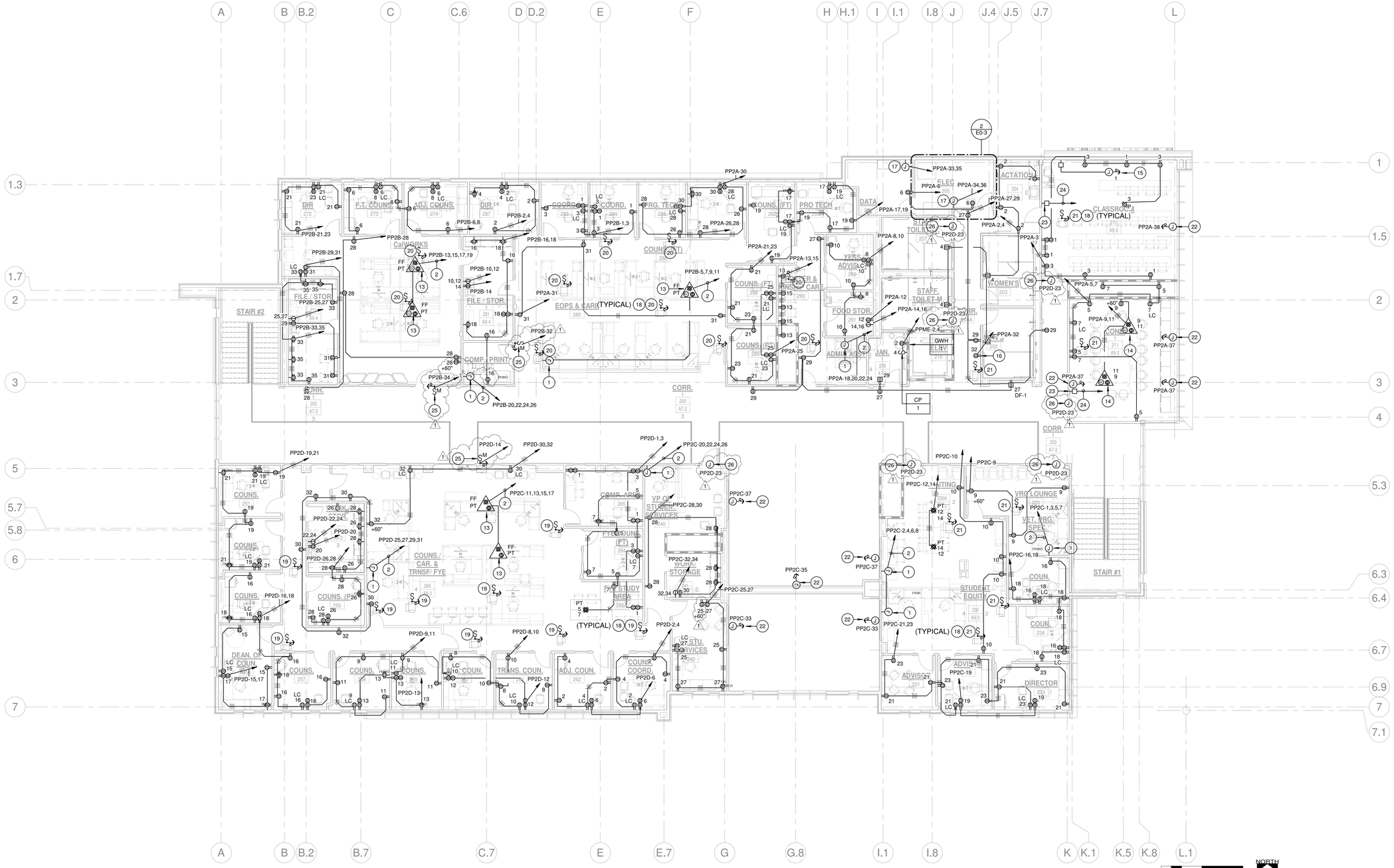
drawn by: FBA checked by: RR

date: 9.03.2019

rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
1ST FLOOR POWER PLAN

drawing no.:
E2-1
drawing of



KEY NOTES

1. PROVIDE SEAL-TITE FLEX CONNECTION TO ELECTRIFIED FURNITURE SYSTEM WIRING HARNESS. THE FURNITURE SYSTEM IS A "2 GENERAL PURPOSE + 2 ISOLATED CIRCUIT" SYSTEM. VERIFY EXACT POINT OF CONNECTION LOCATION WITH THE FURNITURE SYSTEMS DRAWINGS. INSTALL IN ACCORDANCE WITH THE FURNITURE SYSTEM MANUFACTURER'S WIRING REQUIREMENTS.
2. PROVIDE 4#10 (H.), 1#10 (COMMON NEUTRAL), 1#10 (ISOLATED NEUTRAL), 1# 10 (COMMON GROUND) AND 1#10 (ISOLATED GROUND)-1.25 IN. CONDUIT.
3. CONNECT TO ELECTRIC HAND DRYER IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS. REFER TO ARCHITECTURAL INTERIOR ELEVATIONS FOR LOCATIONS AND MOUNTING HEIGHTS OF HAND DRYERS.
4. CONNECT TO ELEVATOR SMOKE CURTAIN SYSTEM. INSTALL ALL ELECTRICAL IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION REQUIREMENTS.
5. CONNECT TO ELEVATOR CONTROLLER IN ACCORDANCE WITH THE ELEVATOR MANUFACTURER'S REQUIREMENTS.
6. PROVIDE AND INSTALL ALL ELECTRICAL DEVICES IN THE ELEVATOR MACHINE ROOM IN LOCATIONS IN ACCORDANCE WITH THE ELEVATOR MANUFACTURER'S SHOP DRAWINGS. PROVIDE ALL CODE REQUIRED CLEARANCES.
7. PROVIDE AND INSTALL ALL ELECTRICAL DEVICES IN THE ELEVATOR PIT IN ACCORDANCE WITH THE ELEVATOR MANUFACTURER'S SHOP DRAWINGS.
8. PROVIDE AND INSTALL 2'-0" LONG SURFACE MOUNTED LED LIGHTING FIXTURE IN ELEVATOR PIT IN ACCORDANCE WITH THE ELEVATOR MANUFACTURER'S REQUIREMENTS. LIGHTING FIXTURE SHALL BE METALUX #2VT2-LD4-DR100-UNV-L940-WL OR EQUAL BY LITHONIA, PHILIPS DAYBRITE.
9. CONNECT TO POWER ASSISTED DOOR IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS.
10. PROVIDE AND INSTALL RECEPTACLE BELOW SINK FOR CONNECTION TO DISPOSAL.
11. ENGRAVE SWITCH COVERPLATE TO READ: "DISPOSAL".
12. PROVIDE AND INSTALL RECEPTACLE FOR CONNECTION TO REFRIGERATOR, +36 IN. AFF.
13. PROVIDE AND INSTALL COMBINATION POWER/DATA FLOOR BOX, FLUSH IN FLOOR, WITH FURNITURE FEED COVER IN FINISH AS SELECTED BY ARCHITECT AND CONNECTION TO THE FURNITURE SYSTEM. PROVIDE SEAL-TITE FLEX CONDUIT CONNECTION, MINIMUM 1.0 IN. FOR POWER AND 1.25 IN. FOR TELECOM. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS.
14. PROVIDE AND INSTALL COMBINATION POWER/DATA/AV FLOOR BOX, FLUSH IN FLOOR, WITH IN USE COVERPLATE IN FINISH AS SELECTED BY ARCHITECT. PROVIDE 1.0 IN. MINIMUM POWER CONDUIT, 1.25 IN. MINIMUM VOICE/DATA CONDUIT AND 1.25 IN. MINIMUM AV CONDUIT FROM BELOW GRADE, UP INTO WALL TO ABOVE THE ACCESSIBLE CEILING. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS.
15. CONNECT TO MOTOR OPERATED PROJECTION SCREEN IN ACCORDANCE WITH THE SCREEN MANUFACTURERS RECOMMENDATIONS.
16. PROVIDE AND INSTALL RECEPTACLE FOR KWIKBOOST CHARGING STATION. INSTALL IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS.
17. CONNECT TO FCU/FAN COIL UNIT. INSTALL IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS.
18. PROVIDE CONNECTION TO VAV BOX.. INSTALL IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. VERIFY EXACT LOCATION AND QUANTITY WITH MECHANICAL DRAWINGS.
19. PROVIDE 2#12, 1#12 GRD - 3/4"C. CONNECT TO CIRCUIT "PP2C-29".
20. PROVIDE 2#12, 1#12 GRD - 3/4"C. CONNECT TO CIRCUIT "PP2B-30".
21. PROVIDE 2#12, 1#12 GRD - 3/4"C. CONNECT TO CIRCUIT "PP2C-31".
22. CONNECT TO MOTOR OPERATED SHADES IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS.
23. PROVIDE SHADE CONTROLLER IN FLUSH WALL OUTLET BOX, +45".
24. PROVIDE 3/4"C., WITH CONTROL WIRING IN ACCORDANCE WITH THE SHADE MANUFACTURER'S REQUIREMENTS.
25. CONNECT TO AUTOMATIC SLIDING DOOR IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS.
26. CONNECT TO CARD READER IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS. COMBINE SAME CIRCUIT IN ONE HOMERUN.

0' 2' 4' 8' 16'

NORTH

2ND FLOOR POWER PLAN

SCALE 1/8" = 1'-0"

1

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1	11/20/19	Addendum 1

drawing title:
2ND FLOOR POWER PLAN

drawing no.:
E2-2

drawing of

Branch Panel: PP1B

Project Name

Location: ELEC. 107 | **Supply From:** DPP1 | **Mounting:** Surface | **Volts:** 120/208 Wye | **Phases:** 3 | **Wires:** 4 | **Isolated Ground Bus:** | **A.I.C. Rating:** 10K | **Mains Type:** | **Mains Rating:** 225 A | **MCB Rating:** 150 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	Receptacle DIRECTOR 184, ASSOC. 185	3	20 A	1	980 VA 600 VA			2	20 A	1	Copier WORK/ STOR. 186	2
3	Receptacle DIRECTOR 184, ASSOC. 185	5	20 A	1		900 VA 600 VA		--	--	--	--	4
5	Receptacle ACAD. COUNS. 177, HOPE 176	4	20 A	1			1160... 1200...	1	20 A	1	Copier WORK/ STOR. 186	6
7	Receptacle ACAD. COUNS. 177, HOPE 176	6	20 A	1	1080... 900 VA			1	20 A	5	Receptacle WORK/ STOR. 186	8
9	Receptacle FA SUPRV. 175, DIR. 174	5	20 A	1		900 VA 940 VA		1	20 A	4	Receptacle WORK/ STOR. 186	10
11	Receptacle FA SUPRV. 175, DIR. 174	3	20 A	1			980 VA 980 VA	1	20 A	3	Receptacle WORK/ STOR. 162, STOR. 173	12
13	Receptacle FILE/ SCAN 172, HUDDLE 171	4	20 A	1	1280... 1080...			1	20 A	6	Receptacle WORK/ STOR. 162, STOR. 173	14
15	Receptacle FILE/SCAN 172, HUDDLE 171	4	20 A	1		940 VA 600 VA		2	20 A	1	Copier STOR. 173	16
17	Furniture System OPEN OFC. 161	1	20 A	1			500 VA 600 VA	--	--	--	--	18
19	Furniture System OPEN OFC. 161	1	20 A	1	500 VA 1200...			1	20 A	1	Copier STOR. 173	20
21	Furniture System OPEN OFC. 161	1	20 A	1		500 VA 800 VA		1	20 A	2	Receptacle OPEN OFC. 161	22
23	Furniture System OPEN OFC. 161	1	20 A	1			500 VA 800 VA	1	20 A	2	Receptacle OPEN OFC. 161	24
25	Receptacle CORRIDOR 161A	4	20 A	1	720 VA 720 VA			1	20 A	4	Receptacle OPEN OFC. 161	26
27	TV Monitors WAITING 1421	2	20 A	1		600 VA 500 VA		1	20 A	1	Floorbox/ TESTING CENTER 122	28
29	Spare	--	20 A	1			0 VA 500 VA	1	20 A	1	Floorbox/ TESTING CENTER 122	30
31	Spare	--	20 A	1	0 VA 0 VA			1	20 A	--	Spare	32
33	Spare	--	20 A	1		0 VA 0 VA		1	20 A	--	Spare	34
35	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	36
37	Provision	--	--	--	0 VA 0 VA			--	--	--	Provision	38
39	Provision	--	--	--		0 VA 0 VA		--	--	--	Provision	40
41	Provision	--	--	--			0 VA 0 VA	--	--	--	Provision	42
					Total Load: 9060 VA	7280 VA	7220 VA					
					Total Amps: 76 A	61 A	60 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Other	2000 VA	100.00%	2000 VA	
Receptacle	21560 VA	73.19%	15780 VA	**Total Conn. Load:** 23560 VA
				Total Est. Demand: 17780 VA
				Total Conn.: 65 A
				Total Est. Demand: 49 A

Notes:

Branch Panel: PP1A

Project Name

Location: ELEC. 107 | **Supply From:** DPP1 | **Mounting:** Surface | **Volts:** 120/208 Wye | **Phases:** 3 | **Wires:** 4 | **Isolated Ground Bus:** | **A.I.C. Rating:** 10K | **Mains Type:** | **Mains Rating:** 225 A | **MCB Rating:** 150 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	Receptacle TESTING 122	4	20 A	1	940 VA 720 VA			1	20 A	4	Receptacle CONF 113	2
3	Receptacle TESTING 122	4	20 A	1		1280... 840 VA		1	20 A	2	Receptacle CONF 113	4
5	Furniture System TESTING 122	1	20 A	1			500 VA 1000...	1	20 A	2	Receptacle CONF 113	6
7	Furniture System TESTING 122	1	20 A	1	500 VA 1000...			1	20 A	2	Receptacle CONF 113	8
9	Furniture System TESTING 122	1	20 A	1		500 VA 810 VA		1	20 A	1	Refrigerator INNOVATION 116	10
11	Furniture System TESTING 122	1	20 A	1			500 VA 1200...	1	20 A	1	Receptacle @Counter INNOVATION 116	12
13	Receptacle RM. 106,105,104,103,102	5	20 A	1	900 VA 1200...			1	20 A	1	Receptacle @Counter INNOVATION 116	14
15	Hand Dryer GNDR. NTRL. REST RM 105	1	20 A	1		1500... 700 VA		1	20 A	1	Garbage Disposal INNOVATION 116	16
17	Hand Dryer WOMEN'S 104	1	20 A	1			1500... 900 VA	1	20 A	4	Receptacle INNOVATION 116	18
19	Hand Dryer MEN'S 103	1	20 A	1	1500... 360 VA			1	20 A	2	Receptacle DATA 108, ELEC. 107	20
21	Receptacle RM. 183,182,180G	3	20 A	1		980 VA 1500...		1	20 A	1	Hand Dryer STAFF. RM 109	22
23	Receptacle RM. 182,180G	5	20 A	1			900 VA 1500...	1	20 A	1	Hand Dryer STAFF. RM 110	24
25	Receptacle HUDDLE 181	4	20 A	1	840 VA 360 VA			1	20 A	2	Receptacle STAFF. RM 109,110	26
27	Receptacle/Door Assist WAI 100A	2	20 A	1		780 VA 900 VA		1	20 A	5	Receptacle CORR 100	28
29	Receptacle OUTDOOR	3	20 A	1			540 VA 1320...	1	20 A	5	Receptacle/DF-1 CORR 100	30
31	Receptacle/Lighting ELEV 112	3	20 A	1	389 VA 1800...			1	20 A	1	KwikBoost CORR.-1 100-1	32
33	FCU-1-117 DATA 108	1	20 A	2		312 VA 312 VA		2	20 A	1	FCU-1-118 ELEC. 107	34
35	--	--	--	--			312 VA 312 VA	--	--	--	--	36
37	F.A. BELL F.R. 106	1	20 A	1	180 VA 1000...			1	20 A	4	Motor Shades CONF 113	38
39	Provision	--	--	--		0 VA 750 VA		1	20 A	3	Motor Shades INNOVATION CENTER 116	40
41	Provision	--	--	--			0 VA 0 VA	--	--	--	Provision	42
					Total Load: 11689 VA	11164 VA	10484 VA					
					Total Amps: 98 A	94 A	87 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Lighting	1277 VA	100.00%	1277 VA	
Motor	1750 VA	100.00%	1750 VA	**Total Conn. Load:** 33337 VA
Other	2000 VA	100.00%	2000 VA	**Total Est. Demand:** 28322 VA
Power	8280 VA	100.00%	8280 VA	**Total Conn.:** 93 A
Receptacle	20030 VA	74.96%	15015 VA	**Total Est. Demand:** 79 A

Notes:

Branch Panel: HL1

Project Name

Location: ELEC. 107 | **Supply From:** MBDH | **Mounting:** Surface | **Volts:** 480/277 Wye | **Phases:** 3 | **Wires:** 4 | **Isolated Ground Bus:** | **A.I.C. Rating:** 22K | **Mains Type:** | **Mains Rating:** 225 A | **MCB Rating:** 100 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	Lighting 1ST FLOOR	29	20 A	1	1111... 522 VA			1	20 A	18	Lighting 1ST FLOOR	2
3	Lighting 1ST FLOOR	15	20 A	1		795 VA 1113...		1	20 A	21	Lighting 1ST FLOOR	4
5	Spare	--	20 A	1			0 VA 1007...	1	20 A	19	Lighting 1ST FLOOR	6
7	Lighting 1ST FLOOR	16	20 A	1	848 VA 318 VA			1	20 A	6	Lighting 1ST FLOOR	8
9	Lighting 1ST FLOOR	14	20 A	1		742 VA 264 VA		1	20 A	6	Lighting OUTDOOR	10
11	Lighting 1ST FLOOR	13	20 A	1			689 VA 1155...	1	20 A	7	Lighting SITE	12
13	Spare	--	20 A	1	0 VA 990 VA			1	20 A	6	Lighting SITE	14
15	Spare	--	20 A	1		0 VA 0 VA		1	20 A	--	Spare	16
17	Spare	--	20 A	1			0 VA 5508...	1	20 A	1	EMH Inverter Panel	18
19	Spare	--	20 A	1	0 VA 0 VA			1	20 A	--	Spare	20
21	Spare	--	20 A	1		0 VA 0 VA		1	20 A	--	Spare	22
23	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	24
25	Spare	--	20 A	1	0 VA 0 VA			1	20 A	--	Spare	26
27	Spare	--	20 A	1		0 VA 0 VA		1	20 A	--	Spare	28
29	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	30
31	Spare	--	20 A	1	3127... 0 VA			1	20 A	--	Spare	32
33	--	--	--	--		0 VA 0 VA		1	20 A	--	Spare	34
35	--	--	--	--			1643... 0 VA	1	20 A	--	Spare	36
37	Spare	--	20 A	1	0 VA 0 VA			1	20 A	--	Spare	38
39	Spare	--	20 A	1		0 VA 0 VA		1	20 A	--	Spare	40
41	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	42
					Total Load: 6703 VA	6041 VA	9911 VA					
					Total Amps: 25 A	22 A	36 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Lighting	5808 VA	100.00%	5808 VA	
Other	16950 VA	100.00%	16950 VA	**Total Conn. Load:** 22640 VA
				Total Est. Demand: 22640 VA
				Total Conn.: 27 A
				Total Est. Demand: 27 A

Notes:

Branch Panel: PP1E

Project Name

Location: ELEC. 107 | **Supply From:** DPP1 | **Mounting:** Surface | **Volts:** 120/208 Wye | **Phases:** 3 | **Wires:** 4 | **Isolated Ground Bus:** | **A.I.C. Rating:** 10K | **Mains Type:** | **Mains Rating:** 225 A | **MCB Rating:** 150 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	Receptacle OUTRCH. ADVSR 146, 145	2	20 A	1	800 VA 600 VA			2	20 A	1	Copier STOR 141	2
3	Receptacle OUTRCH. ADVSR 146, 145	4	20 A	1		720 VA 600 VA		--	--	--	--	4
5	Receptacle OUTRCH. ADVSR 146 145	4	20 A	1			720 VA 1200...	1	20 A	1	Copier STOR 141	6
7	Receptacle FILE. 143, OUTRCH. ADVSR 144	4	20 A	1	940 VA 900 VA			1	20 A	5	Receptacle STOR 141	8
9	Receptacle FILE. 143, OUTRCH. ADVSR 144	4	20 A	1		720 VA 1060...		1	20 A	4	Receptacle COMP. 150C, WAI 150A,TESTIN...	10
11	Receptacle TUTOR 151	4	20 A	1			1040... 900 VA	1	20 A	5	Receptacle COMP. 150C, WAI 150A,TESTIN...	12
13	Receptacle TUTOR 151	2	20 A	1	800 VA 720 VA			1	20 A	4	Receptacle SRC 150	14
15	Receptacle SUPPLY STOR. 1702	1	20 A	2		600 VA 1200...		1	20 A	1	Copier SRC 150	16
17	--	--	--	--			600 VA 600 VA	2	20 A	1	Copier SRC 150	18
19	Receptacle SUPPLY STOR. 152,FILE 153	1	20 A	1	1200... 600 VA			--	--	--	--	20
21	Receptacle SUPPLY STOR. 152,FILE 153	4	20 A	1		720 VA 360 VA		1	20 A	2	Receptacle OUTDOOR	22
23	Receptacle STOR 159, SPRVSR 158	5	20 A	1			900 VA 720 VA	1	20 A	4	Receptacle CORRIDOR	24
25	Receptacle STOR 159, SPRVSR 158	4	20 A	1	940 VA 720 VA			1	20 A	4	Receptacle SRC DIR. 157,COUNS. 156	26
27	Receptacle ADJ. COUNS 155,154	4	20 A	1		720 VA 720 VA		1	20 A	4	Receptacle SRC DIR. 157,COUNS. 156	28
29	Receptacle ADJ. COUNS 155,154	4	20 A	1			720 VA 800 VA	1	20 A	2	Receptacle SRC DIR. 157,COUNS. 156	30
31	Receptacle ADJ. COUNS 155,154	2	20 A	1	800 VA 0 VA			1	20 A	--	Spare	32
33	Spare	--	20 A	1		0 VA 0 VA		1	20 A	--	Spare	34
35	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	36
37	Provision	--	--	--	0 VA 0 VA			--	--	--	Provision	38
39	Provision	--	--	--		0 VA 0 VA		--	--	--	Provision	40
41	Provision	--	--	--			0 VA 0 VA	--	--	--	Provision	42
					Total Load: 9020 VA	7420 VA	8200 VA					
					Total Amps: 76 A	62 A	69 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Receptacle	24640 VA	70.29%	17320 VA	
				Total Conn. Load: 24640 VA
				Total Est. Demand: 17320 VA
				Total Conn.: 68 A
				Total Est. Demand: 48 A

Notes:

Branch Panel: PP1D

Project Name

Location: ELEC. 107 | **Supply From:** DPP1 | **Mounting:** Surface | **Volts:** 120/208 Wye | **Phases:** 3 | **Wires:** 4 | **Isolated Ground Bus:** | **A.I.C. Rating:** 10K | **Mains Type:** | **Mains Rating:** 225 A | **MCB Rating:** 150 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	Receptacle STUDY 131,132	4	20 A	1	1080... 500 VA			1	20 A	1	Furniture System TRIO 130	2
3	Receptacle STUDY 131,132	3	20 A	1		900 VA 500 VA		1	20 A	1	Furniture System TRIO 130	4
5	Receptacle TRIO 130	2	20 A	1			800 VA 500 VA	1	20 A	1	Furniture System TRIO 130	6
7	Receptacle TRIO 130	2	20 A	1	680 VA 500 VA			1	20 A	1	Furniture System TRIO 130	8
9	Receptacle MNGR. 133, SPEC. 134	3	20 A	1		980 VA 720 VA		1	20 A	4	Receptacle STOR. 136,135	10
11	Receptacle MNGR. 133, SPEC. 134	5	20 A	1			900 VA 720 VA	1	20 A	4	Receptacle STOR. 136,135	12
13	Receptacle COMP 130A	1	20 A	1	500 VA 980 VA			1	20 A	3	Receptacle/Floor Box COMP. 114	14
15	Receptacle COMP 130A	1	20 A	1		500 VA 1040...		1	20 A	4	Receptacle/Floor Box COMP. 114	16
17	Receptacle COMP 130A	1	20 A	1			500 VA 1000...	1	20 A	2	Furniture System COMP. 114	18
19	Receptacle COMP 130A	1	20 A	1	500 VA 1000...			1	20 A	2	Furniture System COMP. 114	20
21	VAV Boxes 1ST FLOOR	11	20 A	1		550 VA 1000...		1	20 A	2	Furniture System COMP. 114	22
23	Motor Shades COMP. 114	3	20 A	1			750 VA 1000...	1	20 A	2	Furniture System COMP. 114	24
25	Motor Shades COMP. 114	2	20 A	1	500 VA 1000...			1	20 A	2	Furniture System COMP. 114	26
27	Automatic Sliding Door HIGH TECH LAB 150F	1	20 A	1		180 VA 1000...		1	20 A	2	Furniture System COMP. 114	28
29	Receptacle/Floor BOx COMP. 114	3	20 A	1			980 VA 1000...	1	20 A	2	Furniture System COMP. 114	30
31	Receptacle/Floor Box COMP. 114	4	20 A	1	1040... 1000...			1	20 A	2	Furniture System COMP. 114	32
33	Receptacle/Door Assist CORRIDOR 100	4	20 A	1		1140... 0 VA		1	20 A	--	Spare	34
35	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	36
37	Provision	--	--	--	0 VA 0 VA			--	--	--	Provision	38
39	Provision	--	--	--		0 VA 0 VA		--	--	--	Provision	40
41	Provision	--	--	--			0 VA 0 VA	--	--	--	Provision	42
					Total Load: 9280 VA	8375 VA	8150 VA					
					Total Amps: 78 A	70 A	68 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Motor	1250 VA	100.00%	1250 VA	
Other	10000 VA	100.00%	10000 VA	**Total Conn. Load:** 25798 VA
Power	1262 VA	100.00%	1262 VA	**Total Est. Demand:** 24118 VA
Receptacle	13360 VA	87.43%	11680 VA	**Total Conn.:** 72 A
				Total Est. Demand: 67 A

Notes:

Branch Panel: PP1C

Project Name

Location: ELEC. 107 | **Supply From:** DPP1 | **Mounting:** Surface | **Volts:** 120/208 Wye | **Phases:** 3 | **Wires:** 4 | **Isolated Ground Bus:** | **A.I.C. Rating:** 10K | **Mains Type:** | **Mains Rating:** 225 A | **MCB Rating:** 150 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	Furniture System RECRD. 180	1	20 A	1	500 VA 500 VA			1	20 A	1	Furniture System AID 170	2
3	Furniture System RECRD. 180	1	20 A	1		500 VA 500 VA		1	20 A	1	Furniture System AID 170	4
5	Furniture System RECRD. 180	1	20 A	1			500 VA 500 VA	1	20 A	1	Furniture System AID 170	6
7	Furniture System RECRD. 180	1	20 A	1	500 VA 500 VA			1	20 A	1	Furniture System AID 170	8
9	Furniture System RECRD. 180	1	20 A	1		500 VA 500 VA		1	20 A	1	Furniture System AID 170	10
11	Furniture System RECRD. 180	1	20 A	1			500 VA 500 VA	1	20 A	1	Furniture System AID 170	12
13	Furniture System RECRD. 180	1	20 A	1	500 VA 500 VA			1	20 A	1	Furniture System AID 170	14
15	Furniture System RECRD. 180	1	20 A	1		500 VA 500 VA		1	20 A	1	Furniture System AID 170	16
17	Furniture System RECRD. SPEC. 180	1	20 A	1			500 VA 500 VA	1	20 A	1	Furniture System RECEP 170C	18
19	Furniture System RECRD. SPEC. 180	1	20 A	1	500 VA 500 VA			1	20 A	1	Furniture System RECEP 170C	20
21	Furniture System RECRD. SPEC. 180	1	20 A	1		500 VA 500 VA		1	20 A	1	Furniture System RECEP 170C	22
23	Furniture System RECRD. SPEC. 180	1	20 A	1			500 VA 500 VA	1	20 A	1	Furniture System RECEP 170C	24
25	Furniture System FRONT 180E	1	20 A	1	500 VA 500 VA			1	20 A	10	VAV Boxes 1ST FLOOR	26
27	Furniture System FRONT 180E	1	20 A	1		500 VA 0 VA		1	20 A	--	Spare	28
29	Furniture System FRONT 180E	1	20 A	1			500 VA 0 VA	1	20 A	--	Spare	30
31	Furniture System FRONT 180E	1	20 A	1	500 VA 0 VA			1	20 A	--	Spare	32
33	Spare	--	20 A	1		0 VA 0 VA		1	20 A	--	Spare	34
35	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	36
37	Provision	--	--	--	0 VA 0 VA			--	--	--	Provision	38
39	Provision	--	--	--		0 VA 0 VA		--	--	--	Provision	40
41	Provision	--	--	--			0 VA 0 VA	--	--	--	Provision	42
					Total Load: 5408 VA	4500 VA	4500 VA					
					Total Amps: 45 A	38 A	38 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Other	14000 VA	100.00%	14000 VA	
Power	500 VA	100.00%	500 VA	**Total Conn. Load:** 14403 VA
				Total Est. Demand: 14403 VA
				Total Conn.: 40 A
				Total Est. Demand: 40 A

Notes:

INVERTER PANEL SCHEDULE: EMH

Project: Project Name | **Location:** ELEC 205 | **Supply From:** HL1 | **Volts:** 480/277 Wye | **Mains:**

CKT	Circuit Description	Voltage	Quantity	Rating	Number of Poles	Load	Control
1	Lighting EXTERIOR	277 V	15	20 A	1	416 VA	
2	Lighting EXTERIOR	277 V	15	20 A	1	426 VA	
3	Lighting 1ST FLOOR	277 V	9	20 A	1	225 VA	
4	Lighting 1ST FLOOR	277 V	23	20 A	1	763 VA	
5	Exit Sign 1ST FLOOR	277 V	6	20 A	1	240 VA	
6	Lighting 1ST FLOOR	277 V	23	20 A	1	1219 VA	
7	Exit Sign 1ST FLOOR	277 V	6	20 A	1	120 VA	
8	Lighting 2ND FLOOR	277 V	27	20 A	1	783 VA	
9	Exit Sign 2ND FLOOR	277 V	3	20 A	1	0 VA	
10	Lighting 2ND FLOOR	277 V	20	20 A	1	1060 VA	
11	Exit Sign 2ND FLOOR	277 V	6	20 A	1	0 VA	
12	Lighting 2ND FLOOR	277 V	9	20 A	1	477 VA	
13	Spare	--	--	20 A	1	0 VA	
14	Spare	--	--	20 A	1	0 VA	
15	Spare	--	--	20 A	1	0 VA	
16	Spare	--	--	20 A	1	0 VA	
17	Spare	--	--	20 A	1	0 VA	
18	Spare	--	--	20 A	1	0 VA	
19	Spare	--	--	20 A	1	0 VA	
20	Spare	--	--	20 A	1	0 VA	
						Total Conn. Load:	5508 VA
						Total Amps:	7 A

Notes:
PT/TC - PHOTOCELL ON / TIMECLOCK OFF FUNCTION OF LIGHTING CONTROL PANEL
PC/PC - PHOTOCELL ON / PHOTOCELL OFF FUNCTION OF LIGHTING CONTROL PANEL
LC - LIGHTING CONTROL SYSTEM

Branch Panel: BDF1

Project Name

Location: DATA 108 | **Supply From:** UPS | **Mounting:** Surface | **Volts:** 120/208 Wye | **Phases:** 3 | **Wires:** 4 | **Isolated Ground Bus:** | **A.I.C. Rating:** 10K | **Mains Type:** | **Mains Rating:** 100 A | **MCB Rating:** 100 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	FACP1 DATA 108	1	20 A	1	500 VA 1500...			1	20 A	1	Receptacle DATA 108	2
3	FAMP DATA 108	1	20 A	1		500 VA 1500...		1	20 A	1	Receptacle DATA 108	4
5	FPS1 DATA 108	1	20 A	1			500 VA 360 VA	1	20 A	2	Receptacle DATA 108	6
7	ACP DATA108	1	20 A	1	500 VA 360 VA			1	20 A	2	Receptacle DATA 108	8
9	ID PANEL DATA 108	1	20 A	1		500 VA 180 VA		1	20 A	1	Receptacle DATA 108	10
11	Spare	--	20 A	1			0 VA 180 VA	1	20 A	1	Receptacle DATA 108	12
13	Spare	--	20 A	1	0 VA 0 VA			1	20 A	--	Spare	14
15	Spare	--	20 A	1		0 VA 0 VA		1	20 A	--	Spare	16
17	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	18
19	Spare	--	20 A	1	0 VA 0 VA			1	20 A	--	Spare	20
21	Spare	--	20 A	1		0 VA 0 VA		1	20 A	--	Spare	22
23	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	24
25	Spare	--	20 A	1	0 VA 2860...			3	100 A	1	IDF2 DATA 206	26
27	Spare	--	20 A	1		0 VA 2000...		--	--	--	--	28
29	Spare	--	20 A	1			0 VA 540 VA	--	--	--	--	30
					Total Load: 5720 VA	4680 VA	1580 VA					
					Total Amps: 52 A	43 A	13 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Receptacle	7980 VA	100.00%	7980 VA	
				Total Conn. Load: 7980 VA
				Total Est. Demand: 7980 VA
				Total Conn.: 22 A
				Total Est. Demand: 22 A

Notes:

Branch Panel: PP1F

Project Name

Location: DATA 108 | **Supply From:** DPP1 | **Mounting:** Surface | **Volts:** 120/208 Wye | **Phases:** 3 | **Wires:** 4 | **Isolated Ground Bus:** | **A.I.C. Rating:** 10K | **Mains Type:** | **Mains Rating:** 225 A | **MCB Rating:** 150 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	Receptacle COMP. 114	3	20 A	1	1500... 1000...			1	20 A	2	Furniture System PRG. TECH. 140F	2
3	Receptacle COMP. 114	3	20 A	1		1500... 1000...		1	20 A	2	Furniture System PRG. TECH. 140F	4
5	Receptacle COMP. 114	3	20 A	1			1500... 1000...	1	20 A	2	Furniture System PRG. TECH. 140F	6
7	Receptacle COMP. 114	3	20 A	1	1500... 1000...			1	20 A	2	Furniture System PRG. TECH. 140F	8
9	Receptacle COMP. 114	3	20 A	1		1500... 1000...		1	20 A	2	Furniture System COMP. 150C	10
11	Receptacle COMP. 114	3	20 A	1			1500... 1000...	1	20 A	2	Furniture System COMP. 150C	12
13	Receptacle COMP. 114	3	20 A	1	1500... 1000...			1	20 A	2	Furniture System COMP. 150C	14
15	Receptacle COMP. 114	3	20 A	1		1500... 1000...		1	20 A	2	Furniture System COMP. 150C	16
17	Furniture System TESTING 160	2	20 A	1			1000... 500 VA	1	20 A	1	Receptacle HIGH TECH LAB 150F	18
19	Furniture System TESTING 160	2	20 A	1	1000... 500 VA			1	20 A	1	Receptacle HIGH TECH LAB 150F	20
21	Furniture System TESTING 160	2	20 A	1		1000... 500 VA		1	20 A	1	Receptacle HIGH TECH LAB 150F	22
23	Furniture System TESTING 160	2	20 A	1			1000... 500 VA	1	20 A	1	Receptacle HIGH TECH LAB 150F	24
25	Receptacle SS ADVSR 150	2	20 A	1	1000... 550 VA			1	20 A	11	VAV BOXES 1ST FLOOR	26
27	Receptacle SS ADVSR 150	2	20 A	1		1000... 1200...		1	20 A	12	Card Reade 1ST FLOOR	28
29	Receptacle SS ADVSR 150	2

Branch Panel: PP2B

Project Name

Location: ELEC 205 | **Volts:** 120/208 Wye | **A.I.C. Rating:** 10K
Supply From: DPP2 | **Phases:** 3 | **Mains Type:**
Mounting: Surface | **Wires:** 4 | **Mains Rating:** 225 A
Isolated Ground Bus: | **MCB Rating:** 150 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	Receptacle COORD. 284,283	3	20 A	1	980 VA	540 VA		1	20 A	3	Receptacle DIR. 287	2
3	Receptacle COORD. 284,283	5	20 A	1		900 VA	580 VA	1	20 A	2	Receptacle DIR. 287	4
5	Receptacle EOPS & CARE 280	2	20 A	1			1000... 1080...	1	20 A	6	Receptacle ADJ. COUNS. 274,273	6
7	Receptacle EOPS & CARE 280	2	20 A	1	1000...	980 VA		1	20 A	3	Receptacle ADJ. COUNS. 274,273	8
9	Receptacle EOPS & CARE 280	2	20 A	1		1000...	600 VA	2	20 A	1	Copier FILE / STOR. 281	10
11	Receptacle EOPS & CARE 280	2	20 A	1			1000... 600 VA	--	--	--	--	12
13	Receptacle PRG. SPEC. 2507	2	20 A	1	1000...	1200...		1	20 A	1	Copier FILE / STOR. 281	14
15	Receptacle PRG. SPEC. 2507	2	20 A	1		1000...	720 VA	1	20 A	4	Receptacle FILE / STOR. 281	16
17	Receptacle PRG. SPEC. 2507	2	20 A	1			1000... 760 VA	1	20 A	3	Receptacle FILE / STOR. 281	18
19	Receptacle PRG. SPEC. 2507	2	20 A	1	1000...	500 VA		1	20 A	1	Furniture System COMP./ PRINT 280B	20
21	Receptacle DIR 2503	4	20 A	1		720 VA	500 VA	1	20 A	1	Furniture System COMP./ PRINT 280B	22
23	Receptacle DIR 2503	1	20 A	1			400 VA 500 VA	1	20 A	1	Furniture System COMP./ PRINT 280B	24
25	Copier FILE./ STOR. 271	1	20 A	2	600 VA	500 VA		1	20 A	1	Furniture System COMP./ PRINT 280B	26
27	--	--	--	--		600 VA	1020...	1	20 A	5	Receptacle OPEN OFC 270,CORR. 200	28
29	Copier FILE./ STOR. 271	1	20 A	1			1200... 500 VA	1	20 A	10	VAV Boxes 2ND FLOOR	30
31	Receptacle GAIN 270G,STOR. 271	3	20 A	1	1200...	180 VA		1	20 A	1*	Automatic Sliding Door WAITING 280A	32
33	Receptacle GAIN 270G,STOR. 271	4	20 A	1		720 VA	180 VA	1	20 A	1	Automatic Sliding Door CALWORKS 270	34
35	Receptacle FILE./ STOR. 271	4	20 A	1			720 VA 0 VA	1	20 A	--	Spare	36
37	Provision	--	--	--	0 VA	0 VA		--	--	--	Provision	38
39	Provision	--	--	--		0 VA	0 VA	--	--	--	Provision	40
41	Provision	--	--	--			0 VA 0 VA	--	--	--	Provision	42
			Total Load:		9645 VA	8505 VA	8665 VA					
			Total Amps:		81 A	71 A	72 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Other	4000 VA	100.00%	4000 VA	
Power	860 VA	100.00%	860 VA	**Total Conn. Load:** 26813 VA
Receptacle	22120 VA	72.60%	16060 VA	**Total Est. Demand:** 20754 VA
				Total Conn.: 74 A
				Total Est. Demand: 58 A

Notes:

Branch Panel: PP2A

Project Name

Location: ELEC 205 | **Volts:** 120/208 Wye | **A.I.C. Rating:** 10K
Supply From: DPP2 | **Phases:** 3 | **Mains Type:**
Mounting: Surface | **Wires:** 4 | **Mains Rating:** 225 A
Isolated Ground Bus: | **MCB Rating:** 150 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	Receptacle CLASS. 212	5	20 A	1	1240...	720 VA		1	20 A	4	Receptacle LACTATION 204	2
3	Receptacle CLASS. 212	5	20 A	1		1020...	720 VA	1	20 A	4	Receptacle WOMEN'S 203,MEN'S 202	4
5	Receptacle CONF. 211	4	20 A	1			720 VA 360 VA	1	20 A	2	Receptacle ELEC 205,DATA 206	6
7	Receptacle CONF. 211	4	20 A	1	720 VA	580 VA		1	20 A	2	Receptacle YESS ADVISOR 292,STOR. 291	8
9	Receptacle CONF. 211	3	20 A	1		1300...	720 VA	1	20 A	4	Receptacle YESS ADVISOR 292,STOR. 291	10
11	Receptacle CONF. 211	2	20 A	1			1000... 1200...	1	20 A	1	Copier FOOD STOR. 291	12
13	Receptacle FOSTER 290	3	20 A	1	1200...	600 VA		2	20 A	1	Copier FOOD STOR. 291	14
15	Receptacle FOSTER 290	2	20 A	1		800 VA	600 VA	--	--	--	--	16
17	Receptacle PRO TECH 293,COUNS. 282	4	20 A	1			1160... 500 VA	1	20 A	1	Furniture System ADMIN ASST 290A	18
19	Receptacle PRO TECH 293,COUNS. 282	6	20 A	1	1080...	500 VA		1	20 A	1	Furniture System ADMIN ASST 290A	20
21	Receptacle COUNS. 288,289	5	20 A	1			900 VA 500 VA	1	20 A	1	Furniture System ADMIN ASST 290A	22
23	Receptacle COUNS. 288,289	3	20 A	1			540 VA 500 VA	1	20 A	1	Furniture System ADMIN ASST 290A	24
25	Receptacle COUNS. 288,289	2	20 A	1	800 VA	360 VA		1	20 A	2	Receptacle COUNS. (FT) 2404	26
27	Receptacle/DF-1 CORRIDOR 200	4	20 A	1		1140...	720 VA	1	20 A	4	Receptacle COUNS. (FT) 2404	28
29	Receptacle CORRIDOR 200	5	20 A	1			900 VA 980 VA	1	20 A	3	Receptacle COUNS. (FT) 2404	30
31	Receptacle CORRIDOR 2400	3	20 A	1	540 VA	1800...		1	20 A	1	KwikBoost CORR. 200	32
33	FCU-1-210 DATA 206	1	20 A	2		312 VA	312 VA	2	20 A	1	FCU-1-211 ELEC 205	34
35	--	--	--	--			312 VA 312 VA	--	--	--	--	36
37	Motor Shades CONF 211	3	20 A	1	750 VA	250 VA		1	20 A	1	Motor Shades CLASSROOM 212	38
39	Spare	--	20 A	1		0 VA	0 VA	--	--	--	Provision	40
41	Provision	--	--	--			0 VA 0 VA	--	--	--	Provision	42
			Total Load:		11140 VA	9044 VA	8484 VA					
			Total Amps:		94 A	76 A	71 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Lighting	1248 VA	100.00%	1248 VA	
Motor	1300 VA	100.00%	1300 VA	**Total Conn. Load:** 28668 VA
Other	2000 VA	100.00%	2000 VA	**Total Est. Demand:** 21608 VA
Receptacle	24120 VA	70.73%	17060 VA	**Total Conn.:** 80 A
				Total Est. Demand: 60 A

Notes:

Branch Panel: HL2

Project Name

Location: ELEC 205 | **Volts:** 480/277 Wye | **A.I.C. Rating:** 22K
Supply From: HL1 | **Phases:** 3 | **Mains Type:**
Mounting: Surface | **Wires:** 4 | **Mains Rating:** 100 A
Isolated Ground Bus: | **MCB Rating:** 60 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	Lighting 2ND FLOOR	25	20 A	1	1056...	667 VA		1	20 A	23	Lighting 2ND FLOOR	2
3	Lighting 2ND FLOOR	17	20 A	1		901 VA	1219...	1	20 A	23	Lighting 2ND FLOOR	4
5	Lighting 2ND FLOOR	14	20 A	1			742 VA 901 VA	1	20 A	17	Lighting 2ND FLOOR	6
7	Lighting 2ND FLOOR	24	20 A	1	1272...	0 VA		--	--	--	Spare	8
9	Lighting 2ND FLOOR	19	20 A	1		1007...	0 VA	1	20 A	--	Spare	10
11	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	12
13	Spare	--	20 A	1	0 VA	0 VA		1	20 A	--	Spare	14
15	Spare	--	20 A	1		0 VA	0 VA	1	20 A	--	Spare	16
17	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	18
19	Spare	--	20 A	1	0 VA	0 VA		1	20 A	--	Spare	20
21	Spare	--	20 A	1		0 VA	0 VA	1	20 A	--	Spare	22
23	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	24
25	Spare	--	20 A	1	0 VA	0 VA		1	20 A	--	Spare	26
27	Spare	--	20 A	1		0 VA	0 VA	1	20 A	--	Spare	28
29	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	30
			Total Load:		2995 VA	3127 VA	1643 VA					
			Total Amps:		12 A	12 A	6 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Lighting	667 VA	100.00%	667 VA	
Other	7098 VA	100.00%	7098 VA	**Total Conn. Load:** 7765 VA
				Total Est. Demand: 7765 VA
				Total Conn.: 9 A
				Total Est. Demand: 9 A

Notes:

Branch Panel: IDF2

Project Name

Location: DATA 206 | **Volts:** 120/208 Wye | **A.I.C. Rating:** 10K
Supply From: BDF1 | **Phases:** 3 | **Mains Type:**
Mounting: Surface | **Wires:** 4 | **Mains Rating:** 100 A
Isolated Ground Bus: | **MCB Rating:** 60 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	FPS2 DATA 206	1	20 A	1	500 VA	1500...		1	20 A	1	Receptacle DATA 206	2
3	Spare	--	20 A	1		0 VA	1500...	1	20 A	1	Receptacle DATA 206	4
5	Spare	--	20 A	1			0 VA 540 VA	1	20 A	3	Receptacle DATA 206	6
7	IDCP DATA 206	1	20 A	1	500 VA	360 VA		1	20 A	2	Receptacle DATA 206	8
9	ACT2 DATA 206	1	20 A	1		500 VA	0 VA	1	20 A	--	Spare	10
11	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	12
13	Spare	--	20 A	1	0 VA	0 VA		1	20 A	--	Spare	14
15	Spare	--	20 A	1		0 VA	0 VA	1	20 A	--	Spare	16
17	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	18
19	Spare	--	20 A	1	0 VA	0 VA		1	20 A	--	Spare	20
21	Spare	--	20 A	1		0 VA	0 VA	1	20 A	--	Spare	22
23	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	24
25	Spare	--	20 A	1	0 VA	0 VA		1	20 A	--	Spare	26
27	Spare	--	20 A	1		0 VA	0 VA	1	20 A	--	Spare	28
29	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	30
			Total Load:		2860 VA	2000 VA	540 VA					
			Total Amps:		26 A	19 A	5 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Receptacle	3900 VA	100.00%	3900 VA	
				Total Conn. Load: 3900 VA
				Total Est. Demand: 3900 VA
				Total Conn.: 11 A
				Total Est. Demand: 11 A

Notes:

Branch Panel: PP2D

Project Name

Location: ELEC 205 | **Volts:** 120/208 Wye | **A.I.C. Rating:** 10K
Supply From: DPP2 | **Phases:** 3 | **Mains Type:**
Mounting: Surface | **Wires:** 4 | **Mains Rating:** 225 A
Isolated Ground Bus: | **MCB Rating:** 150 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	Receptacle COMP. 250H,STUDY 265	3	20 A	1	1200...	720 VA		1	20 A	4	Receptacle COUNS. COORD. 263,262	2
3	Receptacle COMP. 250H,COUNS. 264	2	20 A	1		800 VA	720 VA	1	20 A	4	Receptacle COUNS. COORD. 263,262	4
5	Receptacle COMP. 250H,COUNS. 264,STUD...	4	20 A	1			1040... 800 VA	1	20 A	2	Receptacle COUNS. COORD. 263,262	6
7	Receptacle COMP. 250H,COUNS. 264,STUD...	5	20 A	1	1220...	540 VA		1	20 A	3	Receptacle TRANS. COUN. 261,260	8
9	Receptacle COUNS. 259,258	3	20 A	1		540 VA	720 VA	1	20 A	4	Receptacle TRANS. COUN. 261,260	10
11	Receptacle COUNS. 259,258	4	20 A	1			720 VA 800 VA	1	20 A	2	Receptacle TRANS. COUN. 261,260	12
13	Receptacle COUNS. 259,258	4	20 A	1	1160...	180 VA		1	20 A	1	Automatic Sliding Door COUNS. 266	14
15	Receptacle DEAN. OF COUN. 256	3	20 A	1		540 VA	1080...	1	20 A	6	Receptacle COUNS. 257,253	16
17	Receptacle DEAN. OF COUN. 256	2	20 A	1			580 VA 1160...	1	20 A	4	Receptacle COUNS. 257,253	18
19	Receptacle COUNS. 251,525	5	20 A	1	900 VA	1200...		1	20 A	1	Copier WORK / STOR. 254	20
21	Receptacle COUNS. 251,252	4	20 A	1		1160...	600 VA	2	20 A	1	Copier WORK / STOR. 254	22
23	Card Reader 2ND FLOOR	7	20 A	1			700 VA 600 VA	--	--	--	--	24
25	Furniture System EXPS. COUN. 250E	1	20 A	1	500 VA	1240...		1	20 A	5	Receptacle WORK / STOR. 254,255	26
27	Furniture System EXPS. COUN. 250E	1	20 A	1		500 VA	1080...	1	20 A	6	Receptacle WORK / STOR. 254,255	28
29	Furniture System EXPS. COUN. 250E	1	20 A	1			500 VA 720 VA	1	20 A	4	Receptacle WAITING 250A,CORRIDOR	30
31	Furniture System EXPS. COUN. 250E	1	20 A	1	500 VA	840 VA		1	20 A	4	Receptacle WAITING 250A,CORRIDOR	32
33	Tubular Skylight CORR 200	10	20 A	1		1200...	0 VA	1	20 A	--	Spare	34
35	Spare	--	20 A	1			0 VA 0 VA	1	20 A	--	Spare	36
37	Provision	--	--	--	0 VA	0 VA		--	--	--	Provision	38
39	Provision	--	--	--		0 VA	0 VA	--	--	--	Provision	40
41	Provision	--	--	--			0 VA 0 VA	--	--	--	Provision	42
			Total Load:		10165 VA	8730 VA	7620 VA					
			Total Amps:		86 A	74 A	64 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Motor	700 VA	100.00%	700 VA	
Other	3000 VA	100.00%	3000 VA	**Total Conn. Load:** 26497 VA
Power	1380 VA	100.00%	1380 VA	**Total Est. Demand:** 20661 VA
Receptacle	21680 VA	73.06%	15840 VA	**Total Conn.:** 74 A
				Total Est. Demand: 57 A

Notes:

Branch Panel: PP2C

Project Name

Location: ELEC 205 | **Volts:** 120/208 Wye | **A.I.C. Rating:** 10K
Supply From: DPP2 | **Phases:** 3 | **Mains Type:**
Mounting: Surface | **Wires:** 4 | **Mains Rating:** 225 A
Isolated Ground Bus: | **MCB Rating:** 150 A

CKT	Circuit Description	Quan	Trip	Pole	A	B	C	Pole	Trip	Quan	Circuit Description	CKT
1	Furniture System VET. PRG. SPEC. 220A	1	20 A	1	500 VA	1000...		1	20 A	2	Furniture System TAR. SUPRT. CNTR. 230B	2
3	Furniture System VET. PRG. SPEC. 220A	1	20 A	1		500 VA	1000...	1	20 A	2	Furniture System TAR. SUPRT. CNTR. 230B	4
5	Furniture System VET. PRG. SPEC. 220A	1	20 A	1			500 VA 1000...	1	20 A	2	Furniture System TAR. SUPRT. CNTR. 230B	6
7	Furniture System VET. PRG. SPEC. 220A	1	20 A	1	500 VA	1000...		1	20 A	2	Furniture System TAR. SUPRT. CNTR. 230B	8
9	Receptacle VRC 220	3	20 A	1		660 VA	900 VA	1	20 A	5	Receptacle WAITING 2908	10
11	Receptacle COUNS. 266	2	20 A	1			1000... 1000...	1	20 A	2	Floor Receptacle TAR. SUPRT. CNTR. 230B	12
13	Receptacle COUNS. 266	2	20 A	1	1000...	1000...		1	20 A	2	Floor Receptacle TAR. SUPRT. CNTR. 230B	14
15	Receptacle COUNS. 266	2	20 A	1		1000...	980 VA	1	20 A	3	Receptacle COUN. 221,234	16
17	Receptacle COUNS. 266	2	20 A	1			1000... 1080...	1	20 A	6	Receptacle COUN. 221,234	18
19	Receptacle ADVISOR 232,DIR 233	2	20 A	1	800 VA	500 VA		1	20 A	1	Furniture System ADMIN ASST. 240B	20
21	Receptacle ADVISOR 231,232/DIR 233	6	20 A	1		1080...	500 VA	1	20 A	1	Furniture System ADMIN ASST. 240B	22
23	Receptacle ADVISOR 231,232/DIR 233	5	20 A	1			900 VA 500 VA	1	20 A	1	Furniture System ADMIN ASST. 240B	24
25	Receptacle VP STU. SERVICES 242	3	20 A	1	880 VA	500 VA		1	20 A	1	Furniture System ADMIN ASST. 240B	26
27	Receptacle VP STU. SERVICES 242	4	20 A	1		1340...	900 VA	1	20 A	5	Receptacle VP OF SUDENT SERVICES 240	28
29	VAV Boxes 2ND FLOOR	9	20 A	1			450 VA 1200...	1	20 A	1	Copier WORK/ STOR. 241	30
31	Power CLASSROOM 212	7	20 A	1	350 VA	600 VA		2	20 A	1	Copier WORK/ STOR. 241	32
33	Motor Shades COMP 114	2	20 A	1		500 VA	600 VA	--	--	--	--	34
35	Motor Shades COMP 114	1	20 A	1			250 VA 0 VA	1	20 A	--	Spare	36
37	Motor Shades COMP 114	2	20 A	1	500 VA	0 VA		--	--	--	Provision	38
39	Provision	--	--	--		0 VA	0 VA	--	--	--	Provision	40
41	Provision	--	--	--			0 VA 0 VA	--	--	--	Provision	42
			Total Load:		9062 VA	9960 VA	8794 VA					
			Total Amps:		76 A	83 A	73 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Motor	1250 VA	100.00%	1250 VA	
Other	10000 VA	100.00%	10000 VA	**Total Conn. Load:** 27814 VA
Power	800 VA	100.00%	800 VA	**Total Est. Demand:** 24855 VA
Receptacle	15920 VA	81.41%	12960 VA	**Total Conn.:** 77 A
				Total Est. Demand: 69 A

Notes:

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COMPTON COMMUNITY COLLEGE DISTRICT
1111 E. ARTESIA BLVD.
COMPTON, CA 90221

owner

tBP project number: 20987.00

file name: CC_SS_E_R18_Central.rvt

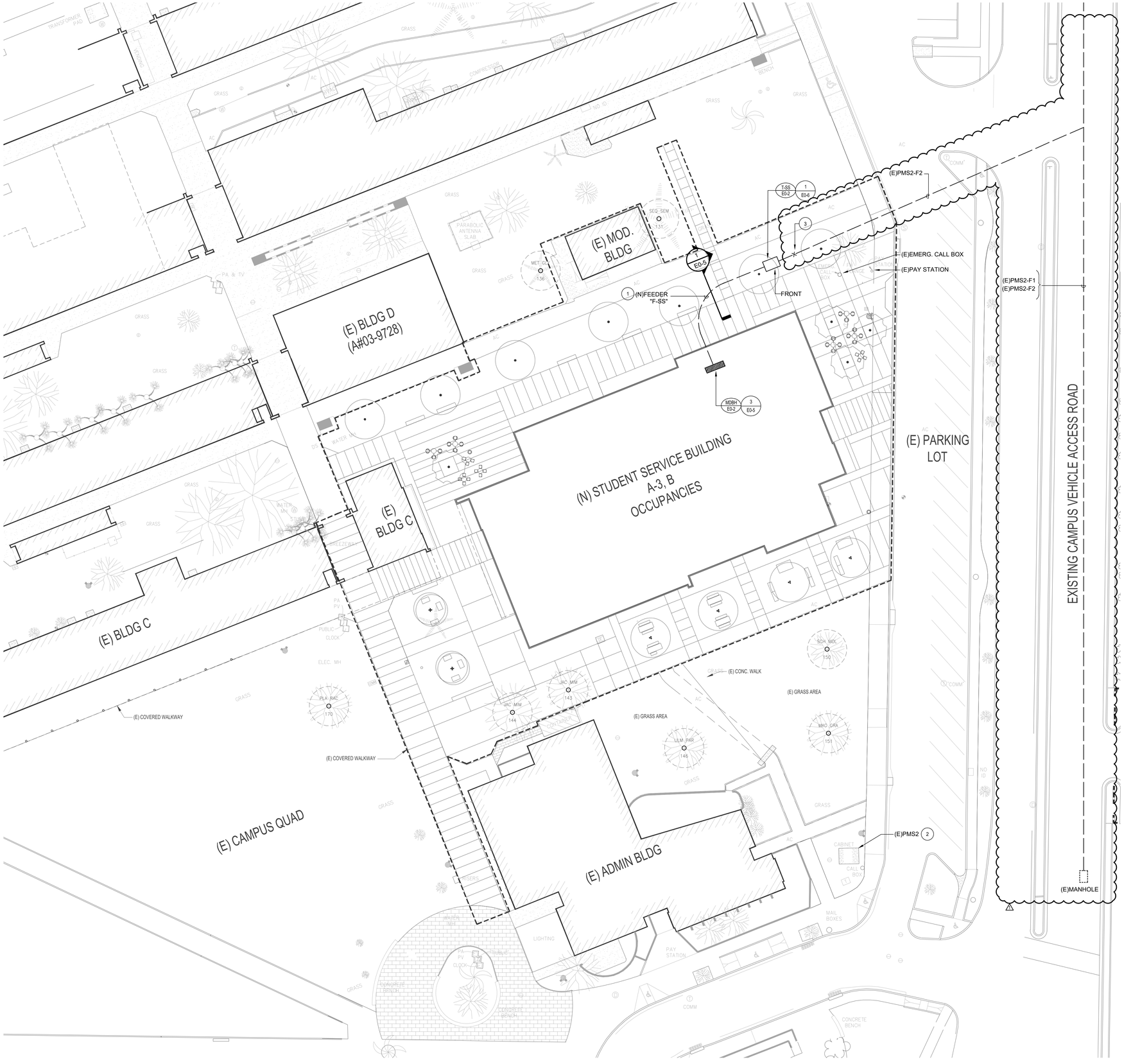
drawn by: FBA checked by: RR

date: 9.03.2019

rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
PANEL SCHEDULES

drawing no.:
E2-5
drawing of



ENLARGED SITE ELECTRICAL PLAN
SCALE: 1" = 20'-0"

0 5 10 20 40

NORTH

KEY NOTES

1. REFER TO SINGLE LINE DIAGRAM SHEET E0-2 FOR FEEDER REQUIREMENTS.
2. REFER TO PMS2 SINGLE LINE DIAGRAM SHEET E0-2.
3. INTERCEPT AT EXISTING 5" CONDUIT SPARE AND RE-ROUTE AS INDICATED.

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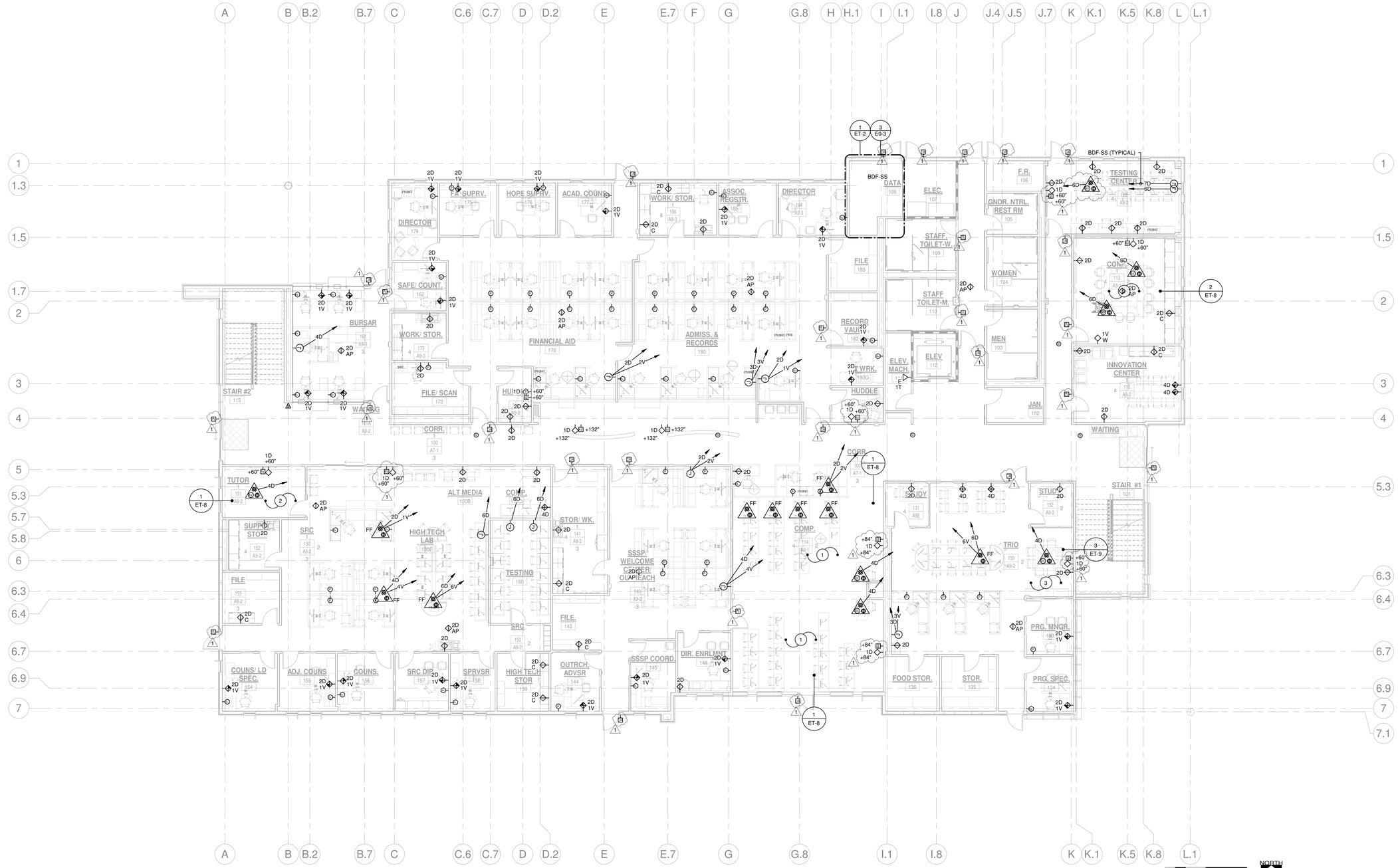
owner

tBP project number : 20987.00
file name:
drawn by: FBA checked by: RR
date: 9.03.2019

Rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
ENLARGED SITE ELECTRICAL PLAN

drawing no.:
ES-2
drawing of ?



1ST FLOOR TELECOM PLAN 1

SCALE 1/8" = 1'-0"

NORTH

0' 2' 4' 8' 16'

KEY NOTES

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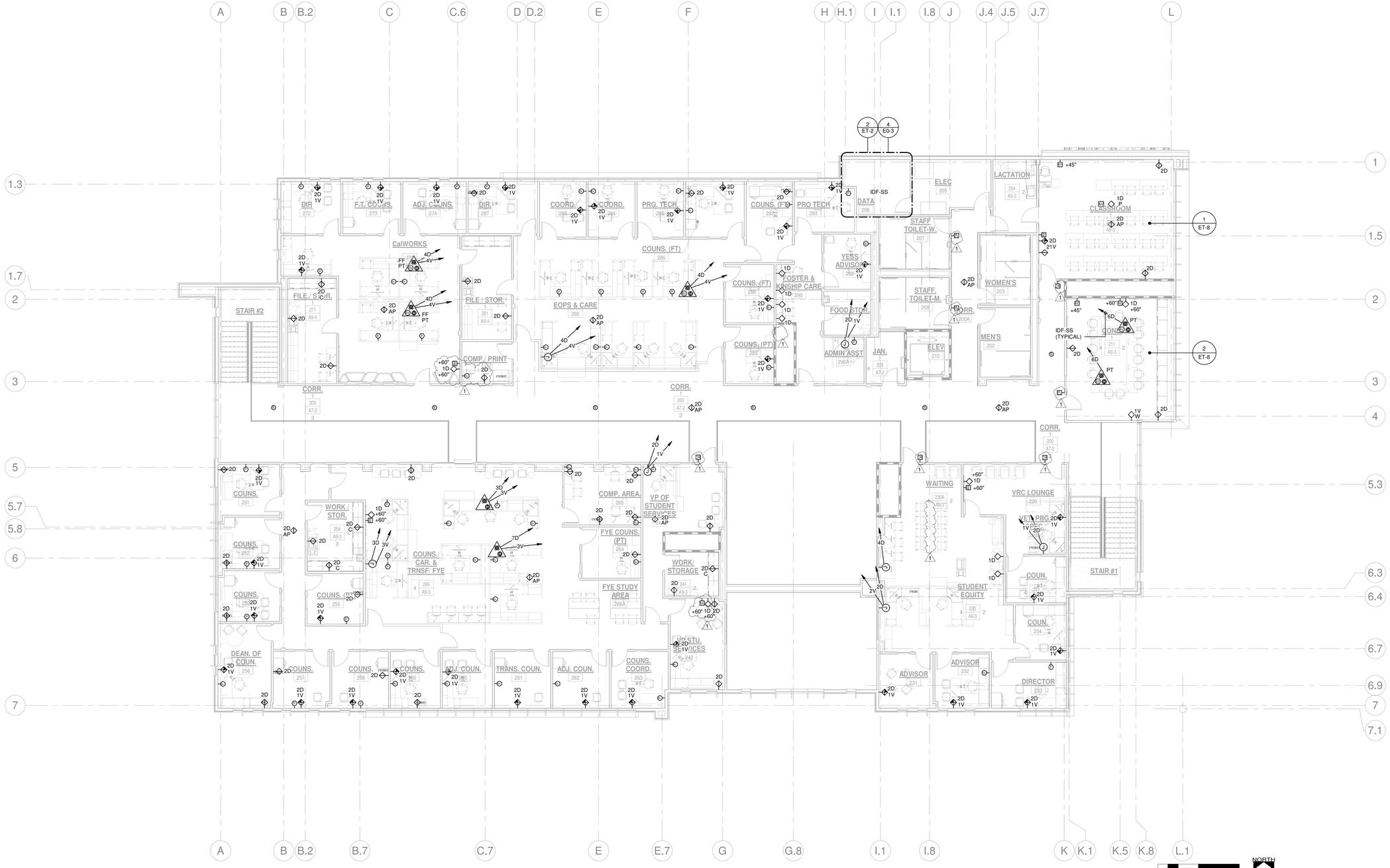
tBP project number: 20987.00
file name: CC_SS_E_R18_Central.rvt
drawn by: FBA checked by: RR
date: 9.03.2019

rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
1ST FLOOR TELECOM PLAN

drawing no.:
ET-5

drawing of



2ND FLOOR TELECOM PLAN

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

KEY NOTES

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tBP project number: 20987.00
file name: CC_SS_E_R18_Central.rvt
drawn by: FBA checked by: RR
date: 9.03.2019

rev:	date:	description:
1	11/20/19	Addendum 1

drawing title:
2ND FLOOR TELECOM PLAN

drawing no.:
ET-6
drawing of

SECTION 00 01 10
TABLE OF CONTENTS

VOLUME 1 OF 2

PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS

00 01 01 - Project Title Page

00 01 07 - Seals Page

00 01 10 - Table of Contents **Addendum 1**

00 31 00 - Available Project Information

The following Division 00 - Procurement and Contracting Requirements documents and Division 01 - General Requirements sections are provided by the Compton Community College District and are under separate cover. These are not produced by the Architect.

00 11 13 - Notice Calling for Bids

00 21 13 - Instructions for Bidders

00 41 00 - Bid Proposal

00 43 24 - Pre-Bid Request for information

00 43 36 - Subcontractors List

00 45 10 - Verification of Contractor & Subcontractor DIR Registration

00 45 13 - Statement of Qualifications

00 45 19 - Non-Collusion Affidavit

00 45 26 - Certificate of Workers Compensation Insurance

00 45 27 - Drug-Free Workplace Certification

00 52 00 - Agreement

00 61 00 - Bid Bond

00 61 13 - Performance Bond

00 61 14 - Labor and Material Payment Bond

00 62 90 - Verification of Certified Payroll Records Submittal to Labor Commissioner

00 65 36 - Guarantee

00 72 00 - General Conditions

00 73 00 - Special Conditions

SPECIFICATIONS

DIVISION 01 -- GENERAL REQUIREMENTS

01 21 00 - Allowances

01 23 00 - Alternates

01 25 00 - Contract Modification Procedures
01 29 00 - Payment Procedures
01 30 40 - Post Bid Interview
01 30 50 - Construction Procedures Manual
01 31 00 - Project Coordination
01 32 00 - Acceleration of Work
01 33 00 - Submittal Procedures
01 35 10 - Alteration Project Procedures
01 42 00 - References
01 43 80 - Work Plan and Milestone Schedule
01 45 00 - Quality Control
01 50 00 - Temporary Facilities and Controls
01 62 00 - Product Options
01 63 00 - Product Substitution Procedures
01 70 00 - Cleaning
01 72 20 - Field Engineering
01 73 20 - Cutting and Patching
01 74 00 - Warranties and Guarantees
01 77 00 - Closeout Procedures
01 78 20 - Project Record Documents
01 78 50 - Operating and Maintenance Data
01 81 00 - Commissioning

DIVISION 02 -- EXISTING CONDITIONS

For Site Preparation and Earthwork, see Division 31
For Pavements and Site Improvements, see Division 32
For Site Utilities, see Division 33
02 41 00 - Demolition
02 41 19 - Selective Demolition

DIVISION 03 -- CONCRETE

03 10 00 - Concrete Forming and Accessories
03 20 00 - Concrete Reinforcing
03 30 00 - Cast-in-Place Concrete
03 35 11 - Concrete Floor Finishes

DIVISION 04 -- MASONRY

04 05 11 - Mortar and Masonry Grout
04 20 00 - Unit Masonry

04 22 00 - Concrete Masonry Units

DIVISION 05 -- METALS

05 05 19 - Post-Installed Concrete Anchors

05 12 00 - Structural Steel Framing

05 12 13 - Architecturally-Exposed Structural Steel Framing

05 31 00 - Steel Decking

05 40 00 - Cold-Formed Metal Framing

05 50 00 - Metal Fabrications

05 51 00 - Metal Stairs

05 52 13 - Pipe and Tube Railings

05 70 00 - Decorative Metal

DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES

06 10 00 - Rough Carpentry

06 20 00 - Finish Carpentry

06 41 00 - Architectural Wood Casework

06 64 60 - Translucent Resin Panel System

06 83 16 - Fiberglass Reinforced Paneling

DIVISION 07 -- THERMAL AND MOISTURE PROTECTION

07 05 53 - Fire and Smoke Assembly Identification

07 21 00 - Thermal Insulation

07 25 00 - Weather Barriers

07 26 16 - Under-Slab Vapor Retarder

07 42 13 - Metal Wall Panels

07 42 13.23 - Metal Composite Material Wall Panels

07 54 00 - Thermoplastic Membrane Roofing **Addendum 1**

07 62 00 - Sheet Metal Flashing and Trim

07 62 70 - Exterior Penetration Flashing Panels

07 72 00 - Roof Accessories

07 84 00 - Firestopping

07 92 00 - Joint Sealants

DIVISION 08 -- OPENINGS

08 06 71 - Door Hardware Schedule

08 11 13 - Hollow Metal Doors and Frames

08 14 16 - Flush Wood Doors

08 31 00 - Access Doors and Panels

08 33 26_13 - Folding Security Grilles (New Section) **Addendum 1**

08 42 29 - Automatic Entrances

08 43 13 - Aluminum-Framed Storefronts

08 44 13 - Glazed Aluminum Curtain Walls

08 62 23 - Tubular Skylights

08 71 00 - Door Hardware

08 80 00 - Glazing

08 87 33 - Architectural Decorative Window Films

08 91 00 - Louvers

DIVISION 09 -- FINISHES

09 05 61 - Common Work Results for Flooring Preparation

09 21 16 - Gypsum Board Assemblies

09 22 36.23 - Metal Lath

09 24 00 - Cement Plastering

09 30 00 - Tiling

09 51 00 - Suspended Acoustical Ceilings

09 65 00 - Resilient Flooring

09 68 13 - Tile Carpeting

09 84 30 - Sound-Absorbing Wall and Ceiling Units

09 91 13 - Exterior Painting

09 91 23 - Interior Painting

09 94 50 - Architectural Decorative Films

09 96 00 - High-Performance Coatings

DIVISION 10 -- SPECIALTIES

10 11 00 - Visual Display Units

10 14 00 - Signage

10 14 53 - Traffic and Parking Signage

10 21 13.17 - Phenolic Toilet Compartments

10 22 39 - Folding Panel Partitions

10 28 00 - Toilet Accessories

10 44 00 - Fire Protection Specialties

10 71 13.43 - Fixed Sun Screens

DIVISION 11 -- EQUIPMENT

11 52 13 - Projection Screens

11 52 16 - Audio-Video Equipment

DIVISION 12 -- FURNISHINGS

12 24 00 - Window Shades

12 36 00 - Countertops

12 48 13 - Entrance Floor Mats and Frames

DIVISION 14 -- CONVEYING EQUIPMENT

14 24 00 - Hydraulic Elevators

VOLUME 2 OF 2

DIVISION 21 -- FIRE SUPPRESSION

21 00 50 - Common Work Results for Fire Suppression Systems

21 05 17 - Sleeves and Sleeve Seals for Fire-Suppression Piping

21 05 18 - Escutcheons for Fire-Suppression Piping

21 05 23 - General-Duty Valves for Water-Based Fire Suppression Piping

21 05 48 - Vibration and Seismic Controls for Fire-Suppression Piping and Equipment

21 05 53 - Identification for Fire-Suppression Piping and Equipment

21 12 00 - Fire-Suppression Standpipes

21 13 13 - Wet-Pipe Sprinkler Systems

DIVISION 22 -- PLUMBING

22 00 50 - Common Work Results for Plumbing Systems

22 05 13 - Common Motor Requirements for Plumbing Equipment

22 05 16 - Expansion Fittings and Loops for Plumbing Piping

22 05 17 - Sleeves and Sleeve Seals for Plumbing Piping

22 05 18 - Escutcheons for Plumbing Piping

22 05 19 - Meters and Gages for Plumbing Piping

22 05 23 - General-Duty Valves for Plumbing Piping

22 05 29 - Hangers and Supports for Plumbing Piping and Equipment

22 05 48 - Vibration and Seismic Controls for Plumbing Piping and Equipment

22 05 53 - Identification for Plumbing Piping and Equipment

22 07 19 - Plumbing Piping Insulation

22 11 16 - Domestic Water Piping

22 11 19 - Domestic Water Piping Specialties

22 11 23 - Domestic Water Pumps

22 13 16 - Sanitary Waste and Vent Piping

22 13 19 - Sanitary Waste Piping Specialties

22 13 19.13 - Sanitary Drains

22 14 13 - Facility Storm Drainage Piping

22 14 23 - Storm Drainage Piping Specialties
22 34 00 - Fuel-Fired, Domestic-Water Heaters
22 42 13.13 - Commercial Water Closets
22 42 13.16 - Commercial Urinals
22 42 16.13 - Commercial Lavatories
22 42 16.16 - Commercial Sinks
22 47 16 - Pressure Water Coolers

DIVISION 23 -- HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

23 00 50 - Common Work Results for HVAC Systems
23 05 13 - Common Motor Requirements for HVAC Equipment
23 05 16 - Expansion Fittings and Loops for HVAC Piping
23 05 17 - Sleeves and Sleeve Seals for HVAC Piping
23 05 18 - Escutcheons for HVAC Piping
23 05 19 - Meters and Gages for HVAC Piping
23 05 23 - General-Duty Valves for HVAC Piping
23 05 29 - Hangers and Supports for HVAC Piping and Equipment
23 05 48 - Vibration and Seismic Controls for HVAC
23 05 53 - Identification for HVAC Piping and Equipment
23 05 93 - Testing, Adjusting, and Balancing for HVAC
23 07 13 - Duct Insulation
23 07 16 - HVAC Equipment Insulation
23 07 19 - HVAC Piping Insulation
23 09 23 - Direct-Digital Control System for HVAC **Addendum 1**
23 11 23 - Facility Natural-Gas Piping
23 21 13 - Hydronic Piping **Addendum 1**
23 21 13.13 - Underground Hydronic Piping
23 21 16 - Hydronic Piping Specialties **Addendum 1**
23 21 23 - Hydronic Pumps
23 23 00 - Refrigerant Piping
23 29 23 - Variable-Frequency Motor Controllers
23 31 13 - Metal Ducts
23 33 00 - Air Duct Accessories
23 33 46 - Flexible Ducts
23 34 23 - HVAC Power Ventilators
23 36 00 - Air Terminal Units
23 37 13 - Diffusers, Registers, and Grilles

23 41 00 - Particulate Air Filtration
23 51 23 - Gas Vents
23 52 16 - Fire-Tube Condensing Boilers
23 73 13 - Custom Air-Handling Units
23 81 26.13 - Variable Refrigerant Flow Split-System Heat Pumps

DIVISION 26 -- ELECTRICAL

26 05 00 - Common Work Results for Electrical
26 05 01 - Basic Electrical Materials and Methods
26 05 05 - Electrical Demolition
26 05 30 - Conduit and Wire
26 05 43 - Underground Ducts and Raceways for Electrical Systems
26 05 48 - Sound Control
26 09 10 - Supplemental Metering and Sub-Metering
26 09 43 - Lighting Control Systems
26 10 05 - Power Distribution (Over 600 volts)
26 24 13 - Switchboards
26 24 16 - Branch Circuit Panelboards and Terminal Cabinets
26 24 19 - Motor Control Equipment
26 33 53 - Uninterruptible Power Supply - UPS
26 50 00 - Lighting Fixtures
26 52 00 - Emergency Lighting Central Battery

DIVISION 27 -- COMMUNICATIONS

27 05 36 - Cable Tray for Communications Systems
27 08 00 - Commissioning of Communications Systems
27 11 00 - Communications Equipment Rooms
27 20 00 - Electronic Network Systems Infrastructure
27 41 16 - Audio-Video Systems and Equipment
27 51 26 - Assistive Listening System
27 53 13 - Clock System

DIVISION 28 -- ELECTRONIC SAFETY AND SECURITY

28 10 00 - Access Control
28 46 20 - Fire Alarm

DIVISION 31 -- EARTHWORK

31 10 00 - Site Clearing
31 20 00 - Earthwork

31 31 32 - Import Materials Testing
31 71 23 - Field Engineering
31 74 16 - Storm Water Pollution Prevention

DIVISION 32 -- EXTERIOR IMPROVEMENTS

32 01 90 - Tree and Shrub Preservation
32 01 91 - Operation and Maintenance of Planting
32 12 16 - Asphalt Paving
32 12 36 - Seal Coat
32 13 13 - Cement Concrete Paving
32 13 16 - Decorative Concrete Paving
32 15 31 - Decomposed Granite
32 17 13 - Pavement Markings
32 32 13 - Cast-in-Place Concrete Retaining Walls
32 84 00 - Planting Irrigation
32 90 00 - Landscape Planting

DIVISION 33 -- UTILITIES

33 10 00 - Site Water Utlilities
33 30 00 - Sanitary Utilities
33 40 00 - Storm Drainage Utilities

END OF SECTION

SECTION 07 54 00

THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Adhered system with thermoplastic roofing membrane.

1. Membrane is OFCI, to be provided by a CMAS contract. Other components are by installing contractor. See Attachment A following this section.

B. Insulation, tapered.

C. Cover Board

D. Flashings.

1. Clad Metal Flashing

E. Roofing cant strips, stack boots, and walkway pads.

1.02 RELATED REQUIREMENTS

A. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings, reglets.

B. Section 07 72 00 - Roof Accessories: Roof-mounted units; prefabricated curbs.

C. Division 22 - Plumbing: Roof drains, plumbing penetrating roofing membrane.

D. Division 26 - Electrical.

1. Conduit penetrating roofing membrane.

1.03 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.

B. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013.

1. Use 2008 as indicated in 2016 CBC Referenced Standards.

C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2016.

1. Use 2013e1 as indicated in 2016 CBC Referenced Standards.

D. ASTM D4434/D4434M - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing; 2015.

1. Use 2012 as indicated in 2016 CBC Referenced Standards.

E. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011.

F. FM (AG) - FM Approval Guide; current edition.

G. FM DS 1-28 - Wind Design; 2007.

H. NRCA (RM) - The NRCA Roofing Manual; 2017.

I. NRCA (WM) - The NRCA Waterproofing Manual; 2005.

J. UL (FRD) - Fire Resistance Directory; current edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene minimum two weeks before starting work of this section.

1. Review preparation and installation procedures and coordinating and scheduling required with related work.

2. Notification: Two weeks prior to pre-application conference, inform District and Architect of scheduled roofing beginning and completion dates, such that District may arrange for independent inspection of roofing Work, and presence of independent testing and inspection agency at pre-application conference.

3. Attendance: Require attendance by Contractor's superintendent and other supervisory and quality control personnel having responsibility for roofing, supervisory personnel of roofing applicator and, if required for warranty provisions, representative of roofing products manufacturer.

a. Construction Manager, Architect's insurer, independent testing and inspection agency and Architect, if authorized by District, will attend.

b. Require attendance of installers of each component of related Work, including deck or substrate construction, rigid insulation, metal flashing, rooftop equipment, penetrations of roof deck, and other Work integral with or adjacent to roofing may attend.

c. If required, attendance shall include authorities having jurisdiction. Contractor shall verify requirement with authorities having jurisdiction and arrange for attendance.

d. Agenda:

1) Meeting purpose is to review Drawings and Specifications for suitability for application of roofing system.

2) Review application procedures and coordination required with related Work. Discuss changes and deviations from Drawings and Specifications, if any, recommended or required.

3) Walk roof areas to review and discuss substrate preparation including repair of unacceptable surfaces, roof drainage, penetrations, equipment curbs, and work performed by other trades, which require coordination with roofing system.

4) Review contract document requirements and submittals for roofing system, including roofing schedule, inspection and testing, and environmental conditions. Identify which governing regulations or insurance requirements will affect roofing system installation.

5) Discuss anticipated weather, as well as procedures for responding to unacceptable weather, including using temporary roofing. Temporary roofing, if necessary, will be added to scope of the Work by contract modification (change order or construction change directive), with acceptable adjustment in Contract Time and Contract Sum.

6) Document discussions in writing, including actions required, and distribute copy of report to each meeting participant.

7) Attendance by Construction Manager, Architect and independent testing and inspection agency shall not relieve Contractor of sole responsibility for means, methods, techniques and sequence of construction, in accordance with provisions of the Conditions of the Contract.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data indicating physical properties of membrane materials, flashing materials, adhesives, and cover board.

C. Applicator's(Contractor) Specimen Warranty: For approval.

D. Shop Drawings: Submit drawings that indicate joint or termination detail conditions, conditions of interface with other materials, and paver layout.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.

1. Instructions and recommendations for application of roofing system, for each substrate and condition of the Project, with specific directions and recommendations for conditions of the Project for specified guarantee by manufacturer.

G. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.

H. Installer's Qualification Statement.

I. Specimen Warranty: For approval.

1. Applicator's(Contractor) Specimen Warranty: For approval.

J. Warranty Documentation:

1. Submit manufacturer warranty and ensure that forms have been completed in District's name and registered with manufacturer.

2. Submit installer's certification that installation complies with warranty conditions for waterproof membrane.

K. Installer's qualification data.

1. Applicator's Certification: Written documentation that applicator is certified by roofing manufacturer to install roofing systems to be provided for the Project as specified in this Section.

L. Applicator Warranty: Submit applicators/ contractor’s warranty and ensure forms have been completed in District's name and registered with manufacturer.

M. Material Safety Data Sheet: For all products submitted. For Contractor's use only.

1.06 QUALITY ASSURANCE

A. Comply with Title 24 Part 2 - California Building Code Sections 1504 Performance Requirements, 1505 Fire Classification and 1507 Requirements for Roof Coverings; and Part 6 - California Energy Code requirements

B. Roofing System shall be Energy Star Certified.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum twenty-five years of documented experience.

D. Installer Qualifications: Company specializing in performing the work of this section with at least five years of documented experience and approved by manufacturer.

E. Industry Standards:

1. Work specified in this Section shall conform to manufacturer's product data and application instructions.
2. Work shall also conform to the more stringent of recommended practices and details published in NRCA Roofing and Waterproofing Manual and Western States Roofing Contractors Association (WSRCA).
3. Perform work in accordance with NRCA (RM) and NRCA (WM).
    a. Maintain one copy on site.

F. Testing and Inspection:
1. District's independent inspection and testing agency will perform inspections and tests of roofing work.
2. Costs of this service will be paid for by District.
3. Contractor shall cooperate with independent testing and inspection agency.
4. Refer to general requirements specified in Section 01 45 00 - Quality Control.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.

B. Store materials in weather protected environment, clear of ground and moisture.
1. Place all materials on pallets and fully protect from moisture.

C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

D. Protect foam insulation from direct exposure to sunlight.

E. All materials which are determined to be damaged by the Construction Manager or the manufacturer are to be removed from the job site and replaced at no cost to the District.

1.08 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather. Consult with the Manufacturer, as installation time and system integrity may be affected.

B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above 95 degrees F.
1. Do not apply roofing membrane when environmental conditions are outside the ranges recommended by manufacturer.

C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
1. All seams shall be cleaned and heat welded before leaving the job site that day.

E. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

F. Temporary Roofing: Provide temporary roof membrane if necessary to protect portions of the Work before final roofing can be installed.

1. Record by way of change order the District's agreement to proceed with temporary roofing, along with additional costs and other changes (if any) to Contract Documents.
2. Remove temporary roofing before starting installation of final roofing system.

G. Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage.

1. Where such access is absolutely required, the General Contractor or Construction Manager shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas.
2. A substantial protection layer consisting of plywood over felt or plywood over insulation board shall be provided for all new and existing roof areas that receive rooftop traffic during construction.

1.09 WARRANTY

A. See Section 01 77 00 - Closeout Procedures, for additional warranty requirements.

B. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind within the limits specified.

1. Warranty shall also include insulation and flashing as part of the roofing system and all other manufacturer supplied system components to be used as part of the roofing assembly..
2. Warranty Term: 20 years, Non-Prorated and no dollar limit (NDL).
3. Provide a written guarantee signed by the manufacturer's authorized official, agreeing to correct failures in product and installation, with no dollar limit on such corrections, for the noted warranty term from date established in Notice of Completion.
4. For repair and replacement include costs of both material and labor in warranty.
5. Exceptions Not Permitted:
   a. Damage due to roof traffic or storage.
   b. Damage due to wind speed greater than 56 mph but less than 90 mph.
   c. Damage due to "bird baths," or ponding water during the warranty period.

C. Applicator/Roofing Contractor Warranty:

1. The Applicator shall supply the District with a separate five-year workmanship warranty.
2. In the event any work related to roofing, flashing, or associated metal is found to be within the Applicator warranty term, defective or otherwise not in accordance with the Contract Documents, the Applicator shall repair that defect at no cost to the District.
3. The Applicator's warranty obligation shall run directly to the District, and a copy shall be sent to the manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. CMAS Contract Campus Standard Basis of Design Product: TPA FB as manufactured by Tremco.

1. Tremco Contact: Steve Tolsma, 714.443.1744, stolsma@tremcoinc.com

B. Insulation:

1. Any insulation as part of the tested and warrantable roofing system membrane assembly.

2.02 PERFORMANCE REQUIREMENTS

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. Roofing System Design: Provide a roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7.

1. Safety Factor: As required by code; minimum 2.0
2. Factory Mutual Research Corporation (FM) - Norwood, MA: Class 1-90 (Attachment Criteria)

2.03 ROOFING

A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered, over vapor retarder and insulation.

1. Roof Assembly: (from the top down)
   a. Roofing Membrane, Class A.
   b. Cover Board - Glass mat gypsum panel.
   c. Insulation - Minimum R-30 Rigid board.
      1) Additonal tapered layers for crickets.
   d. Roof deck.

B. Roofing Assembly Requirements:

1. Solar Reflectance Index (SRI): 108, minimum, calculated in accordance with ASTM E1980.
   a. Field applied coating may not be used to achieve specified SRI.
2. Roof Covering External Fire Resistance Classification: UL (FRD) Class A.
3. Factory Mutual Classification: Class 1 and windstorm resistance of 1-90, in accordance with FM DS 1-28. FM Certification is not required.

2.04 MEMBRANE ROOFING AND ASSOCIATED MATERIALS

A. Membrane Roofing Materials: (OFCI)

1. PVC: Polyvinyl chloride (PVC) conforming to ASTM D4434/D4434M, Type IV, sheet contains reinforcing fibers or reinforcing fabrics.
   a. Thickness: 60 mil, 0.060 inch, minimum.
   b. Backing: Non-woven polyester fleece.
2. Sheet Width: Factory fabricated into largest sheets possible.
3. Solar Reflectance: 0.86, minimum, initial, and 0.65, minimum, 3-year, certified by Cool Roof Rating Council.

4. Thermal Emissivity: 0.86, minimum, initial, and 0.79, minimum, 3-year, certified by Cool Roof Rating Council.
5. Color: White, integral.

B. Seaming(Welding) Materials: As recommended by membrane manufacturer.

C. Insulation and Cover Board Fasteners and Plates: As recommended and approved by membrane manufacturer.

D. Flexible Flashing Material: Material recommended by membrane manufacturer.

2.05 COVER BOARD

A. Cover Board: Glass mat faced gypsum panels, ASTM C1177/C1177M, fire resistant type, 1/4 inch thick.

1. Application: Over insulation and at parapet wall studs.
2. Manufacturers:
   a. Georgia-Pacific; DensDeck Prime: www.densdeck.com/#sle.
   b. National Gypsum Company; DEXcell Glass Mat Roof Board: www.nationalgypsum.com/#sle.
   c. USG Corporation; Securock Ultralight Glass-Mat Roof Board: www.usg.com/#sle.

2.06 INSULATION

A. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.

1. Classifications:
   a. Type II:
      1) Class 1 - Faced with glass fiber reinforced cellulosic felt facers on both major surfaces of core foam.
      2) Compressive Strength: Classes 1-2-3, Grade 3 - 25 psi (172 kPa), minimum.
      3) Thermal Resistance, R-value: At 1-1/2 inch thick; Class 1, Grades 1-2-3 - 8.4 (1.48) at 75 degrees F.
2. Board Size: 48 by 96 inch.
3. Board Thickness: 3.0 inch, maximum, single layer.
4. Tapered Board: Slope as indicated; minimum thickness 1/2 inch; fabricate of fewest layers possible.
5. Board Edges: Square.
6. Manufacturers:
   ~~a. Dow Chemical Co; THERMAX: www.dow.com.~~
   ~~b~~**a. Basis of Design:** GAF; EnergyGuard Polyiso Insulation: www.gaf.com/#sle.
   b. Hunter Panels, H-Shield Polyiso Roof Insulation: www.hunterpanels.com
   c. Johns Manville Corp, Enrgy3 Polyiso Roof Insulation: www.jm.com
   ~~c. Rmax Inc.; ECOMAXci: www.rmax.com.~~
   ~~d. Versico Roofing Systems; SecurShield Insulation: www.versico.com/#sle.~~

2.07 ACCESSORIES

A. Clad Metal Flashing:

1. Description: PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles.
2. Materials: 24 gauge, G90 galvanized metal sheet with a 20 mil (0.5 mm) unsupported roofing membrane laminated on one side.
3. Clad Metal Color: Match roofing membrane.

B. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.

C. Butyl Tape: Two-sided rubber type, width as required, self adhering.
1. Basis of Design Product: TremFlash (TF) Tape as manufactured by Tremco, or approved equal.

D. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.

E. Membrane Adhesive: As recommended by membrane manufacturer.

F. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.

G. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.

H. Insulation Adhesive: As recommended by insulation manufacturer.

I. Strip Reglet Devices: Galvanized steel, maximum possible lengths per location, with attachment flanges.

J. Termination Bar: 1.34 inch wide extruded aluminum, pre-punched strip.

K. Sealants: As recommended by membrane manufacturer.

L. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane. Used as a protection layer from rooftop traffic.
1. Composition: Roofing membrane manufacturer's standard.
2. Size: Manufacturer's standard size(s).
3. Surface Color: Light Gray.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.
1. The roof deck and existing roof construction must be structurally sound to provide support for the new roof system.
a. Applicator shall load materials on the rooftop in such a manner to eliminate risk of deck overload due to concentrated weight.
b. Contractor shall ensure that the roof deck is secured to the structural framing according to local building code and in such a manner as to resist all anticipated wind loads in that location.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and nailing strips and reglets are in place.

3.02 CONCRETE DECK PREPARATION

A. Fill surface honeycomb and variations with latex filler.

B. Confirm dry deck by moisture meter with 12 percent moisture maximum.

3.03 INSTALLATION - GENERAL

A. Perform work in accordance with manufacturer's instructions, NRCA (RM), and NRCA (WM) applicable requirements.

B. Do not apply roofing membrane during unsuitable weather.

C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.

D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

F. Coordinate this work with installation of associated counterflashings installed by other sections as the work of this section proceeds.

3.04 INSULATION AND COVER BOARD INSTALLATION - UNDER MEMBRANE

A. Loosely apply vapor retarder directly over the deck surface with adhesive and all side and end joints sealed in accordance with manufacturer's instructions.

1. Extend vapor retarder under cant strips and blocking to deck edge.

2. Seal all penetrations and terminations.

3. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.

B. Ensure vapor retarder is clean and dry, continuous, and ready for application of insulation.

C. Attachment of Insulation:

1. Embed first layer of insulation in full bed of adhesive in accordance with roofing and insulation manufacturers' instructions.

2. Mechanically fasten subsequent layer of insulation to deck in accordance with roofing manufacturer's instructions and FM (AG) Factory Mutual requirements.

D. Cover Boards: Mechanically fasten cover boards in accordance with roofing manufacturer's instructions and FM (AG) Factory Mutual requirements.

E. Lay subsequent layers of insulation and cover board with joints staggered minimum 6 inch from joints of preceding layer.

F. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

G. Lay boards with edges in moderate contact without forcing. Cut to fit neatly to perimeter blocking and around penetrations through roof.

H. At roof drains, use boards cut to slope to slope down to roof drains over a distance of 18 inches.

I. Do not apply more insulation or cover board than can be covered with membrane in same day.

3.05 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

B. Shingle joints on sloped substrate in direction of drainage.

C. Fully Adhered Application: Apply adhesive to substrate at rate of no less than 0.69 gal/square. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

E. Mechanical Attachment: Apply membrane and mechanical attachment devices in accordance with manufacturer's instructions.

1. Install mechanical fasteners at terminations, penetrations, and perimeter of roofing.

F. At intersections with vertical surfaces:

1. Extend membrane up base angles a minimum of 8 inches onto vertical surfaces.
2. Fully adhere flexible flashing over membrane and up to nailing strips.
3. Secure flashing to nailing strips at 4 inches on center.
4. Insert flashing into reglets and secure.

G. Around roof penetrations, seal flanges and flashings with flexible flashing.

H. Coordinate installation of roof drains and sumps and related flashings.

I. Over the completed roof membrane system, install a perimeter bar at 4 feet, and 8 feet. spacing from the base angle of the parapet wall or building’s edge and cover with a membrane cove strip welded to the field sheet on both sides of the perimeter bar.

1. This securement is an assembly and application requirement.

J. 4 inch wide, 24 gauge metal strap shall be applied to the parapet wall studs to receive the intermediate fastening required for wall flashing membrane securement to the parapet wall.

1. Straps shall be applied 30 inches from the base angle of the wall and repeated at this same spacing interval.

3.06 FINISHING UNBALLASTED SURFACES

A. Install walkway pads. Space pad joints to permit drainage.

3.07 FIELD QUALITY CONTROL

A. See Section 01 45 00 - Quality Control, for general requirements for field quality control and inspection.

B. Require site attendance of roofing material manufacturers daily during installation of the Work.

1. Roofing system manufacturer shall provide to Architect a written on site approval and sign off on pre-roofing deck, insulation installation, membrane installation, flashing details and completed assembly.
2. Roofing system manufacturer shall provide to Architect a Project Closeout Report upon delivery of the project warranty. This report shall include the following sections:
    a. Project Specifications
    b. Project Summary
    c. Progress reports as a result of roof inspections
    d. Job progress photos
    e. Warranty document with Maintenance Manual describing maintenance and emergency repair.

C. Regular daily written reports shall be provided to the Contractor and Architect for every day of roofing installation work.

D. Roofing Inspection and Testing Services by Independent Agency: District's independent agency will provide inspection and testing services during application of roofing system.
1. Unless otherwise directed, inspection, including test cuts and evaluation procedures, will be performed in accordance with Chapter V, "Quality Control," of The NRCA Low-Slope Roofing Manual.
2. Independent agency will provide reports of inspections and tests to Construction Manager and Architect. Copies of reports will also be provided to Contractor.
3. Water Test: Conduct simulated rain storm test by indirect spray of water for 15 minutes over entire roof surface. Check area below roofing for leaks and check top surface for standing water.
    a. Record test and inspection by video tape or digital recording.
4. Remedial Work: Correct all defects and irregularities reported from inspections and tests, at no change in Contract Sum or Contract Time.

3.08 CLEANING

A. Remove bituminous markings from finished surfaces.

B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.

C. Repair or replace defaced or damaged finishes caused by work of this section.

3.09 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 08 33 26.13
FOLDING SECURITY GRILLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Folding metal grilles and operating hardware, manual operation.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Support framing.

B. Section 08 71 00 - Door Hardware: Cylinder cores and keys.

1.03 REFERENCE STANDARDS

A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide general construction, component connections and details.

C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.

D. Manufacturer's Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.

E. Maintenance Data: Indicate lubrication requirements and frequency.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in overhead coiling grille construction with three years minimum experience.

B. Installer Qualifications: Company specializing in installing overhead coiling grilles with three years documented experience approved by manufacturer.

C. Basis of Design: Specifications are based on door types and model numbers by the specified basis of design manufacturer. Door types manufactured by other acceptable manufacturers are permitted, subject to compliance with specified requirements, and provided that deviations in dimensions and profile are minor, and do not detract substantially from the indicated design intent.

1. Comply with requirements specified in Section 01 40 00 and Section 01 60 00.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.

C. Warranty: Include coverage for electric motor and transmission.

D. Provide five year manufacturer warranty for electric operating equipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Product: ESG32 - GlideGard as manufactured by The Cookson Company, www.cooksondoor.com., or approved equal.

B. Other Acceptable Manufacturers:

1. Cornell Iron Works, Inc.: www.cornelliron.com.
2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DESIGN / PERFORMANCE REQUIREMENTS

A. Stacking:

1. Minimum stacking shall be 1.05 inches/linear foot (87.5 mm/meter) of opening plus 3.5 inches (89 mm) for each locking member.
2. Grille support must be designed to carry the weight of a fully stacked door at any point along its length. Support is to carry the total weight / the total stacking and is express as lbs. per linear ft.

B. Lintel Deflection: Accommodate deflection of lintel to prevent damage to components, deterioration of seals, or movement between door frame and perimeter framing.

C. Thermal Movement: Design sections to permit thermal expansion and contraction of components to match perimeter opening construction.

2.03 HORIZONTAL GRILLE AND COMPONENTS

A. Curtain:

1. Vertical Tubes: 5/16 inch (8 mm) diameter, 6063 T5 aluminum alloy, 3.5 inches (89 mm) on center.
2. Tube Spacers: 7/16 inch (11 mm) outside diameter aluminum tubes to maintain horizontal chain spacing.
3. Horizontal Bars: Aluminum bars, 6 inches x 3/4 inch (152 mm x 19 mm), Bars to be vertically spaced at 6 inches in a straight pattern.
4. Hinge Panels: 2 inch (51 mm) high continuous interlocking aluminum panels at the top and bottom of the closure.
5. Leading End Member: 1 5/16 x 2 3/8 x 1/8 inch (33 x 60 x 3 mm) thick extruded aluminum tube with recess for attaching curtain sections.
    a. Provide concealed masterkeyable, cylinder operated top and bottom ratcheted rod #2 member with lock operable from both sides of curtain. Supply dustproof floor sockets for all drop bolts. Provide rubber bumper at the edge of the locking member.
6. Intermediate Member(s): 1 5/16 x 2 3/8 x 1/8 inch (33 x 60 x 3 mm) thick extruded aluminum tube with recess for attaching curtain sections.
    a. Provide concealed masterkeyable, cylinder operated, top and bottom ratcheted rod, #2 member with lock operable from both sides of curtain. Supply dustproof

floor sockets for all drop bolts. Provide rubber bumper at the edge of the locking member.

7. Trailing End Member: 1 5/16 x 2 3/8 x 1/8 inch (33 x 60 x 3 mm) thick extruded aluminum tube with recess for attaching curtain sections.
   a. Provide concealed masterkeyable, cylinder operated top and bottom ratcheted rod, #2 member with lock operable from both sides of curtain. Supply dustproof floor sockets for all drop bolts. Provide rubber bumper at the edge of the locking member.
8. Trolleys: 1 1/8 inch (29 mm) diameter nylon tired ball bearing wheels; two wheel assembly at each hanger; three wheel assembly at all vertical members.
9. Track: 1.3 x 1.8 inch (33 x 46 mm) thick extruded aluminum section with continuous recess for splice tongues and pins.
   a. Provide 90 degree curve track section(s) with a 14 inch radius.
   b. Finishes: As selected by Architect.

2.04 MATERIALS

A. Aluminum: ASTM B221.

2.05 OPERATION

A. Manual push-pull.

2.06 ACCESSORIES

A. Pocket Door(s):
   1. Door
      a. Material: A36 HR steel
      b. Thickness: USS 12-gauge
      c. Finish: Phosphate treatment followed by a light gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.
      d. Finish: Phosphate treatment followed by a baked-on polyester powder coat, custom color as selected by Architect; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM-D-3363 pencil hardness: H or better.
      e. Size: Rough opening minus 13/16” (20.6 mm)
   2. Frame
      a. Material: A36 HR steel
      b. Thickness: USS 12-gauge steel
      c. Finish: Phosphate treatment followed by a light gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.
      d. Finish: Phosphate treatment followed by a baked-on polyester powder coat, custom color as selected by Architect; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM-D-3363 pencil hardness: H or better.
      e. Size: Overlaps opening 2” (50.8 mm) with a 5/8” (15.9 mm) projection off wall
   3. Hinges: 3” (76.2 mm) non-mortise type
   4. Lock: 1” (25.4 mm) security mortise cylinder

B. Emergency Egress Door

1. Fall away man-door egress operable by means of thumb-turn. Door not to be used as a regular means of egress.

2.07 FABRICATION

A. Fabricate with every fourth vertical rod as a hanger rod. Provide tube spacers at each hanger rod to maintain chain spacing.

B. Hinge Panels: Continuous rows between top two and bottom two chain sets.

C. Intermediate Members: Spacing not to exceed 13 feet (3.05 M) on center and located at each curve.

D. Bi-Parting Grilles: Attach strike channel to appropriate curtain section.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that opening sizes, tolerances and conditions are acceptable.

3.02 INSTALLATION

A. Install grille unit assembly in accordance with manufacturer's instructions.

B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

E. Install perimeter trim.

3.03 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.

B. Maximum Variation From Plumb: 1/16 inch.

C. Maximum Variation From Level: 1/16 inch.

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

3.04 ADJUSTING

A. Adjust grille, hardware and operating assemblies for smooth and noiseless operation.

3.05 CLEANING

A. Clean grille and components.

B. Remove labels and visible markings.

END OF SECTION

SECTION 23 09 23

DIRECT DIGITAL CONTROL SYSTEM FOR HVAC

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish a campus standard Alerton Compass System. The operator's workstation, all building controllers, application controllers, and all input/output devices shall communicate using the protocols and network standards as defined by ANSI/ ASHRAE Standard 135-2016, BACnet. All workstations and controllers, including unitary controllers, shall be native BACnet MSTP or BACnet IP devices. No gateways shall be used for communication to controllers installed under this section. Gateways may be used for communication to existing systems or to systems installed under other sections.

B. Provide all necessary BACnet-compliant hardware and software to meet the system's functional specifications. Provide Protocol Implementation Conformance Statement (PICS) for Windows-based control software and every controller in system, including unitary controllers.

C. Prepare individual hardware layouts, interconnection drawings, and software configuration from project design data.

D. Implement the detailed design for all analog and binary objects, system databases, graphic displays, logs, and management reports based on control descriptions, logic drawings, configuration data, and bid documents.

E. Design, provide, and install all equipment cabinets, panels, data communication network cables needed, and all associated hardware.

F. Provide and install all interconnecting cables between supplied cabinets, application controllers, and input/output devices.

G. Provide and install all interconnecting cables between all operator's terminals and peripheral devices (such as printers, etc.) supplied under this section.

H. Provide complete manufacturer's specifications for all items that are supplied. Include vendor name of every item supplied.

I. Provide supervisory specialists and technicians at the job site to assist in all phases of system installation, startup, and commissioning.

J. Provide a comprehensive operator and technician training program as described herein.

K. Provide as-built documentation, operator's terminal software, diagrams, and all other associated project operational documentation (such as technical manuals) on approved media, the sum total of which accurately represents the final system.

L. Provide new sensors, dampers, valves, and install only new electronic actuators. No used components shall be used as any part or piece of installed system.

~~M. Include as an added bid item the cost of the service contract for the remote monitoring of all BMS controlled systems in the building.~~

~~N. Include as an added bid item the cost of the scheduling modifications and refinement with the tenant.~~

1.02 SYSTEM DESCRIPTION

A. A distributed logic control system complete with all software and hardware functions shall be provided and installed. System shall be completely based on ANSI/ASH RAE Standard 135-2016, BACnet and achieved listing under the BACnet Testing Laboratories BACnet - Advanced Workstation Software (B-AWS). This system is to control all mechanical equipment, including all unitary equipment such as VAV boxes, AC units, etc., and all air handlers, boilers, lighting control panels, UPS, generators, building elevators, and any other listed equipment using native BACnet-com pliant components. Non-BACnet-compliant or proprietary equipment or systems (including gateways) shall not be acceptable and are specifically prohibited.

B. Provide integration to the lighting system through BACnet IP protocol so the lighting can be scheduled through the DOC system and include graphics that show whether lights are on or off on the floor plans. The DOC system shall be able to interface with the lighting control panel to facilitate scheduling, automatic daylight saving time adjustments, etc.

C. Operator's workstation software shall use Microsoft Windows 8 or Windows 10 as the computer operating system. The Direct Digital Control system (DOC) application program shall be written to communicate specifically utilizing BACnet protocols. Software functions delivered on this project shall include password protection, scheduling (including optimum start), alarming, logging of historical data, full graphics including animation, after-hours billing program, demand limiting, and a full suite of field engineering tools including graphical programming and applications. Systems using operating systems other than that described above are strictly prohibited. All software required to program application specific controllers and all field level devices and controllers will be left with the owner. All software passwords required to program and make future changes to the system will also become the property of the owner. All software required to make any program changes anywhere in the system, along with scheduling and trending applications, will be left with the owner. All software passwords required to program and make future changes to schedules, trends and related program changes will also become the property of the owner. All software required for all field engineering tools including graphical programming and applications will be left with the owner. All software passwords required to program and make future changes to field engineering tools, including graphical programming and applications will be left with the owner.

D. Building controllers shall include complete energy management software, including scheduling building control strategies with optimum start and logging routines. All energy management software and firmware shall be resident in field hardware and shall not be dependent on the operator's terminal. Operator's terminal software is to be used for access to field-based energy management functions only. Provide zone-by-zone direct digital logic control of space temperature, scheduling, runtime accumulation, equipment alarm reporting, and override timers for after-hours usage.

E. Room sensors shall be provided with digital readout that allows the user to view room temperature and humidity, adjust the room setpoint within preset limits and set desired override time. User shall also be able to start and stop unit from the digital sensor. Include all necessary wiring and firmware such that room sensor includes field service mode. Field service mode shall allow a technician to balance VAV zones and access any parameter in zone controller directly from the room sensor. Field service mode shall have the ability to be locked out.

F. All application controllers for every terminal unit (VAV, FCU, etc.) air handler, all central plant equipment, and any other piece of controlled equipment shall be fully programmable.

Application controllers shall be mounted next to controlled equipment and communicate with building controller through BACnet MSTP.

1.03 APPROVED MANUFACTURERS

A. Approved Control Manufacturers

1. Alerton Compass (integrated into existing Alerton Compass network)
2. Other systems will not be accepted.

1.04 QUALITY ASSURANCE

A. The Building Automation System (BAS) system shall be designed, installed, commissioned, and serviced by manufacturer authorized and trained personnel. System provider shall have an in-place support facility within 2 hours' response time of the site with technical staff, spare parts inventory, and necessary test and diagnostic equipment.

B. The contractor shall provide full-time, on-site, experienced project manager for this work, responsible for direct supervision of the design, installation, start-up and commissioning of the BAS system.

C. The Bidder shall be regularly engaged in the design, installation and maintenance of BAS systems and shall have demonstrated technical expertise and experience in the design, installation and maintenance of BAS systems similar in size and complexity to this project.

D. Materials and equipment shall be manufacturer's latest standard design that complies with the specification requirements.

E. All BAS peer-to-peer network controllers, central system controllers and local user displays shall be UL Listed under Standard UL 916, category PAZX.

F. All electronic equipment shall conform to the requirements of FCC Regulation, Part 15, Governing Radio Frequency Electromagnetic Interference and be so labeled.

G. Control system shall be engineered, programmed and supported completely by representative's local office

1.05 REFERENCE STANDARDS

A. The latest edition of the following standards and codes in effect and amended as of supplier's proposal date, and any applicable subsections thereof, shall govern design and selection of equipment and material supplied:

1. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).
2. ANSI/ASHRAE Standard 135-2016, BACnet.
3. California Building Code (CBC), including local amendments.
4. UL 916 Underwriters Laboratories Standard for Energy Management Equipment. Canada and the US.
5. National Electrical Code (NEC).
6. FCC Part 15, Subpart J, Class A
7. EMC Directive 89/336/EEC (European CE Mark).
8. UL-864 UUKL listing for Smoke Controls for any equipment used in smoke control sequences.

B. City, county, state, and federal regulations and codes in effect as of contract date.

C. Except as otherwise indicated, the system supplier shall secure and pay for all permits, inspections, and certifications required for his work, and arrange for necessary approvals by the governing authorities.

1.06 SUBMITTALS

A. Drawings

1. The system supplier shall submit engineered drawings, control sequence, and bill of materials for approval.
2. Drawings shall be submitted in the following standard sizes: 11" x 17" (ANSI B).
3. Eight complete sets (copies) of submittal drawings shall be provided.
4. Drawings shall be available on CD-ROM.

B. System Documentation: Include the following in submittal package:

1. System configuration diagrams in simplified block format.
2. All input/output object listings and an alarm point summary listing.
3. Electrical drawings that show all system internal and external connection points, terminal block layouts, and terminal identification.
4. Complete bill of materials, valve schedule and damper schedule.
5. Manufacturer's instructions and drawings for installation, maintenance, and operation of all purchased items.
6. Overall system operation and maintenance instructions- including preventive maintenance and troubleshooting instructions.
7. For all system elements-operator's workstation(s), building controller(s), application controllers, routers, and repeaters- provide BACnet Protocol Implementation Conformance Statements (PICS) as per ANSI/ ASHRAE Standard 135-2016.
8. Provide complete description and documentation of any proprietary (non-BACnet) services and/or objects used in the system.
9. A list of all functions available and a sample of function block programming that shall be part of delivered system.

C. Project Management

1. The vendor shall provide a detailed project design and installation schedule with time markings and details for hardware items and software development phases. Schedule shall show all the target dates for transmission of project information and documents, and shall indicate timing and dates for system installation, debugging, and commissioning.

1.07 WARRANTY

A. Warranty shall cover all costs for parts, labor, associated travel, and expenses for a period of one year from completion of system acceptance.

B. Hardware and software personnel supporting this warranty agreement shall provide on-site or off-site service in a timely manner after failure notification to the vendor. The maximum acceptable response time to provide this service at the site shall be 24 hours, Monday through Friday and 48 hours on Saturday and Sunday.

C. This warranty shall apply equally to both hardware and software.

PART 2 - PRODUCTS

2.01 OPERATOR'S WORKSTATION

A. General structure of workstation interaction shall be a standard client/server relationship. Server shall be used to archive data and store system database. Clients shall access server for all archived data. Each client shall include flexibility to access graphics from server or local drive. Server shall support a minimum of 50 simultaneous clients.

B. BACnet Conformance

1. Operator Work Station shall be approved by the BTL as meeting the BACnet Advanced Work Station requirements.

2. Refer to Section 22.2, BACnet Functional Groups, in the BACnet standard, for a complete list of the services that must be directly supported to provide each of the functional groups listed above. All proprietary services, if used in the system, shallbe thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

3. Standard BACnet object types accessed by the workstation shall include as a minimum: Analog *Value*, Analog Input, Analog Output, Binary Value, Binary Input, Binary Output, Calendar, Device, Event Enrollment, File, Notification Class, Program, and Schedule object types. All proprietary object types, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

4. The operator's workstation shall comply with Annex J of the BACnet specification for IP connections. Must support remote connection to server using a thick client application. This device shall use Ethernet to connect to the IP internetwork, while using the same Ethernet LAN for non-IP communications to other BACnet devices on the LAN. Must support interoperability on wide area networks (WANs) and campus area networks (CANs). Workstation shall support Foreign Device Registration to allow temporary workstation connection to IP network.

C. Displays

1. Operator's workstation shall display all data associated with project as called out on drawings and/or object type list supplied. Graphic files shall be created using digital, full color photographs of system installation, AutoCAD or Visio drawing files of field installation drawings and wiring diagrams from as-built drawings. Operator's workstation shall display all data using three-dimensional graphic representations of all mechanical equipment. System shall be capable of displaying graphic file, text, and dynamic object data together on each display and shall include animation. Information shall be labeled with descriptors and shall be shown with the appropriate engineering units. All information on any display shall be dynamically updated without any action by the user. Workstation shall allow user to change all field-resident EMCS functions associated with the project, such as setpoints, weekly schedules, exception schedules, etc., from any screen, no matter if that screen shows all text or a complete graphic display. This shall be done without any reference to object addresses or other numeric/mnemonic indications.

2. All displays and programming shall be generated and customized by the local EMCS supplier and installer. Systems requiring factory development of graphics or programming of DOC logic are specifically prohibited.

3. Binary objects shall be displayed as ACTIVE/I NACTIVE/NULL or with customized text such as Hand-Off-Auto. Text shall be justified left, right or center as selected by the user. Also, allow binary objects to be displayed as individual change-of-state graphic objects on the display screen such that they overlay the system graphic. Each binary object displayed in this manner shall be assigned up to three graphic files for display when the point is ON, OFF or in alarm. For binary outputs, toggle the object's commanded status when the graphic item is selected with the system mouse. Similarly, allow the workstation operator to toggle the binary object's status by selecting with the mouse, for example, a graphic of a switch or light, which then displays a different graphic (such as an "ON" switch or lighted lamp. Additionally, allow binary objects to be displayed as an animated graphic. Animated graphic objects shall be displayed as a sequence of multiple graphics to simulate motion. For example, when a pump is in the OFF condition, display a stationary graphic of the pump. When the operator selects the pump graphic with the mouse, the represented object's status is toggled and the graphic of the pump's impeller rotates in a time- based animation. The operator shall be able to click an animated graphical object or switch it from the OFF position to ON, or ON to OFF. Allow operator to change graphic file assignment and also create new and original graphics online. System shall be supplied with a library of standard graphics, which may be used unaltered or modified by the operator. Systems that do not allow customization or creation of new graphic objects by the operator (or with third-party software) shall not be allowed.

4. Analog objects shall be displayed with operator modifiable units. Analog input objects may also be displayed as individual graphic items on the display screen as an overlay to the system graphic. Each analog input object may be assigned a minim um of five graphic files, each with high/low limits for automatic selection and display of these graphics. As an example, a graphic representation of a thermometer would rise and fall in response to either the room tem perature or its deviation from the controlling setpoint. Analog output objects, when selected with the mouse, shall be displayed as a prompted dialog (text only) box. Selection for display type shall be individual for each object. Analog object values may be changed by selecting either the "increase" or "decrease" arrow in the analog object spinner box without using the keypad. Pressing the button on the right side of the analog object spinner box allows direct entry of an analog value and accesses various menus where the analog value may be used, such as trend logs.

5. Analog objects may also be assigned to a system graphic, where the color of the defined object changes based on the analog object's value. For example, graphical thermostat device served by a single control zone would change color with respect to the temperature of the zone or its deviation from setpoint. All editing and area assignment shall be created or modified online using simple icon tools.

6. A customized menu label (push-button) shall be used for display selection. Menu items on a display shall allow penetration to lower level displays or additional menus. Dynamic point information and menu label pushbuttons may be mixed on the same display to allow sub-displays to exist for each item. Each display may be protected from viewing unless operator has appropriate security level. A security level may be assigned to each display

and system object. The menu label shall not appear on the graphic if the operator does not have the appropriate security level.

7. The BAS displays shall have the ability to link to content outside of the BAS system. Such content shall include but is not limited to: Launching external files in their native applications (for example, a Microsoft Word document) and launching a Web browser resolving to a specified Web address.
8. The BAS system shall have the ability to run multiple, concurrent displays windows showing continuously updated data.
9. Graphic items with custom geometry that offer both color gradient shading and variable opacity in scale to system variables and range setpoints (OmniGraphics). Ability to automatically resize to display (OmniZoom).

D. Password Protection

1. Provide security system that prevents unauthorized use unless operator is logged on. Access shall be limited to operator's assigned functions when user is logged on. This includes displays as outlined above.
2. Each operator's terminal shall provide security for a minimum of 200 users. Each user shall have an individual User ID, User Name, and Password. Entries are alphanumeric characters only and are case sensitive (except for User ID). User ID shall be 0-8 characters, User Name shall be 0-29 characters, and Password shall be 4-8 characters long. Each system user shall be allowed individual assignment of only those control functions, menu items, and user specific system start display, as well restricted access to discrete BACnet devices to which that user requires access. All passwords, user names, and access assignments shall be adjustable online at the operator's terminal. Users should have the capability to be assigned to specific user type "groups" that can share the same access levels to speed setup. Users who are members of multiple "groups" shall have the ability to activate/deactivate membership to those groups while using the BAS (without logout). Users shall also have a set security level, which defines access to displays and individual objects the user may control. System shall include 10 separate and distinct security levels for assignment to users.
3. System shall include an Auto Logout Feature that shall automatically logout user when there has been no keyboard or mouse activity for a set period of time. Time period shall be adjustable by system administrator. Auto Logout may be enabled and disabled by system administrator. Operator terminal shall display message on screen that user is logged out after Auto Logout occurs.
4. The system shall permit the assignment of an effective date range, as well as an effective time of day, that the User IDs are permitted to authenticate.

E. Operator Activity Log

1. Operator Activity Log that tracks all operator changes and activities shall be included with system. System shall track what is changed in the system, who performed this change, date and time of system activity, and value of the change before and after operator activity. Operator shall be able to display all activity, sort the changes by user and also by operation. Operator shall be able to print the Operator Activity log display.
2. Log shall be gathered and archived to hard drive on operator's workstation as needed. Operator shall be able to export data for display and sorting in a spreadsheet.

3. Any displayed data that is changeable by the operator may be selected using the right mouse button and the operator activity log shall then be selectable on the screen. Selection of the operator activity log using this method shall show all operator changes of just that displayed data.

F. Scheduling

1. Operator's workstation shall show all information in easy-to-read daily format including calendar of this month and next. All schedules shall show actual ON/OFF times for day based on scheduling priority. Priority for scheduling shall be events, holidays and daily, with events being the highest.
2. Holiday and special event schedules shall display data in calendar format. Operator shall be able to schedule holidays and special events directly from these calendars.
3. Operator shall be able to change all information for a given weekly or exception schedule if logged on with the appropriate security access.
4. System shall include a Schedule Wizard for set up of schedules. Wizard shall walk user through all steps necessary for schedule generation. Wizard shall have its own pull-down selection for startup or may be started by right-clicking on value displayed on graphic and then selecting Schedule.
5. Scheduling shall include optimum start based on outside air temperature, current heating/cooling setpoints, indoor temperature and history of previous starts. Each and every individual zone shall have optimum start time independently calculated based on all parameters listed. User shall input schedules to set time that occupied setpoint is to be attained. Optimum start feature shall calculate the startup time needed to match zone temperature to setpoint. User shall be able to set a limit for the maximum startup time allowed.
6. Any displayed data that is changeable by the operator may be selected using the right mouse button and the schedule shall then be selectable on the screen. Selection of the schedule using this method shall allow the viewing of the assigned schedule or launch the Schedule Wizard to allow the point to be scheduled.

G. Alarm Indication and Handling.

1. Operator's workstation shall provide audible, visual, printed, and email means of alarm indication. The alarm dialog box shall always become the top dialog box regardless of the application(s) currently running. Printout of alarms shall be sent to the assigned terminal and port. Alarm notification can be filtered based on the User ID's authorization level.
2. System shall provide log of alarm messages. Alarm log shall be archived to the hard disk of the system operator's terminal. Each entry shall include a description of the event-initiating object generating the alarm. Description shall be an alarm message of at least 256 characters in length. Entry shall include time and date of alarm occurrence, time and date of object state return to normal, time and date of alarm acknowledgment, and identification of operator acknowledging alarm.
3. Alarm messages shall be in user-definable text (English or other specified language) and shall be delivered either to the operator's terminal, client or through remote communication using email (Authenticated SMTP supported).

4. System shall include an Alarm Wizard for set up of alarms. Wizard shall walk user through all steps necessary for alarm generation. Wizard shall have its own pull- down selection for startup or may be started by right-clicking on value displayed on graphic and then selecting alarm setup.
5. Any displayed data that is changeable by the operator may be selected using the right mouse button and the alarm shall then be selectable on the screen. Selection of the alarm using this method shall allow the viewing of the alarm history or launch the Alarm Wizard to allow the creation of a new alarm.

H. Trendlog Information

1. System server shall periodically gather historically recorded data stored in the building controllers and store the information in the system database. Stored records shall be appended with new sample data, allowing records to be accumulated. Systems that write over stored records shall not be allowed unless limited file size is specified. System database shall be capable of storing up to 50 million records before needing to archive data. Samples may be viewed at the operator's workstation. Operator shall be able to view all trended records, both stored and archived. All trendlog records shall be displayed in standard engineering units.
2. Software that is capable of graphing the trend logged object data shall be included. Software shall be capable of creating two-axis (X, Y) graphs that display up to 10 object types at the same time in different colors. Graphs shall show object values relative to time. Each trendlog shall support a custom scale setting for the graph view that is to be stored continuously. System shall be capable of trending on an interval determined by a polling rate, or change-of-value.
3. Operator shall be able to change Trendlog setup information. This includes the information to be logged as well as the interval at which it is to be logged. All input, output, and value object types in the system may be logged. All operations shall be password protected. Setup and viewing may be accessed directly from any and all graphics on which object is displayed.
4. System shall include a Trend Wizard for setup of logs. Wizard shall walk user through all necessary steps. Wizard shall have its own pull-down selection for startup, or may be started by right-clicking on value displayed on graphic, and then selecting Trendlogs from the displayed menu.
5. System shall be capable of using Microsoft SQL as the system database.
6. Any displayed data that is changeable by the operator may be selected using the right mouse button and the trendlog shall then be selectable on the screen. Selection of the trendlog using this method shall allow the viewing of the trendlog view or launch the Trendlog wizard to allow the creation of a new trend.

I. Energy Log Information

1. System server shall be capable of periodically gathering energy log data stored in the field equipment and archive the information. Archive files shall be appended with new data, allowing data to be accumulated. Systems that write over archived data shall not be allowed unless limited file size is specified. Display all energy log information in standard engineering units.

2. All data shall be stored in database file format for direct use by third-party programs. Operation of system shall stay completely online during all graphing operations.
3. Operator shall be able to change the energy log setup information as well. This includes the meters to be logged, meter pulse value, and the type of energy units to be logged. All meters monitored by the system may be logged. System shall support using flow and temperature sensors for BTU monitoring.
4. System shall display archived data in tabular format form for both consumption and peak values. Data shall be shown in hourly, daily, weekly, monthly and yearly formats. In each format, the user shall be able to select a specific period of data to view.

J. Demand Limiting

1. System shall include demand limiting program that includes two types of load shedding. One type of load shedding shall shed/restore equipment in binary fashion based on energy usage when compared to shed and restore settings. The other type of shedding shall adjust operator selected control setpoints in an analog fashion based on energy usage when compared to shed and restore settings. Shedding may be implemented independently on each and every zone or piece of equipment connected to system.
2. Binary shedding shall include minimum of five (5) priority levels of equipment shedding. All loads in a given priority level shall be shed before any loads in a higher priority level are shed. Load shedding within a given priority level shall include two methods. In one, the loads shall be shed/restored in a "first off-first on" mode, and in the other the loads are just shed/restored in a "first off-last on" (linear) fashion.
3. Analog shed program shall generate a ramp that is independently used by each individual zone or individual control algorithm to raise the appropriate cooling setting and lower appropriate heating setting to reduce energy usage.
4. Status of each and every load shed program shall be capable of being displayed on every operator terminal connected to system. Status of each load assigned to an individual shed program shall be displayed along with English description of each load.

K. Tenant Activity

1. System shall include program that monitors after-hours overrides by tenants, logs that data, and generates a bill based on usage and rate charged for each tenant space. Tenant Activity program shall be able to assign multiple zones, from a list of every zone connected to system, to a particular tenant. Every zone is monitored for after-hour override usage and that data logged in server. Operator may then generate a bill based on the usage for each tenant and the rate charged for any overtime use.
2. Configuration shall include entry of the following information for use in logging and billing:
    a. Tenant's contact name and address
    b. One or multiple tenant zones that make up a total tenant space, including a separate billing rate for each separate zone
    c. Minimum and maxim um values an event duration and event limit
    d. Property management information
    e. Overall billing rate
    f. Seasonal adjustments or surcharge to billing rate

g. Billing notification type such including, but not limited to printer, file and email

h. Billing form template

3. Logging shall include recording the following information for each and every tenant event:

a. Zone description

b. Time the event begins

c. Total override time

d. Limits shall be applied to override time

4. A tenant bill shall be generated for a specific period using all the entered configuration data and the logged data. User with appropriate security level shall be able to view and override billing information. User shall be able to select a billing period to view and be able to delete events from billing and edit a selected tenant activity event's override time.

L. Reports

1. System server shall be capable of periodically producing reports of trendlogs, alarm history, tenant activities, device summary, energy logs, and override points. The frequency, content, and delivery are to be user adjustable.

2. All reports shall be capable of being delivered in multiple formats including text- and comma-separated value (CSV) files. The files can be printed, emailed, or saved to a folder, either on the server hard drive or on any network drive location.

M. Configuration/Setup

1. Provide means for operator to display and change system configuration. This shall include, but not be limited to, system time, day of the week, date of daylight savings set forward/set back, printer termination, port addresses, modem port and speed, etc. Items shall be modified using understandable terminology with simple mouse/cursor key movements.

N. Field Engineering Tools

1. Operator's workstation software shall include field engineering tools for programming all controllers supplied. All controllers shall be programmed using graphical tools that allow the user to connect function blocks on screen that provide sequencing of all control logic. Function blocks shall be represented by graphical displays that are easily identified and distinct from other types of blocks. Graphical programming that uses simple rectangles and squares is not acceptable.

2. User shall be able to select a graphical function block from menu and place on screen. Provide zoom in and zoom out capabilities. Function blocks shall be downloaded to controller without any reentry of data.

3. Programming tools shall include a real-time operation mode. Function blocks shall display real-time data and be animated to show status of data inputs and outputs when in real-time operation. Animation shall show change of status on logic devices and countdown of timer devices in graphical format

4. Field engineering tools shall also include a database manager of applications that include logic files for controllers and associated graphics. Operator shall be able to

select unit type, input/output configuration and other items that define unit to be controlled. Supply minimum of 250 applications as part of workstation software.

5. Field engineering tool shall include Device Manager for detection of devices connected anywhere on the BACnet network by scanning of the entire network. This function shall display device instance, network identification, model number, and description of connected devices. It shall record and display software file loaded into each controller. *A* copy of each file shall be stored on the computer's hard drive. If needed, this file shall be downloaded to the appropriate controller using the mouse.
6. System shall automatically notify the user when a device that is not in the database is added to the network.
7. System shall include backup/restore function that will back up entire system to selected medium and then restore system from that media. The system shall be capable of creating a backup for the purpose of instantiating a new client PC.
8. The system shall provide a means to scan, detect, interrogate, and edit third-party BACnet devices and BACnet objects within those devices.

O. Workstation Hardware

1. Provide operator's workstation(s) at location(s) noted on the plans.
2. Workstation/server computer minimum requirements
   a. PC Processor of 2.5 GHz quad-core or better
   b. 8 GB RAM or better
   c. 1TB hard disk or better
   d. High-performance graphics adapter
   e. Ethernet 10/100 network interface card
   f. Keyboard, monitor, mouse, USB port and CD-ROM
   g. Microsoft Windows 8 or Windows 10
   h. Monitor size shall be 22" minimum
   i. Color printer (inkjet, color dye or laser)

P. Software

1. At the conclusion of project, contractor shall leave with owner a CD ROM that includes the complete software operation system and project graphics, setpoints, system parameters, etc. This backup shall allow the owner how to completely restore the system in the case of a computer malfunction.

2.02 GRAPHICAL USER INTERFACE

A. Display of Data

1. Graphics displays shall include animation of all Fans shall turn, pilot lights shall blink, coils shall change colors, and so on.
2. Real-time data shall be shown. This data must be directly gathered using the BACnet network and automatically updated without any user action.

3. It shall be possible for user to change data if the user is logged on with the appropriate password. Clicking on a button or typing in a new value shall change digital data. Using pull-down menus or typing in a new value shall change analog data.
4. Data displays shall be navigated using pushbuttons on the displays that are simply clicked on with the mouse to select a new display.

B. Time Schedule Adjustment

1. Logged in access shall allow user to view and edit all schedules in the system. This includes standard, holiday and event schedules as described in BAS specification. Display of schedules shall show interaction of all schedules on a single display so user sees an overview of how all work together. User shall be able to edit schedules from this display.
2. Display of all three schedules must show all ON times for standard, holiday and event schedules in different colors on a given day. In addition, OFF times for each must also be shown in additional colors. User shall be able to select from standard calendar what days are to be scheduled and same display shall show all points and zones affected. User shall be able to set time for one day and select all days of the week that shall be affected as a recurrence of that same schedule for that given day.
3. Schedule list shall show all schedules currently defined. This list shall include all standard, holiday and event schedules. In addition, user shall be able to select a list that shows all scheduled points and zones.

C. Logging of Information

1. User shall use standard browser technology to view all trendlogs in system. User shall be able to view logged data in tabular form or graphical format. User shall be able to adjust time interval of logged data viewed and shall be able to adjust Y axis of data viewed in graphical format. Data shall be in CSV format.

D. Alarm Handling

1. The front end shall display alarms as they occur. User shall be able to acknowledge alarms using browser technology. In addition, user shall be able to view history of alarm occurrence over a user-selected time frame. In addition, those alarms may be filtered for viewing per user-selected options. A single selection shall display all alarms that have not been acknowledged.

E. BACnet Communication

1. The Alerton system shall directly communicate to all devices on the BAS network using BACnet protocol. No intermediate devices shall be necessary for BACnet communication.

2.03 BUILDING CONTROLLER

A. General Requirements

1. BACnet Conformance
   a. Building Controller shall be approved by the BTL as meeting the BACnet Building Controller requirements.
   b. Please refer to section 22.2, BACnet Functional Groups, in the BACnet standard, for a complete list of the services that must be directly supported to provide each of the

functional groups listed above. All proprietary services, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

2. Building controller shall be of modular construction such that various modules may be selected to fit the specific requirements of a given project. At a minim um, modules shall consist of a power supply module, a BACnet Ethernet-MS/TP (master slave token passing) module, a BACnet MS/TP-only module, and a modem module for telephone communication. Those projects that require special interfaces may use Modbus modules as needed. However, all Ethernet communications and all controllers-including central plant controllers, advanced application controllers and unitary controllers-supplied by BAS manufacturer shall utilize the BACnet protocol standard.
3. Modules shall be selected to fit the particular project application. Up to seven modules shall be powered by a single power supply module. All modules shall be panel-mounted on DIN rail for ease of addition and shall be interconnected using a simple plug-in cable. A module in the middle shall be replaceable without removing any other modules.
4. All modules shall be capable of providing global control strategies for the system based on information from any objects in the system, regardless if the object is directly monitored by the building controller module or by another controller. The software program implementing these strategies shall be completely flexible and user-definable. All software tools necessary for programming shall be provided as part of project software. Any systems utilizing factory pre-programmed global strategies that cannot be modified by field personnel on-site, using a WAN or downloaded through remote communications are not acceptable. Changing global strategies using firmware changes is also unacceptable.
5. Programming shall be object-oriented using control function blocks, and support DDC functions, 1000 Analog Values and 1000 Binary Values. All flowcharts shall be generated and automatically downloaded to controller. Programming tool shall be supplied and be resident on workstation. The same tool shall be used for all controllers.
6. Provide means to graphically view inputs and outputs to each program block in real- time as program is executing. This function may be performed using the operator's workstation or field computer.
7. Controller shall have sufficient memory to ensure high performance and data reliability. Battery shall provide power for orderly shutdown of controller and storage of data in nonvolatile flash memory. Battery backup shall maintain real-time clock functions for a minimum of 20 days.
8. Global control algorithms and automated control functions shall execute using 32- bit processor.
9. Schedules
    a. Each building controller module shall support a minimum of 80 BACnet Schedule Objects and 80 BACnet Calendar Objects.
    b. Building controller modules shall provide normal seven-day scheduling, holiday scheduling and event scheduling.
10. Logging Capabilities

a. Each building controller shall log as minim um 320 values. Any object in the system (real or calculated) may be logged. Sample time interval shall be adjustable at the operator's workstation.

b. Logs may be viewed both on-site or off-site using WAN or remote communication.

c. Building controller shall periodically upload trended data to networked operator's workstation for long-term archiving if desired.

d. Archived data stored in database format shall be available for use in third-party spreadsheet or database programs.

11. Alarm Generation

a. Alarms may be generated within the system for any object change of value or state (either real or calculated). This includes things such as analog object value changes, binary object state changes, and various controller communication failures.

b. Each alarm may be dialed out as noted elsewhere.

c. Alarm log shall be provided for alarm viewing. Log may be viewed on-site at the operator's terminal or off-site using remote communications.

d. Controller must be able to handle up to 320 alarm setups stored as BACnet event enrollment objects, with system destination and actions individually configurable.

12. Demand Limiting

a. Demand limiting of energy shall be a built-in, user-configurable function. Each controller module shall support shedding of up to 200 loads using a minimum of two types of shed programs.

b. Load shedding programs in building controller modules shall operate as defined in section 2.1.J of this specification.

13. Tenant Activity Logging

a. Tenant Activity logging shall be supported by building controller module. Each independent module shall support a minimum of 80 zones.

b. Tenant Activity logging shall function as defined in section 2.1.K of this specification.

B. Ethernet - MS/TP Module

1. Ethernet - MS/TP Module shall support every function as listed under paragraph A, General Requirements, of this section and the following.

2. All communication with operator's workstation and all application controllers shall be through BACnet. Building controller Ethernet - MS/TP module shall incorporate as a minimum, the functions of a 2-way BACnet router. Controller shall route BACnet messages between the high-speed LAN (Ethernet 10/lOOM Hz) and MS/TP LAN. Ethernet - MS/TP module shall also route messages from all other building controller modules onto the BACnet Ethernet network.

a. MS/TP LAN must be software-configurable from 9.6 to 76.8Kbps.

b. The RJ-45 Ethernet connection must accept either 10Base-T or 100Base-TX BACnet over twisted pair cable (UTP).

3. BACnet Conformance

a. Ethernet - MS/TP module shall, as a minimum, support MS/TP and Ethernet BACnet LAN types. It shall communicate directly using these BACnet LANs as a native BACnet

device and shall support simultaneous routing functions between all supported LAN types. Global controller shall be approved by the BACnet Testing Laboratory (BTL) as meeting the BACnet Building Controller requirements.

b. All proprietary object types, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

c. The building controller shall comply with Annex J of the BACnet specification for IP connections. This device shall use Ethernet to connect to the IP internetwork, while using the same Ethernet LAN for non-I P communications to other BACnet devices on the LAN. Must support interoperability on WANs and CANs and function as a BACnet Broadcast Management Device (BBMD).

C. MS/TP Module

1. MS/TP Module shall support every function as listed under paragraph A, General Requirements, of this section and the following:

a. Building controller MS/TP mod ule communications shall be though BACnet MS/TP LAN to all advanced application and application-specific controllers. MS/TP module shall also route messages to Ethernet - MS/TP module for communication over WAN.

b. MS/TP LAN must be software configurable from 9.6 to 76.8Kbps

c. Configuration shall be through RS-232 connection.

2. BACnet Conformance

a. MS/TP module shall be approved by the BTL (BACnet Testing Laboratory) as meeting the BACnet Building Controller requirements. MS/TP module shall as a minimum support MS/TP BACnet LAN type. It shall communicate directly using this BACnet LAN as a native BACnet device and shall support simultaneous routing functions between all supported LAN types.

b. Standard BACnet object types supported shall include, as a minimum, Analog Value, Binary Value, Calendar, Device, File, Group, Notification Class, Program, and Schedule object types. All proprietary object types, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

D. Power Supply Module

1. Power supply module shall power up to seven building controller modules. Input for power shall accept between 17-30VAC, 47-65Hz.

2. Power supply module shall include rechargeable battery for orderly shutdown of controller modules including storage of all data in flash memory and for continuous operation of real-time clocks for minimum of 20 days.

2.04 AIR HANDLER APPLICATION CONTROLLERS

A. Provide one or more native BACnet application controllers for each air handler and provide native BACnet application controllers as needed for central plant control that adequately cover all objects listed in object list. All controllers shall interface to building controller through either MS/TP LAN using BACnet protocol, or Ethernet LAN using BACnet over Ethernet or BACnet TCP/IP. No gateways shall be used. Controllers

shall include input, output and self-contained logic program as needed for complete control of units. Controllers shall be fully programmable using graphical programming blocks. Programming tool shall be resident on operator workstation and be the same tool as used for the building controller. No auxiliary or non-BACnet controllers shall be used.

A. BACnet Conformance

1. Application controllers shall be approved by the BTL as meeting the BACnet Advanced Application Controller requirements.
2. Please refer to section 22.2, BACnet Functional Groups, in the BACnet standard, for a complete list of the services that must be directly supported to provide each of the functional groups listed above. All proprietary services, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.
3. Standard BACnet object types supported shall include, as a minim um, Analog Input, Analog Output, Analog Value, Binary Input, Binary Output, Binary Value, Multi-state Values, Device, File, and Program object types. All proprietary object types, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

B. Application controllers shall include universal inputs with 12-bit resolution that accept 3K and 10K thermistors, 0-10VDC, Platinum 1000 ohm RTD, 0-SVDC, 4-20mA and dry contact signals. Any input on a controller may be either analog or digital with a minimum of three inputs that accept pulses. Controller shall also include support and modifiable programming for interface to intelligent room sensor with digital display. Controller shall include binary and analog outputs on board. Analog outputs with 12-bit resolution shall support either 0-10VDC or 0-20mA. Binary outputs shall have LED indication of status. Software shall include scaling features for analog outputs.

1. Application controller shall include 20VDC voltage supply for use as power supply to external sensors.
2. All outputs must have onboard Hand-Off-Auto (HOA) switches and a status indicator light. HOA switch position shall be monitored. Each analog output shall include a potentiometer for manually adjusting the output when the HOA switch is in the Hand position.
3. The position of each and every HOA switch shall be available system wide as a BACnet object property.

C. All program sequences shall be stored on board application controller in EEPROM. No batteries shall be needed to retain logic program. All program sequences shall be executed by controller up to 20 times per second (minimum of 10 times per second) and capable of multiple PID loops for control of multiple devices. All calculations shall be completed using floating-point math and system shall support display of all information in floating-point nomenclature at operator's terminal.

1. The following control blocks shall be supported:
    a. Natural Log
    b. Exponential
    c. Log base 10

d. X to the power of Y

e. Nth square root of X

f. f. 5th Order Polynomial Equations

g. Astronomical Clock (sunrise/sunset calculation)

h. Time based schedules

D. Programming of application controller shall be completely modifiable in the field over installed BACnet LANs or remotely using modem interface. Operator shall program logic sequences by graphically moving function blocks on screen and tying blocks together on screen. Application controller shall be programmed using programming tools as described in operator's terminal section.

E. Application controller shall include support for intelligent room sensor (see Section 2.10.B.) Display on intelligent room sensor shall be programmable at application controller and include an operating mode and a field service mode. All button functions and display data shall be programmable to show specific controller data in each mode, based on which button is pressed on the sensor. See sequence of operation for specific display requirements at intelligent room sensor.

F. Schedules

1. The controller shall support a minimum of 3 BACnet Schedule Objects and have a real time clock on board with battery backup to maintain time through a power loss.

G. Logging Capabilities

1. Controller shall support a minimum of 50 trendlogs. Any object in the controller (real or calculated) may be logged. Sample time interval shall be adjustable at the operator's workstation.

2. Controller shall periodically upload trended data to system server for long-term archiving if desired. Archived data stored in (MS Jet Database or SQL) database form and shall be available for use in third-party spreadsheet or database programs.

H. Alarm Generation

1. Alarms may be generated within the controller for any object change of value or state (either real or calculated). This includes things such as analog object value changes, and binary object state changes.

2. Alarm log shall be provided for alarm viewing. Log may be viewed on-site at the operator's terminal or off-site using remote communications.

3. Controller must be able to handle up to 25 alarm setups stored as BACnet event enrollment objects, with system destination and actions individually configurable.

I. The controller processor shall be a 32-bit processor.

J. The packaging of the controller shall provide operable doors to cover the terminals once installation is complete. The housing of the controller shall provide for DIN rail mounting and also fully enclose circuit board.

2.05 TERMINAL UNIT APPLICATION CONTROLLERS (FAN-COILS)

A. Provide one native BACnet application controller for each piece of unitary mechanical equipment that adequately covers all objects listed in object list for unit. All controllers shall interface to building controller through MS/TP LAN using BACnet protocol. No gateways shall

be used. Controllers shall include input, output and self-contained logic program as needed for complete control of unit.

B. BACnet Conformance

1. Application controllers shall, as a minim um, support MS/TP BACnet LAN types. They shall communicate directly using this BACnet LAN at 9.6, 19.2, 38.4 and 76.8 Kbps, as a native BACnet device. Application controllers shall be approved by the BTL as meeting the BACnet Application Specific Controller requirements and support all BACnet services necessary to provide the following BACnet functional groups:

   a. Files Functional Group

   b. Reinitialize Functional Group

   c. Device Communications Functional Group

2. Please refer to Section 22.2, BACnet Functional Groups in the BACnet standard, for a complete list of the services that must be directly supported to provide each of the functional groups listed above. All proprietary services, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

3. Standard BACnet object types supported shall include, as a minimum, Analog Input, Analog Output, Analog Value, Binary Input, Binary Output, Binary Value, Device, File, and Program Object Types. All proprietary object types, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

C. Application controllers shall include universal inputs with 10-bit resolution that can accept 3K and lOK thermistors, 0-5VDC, 4-20mA, dry contact signals and a minim um of 3 pulse inputs. Any input on controller may be either analog or digital. Controller shall also include support and modifiable programming for interface to intelligent room sensor. Controller shall include binary outputs on board with analog outputs as needed.

D. All program sequences shall be stored on board controller in EEPROM. No batteries shall be needed to retain logic program. All program sequences shall be executed by controller 10 times per second and shall be capable of multiple PID loops for control of multiple devices. Programming of application controller shall be completely modifiable in the field over installed BACnet LANs or remotely through modem interface. Operator shall program logic sequences by graphically moving function blocks on screen and tying blocks together on screen. Application controller shall be programmed using same programming tools as building controller and as described in operator workstation section. All programming tools shall be provided and installed as part of system.

E. Application controller shall include support for intelligent room sensor (see Section 2.10.B.) Display on room sensor shall be programmable at controller and include an operating mode and a field service mode. All button functions and display data shall be programmable to show specific controller data in each mode based on which button is pressed on the sensor. See sequence of operation for specific display requirements at intelligent room sensor.

2.06 VAV BOX CONTROLLERS- SINGLE DUCT WITH HOT WATER REHEAT

A. Provide one native BACnet application controller for each VAV box that adequately covers all objects listed in object list for unit. All controllers shall interface to building controller through MS/TP LAN using BACnet protocol. No gateways shall be used. Controllers shall include on board

CFM flow sensor, inputs, outputs and programmable, self-contained logic program as needed for control of units.

B. BACnet Conformance

1. Application controllers shall, at a minimum, support MS/TP BACnet LAN types. They shall communicate directly through this BACnet LAN at 9.6, 19.2, 38.4 and 76.8 Kbps, as a native BACnet device. Application controllers shall be approved by the BTL as meeting the BACnet Application Specific Controller requirements.

2. Please refer to Section 22.2, BACnet Functional Groups, in the BACnet standard, for a complete list of the services that must be directly supported to provide each of the functional groups listed above. All proprietary services, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

3. Standard BACnet object types supported shall include, as a minimum, Analog Input, Analog Output, Analog Value, Binary Input, Binary Output, Binary Value, Device, File, and Program Object Types. All proprietary object types, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

C. Application controllers shall include universal inputs with 10-bit resolution that can accept 3K and lOK thermistors, 0-5 VDC, and dry contact signals. Inputs on controller may be either analog or digital. Controller shall also include support and modifiable programming for interface to intelligent room sensor with digital display. Controller shall also include binary outputs on board. For applications using variable speed parallel fans, provide a single analog output selectable for 0-10 V or 0-20 mA control signals. Application controller shall include microprocessor driven flow sensor for use in pressure independent control logic. All boxes shall be controlled using pressure- independent control algorithms and all flow readings shall be in CFM (LPS if metric).

D. All program sequences shall be stored on board application controller in EEPROM. No batteries shall be needed to retain logic program. All program sequences shall be executed by controller 10 times per second and shall be capable of multiple PIO loops for control of multiple devices. Programming of application controller shall be completely modifiable in the field over installed BACnet LANs or remotely using modem interface. Operator shall program logic sequences by graphically moving function blocks on screen and tying blocks together on screen. Application controller shall be programmed using the same programming tool as Building Controller and as described in operator's workstation section. All programming tools shall be provided as part of system.

E. Application controller shall include support for intelligent room sensor (see Section 2.10.B.) Display on room sensor shall be programmable at application controller and include an operating mode and a field service mode. All button functions and display data shall be programmable to show specific controller data in each mode based on which button is pressed on the sensor. See sequence of operations for specific display requirements for intelligent room sensor.

F. On board flow sensor shall be microprocessor-driven and pre-calibrated at the factory. Pre-calibration shall be at 16 flow points as a minimum. All factory calibration data shall be stored in non-volatile memory. Calibration data shall be field adjustable to compensate for variations in VAV box type and installation. All calibration parameters shall be adjustable through

intelligent room sensor. Operator's workstation, portable computers, and special hand-held field tools shall not be needed for field calibration.

G. Provide duct temperature sensor at discharge of each VAV box that is connected to controller for reporting back to operator's workstation.

2.07 AUXILIARY CONTROL DEVICES

A. Temperature Sensors

B. All temperature sensors to be solid-state electronic, interchangeable with housing appropriate for application. Wall sensors to be installed as indicated on drawings. Mount 48 inches above finished floor. Duct sensors to be installed such that the sensing element is in the main air stream. Immersion sensors to be installed in wells provided by control contractor, but installed by mechanical contractor. Immersion wells shall be filled with thermal compound before installation of immersion sensors. Outside air sensors shall be installed away from exhaust or relief vents, not in an outside air intake, and in a location that is in the shade most of the day.

C. Intelligent Room Sensor with LCD Readout

1. All room sensors shall be a combination temperature and humidity sensor and integrated Co2 where shown on the floor plans. The sensor shall contain a backlit LCD digital display and user function keys along with temperature sensor. Controller shall function as room control unit, and shall allow occupant to raise and lower setpoint, and activate terminal unit for override use-all within limits as programmed by building operator. Sensor shall also allow service technician access to hidden functions as described in sequence of operation.

2. Override time may be set and viewed in half-hour increments. Override time countdown shall be automatic, but may be reset to zero by occupant from the sensor. Time remaining shall be displayed. Display shall show the word "OFF" in unoccupied mode unless a function button is pressed.

3. See sequence of operation for specific operation of LCD displays and function keys in field service mode and in normal occupant mode. Provide intelligent room sensors as specified in point list.

4. Field service mode shall be customizable to fit different applications. If intelligent room sensor is connected to VAV controller, VAV box shall be balanced and all air flow parameters shall be viewed and set from the intelligent room sensor with no computer or other field service tool needed.

D. Wall Sensor

1. Standard wall sensor shall use solid-state sensor identical to intelligent room sensor and shall be packaged in aesthetically pleasing enclosure. Sensor shall provide override function, warmer/cooler lever for set point adjustment and port for plug-in of Field Service Tool for field adjustments. Override time shall be stored in controller and be adjustable on a zone-by-zone basis. Adjustment range for warmer/cooler lever shall also be stored in EEPROM on controller. All programmable variables shall be available to field service tool through wall sensor port.

E. Wireless Wall Sensor

1. Wireless wall sensor shall use solid-state sensor and shall be packaged in aesthetically pleasing enclosure. Sensor shall provide override function, warmer/cooler dial for set

point adjustment. Override time shall be stored in controller and be adjustable on a zone-by-zone basis. Adjustment range for warmer/cooler lever shall also be stored in EEPROM on controller. All programmable variables shall be available to field service tool through wall sensor port. There shall be a mechanical means to lock the wall sensor to the base to prevent theft and vandalism.

2. Wireless wall sensor shall have a battery life of 5 year with alkaline batteries and 7.5 years with lithium batteries. A low battery indication shall be signaled to the controller prior to the battery being exhausted. The wireless sensor shall run on industry standard AA style batteries.
3. The wireless range in open air shall meet or exceed 300 ft. The strength of the wireless signal must be indicated at the wireless sensor to aid in placement and trouble shooting. The receiver shall have a wireless-communications-received light that indicates the proper communication is occurring.
4. The wireless wall sensor and receiver must be paired in an addressable mean to facilitate easy replacement and reassignment.

F. Airflow Control:

1. Where indicated, provide airflow measuring stations and control. Refer to Section 237213, “Custom Air Handling Units," and control diagrams on Drawings.
2. A factory-furnished and calibrated controller shall be programmed, in nonvolatile EPROM, with application-specific airflow set point and range.
3. The controller and actuator shall communicate to control the desired airflow.
4. The controller shall receive a zero- to 10-V de input signal and report a zero- to 20- mA output signal that is proportional to the airflow.
5. Airflow measurement and control range shall be suitable for operation between 150 to 2000 fpm (0.8 to 10 m/s).
6. Ambient Operating Temperature Range: Minus 40 to plus 140 deg F (Minus 40 to plus 60 deg C).
7. Ambient Operating Humidity Range: 5 to 95 percent relative humidity, non- condensing.
8. Provide unit with control transformer rated for not less than 85 VA. Provide transformer with primary and secondary protection and primary disconnecting means. Coordinate requirements with field power connection.
9. Provide screw terminals for interface to field wiring.
10. Factory mount electronics within a NEMA 250, Type 1painted steel enclosure.

2.08 THERMAL ENERGY METERS

A. Performance Requirements: Manufacturer shall certify that each energy meter indicated complies with specified performance requirements and characteristics.

1. Product certificates are required.
2. Insertion-Type Thermal Energy Meters:
    a. Manufacturer: Subject to compliance with requirements, provide products by the following:

1) ONICON Incorporated Turbine Flow Meter Model F-1210 and BTU Meter Model System-10-BAC.

b. Description:

1) Factory-packaged meter consisting of supply and return temperature sensors, flow sensor, digital display, keypad user interface, installation hardware, color-coded interconnecting cabling, and installation instructions.

2) Each thermal energy meter shall be individually calibrated and provided with calibration certification traceable to NIST.

c. Alphanumeric display of the following on face of enclosure:

1) Total energy consumption.

2) Energy rate.

3) Flow rate.

4) Supply temperature.

5) Return temperature.

6) Visual indication of power status (on/off) on face of enclosure.

d. Electronics Enclosure:

1) Remote from temperature and flow sensors.

2) NEMA 250, Type 12 or Type 13 for indoor applications and NEMA 250, Type 4 or Type 4X for outdoor applications.

3) Labeled terminal strip for field wiring connections.

e. Programming:

1) Factory programmed for specific application and field programmable through keypad on face of enclosure.

2) Programmed parameters and total energy consumption shall be stored in non-volatile EEPROM memory.

f. Output Signals:

1) Total Energy Consumption: Isolated solid-state dry contact with 100 mA, 50-V rating and contact duration of 0.5, 1, 2, or 6 seconds.

2) Energy Rate, Flow Rate, Supply Temperature, Return Temperature: 4 to 20 mA or zero- to 10-V de for each.

g. Temperature Sensors:

1) Temperature range matched to application.

2) Temperature accuracy within 0.15 deg F (0.08 deg C) over the calibrated range.

3) Stainless-steel or brass thermowell with NPS 1/2 (DN 15) N PT connection for each sensor.

h. Current Sensors:

1) Veris Model H-908 or equal.

i. Differential Pressure Transmitters & Switches:

1) Duct Static Pressure shall be Dwyer Model MS2-D102 or equal.

2) Space Static Pressure shall be Dwyer Model MS2-Wlll or equal.

3) Hydronic Differential Pressure shall be Dwyer Model 629-05-CH-P2-E5- 51-3V or equal.

4) Filter Switches shall be Dwyer Model ADPS-04-1-N or equal.

2.09 ELECTRONIC ACTUATORS AND VALVES

A. Quality Assurance for Actuators and Valves

1. UL Listed Standard 873 and C.S.A. Class 4813 02 certified.
2. NEMA 2 rated enclosures for inside mounting, provide with weather shield for outside mou nting.
3. Five-year manufacturer's warranty. Two-year unconditional and three-year product defect from date of installation.

B. Execution Details for Actuators and Valves

1. Furnish a Freeze-stat and install "Hard Wire" interlock to disconnect the mechanical spring return actuator power circuit for fail-safe operation. Use of the control signal to drive the actuators closed is not acceptable.
2. Each DOC analog output point shall have an actuator feedback signal, independent of control signal, wired and terminated in the control panel for true position information and troubleshooting. Or the actuator feedback signal may be wired to the DOC as an analog input for true actuator position status.
3. VAV box damper actuation shall be floating type or analog (2-lOVDC, 4-20mA).
4. Booster-heat valve actuation shall be floating type or analog (2-lOvdc, 4-20ma).
5. Primary valve control shall be analog (2-lOVDC, 4-20mA).

C. Actuators for damper and control valves 0.5-6 inches shall be electric unless otherwise specified, provide actuators as follows:

1. UL Listed Standard 873 and Canadian Standards Association Class 481302 shall certify actuators.
2. NEMA 2 rated actuator enclosures for inside mounting. Use additional weather shield to protect actuator when mounted outside.
3. Five-year manufacturer's warranty. Two-year unconditional and Three year product defect from date of installation.
4. Mechanical spring shall be provided when specified. Capacitors or other non-mechanical forms of fail-safe are not acceptable.
5. Position indicator device shall be installed and made visible to the exposed side of the actuator. For damper short shaft mounting, a separate indicator shall be provided to the exposed side of the actuator.
6. Overload Protection: Actuators shall provide protection against actuator burnout by using an internal current limiting circuit or digital motor rotation sensing circuit. Circuit shall

insure that actuators cannot burn out due to stalled damper or mechanical and electrical paralleling. End switches to deactivate the actuator at the end of rotation are acceptable only for butterfly valve actuators.

7. A Pushbutton gearbox release shall be provided for all non-spring actuators.
8. Modulating actuators shall be 24VAC and consume lOVA power or less.
9. Conduit connectors are required when specified and when code requires it.

D. Damper Actuators:

1. Outside air and exhaust air damper actuators shall be mechanical spring return. Capacitors or other non-mechanical forms of fail-safe are not acceptable. The actuator mounting arrangement and spring return feature shall permit normally open or normally closed positions of the damper as required.
2. Economizer actuators shall utilize analog control 2-lOVDC, floating control is not acceptable.
3. Electric damper actuators (including VAV box actuators) shall be direct shaft- mounted and use a V-bolt and toothed V-clamp causing a cold weld effect for positive gripping. Single bolt or set-screw type fasteners are not acceptable.
4. One electronic actuator shall be direct shaft-mounted per damper section. No connecting rods or jackshafts shall be needed. Small outside air and return air economizer dampers may be mechanically linked together if one actuator has sufficient torque to drive both and damper drive shafts are both horizontal installed.
5. Multi-section dampers with electric actuators shall be arranged so that each damper section operates individually. One electronic actuator shall be direct shaft-mounted per damper section. (See below execution section for more installation details.)

E. Valve Actuators 0.5-6 inches

1. Mechanical spring shall be provided on all actuators for pre-heat coil and actuators for AHU heating or cooling coil when units are mounted outside. See plans for fail- safe flow function: Normal Open or Normal Closed. Capacitors or other non-mechanical forms of fail-safe are not acceptable.
2. All zone service actuators shall be non-spring retu rn unless otherwise specified.
3. The valve actuator shall be capable of providing the minimum torque required for proper valve close-off for the required application.
4. All control valves actuators shall have an attached 3-foot cable for easy installation to a junction box.
5. Override handle and gearbox release shall be provided for all non-spring return valve actuators.

F. Control Valves 0.5-6 inches

1. The BAS contractor shall furnish all specified motorized control valves and actuators. BAS contractor shall furnish all control wiring to actuators. The contractor shall install all valves. Equal percentage control characteristic shall be provided for all water coil control valves. Linear valve characteristic is acceptable for 3-way valves that are 2.5 inches and above.
2. Characterized control valves shall be used for hydronic heating or cooling applications and small to medium AHU water-coil applications to 200 GPM. Cooling tower coil control

valves shall be for water-coil applications up to 550 GPM Actuators are non-spring return for terminal unit coil control unless otherwise noted. If the coil is exposed to the outside air stream, see plans for spring return requirement.

a. Leakage is aero percent, close-off is 200psi, maximum differential is 30psi; rangeability is 500:1.

b. Valves 0.5-2 inches shall be nickel-plated forged brass body, NPT screw type connections.

c. Valves 0.5-1.25 inches shall be rated for ANSI Class 600 working pressure. Valves over 1.5 inches shall be rated for ANSI Class 400 working pressure. Two- position control valves shall be line size.

d. The operating temperature range shall be 0-250 degrees F.

e. Stainless steel ball and stem shall be furnished on all modulating valves.

f. Seats shall be fiberglass reinforced Teflon.

g. Two-way and three-way valves shall have an equal percentage control port. Full stem rotation is required for maximum flow to insure stable BTU control of the coil.

h. Three-way valve shall be applicable for both mixing and diverting.

i. The characterizing disc is made of TEFZEL and shall be keyed and held secure by a retaining ring.

j. The valves shall have a blow-out proof stem design.

k. The stem packing shall consist of 2 lubricated 0-rings designed for on-off or modulating service and require no maintenance.

l. The valves shall have an ISO type, 4-bolt flange for mou nting actuator in any orientation parallel or perpendicular to the pipe.

m. A non-metallic thermal isolation adapter shall separate valve flange from actuator.

n. One fastening screw shall secure the direct coupling of the thermal isolation adapter between the actuator and the valve. This will prevent all lateral or rotational forces from affecting the stem and its packing 0-rings.

3. Globe valves 0.5-2 inches shall be single port, top or bottom guided plug control or water flow applications.

a. Valves shall be bronze body, NPT screw type, and shall be rated for ANSI Class 250 working pressure.

b. Valves 0.5 inches (DN15) through 2 inches (DN50) with spring return actuators shall close off against 50 psi pressure differential with Class III leakage (0.1%).

c. The operating temperature range shall be 20-280 degrees F.

d. Spring loaded TFE packing shall protect against leakage at the stem.

e. Two-way valves shall have an equal percentage control port.

f. Three-way valves shall have a linear control and bypass port.

g. Mixing and diverting valves must be installed specific to the valve design.

4. Globe Valve 2.5-6 inches

a. Valves 2.5 inches (DN65) through 6 inches (DN50) shall be iron body, 125 lb. flanged with Class III (0.1%) close-off leakage at 50 psi differential.

b. Valves with spring return actuators shall close off against 50 psi pressure differential with Class III leakage (0.1%).

c. Flow type for two-way valves shall be equal percentage. Flow type for three-way valves shall be linear.

d. Mixing and diverting valves must be installed specific to the valve design.

G. Butterfly valves

1. Butterfly valves shall be sized for modulating service at 60-70 degree stem rotation. Isolation valves shall be line-size. Design velocity shall be less than 12 feet per second when used with standard EPDM seats.

a. Body is cast iron.

b. Disc is aluminum bronze standard.

c. Seat is EPDM standard.

d. Body Pressure is 200 psi, -30-275 degrees F.

e. Flange is ANSI 125/250.

f. Media Temperature Range is -22-240 degree F.

g. Maximum Differential Pressure is 200 psi for 2- to 6- inch size.

H. Butterfly Valve Industrial Actuators

1. Actuators shall be approved under Canadian Standards Association or other Nationally Recognized Testing Laboratory to UL standards. CSA Class 4813 02 or equal. Enclosure shall be NEMA 4 (weatherproof) enclosure and will have an industrial quality coating.

a. Actuator shall have a motor rated for continuous duty. The motor shall be fractional horsepower; permanent split capacitor type designed to operate on a 120VAC, lpH, 60Hz supply. Two adjustable cam-actuated end travel limit switches shall be provided to control direction of travel. A self-resetting thermal switch shall be imbedded in the motor for overload protection.

b. Reduction gearing shall be designed to withstand the actual motor stall torque. Gears shall be hardened alloy steel, permanently lubricated. A self-locking gear assembly or a brake shall be supplied.

c. Actuator shall have a 6 ft wiring harness provided for ease in field wiring (above 1500 in-lbs). Two adjustable SPDT cam-actuated auxiliary switches, rated at 250VAC shall be provided for indication of open and closed position. Actuator shall have heater and thermostat to minimize condensation within the actuator housing.

d. Actuator shall be equipped with a hand wheel for manual override to permit operation of the valve in the event of electrical power failure or system malfunction. Hand wheel must be permanently attached to the actuator and when in manual operation electrical power to the actuator will be permanently interrupted. The hand wheel will not rotate while the actuator is electrically driven.

e. The actuator shall be analog, floating, or two position as called out in the control sequence of operation. All Analog valves shall be positive positioning, and respond to a 2-lOVDC, 4-20mA, or adjustable signal as required. Analog actuators shall have a digital control card allowing any voltage input for control and any DC voltage feedback signal for position indication.

2. Performance Verification Test
    a. Control loops shall cause productive actuation with each movement of the actuator and actuators shall modulate at a rate that is stable and responsive. Actuator movement shall not occur before the effects of previous movement have affected the sensor.
    b. Actuator shall have capability of signaling a trouble alarm when the actuator Stop-Go Ratio exceeds 30%.
3. Actuator mounting for damper and valve arrangements shall comply with the following:
    a. Damper actuators: Shall not be installed in the air stream
    b. A weather shield shall be used if actuators are located outside. For damper actuators, use clear plastic enclosure.
    c. Damper or valve actuator ambient temperature shall not exceed 122 degrees F through any combination of medium temperature or surrounding air. Appropriate air gaps, thermal isolation washers or spacers, standoff legs, or insulation shall be provided as necessary.
    d. Actuator cords or conduit shall incorporate a drip leg if condensation is possible. Water shall not be allowed to contact actuator or internal parts. Location of conduits in temperatures dropping below dew point shall be avoided to prevent water from condensing in conduit and running into actuator.
4. Damper mounting arrangements shall comply with the following:
    a. The contractor shall furnish and install damper channel supports and sheet metal collars.
    b. No jack shafting of damper sections shall be allowed.
    c. Multi-section dampers shall be arranged so that each damper section operates individually. One electronic actuator shall be direct shaft mounted per section.
5. Valve Sizing for Water Coil
    a. Modulating control valve body size may be reduced, at most, two pipe sizes from the line size or not less than half the pipe size. The BAS contractor shall size all water coil control valves for the application as follows:
        1) Booster-heat valves shall be sized not to exceed 4-9psi differential pressure. Size valve for 50% valve authority. Valve design pressu re drop is equal to the sum of coil drop plus the balance valve drop.
        2) Primary valves shall be sized not to exceed 5-15psi differential pressure. Size valve for 50% valve authority. Valve design pressu re drop is equal to the sum of coil drop plus the bala nce valve drop.
        3) Butterfly valves shall be sized for modulating service at 60-70 degree rotation. Design velocity shall be 12 feet per second or less when used with standard EPDM seats.
    b. Valve mounting arrangements shall comply to the following:
        1) Unions shall be provided on all ports of two-way and three-way valves.

2) Install three-way equal percentage characterized control valves in a mixing configuration with the "A" port piped to the coil.

3) Install 2.5 inches and above, three-way globe valves, as manufactured for mixing or diverting service to the coil.

2.10 CONTROL PANELS

A. All controllers, power supplies and relays shall be mounted in enclosures.

B. Enclosures may be NEMA 1when located in a clean, dry, indoor environment. Indoor enclosures shall be NEMA 12 when installed in other than a clean environment.

C. Enclosures shall have hinged, locking doors.

D. Provide laminated plastic nameplates for all enclosures in any mechanical room or electrical room. Include location and unit served on nameplate. Laminated plastic shall be 0.125 inches thick and appropriately sized to make label easy to read.

E. Control panels must be assembled by a UL authorized fabricator in accordance with UL508A standards and labeled with separate UL label numbers.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence.

B. Notify the owner's representative in writing of conditions detrimental to the proper and timely completion of the work

C. Do not begin work until all unsatisfactory conditions are resolved.

3.02 INSTALLATION (GENERAL)

A. Install in accordance with manufacturer's instructions.

A. Provide all miscellaneous devices, hardware, software, interconnections, installation, and programming required to ensure a complete operating system in accordance with the sequences of operation and point schedules.

3.03 LOCATION AND INSTALLATION OF COMPONENTS

A. Locate and install components for easy accessibility; in general, mount 48 inches above floor with minimum 3 feet of clear access space in front of units. Obtain approval on locations from owner's representative prior to installation.

B. All instruments, switches, transmitters, etc., shall be suitably wired and mounted to protect them from vibration, moisture, and high or low temperatures.

C. Identify all equipment and panels. Provide permanently mounted tags for all panels.

D. Provide stainless steel or brass thermowells suitable for respective application and for installation under other sections, and sized to suit pipe diameter without restricting flow.

3.04 INTERLOCKING AND CONTROL WIRING

A. Provide all interlock and control wiring. All wiring shall be installed neatly and professionally, in accordance with Specification Division 16 and all national, state and local electrical codes.

B. Provide wiring as required by functions as specified and as recommended by equipment manufacturers, to serve specified control functions. Provide shielded low capacitance wire for all communications trunks.

C. Control wiring shall not be installed in power circuit raceways. Magnetic starters and disconnect switches shall not be used as junction boxes. Provide auxiliary junction boxes as required. Coordinate location and arrangement of all control equipment with the owner's representative prior to rough-in.

D. Provide auxiliary pilot duty relays on motor starters as required for control function.

E. Provide power for all control components from nearest electrical control panel or as indicated on the electrical drawings; coordinate with electrical contractor.

F. All control wiring in the mechanical, electrical, telephone and boiler rooms to be installed in raceways. All other wiring to be installed neatly and inconspicuously per local code requirements. If local code allows, control wiring above accessible ceiling spaces may be run with plenum-rated cable (without conduit).

3.05 DDC OBJECT TYPE SUMMARY

A. Provide all database generation.

B. Displays

1. System displays shall show all analog and binary object types within the system.They shall be logically laid out for easy use by the owner. Provide outside air temperature indication on all system displays associated with economizer cycles.

C. Run Time Totalization

1. At a minimum, run time totalization shall be incorporated for each monitored supply fan, return fan, exhaust fan, hot water and chilled water pumps. Warning limits for each point shall be entered for alarm and or maintenance purposes.

D. Trendlog

1. All binary and analog object types (including zones) shall have the capability to be automatically trended.

E. Alarm

1. All analog inputs (High/Low Limits) and selected binary input alarm points shall be prioritized and routed (locally or remotely) with alarm message per owner's requirements.

F. Database Save

1. Provide backup database for all standalone application controllers on disk.

3.06 FIELD SERVICES

A. Prepare and start logic control system under provisions of this section.

B. Start up and commission systems. Allow sufficient time for startup and commissioning prior to placing control systems in permanent operation.

C. Provide the capability for off-site monitoring at control contractor's local or main office. At a minim um, off-site facility shall be capable of system diagnostics and software download. Owner shall provide phone line for this service for one year or as specified.

D. Provide owner's representative with spare parts list. Identify equipment critical to maintaining the integrity of the operating system.

3.07 AS-BUILT DOCUMENTATION REQUIRED

A. Complete set of accurate control drawings and programming.

3.08 TRAINING

A. Provide application engineer to instruct owner in operation of systems and equipment.

B. Provide system operator's training to include (but not be limited to) such items as the following: modification of data displays, alarm and status descriptors, requesting data, execution of commands and request of logs. Provide this training to a minimum of three persons.

C. Provide on-site training above as required, up to 16 hours as part of this contract.

D. Provide tuition for at least two individuals to attend for a two-day factory training class.

E. If applicable, costs for travel, lodging and meals will be the responsibility of the owner.

3.09 DEMONSTRATION

A. Demonstrate complete operating system to owner's representative.

B. Provide certificate stating that control system has been tested and adjusted for proper operation.

END OF SECTION

SECTION 23 21 13
HYDRONIC PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes pipe and fitting materials and joining methods for the following:
   1. Copper tube and fittings.
   2. Steel pipe and fittings.
   3. Joining materials.
   4. Transition fittings.
   5. Dielectric fittings.
   6. Bypass chemical feeder.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of the following:
   1. Pipe.
   2. Fittings.
   3. Joining materials.
   4. Bypass chemical feeder.

B. Sustainable Design Submittals:
   1. Product Data: For adhesives, indicating VOC content.

C. Delegated-Design Submittal:
   1. Design calculations and detailed fabrication and assembly of pipe anchors and alignment guides, hangers and supports for multiple pipes, expansion joints and loops, and attachments of the same to the building structure.
   2. Locations of pipe anchors and alignment guides and expansion joints and loops.
   3. Locations of and details for penetrations, including sleeves and sleeve seals for exterior walls, floors, basement, and foundation walls.
   4. Locations of and details for penetration and firestopping for fire- and smoke-rated wall and floor and ceiling assemblies.

1.03 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Piping layout, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Suspended ceiling components.
   2. Other building services.
   3. Structural members.
   4. Refer to Section 23 00 50, “Common Work Results for HVAC Systems for additional requirements.

B. Qualification Data: For Installer.

C. Welding certificates.

D. Field quality-control reports.

E. Preconstruction Test Reports:

F. Water Analysis: Submit a copy of the water analysis to illustrate water quality available at Project site.

1.04 QUALITY ASSURANCE

A. Steel Support Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code: Section IX.

1. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.

2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

1.05 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on water quality.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:

1. Hot-Water Heating Piping: 100 psig at 200 deg F.

2. Chilled-Water Piping: 150 psig at 73 deg F.

3. Makeup-Water Piping: 150 psig at 73 deg F.

4. Condensate-Drain Piping: 180 deg F.

5. Air-Vent Piping: 200 deg F.

6. Safety-Valve-Inlet and -Outlet Piping: Equal to the pressure of the piping system to which it is attached.

2.02 COPPER TUBE AND FITTINGS

A. Drawn-Temper Copper Tubing: ASTM B 88, Type L , and ASTM B 88, Type M.

B. Wrought-Copper Unions: ASME B16.22.

2.03 STEEL PIPE AND FITTINGS

A. Steel Pipe: ASTM A 53/A 53M, black steel with plain ends; welded and seamless, Grade B, and wall thickness as indicated in "Piping Applications" Article.

B. Cast-Iron Threaded Fittings: ASME B16.4; Classes 125 and 250 as indicated in "Piping Applications" Article.

C. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300 as indicated in "Piping Applications" Article.

D. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300 as indicated in "Piping Applications" Article.

E. Cast-Iron Pipe Flanges and Flanged Fittings: ASME B16.1, Classes 25, 125, and 250; raised ground face, and bolt holes spot faced as indicated in "Piping Applications" Article.

F. Wrought-Steel Fittings: ASTM A 234/A 234M, wall thickness to match adjoining pipe.

G. Wrought Cast- and Forged-Steel Flanges and Flanged Fittings: ASME B16.5, including bolts, nuts, and gaskets of the following material group, end connections, and facings:

1. Material Group: 1.1.
2. End Connections: Butt welding.
3. Facings: Raised face.

H. Grooved Mechanical-Joint Fittings and Couplings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
   a. Central Sprinkler Company.
   b. S. P. Fittings.
   c. Smith-Cooper International.
   d. Victaulic Company.
2. Joint Fittings: ASTM A 536, Grade 65-45-12 ductile iron; ASTM A 47/A 47M, Grade 32510 malleable iron; ASTM A 53/A 53M, Type F, E, or S, Grade B fabricated steel; or ASTM A 106/A 106M, Grade B steel fittings with grooves or shoulders constructed to accept grooved-end couplings; with nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings.
3. Couplings: Ductile- or malleable-iron housing and EPDM gasket of central cavity pressure-responsive design; with nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings.

I. Steel Pipe Nipples: ASTM A 733, made of same materials and wall thicknesses as pipe in which they are installed.

2.04 JOINING MATERIALS

A. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch maximum thickness unless otherwise indicated.
   a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
   b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.

B. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

D. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for joining copper with copper; or BAg-1, silver alloy for joining copper with bronze or steel.

E. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.05 TRANSITION FITTINGS

A. Plastic-to-Metal Transition Fittings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
    a. Charlotte Pipe and Foundry Company.
    b. IPEX USA LLC.
    c. KBI (King Bros. Industries).
    d. Viega LLC.
2. One-piece fitting with one threaded brass or copper insert and one solvent-cement-joint end of material and wall thickness to match plastic pipe material.

B. Plastic-to-Metal Transition Unions:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
    a. Charlotte Pipe and Foundry Company.
    b. IPEX USA LLC.
    c. KBI (King Bros. Industries).
    d. NIBCO INC.
2. Brass or copper end, solvent-cement-joint end of material and wall thickness to match plastic pipe material, rubber gasket, and threaded union.

2.06 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

B. Dielectric Unions:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
    a. A.Y. McDonald Mfg. Co.
    b. Capitol Manufacturing Company.
    c. Central Plastics Company.
    d. HART Industrial Unions, LLC.
    e. Jomar Valve.
    f. Matco-Norca.
    g. Watts; a Watts Water Technologies company.

h. Wilkins.

i. Zurn Industries, LLC.

2. Description:

a. Standard: ASSE 1079.

b. Pressure Rating: 125 psig minimum at 180 deg F.

c. End Connections: Solder-joint copper alloy and threaded ferrous.

C. Dielectric Flanges:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

a. Capitol Manufacturing Company.

b. Central Plastics Company.

c. Matco-Norca.

d. Watts; a Watts Water Technologies company.

e. Wilkins.

f. Zurn Industries, LLC.

2. Description:

a. Standard: ASSE 1079.

b. Factory-fabricated, bolted, companion-flange assembly.

c. Pressure Rating: 125 psig minimum at 180 deg F.

d. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

D. Dielectric-Flange Insulating Kits:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

a. Advance Products & Systems, Inc.

b. Calpico, Inc.

c. Central Plastics Company.

d. Pipeline Seal and Insulator, Inc.

2. Description:

a. Nonconducting materials for field assembly of companion flanges.

b. Pressure Rating: 150 psig.

c. Gasket: Neoprene or phenolic.

d. Bolt Sleeves: Phenolic or polyethylene.

e. Washers: Phenolic with steel backing washers.

E. Dielectric Nipples:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

a. Elster Perfection Corporation.

b. Grinnell Mechanical Products.

c. Matco-Norca.

d. Precision Plumbing Products.

e. Victaulic Company.

2. Description:

a. Standard: IAPMO PS 66.

b. Electroplated steel nipple, complying with ASTM F 1545.

c. Pressure Rating: 300 psig at 225 deg F.

d. End Connections: Male threaded or grooved.

e. Lining: Inert and noncorrosive, propylene.

2.07 BYPASS CHEMICAL FEEDER

A. Description: Welded steel construction; 125-psig working pressure; 5-gal. capacity; with fill funnel and inlet, outlet, and drain valves.

1. Chemicals: Specially formulated, based on analysis of makeup water, to prevent accumulation of scale and corrosion in piping and connected equipment.

PART 3 - EXECUTION

3.01 PIPING APPLICATIONS

A. Hot-water heating piping, aboveground, NPS 2 and smaller, shall be any of the following:

1. Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.

B. Hot-water heating piping, aboveground, NPS 2-1/2 and larger, shall be any of the following:

1. Schedule 40 steel pipe, wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, and welded and flanged joints.

2. Schedule 40 steel pipe; grooved, mechanical joint coupling and fittings; and grooved, mechanical joints (On roof only).

C. Chilled-water piping, aboveground, NPS 2 and smaller, shall be any of the following:

1. Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.

D. Chilled-water piping, aboveground, NPS 2-1/2 and larger, shall be any of the following:

1. Schedule 40 steel pipe, wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, and welded and flanged joints.

2. Schedule 40 steel pipe; grooved, mechanical joint coupling and fittings; and grooved, mechanical joints.

E. Makeup-water piping installed aboveground shall be the following:

1. Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.

F. Condensate-Drain Piping:

1. General Use: Type M, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.

2. Condensing Boiler Condensate-Drain Piping: Schedule 40 CPVC plastic pipe and fittings and solvent-welded joints.

G. Blowdown-Drain Piping: Same materials and joining methods as for piping specified for the service in which blowdown drain is installed.

H. Air-Vent Piping:

1. Inlet: Same as service where installed with metal-to-plastic transition fittings for plastic piping systems according to piping manufacturer's written instructions.
2. Outlet: Type K, annealed-temper copper tubing with soldered or flared joints.

I. Safety-Valve-Inlet and -Outlet Piping for Hot-Water Piping: Same materials and joining methods as for piping specified for the service in which safety valve is installed with metal-to-plastic transition fittings for plastic piping systems according to piping manufacturer's written instructions.

3.02 PIPING INSTALLATIONS

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

E. Install piping to permit valve servicing.

~~F. Install piping at indicated slopes.~~

~~G.~~**F.** Install piping free of sags and bends.

~~H.~~**G.** Install fittings for changes in direction and branch connections.

~~I.~~**H.** Install piping to allow application of insulation.

~~J.~~**I.** Select system components with pressure rating equal to or greater than system operating pressure.

~~K.~~**J.** Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.

~~L.~~**K.** Install drains, consisting of a tee fitting, NPS 3/4 ball valve, and short NPS 3/4 threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.

~~M. Install piping at a uniform grade of 0.2 percent upward in direction of flow.~~

~~N.~~**L.** Reduce pipe sizes using eccentric reducer fitting installed with level side up.

~~O.~~**M.** Install branch connections to mains using mechanically formed tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.

~~P.~~**N.** Install valves according to Section 230523 “General-Duty Valves for HVAC Piping.”

~~Q.~~**O.** Install unions in piping, NPS 2 and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.

~~R.~~**P.** Install flanges in piping, NPS 2-1/2 and larger, at final connections of equipment and elsewhere as indicated.

~~S.~~**Q.** Install shutoff valve immediately upstream of each dielectric fitting.

~~T.~~**R.** Comply with requirements in Section 230516 "Expansion Fittings and Loops for HVAC Piping" for installation of expansion loops, expansion joints, anchors, and pipe alignment guides.

~~U.~~**S.** Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for identifying piping.

~~V.~~**T.** Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."

~~W.~~**U.** Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."

~~X.~~**V.** Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 230518 "Escutcheons for HVAC Piping."

3.03 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric unions.

C. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric flanges.

D. Dielectric Fittings for NPS 5 and Larger: Use dielectric flange kits.

3.04 HANGERS AND SUPPORTS

A. Comply with requirements in Section 230529 "Hangers and Supports for HVAC Piping and Equipment" for hanger, support, and anchor devices. Comply with the following requirements for maximum spacing of supports. Comply with the more stringent requirements of the CMC and this Specification.

B. Comply with requirements in Section 230548 "Vibration and Seismic Controls for HVAC" for seismic restraints.

C. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet long.
2. Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet or longer.
3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet or longer, supported on a trapeze.
4. Spring hangers to support vertical runs.
5. Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.

D. Install hangers for steel piping with the following maximum spacing and minimum rod sizes:

1. NPS 3/4: Maximum span, 7 feet.
2. NPS 1: Maximum span, 7 feet.

3. NPS 1-1/2: Maximum span, 9 feet.
4. NPS 2: Maximum span, 10 feet.
5. NPS 2-1/2: Maximum span, 11 feet.
6. NPS 3 and Larger: Maximum span, 12 feet.

E. Install hangers for drawn-temper copper piping with the following maximum spacing and minimum rod sizes:
1. NPS 3/4: Maximum span, 5 feet; minimum rod size, 3/8 inch.
2. NPS 1: Maximum span, 6 feet; minimum rod size, 3/8 inch.
3. NPS 1-1/4Maximum span, 7 feet; minimum rod size, 3/8 inch.
4. NPS 1-1/2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
5. NPS 2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
6. NPS 2-1/2: Maximum span, 9 feet; minimum rod size, 3/8 inch.
7. NPS 3 and Larger: Maximum span, 10 feet; minimum rod size, 3/8 inch.

F. Support vertical runs at roof, at each floor, and at 10-foot intervals between floors.

3.05 PIPE JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

D. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8/A5.8M.

E. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

F. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.

G. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

H. Grooved Joints: Assemble joints with coupling and gasket, lubricant, and bolts. Cut or roll grooves in ends of pipe based on pipe and coupling manufacturer's written instructions for pipe wall thickness. Use grooved-end fittings and rigid, grooved-end-pipe couplings.

3.06 TERMINAL EQUIPMENT CONNECTIONS

A. Sizes for supply and return piping connections shall be the same as or larger than equipment connections.

B. Install control valves in accessible locations close to connected equipment.

C. Install bypass piping with globe valve around control valve. If parallel control valves are installed, only one bypass is required.

D. Install ports for pressure gages and thermometers at coil inlet and outlet connections. Comply with requirements in Section 230519 "Meters and Gages for HVAC Piping."

3.07 CHEMICAL TREATMENT

A. Install bypass chemical feeders in each hydronic system where indicated.

1. Install in upright position with top of funnel not more than 48 inches above the floor.
2. Install feeder in minimum NPS 3/4 bypass line, from main with full-size, full-port, ball valve in the main between bypass connections.
3. Install NPS 3/4 pipe from chemical feeder drain to nearest equipment drain and include a full-size, full-port, ball valve.

B. Fill system with fresh water and add liquid alkaline compound with emulsifying agents and detergents to remove grease and petroleum products from piping. Circulate solution for a minimum of 24 hours, drain, clean strainer screens, and refill with fresh water.

C. Add initial chemical treatment and maintain water quality in ranges noted above for the first year of operation.

3.08 FIELD QUALITY CONTROL

A. Prepare hydronic piping according to ASME B31.9 and as follows:

1. Leave joints, including welds, uninsulated and exposed for examination during test.
2. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
3. Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens.
4. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
5. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.

B. Perform the following tests on hydronic piping

1. Tests shall be made in the presence of the authority having jurisdiction.
2. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
3. While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
4. Isolate expansion tanks and determine that hydronic system is full of water.
5. Subject piping system to not less than the greater of the following hydrostatic test pressures:
    a. 1.5 times the system's working pressure.
    b. 100 psi.

6. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times the "SE" value in Appendix A in ASME B31.9, "Building Services Piping."
7. After hydrostatic test pressure has been applied for at least four hours, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
8. Prepare written report of testing.

C. Perform the following before operating the system:

1. Open manual valves fully.
2. Inspect pumps for proper rotation.
3. Set makeup pressure-reducing valves for required system pressure.
4. Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
5. Set temperature controls so all coils are calling for full flow.
6. Inspect and set operating temperatures of hydronic equipment, such as boilers, chillers, cooling towers, to specified values.
7. Verify lubrication of motors and bearings.

END OF SECTION

SECTION 23 21 16
HYDRONIC PIPING SPECIALTIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Hydronic specialty valves.
2. Air-control devices.
3. Strainers.
4. Connectors.

B. Related Requirements:

1. Section 230516 "Expansion Fittings and Loops for HVAC Piping" for expansion fittings and loops.
2. Section 230523 "General-Duty Valves for HVAC Piping" for specification and installation requirements for globe valves common to most piping systems.
3. Section 230923 "Direct Digital Control System for HVAC" for automatic control valve and sensor specifications, installation requirements, and locations.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of the following:

1. Hydronic Specialty Valves: Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves.
2. Air-control devices.
3. Strainers.
4. Connectors.

1.03 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For air-control devices, hydronic specialties, and special-duty valves to include in emergency, operation, and maintenance manuals.

1.04 MAINTENANCE MATERIAL SUBMITTALS

A. Differential Pressure Meter: For each type of balancing valve and automatic flow control valve, include flowmeter, probes, hoses, flow charts, and carrying case.

1.05 QUALITY ASSURANCE

A. Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code: Section IX.

1. Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

PART 2 - PRODUCTS

2.01 HYDRONIC SPECIALTY VALVES

A. Bronze, Calibrated-Orifice, Balancing Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
    a. Armstrong Pumps, Inc.
    b. Bell & Gossett; a Xylem brand.
    c. Flow Design, Inc.
    d. Gerand Engineering Co.
    e. Grinnell Mechanical Products.
    f. Griswold Controls.
    g. HCI; Hydronics Components Inc.
    h. Nexus Valve, Inc.
    i. NIBCO INC.
    j. NuTech Hydronic Specialty Products.
    k. Oventrop Corporation.
    l. TACO Comfort Solutions, Inc.
    m. Tour & Andersson; available through Victaulic Company.
    n. Tunstall Corporation.
    o. Victaulic Company.
2. Body: Bronze, ball or plug type with calibrated orifice or venturi.
3. Ball: Brass or stainless steel.
4. Plug: Resin.
5. Seat: PTFE.
6. End Connections: Threaded or socket.
7. Pressure Gage Connections: Integral seals for portable differential pressure meter.
8. Handle Style: Lever, with memory stop to retain set position.
9. CWP Rating: Minimum 125 psig (860 kPa).
10. Maximum Operating Temperature: 250 deg F (121 deg C).

B. Cast-Iron or Steel, Calibrated-Orifice, Balancing Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
    a. Armstrong Pumps, Inc.
    b. Bell & Gossett; a Xylem brand.
    c. Flow Design, Inc.
    d. Gerand Engineering Co.
    e. Grinnell Mechanical Products.

f. Griswold Controls.
g. HCI; Hydronics Components Inc.
h. Nexus Valve, Inc.
i. NIBCO INC.
j. NuTech Hydronic Specialty Products.
k. Oventrop Corporation.
l. TACO Comfort Solutions, Inc.
m. Tour & Andersson; available through Victaulic Company.
n. Tunstall Corporation.
o. Victaulic Company.

2. Body: Cast-iron or steel body, ball, plug, or globe pattern with calibrated orifice or venturi.
3. Ball: Brass or stainless steel.
4. Stem Seals: EPDM O-rings.
5. Disc: Glass and carbon-filled PTFE.
6. Seat: PTFE.
7. End Connections: Flanged or grooved.
8. Pressure Gage Connections: Integral seals for portable differential pressure meter.
9. Handle Style: Lever, with memory stop to retain set position.
10. CWP Rating: Minimum 125 psig (860 kPa).
11. Maximum Operating Temperature: 250 deg F (121 deg C).

C. Diaphragm-Operated, Pressure-Reducing Valves: ASME labeled.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
   a. AMTROL, Inc.
   b. Apollo Valves; Conbraco Industries, Inc.
   c. Armstrong Pumps, Inc.
   d. Bell & Gossett; a Xylem brand.
   e. Spence Engineering Company, Inc.
   f. Watts; a Watts Water Technologies company.
2. Body: Bronze or brass.
3. Disc: Glass and carbon-filled PTFE.
4. Seat: Brass.
5. Stem Seals: EPDM O-rings.
6. Diaphragm: EPT.
7. Low inlet-pressure check valve.
8. Inlet Strainer: <Insert materials>, removable without system shutdown.
9. Valve Seat and Stem: Noncorrosive.

10. Valve Size, Capacity, and Operating Pressure: Selected to suit system in which installed, with operating pressure and capacity factory set and field adjustable.

D. Diaphragm-Operated Safety Valves: ASME labeled.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
    a. AMTROL, Inc.
    b. Apollo Valves; Conbraco Industries, Inc.
    c. Armstrong Pumps, Inc.
    d. Bell & Gossett; a Xylem brand.
    e. Spence Engineering Company, Inc.
    f. Watts; a Watts Water Technologies company.
2. Body: Bronze or brass.
3. Disc: Glass and carbon-filled PTFE.
4. Seat: Brass.
5. Stem Seals: EPDM O-rings.
6. Diaphragm: EPT.
7. Wetted, Internal Work Parts: Brass and rubber.
8. Inlet Strainer: <Insert materials>, removable without system shutdown.
9. Valve Seat and Stem: Noncorrosive.
10. Valve Size, Capacity, and Operating Pressure: Comply with ASME Boiler and Pressure Vessel Code: Section IV, and selected to suit system in which installed, with operating pressure and capacity factory set and field adjustable.

2.02 AIR-CONTROL DEVICES

A. Manual Air Vents:

1. Refer to detail on Drawings.
2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
    a. AMTROL, Inc.
    B. Apollo Valves; Conbraco Industries, Inc.
    c. Armstrong Pumps, Inc.
    d. Bell & Gossett; a Xylem brand.
    e. HCI; Hydronics Components Inc.
    f. Nexus Valve, Inc.
    g. NuTech Hydronic Specialty Products.
    h. TACO Comfort Solutions, Inc.
3. Body: Bronze.
4. Internal Parts: Nonferrous.
5. Operator: Screwdriver or thumbscrew.

6. Inlet Connection: NPS 1/2 (DN 15).
7. Discharge Connection: NPS 1/8.
8. CWP Rating: 150 psig (1035 kPa).
9. Maximum Operating Temperature: 225 deg F (107 deg C).

B. Automatic Air Vents:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
   a. AMTROL, Inc.
   b. Armstrong Pumps, Inc.
   c. Bell & Gossett; a Xylem brand.
   d. Nexus Valve, Inc.
   e. NuTech Hydronic Specialty Products.
   f. Spirotherm, Inc.
   g. TACO Comfort Solutions, Inc.
2. Body: Bronze or cast iron.
3. Internal Parts: Nonferrous.
4. Operator: Noncorrosive metal float.
5. Inlet Connection: NPS 1/2 (DN 15).
6. Discharge Connection: NPS 1/4 (DN 8).
7. CWP Rating: 150 psig (1035 kPa).
8. Maximum Operating Temperature: 240 deg F (116 deg C).

C. Bladder-Type Expansion Tanks:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
   a. AMTROL, Inc.
   b. Armstrong Pumps, Inc.
   c. Bell & Gossett; a Xylem brand.
   d. Flo Fab.
   e. TACO Comfort Solutions, Inc.
2. Tank: Welded steel, rated for 125-psig (860-kPa) working pressure and 375 deg F (191 deg C) maximum operating temperature. Factory test after taps are fabricated and supports installed and are labeled according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
3. Bladder: Securely sealed into tank to separate air charge from system water to maintain required expansion capacity.
4. Air-Charge Fittings: Schrader valve, stainless steel with EPDM seats.

D. Tangential-Type Air Separators:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

a. AMTROL, Inc.

b. Armstrong Pumps, Inc.

c. Bell & Gossett; a Xylem brand.

d. TACO Comfort Solutions, Inc.

2. Tank: Welded steel; ASME constructed and labeled for 125-psig (860-kPa) minimum working pressure and 375 deg F (191 deg C) maximum operating temperature.

3. Air Collector Tube: Perforated stainless steel, constructed to direct released air into expansion tank.

4. Tangential Inlet and Outlet Connections: Threaded for NPS 2 (DN 50) and smaller; flanged connections for NPS 2-1/2 (DN 65) and larger.

5. Blowdown Connection: Threaded.

6. Size: Match system flow capacity.

E. Air Purgers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

a. AMTROL, Inc.

b. Armstrong Pumps, Inc.

c. Bell & Gossett; a Xylem brand.

d. TACO Comfort Solutions.

2. Body: Cast iron with internal baffles that slow the water velocity to separate the air from solution and divert it to the vent for quick removal.

3. Maximum Working Pressure: 150 psig (1035 kPa).

4. Maximum Operating Temperature: 250 deg F (121 deg C).

2.03 STRAINERS

A. Y-Pattern Strainers:

1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.

2. End Connections: Threaded ends for NPS 2 (DN 50) and smaller; flanged ends for NPS 2-1/2 (DN 65) and larger.

3. Strainer Screen: Stainless-steel, [20] [40] [60]-mesh strainer, or perforated stainless-steel basket.

4. CWP Rating: 125 psig (860 kPa).

B. Basket Strainers:

1. Body: ASTM A 126, Class B, high-tensile cast iron with bolted cover and bottom drain connection.

2. End Connections: Threaded ends for NPS 2 (DN 50) and smaller; flanged ends for NPS 2-1/2 (DN 65) and larger.

3. Strainer Screen: [40] [60]-mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.

4. CWP Rating: 125 psig (860 kPa).

C. T-Pattern Strainers:

1. Body: Ductile or malleable iron with removable access coupling and end cap for strainer maintenance.
2. End Connections: Grooved ends.
3. Strainer Screen: [40] [60]-mesh startup strainer, and perforated stainless-steel basket with 57 percent free area.
4. CWP Rating: 750 psig (5170 kPa).

2.04 CONNECTORS

A. Stainless-Steel Bellow, Flexible Connectors:

1. Body: Stainless-steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket.
2. End Connections: Threaded or flanged to match equipment connected.
3. Performance: Capable of 3/4-inch (20-mm) misalignment.
4. CWP Rating: 150 psig (1035 kPa).
5. Maximum Operating Temperature: 250 deg F (121 deg C).

B. Spherical, Rubber, Flexible Connectors:

1. Body: Fiber-reinforced rubber body.
2. End Connections: Steel flanges drilled to align with Classes 150 and 300 steel flanges.
3. Performance: Capable of misalignment.
4. CWP Rating: 150 psig (1035 kPa).
5. Maximum Operating Temperature: 250 deg F (121 deg C).

PART 3 - EXECUTION

3.01 VALVE APPLICATIONS

A. Install shutoff-duty valves at each branch connection to supply mains and at supply connection to each piece of equipment.

B. Install calibrated-orifice, balancing valves at each branch connection to return main.

C. Install calibrated-orifice, balancing valves in the return pipe of each heating or cooling terminal.

D. Install check valves at each pump discharge and elsewhere as required to control flow direction.

E. Install safety valves at hot-water generators and elsewhere as required by ASME Boiler and Pressure Vessel Code. Install drip-pan elbow on safety-valve outlet and pipe without valves to the outdoors; pipe drain to nearest floor drain or as indicated on Drawings. Comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1, for installation requirements.

F. Install pressure-reducing valves at makeup-water connection to regulate system fill pressure.

3.02 HYDRONIC SPECIALTIES INSTALLATION

A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting **and drainage**.

B. Install automatic air vents at high points of system piping in mechanical equipment rooms only. Install manual vents at heat-transfer coils, where piping cannot be installed with the required grade, and elsewhere as required for air venting. Refer to Section 232113, Hydronic Piping, for pipe grading requirements.

C. Install piping from boiler air outlet, air separator, or air purger to expansion tank with a 2 percent upward slope toward tank.

D. Install tangential air separator in pump suction. Install blowdown piping with gate or full-port ball valve; extend full size to nearest floor drain.

E. Install expansion tanks above the air separator. Install tank fitting in tank bottom and charge tank. Use manual vent for initial fill to establish proper water level in tank.

   1. Install tank fittings that are shipped loose.

   2. Support tank from floor or structure above with sufficient strength to carry weight of tank, piping connections, fittings, plus tank full of water. Do not overload building components and structural members.

F. Install expansion tanks where shown on Drawings. Vent and purge air from hydronic system, and ensure that tank is properly charged with air to suit system Project requirements.

END OF SECTION