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Addendum #2

Project Name:	Nebraska Innovation Campus - 4H Building Renovation & NIC Office Building.
Project No.:	11053
Issued:	November 13, 2012
Bid Date:	**Tuesday**, November **20th,** 2012
Bid Opening:	2:00pm – Private Opening
Location:	728 Q Street Suite C, Lincoln, NE 68508

This Addendum is issued to all known bidders before receipt of proposals. This Addendum is to authorize the use of the following information in preparing proposals for the above named project. The bidder **must** enter the number of this Addendum on the **Proposal Sheet.**

GENERAL CLARIFICATIONS

ADD 2-1. A list of plan holders as of this date can be found at A & D Technical Supply, http://www.adtechplans.com

ADD 2-2. Bid Date indicated in Addendum #1: Change the day from Thursday to Tuesday. The date, November 20th is correct.

ADD 2-3. Geotechnical Engineering Report has been included with this addendum.

ADD 2-4. Wood Grain Direction: The wood grain designation indicated in various details does not reflect the design intent. Grain on wood panels is to have a vertical orientation.

MODIFICATIONS TO THE DRAWINGS

ADD 2-5. COVER SHEET

a. Refer to the Index of Drawings, Sheet S102CD; Change the title of the sheet to First Floor Framing.
b. Refer to the Index of Drawings, Sheet S103CD; Change the title of the sheet to Second Floor Framing.

ADD 2-6. DRAWING AS100

a. Refer to the Plaza east of Link Building Area C; Square Area Drain location symbols should be moved to inside circular landscape elements and centered on elevation points 1153.00 shown. Coordinate with Civil Drawings C301.

ADD 2-7. DRAWING A101A

a. Refer to Breakout 112.1: The dimension from grid e10 to new stud wall at column eD.2 is to change from 11 3/8" to 1'-3".
b. Refer to Pre-Function 109: Interior elevation reference D4/A510 is not used, disregard.
c. Refer to enlarged plan M10/A101A: See attachment M10/A101A for new layout at exterior wall.
a. Refer to section A6: Modify section as shown in the attached partial detail A6/A300. Change stud framing from 6", to 8", 18 ga. steel studs at 16" o.c. to the underside of the existing steel bar joists. See attachment A6/A300.

ADD 2-8. DRAWING A102A

a. In Auditorium 219, Pre-function 210 and Pre-function 212, at each of the recesses at the structural columns, the Stretched-Fabric Wall system finish is to extend into the recess and stop at the inside corners of the recess. The back wall of the recess is to receive a paint finish.

ADD 2-9. DRAWING A104

a. The roof assembly indicates 3/4 inch tongue and groove plywood over the top of the existing roof sheathing. The tongue and groove plywood is to be screwed to the wood blocking embedded in the top chord of the bar joists. All subsequent layers of roofing are to be fastened to the new 3/4 inch roof sheathing and does not need to correlate with the existing bar joists.

b. In each of the corners of the lower roof area of the 4h Building, the existing roof structure / deck, is warped and does not form a true hip. The new layers of roof sheathing are to be scored to allow them to conform to the roof surface. The upper roof is structured as a true hip.

ADD 2-10. DRAWING A107

a. Door frame types coordinated. See attached sketch A107 – Door Schedule.

ADD 2-11. DRAWING A200

a. Refer to exterior South Elevation L1: Add aluminum window frame type AW-11 east of grid e7 and west of mechanical louvers. See attachment G1/A500

ADD 2-12. DRAWING A300

a. Refer to section A1: Replace with attached detail A1/A300.

ADD 2-13. DRAWING A301

a. Revised entrance overhang, see attached sketch A1/A301.

ADD 2-14. DRAWING A304

a. Added drawing G9/A304, section through ramp on the Second Level of the Link Corridor. Added keynote 054000.F. See attached sketch G9/A304.

ADD 2-15. DRAWING A351

a. Refer to enlarged stair plan M14 & J14: Provide handrail along exterior wall and extend 12” past bottom riser and return to wall. Handrail along interior wall to extend 1’-11” past bottom riser and return to wall. Provide 42” guardrail along portions of exterior wall at window locations with 4” maximum picket spacing. Refer to typical guardrail details.

b. Refer to enlarged stair plans M9 & J9: The stainless steel decorative railing/guardrail and the handrails are extend 2’-0” past top riser and 2’-0” past bottom riser. Center illuminated decorative handrail shall extend 2’-0” past top riser and 2’-0” past bottom riser, return to floor.

c. Refer to enlarged stair plan M1: Handrails shall extend 1’-11” past bottom riser at mid-landing. Handrail to extend 12” past top riser at top of stair.

d. Refer to enlarged stair plan J1: Handrails shall extend 1’-11” past bottom riser at bottom of stair along exterior sides of stair. Center handrail to extend 12” past top riser at top of stair and mid-landing

ADD 2-16. DRAWING A352

a. Refer to enlarged plan M1: Provide typical guardrail as drawn and noted elsewhere on Sheet A352, at exposed slab edges of mechanical mezzanine as shown in stair section F1/A352. Extend handrails 12” past top riser.

ADD 2-17. DRAWING A356

a. Added section detail tag and modified outline of bench under Stair A.

ADD 2-18. DRAWING A400

a. Refer to Detail N13/A400. This detail was to indicate a different condition from the typical condition shown in Detail N16/A400. In the areas of the "Grand Arches" there is to be a reglet installed into the bed joint of the limestone coping with counterflashing to flash over the EPDM flashing which extends up the parapet wall. There are five such locations and each extends the width of one structural bay.

ADD 2-19. DRAWING A405

a. Added detail A7/A405, plan detail of wood paneling at Elevator Lobbies in the NIC building. See attached sketch.
b. Added A8/A405, plan detail of wood paneling transition to tile at Elevator Lobbies in the NIC building. See attached sketch.
c. Added detail D7/A405, plan detail of recessed light fixture in tile at Restrooms in both the NIC building and 4H building. See attached sketch.
d. Modified detail K10/A405, plan detail of recessed light fixture in wood paneling at NIC elevator lobbies. See attached sketch.
e. Modified detail G10/A405 to coordinate with wood paneling. See attached sketch.
f. Modified detail D10/A405 to coordinate with adjacent tile. See attached sketch.
g. Added detail G7/A405, typical section detail of outside corner tile transition. See attached sketch G7/A405.
h. Added detail A3/A405, section detail of bench between ramp and stair on the second level of the Link Corridor. Added keynote 057300.J. See attached sketch A3/A405.

ADD 2-20. DRAWING A500

a. Refer to Aluminum Frame Types AL-04 and AL-05: See AL-06 for Horizontal dimensional constraints of vertical mullions.

ADD 2-21. DRAWING A511

a. Refer to interior elevation A7: Joints between the fabric wall panels on the south side of Auditorium 219 are to have the same vertical joint pattern as indicated in interior elevation A1/A511.

ADD 2-22. DRAWING A512

a. Adjusted tile pattern to coordinate with 5'-0" recessed light fixture in Restrooms, Area D. See attached sketch A10/A512.
b. Modified keynotes, notes, and added detail section of bench between ramp and stair in Link. See attached sketch N5/A512.
c. Modified keynotes and added detail section of bench between ramp and stair in Link. See attached sketch F1/A512.

ADD 2-23. DRAWING A513

a. G16/A513, modified joint pattern in wood paneling. Added detail tags. See attached sketch.
b. D1/A513, modified joint pattern in wood paneling. Added detail tags. See attached sketch.
c. Added interior elevation G12/A513 of future typical tenant entrance. See attached sketch.

ADD 2-24. DRAWING A600

a. Refer to section detail K7: Replace keynote xxxxxx with 061600.D3 "3/4" x 1 ½" HARDWOOD TRIM – STAIN FINISH"

ADD 2-25. DRAWING S001AB

a. Refer to Details 5 and 6: Change the note “crushed concrete bed” to “Drainage Course”.

b. Refer to Details 5 and 6: The note referring to vapor. Change the note to read: Install the vapor barrier directly below the concrete slab, on top of the drainage course.

ADD 2-26. DRAWING S001CD

a. Refer to Details 8 and 9: Change the note “crushed concrete bed” to “Drainage Course”.

b. Refer to Details 8 and 9: The note referring to vapor. Change the note to read: Install the vapor barrier directly below the concrete slab, on top of the drainage course.

ADD 2-27. DRAWING S001CD

a. See attached sketch S9. Note revisions to schedule.

ADD 2-28. DRAWING S101CD

a. Refer to attached drawing sheet S101CD. Note revisions to the foundations at the south end of area C. Note that pad footings located at grid locations B-2 and E-3 have been lowered to 98'-0". Note that pad footings at grid locations B-3, B-6, and E-7 have been lowered to 98'-6". Note that grade beam step located on grid A near grid 4 has been re-located to south of grid location A-1. Note that pad footing located at grid location C-4 has been lowered to 96'-0" and a 24"x24" concrete pier has been added. Note that concrete piers have been added at grid locations A-1, A-2, and A-3. Change detail mark 6/S501CD located near grid location A-1 to 7/S501CD. Change detail mark 11/S501CD located near grid location A-3 to 12/S501CD.

ADD 2-29. DRAWING S102CD

a. Refer to attached drawing sheet S102CD. Note revisions to lower roof framing at area C. Note additional information for ramp at Area C.

ADD 2-30. DRAWING S103A

a. The notes on the drawing concerning the removal of existing bridging members and the notes indicating adding steel members to the existing bridging members shall apply at grid eC and eD.

b. Revise the notes concerning the addition of new steel members to read as follows: WELD HSS4X4X1/4 TUBE TO THE TOP HORIZONTAL BRIDGING MEMBER AND WELD C8X11.5 TO THE BOTTOM BRIDGING MEMBER ON THE (EAST/WEST) SIDE OF THE EXISTING TRUSS.

ADD 2-31. DRAWING S103CD

a. Refer to attached drawing sheet S103CD. Note revisions to upper roof framing at Area C.

ADD 2-32. DRAWING S104CD

a. Refer to attached drawing sheet S104CD. Note revisions to the spot elevations. Note revisions to the penthouse floor framing at the west stairs.

ADD 2-33. DRAWING S105CD

a. Refer to attached drawing sheet S105CD. Note revisions to the spot elevations.

ADD 2-34. DRAWING S304CD

a. See attached Sketch S7. Note revisions to detail. See architectural for more information.

ADD 2-35. DRAWING S502AB

a. See detail 8. Beams CB123, CB124, CB125, CB126, CB127 shall be 41" wide x 26" deep.

b. See detail 9 and 10. Beams CB101, CB102, CB104, CB105, CB106, CB107, CB109, CB110, CB111, CB112, CB114, CB115, CB116, CB117, CB119, CB120 shall be 20" wide x 32" deep. Beams CB103, CB108, CB113, CB118 shall be 20" wide x 24" deep.

ADD 2-36. DRAWING S502CD

a. See attached Sketch S8. Note revisions to detail. See architectural for more information.

ADD 2-37. DRAWING S503CD

a. See attached Sketch S10. This is a new detail indicating attachment of columns for screen wall around cooling tower.

b. See attached Sketch S13. This is a new detail indicating the roof support at the south end of area C. This is typical for the lower and upper roof.

c. See attached Sketch S14. This is a new detail indicating the floor support at the south end of area C.

ADD 2-38. DRAWING S504AB

a. See attached sketch S15. This is a new detail indicating the existing bridging members to be removed at grid eD between grids e13 and e14. This detail will apply at grid eC between grids e13 and e14. The existing framing members are arranged in a similar fashion, but are not the same as those at grid eD. Dimensions and actual existing members will need to be verified in the field at both locations.

ADD 2-39. DRAWING S504CD

a. See attached Sketch S11. Note revisions to the detail for connecting the beam to the column.

b. See attached Sketch S12. Note additional information (grate note, detail mark) added to the detail and revisions to the dimensions. The sketch is on 11x17 paper and was plotted to fit on the 11x17 paper.

c. See attached Sketch S16. Note dimension revisions and revisions to beam size.

ADD 2-40. DRAWING M101A

a. Add three (3) 22x10 smoke dampers, one to each 22x10 transfer air duct from Breakout Rooms 110.1, 110.2 and 110.3 to Pre-Function 109.

ADD 2-41. DRAWING M101C

a. In NIC LINK 1101, relocate VAV-1101B sensor south of Column Line M next to egress door to maintain clear surface on West display wall of NIC LINK 1101.

ADD 2-42. DRAWING – VARIOUS ELECTRICAL DRAWINGS

a. Remove the keyed note associated with light fixtures configured for 'security lighting' for fixtures in the following rooms: 101, 108, 123A, 125A, 128, 132, 201, 208, 220, 222, 225, 226, 227, 1101, 1205, 1210, 2101, 2102, 2205, 2210, 3205, 3210, 4210.

ADD 2-43. DRAWING – VARIOUS ELECTRICAL DRAWINGS

a. All Type S1 light fixtures (stairwell wall fixtures) shall be mounted at 108" AFF.

ADD 2-44. DRAWING E101A

a. Replace last sentence of keyed note 8 with the following: "VERTICAL COVE LIGHTING IN THE BREAKOUT ROOM BULKHEADS SHALL BE TYPE M12 LIGHT FIXTURES, MOUNT BOTTOM EDGE OF FIXTURE 8" AFF."

b. See **Attachment E101A.1** for revised partial plan view.

ADD 2-45. DRAWING E101B

a. See **Attachment E101B.1** for revised partial plan view.

ADD 2-46. DRAWING E101C

a. See **Attachment E101C.2** for revised partial plan view.

b. Refer to keyed note 7; revise the fixture allowance from "$500" to "$2000".

ADD 2-47. DRAWING E101D

a. Delete the Type S1 fixture located on the north wall of Stair 1205.

ADD 2-48. DRAWING E102A

a. See **Attachment E102A.1** for revised partial plan view.

ADD 2-49. DRAWING E104A

a. Replace keyed note 23 with keyed note 27 at the two wall junction boxes shown on the east wall of Room Aud. Floor 131.

b. Replace keyed note 29 with keyed note 23 at the junction box on the east side of Room Aud. Floor 131, immediately adjacent to the receptacle circuited to UNL-L1-41.

c. Delete keyed note 29 in its entirety.

e. Provide a new keyed note 31. Keyed note to read as follows:

Provide necessary relay device for the power and control of smoke damper by the fire alarm system. Circuit to the fire alarm system. Damper not shown on this sheet, coordinate with mechanical for precise location of the damper.

d. Provide a keyed note 31 at breakout room doors 110.1A, 110.1B, 110.1C.

ADD 2-50. DRAWING E401

a. Refer to Plan 2; adjust the location of the wall mounted fire alarm speaker strobe and the video security camera FC-21. Relocate these devices to the north wall of the room, adjacent to Door 1103.2, on the west side of the door opening.

b. Refer to Plans 4 and 6; see **Attachment E401.1** for revised plan views.

ADD 2-51. DRAWING E504

a. Refer to Detail 1, add the following sentence to keyed note 6: In addition to the fiber conduit between equipment racks, provide two (2) 2" spare conduits for use by the AV and the controls contractor. Route these conduits with the fiber conduit as much as possible.

ADD 2-52. DRAWING E505

a. Refer to Detail 3, add keyed note 10. Keyed note 10 to read "Camera located in the elevator cab. Coordinate installation of camera in elevator cab and required camera cable in the elevator traveler cable with the elevator supplier."

ADD 2-53. DRAWING E505

a. Refer to Detail 3; add keyed note 10 to cameras FC-29, FC-30, FC-31, FC-32.

ADD 2-54. DRAWING E601

a. Provide a keyed note 12 adjacent to panels EQ-NBL1, EQ-NBL2, EQ-NBL3. These panels require surge protection device.

ADD 2-55. DRAWING E604

a. On the Lighting Fixture Schedule, replace the schedule with the schedule attached with this addendum, **see Attachment E604.2.**

ADD 2-56. DRAWING ES101

a. Refer to Plan 1; see **Attachment ES101.2** for revised plan view showing adjusted light pole locations in the parking lot and the revised PIV location near the generator.

MODIFICATIONS TO THE SPECIFICATIONS

ADD 2-57. SECTION 008000- SUPPLEMENTARY GENERAL CONDITIONS

a. Refer to article 13.13. FEES FOR TESTS AND SPECIAL INSPECTIONS, in 13.13.1 delete the first two sentences and add the following: "The Contractor shall employ the services of a special inspection consultant. All independent testing and special inspection consultants shall be approved by the Contractor and Owner. Costs will be paid for by the Contractor."

ADD 2-58. SECTION 012300- ALTERNATES

a. Refer to the List of Alternates Issued In Addendum Number One: Allowance No. 2, Quality Control Testing. The intent is that this allowance will be used in the case where testing is required and is not **already** specified. The Contractor is responsible for testing already specified in Divisions 02 through 49.

ADD 2-59. SECTION 012300- ALTERNATES

a. Refer to article 3.1 SCHEDULE OF ALTERNATES, paragraphs G and H. The description of Alternates 7 and 8 make reference to sheets A405 and A406. Those should refer to sheet A401.

ADD 2-60. SECTION 012300- ALTERNATES

a. Refer to article 3.1 SCHEDULE OF ALTERNATES, paragraphs G and H. The description of Alternates 7 and 8 make reference to specification section 057000. There are also components of the Sun Shades and Canopy that are specified in other specification sections. See the keynotes on the details issued in Addendum #01.

ADD 2-61. SECTION 033000- CAST-IN-PLACE CONCRETE

a. Refer to article 2.7.A.1. Barrier-Bac VB-250 is approved as a manufacturer/product.

ADD 2-62. SECTION 033000- CAST-IN-PLACE CONCRETE

a. Refer to article 2.7.A.1. Viper VaporCheck II is approved as a manufacturer/product

ADD 2-63. SECTION 064023- INTERIOR ARCHITECTURAL WOODWORK

a. Add article 2.9 to this section. See attachment 064023-1.

ADD 2-64. SECTION 074213- METAL WALL PANELS

a. Refer to Article 2.4 CONCEALED-FASTENER, LAP-SEAM METAL WALL PANELS, Paragraph B.2: Clarification, the thickness of the galvanized steel sheet is to be 22 gauge.

b. Refer to Article 2.5 EXPOSED-FASTENER, LAP-SEAM METAL WALL PANELS, Paragraph B.2: Clarification, the thickness of the galvanized steel sheet is to be 22 gauge

ADD 2-65. SECTION 089000- LOUVERS AND VENTS

a. Refer to article 2.3.A.1. Pottorff is approved as a manufacturer.

ADD 2-66. SECTION 092401- POLYMER BASED DIRECT APPLIED EXTERIOR FINISH SYSTEM

a. Refer to article 2.2.G.2. Z-Reveal Molding Trim Unit: Add Gordon, Final Forms I – 810-5/8" as approved as a manufacturer/product

ADD 2-67. SECTION 092900- GYPSUM BOARD

a. Refer to article 2.5.A.3. Trim Accessories: Add Gordon, Final Forms II-FD 5815 as approved as a manufacturer/product

ADD 2-68. SECTION 095113- ACOUSTICAL PANEL CEILINGS

a. Refer to article 2.6.A., Metal Edge Molding and Trim: Add Gordon Contura as approved as a manufacturer/product.

ADD 2-69. SECTION 097713- STRETCHED – FABRIC WALL SYSTEMS

a. Refer to article 2.1.A., Manufacturers: Add Whisper Walls as an approved manufacturer.

ADD 2-70. SECTION 102113- TOILET COMPARTMENTS

a. Refer to article 2.2.A. Hadrian is approved as a manufacturer.

ADD 2-71. SECTION - VARIOUS MECHANICAL SPECIFICATIONS

a. The following manufacturers have received prior approval for the sections listed for bidding purposes subject to shop drawing review:

1) 221119 – Domestic Water Piping Specialties (Mixing Valves)	Lawler
2) 221123 – Domestic Water Pumps	Armstrong
3) 232113 – Hydronic Piping (Air Control Devices)	Armstrong, Patterson
4) 232113 – Hydronic Piping (Air/Dirt Separators)	Wessels
5) 232123 – Hydronic Pumps	Armstrong, Patterson
6) 233113 – Metal Ducts (Single and Double Wall Round)	LA Pine Metal, Norlock
7) 233300 – Air Duct Accessories (Dampers)	NCA Manuf, United Enertech
8) 233413 – Axial HVAC Fans	ACME, PennBarry
9) 233423 – HVAC Power Ventilators	ACME, PennBarry
10) 235700 – Heat Exchangers for HVAC	Armstrong, Mueller, Plate Concepts
11) 238239.16 – Propeller Unit Heaters	Markel, Vulcan, Rittling, Sigma

ADD 2-72. SECTION 237313 – MODULAR INDOOR CENTRAL-STATION AIR-HANDLING UNITS

a. Refer to Paragraph 2.2.A.4, revise to read, “Leakage shall not exceed Class 6 per ASHRAE 111 at +/-8 inches w.g. and air leakage must be less than 1% at +/-8.

ADD 2-73. SECTION - VARIOUS ELECTRICAL SPECIFICATIONS

a. The following manufacturers have received prior approval for the sections listed for bidding purposes subject to shop drawing review:

1) 263213 – Engine Generators	Generac
2) 264313 – Surge Protective Devices (SPD)	APT, Inc.
3) 271300 – Communications Backbone Cabling (UTP Cabling Hardware, Optical-Fiber Cable Hardware)	Legrand Ortronics
4) 271500 – Communications Horizontal Cabling (UTP Cabling Hardware)	Legrand Ortronics
5) 283111 – Digital, Addressable Fire-alarm System	Edwards

ADD 2-74. SECTION 260519 – LOW-VOLTAGE ELEC POWER CONDUCTORS AND CABLES

a. Refer to Paragraph 3.1.A, replace the first sentence as follows: Service Entrance: Unless specifically noted on the Feeder Schedule on Sheet E601, provide copper for service entrance rated smaller than 600 amps; copper or aluminum for service entrances rated 600 amps and larger.

ADD 2-75. SECTION 260519 – LOW-VOLTAGE ELEC POWER CONDUCTORS AND CABLES

a. Refer to Paragraph 3.1.B, replace the first sentence as follows: Feeders: Unless specifically noted on the Feeder Schedule on Sheet E601, provide copper for feeders rated smaller than 600 amps; copper or aluminum for feeders rated 600 amps and larger.

ADD 2-1. SECTION 264113 – LIGHTNING PROTECTION FOR STRUCTURES

a. Delete Section 264113 in its entirety. There is no lightning protection system on the project.

ADD 2-2. SECTION 271300 – COMMUNICATIONS BACKBONE CABLING

a. Refer to Paragraph 2.6.C, add the following sentence: Provide four (4) fiber patch cords per equipment rack.

ADD 2-3. SECTION 271500 – COMMUNICATIONS HORIZONTAL CABLING

a. Refer to Paragraph 2.5.G, add the following item:

1. Provide twenty-four (24) CAT 6 patch cords per equipment rack.

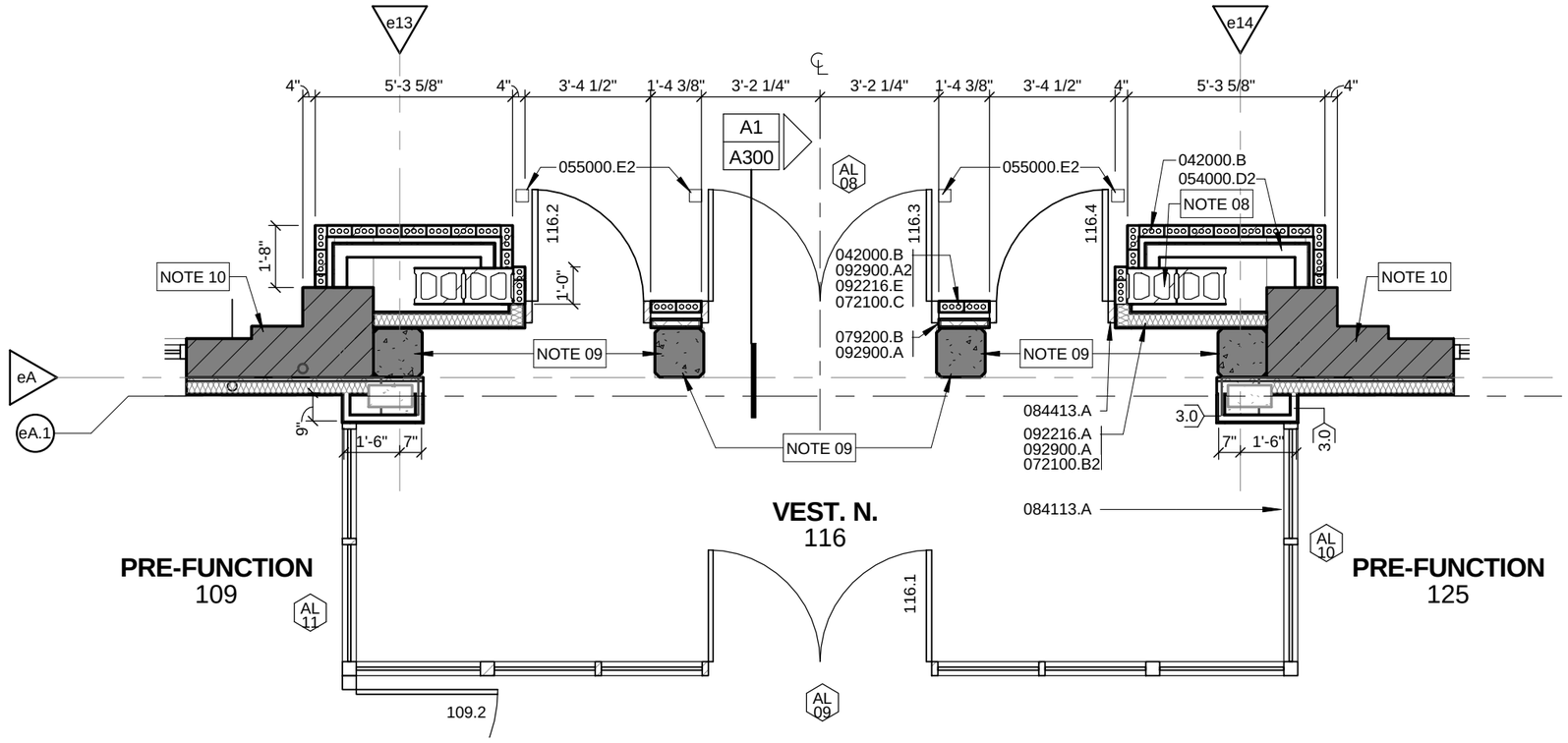
ADD 2-4. SECTION 283111 – DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

a. Delete all references to a 'system printer'. No printer is required with the fire alarm system.

ADD 2-5. SECTION 283111 – DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

a. Refer to Paragraph 1.3.A.1, replace the second sentence of the paragraph with the following: Provide a one back up amplifier capable of backing up any single amplifier failure.

End of Addendum #2



M10	ENLARGED PLAN
SCALE: 1/4" = 1'-0"	AREA A - PLAZA SIDE ENTRY VESTIBULE - NEW ENTRY FACADE OVER PREVIOUSLY DEMOLISHED BUILDING CONNECTION

NEW SHEET NOTES FOR DETAIL M10/A101A

NOTE 08 12" CMU REINFORCED ARCH SUPPORT WALL UP TO SPRING LINE OF NEW MASONRY ARCH. TIE WALL INTO NEW TRENCH FOOTING.

NOTE 09 FIELD VERIFY ALL DIMENSIONS ASSOCIATED WITH EXISTING CAST IN PLACE ARCHED OPENINGS TO REMAIN. APPLY PAINTABLE SEALANT AT INTERSECTION OF ALL NEW SURFACE MATERIALS TO EXISTING CONCRETE.

NOTE 10 EXISTING MASONRY EXTERIOR WALL. FIELD VERIFICATION OF DIMENSIONS AND CORRECTION OF DAMAGED CONDITION OF EXISTING WALLS REQUIRED AT OPENINGS, TYP.

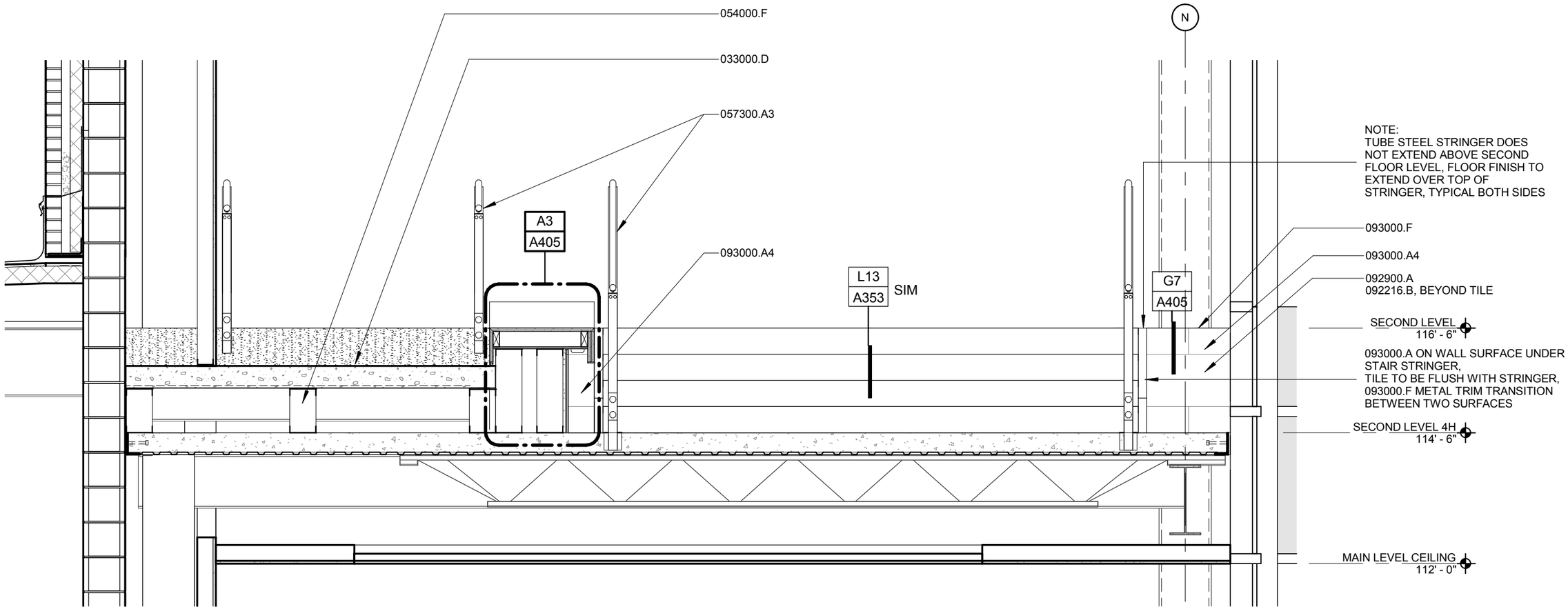
DOOR SCHEDULE											
			DOOR			FRAME			Hdwr.		
Door No.	Door Size	F.R.	Elev.	Mat'l	Fin.	Type	Mat'l	Fin.	Set	NOTES	Door No.
MAIN LEVEL											
1100.1	PAIR 3'-0" x 8'-0"		FG	AL	HPOF	AL-	AL	HPOF	1		1100.1
1100.2	PAIR 3'-0" x 8'-0"		FG	AL	HPOF	AL-	AL	HPOF	2		1100.2
1102.1	3'-6" x 8'-0"		N	WD	STN	HM	HM	PNT	37		1102.1
1102.2	PAIR 3'-0" X 8'-0"		N	HM	PNT	HM-01A	HM	PNT	36		1102.2
1103.1	3'-0" x 7'-0"		N	HM	PNT	HM-01	HM	PNT	34		1103.1
1103.2	3'-0" x 7'-0"		N	HM	PNT	HM-01	HM	PNT	56		1103.2
1103.3	3'-0" x 8'-0"		N	HM	PNT	HM-01A	HM	PNT	35		1103.3
1104	3'-0" x 7'-0"		N	HM	PNT	HM-01	HM	PNT	15		1104
1105	3'-0" x 7'-0"		F	HM	PNT	HM-01	HM	PNT	52		1105
1106	PAIR 3'-6" x 8'-0"		F	HM	PNT	HM-01A	HM	PNT	38		1106
1200	PAIR 3'-0" x 8'-0"		FG	AL	HPOF	AL-	AL	HPOF	39		1200
1203.1	PAIR 3'-0" x 8'-0"		FG	AL	HPOF	AL-	AL	AL	2		1203.1
1203.2	PAIR 3'-0" x 8'-0"		FG	AL	HPOF	AL-	AL	AL	1		1203.2
1205	3'-0" x 8'-0"	90 MIN	N	HM	PNT	HM-01	HM	PNT	44		1205
1206	3'-0" x 8'-0"	90 MIN	N	HM	PNT	HM-01	HM	PNT	45		1206
1207	2'-8" x 8'-0"		F	HM	PNT	HM-01	HM	PNT	41		1207
1208	3'-0" x 8'-0"		F	WD	STN	HM-01	HM	PNT	42		1208
1209	3'-0" x 8'-0"		N	HM	PNT	HM-01	HM	PNT	43		1209
1210	3'-0" x 8'-0"	90 MIN	N	WD	STN	HM-01	HM	PNT	44		1210
1211	3'-0" x 8'-0"		F	HM	PNT	HM-01A	HM	PNT	46		1211
1212	3'-0" x 8'-0"		F	WD	STN	HM-01	HM	PNT	40		1212
1213	3'-0" x 8'-0"		F	WD	STN	HM-01	HM	PNT	40		1213
1220.1	PAIR 3'-0" x 8'-0"		FG	WD	STN	HM-04	HM	PNT	48		1220.1
1230.1	PAIR 3'-0" x 8'-0"		FG	WD	STN	HM-04	HM	PNT	47		1230.1
1230.2	3'-0" x 8'-0"		N	WD	STN	HM-01	HM	PNT	49		1230.2
1230.3	PAIR 3'-0" x 8'-0"		FG	WD	STN	HM-04	HM	PNT	47		1230.3
1240	PAIR 3'-0" x 8'-0"		FG	WD	STN	HM-04	HM	PNT	48		1240

DOOR SCHEDULE											
			DOOR			FRAME			Hdwr.		
Door No.	Door Size	F.R.	Elev.	Mat'l	Fin.	Type	Mat'l	Fin.	Set	NOTES	Door No.
SECOND LEVEL											
2100	3'-0" x 8'-0"		FG	AL	HPOF	AL-	AL	HPOF	60		2100
2101	PAIR 3'-0" x 8'-0"		FG	AL	HPOF	AL-	AL	HPOF	39		2101
2102	3'-0" x 8'-0"	90 MIN	N	WD	STN	HM-01	HM	PNT	55		2102
2205	3'-0" x 8'-0"	90 MIN	N	WD	STN	HM-01	HM	PNT	44		2205
2208	3'-0" x 8'-0"		F	WD	STN	HM-01	HM	PNT	42		2208
2209	3'-0" x 8'-0"		N	HM	PNT	HM-01	HM	PNT	43		2209
2210	3'-0" x 8'-0"	90 MIN	N	WD	STN	HM-01	HM	PNT	44		2210
2211	3'-0" x 8'-0"		F	WD	STN	HM-01	HM	PNT	41		2211
2213	3'-0" x 8'-0"		F	WD	STN	HM-01	HM	PNT	40		2213
2214	3'-0" x 8'-0"		F	WD	STN	HM-01	HM	PNT	40		2214

DOOR SCHEDULE											
			DOOR			FRAME			Hdwr.		
Door No.	Door Size	F.R.	Elev.	Mat'l	Fin.	Type	Mat'l	Fin.	Set	NOTES	Door No.
THIRD LEVEL											
3205.1	3'-0" x 8'-0"	90 MIN	N	WD	STN	HM-01	HM	PNT	44		3205.1
3208	3'-0" x 8'-0"		F	WD	STN	HM-01	HM	PNT	42		3208
3209	3'-0" x 8'-0"		N	HM	PNT	HM-01	HM	PNT	43		3209
3210.1	3'-0" x 8'-0"	90 MIN	N	WD	STN	HM-01	HM	PNT	44		3210.1
3211	3'-0" x 8'-0"		F	WD	STN	HM-01	HM	PNT	41		3211
3213	3'-0" x 8'-0"		F	WD	STN	HM-01	HM	PNT	40		3213
3214	3'-0" x 8'-0"		F	WD	STN	HM-01	HM	PNT	40		3214

DOOR SCHEDULE											
			DOOR			FRAME			Hdwr.		
Door No.	Door Size	F.R.	Elev.	Mat'l	Fin.	Type	Mat'l	Fin.	Set	NOTES	Door No.
PENTHOUSE LEVEL											
4206.1	3'-0" x 7'-0"		N	HM	PNT	HM-01	HM	PNT	51		4206.1
4206.2	3'-0" x 7'-0"	90 MIN	N	HM	PNT	HM-01	HM	PNT	7		4206.2
4207	3'-0" x 7'-0"		F	HM	PNT	HM-01	HM	PNT	50		4207
4208	3'-0" x 7'-0"	90 MIN	F	HM	PNT	HM-01	HM	PNT	7		4208
4209	3'-0" x 7'-0"		N	HM	PNT	HM-01	HM	PNT	51		4209
4210	3'-0" x 7'-0"	90 MIN	N	HM	PNT	HM-01	HM	PNT	7		4210
4211	3'-0" x 7'-0"		F	HM	PNT	HM-01	HM	PNT	57		4211

Reference: A107 DOOR SCHEDULE
Bid Package 02
Addendum 02
4H Renovation & NIC Building



G9 RAMP SECTION

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

SITE STAIR - WEST SIDE

Q

P

KEYNOTE LEGEND

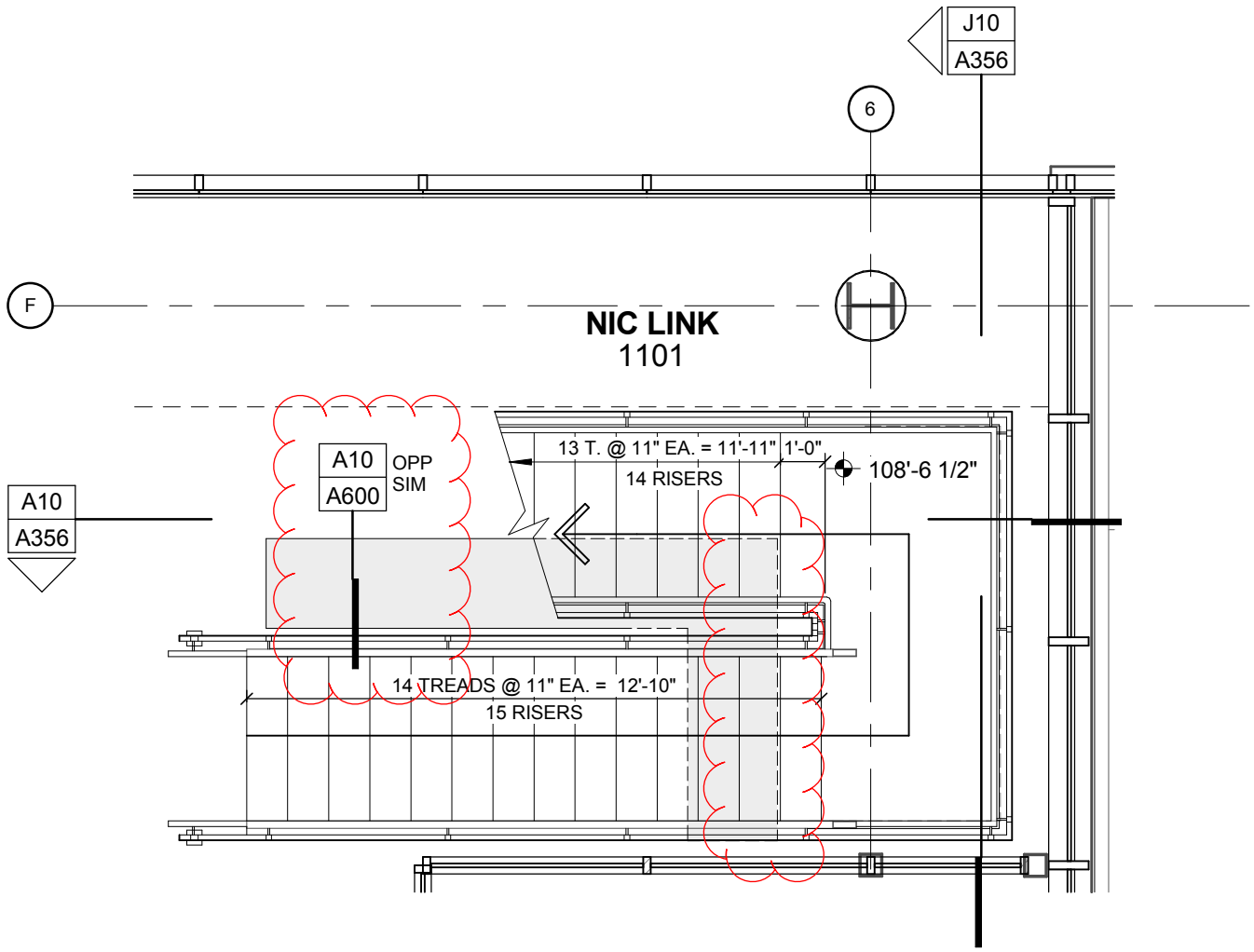
033000.D	5” CONCRETE FLOOR SLAB – SEE STRUCTURAL
033000.H	12” CONCRETE SHEAR WALL – SEE STRUCTURAL
033000.K	12” CAST-IN-PLACE CONCRETE SITE WALL WITH GROUT CLEANED FINISH – CHAMFER EDGES
033000.L	CAST-IN-PLACE CONCRETE STAIR
051200.B	STEEL BEAM – REFER TO STRUCTURAL
051200.D	STEEL TUBE – REFER TO STRUCTURAL
051200.F3	4” X 4” X 1/4” STEEL ANGLE – CONTINUOUS
054000.A	6” STRUCTURAL STEEL STUDS SPACED AT 24” O.C.
054000.F	COLD-FORMED METAL FRAMING – SEE STRUCTURAL
055000.L	1-1/2” DIAMETER STAINLESS STEEL HANDRAIL
057300.A3	DECORATIVE STAINLESS STEEL RAIL SYSTEM – NO GUARDRAIL – POST & HANDRAIL ONLY

Reference: G9/A304
Bid Package 02
Addendum 02
4H Renovation & NIC Building

E15 ENLARGED PLAN - STAIR

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

SECOND LEVEL LINK



A15 ENLARGED PLAN - STAIR

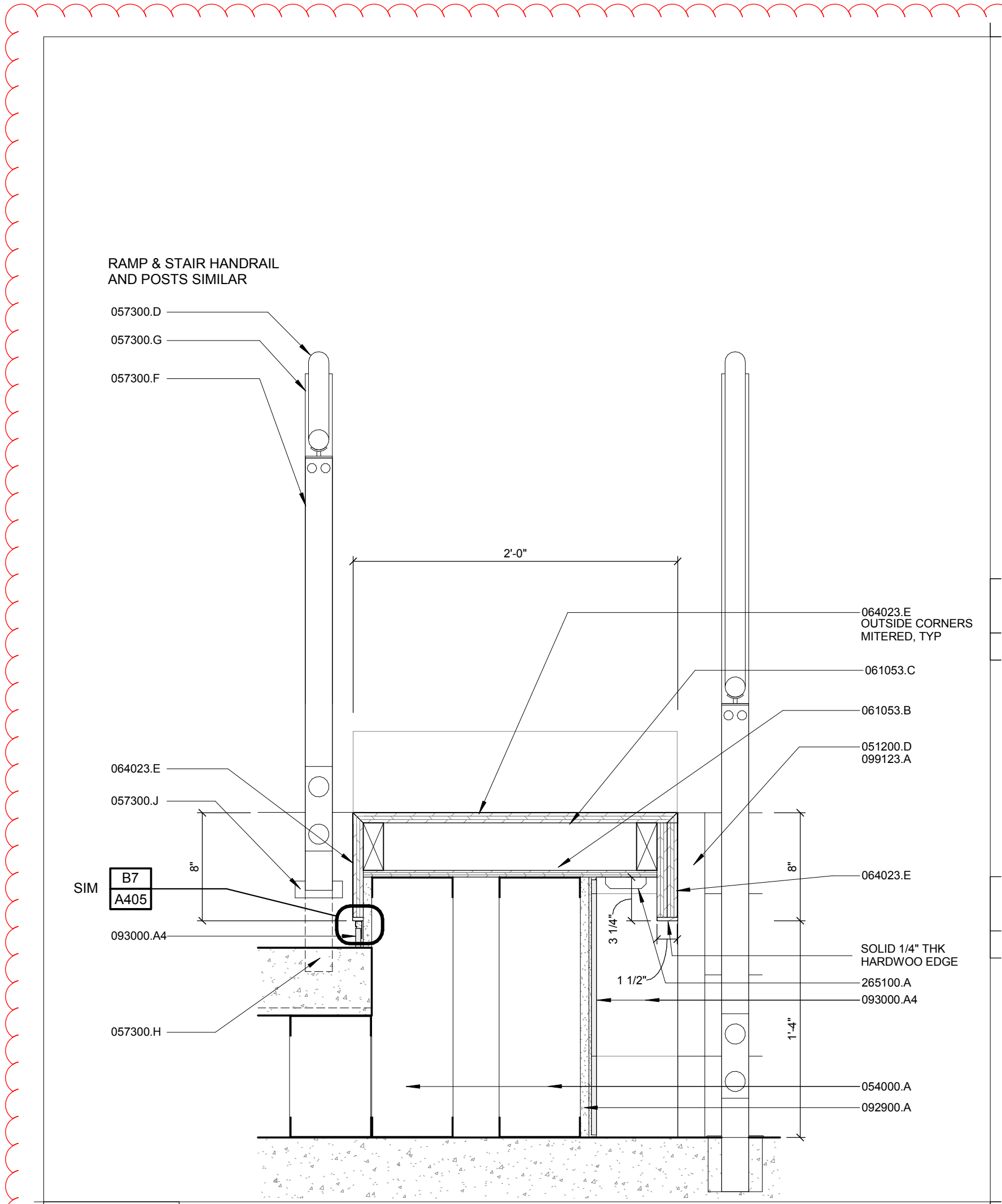
SCALE: 1/4" = 1'-0"

MAIN LEVEL LINK

15 16 17 18

E D C B A

Reference: A15/A356
Bid Package 02
Addendum 02
4H Renovation & NIC Building



A3 SECTION DTL

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

BENCH AT LINK

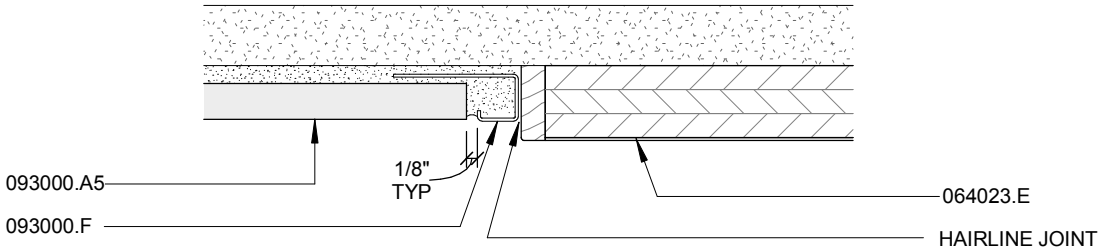
3 4 5 6

C:\Documents and Settings\jraybuck\My Docume

KEYNOTE LEGEND

033000.H	12” CONCRETE SHEAR WALL – SEE STRUCTURAL
042000.A2	10” CONCRETE MASONRY UNITS
042000.B	FACE BRICK
051200.A	STEEL COLUMN – REFER TO STRUCTURAL
051200.D	STEEL TUBE – REFER TO STRUCTURAL
054000.A	6” STRUCTURAL STEEL STUDS SPACED AT 24” O.C.
054000.B	3 5/8” STRUCTURAL STEEL STUDS SPACED AT 24” O.C.
057300.D	1 1/2” DIA. WOOD HANDRAIL
057300.F	STAINLESS STEEL BLADE POST
057300.G	STAINLESS STEEL HANDRAIL SADDLE
057300.H	7”X7”X1/2” EMBED PLATE
057300.J	5”X5”X1/8” THK STAINLESS STEEL ESCUTCHEON PLATE
061053.A	WOOD BLOCKING
061053.B	1/2" PLYWOOD BACKING
061053.C	2 X 4 WOOD STUDS @ 16” O.C.
061600.A	5/8” GLASS MAT GYPSUM WALL SHEATHING

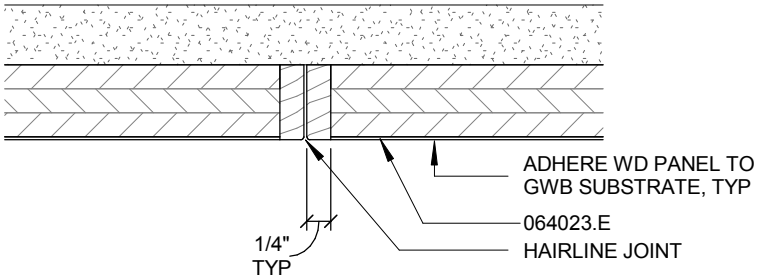
Reference: A3/A405
Bid Package 02
Addendum 02
4H Renovation & NIC Building



B7 PLAN DTL

SCALE: 6" = 1'-0"

TYPICAL WD PANEL TO TILE TRANSITION, HORIZONTAL JOINT SIMILIAR



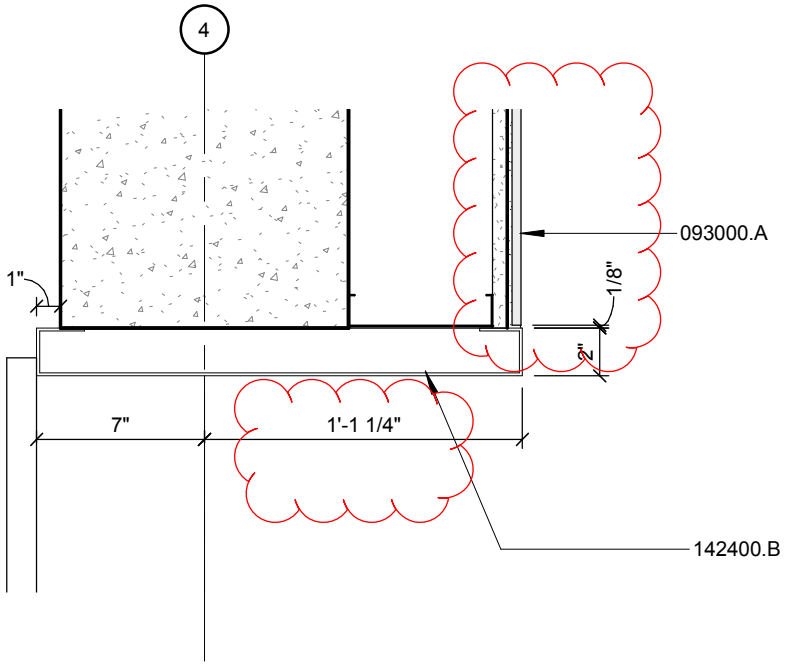
A7 PLAN DTL

SCALE: 6" = 1'-0"

TYPICAL WD PNL VERTICAL JOINT, HORIZONTAL JOINT SIMILAR

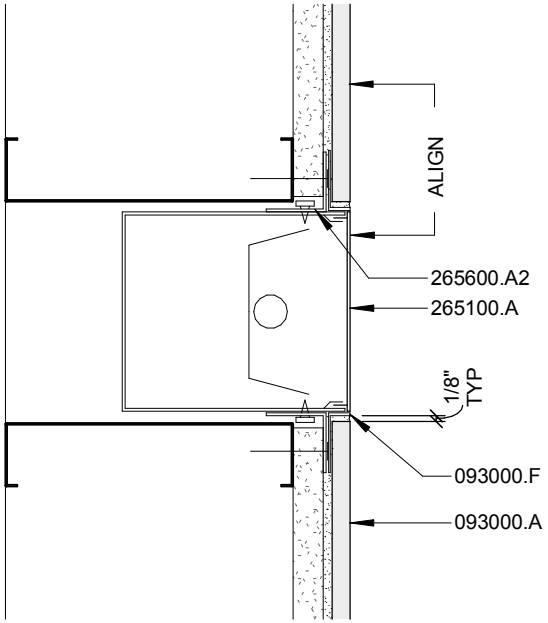
7 8 9

Reference: A7 & B7/A405
Bid Package 02
Addendum 02
4H Renovation & NIC Building



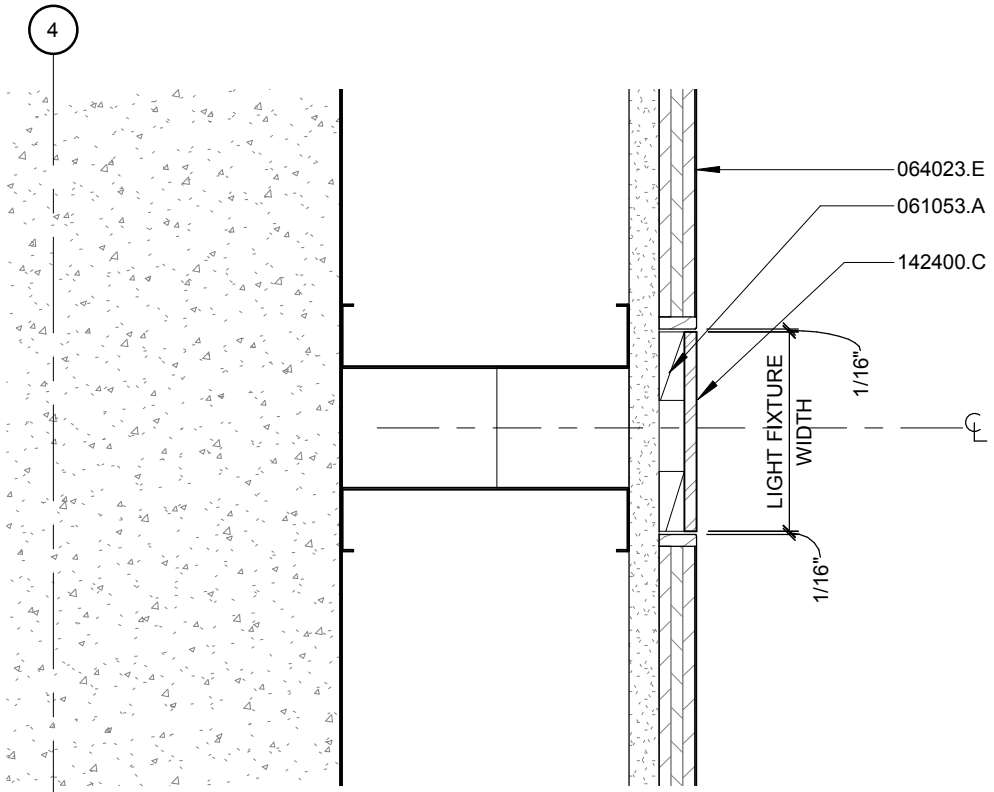
D10	PLAN DTL
SCALE: 1 1/2" = 1'-0"	TYPICAL ELEVATOR DOOR JAMB - AREA D

Reference: D10/A405
Bid Package 02
Addendum 02
4H Renovation & NIC Building



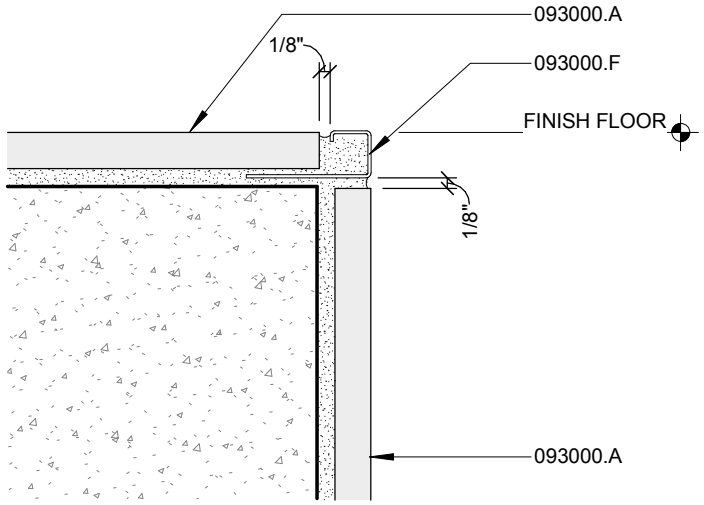
D7	PLAN DTL
SCALE: 3" = 1'-0"	TYPICAL DETAIL AT RECESSED LIGHT FIXTURE IN TILE

Reference: D7/A405
Bid Package 02
Addendum 02
4H Renovation & NIC Building



G10	PLAN DTL
SCALE: 3" = 1'-0"	TYPICAL CALL BUTTON PLATE

Reference: G10/A405
Bid Package 02
Addendum 02
4H Renovation & NIC Building



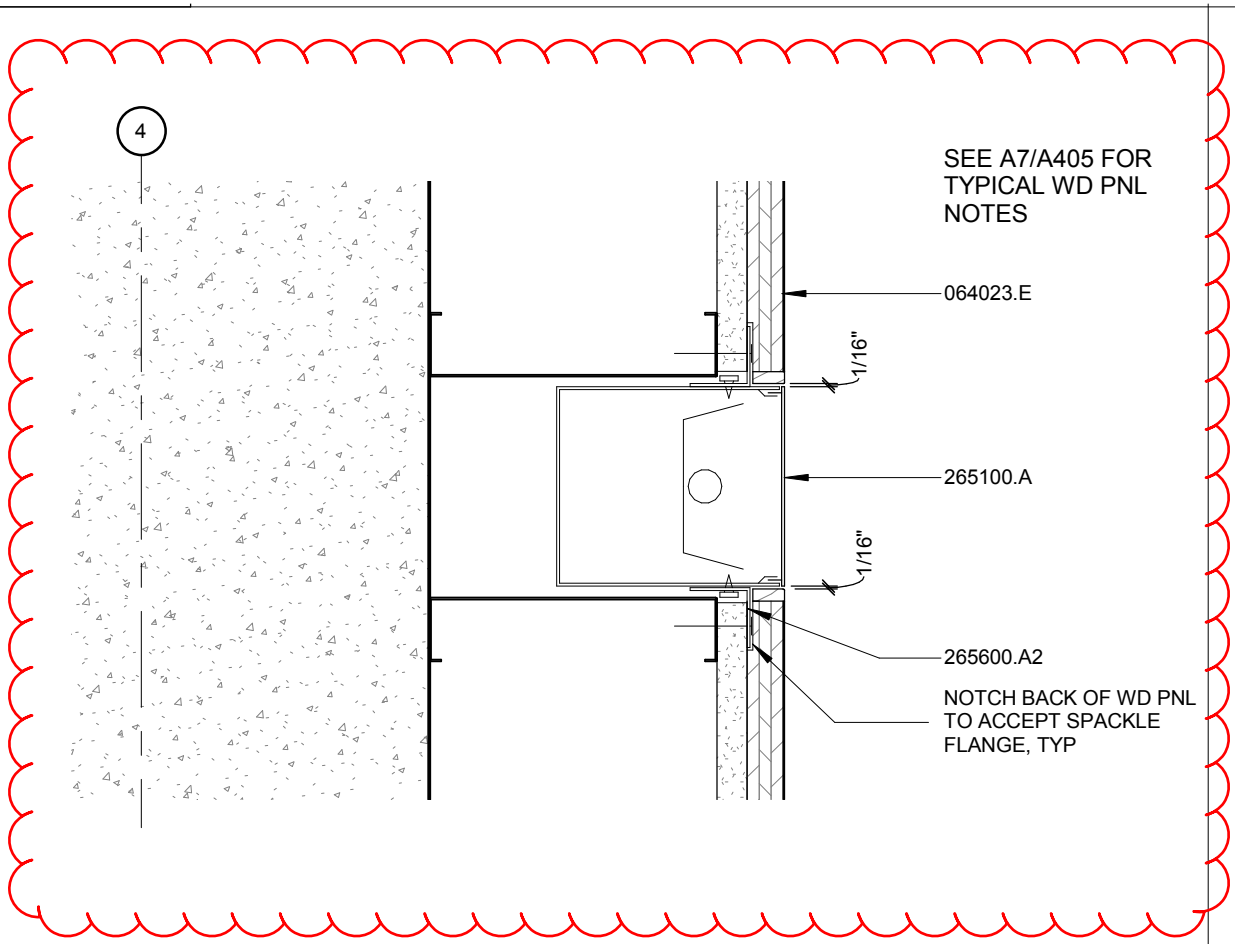
G7	SECTION DTL
SCALE: 6" = 1'-0"	TYPICAL OUTSIDE CORNER TILE TRANSITION

Reference: G7/A405

Bid Package 02

Addendum 02

4H Renovation & NIC Building



K10 PLAN DTL

SCALE: 3" = 1'-0"

TYPICAL DETAIL AT RECESSED LIGHT FIXTURE IN WOOD PANEL

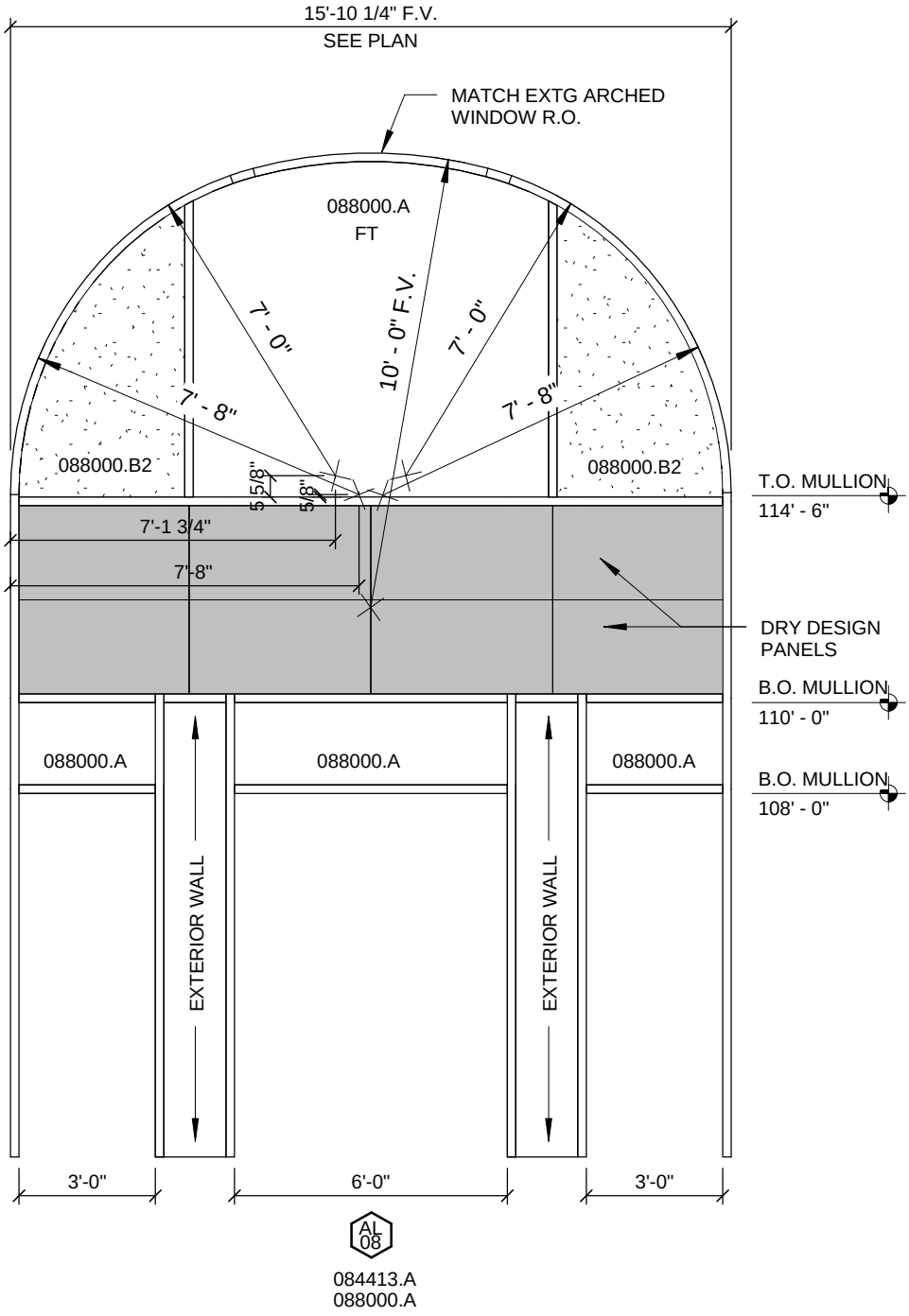
SC

Reference: K10/A405

Bid Package 02

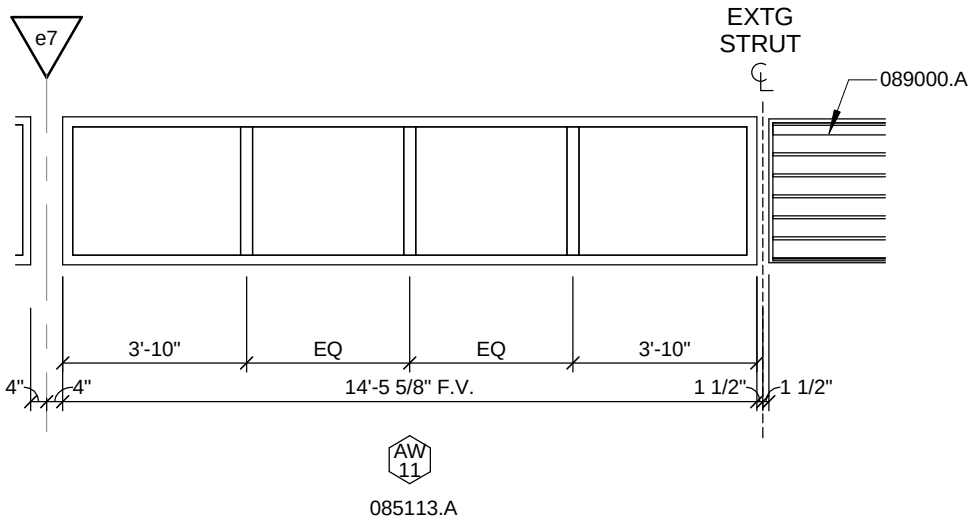
Addendum 02

4H Renovation & NIC Building

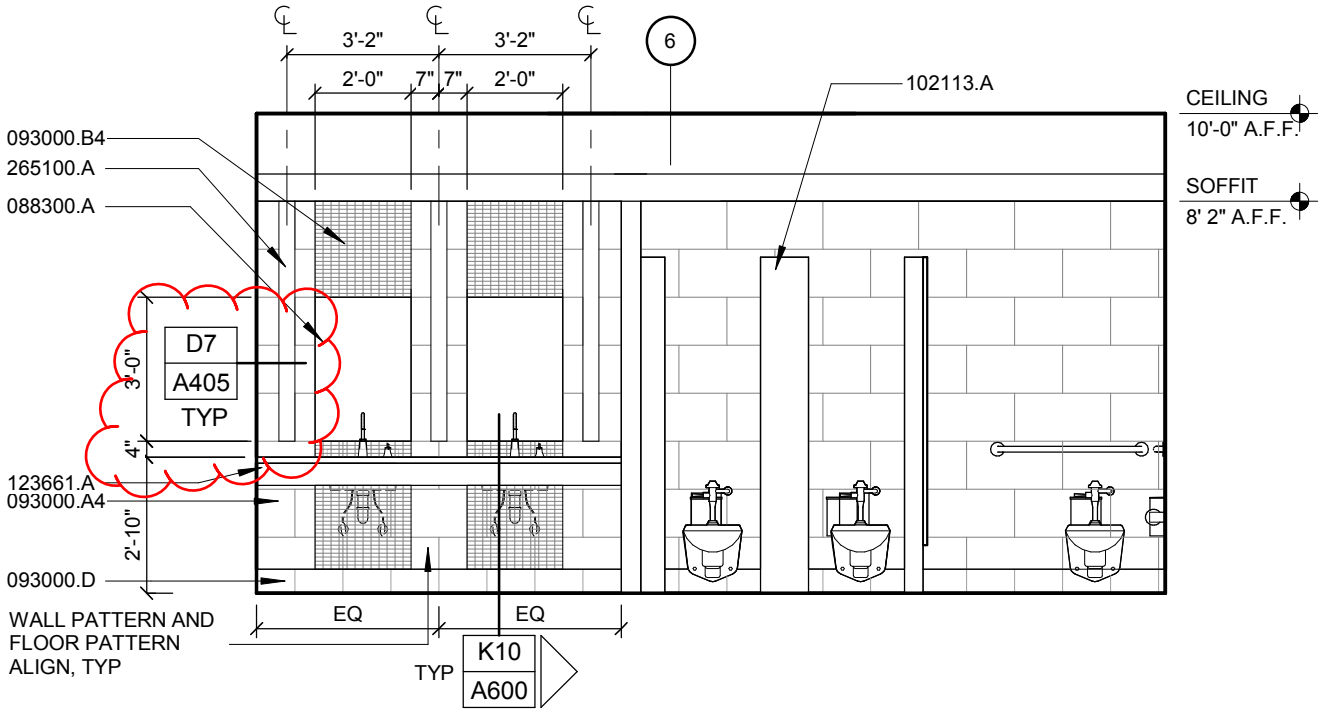


A1/A500 - AL-08

Bid Package 02
Addendum 02



G1/A500
Bid Package 02
Addendum 02

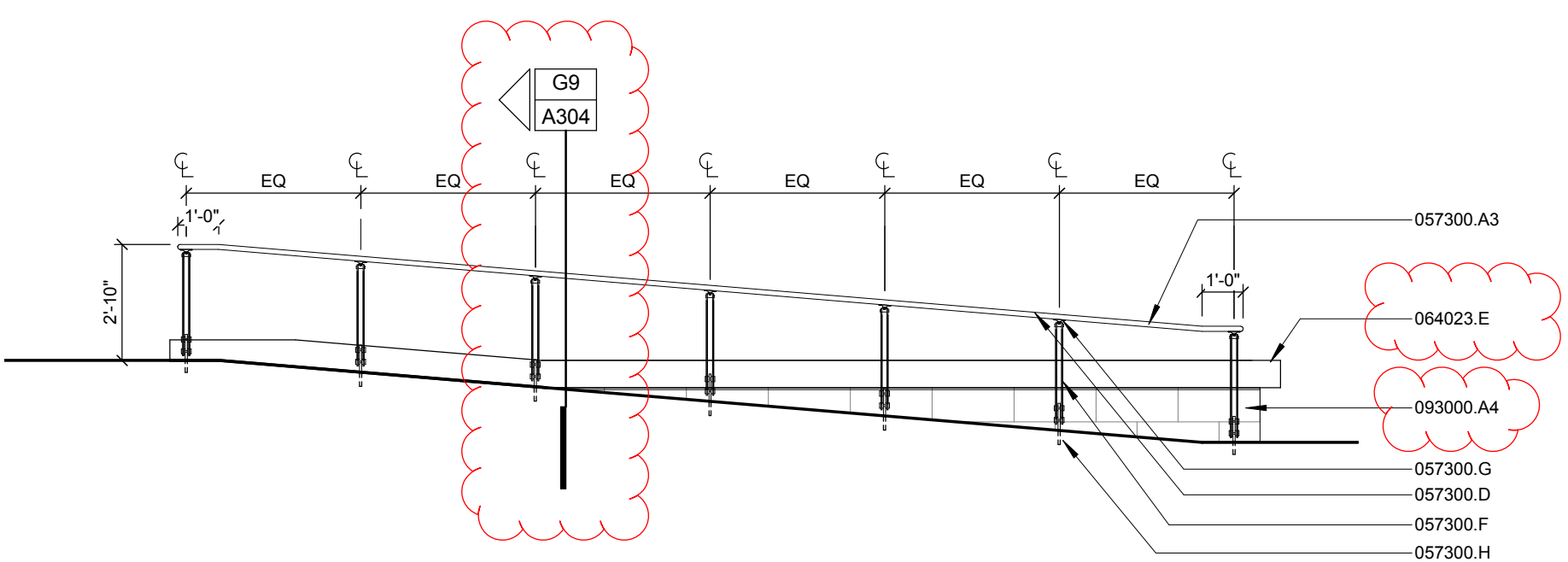


A10 INTERIOR ELEVATION

SCALE: 1/4" = 1'-0" | TYPICAL RESTROOM ELEVATION - AREA D

10 | 11 | 12 | 13

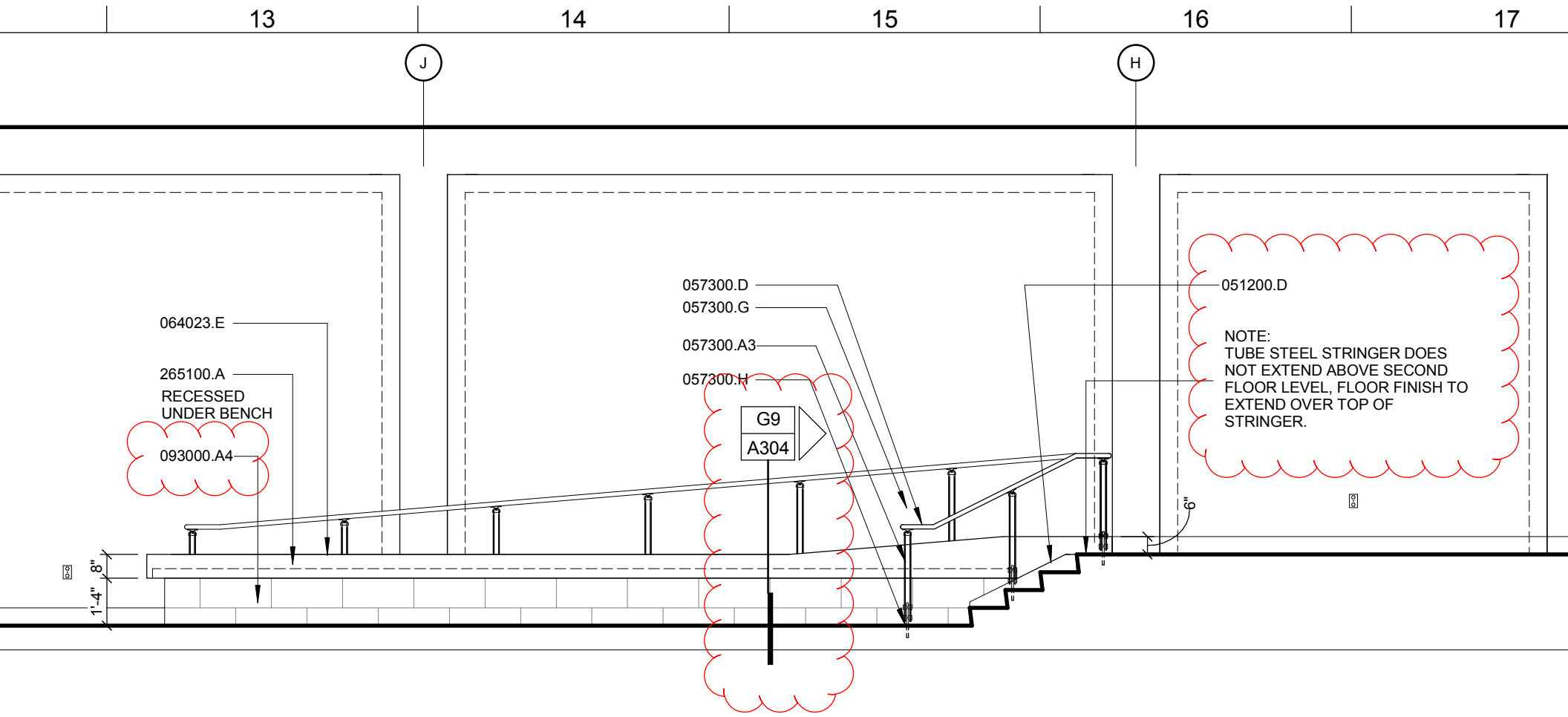
Reference: A10/A512
Bid Package 02
Addendum 02
4H Renovation & NIC Building



F1 INTERIOR ELEVATON

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

Reference: F1/A512
Bid Package 02
Addendum 02
4H Renovation & NIC Building

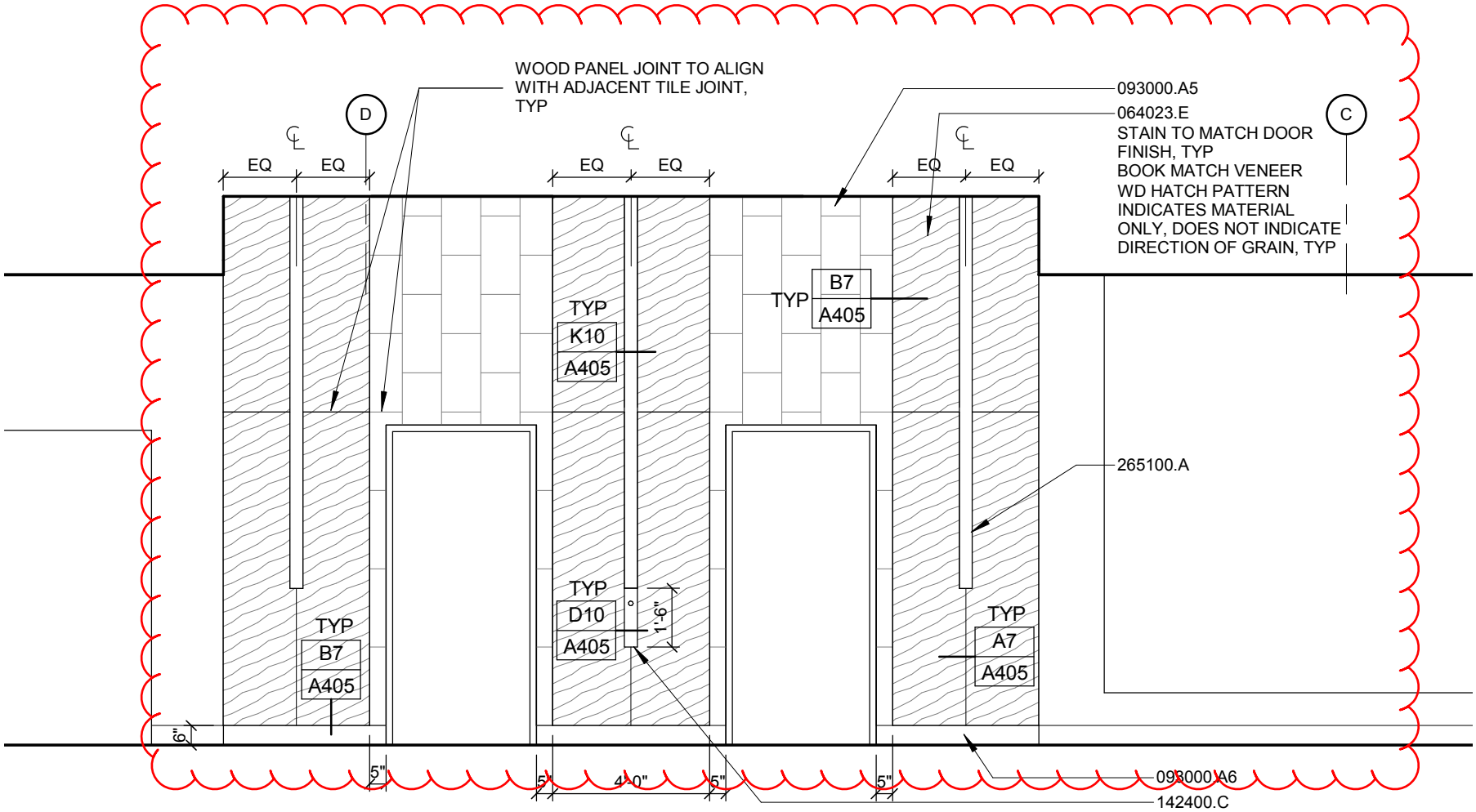


Reference: N5/A512

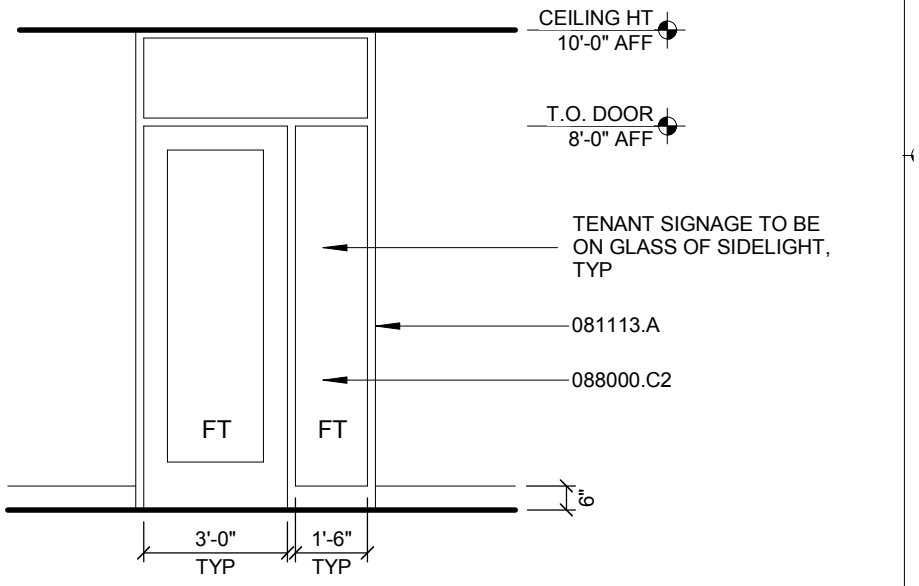
Bid Package 02

Addendum 02

4H Renovation & NIC Building

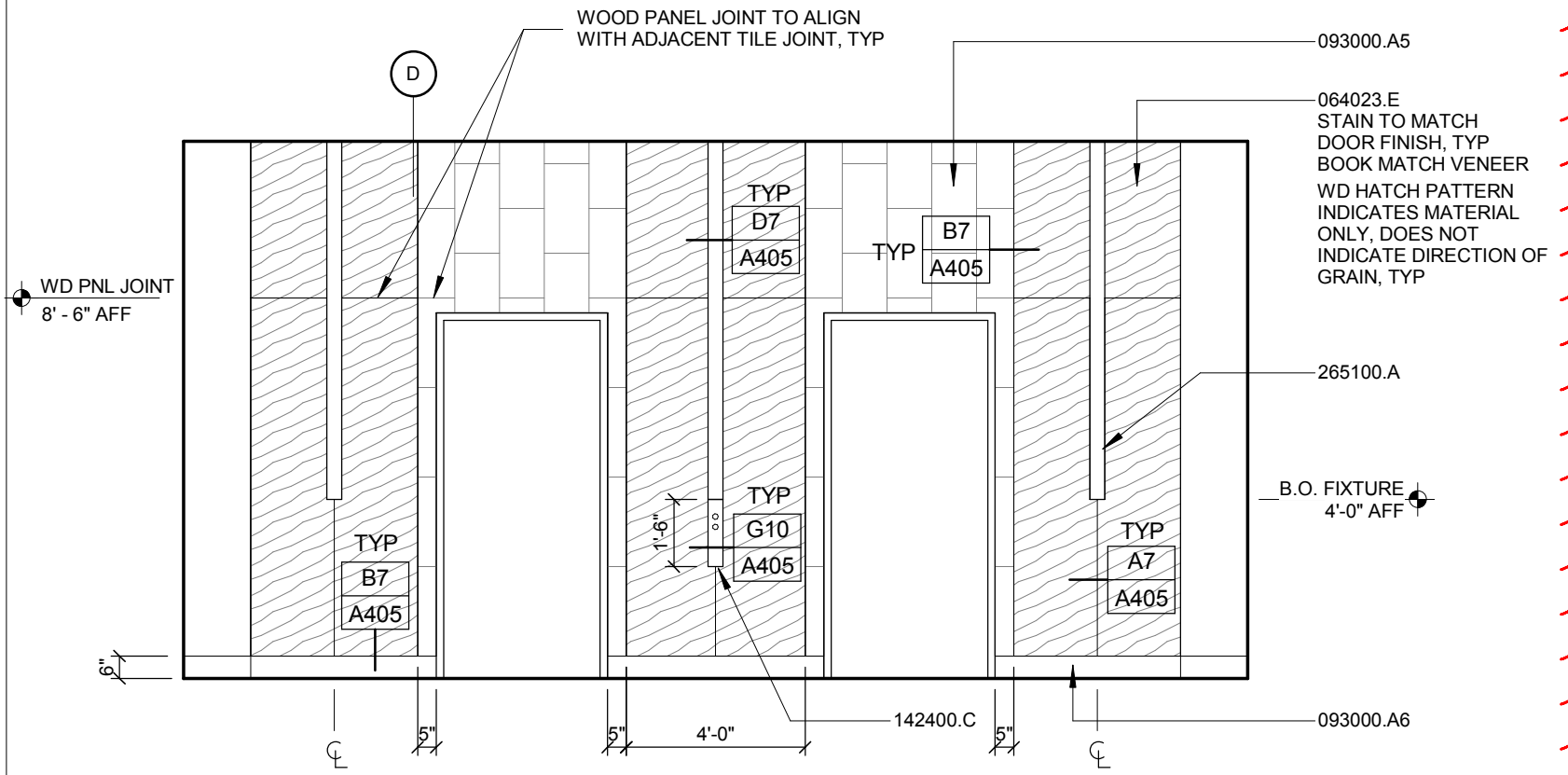


Reference: D1/A513
Bid Package 02
Addendum 02
4H Renovation & NIC Building



G12	INTERIOR ELEV - FUTURE
SCALE: 1/4" = 1'-0"	TYPICAL TENANT ENTRANCE - FUTURE

Reference: G12/A513
Bid Package 02
Addendum 02
4H Renovation & NIC Building

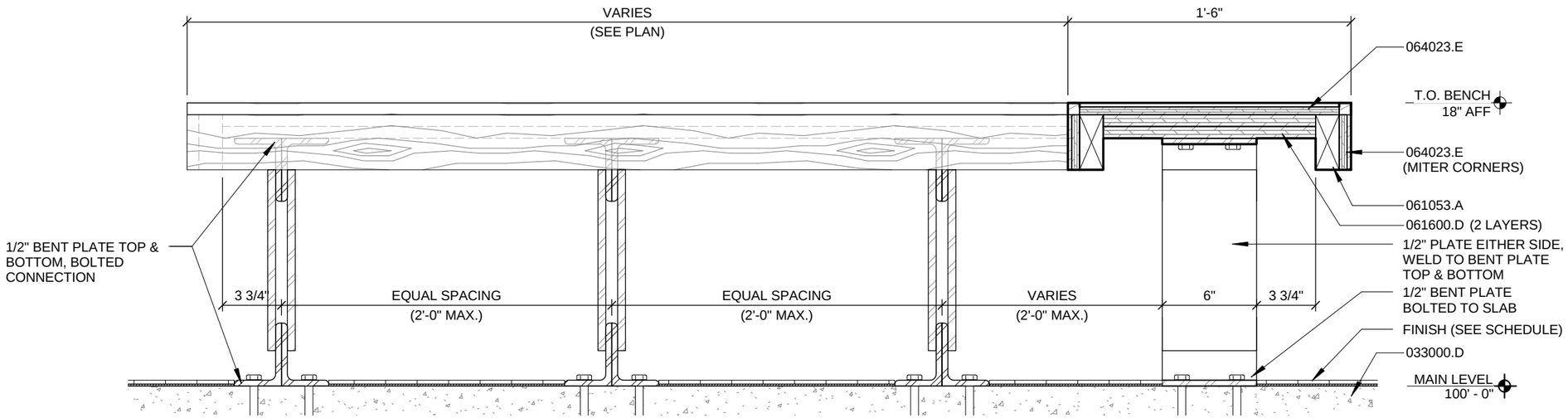


G16 INTERIOR ELEVATION

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

SECOND AND THIRD LEVEL ELEVATOR LOBBY

Reference: G16/A512
Bid Package 02
Addendum 02
4H Renovation & NIC Building



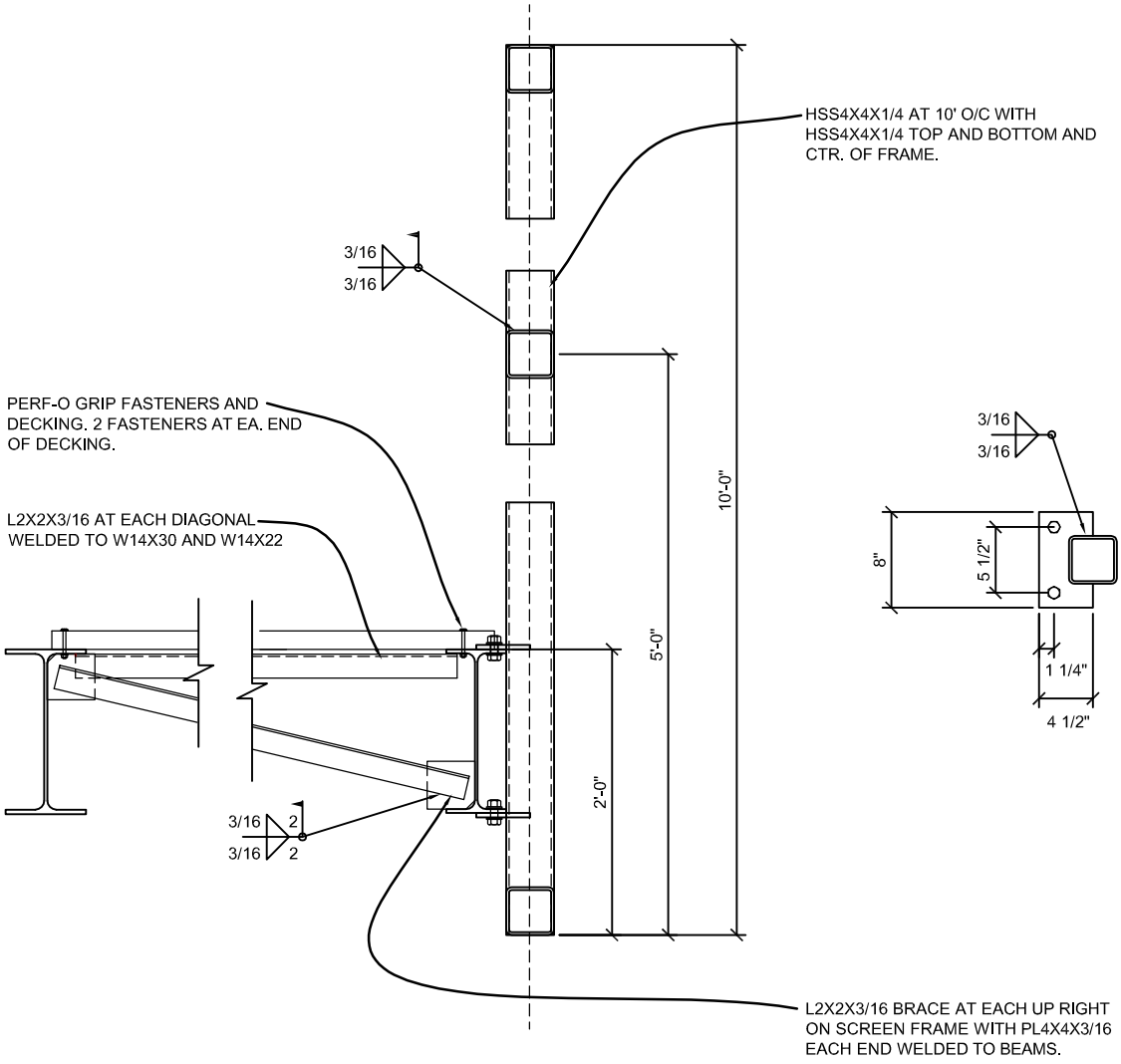
A10 SECTION DETAIL

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

BENCH UNDER OPEN STAIRS

10 11 12 13 14 15

A10/A600
Bid Package 02
Addendum 02

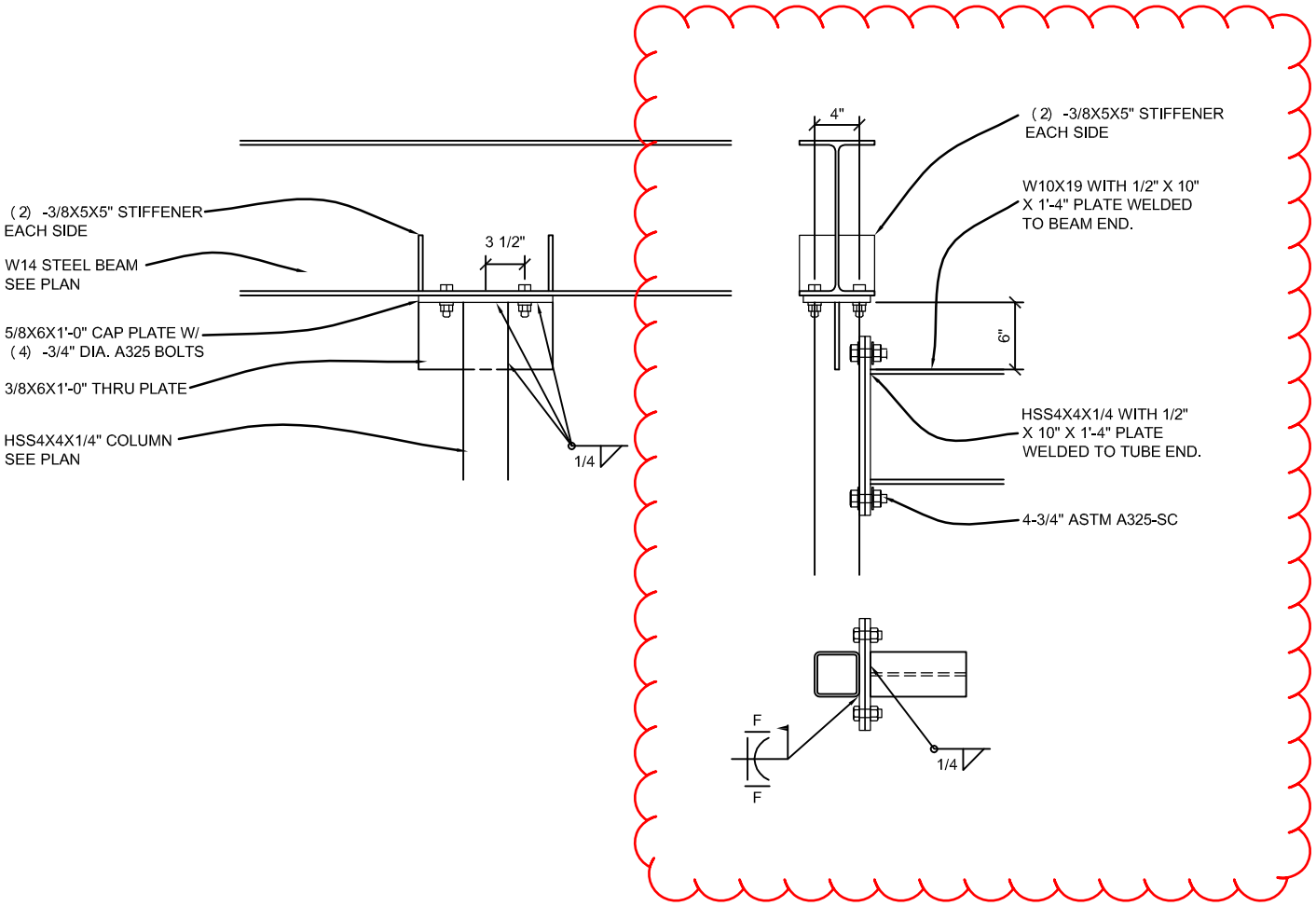


16

Screen Wall Detail

Scale: No Scale

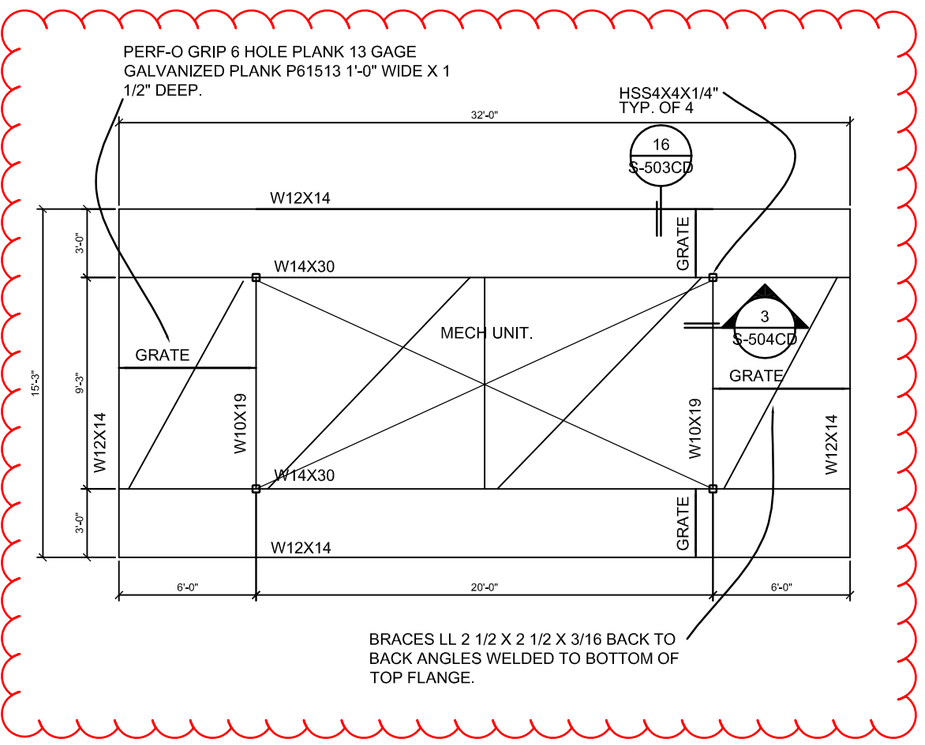
Attachment: S10
Reference: 16/S503CD
Bid Package: 02
Addendum: 02

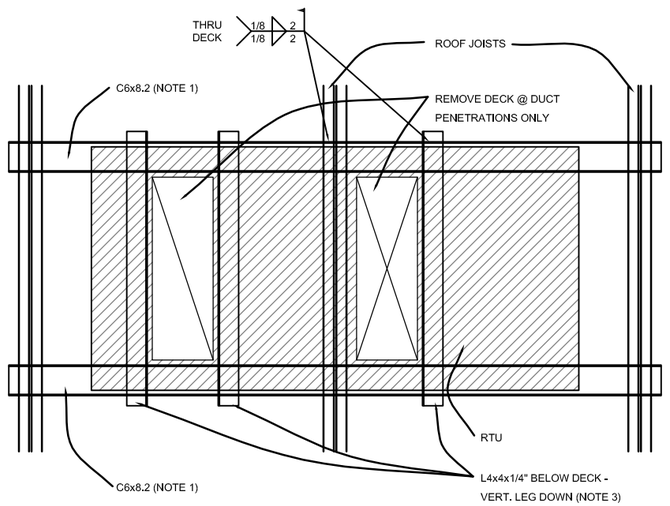


3 Beam / Column Connection

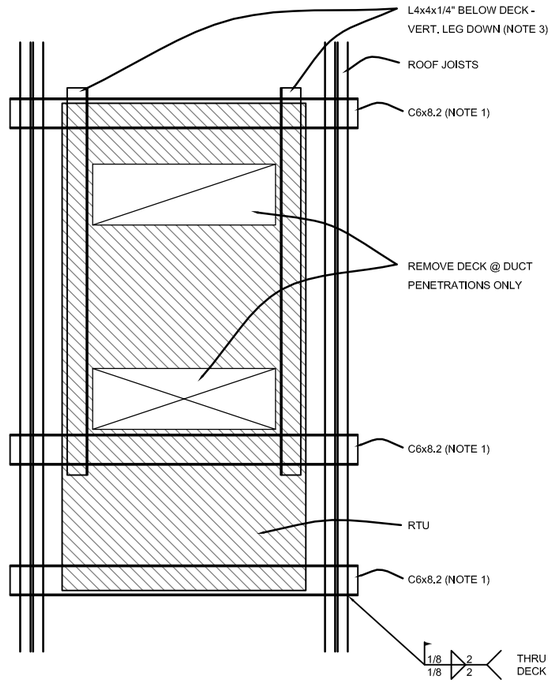
Scale: No Scale

Attachment: S11
Reference: 3/S504CD
Bid Package: 02
Addendum: 02





RTU PLAN VIEW



RTU PLAN VIEW

MECHANICAL UNIT SUPPORT NOTES:

1) INSTALL CHANNELS FROM TOP SIDE, AFTER DECK PLACEMENT. LOCATE IN DECK FLUTES ADJUSTING SPACING IN 6" INCREMENTS TO SUPPORT EDGE OF CURB.

2) POSITION CURB OVER CHANNELS AND LOCATE REQUIRED DUCT PENETRATIONS THRU ROOF. REFER TO MECHANICAL DRAWINGS FOR EXACT SIZES.

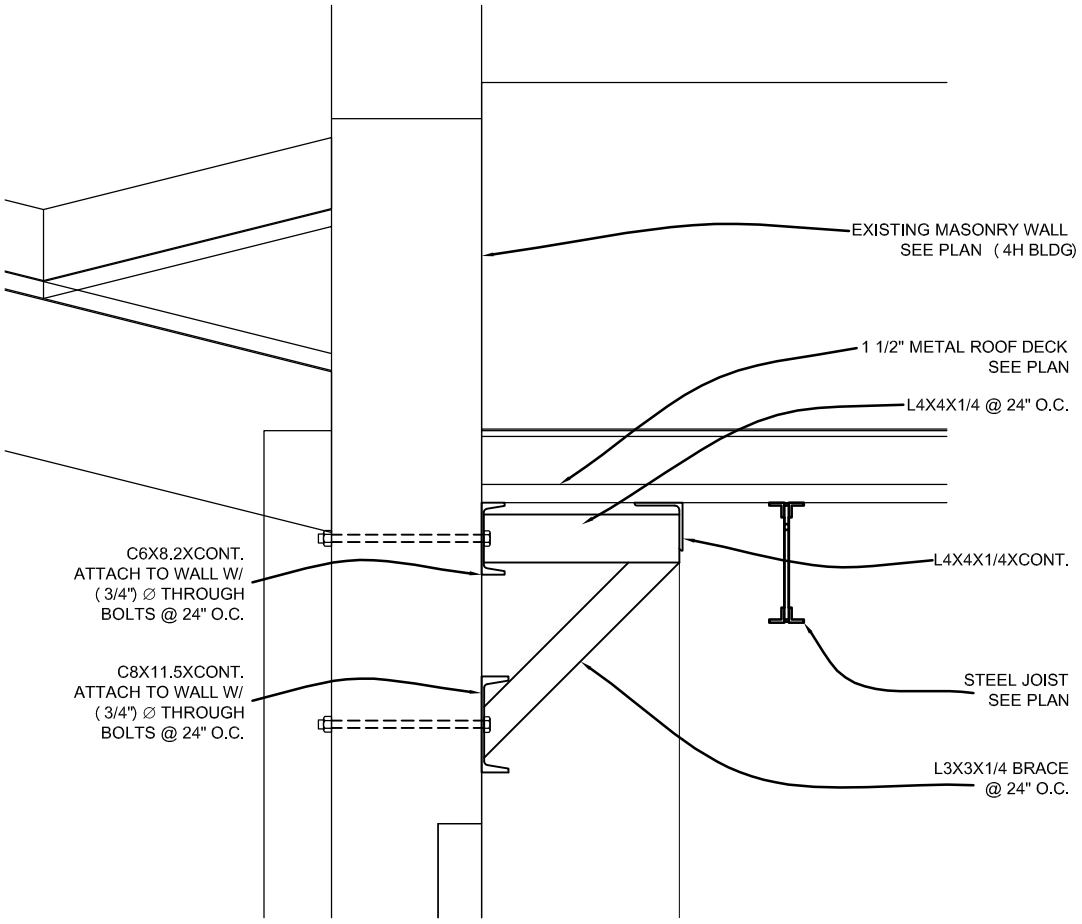
3) POSITION ANGLES BELOW DECK AND WELD TO CHANNELS THRU DECK FROM TOP SIDE. (OMIT CROSS ANGLE IF DECK OVERHANG DOES NOT EXCEED 1'-0" AND DECK HAS MINIMUM BACKSPAN = 2x OVERHANG DIMENSION.)

4) CUT ROOF DECK ONLY AS REQUIRED FOR DUCT PENETRATIONS.

17 CoolingTower Framing Schematic

Scale: No Scale

Attachment: S12
Reference: 17/S504CD
Bid Package: 02
Addendum: 02

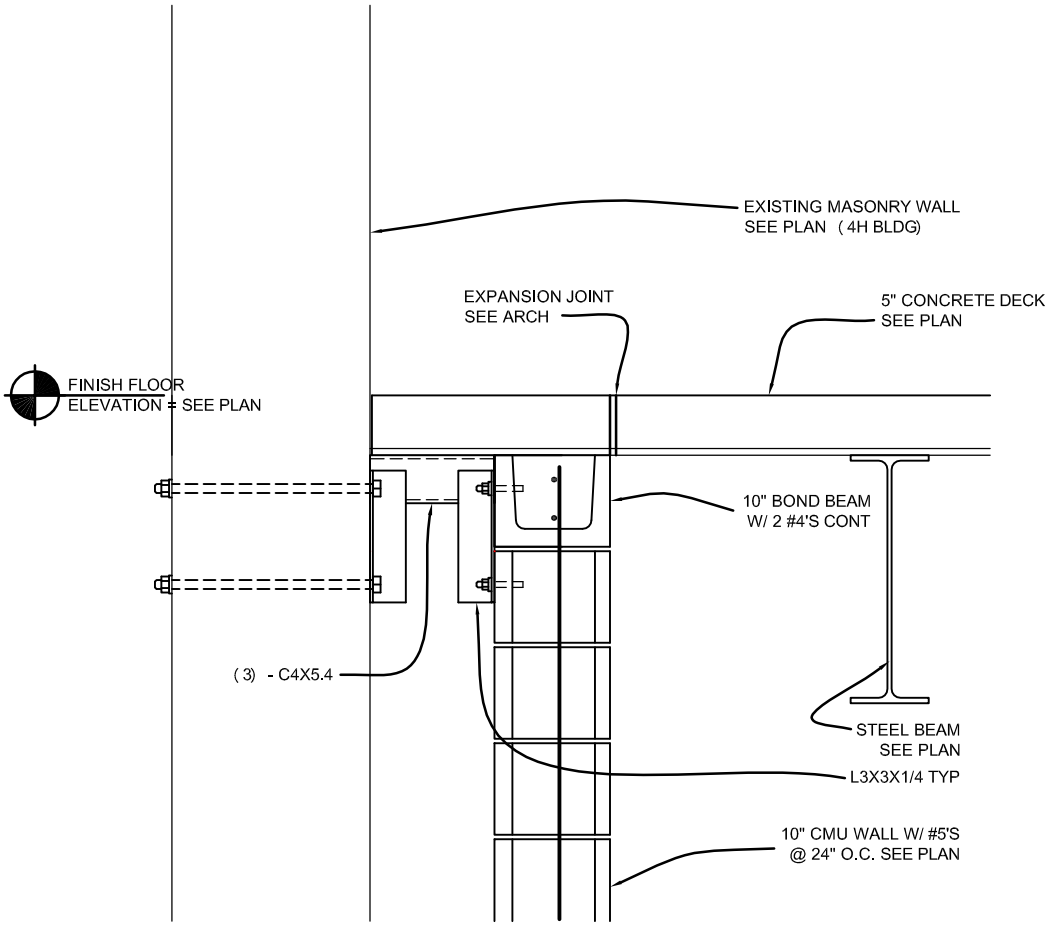


15

Roof Deck Support

Scale: No Scale

Attachment: S13
Reference: 15/S503CD
Bid Package: 02
Addendum: 02



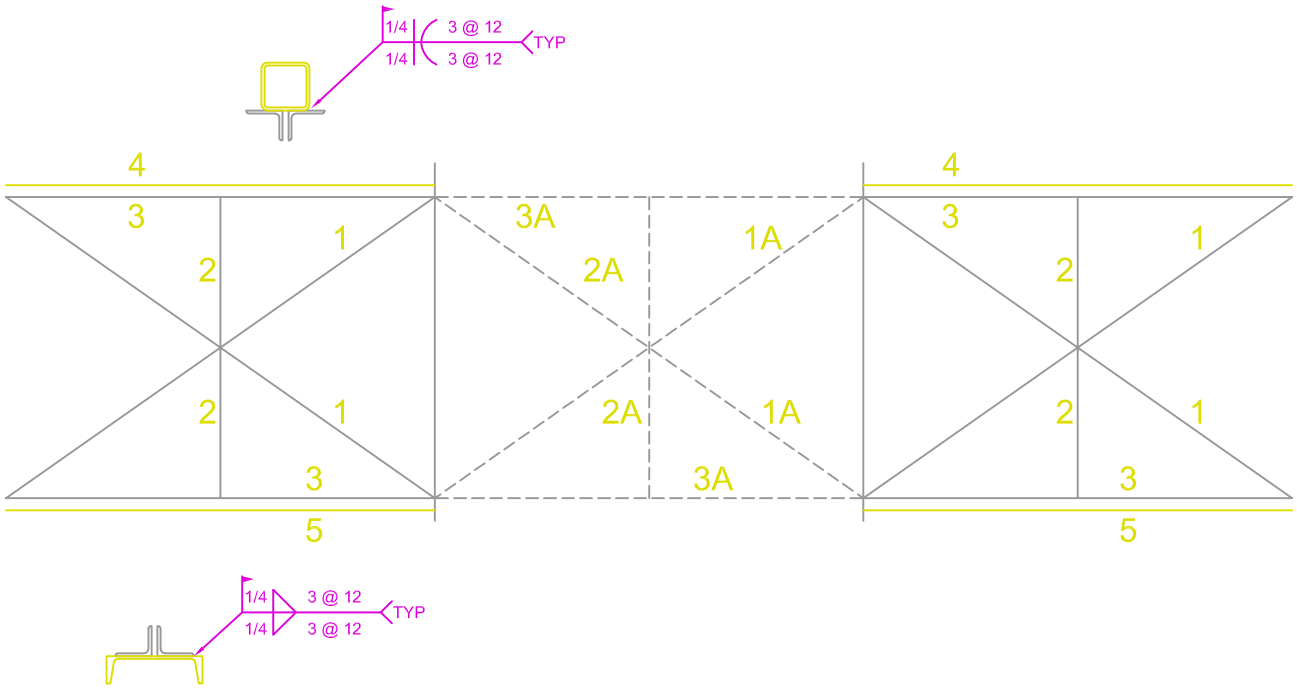
ATTACH TO EXISTING WALL W/ (2) -13/4" ∅ THROUGH BOLTS. SPACE BOLTS 8" APART. ATTACH TO 10" CMU W/ (2) -1/2" ∅ THREADED RODS USING HILTI HY-150 AHDESIVE SYSTEM. ONE ROD PER GROUTED CELL.

17

Floor Deck Support

Scale: No Scale

Attachment: S14
Reference: 17/S503CD
Bid Package: 02
Addendum: 02

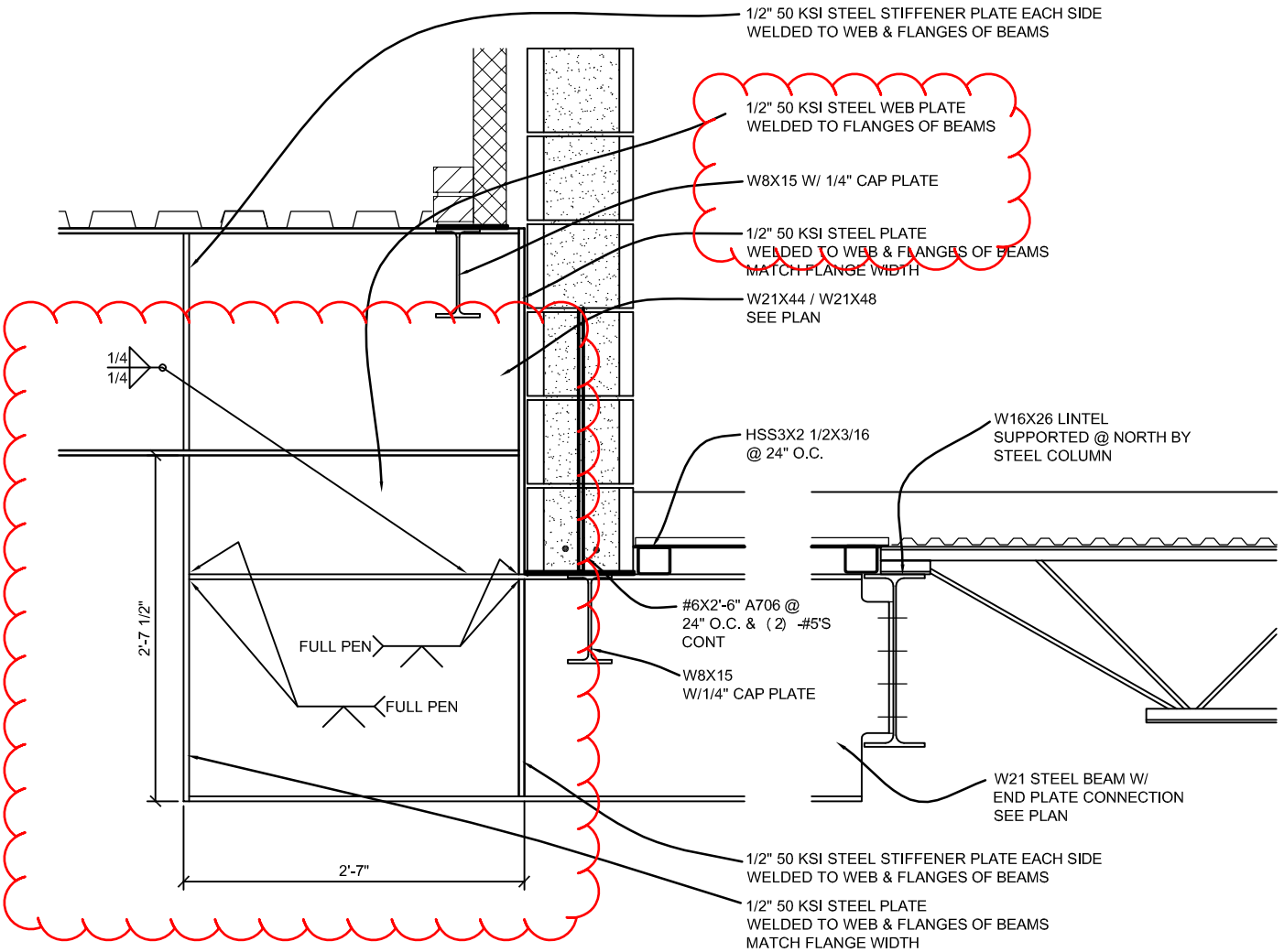


EXISTING MEMBERS
1 L4X4X5/16
1A L4X4X5/16 - REMOVE
2 L3X3X1/4
2A L3X31/4 - REMOVE
3 LL3X2 1/2X14
3A LL3X2 1/2X1/4 - REMOVE
NEW MEMBERS
4 HSS4X4X1/4
5 C8X11.5

10 Bridging Schematic Detail

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

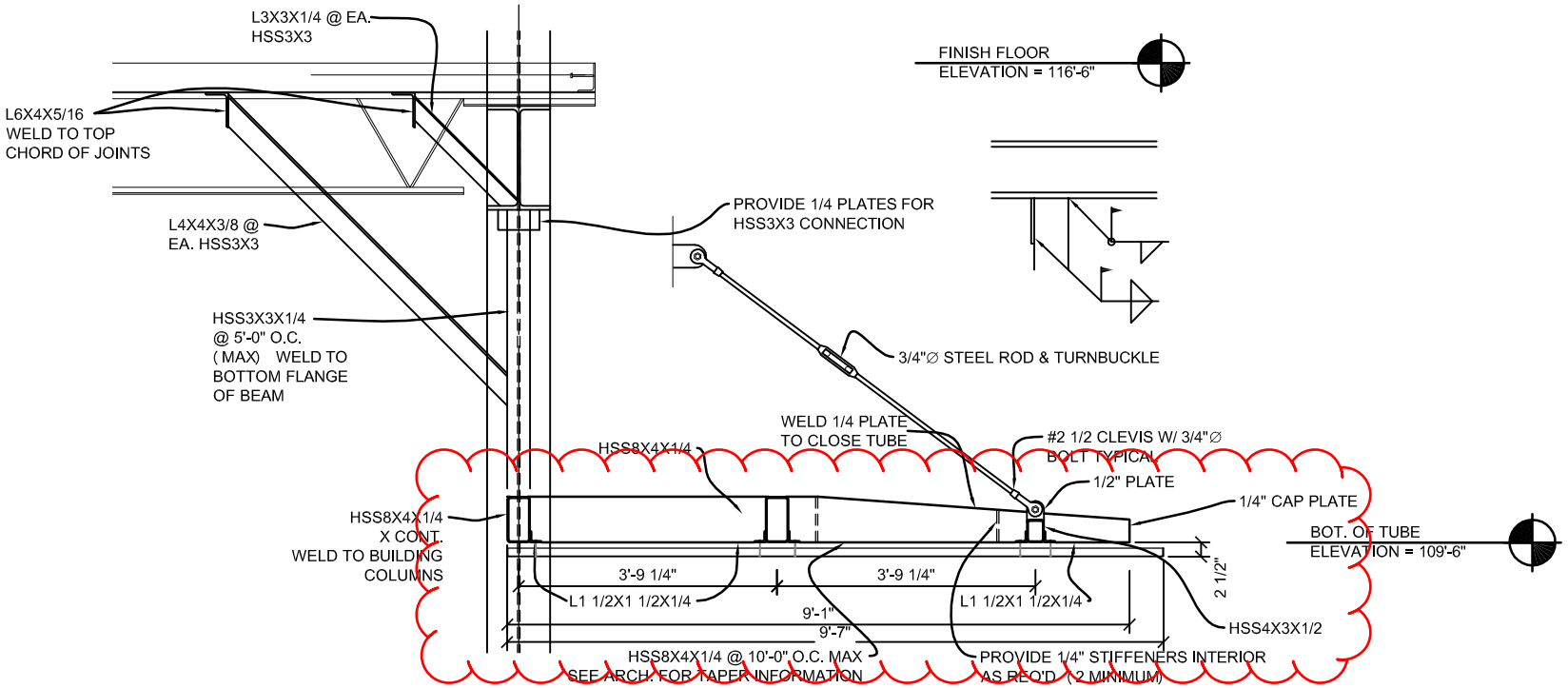
Attachment: S15
Reference: 10/S504AB
Bid Package: 02
Addendum: 02



10 Framing Detail

Scale: No Scale

Attachment: S16
Reference: 10/S504CD
Bid Package: 02
Addendum: 02

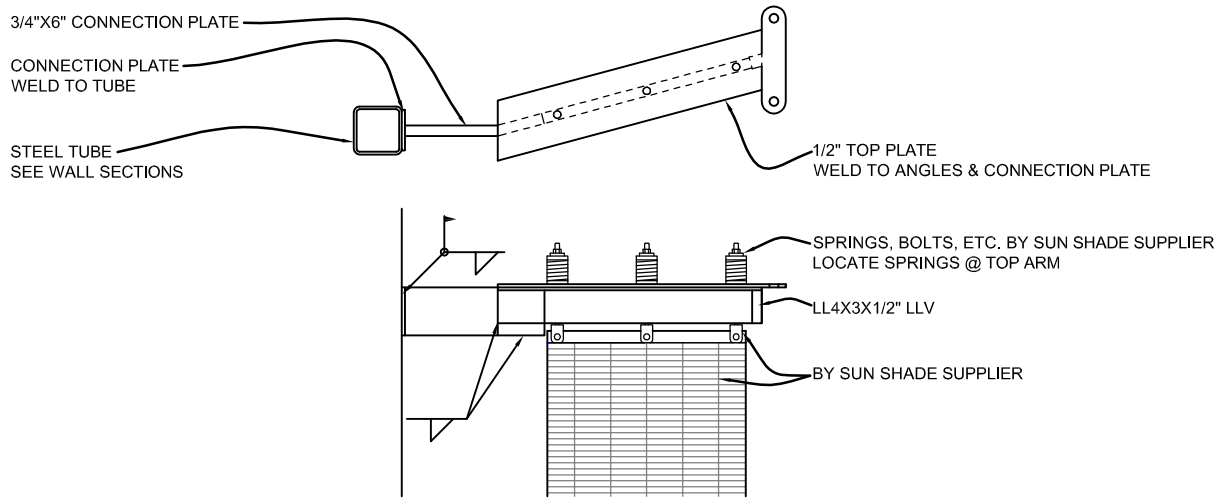


NOTE: ALL WELDED CONNECTIONS
GRIND WELDS SMOOTH FOR NEAT APPEARANCE
ASSEMBLE STRUCTURE TO THE GREATEST EXTENT POSSIBLE IN THE SHOP
NOTIFY ARCHITECT, WHEN FIRST STRUCTURE HAS BEEN ASSEMBLED, FOR INSPECTION OF WELD APPEARANCE

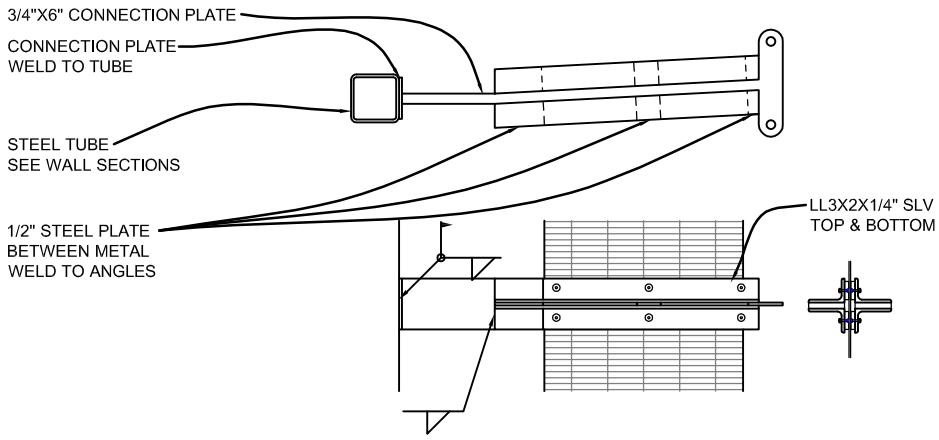
5 Exterior Canopy Detail

Scale: 3/8" = 1'-0"

Attachment: S7
Reference: 5/S304CD
Bid Package: 02
Addendum: 02



SUN SHADE TOP SUPPORT ARM



SUN SHADE MIDDLE SUPPORT ARM

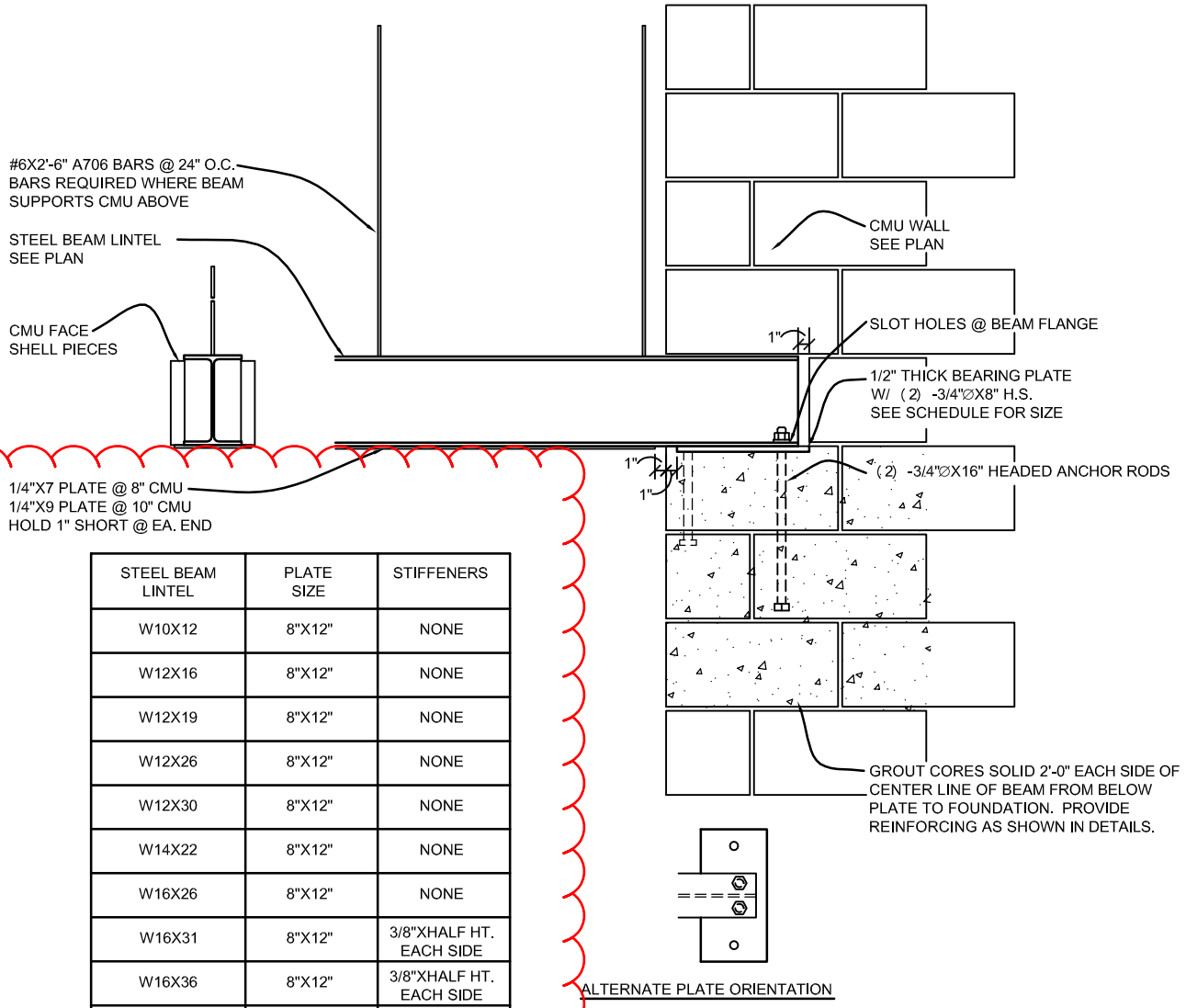
NOTES:
1. ALL EXPOSED STEEL SHALL BE GALVANIZED. DAMAGED GALVANIZING SHALL BE REPAIRED BEFORE WORK IS ACCEPTED.
2. 5/8"∅ RODS, 5/8" TURNBUCKLES, & #2 CLEVISES SHALL BE PROVIDED TO PROVIDE LATERAL TIE BETWEEN ARMS & BACK TO STRUCTURE. ALL HARDWARE SHALL GALVANIZED.
3. VERIFY LOADS PROVIDED BY SUN SHADE SUPPLIER W/ ARCHITECT PRIOR TO STEEL FABRICATION.
4. SEE ARCHITECTURAL FOR FURTHER INFORMATION.
5. SUN SHADE BOTTOM SUPPORT ARM SHALL BE THE SAME AS THE TOP ARM BUT MIRRORED AND NO SPRING HARDWARE.

20

Sun Shade Detail

Scale: No Scale

Attachment: S8
Reference: 20/S502CD
Bid Package: 02
Addendum: 02

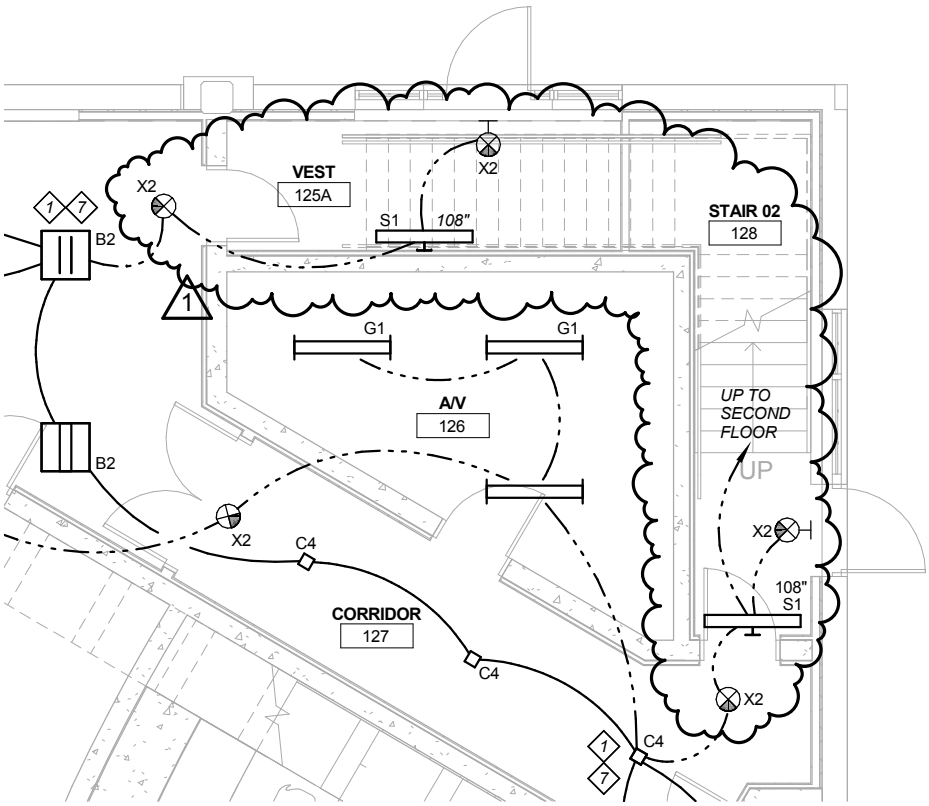


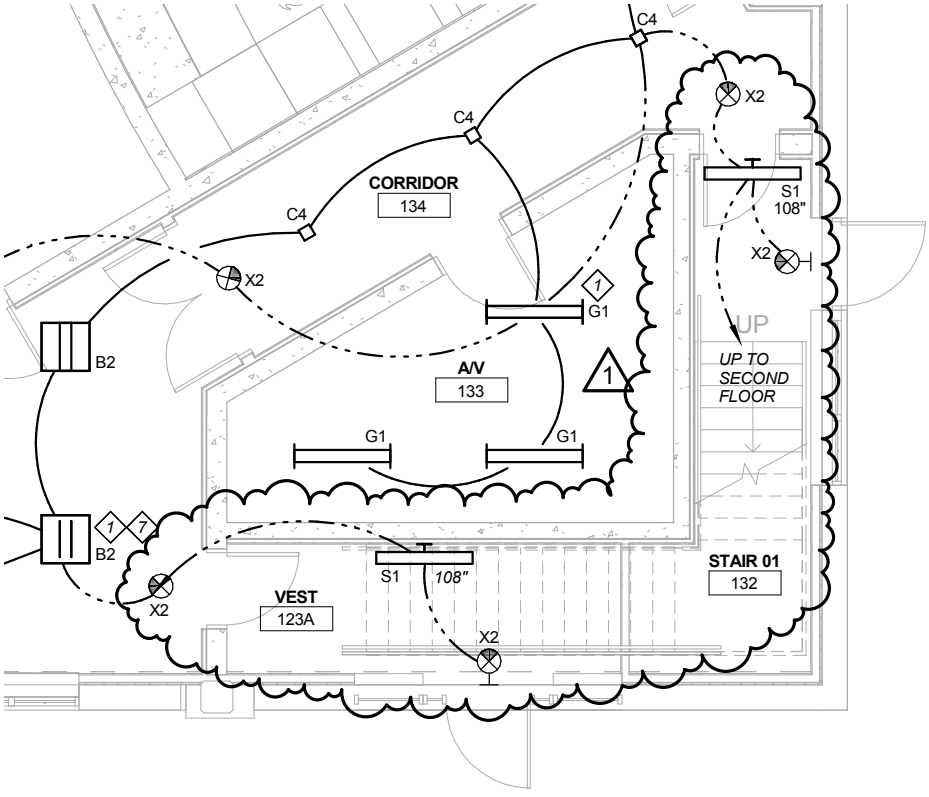
STEEL BEAM LINTEL	PLATE SIZE	STIFFENERS
W10X12	8"X12"	NONE
W12X16	8"X12"	NONE
W12X19	8"X12"	NONE
W12X26	8"X12"	NONE
W12X30	8"X12"	NONE
W14X22	8"X12"	NONE
W16X26	8"X12"	NONE
W16X31	8"X12"	3/8"XHALF HT. EACH SIDE
W16X36	8"X12"	3/8"XHALF HT. EACH SIDE
W18X40	8"X16"	3/8"XHALF HT. EACH SIDE
W21X44	8"X16"	3/8"XHALF HT. EACH SIDE
W21X48	8"X16"	3/8"XHALF HT. EACH SIDE

6 Steel Beam Lintel Detail

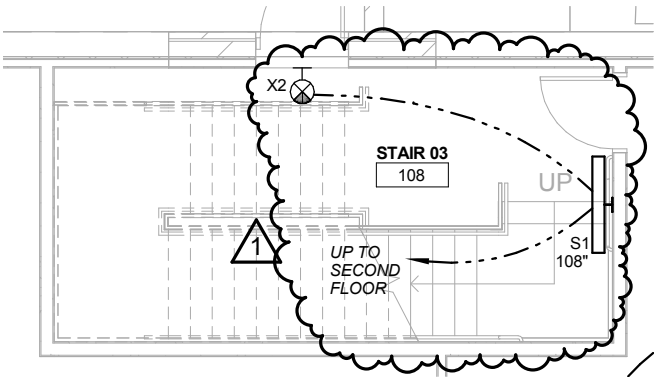
Scale: No Scale

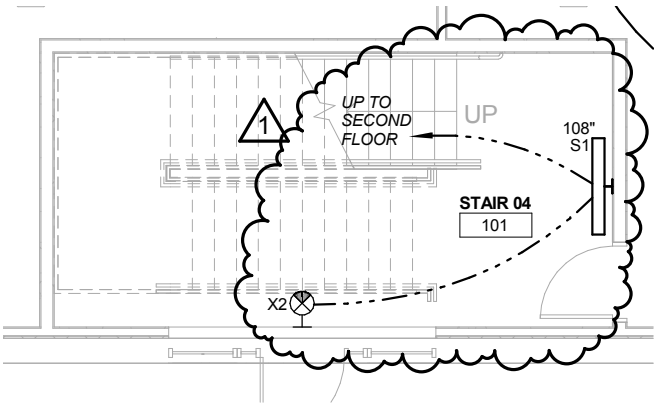
Attachment: S9
Reference: 6/S001CD
Bid Package: 02
Addendum: 02

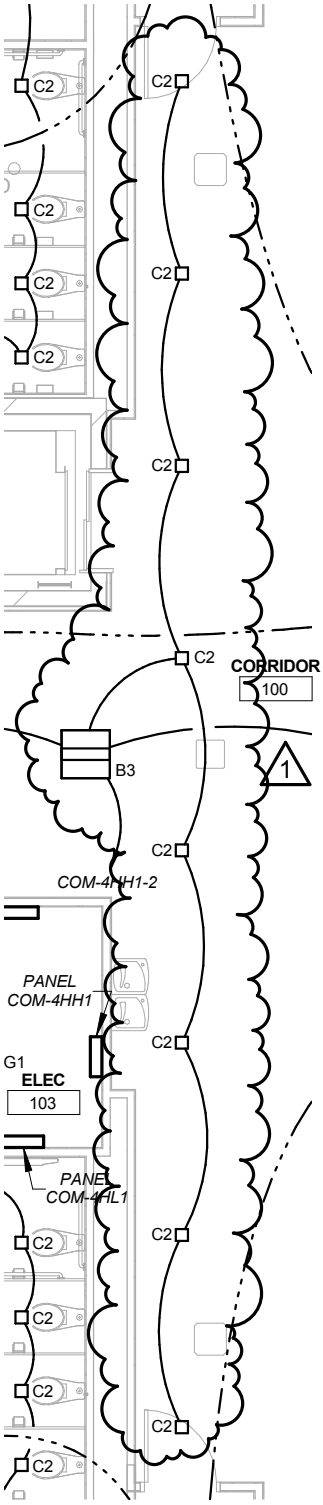




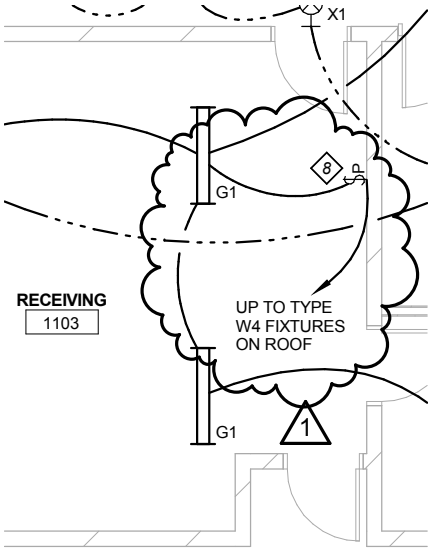
Attachment: E101A.1
Reference: 1/E101A
Bid Package 02
Addendum 02

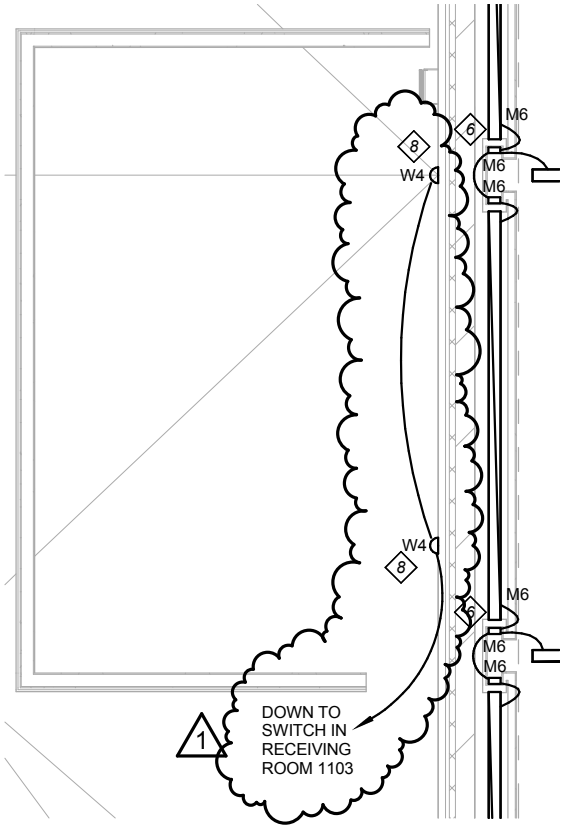






Attachment: E101B.1
Reference: 1/E101B
Bid Package 02
Addendum 02

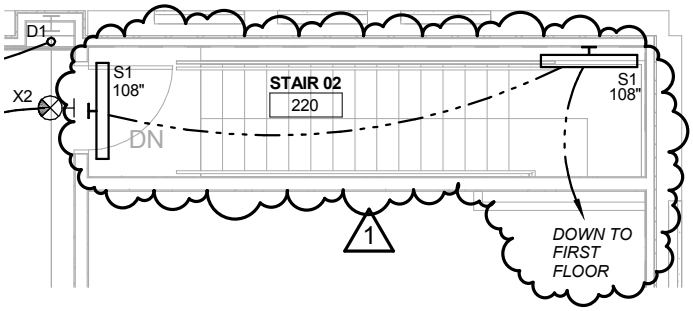


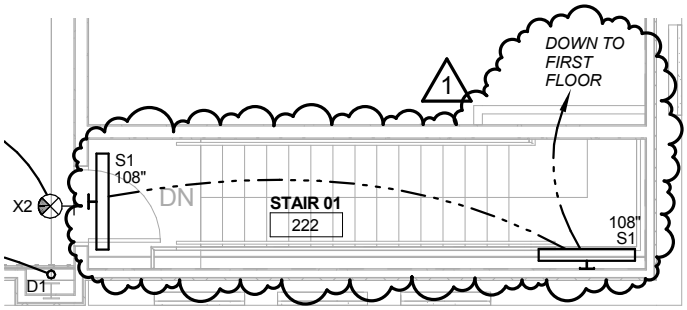


1

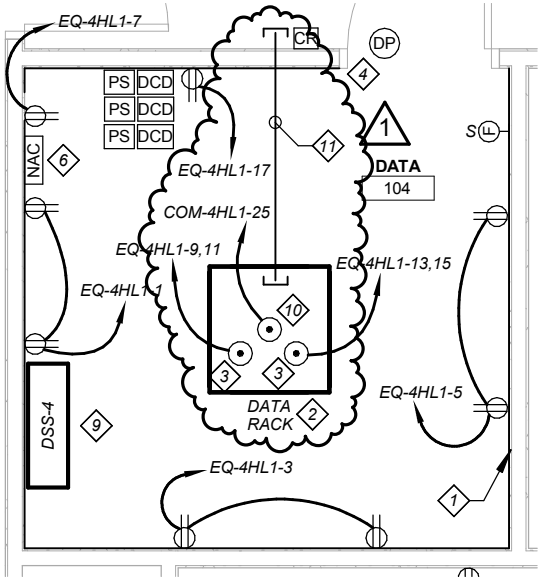
8 *PROVIDE A PILOT LIGHT SWITCH (LIT WHEN FIXTURES ARE ON) IN REVEIVING 1103. LOCATE PILOT LIGHT SWITCH ADJACENT TO ROOF TOP LADDER IN ROOM 1103. CIRCUIT THE SWITCH AND ASSOCIATED TYPE W4 FIXTURES TO RECEIVING 1103 LIGHTING CIRCUIT. PROVIDE CONTINUOUS HOT LEG, SO SWITCH IS MANUALLY CONTROLLED ONLY. <u>NOTE: THIS WORK IS OMITTED IF ALTERNATE 1B OR 1C IS TAKEN.</u>*

Attachment: E101C.2
Reference: 1,2/E101C
Bid Package 02
Addendum 02

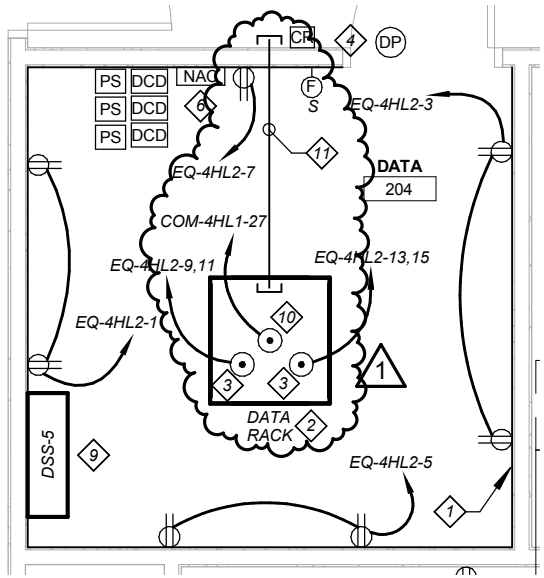




Attachment: E102A.1
Reference: 1/E102A
Bid Package 02
Addendum 02



4 Enlarged Electrical Plan - Data 104
1/4" = 1'-0"



6 Enlarged Electrical Plan - Data 204
1/4" = 1'-0"

1

10 *PROVIDE A 120V, 20A CIRCUIT TO EQUIPMENT RACK TO FEED PUBLIC ADDRESS (PA) COMPONENTS INSTALLED WITHIN THE RACK. PROVIDE A SURFACE MOUNT JUNCTION BOX AT STRUCTURE AND PROVIDE A TWIST LOCK RECEPTACLE AND CORD DROPPED TO THE RACK. PROVIDE CORD WITH STAINLES STEEL CORD GRIP AT BOX. AT RACK, PROVIDE A 6 OUTLET SURGE STRIP FED FROM THIS CIRCUIT. COORDINATE LOCATION OF STRIP.*

11 *PROVIDE TWO (2) 2" CONDUITS STUBBED FROM ABOVE THE EQUIPMENT RACK ROUTED ALONG THE STRUCTURAL CEILING AND STUBBED OUT INTO THE ADJACENT CORRIDOR ABOVE THE SUSPENDED CEILING. CONDUITS FOR PA SYSTEM CIRCUITS, ALL WIRING BY OTHERS.*

Attachment: E401.1
Reference: 4,6/E401
Bid Package 02
Addendum 02

LIGHTING FIXTURE SCHEDULE

TYPE NO.	DESCRIPTION / SPEC. NO.	LAMPS NO.	LAMPS WATT	LAMPS TYPE	VOLT	MOUNTING	NOTES	OTHER MANUFACTURERS
A1	2 x 2 FLUORESCENT LENSED TROFFER - GRID COLUMBIA #4PS-22-317-G-FS-A12125-E-U	3	17	F017-T8 4100K OCT	277	RECESSED GRID	B,C,I	1,6,13
A2	2 x 4 FLUORESCENT LENSED TROFFER - GRID - INV LENS COLUMBIA #4PS-24-232-G-FS-A12125-INV-EP-U	2	32	F032-T8 4100K OCT	277	RECESSED GRID	B,C,I	1,6,13
A3	2 x 4 FLUORESCENT LENSED TROFFER - GRID COLUMBIA #4PS-24-232-G-FS-A12125-E-U	2	32	F032-T8 4100K OCT	277	RECESSED GRID	B,C,I	1,6,13
A4	2 x 4 FLUORESCENT LENSED TROFFER - SELF FLANGE COLUMBIA #4PS-24-232-F-FS-A12125-E-U	2	32	F032-T8 4100K OCT	277	RECESSED GYP CEILING	B,C,I	1,6,13
B1	2 x 2 DIR/INDIR LED LENSED TROFFER 0-10V DIM - GRID COLUMBIA #LEPC22-40-HL-G-LL-ED-U		38	3800 LUMEN 80 CRI, 4000K	277	RECESSED GRID	R	6,24
B2	2 x 2 DIR/INDIR FLUOR LENSED TROFFER STEP DIM - GRID COLUMBIA #EPC22-217G-SH-ESD104-U	2	17	F017-T8 4100K OCT	277	RECESSED GRID	B,C,I,R	6,24
B3	2 x 2 DIR/INDIR FLUOR LENSED TROFFER - GRID COLUMBIA #EPC22-217G-SH-E104-U	2	17	F017-T8 4100K OCT	277	RECESSED GRID	B,C,I	6,24
B4	2 x 2 DIR/INDIR FLUOR LENSED TROFFER - SELF FLANGE COLUMBIA #EPC22-217FK22-SH-E104-U	2	17	F017-T8 4100K OCT	277	RECESSED GYP CEILING	B,C,I	6,24
C1	6" DIA. HIGH OUTPUT LED DOWNLIGHT 0-10V DIM - GRID PMC LIGHTING #6LE-MX-4500-R-40N-1-D-2-H		51	4500 LUMENS 4000K, 80 CRI	277	RECESSED GRID	Q,R	7,14
C2	6" SQUARE FLUOR 1 LAMP DOWNLIGHT - SELF FLANGE PORTFOLIO #CSQ6126-E-6CSQ1-H	1	26	TTT 4-PIN GX24q-3	277	RECESSED GYP CEILING	B,C,I	8,14
C3	6" SQUARE FLUOR 2 LAMP DOWNLIGHT - SELF FLANGE PORTFOLIO #CSQ6226-E-6CSQ1-H	2	26	TTT 4-PIN GX24q-3	277	RECESSED GYP CEILING	B,C,I	8,14
C4	6" SQUARE FLUOR 2 LAMP DOWNLIGHT - GRID PORTFOLIO #CSQ6226-E-6CSQ0-H	2	26	TTT 4-PIN GX24q-3	277	RECESSED GRID	B,C,I	8,14
C5	EXTERIOR METAL HALIDE SQUARE APERT. DOWNLIGHT ZUMTOBEL #CAR701-T4035-277E-F-BK-BK	1	35	3300 LMN MH 4000K, 80 CRI	277	EXTERIOR SOFFIT		5
D1	UPLIGHT AT 2ND FLOOR DINING TRUSSES ERCO #33833.023		3.2	300 LUMENS 4000K, 80 CRI	120	RECESSED SOFFIT	S	
G1	1 X 4 INDUSTRIAL STRIP - 10% UPLIGHT & LOUVER LENS METALUX #I8-232-G-TBW-UNV-ER81-UPL	2	32	F032-T8 4100K OCT	277	CHAIN HUNG	B,C,F,I	6,13,26
G2	1 X 4 INDUSTRIAL STRIP METALUX #DCIF-232-UNV-EB81	1	32	F032-T8 4100K OCT	277	CHAIN HUNG	B,C,F,I	6,13,26
K1	LED HANDRAIL IO LIGHTING #0.06.SSP.2.PMC.GL.55.35KMO.HR.4	190 LUMENS PER FT. 3500K, 80 CRI			277	HANDRAIL	M	21
M1	2 FOOT FLUORESCENT COVE LIGHT PRUDENTIAL LIGHTING #SC-1T8-02-UNV-10THD	1	17	F017-T8 4100K OCT	277	SURFACE COVE	B,C,I,P	9,26
M2	4 FOOT FLUORESCENT COVE LIGHT PRUDENTIAL LIGHTING #SC-1T8-04-UNV-10THD	1	32	F032-T8 4100K OCT	277	SURFACE COVE	B,C,I,P	9,26
M3	4 FOOT FLUORESCENT COVE LIGHT (PRE-FUNCTION 115) INSIGHT #VO-KSM-SA-T8-32-4-2-W-PLV	1	32	F032-T8 4100K OCT	277	SURFACE COVE	B,C,I,P	10,13,17
M4	8 FOOT FLUORESCENT COVE LIGHT (PRE-FUNCTION 115) INSIGHT #VO-KSM-SA-T8-32-8-2-W-PLV	2	32	F032-T8 4100K OCT	277	SURFACE COVE	B,C,I,P	10,13,17
M5	4 FOOT FLUORESCENT STRIP FIXTURE (DINING 211) DAY-BRITE #N-1-32-277-4	1	32	F032-T8 4100K OCT	277	SURFACE COVE	B,C,I,P	6,13,26
M6	LINEAR LED SYMMETRIC - INTERIOR (LENGTH VARIES) PHILIPS VAYA #9105037021 (SEE NOTE W BELOW)		15	860 LUMENS 3000K, 80 CRI	277	SURFACE COVE	A,W	2,11,15
M7	4 FOOT FLUORESCENT STRIP FIXTURE (CORRIDOR 100) DAY-BRITE #N-1-32-277-NAR-4	1	32	F032-T8 4100K OCT	277	SURFACE COVE	B,C,I	1,6,26
M8	14' LINEAR LED SYMMETRIC - EXTERIOR IO LIGHTING #0.04.E.35K.60.100.1.14'.4	260 LUMENS PER FT. 3500K, 80 CRI			277	EXTERIOR BENCH	D	10,22
M9	19' LINEAR LED SYMMETRIC - EXTERIOR IO LIGHTING #0.04.E.35K.60.100.1.19'.4	260 LUMENS PER FT. 3500K, 80 CRI			277	EXTERIOR BENCH	D	10,22
M10	24' LINEAR LED SYMMETRIC - EXTERIOR IO LIGHTING #0.04.E.35K.60.100.1.24'.4	260 LUMENS PER FT. 3500K, 80 CRI			277	EXTERIOR BENCH	D	10,22
M11	29' LINEAR LED SYMMETRIC - EXTERIOR IO LIGHTING #0.04.E.35K.60.100.1.29'.4	260 LUMENS PER FT. 3500K, 80 CRI			277	EXTERIOR BENCH	D	10,22
M12	10 FOOT FLUORESCENT COVE LIGHT PRUDENTIAL LIGHTING #SC-1T8-10-UNV-10THD	1	32	F032-T8 4100K OCT	277	SURFACE COVE	B,C,I,P	9,26
N1	16 FOOT LINEAR RECESSED FLUOR STRIP - 0-10V DIM AXIS #BBR-S-FL-S16-NL4-T8-+S-W-277-D-1	6	32	F032-T8 4100K OCT	277	RECESSED CEILING	A,B,C,R	17
N2	LINEAR RECESSED FLUOR STRIP (LENGTH VARIES) AXIS #BBR-S-FL-X-X-T8-+S-W-277-ERS-1-DS (SEE NOTE X)		32	F032-T8 4100K OCT	277	RECESSED WALL	A,B,C,X	17
N3	4 FOOT LINEAR RECESSED FLUOR STRIP - 0-10V DIM AXIS #BBR-S-FL-4-NL4-T8-1-W-277-D-1	1	32	F032-T8 4100K OCT	277	RECESSED WALL	A,B,C,R	17
P1	8" DIA, 4' FLUOR CYLINDER PENDANT - 0-10V DIM VISA LIGHTING #CP5205-CBL-2FHP32-DIM	2	32	F032-T8 4100K OCT	277	PENDANT MOUNT	B,C,I R,V	12,16,27
P2	12" DIA, 4' FLUOR CYLINDER PENDANT - 0-10V DIM VISA LIGHTING #CP5209-CBL-2FHP32-DIM	2	32	F032-T8 4100K OCT	277	PENDANT MOUNT	B,C,I R,V	12,16,27
P3	12" DIA, 8' FLUOR CYLINDER PENDANT - 0-10V DIM VISA LIGHTING #CP5213-CBL-2FHP32-DIM	4	32	F032-T8 4100K OCT	277	PENDANT MOUNT	B,C,I R,V	12,16,27
P4	6" DIAMETER LED PENDANT - 0-10V DIM PMC LIGHTING #6LECHP-2800-P-CW-1-D-U-H-Z		36	2600 LUMENS 4000K, 80 CRI	277	PENDANT MOUNT	R	7,17
R1	SURFACE MOUNT UTILITY FIXTURE SHAPER #226-CFL/2/26-277/NA	2	26	TTT 4-PIN GX24q-3	277	SURFACE CEILING	B,C,I	12,18,27
S1	STAIRWELLS LINEAR WALL BRACKET METALUX #BAU-2-32-UNV-EL-EB81/PLUS-1-WH	2	32	F032-T8 4100K OCT	277	SURFACE WALL	A,I	6,19,28
U1	LED PARKING LOT LUMINAIRE - TYPE II DISTRIBUTION KIM LIGHTING #AR-2-120L-4K-277-DB		129	6100 LUMENS 4000K, 80 CRI	277	POLE MOUNT	T,U	23,25
U2	LED PARKING LOT LUMINAIRE - TYPE IV DISTRIBUTION KIM LIGHTING #AR-4-120L-4K-277-DB		129	6100 LUMENS 4000K, 80 CRI	277	POLE MOUNT	T	23,25
V1	EXTERIOR LED FIXTURES AT COMPANION CANOPIES LUMENPULSE #LOGHO-277-48-40K-10X60-WAM12-SI-NO	10,000 LUMENS @ NADIR 4000K, 85 CRI			277	SURFACE WALL	J	
V2	EXTERIOR LED STEPLIGHT PRESCOLITE #SLLED1-35K-BL-277V-SLD12CMB		13	127 LUMENS 3000K, 80 CRI	277	RECESSED CONC. WALL	G	5
W1	EXTERIOR LED UP/DOWN WALL SCONCE BETA CALCO ATIA #231988-BL-277	2	70	6600 LMN MH 4000K, 80 CRI	277	SURFACE WALL	A	5
W2	EXTERIOR LED WALL SCONCE INVUE #ENT-B01-LED-E1-BL4-BK		27	2100 LUMENS 4000K, 80 CRI	277	SURFACE WALL	A	5,23
W3	EXTERIOR METAL HALIDE DOWNLIGHT ERCO #81042.000	1	35	3900 LMN MH 4000K, 80 CRI	277	EXTERIOR SOFFIT		5,30
W4	EXTERIOR METAL HALIDE WALL SCONCE LUMARK #MPWP-GL-70-277	1	70	5000 LMN MH 4000K, 80 CRI	277	SURFACE WALL	A	5
X1	LED EXIT SIGN SURE-LITES #LPX-6	LED FURNISHED WITH FIXTURE			277	MOUNTING VARIES	E,H	6,20,29
X2	ARCHITECTURAL LED EXIT SIGN - SINGLE FACED SURE-LITES #ES6-1-RM	LED FURNISHED WITH FIXTURE			277	MOUNTING VARIES	E,H	6,20,29
X3	ARCHITECTURAL LED EXIT SIGN - DOUBLE FACED SURE-LITES #ES6-2-RM	LED FURNISHED WITH FIXTURE			277	SURFACE WALL/CEILING	A,H,E	6,20,29

OTHER MANUFACTURERS:

1	METALUX	11	LUMENPULSE	21	INTENSE LIGHTING
2	INSIGHT LIGHTING	12	SCOTT LIGHTING	22	COLOR KINETICS
3	AXIS LIGHTING	13	DAY-BRITE	23	GARDCO
4	ADVENT	14	PATHWAY LIGHTING	24	ATTUNE
5	ERCO LIGHTING	15	EMERGE LIGHTING	25	MCGRAW EDISON
6	LITHONIA	16	OCL	26	COLUMBIA
7	GOTHAM	17	PRUDENTIAL LIGHTING	27	CAMMAN INDUSTRIES
8	KIRLIN	18	CAPRI LIGHTING	28	KENALL
9	FOCAL POINT	19	ALKCO	29	DUAL-LITE
10	WINONA LIGHTING	20	CHLORIDE	30	WE-EF

GENERAL NOTES (APPLICABLE TO ALL LIGHT FIXTURES):

1 ALL FIXTURES TO BE CONTROLLED BY A 0-10V LIGHTING CONTROL SYSTEM (ENCELIUM, BY CONTROLS CONTRACTOR). SEE LIGHTING CONTROL PLANS ON E402 & E502 FOR DETAILS. CONTRACTOR RESPONSIBLE TO FULLY COORDINATE WITH CONTROLS CONTRACTOR TO ENSURE THAT FIXTURES, BALLASTS AND DRIVERS (LED) ARE FULLY COMPATIBLE WITH THE LIGHTING CONTROLS SYSTEM.

2 CONTRACTOR TO VERIFY LIGHT FIXTURE INSTALLATION REQUIREMENTS FOR APPLICABLE INSTALLATION LOCATION

SPECIFIC FIXTURE NOTES:

A CONTRACTOR TO PROVIDE BACKING FOR ALL WALL MOUNTED FIXTURES.

B ALL FLUORESCENT LAMPS SHALL BE MINIMUM 82 CRI, AND 4100K CCT, UNLESS OTHERWISE NOTED.

C FLUORESCENT BALLASTS TO BE HIGH FREQUENCY ELECTRONIC PROGRAM START AND HAVE LESS THAN 10% THD. AND AN A+ SOUND RATING.

D SEE DETAIL 5 ON SHEET E501 FOR INSTALLATION REQUIREMENTS.

E MOUNT FIXTURE ABOVE DOOR.

F CHAIN HANG FIXTURE BELOW PIPES AND DUCTS. COORDINATE WITH MECHANICAL CONTRACTOR. SUPPORT FIXTURES FROM STRUCTURE ONLY. FIXTURES IN THE SAME ROOM SHALL BE MOUNTED AT THE SAME HEIGHT ABOVE FINISHED FLOOR.

G PROVIDE STEPLIGHT WITH CONCRETE BACKBOX. SEE DETAIL 4 ON SHEET E501 FOR INSTALLATION DETAIL.

H MOUNT DIRECTIONAL ARROWS AS SHOWN ON DRAWINGS.

I FLUORESCENT LAMPS USED WITH DIMMING BALLASTS SHALL BE BURNED IN MINIMUM OF 100 HRS. AT 100% BEFORE DIMMING.

J SEE DETAIL 3 ON SHEET E501 FOR MOUNTING INFORMATION.

K CONTRACTOR TO VERIFY LIGHT FIXTURE INSTALLATION REQUIREMENTS.

L MOUNT PER INSTALLATION DETAIL 4 ON SHEET E503.

M LIT HANDRAIL INSTALLATION SHALL BE FULLY COORDINATED WITH THE ARCHITECT AND INSTALLATION CONTRACTOR. SEE ADDITIONAL DISCUSSION IN SPECIFICATION 265100, ARTICLE 3.1, PART G. SEE DETAIL 7, SHEET E501 FOR INSTALLATION DETAIL.

N SELECT FIXTURES EQUIPPED WITH GENERATOR TRANSFER DEVICE (GTD). SEE LIGHTING PLANS SHEETS FOR LOCATIONS.

O MOUNT PER INSTALLATION DETAIL 19 ON SHEET E503.

P NOT ALL COVE ROW LENGTHS SPECIFIED HERE. CONTRACTOR TO REVIEW DRAWINGS IN DETERMINING SPECIFIC LENGTHS OF COVE FIXTURES REQUIRED FOR A CONTINOUS, EVEN ILLUMINATION OF THE COVE SPACE. INSTALL PER DETAILS 1 OR 2 AS APPLICABLE ON SHEET E503.

Q PROVIDE FIXTURE WITH APPROPRIATE SLOPED CEILING ADAPTER. INSTALL PER DETAIL 3 ON SHEET E503.

R FIXTURE TO INCLUDE STEP-DIMMING BALLAST OR DRIVER FOR MULTI-LEVEL LIGHTING CONTROL PER SHEET E402. FURNISH AS REQUIRED.

S PROVIDE A 277:120V TRANSFORMER AS REQUIRED TO POWER THE TYPE D1 FIXTURES. LOCATE XFMR IN ACCESSIBLE, CONCEALED LOCATION.

T PROVIDE ALL MOUNTING HARDWARE (I.E. TENON ADAPTERS) AS REQ'D FOR POLE MOUNTED FIXTURES. COORDINATE WITH POLES PROVIDED.

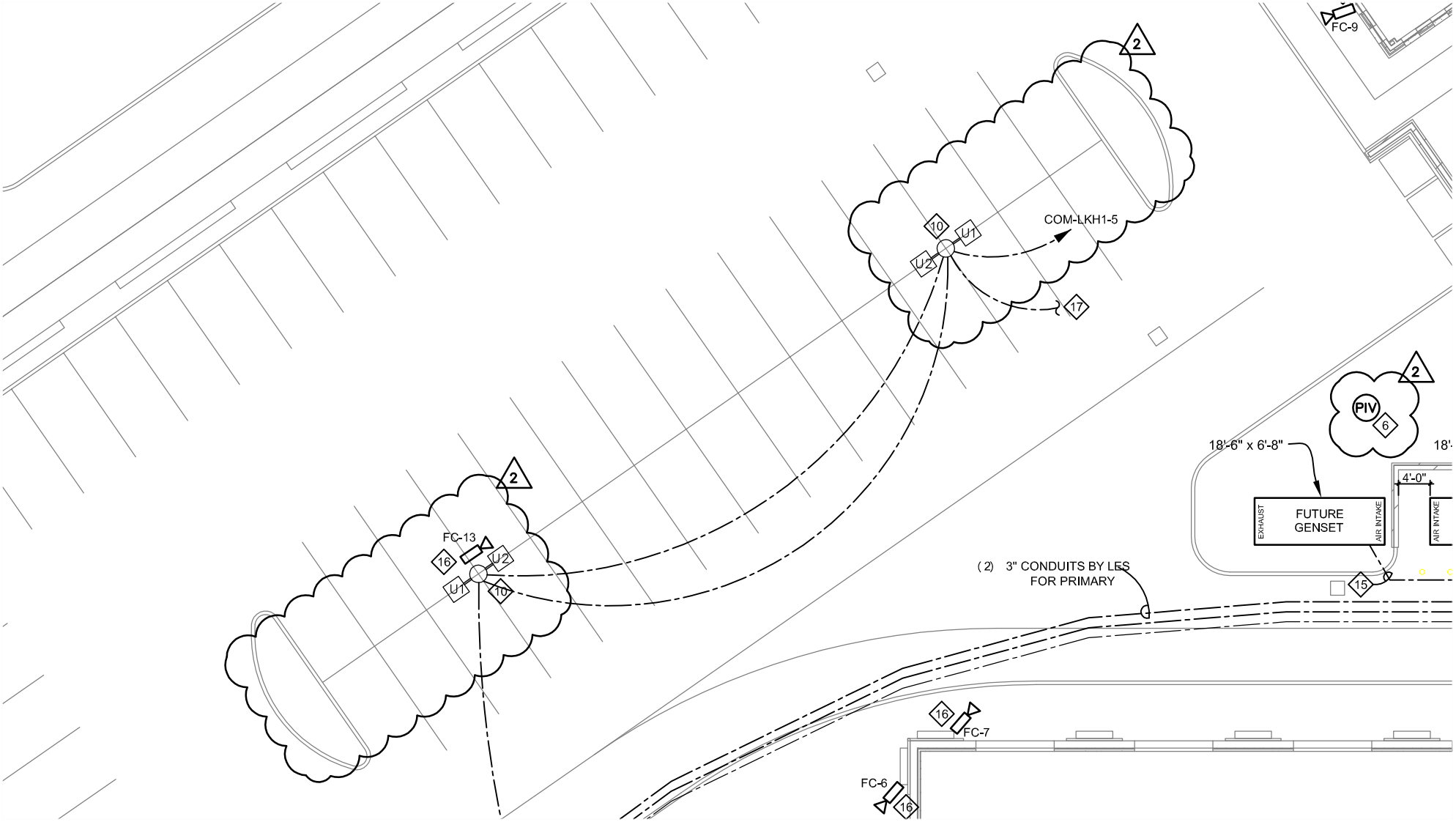
U PROVIDE ONE OF THE TYPE U1 FIXTURES WITH INTEGRAL PHOTOCELL.

V PROVIDE FIXTURE WITH AIRCRAFT CABLE FOR ADJUSTMENT OF INSTALLED HEIGHTS. FINAL HEIGHTS TO BE VERIFIED IN THE FIELD.

W TYPE M6 FIXTURES ARE SHOWN IN MANY LOCATIONS ON THE DRAWINGS. SEVERAL DIFFERENT FIXTURE LENGTHS ARE REQUIRED TO FULLY ILLUMINATE THE COVE IN EACH LOCATION, MANY OF THE LENGTHS ARE NOT INDICATED ON THE PLANS.
LENGTHS NEEDED INCLUDE THE FOLLOWING:
ROOM NIC LINK 1101 - HORIZONTAL M6 FIXTURES - (4) 17 FOOT LENGTHS, (1) 9 FOOT LENGTH
ROOM NIC LINK 1101 - VERTICAL M6 FIXTURES - (10) 10 FOOT LENGTHS
ROOM NIC LINK 2101 - HORIZONTAL M6 FIXTURES - (1) 20 FOOT LENGTH (AT BENCH), (4) 16 FOOT LENGTHS, (1) 9 FOOT LENGTH
ROOM NIC LINK 2101 - VERTICAL M6 FIXTURES - (5) 12 FOOT LENGTHS, (2) 11 FOOT LENGTHS, (3) 10 FOOT LENGTHS
LENGTHS INDICATED ARE NOMINAL, BASED ON AVAILABLE SEGMENT LENGTHS OF 12", 24", AND 48".
CONTRACTOR SHALL PROVIDE COMBINATION OF LENGTHS NECESSARY TO ACHIEVE OVERALL LENGTHS INDICATED ABOVE.
CONTRACTOR SHALL CENTER LIGHT FIXTURES IN EACH COVE FOR A CONSISTENT LOOK.

X TYPE N2 FIXTURES ARE SHOWN IN MANY LOCATIONS ON THE DRAWINGS. SEVERAL DIFFERENT FIXTURE LENGTHS ARE REQUIRED AT THE VARIOUS WALL LOCATIONS. LENGTHS ARE NOT INDICATED ON THE PLANS. LENGTHS REQUIRED INCLUDE THE FOLLOWING:
ALL RESTROOMS (102, 107, 202, 207, 1213, 1214, 2213, 2214, 3213, 3214) - 5 FOOT LENGTHS, QUANTITIES PER THE PLAN SHEETS
ROOM CORR 1201 - (3) 8 FOOT LENGTHS
ROOMS ELEV LOBBY 2201 & 3201 - (3) 6 FOOT LENGTHS PER ROOM
ALL TYPE N2 FIXTURES INDICATED ABOVE SHALL BE INSTALLED TIGHT TO THE TOP OF THE WALL, LEAVING NO GAP BETWEEN THE WALL AND THE CEILING. ALL TYPE N2 FIXTURES SHALL BE INSTALLED IN TILED WALLS, PROVIDE DRYWALL SPACKLE FLANGE AS REQUIRED FOR PROPER INSTALLATION WITHIN A TILED WALL. VERIFY COMPLETE COORDINATION OF THE MOUNTING BRACKET LOCATION IN THE TILED WALL PRIOR TO THE RELEASE OF THE LIGHT FIXTURE ORDER. SEE ARCHITECTURAL SHEETS FOR ELEVATIONS.

Attachment: E604.2
Reference: E604
Bid Package 02
Addendum 02



Attachment: ES101.2
Reference: 1/ES101
Bid Package 02
Addendum 02

SECTION 064023 - INTERIOR ARCHITECTURAL WOODWORK

2.9 FLUSH WOOD PANELING

A. Grade: Custom.

B. Wood Species and Cut: Red oak, rift cut.

1. Lumber Trim and Edges: Edges indicated as solid wood are to be compatible with grain and color of veneered panels.

C. Matching of Adjacent Veneer Leaves: Book match.

D. Veneer Matching within Panel Face: Balance match.

E. Panel-Matching Method: Match panels within each separate area by the following method:

1. Premanufactured sets used full width.

PART 3 EXECUTION

3.2 INSTALLATION

J. Paneling: Anchor paneling to supporting substrate with splined connection strips. Minimize use face fastening.

1. Install flush paneling with no more than 1/16 inch in 96-inch (1.5 mm in 2400-mm) vertical cup or bow and 1/8 inch in 96-inch (3 mm in 2400-mm) horizontal variation from a true plane.

GEOTECHNICAL ENGINEERING REPORT

Proposed NIC 4H & Companion Building

Innovation Park
Lincoln, NE

PREPARED FOR

Scott Woodbury Wiegert
728 Q Street
Suite C
Lincoln, NE 68508

June 1, 2012

benesch
engineers · scientists · planners

benesch
engineers · scientists · planners

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June 1, 2012

Mr. Don Mohlman
Scott Woodbury Wiegert
728 Q Street
Suite C
Lincoln, NE 68508

REFERENCE: Geotechnical Engineering Report
Proposed NIC 4H & Companion Building
Innovation Park
Lincoln, NE

Dear Mr. Mohlman:

Alfred Benesch & Company (Benesch) is pleased to submit the enclosed report that summarizes the findings of a geotechnical engineering study and provides recommendations related to the design and construction of the foundation for the referenced project.

If any questions arise concerning this report or if additional information is needed about soil conditions at this site, please contact Benesch for assistance.

Sincerely,

Doyle B. Petersen

Doyle B. Petersen, P.E.
Project Engineer

Enclosures

Orig. & 2 pc.: Scott Woodbury Wiegert
2 pc.: Davis Design

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

PROJECT OVERVIEW

The proposed project consists of a complete renovation of the existing 4H Building and the construction of a new Companion Office Building. The new building will be a three-story, slab-on-grade structure with a penthouse level. Elevators will require pits to a depth of 4 to 5 feet below the floor slab. The total area of the new building will be approximately 98,000 ft^2. The anticipated main framing will be steel post and beam construction with lateral force resisted by a combination of shear walls and moment frames. General floor construction will be concrete topping on precast concrete hollow core planks. The roof over the penthouse will be constructed with steel joists and a flexible EPDM membrane. Paved parking and drive areas will be located west of the new building. Plaza areas will be to the northeast and southeast of the new building. Additional information from Davis Design consists of:

Type of Foundation(s) Being Considered:	Shallow Footings and Grade Beams; Geopiers™; or Auger Cast Piles.
Companion Building Estimated Maximum Column Load:	Exterior = 80 kips (Dead Load) + 80 kips (Live Load) Interior = 225 kips (Dead Load) + 206 kips (Live Load)
Remodeled 4H Building Estimated Maximum Column Load:	145 kips (Dead Load) + 125 kips (Live Load)
Estimated Maximum Floor Live Load:	100 lbf/ft^2
Estimated Maximum Roof Live Load:	30 lbf/ft^2
Acceptable Differential Settlement:	¼ to ½ inch
Companion Building and 4H Building Finished Floor Elevations:	First Floor =: 1154.25 feet
Bottom-of-Footing Elevations:	Exterior Frost Depth (Estimated) = 1150 feet Interior (Estimated) = 1152 feet
Estimated Fill Height:	0.5 to 3.5 feet

1 kip = 1,000 lbf

FACTORS AFFECTING SITE PREPARATION

- Unsuitable floor and pavement subgrade materials extend to depths of 0.5 feet.
- Low-moisture-content (moist) soils were encountered at one location (B-8) to the depth of the boring (10 feet). The calculated pavement heave of these soils is 1.8 inches if soils get wetter.
- Utilities are known to be within the building area. The existing utility backfill is likely unsuitable foundation material and possibly unsuitable floor/pavement subgrade material.

- Unsuitable foundation soils for spread footing were encountered to depths of 5.0 to 14.5 feet at the boring locations..

INTERMEDIATE AND DEEP FOUNDATIONS

A discussion has been provided regarding Geopiers™. Recommendations have been presented for the design and construction of auger cast piles and drilled shafts.

2.0 SUBSURFACE EXPLORATION

A program of Dutch friction-cone soundings, test borings and soil sampling was performed at the project site from January 31 through February 2, 2012. Six (6) Dutch friction-cone soundings were made at the site. The results of the soundings were used to determine the depths for obtaining undisturbed soil samples from an exploratory boring made immediately adjacent to each sounding. Nine (9) exploratory borings were taken to depths of 5 to 83.5 feet below the existing grade to establish the general subsurface conditions of the area under consideration.

The Dutch friction-cone soundings were performed with a mechanical penetrometer in accordance with ASTM D 3441, Standard Method for Deep, Quasi-Static, Cone, and Friction Cone Penetration Tests of Soil. The plot of the data from this test identifies the relative positions and thicknesses of hard and soft layers of soil.

The borings were made in accordance with ASTM D 1452, Standard Practice for Soil Investigation and Sampling by Auger Borings. Machine-driven, continuous-flight and hollow-stem augers used to advance the holes for split-barrel and thin-walled tube sampling.

Penetration tests were performed with a CME Automatic Free-Fall SPT Hammer (hammer efficiency approximately 80%) in accordance with ASTM D 1586, Standard Method for Penetration Test and Split-Barrel Sampling of Soils. Representative samples of soil were obtained for identification purposes. The resistance of the soil to penetration of the sampler, measured in blows per foot (N), is an indication of the relative density of cohesionless soil and of the consistency of cohesive soil.

Undisturbed soil samples were recovered for visual observation and laboratory testing in accordance with ASTM D 1587, Standard Method for Thin-Walled Tube Sampling of Soil, utilizing an open-tube sampler having an outside diameter of 3.0 inches.

The vicinity map and the boring location plan are presented in Appendix A. The penetration diagrams (see Appendix B) present the results of the Dutch friction-cone soundings. The boring logs (see Appendix C) present the data obtained in the subsurface exploration. The logs include the surface elevations, the approximate depths and elevations of major changes in the character of the subsurface materials, visual descriptions of the materials in accordance with the criteria presented in Appendix D, groundwater data, the penetration resistance recorded in blows per 0.5-ft increments of depth, and the locations of undisturbed samples of soil.

The locations of the soundings and borings were determined by tape measurements from the northwest corner of the existing 4H Building. Table 1 presents the measured distances of the boring locations. Elevations (approximate) at the sounding and boring locations were determined by survey with reference to the top of the floor slab of the existing 4H Building at the center doors on the north side of the building. Davis Design indicated that the elevation of this benchmark is 1153.80 feet. Water level readings were made in the auger borings at times and under conditions stated on the boring logs.

TABLE 1
LOCATIONS OF BORINGS

Boring No.	North or South of NW Corner of Existing 4H Building	East or West of NW Corner of Existing 4H Building
B-1	150' N	115' E
B-2	250' N	150' E
B-3	115' N	40' W
B-4	45' N	70' E
B-5	185' N	225' E
B-6	50' N	145' E
B-7	55' N	220' E
B-87	100' S	60' W
B-9	25' N	145' W

3.0 LABORATORY ANALYSES

The split-barrel and undisturbed soil samples obtained during the subsurface exploration were examined in the laboratory by a member of Benesch's professional engineering staff to supplement the field identification. Standard tests were performed on selected samples to determine the engineering properties of the foundation materials.

The moisture contents and dry unit weights of selected undisturbed soil samples were determined in the laboratory. These test results are presented in the boring logs opposite the respective sample locations. The moisture contents were determined in accordance with either ASTM D 4643, Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method, or ASTM D 2216, Standard Test Method for Determination of Water (Moisture) Content of Soil and Rock by Mass. The dry unit weights were determined in accordance with the Displacement Method of the Corps of Engineers, EM1110-2-1906, Appendix II, Unit Weights, Void Ratio, Porosity, and Degree of Saturation. These data correlate with the strength and compressibility of the soil. High moisture content and low density usually indicate low strength and high compressibility.

The unconfined compressive strengths of several undisturbed samples were estimated in the laboratory with a calibrated hand penetrometer. These strengths are presented on the boring logs and are estimates only. Actual values are generally lower than the estimated values indicated on the boring logs.

The compressibility of each of two undisturbed samples of the foundation soils was determined in accordance with ASTM D 2435, Standard Test Method for One-Dimensional Consolidation Properties of Soils, except that time-rate readings were not obtained. The data from the consolidation tests can be used to develop an estimate of the maximum amount of settlement of the structure. A brief summary of the test data is presented in Table 2, and the complete test reports are presented in Appendix E.

TABLE 2
CONSOLIDATION TEST DATA

Boring No.	Depth, ft.	Initial Void Ratio	Overburden Pressure, tons/ft^2	Preconsol-idation Pressure, tons/ft^2	Compression Index	Recompression Index	Coefficient of Consolidation, in^2/min
B-1	5.5-6.0	1.05	0.33	1.55	0.45	0.042	--
B-6	5.5-6.0	1.13	1.7	1.7	0.49	0.039	--

4.0 GEOLOGY AND SITE CONDITIONS

The city of Lincoln lies in the Dissected Till Plains section of Nebraska, a part of the Central Lowland province of the Interior Plains physiographic division[1]. The project site is located in the central part of the city on loess-mantled terraces. The terraces are located adjacent to alluvial bottomlands, and generally consist of Peoria loess deposits atop alluvial silts and sands. Older terraces existing adjacent to younger terraces generally consist of Peoria loess overlying Loveland formation terrace clays and sands.

The site has been previously graded as evidenced by the fill encountered at the boring locations. Two slab-on-grade buildings and existing paved parking lots are currently located in the proposed building area. These buildings and the pavement structures will be removed prior to construction of the Companion Building. Existing buried utility lines are also located in the proposed building area.

The subsurface materials encountered at the boring locations generally consisted of existing cohesive fill, topsoil, subsoil, Peoria lean clays, alluvial sands, and bedrock (Dakota sandstone) in descending order of occurrence. Detailed descriptions are provided in the boring logs, which are presented in Appendix C.

Groundwater was encountered at elevations ranging from 1130.3 to 1132.8 feet (18.0 to 22.4 feet below existing grade). The water table could be expected to fluctuate several feet depending on surface drainage, rainfall, lawn watering, vegetation, temperature, and other factors.

[1] Physiographic Provinces of North America, Map by A. K. Lobeck, 1948; The Geographical Press; Columbia University, New York

5.0 DISCUSSION AND RECOMMENDATIONS

Four basic requirements for a satisfactory foundation of a structure are as follows:

A. The base of the foundation must be located below the depth to which the soil is subject to frost action and seasonal volume change caused by alternate wetting and drying.
B. The foundation (including the earth beneath it) must be stable or safe from failure.
C. The foundation must not settle or deflect enough to disfigure or damage the structure.
D. The foundation structure must be properly located with respect to any future influence that could adversely affect its performance.

The following recommendations for design and construction of the foundation for the proposed building are based upon site conditions, the engineering properties of the subsurface materials, and the requirements of the proposed structure.

1. SUITABLE FLOOR AND PAVEMENT SUBGRADEMATERIAL

The project site will be filled approximately 0.5 to 3.5 feet above existing grade. The upper 0.5 feet of existing soils should not be used to support the floor slab, pavement structure, or new fill. The remaining soils may be left in the building area and areas to be paved if these soils are "wet" and prove stable under a loaded dump truck or similar piece of equipment. By Benesch's definition, a "wet" cohesive soil contains sufficient moisture to be rolled into a 1/8-inch-diameter thread without crumbling. A "moist" cohesive soil would crumble when being rolled to form a 1/8-inch-diameter thread.

At the time of the exploration, the soils at B-8--which is near a proposed paved area--were moist to the depth of the boring (10 feet below existing grade). These soils consisted of lean clay fill, subsoil (lean and fat clays), and Peoria lean clay. These soils have moderate to high volume-change potential and will swell as their moisture contents increase. The estimated heave of a pavement structure is 1.8 inches as these soils become wetter. The magnitude of potential heave is difficult to estimate and should only be used as a rough approximation. To reduce the potential swell to less than ¼ inch, all existing fill, topsoil, subsoil, and lower subsoil that are low in moisture should be (a) removed and replaced with controlled earth fill, (b) reworked to conform to the moisture content and compaction recommendations presented in Table 8, or (c) "cured" to raise the moisture content of the soils. Controlled earth fill is defined as earth fill that is designed, compacted, and tested in accordance with generally accepted good practice and placed with observation by the Geotechnical Engineer. At B-8, the removal of these soils to reduce the calculated swell/heave to less than ¼ inches would require excavating to a depth of 5.5 feet below existing grade.

Curing of a soil that is low in moisture content consists of uniformly wetting the soil until the moisture content has increased to a level at least equal to its plastic limit (approximately 22%). The time required to uniformly cure the moist soil is dependent on several factors including the thickness of the dry materials, the variability of the subsurface material types, and weather conditions. The curing process could take from several days to two or more weeks to occur. Serious consideration should be given to starting the curing operations prior to beginning the subsequent construction activities. A moisture content at least equal to the plastic limit of the soil should be maintained until the floor slab or pavement structure is constructed. The Geotechnical Engineer should inspect areas that have been "cured" to verify that the moisture content of the subgrade soils has been increased to sufficient depth prior to the commencement of the construction activities.

2. SUITABLE FOUNDATION MATERIAL

The existing fill and topsoil should not be used to support load-bearing footings. If the Companion Building is supported by spread footings seated on the existing natural soils, the estimated differential settlement is 1.0 inch, which is greater than the acceptable settlement (½ inch), at an allowable net bearing pressure of 3,000 lbf/ft^2. The net bearing pressure is the contact pressure at the base of the foundation in excess of the pressure at the same level due to the surrounding surcharge. The surcharge pressure is equal to the total weight of a column of soil that extends from the lowest immediately adjacent ground surface to the bottom of the foundation divided by the soil column's area.

The estimated differential settlement could be reduced to 0.5 inches and the net bearing pressure increased to 4,500 lbf/ft^2 by (a) reworking or (b) removing and replacing the existing soils down to the upper surface of the alluvial sands. The minimum depth at each boring location in the building area to this upper surface is presented in Table 3.

TABLE 3
LOCATION OF THE UPPER SURFACE OF THE ALLUVIAL SANDS IN THE BUILDING AREA

Boring No.	Elevation, ft	Depth Below Existing Grade, ft
B-1	1143.2	8.5
B-2	1142.3	8.5
B-3	1138.8	14.5
B-4	1140.4	13.0
B-5	1146.4	5.0
B-6	1143.9	9.0

Optional methods of undercutting are as follows (see Recommendation 6 for further details on each alternative):

A. **Undercut along Footing Lines.** Remove or rework the soils located along the load-bearing footing lines and seat all footings at conventional depths in controlled earth fill.

B. **Undercut the Entire Building Area.** Remove or rework the soils located within the entire building area and seat all footings at normal depths in controlled earth fill.

Alternative foundation systems in lieu of undercutting would be to support the structure on a deep foundation (such as auger cast piles or drilled shafts) or on an intermediate depth system--such as Geopiers™. Recommendations 7, 8, and 9 provide further details on each alternative.

3. EXISTING UTILITY LINES

Existing utilities are currently located within the proposed building area. The utility line backfill is not considered suitable foundation material and might not be suitable floor subgrade or pavement subgrade material. Wall footings that intercept the backfill materials of these utilities could be designed to bridge over the backfill. For column footings, the difference in elevation between the bottom of a column footing and the

bottom of an existing utility trench should not be greater than the horizontal distance between the nearest edge of the utility trench and the closest edge of the footing. Column footings may need to be lowered below plan footing depth to meet this recommendation.

An alternative to bridging over the backfill or lowering footings would be to remove all utility backfill, relocate the utilities outside the building area, and backfill the excavations with controlled earth fill. A second alternative would be to remove all existing utility backfill and recompact the backfill into the resulting excavation in accordance with the moisture content and compaction recommendations presented in Table 8 **if** the utility lines can withstand the stresses imposed by the compacted fill and footing loads.

4. MINIMUM DEPTH OF FOOTINGS

The bottoms of all exterior footings should be placed at a minimum depth of 40 inches below finished grade to provide reasonable protection against frost action and seasonal volume change. In addition, the bottom of a proposed footing should be constructed so that either (a) the elevation of the proposed footing and an existing footing are the same or (b) the horizontal distance between the nearest edge of the proposed footing and nearest edge of the existing footing is equal to or greater than the difference in elevation between the footings.

5. VERTICAL MODULUS OF SUBGRADE REACTION

The suggested value of the vertical modulus of subgrade reaction to be used in the design of footings and pavement structure is 150 lbf/in^3.

6. PREPARATION OF THE BUILDING AREA AND AREAS TO BE PAVED

Brief descriptions of the following alternatives are provided in Recommendation 2.

Alternative A. ***(Undercut Along Footing Lines)***

All existing pavement, vegetation, and the upper 0.5 feet of existing soils should be removed from the building area and areas to be paved. In addition, all existing footings, existing floor slabs, and soils disturbed by demolition operations should be removed. If the estimated heave presented in Recommendation 1 is considered excessive, all existing fill, topsoil, subsoil, and lower subsoil that are low in moisture content should be (a) removed and replaced, (b) reworked or (c) cured. Thereafter, the exposed ground located in areas that have been "cut" to the proposed subgrade elevations and areas to be filled should be proofrolled with a loaded dump truck or similar piece of equipment (in the presence of the Geotechnical Engineer) to locate unstable materials. Any unstable material should be either removed and replaced with controlled earth fill or reworked to conform to the moisture content and compaction recommendations presented in Table 8. In addition, all soils located above the alluvial sand (see Table 3) along load-bearing footing lines should be either removed and replaced with controlled earth fill or reworked to conform to the moisture content and compaction recommendations presented in Table 8.

The bottoms of the trench excavations should extend beyond the edges of the proposed footings a minimum horizontal distance of 3.0 feet or two-thirds the distance between the bottom-of-footing elevation and the surface of the suitable natural foundation material, whichever is greater. However, the excavations should not encroach on the foundation soils of existing footings, which are defined as soils located inside a line drawn downward and outward from the outside edge of the existing footing on a slope of 1.0 horizontal to 1.0 vertical.

The sides of the excavation should be sloped to permit the controlled earth fill to be placed against the sides of the excavations to the recommended degree of compaction.

The Geotechnical Engineer should observe the building area and areas to be paved to verify conformance to the above recommendations. Upon approval of the building area and areas to be paved by the Geotechnical Engineer, the site should be filled to the desired elevations with controlled earth fill. Footings can then be constructed at conventional depths, seated within controlled earth fill. The Geotechnical Engineer should observe the foundation excavation to verify that the footings will be seated in suitable foundation materials.

Immediately prior to placement of the pavement structure, the subgrade in cut and fill sections should be scarified to a minimum depth of 6 inches and reworked to a uniform condition conforming to the moisture content and compaction recommendations presented in Table 8.

Alternative B. ***(Undercut the Entire Building Area)***

The areas to be paved should be prepared as in Alternative A. In addition, all soils above the alluvial sands in the building area (located above the depths presented in Table 3) should be either removed and replaced with controlled earth fill or reworked to conform to the moisture content and compaction recommendations presented in Table 8. The removal or reworking of these materials should extend beyond the outside edges of the proposed footings a minimum horizontal distance of 3.0 feet or two-thirds the distance between the bottom-of-footing elevation and the surface of the suitable natural foundation material, whichever is greater. However, the excavations should not encroach on the foundation soils of existing footings, which are defined as soils located inside a line drawn downward and outward from the outside edge of the existing footing on a slope of 1.0 horizontal to 1.0 vertical. The sides of the excavation should be sloped to permit the controlled earth fill to be placed against the sides of the excavations to the recommended degree of compaction.

The Geotechnical Engineer should observe the building area and areas to be paved to verify conformance to the above recommendations. Upon approval of these areas by the Geotechnical Engineer, the site should be filled to the desired elevation with controlled earth fill. Footings can then be constructed at conventional depths, seated within controlled earth fill. The Geotechnical Engineer should observe the foundation excavation to verify that the footings will be seated in suitable foundation materials.

Alternative C. ***(Intermediate and Deep Foundation Systems)***

The building area and areas to be paved should be prepared as in Alternative A, except that undercutting along footing lines would not be required.

7. DISCUSSION AND RECOMMENDATIONS FOR AUGER CAST PILE FOUNDATIONS

Auger Cast Pile Capacity

Benesch suggests calculating the allowable section capacity of a pressure-grouted auger cast pile as follows:

$$P_a = 0.25 * f'_c * A$$

f'_c = 28-Day Grout Compressive Strength
A = Pile Section Area

The 0.25 coefficient could be increased to 0.33 if a pile load test is performed, or at the discretion of the Structural Engineer.

Auger cast piles will develop resistance to (a) downward loads through end-bearing and adhesion (skin-friction) between the pile and the soil and (b) upward loads through adhesion and the weight of the pile. Piles should achieve allowable section compressive capacity in the upper 5 feet (approximate) of the unweathered Dakota sandstone. The minimum depth (and associated elevation) to the surface of the unweathered Dakota sandstone at each of the three locations where deep borings were made is presented in Table 4. Benesch recommends the design parameters in Table 5 be used to design the piles.

TABLE 4
DEPTHS AND ELEVATIONS OF UNWEATHERED DAKOTA SANDSTONE

Boring No.	Bedrock Surface Depth, ft	Bedrock Surface Elev., ft
B-2	74.5	1076.3
B-4	74.5	1078.9
B-5	64.5	1086.9

TABLE 5
SUGGESTED ALLOWABLE SOIL DESIGN VALUES FOR AUGER CAST PILES
(FACTOR OF SAFETY = 2.5)

Elevation, ft.	Soil Type(s)	Unit Weight, pcf	Compressive Unit Skin Friction, tsf (E = Elevation, ft)	Unit End Bearing, tsf
-	New Fill	125	0.2	-
≥ 1147	Existing Fill, Subsoil, and Peoria	115	0.1	1.8
1147 - 1130	Medium Dense Sandy Alluvium	130	0.3	3.1
1130 - 1105	Medium Dense and Dense Sandy Alluvium	135	0.5	5.5
1105 - 1087	Very Dense Sandy Alluvium	135	0.5	13.2
-	Dakota Sandstone	140	0.5	150[a]

[a]Assuming the piles are seated at least 5 feet into the unweathered Dakota sandstone.

Minimum Pile Spacing

Auger cast piles should be installed at a minimum center-to-center spacing of three (3) pile diameters to avoid a reduction in the individual compressive capacity due to group effects. If piles are installed closer than three (3) diameters, the potential reduction in capacity per pile depends on the size, spacing and length of the piles. There is no need for applying a reduction factor for compressive pile groups seated in the unweathered Dakota sandstone if skin friction is **not** included in the capacity calculations. Benesch suggests that installation of adjacent piles having a center-to-center spacing of less than six (6) pile diameters be delayed until the grout in the initial pile has set.

Load Testing

A load test(s) should be performed to verify the design of the auger cast piles **if** a factor of safety of 2.0 is desired instead of 2.5 **or** the compressive stress in an auger cast pile exceeds 0.25 times f'_c. The number of load tests will depend on the reason(s) for performing the tests. The static load test(s) should be performed in accordance with the "Standard Loading Procedure" described in ASTM D 1143, Standard Test Method for Pile Under Static Axial Compression Load. The test and reaction piles utilized during the load testing procedures should not be used to support the structure. The final location of the load test(s) should be subject to the approval of the Geotechnical Engineer. The load test(s) should be performed under the supervision of the Geotechnical Engineer to maintain continuity between the subsurface exploration, analyses, and installation of the piles.

Inspection of Auger Cast Piles

Continuous observation by the Geotechnical Engineer or his representative should be performed during installation of the auger cast piles. A reduced pile capacity could result if the piles are not properly constructed.

8. DISCUSSION AND RECOMMENDATIONS FOR DRILLED SHAFT FOUNDATIONS

The allowable bearing in compression is a combination of skin friction on the sides of the shaft and end bearing. If the bottom of the shaft excavations will not be cleaned and inspected prior to placement of concrete, it should be assumed that no end bearing will be developed, and that compressive capacity will only be a function of the skin friction resistance on the sides of the shaft. The upper 5 feet of the shaft should be ignored in the calculation of the skin friction. Furthermore, if the center-to-center spacing between shafts is less than three (3) shaft diameters, the capacity of the shafts should be reduced unless the shafts are seated at least 5 feet into the unweathered Dakota sandstone and skin friction is **not** included in the capacity calculations. The minimum depth (and associated elevation) to the surface of the unweathered Dakota sandstone at each of the three locations where deep borings were made is presented in the above Table 4. Benesch recommends the design parameters in Table 6 be used to design the shafts.

TABLE 6
SUGGESTED ALLOWABLE SOIL DESIGN VALUES FOR DRILLED SHAFTS
(FACTOR OF SAFETY = 2.5)

Elevation, ft.	Soil Type(s)	Unit Weight, pcf	Compressive Unit Skin Friction, tsf (E = Elevation, ft)	Unit End Bearing, tsf
-	New Fill	125	0.2	-
≥ 1147	Existing Fill, Subsoil, and Peoria	115	0.1	1.2
1147 - 1130	Medium Dense Sandy Alluvium	130	0.3	3.1
1130 - 1105	Medium Dense and Dense Sandy Alluvium	135	0.5	5.5
1105 - 1087	Very Dense Sandy Alluvium	135	0.5	12.0
-	Dakota Sandstone	140	0.5	150[a]

[a]Assuming the shafts are seated at least 5 feet into the unweathered Dakota sandstone.

Use of drilling slurry or casing will be necessary if the shaft extends into the saturated sands, which were encountered at elevations of 1130.3 to 1132.8 feet (18 to 22.4 feet below existing grade).

Drilled Shaft Construction Considerations

Construction of a drilled shaft requires boring a hole of a specified diameter and depth and then backfilling the hole with reinforced concrete. The selection of equipment and procedures for constructing drilled shafts is a function of the shaft dimensions, the soil conditions and the groundwater characteristics. Consequently, the design and performance of drilled shafts can be significantly influenced by the equipment and construction procedures used to install the shafts. In particular, shaft friction and end bearing will be impacted by the procedures used for construction and also by the method of placement and properties of the concrete. Construction procedures and methods are of paramount importance to the success of drilled shaft installations.

In general, there are three typical methods of installing drilled shafts: the dry method, the casing method and the wet method. Due to the potential for the saturated sands to cave, the casing or wet method should be used for installation of the shafts.

The wet method of construction generally involves the use of either bentonite or polymer slurry. It should be noted that sometimes the use of slurry can create undesirable site conditions due to the quantity of water used in this drilling technique. The following recommendations are provided with regard to using slurry:

- Slurry should be not less than 5 feet above the groundwater level or higher if needed to provide a stable hole.
- Maintain slurry level above any unstable zones a sufficient distance.

- Slurry mixture should be mixed outside the shaft and then pumped into the hole. Slurry should not be mixed in the hole if soils are unstable.
- Slurry should be tested according to ANSI/API RP 13B, Recommended Practice for Field Testing Water-Based Drilling Fluids.
- Slurry should meet specifications for density, viscosity, sand content, etc. before concrete is pumped in by properly cleaning the slurry. If the slurry sand content/viscosity is too high, the slurry might be enveloped by concrete.
- The concrete should be pumped in the same day that it is drilled with slurry. If bentonite slurry is allowed to sit in the hole for too long, excessive filter cake can build up and reduce skin friction.
- Tremie or pump pipe should be plugged using either a pig or rabbit, in order to keep concrete and slurry separate during installation of the tremie or pipe.
- Bottom of tremie should not be lifted above level of concrete in pier. It should be embedded a minimum of 5 feet into the concrete.
- Concrete should have a minimum slump of 7.0 inches.
- Concrete should not setup until all slurry has been pushed from hole and steel has been set, such that a retarder admixture might be necessary.
- Concrete should be pumped long enough that uncontaminated concrete will flow out of the top of the hole so as to remove all slurry from the shaft.
-

Overall, if good practice is used, use of slurry to installed drilled shafts will not decrease skin friction between the concrete shaft and soil.

The casing method consists of oscillating, vibrating, pushing or driving casing to the depth necessary to stabilize the hole. Excavation is then continued either in the dry or under water. Upon completion of the shaft excavation, the hole is cleaned and the reinforcing steel is installed. Once concrete has been placed in the shaft excavation, the casing can be removed.

If end bearing capacity is needed, the base of each shaft should be cleaned so that a minimum of 50% of the base will have less than 1/2 inch of sediment at the time of concrete placement. The maximum depth of sediment or debris at the base of the shaft should not exceed 1.0 inch. If the drilled shaft encounters the groundwater, water will be present in the shaft during drilling operations, such that the bottom of the shaft should be cleaned out with a spin bucket or air lift methods. After a wait period equal to the time to set the reinforcing steel cage and concrete placement setup, the amount of sediment in the bottom of the shaft should be measured. If the amount of sediment meets the above requirements, the base of the shaft should be cleaned a second time and then shaft construction should proceed immediately. If after the described wait period the amount of sediment exceeds the requirements, the shaft should be cleaned out again and repeating the above procedure until the sediment accumulation meets the requirements. Additionally, if the base of the shaft is in cohesionless materials, the height of water in the shaft should be maintained at a level above the water table such that the soils at the shaft base will not be undermined by an upward hydraulic gradient.

The reinforcing steel—typically a rebar cage—is sometimes placed to the bottom of the hole, because it is difficult to keep a partial-length cage in position by a hoist line as the casing is withdrawn. The reinforcing steel should, therefore, be designed to accommodate both the structural requirements of the completed shaft and the stability requirements for its placement and concrete placement. After the reinforcing steel is placed, the hole should be filled with concrete. Concrete aggregate should be sized to allow unimpeded flow between

reinforcing bars and spiral steel. A tremie or another approved construction technique should be used to place the concrete at the base of the drilled shaft if water/slurry is present in hole.

To minimize the potential for ground loss adjacent to the drilled hole or bearing soil deterioration in the base of the hole, Benesch recommends that the specifications state that where obstructions, caving conditions or excessive water seepage is encountered in the drilled hole or where there is a potential for heaving conditions at the base of the hole or loss of ground, which—in the opinion of the Engineer—impacts the construction of the drilled shaft or adjacent existing structures, no further drilling should be allowed until the contractor implements measures to prevent caving, water inflow, ground loss and/or bottom heave.

Installation of drilled shafts should be monitored under the supervision of an experienced and qualified geotechnical engineer familiar with the subsurface conditions of the project site. Inspection and identification of the soils removed from the hole or retrieved from auger flights and cleanout buckets should be accomplished by experienced and qualified personnel familiar with subsurface conditions at this project site in order to confirm that the subsurface conditions assumed for design are present.

9. GEOPIERS™

Geopiers™ consist of a specially constructed, crushed-limestone-filled bore hole. Benesch suggests that a Geopier™ representative be contacted to determine if this foundation system would be an economical and feasible method of supporting the proposed building.

10 OSHA EXCAVATION REQUIREMENTS

Excavations that will be occupied by personnel should be made in accordance with the Occupational Safety and Health Administration (OSHA) Construction Standards-29 CFR Part 1926, Subpart P-Excavations as published in the Federal Register, Vol. 54, 209, Tuesday, October 31, 1989, Rules and Regulations. OSHA states that a soil should be reclassified if the properties, factors, or conditions affecting the soil's classification change in any way. Sheet piling and/or shoring will be necessary if the sides of the excavations cannot be sloped to meet OSHA regulations.

11. LATERAL EARTH PRESSURE AND RETAINING WALL DESIGN

Any basement-type wall or retaining wall should be designed to withstand the pressure from the backfill. The pressure exerted by the backfill against the walls should be computed on the basis of the equivalent-fluid theory, by which the lateral pressure is considered to be caused by a fluid having a unit weight such that the total pressure of the soil and the so-called equivalent fluid are the same. The equivalent fluid unit weights of the various recommended backfill materials, placed in accordance with Recommendation 15, are shown in Table 7. For the portion of the wall backfilled with sandy soil, in order for the equivalent fluid unit weights of sandy soils to be applicable, the sand should occupy the area presented in Figure 1. The clay cap (if needed) will not significantly affect the magnitude of lateral pressures on the wall if the clay cap comprises less than 20% of the total soil column in-front or behind the wall, and as such the clay soil can be assumed to have the same properties as the granular materials below. The active and passive fluid weights are based on the assumption that the ground surface is level in front and behind walls.

TABLE 7
RECOMMENDED LATERAL EARTH PRESSURE PROPERTIES

Soil Type	Equivalent-Fluid Unit Weight (lbf/ft^3)						Moist Unit Weight (lbf/ft^3)	Base Friction Coefficient
	Unsaturated			Saturated (Includes Hydrostatic Pressures)				
	Active	At Rest	Passive	Active	At Rest	Passive		
Clays and Silts	50	70	240	75	85	140	120	0.35[1]
Silty and Clayey Sands[2]	35	55	280	75	85	155	125	0.45
Sand[3]	30	50	300	75	85	170	115	0.55

[1]Base friction resistance should also be evaluated for adhesion. Recommended adhesional friction is 1000 lbf/ft^2.
[2]More than 10% silt and clay.
[3]Less than 10% silt and clay.

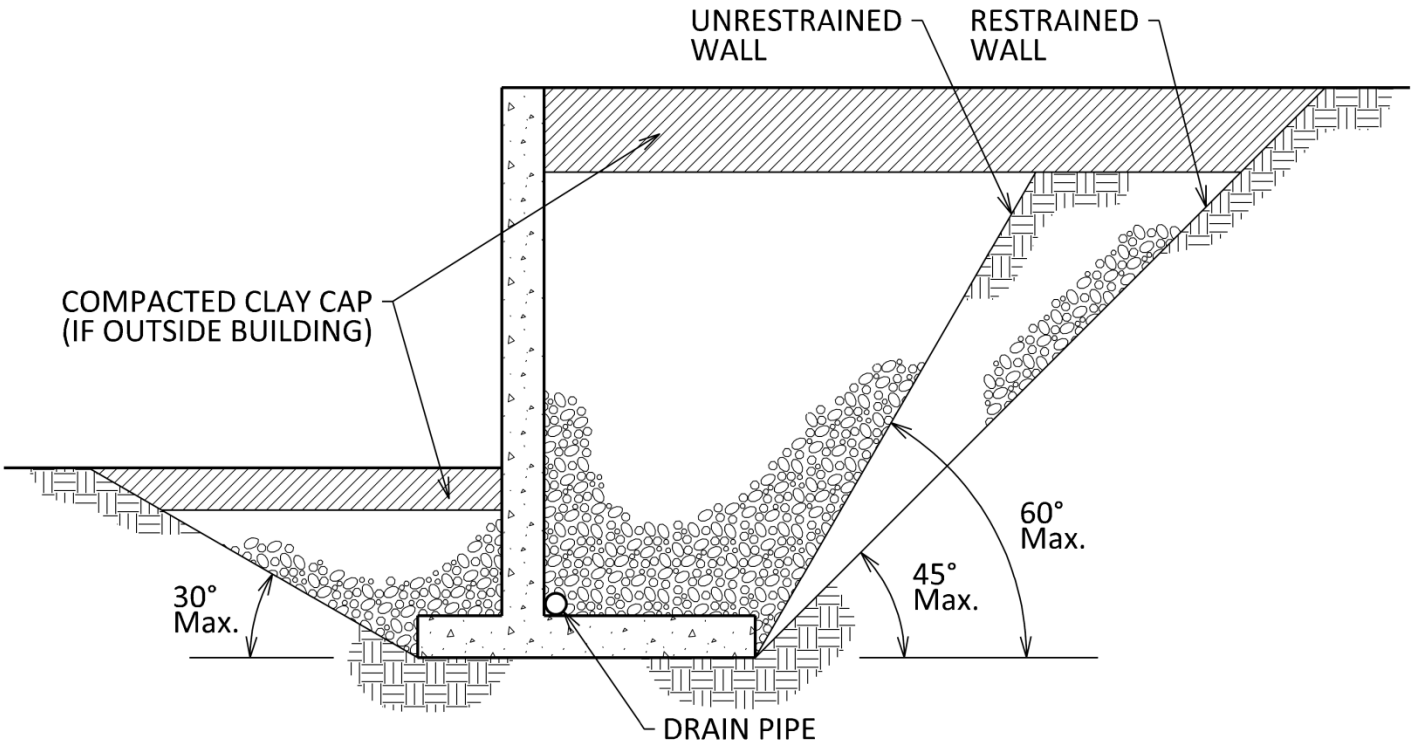


FIGURE 1. REQUIRED AREA FOR SAND PLACED IN FRONT AND BEHIND BASEMENT-TYPE WALLS AND RETAINING WALLS

In calculating the passive-earth-pressure resistance, the upper 40 inches (from finished grade) should not be assumed to contribute resistance against horizontal movement if exposed to frost action or seasonal moisture/volume change of the soil. The suggested equivalent-fluid unit weight for calculating the passive-earth-pressure resistance is shown in Table 7.

Additional resistance to horizontal movement will be provided by frictional resistance between the base of the footing and the foundation soil. The recommended base friction coefficients are shown in Table 7. In order to assume the higher base friction coefficients for the granular soils, the granular soils should extend to a depth of at least 1.0 times the foundation width below the bottom of foundation. For clays and silts, the base friction might be controlled by either the undrained shear strength of the foundation soil (adhesional friction) or the drained friction angle of the foundation soil (friction coefficient). The adhesional friction is independent of the footing load, and as such, might control for design of heavily loaded footings. The minimum (dead) load on the footing should be used with the friction coefficient to calculate drained frictional resistance. The lesser of either the undrained or drained frictional resistance should be used for design. If a keyed retaining wall foundation is being considered to increase sliding resistance, Benesch should be contacted for further recommendations.

The backfill above a retaining wall footing will help resist overturning of the wall. Wet unit weights shown in Table 7 should be used in calculating the weights of backfill above a retaining-wall footing. A minimum factor of safety of 1.5 should be applied to the overall retaining-wall design. The maximum soil pressure beneath a retaining-wall footing should not exceed 2,000 lbf/ft^2.

12. RETAINING-WALL AND UNDERFLOOR DRAINS

A drainage system (consisting of a slotted drainpipe encased in granular filter material) should be installed behind any retaining wall to intercept surface water that might enter the backfill. The 4-inch-diameter drainpipes (with 1/8-in. slots) should be backfilled with fine aggregate for State of Nebraska "47B" concrete (hereinafter referred to as "sand-gravel"). The pipes should have a minimum of 4 inches of sand-gravel encasing the bottoms and sides, and the sand-gravel should extend to within 2 feet of finished grade. It is recommended that the last two feet of backfill consist of compacted clay, especially when located outside the proposed building.

The drains should discharge (a) into a sump from which the water can be pumped to a positive outfall, such as a drainage ditch, swale or storm sewer, or (b) by gravity to the low areas. An alternative to encasing the pipes with sand-gravel would be to wrap the lines with a geotextile. Fine sand could then be used in lieu of the sand-gravel. Any granular backfill placed outside the proposed building should be capped with at least two feet of clay.

13. PROTECTIVE SLOPES AROUND THE BUILDING

The site should be graded in a manner that will divert water away from the building. The protective slopes around the building should meet the requirements on the following page.

A. Slope downward from the building to lower areas or drainage swales.
B. Minimum horizontal length of 10 feet, minimum vertical fall of 6 inches (5 percent).
C. Minimum gradient (beyond 10 feet from building):
    1. Impervious surface; 1/8 inch per foot (1 percent).
    2. Pervious surface; 1/4 inch per foot (2 percent).

14. TYPES OF SOILS TO BE USED AS FILL AND BACKFILL

Controlled earth fill placed within the building area and areas to be paved should be constructed of inorganic CL[2], ML[3], SM[4], and/or SC[5] materials (all with a liquid limit less than 50 and a plasticity index less than 30). The lean clays encountered at the project site are considered suitable for use as fill within the building area and areas to be paved. It should be noted, however, that some of these soils are low in moisture content and will require the addition of water to achieve a moisture content necessary for proper placement.

The materials used as fill and backfill outside the building area and areas to be paved may consist of CL, ML, SM, SC, and/or CH (fat clay, fat clay with sand, and/or sandy fat clay). Proposed fill and backfill materials should be subject to approval by the Geotechnical Engineer. Representative samples of the proposed fill and backfill materials should be submitted to the Geotechnical Engineer at least three days prior to placement so the necessary laboratory tests can be performed.

15. PLACEMENT OF FILL AND BACKFILL

The suggested basis for controlling the placement of fill and backfill on the site, excluding free-draining granular materials, are the "optimum moisture content" and "maximum dry density" as determined by ASTM D 698, Procedure A, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using **Standard Effort** (12,400 ft-lbf/ft^3) (600 kN-m/m^3). The recommended acceptable values of moisture content and degree of compaction are given in Table 8.

[2] Lean clay, lean clay with sand and sandy lean clay.
[3] Silt, silt with sand and sandy silt.
[4] Silty sand.
[5] Clayey sand.

TABLE 8
COMPACTION RECOMMENDATIONS FOR CONTROLLED EARTH FILL AND BACKFILL

Location	Soil Type	Minimum Moisture Content	Minimum Compaction*
(a) Below top-of-interior footing elevation in the building area and (b) from 0.0 to 1.0 foot below pavement subgrade elevation outside the building area.	Glacial Till	Optimum	100%
	Silts and Lean Clays	2% Below Optimum	100%
	Silty and Clayey Sands	**	100%
(a) Above top-of-interior-footing elevation in the building area and (b) greater than 1.0 foot below pavement subgrade elevation outside the building area.	Glacial Till	Optimum	95%
	Silts and Lean Clays	2% Below Optimum	95%
	Silty and Clayey Sands	**	95%
Backfill of footings and utility trenches outside the building area and outside of areas to be paved.	Silts and Clays	2% Below Optimum	92%

*Percent of Maximum Dry Density (ASTM D 698, Procedure A)
**Moisture as necessary to obtain density (near Optimum)

Clean free-draining sand used as backfill outside and within the zone of influence of a footing should be consolidated by means of a vibratory compactor to at least 55 and 65% "relative density", respectively, as determined in accordance with ASTM D 4253 (Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table) and D 4254 (Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculations of Relative Density).

16. SITE SEISMICITY

Based on the geotechnical investigation at this site, coupled with Benesch's knowledge of subsurface conditions elsewhere in the general Lincoln area, we recommend that Site Class D (S_D) be used to assess lateral loads from seismic events in accordance with the 2006 International Building Code (IBC). The lateral loads may be transmitted from the structure to the surrounding soils by a combination of base friction and passive resistance on the footings. Overturning loads may be reacted by the dead weight of the structure and bearing resistance of the foundation soils. The allowable bearing capacity given previously may be increased by one third to assess stability from transient seismic forces.

17. GRADING OBSERVATION

Observation and frequent testing by the Geotechnical Engineering Firm during compaction of fill and backfill are necessary to verify proper moisture content and degree of compaction. A professional opinion should be obtained from the Geotechnical Engineer that the site has been properly prepared, that all footings will be seated on suitable foundation materials, and that all fill, backfill, and subgrade materials conform to the moisture content and compaction recommendations presented above. If these testing and observation services are not

performed, the allowable bearing pressure stated in Recommendation 2 might be invalid. As the Geotechnical Engineer for this project, Benesch has interpreted the results of the subsurface exploration and laboratory tests to arrive at the recommendations presented in this report. Consequently, Benesch is in the best position to relate actual observed conditions to those assumed for this report and to provide revised recommendations if differences are found during grading operations and construction of the foundation for the referenced project.

18. SUBGRADE OBSERVATION

The floor subgrade, pavement subgrade and foundation materials should be observed by the Geotechnical Engineer immediately prior to placement of the concrete or paving components. Severe changes in the condition of these materials can occur after initial preparation as the result of rain, drying, freezing, and construction activities. Any subgrade or foundation material that becomes disturbed, desiccated, or does not conform to the moisture content and compaction recommendations previously presented should either be removed and replaced or reworked to meet these recommendations.

19. APPLICABILITY OF RECOMMENDATIONS

The recommendations presented in this report are based in part upon Benesch's analyses of the data from the Dutch friction-cone soundings and soil borings. The penetration diagrams, boring logs, and related information depict subsurface conditions only at the specific sounding and boring locations and at the time of the subsurface exploration. Soil conditions may differ between the soundings and exploratory borings and might change with the passage of time. The nature and extent of any variations between the sounding and boring locations or of any changes in soil conditions (e.g., drying of soil) might not become evident until grading operations and construction of the foundation for the referenced project have begun. If variations and changes in the soil conditions then appear, it will be necessary to re-evaluate the recommendations stated in this report.

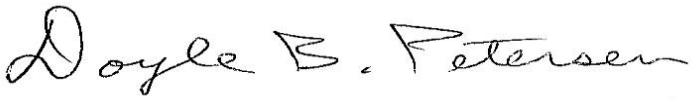
6.0 CONCLUSIONS

Benesch concludes, on the basis of the findings of the subsurface exploration at the project site and the evaluation of the engineering properties of samples of the foundation materials, that the proposed building can be supported by spread footings seated on controlled earth fill, an intermediate depth foundation system (Geopiers™), or a deep foundation system (drill shafts or auger cast piles). Low-moisture-content (moist) soils were encountered at B-8. These soils would swell/heave as their moisture contents increase. Recommendations have been provided regarding the remediation of these moist soils if the estimated swell/heave is considered excessive.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices for exclusive use by Scott Woodbury Wiegert, Davis Design, and the Contractor for specific application to the proposed proposed building. The recommendations of this report are not valid for any other purpose.

Benesch should be contacted if any questions arise concerning this report or if changes in the nature, design or location of the structure are planned. If any such changes are made, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed by Benesch and the conclusions of this report are modified or verified in writing. This report shall not be reproduced, except in full, without the written approval of Alfred Benesch & Company.

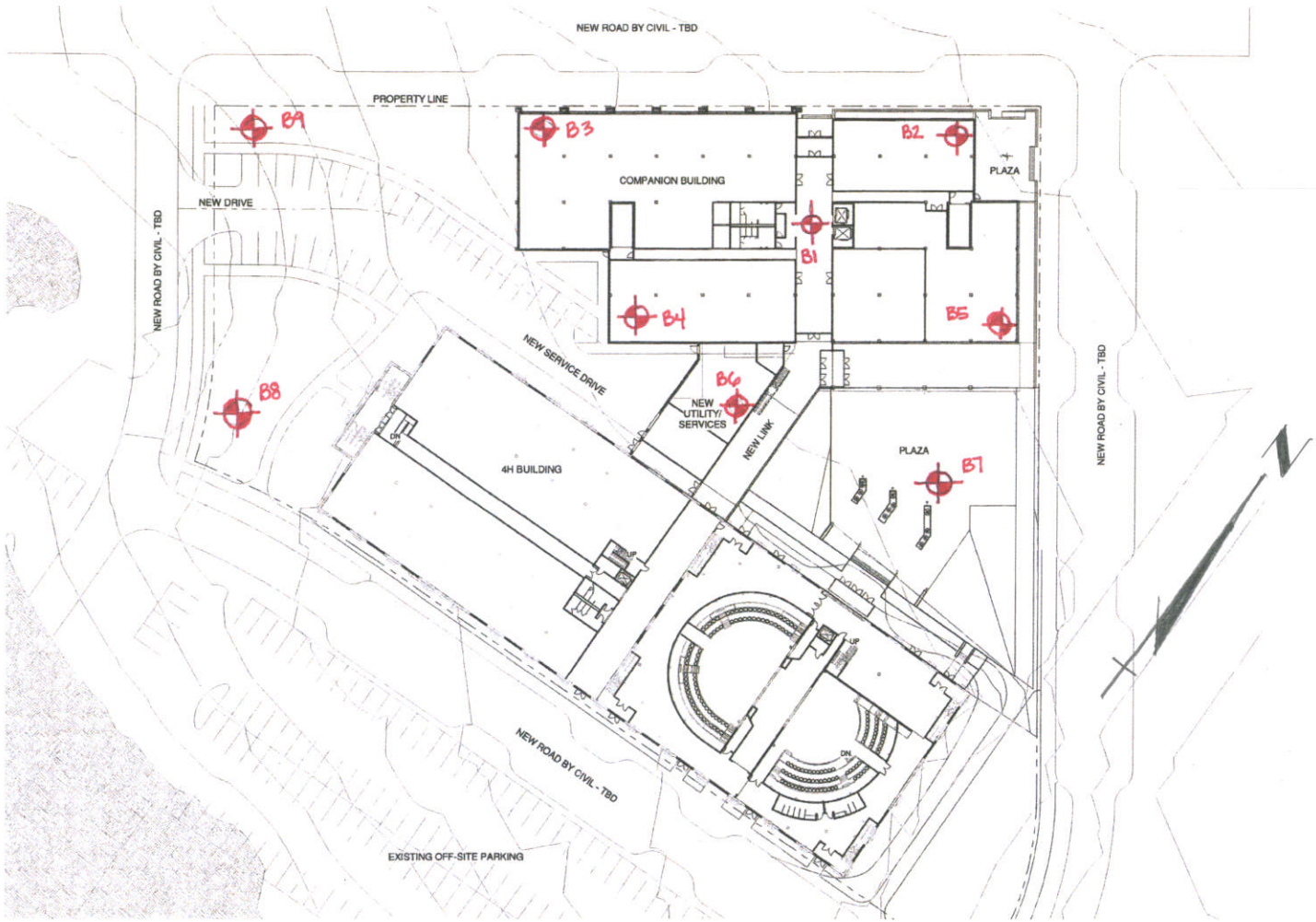
Prepared By:



Doyle B. Petersen, P.E

APPENDIX A. VICINITY MAP AND BORING LOCATION PLAN

VICINITY MAP
PROPOSED NIC 4H + COMPANION BUILDING
INNOVATION PARK
LINCOLN, NEBRASKA



BORING LOCATION PLAN
PROPOSED NIC 4H & COMPANION BUILDING
INNOVATION PARK
LINCOLN, NEBRASKA

APPENDIX B. DUTCH FRICTION-CONE PENETRATION DIAGRAMS

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **Proposed NIC 4H & Companion Building**
Project Location: **Innovation Park; Lincoln, NE**
Project Number: **00110449.00**

Sounding No: **S-1**
Location: **B-1**
Surface Elevation: **1151.7 feet**

Date: **1/31/2012**
Tested By: **CL**
Recorded By: **GBW**

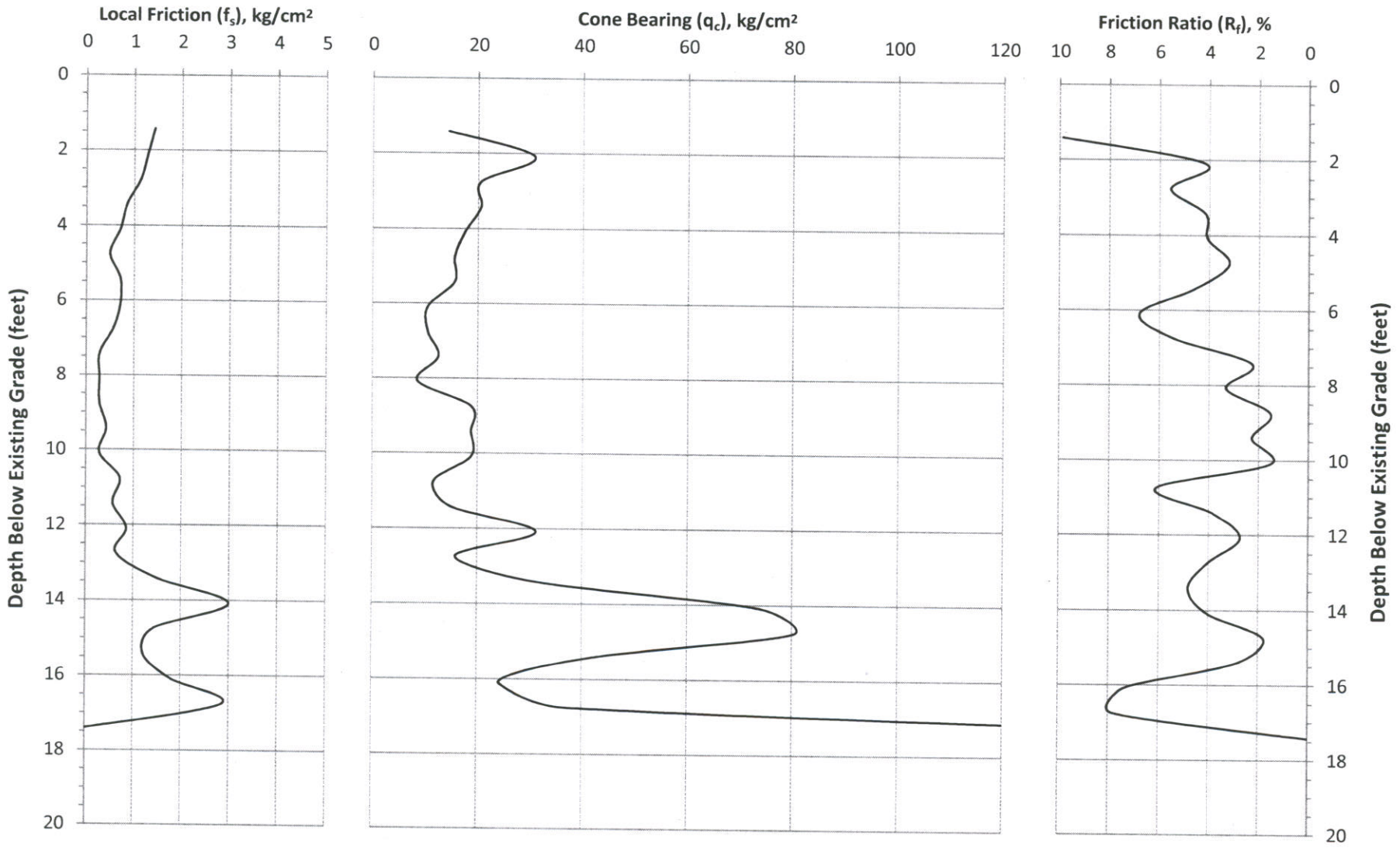

Figure B-1a

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Project Name: **Proposed NIC 4H & Companion Building**
Project Location: **Innovation Park; Lincoln, NE**
Project Number: **00110449.00**

Sounding No: **S-2**
Location: **B-2**
Surface Elevation: **1150.8 feet**

Date: **1/31/2012**
Tested By: **CL**
Recorded By: **GBW**

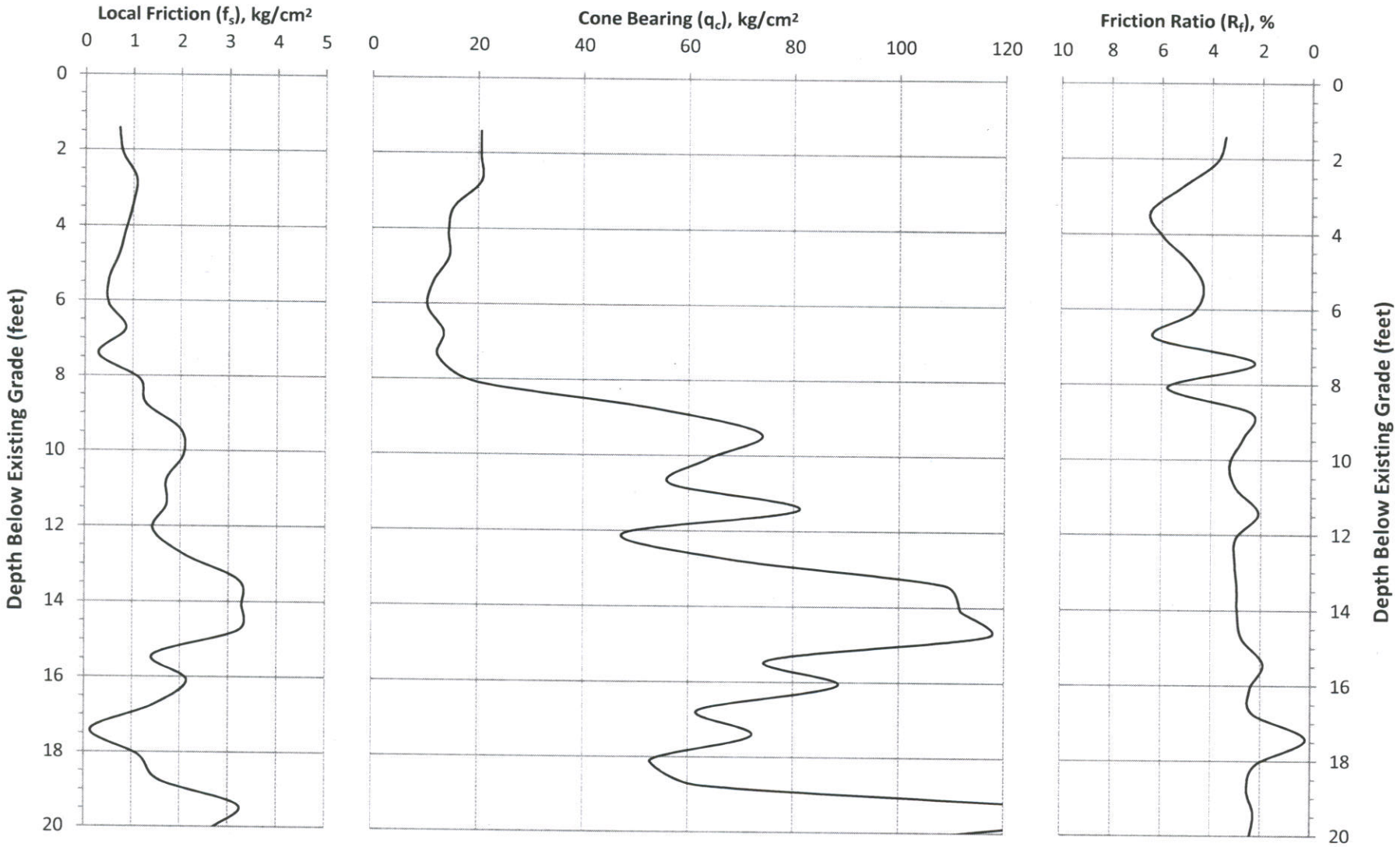

Figure B-2a

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Project Name: **Proposed NIC 4H & Companion Building**
Project Location: **Innovation Park; Lincoln, NE**
Project Number: **00110449.00**

Sounding No: **S-2**
Location: **B-2**
Surface Elevation: **1150.8 feet**

Date: **1/31/2012**
Tested By: **CL**
Recorded By: **GBW**

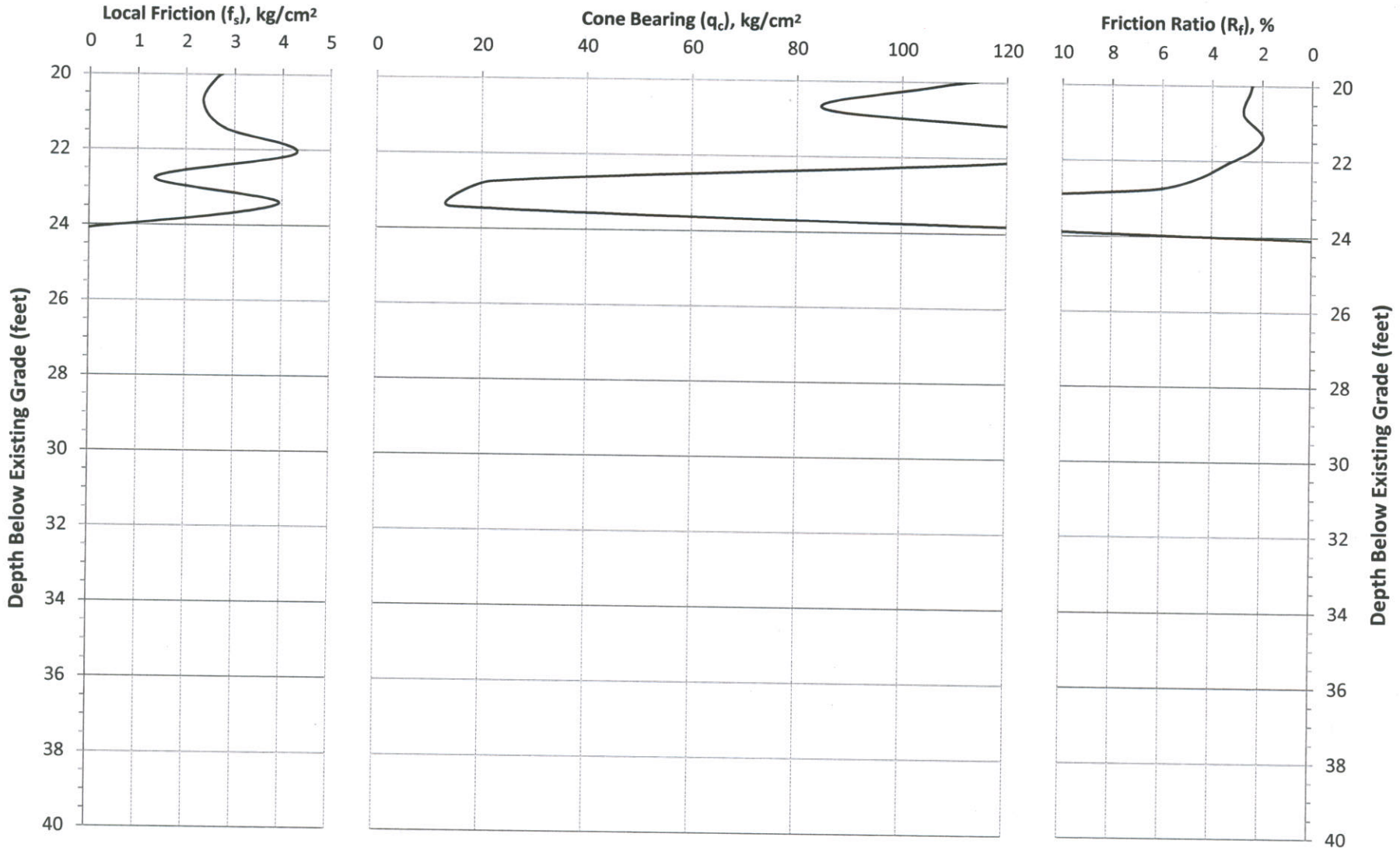

Figure B-2b

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Project Name: **Proposed NIC 4H & Companion Building**
Project Location: **Innovation Park; Lincoln, NE**
Project Number: **00110449.00**

Sounding No: **S-3**
Location: **B-3**
Surface Elevation: **1153.3 feet**

Date: **1/31/2012**
Tested By: **CL**
Recorded By: **GBW**

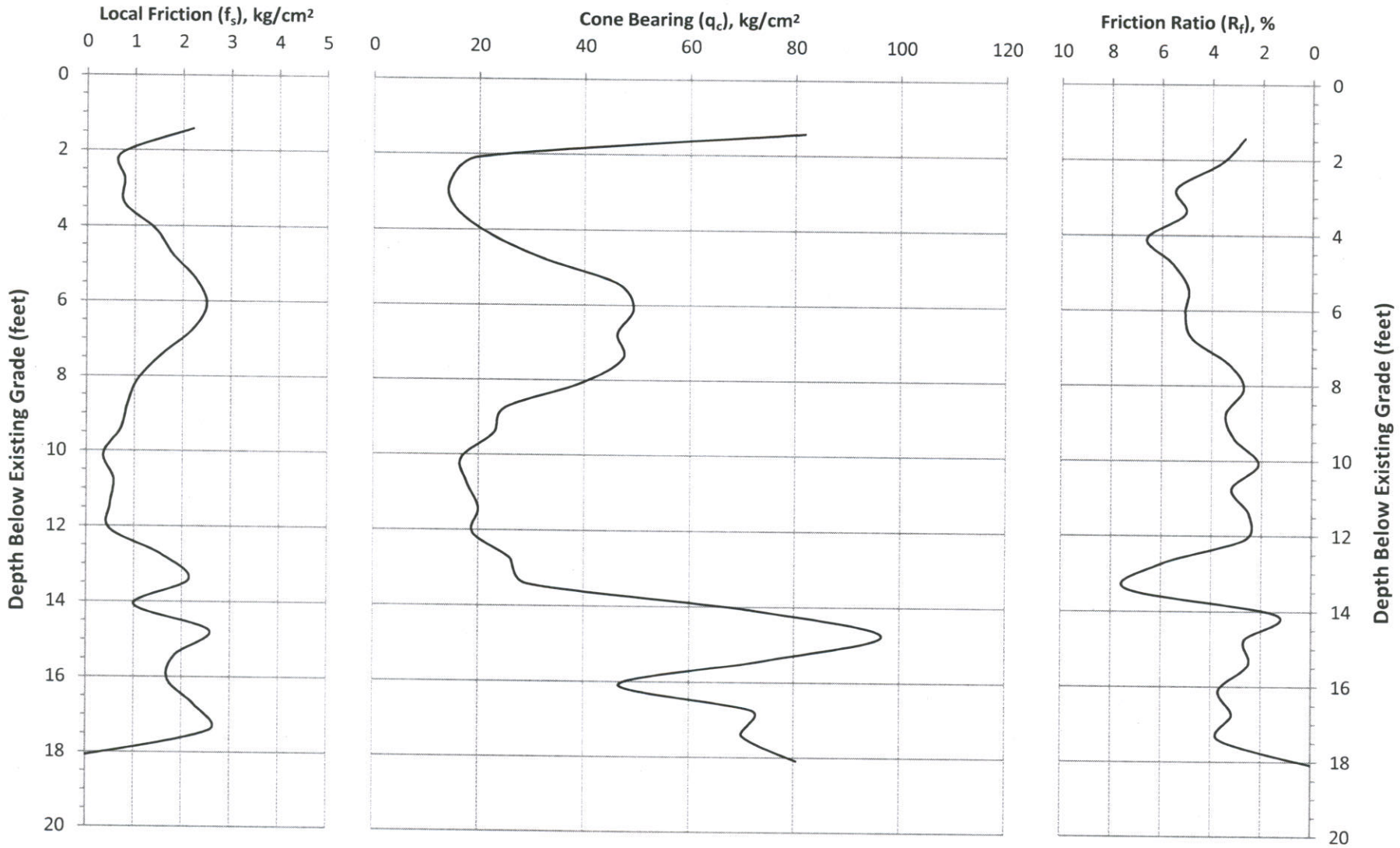

Figure B-3a

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Project Name: **Proposed NIC 4H & Companion Building**
Project Location: **Innovation Park; Lincoln, NE**
Project Number: **00110449.00**

Sounding No: **S-4**
Location: **B-4**
Surface Elevation: **1153.4 feet**

Date: **1/31/2012**
Tested By: **CL**
Recorded By: **GBW**

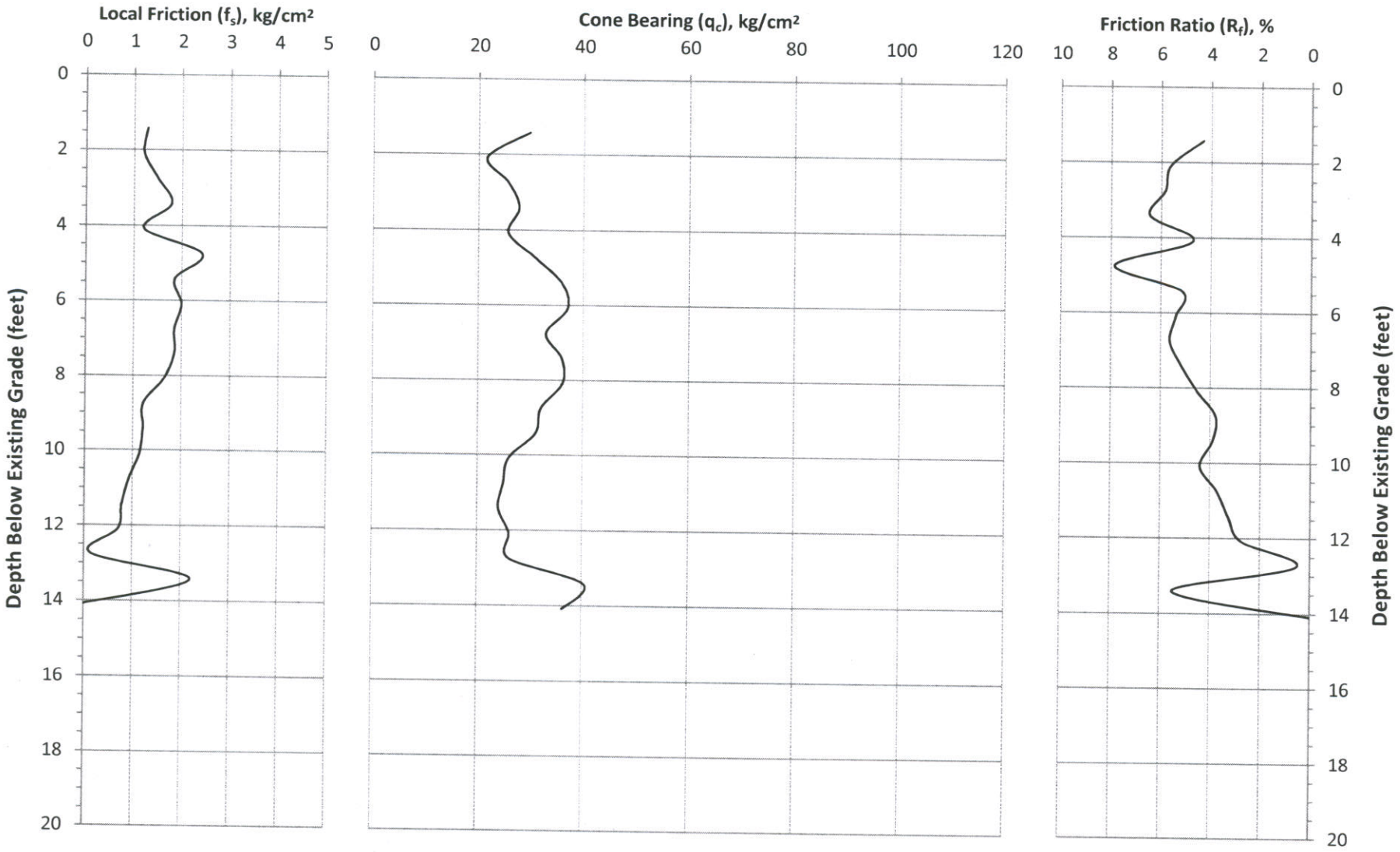

Figure B-4a

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Project Name: **Proposed NIC 4H & Companion Building**
Project Location: **Innovation Park; Lincoln, NE**
Project Number: **00110449.00**

Sounding No: **S-5**
Location: **B-5**
Surface Elevation: **1151.4 feet**

Date: **1/31/2012**
Tested By: **CL**
Recorded By: **GBW**

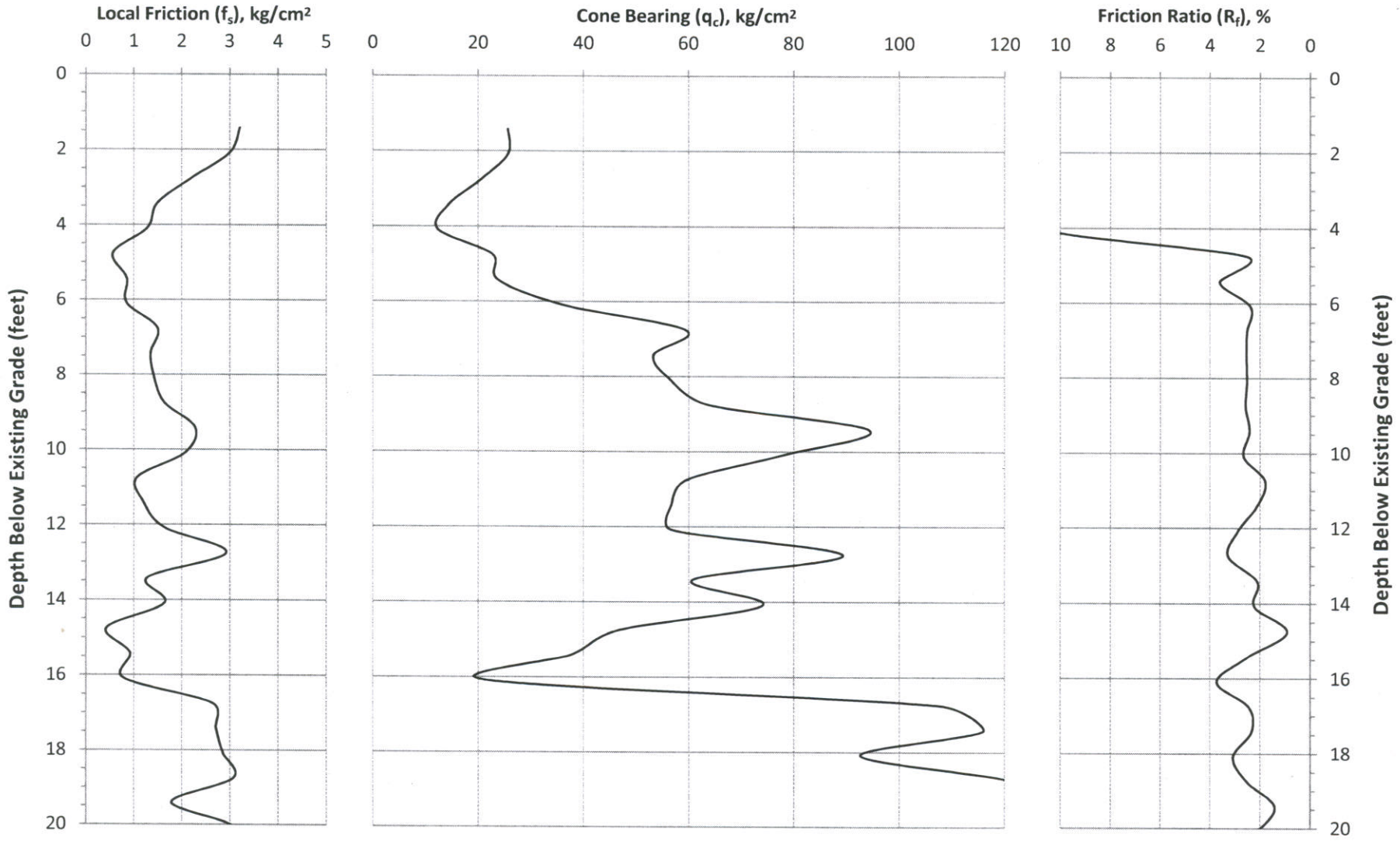

Figure B-5a

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Project Name: **Proposed NIC 4H & Companion Building**
Project Location: **Innovation Park; Lincoln, NE**
Project Number: **00110449.00**

Sounding No: **S-5**
Location: **B-5**
Surface Elevation: **1151.4 feet**

Date: **1/31/2012**
Tested By: **CL**
Recorded By: **GBW**

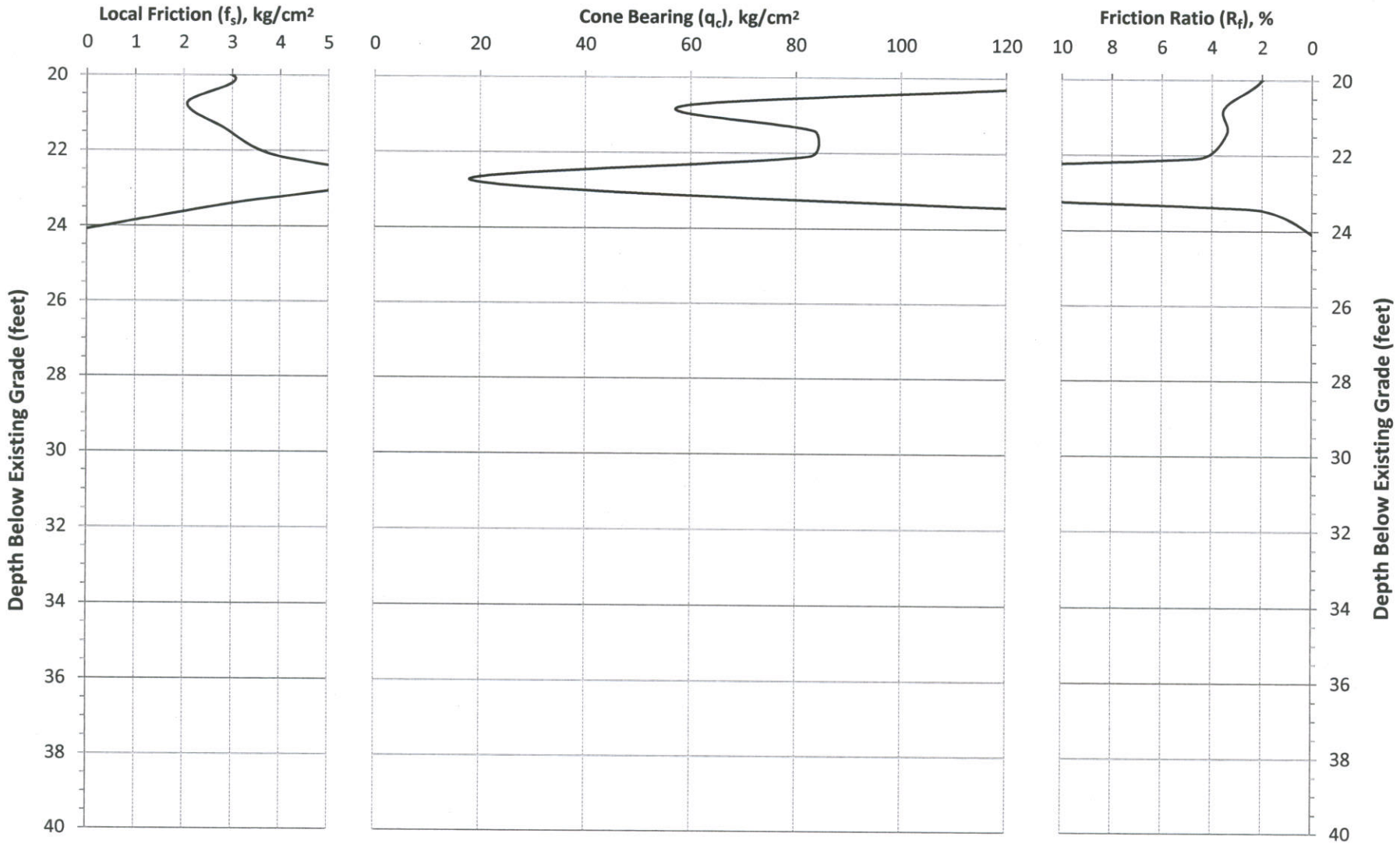

Figure B-5b

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Project Name: **Proposed NIC 4H & Companion Building**
Project Location: **Innovation Park; Lincoln, NE**
Project Number: **00110449.00**

Sounding No: **S-6**
Location: **B-6**
Surface Elevation: **1152.9 feet**

Date: **1/31/2012**
Tested By: **CL**
Recorded By: **GBW**

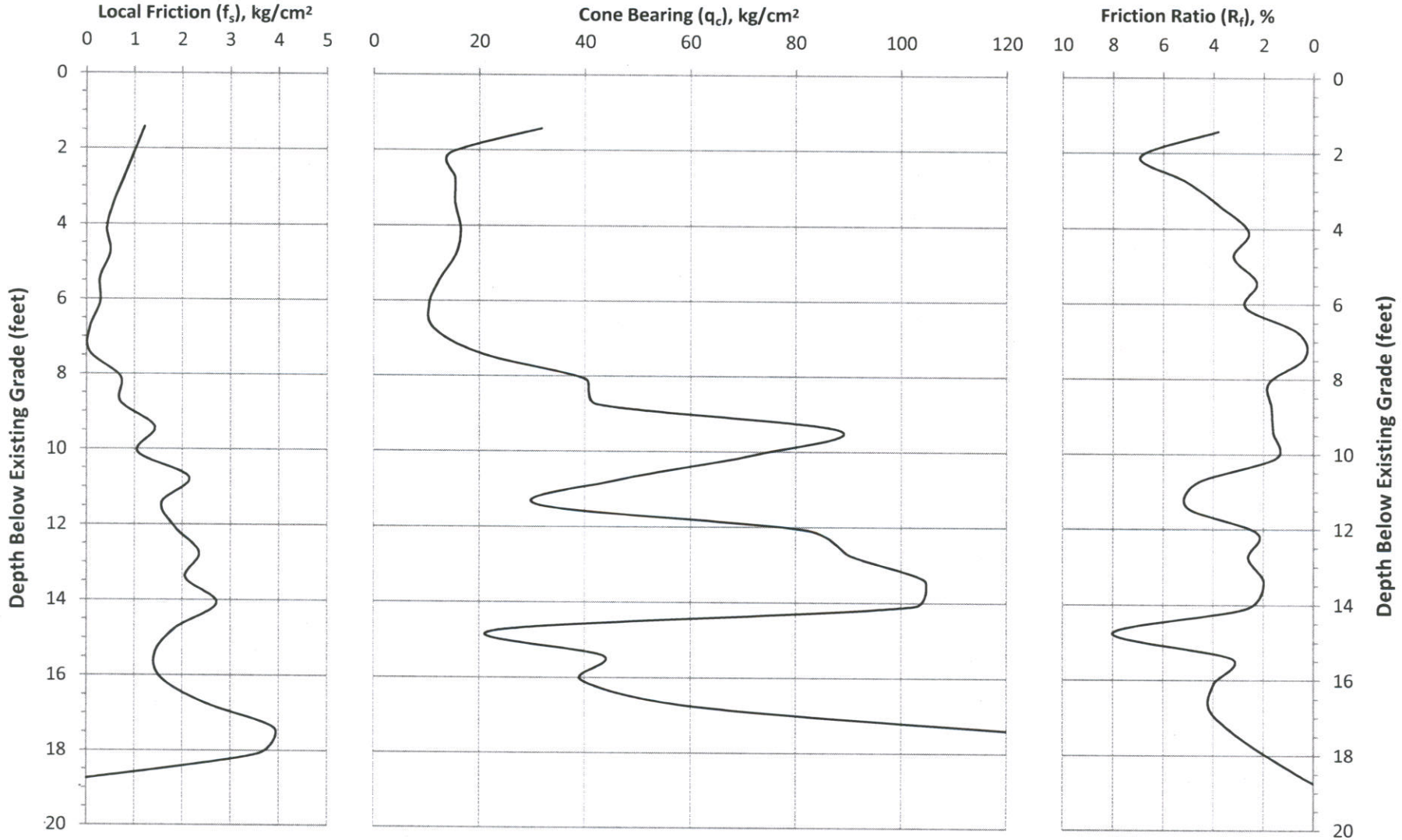

Figure B-6a

APPENDIX C. BORING LOGS

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PROJECT: Propsed NIC 4H & Companion Building

LOCATION: Innovation Park; Lincoln, NE

JOB NO.: 00110449.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & GBW

BORING LOG

BORING No.: B-1
SHEET 1 of 2
DATE: 2-1-2012

WATER LEVELS ▽ Cave-in at 20.0' IAD

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1151.7	0.0		ASPHALT; 6" thick						0.0
1151.2	0.5		CL - LEAN CLAY; medium plasticity; olive brown; wet; stiff. (Peoria)						
1150.2	1.5		CL - LEAN CLAY; medium plasticity; olive brown slightly mottled with very dark gray and dark yellowish brown; wet; stiff. (Peoria)			1.85*			
						1.5*	83.6	25.8	
1149.1	2.6		CL - LEAN CLAY; medium plasticity; olive brown heavily mottled with dark yellowish brown and gray, slightly mottled with very dark gray; wet; stiff. (Peoria)	1		2.5*			2.5
						2.1*			
1148.1	3.6		CL - LEAN CLAY; medium plasticity; olive brown; wet; medium stiff to stiff. (Peoria)			2.0*			
1146.2	5.5								5.0
1145.7	6.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; olive brown slightly mottled with very dark gray; wet; stiff. (Peoria)				95.0	30	
1145.2	6.5		CL - LEAN CLAY; 5-15% fine sand; medium plasticity; olive brown slightly mottled with very dark gray; wet; stiff. (Peoria)	2		1.3*			
1144.7	7.0		CL - SANDY LEAN CLAY; 30-40% fine sand; medium plasticity; olive brown mottled with yellowish brown slightly mottled with very dark gray; wet; medium stiff. (Alluvium)			1.4*	85.7	20.2	
1144.2	7.5		CL - SANDY LEAN CLAY; 40-50% fine sand; medium plasticity; olive brown mottled with yellowish brown slightly mottled with very dark gray; wet; medium stiff. (Alluvium)						7.5
1143.2	8.5		SC - CLAYEY SAND; 55-65% fine sand; medium plasticity; olive brown; wet; loose; with few thin clean sand seams. (Peoria)						
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; moist; loose; with few thin silty sand seams. (Alluvium)		3				10.0
1140.7	11.0		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light yellowish brown; moist; loose; with few thin silty sand seams. (Alluvium)		2 4 (6)				
1138.7	13.0		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light yellowish brown; moist; loose to medium dense; with few thin silty sand seams. (Alluvium)						12.5
1136.2	15.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light yellowish brown; moist; loose; with few thin silty sand seams. (Alluvium)						15.0
1135.2	16.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; yellowish brown; moist; loose to medium dense. (Alluvium)						
1134.2	17.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light yellowish brown; moist; medium dense. (Alluvium)						17.5
1131.7	20.0								20.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 1a

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LOCATION: Innovation Park; Lincoln, NE

JOB NO.: 00110449.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & GBW

BORING LOG

BORING No.: B-1
SHEET 2 of 2
DATE: 2-1-2012

WATER LEVELS ▽ Cave-in at 20.0' IAD

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; brown; saturated; medium dense. (Alluvium)		5 5 5				20.0
1130.2	21.5		Boring Terminated at: 21.5ft		(10)				22.5
									25.0
									27.5
									30.0
									32.5
									35.0
									37.5
									40.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 1b

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RIG / METHOD: CME 75HT / Hollow-Stem & Bull Sampler
CREW: CL, BH & GBW

BORING LOG

BORING No.: B-2
SHEET 1 of 5
DATE: 2-2-2012

WATER LEVELS ▽ Cave-in at 18.0' on 2/3/12

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1150.8	0.0		ASPHALT; 5 1/2" thick						0.0
1150.3	0.5		CL - LEAN CLAY; 5-15% fine sand; medium plasticity; black; wet; medium stiff. (Topsoil)						
1149.8	1.0		CH - FAT CLAY; high plasticity; very dark grayish brown heavily mottled with very dark brown mottled with black; wet; stiff. (Upper Subsoil)	3		2.0*	92.4	22.6	
1149.2	1.6		CH - FAT CLAY; 0-5% fine sand; high plasticity; olive brown with very dark grayish brown; wet; stiff to very stiff. (Lower Subsoil)			2.75*			
1148.5	2.3		CH - FAT CLAY; same as above except very stiff. (Lower Subsoil)			3.0*	100.6	23.6	2.5
1148.0	2.8		CL - LEAN CLAY; medium plasticity; olive brown; wet; stiff. (Peoria)		3				
1147.8	3.0				3				
					3				
1145.8	5.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; olive brown slightly mottled with very dark gray; wet; medium stiff. (Peoria)		(6)				5.0
1145.2	5.6		SC - CLAYEY SAND; 50-60% fine sand; medium plasticity; olive brown slightly mottled with very dark gray; wet; loose; with a thin sand seam. (Alluvium)	4			80.7	27.1	
1144.5	6.3		SM - SILTY SAND; 70-80% fine sand; low plasticity; olive brown; moist; loose. (Alluvium)				111.6	8.6	
1143.8	7.0								7.5
1142.3	8.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; moist; loose. (Alluvium)		3				
					3				
					2				
					(5)				10.0
1139.3	11.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light yellowish brown with yellowish brown; moist; loose to medium dense. (Alluvium)		2				
					3				
					4				
					(7)				12.5
1137.3	13.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown with pale brown; moist; medium dense; with few thin silty sand seams. (Alluvium)		2				
					5				
					5				
					(10)				15.0
									17.5
1132.3	18.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale brown; saturated; medium dense. (Alluvium)		4				
					4				
					6				
1130.8	20.0				(10)				20.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 2a

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BORING LOG

BORING No.: B-2
SHEET 2 of 5
DATE: 2-2-2012

WATER LEVELS ▽ Cave-in at 18.0' on 2/3/12

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale brown; saturated; medium dense. (Alluvium)						20.0
1127.3	23.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; yellowish brown mottled with dark yellowish red; saturated; very dense; with few very thin clay seams. (Alluvium)		10 14 26 (40)				22.5 25.0
1122.3	28.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; greenish gray; saturated; dense. (Alluvium)		7 11 12 (23)				27.5 30.0
1117.3	33.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 95-100% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)		11 23 38 (61)				32.5 35.0
1110.8	40.0				14 24 25 (49)				37.5 40.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 2b

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BORING LOG

BORING No.: B-2
SHEET 3 of 5
DATE: 2-2-2012

WATER LEVELS ▽ Cave-in at 18.0' on 2/3/12

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 95-100% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)						40.0
									42.5
1107.3	43.5		SP-SM - POORLY GRADED SAND with Silt; 5-10% fine gravel; 85-95% fine to coarse sand; nonplastic; light yellowish brown with yellowish brown; saturated; very dense; with silty, clayey sand seams. (Alluvium)		19 29 35 (64)				45.0
									47.5
1102.3	48.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 95-100% fine to coarse sand; nonplastic; brownish yellow; saturated; very dense. (Alluvium)		15 26 32				
1101.3	49.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; brownish yellow; saturated; very dense. (Alluvium)		(58)				50.0
									52.5
1097.3	53.5		GP - POORLY GRADED GRAVEL; 50-60% fine to coarse gravel; 40-50% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)		11 12				
1096.5	54.3		SM - SILTY SAND; 75-85% fine sand; low plasticity; brownish yellow; saturated; dense. (Alluvium)		21 (33)				55.0
									57.5
1092.3	58.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; pale yellow; saturated; dense. (Alluvium)		4 15 16				
1090.8	60.0				(31)				60.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 2c

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BORING LOG

BORING No.: B-2

DATE: 2-2-2012

WATER LEVELS ▽ Cave-in at 18.0' on 2/3/12

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; pale yellow; saturated; dense. (Alluvium)						60.0
1087.3	63.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brownish yellow; saturated; very dense. (Dakota Sandstone)		100 in 8"				62.5
									65.0
									67.5
1082.3	68.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale yellow; saturated; medium dense; non-cemented. (Dakota Sandstone)		10 8 9 (17)				70.0
									72.5
1077.3	73.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brownish yellow with pale yellow; saturated; very dense; with a trace of medium sand. (Dakota Sandstone)		8 20 74 (94)				
1076.3	74.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; light yellowish brown with brownish yellow; saturated; very dense. (Dakota Sandstone)						75.0
									77.5
1072.3	78.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; white with pale yellow; saturated; very dense. (Dakota Sandstone)		100 in 7"				
1070.8	80.0								80.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

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Figure C - 2d

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BORING LOG

BORING No.: B-2
SHEET 5 of 5
DATE: 2-2-2012

WATER LEVELS ▽ Cave-in at 18.0' on 2/3/12

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; white with pale yellow; saturated; very dense. (Dakota Sandstone)						80.0
1067.3	83.5		Boring Terminated at: 83.5ft						82.5
									85.0
									87.5
									90.0
									92.5
									95.0
									97.5
									100.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

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Figure C - 2e

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BORING LOG

BORING No.: B-3
SHEET 1 of 2
DATE: 2-1-2012

WATER LEVELS ▽ Cave-in at 23.0' IAD ▼ 22.4 on 2-2-2012

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1153.3	0.0		ASPHALT; 6" thick						0.0
1152.8	0.5		CL - SANDY LEAN CLAY; 30-40% fine sand; medium plasticity; black; wet; medium stiff to stiff. (Topsoil)						
1151.3	2.0		CL - SANDY LEAN CLAY; 30-40% fine sand; medium plasticity; very dark grayish brown mottled with black; wet; stiff. (Topsoil)				98.1	15.8	2.5
1150.7	2.6		CH - FAT CLAY with Sand; 20-30% fine to coarse sand; high plasticity; very dark grayish brown heavily mottled with dark gray mottled with dark greenish gray; wet; very stiff. (Upper Subsoil)	5		2.25*			
1150.2	3.1					3.25*	95.7	24.7	
1149.7	3.6					3.0*			
1149.2	4.1		CH - FAT CLAY; 5-10% fine sand; high plasticity; very dark greenish gray heavily mottled with dark yellowish brown mottled with very dark gray; wet; very stiff. (Lower Subsoil)			4.25*			
			CH - FAT CLAY; 0-5% fine sand; high plasticity; very dark greenish gray heavily mottled with dark yellowish brown mottled with very dark gray; wet; very stiff to hard. (Lower Subsoil)						5.0
1147.3	6.0		CL - LEAN CLAY; medium plasticity; olive brown with dark grayish brown; wet; very stiff. (Lower Subsoil)						
			CL - LEAN CLAY; medium plasticity; light olive brown; wet; very stiff. (Peoria)						7.5
1145.3	8.0		CL - LEAN CLAY; medium plasticity; light olive brown slightly mottled with yellowish red and black; wet; stiff to very stiff. (Peoria)						
									10.0
1141.3	12.0		CL - SANDY LEAN CLAY; 40-50% fine sand; medium plasticity; yellowish brown; wet; stiff. (Alluvium)						12.5
1139.8	13.5		SC - CLAYEY SAND; 60-70% fine sand; medium plasticity; yellowish brown; wet; loose. (Alluvium)						
1138.8	14.5		SM - SILTY SAND; 75-85% fine sand; low plasticity; yellowish brown; moist; loose to medium dense. (Alluvium)						
1138.3	15.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; moist; medium dense. (Alluvium)		4 5				15.0
1137.3	16.0		SM - SILTY SAND; 75-85% fine sand; low plasticity; brown; moist; medium dense. (Alluvium)		4 (9)				
1136.3	17.0		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light yellowish brown; moist; medium dense. (Alluvium)						17.5
1133.3	20.0								20.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 3a

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BORING LOG

BORING No.: B-3

SHEET 2 of 2

DATE: 2-1-2012

WATER LEVELS ▽ Cave-in at 23.0' IAD ▼ 22.4 on 2-2-2012

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1132.8	20.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; yellowish brown; moist; loose to medium dense. (Alluvium)		2 3 4 (7)				20.0
1132.3	21.0		SC - CLAYEY SAND; 60-70% fine sand; medium plasticity; yellowish brown; wet to saturated; loose to medium dense. (Alluvium)						
			SM - SILTY SAND; 75-85% fine sand; nonplastic; yellowish brown; saturated; loose to medium dense; with few thin clay seams. (Alluvium)						22.5
					4 3 5 (8)				25.0
1126.3	27.0		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)						27.5
1123.8	29.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; olive gray; saturated; medium dense. (Alluvium)		4 5 10 (15)				30.0
1121.8	31.5		Boring Terminated at: 31.5ft						32.5
									35.0
									37.5
									40.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 3b

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BORING LOG

BORING No.: B-4

SHEET 1 of 4

DATE: 2-1-2012

WATER LEVELS ▽ Cave-in at 21.5' on 2/2/12 ▼ 21.5 on 2-2-2012

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1153.4	0.0		ASPHALT; 6" thick						0.0
1152.9	0.5		CL - SANDY LEAN CLAY; 30-40% fine sand; medium plasticity; black with dark brown; wet; stiff. (Fill)						
1151.9	1.5		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; very dark grayish brown with black; wet; stiff. (Topsoil)				88.4	19.2	
1151.2	2.2		CH - FAT CLAY; 5-10% fine sand; high plasticity; very dark grayish brown with black; wet; very stiff. (Upper Subsoil)	6		3.5*			2.5
1150.5	2.9		CH - FAT CLAY; 5-10% fine sand; high plasticity; very dark grayish brown mottled with dark yellowish brown mottled with very dark gray; wet; stiff to very stiff. (Upper Subsoil)				105.3	17	
1149.8	3.6		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; grayish brown; wet; very stiff. (Lower Subsoil)						
1148.4	5.0		CL - LEAN CLAY; medium plasticity; light olive brown slightly mottled with black and dark yellowish red; wet; stiff. (Peoria)		3 4 5 (9)				5.0
1144.9	8.5		CL - LEAN CLAY; medium plasticity; light olive brown slightly mottled with black; wet; stiff. (Peoria)				91.6	26.3	7.5
1144.2	9.2		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; light olive brown mottled with very dark gray and dark yellowish brown; wet; stiff to very stiff. (Peoria)	7		2.75* 1.75*	91.2	26.3	
1142.8	10.6					1.75*			10.0
1140.4	13.0		SC - CLAYEY SAND; 55-65% fine sand; medium plasticity; yellowish brown; wet; medium dense. (Alluvium)		3 3 7				12.5
1138.7	14.7		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown with brown and yellowish brown; moist; medium dense; with few thin silty sand seams. (Alluvium)		(10)				15.0
					7 7 6				17.5
1133.4	20.0				(13)				20.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 4a

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CREW: CL & GBW

BORING LOG

BORING No.: B-4

DATE: 2-1-2012

WATER LEVELS ▽ Cave-in at 21.5' on 2/2/12 ▼ 21.5 on 2-2-2012

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown with brown and yellowish brown; moist; medium dense; with few thin silty sand seams. (Alluvium)						20.0
1131.9	21.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown with brown and yellowish brown; saturated; medium dense; with few thin silty sand seams. (Alluvium)						22.5
1129.9	23.5		CL - LEAN CLAY; medium plasticity; grayish brown mottled with dark yellowish red and black; saturated; medium stiff; with clean sand seams. (Alluvium)		2				
1129.4	24.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; yellowish brown; saturated; loose. (Alluvium)		2 4 (6)				25.0
									27.5
1124.9	28.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; greenish gray; saturated; very dense. (Alluvium)		17 33 45 (78)				30.0
					17 30 35 (65)				32.5
1118.9	34.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 95-100% fine to coarse sand; nonplastic; light greenish gray; saturated; very dense. (Alluvium)						35.0
									37.5
1114.9	38.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		11 16 19 (35)				40.0
1113.4	40.0								

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

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Figure C - 4b

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BORING LOG

BORING No.: B-4

SHEET 3 of 4

DATE: 2-1-2012

WATER LEVELS ▽ Cave-in at 21.5' on 2/2/12 ▼ 21.5 on 2-2-2012

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; very pale brown; saturated; dense. (Alluvium)						40.0
									42.5
1109.9	43.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		13 20 22				
1108.9	44.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 95-100% fine to coarse sand; nonplastic; light yellowish brown; saturated; very dense. (Alluvium)		(42)				45.0
									47.5
1104.4	49.0		ML - SILT; low plasticity; grayish brown; saturated; medium dense. (Alluvium)		11 7 14				
1103.7	49.7		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 95-100% fine to coarse sand; nonplastic; grayish brown; saturated; medium dense. (Alluvium)		(21)				50.0
									52.5
1099.9	53.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 95-100% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense; with a 2"-thick fat clay seam. (Alluvium)		3 4 11 (15)				55.0
									57.5
1094.9	58.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light olive brown; saturated; medium dense; with fat clay seams. (Alluvium)		5 7 10				
1093.4	60.0				(17)				60.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 4c

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CREW: CL & GBW

BORING LOG

BORING No.: B-4

SHEET 4 of 4

DATE: 2-1-2012

WATER LEVELS ▽ Cave-in at 21.5' on 2/2/12 ▼ 21.5 on 2-2-2012

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light olive brown; saturated; medium dense; with fat clay seams. (Alluvium)						60.0
									62.5
1089.9	63.5		SM - SILTY SAND; 75-85% fine sand; low plasticity; light yellowish brown; saturated; dense. (Alluvium)		5 10 17 (27)				65.0
									67.5
1084.9	68.5		CH - FAT CLAY; high plasticity; brownish gray mottled with dark grayish brown; saturated; hard. (Weathered Shale)		9 19 42 (61)				
1084.4	69.0								
1083.9	69.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown; saturated; very dense; with thin clay shale seams. (Weathered Dakota Sandstone)						70.0
			SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Weathered Dakota Sandstone)						72.5
1079.9	73.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; brownish yellow; saturated; dense; with 50% clay shale chunks. (Weathered Dakota Sandstone)		14 28 63 (91)				
1078.9	74.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; yellowish red; saturated; very dense. (Dakota Sandstone)						75.0
1076.4	77.0		IRONSTONE; 6" thick						
1075.9	77.5								77.5
1074.9	78.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; light brownish gray; saturated; very dense. (Dakota Sandstone)		100 in 6.25"				
1074.4	79.0		Boring Terminated at: 79.0ft						80.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

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Figure C - 4d

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BORING LOG

BORING No.: B-5

SHEET 1 of 5

DATE: 2-2-2012

WATER LEVELS ▽ Cave-in at 20.2' 1 hr. IAD

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1151.4	0.0		ASPHALT; 4" thick						0.0
1151.1	0.3		CH - FAT CLAY; high plasticity; very dark grayish brown with dark grayish brown; wet; very stiff. (Fill)			3.75*			
1150.4	1.0		CH - FAT CLAY; 0-5% fine sand; high plasticity; olive brown mottled with dark yellowish brown slightly mottled with gray; wet; very stiff. (Lower Subsoil)			2.2*	94.2	23.3	
1149.4	2.0		CL - LEAN CLAY; medium plasticity; olive brown slightly mottled with dark yellowish brown and black; wet; very stiff. (Peoria)	8		2.6*			2.5
						2.25*	98.0	23.8	
1148.4	3.0		CL - LEAN CLAY; medium plasticity; olive brown; wet; stiff. (Peoria)		2				
					2				
1146.9	4.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown; moist; loose. (Alluvium)		3				
1146.4	5.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown with very pale brown; moist; loose to medium dense. (Alluvium)		3				5.0
					(5)				
									7.5
1141.9	9.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; moist; medium dense. (Alluvium)		5				
					5				10.0
					4				
					7				
					(9)				
									12.5
1137.9	13.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown with brown; moist; loose; with few thin silty sand seams. (Alluvium)		2				
					3				
					3				
					(6)				15.0
1134.9	16.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)						17.5
					5				
					7				
					7				
1131.4	20.0				(14)				20.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 5a

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CREW: CL, PN & GBW

BORING LOG

BORING No.: B-5

SHEET 2 of 5

DATE: 2-2-2012

WATER LEVELS ▽ Cave-in at 20.2' 1 hr. IAD

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)						20.0
									22.5
1127.9	23.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)		15 19 26 (45)				
									25.0
									27.5
1122.9	28.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; greenish gray; saturated; very dense. (Alluvium)		9 19 26 (45)				
									30.0
									32.5
1117.9	33.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 95-100% fine to coarse sand; nonplastic; light brownish gray; saturated; very dense. (Alluvium)		9 19 21 (40)				
									35.0
									37.5
1112.9	38.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 95-100% fine to coarse sand; nonplastic; strong brown; saturated; very dense. (Alluvium)		10 19 22 (41)				
1111.4	40.0								40.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 5b

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CREW: CL, PN & GBW

BORING LOG

BORING No.: B-5

SHEET 3 of 5

DATE: 2-2-2012

WATER LEVELS ▽ Cave-in at 20.2' 1 hr. IAD

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 95-100% fine to coarse sand; nonplastic; strong brown; saturated; very dense. (Alluvium)						40.0
1107.9	43.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 95-100% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense. (Alluvium)		5 7 10 (17)				42.5 45.0
1102.9	48.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 95-100% fine to coarse sand; nonplastic; brownish yellow; saturated; very dense. (Alluvium)		13 22 23 (45)				47.5 50.0
					28 21 23 (44)				52.5 55.0
1092.9	58.5		SM - SILTY SAND; 75-85% fine to medium sand; low plasticity; light yellowish brown; saturated; dense. (Alluvium)		7 14 20 (34)				57.5
1091.4	60.0								60.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

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Figure C - 5c

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BORING LOG

BORING No.: B-5
SHEET 4 of 5
DATE: 2-2-2012

WATER LEVELS ▽ Cave-in at 20.2' 1 hr. IAD

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine to medium sand; low plasticity; light yellowish brown; saturated; dense. (Alluvium)						60.0
									62.5
1087.9	63.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brownish yellow; saturated; dense to very dense. (Weathered Dakota Sandstone)		16 31 62				
1086.9	64.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brownish yellow; saturated; very dense. (Dakota Sandstone)		(93)				65.0
									67.5
					100 in 5.75"				
									70.0
									72.5
1077.9	73.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; brownish yellow; saturated; very dense. (Dakota Sandstone)		100 in 4"				
									75.0
									77.5
1072.9	78.5								80.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

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Figure C - 5d

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BORING LOG

BORING No.: B-5

SHEET 5 of 5

DATE: 2-2-2012

WATER LEVELS ▽ Cave-in at 20.2' 1 hr. IAD

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			Boring Terminated at: 80.0ft						80.0
									82.5
									85.0
									87.5
									90.0
									92.5
									95.0
									97.5
									100.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 5e

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CREW: CL & GBW

BORING LOG

BORING No.: B-6

SHEET 1 of 2

DATE: 2-1-2012

WATER LEVELS ▽ Cave-in at 21.0' IAD

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1152.9	0.0		ASPHALT; 6" thick						0.0
1152.4	0.5		CL - LEAN CLAY; 10-15% fine sand; medium plasticity; black; wet; stiff. (Fill)						
1151.9	1.0		CL - LEAN CLAY; medium plasticity; olive brown; wet; stiff; with a trace of lime; blocky. (Peoria)						
1151.5	1.4		CL - LEAN CLAY; medium plasticity; olive brown slightly mottled with dark yellowish brown and gray; wet; stiff to very stiff. (Peoria)	9		2.0*	87.5	27.1	
1150.3	2.6					2.5*			2.5
1149.9	3.0		CL - LEAN CLAY; medium plasticity; olive brown; wet; stiff. (Peoria)						
1147.9	5.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; olive brown slightly mottled with gray and black; wet; stiff. (Peoria)	10		1.25* 1.25* 2.0* 1.5*	80.5	29.4	5.0
1145.9	7.0		CL - LEAN CLAY; medium plasticity; olive brown; wet; medium stiff. (Peoria)			1.6*			7.5
1144.4	8.5		SM - SILTY SAND; 75-85% fine sand; low plasticity; olive brown; moist; loose. (Alluvium)						
1143.9	9.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown with brown; moist; loose to medium dense; with silty sand seams. (Alluvium)		3				10.0
1142.4	10.5		SC - CLAYEY SAND; 60-70% fine sand; medium plasticity; brown; wet; loose. (Alluvium)		2				
1141.9	11.0		SM - SILTY SAND; 70-80% fine sand; low plasticity; brown; moist; loose. (Alluvium)		3 (5)				
1140.4	12.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; moist; loose to medium dense. (Alluvium)						12.5
1139.4	13.5		SM - SILTY SAND; 75-85% fine sand; low plasticity; brown; moist; loose to medium dense. (Alluvium)						
1138.9	14.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; moist; loose. (Alluvium)						15.0
1137.4	15.5		SC - CLAYEY SAND; 60-70% fine sand; medium plasticity; yellowish brown; wet; loose to medium dense. (Alluvium)						
1135.9	17.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; yellowish brown with light yellowish brown; moist; medium dense. (Alluvium)						17.5
1134.9	18.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown with yellowish brown; moist; medium dense; with silty sand seams. (Alluvium)						
1132.9	20.0								20.0

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* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 6a

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BORING LOG

BORING No.: B-6

SHEET 2 of 2

DATE: 2-1-2012

WATER LEVELS ▽ Cave-in at 21.0' IAD

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown with yellowish brown; moist; loose to medium dense; with silty sand seams. (Alluvium)		4 6 7				20.0
1131.9	21.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brown; saturated; medium dense. (Alluvium)		(13)				
1131.4	21.5		Boring Terminated at: 21.5ft						22.5
									25.0
									27.5
									30.0
									32.5
									35.0
									37.5
									40.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

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Figure C - 6b

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BORING LOG

BORING No.: B-7
SHEET 1 of 1
DATE: 2-1-2012

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1152.8	0.0		ASPHALT; 5 1/2" thick					0.0
1152.3	0.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; yellowish brown with very dark grayish brown; moist; loose. (Fill)					
1152.1	0.7							
1151.6	1.2		CH - FAT CLAY; 5-10% fine to coarse sand; high plasticity; olive brown with very dark grayish brown; wet; very stiff; blocky. (Fill)	11	1.6*	98.7	23	
			CL - LEAN CLAY; medium plasticity; olive brown slightly mottled with very dark gray; wet; stiff; with few lime concretions. (Peoria)		1.25*			
1150.3	2.5							2.5
1150.0	2.8		CL - LEAN CLAY; medium plasticity; light olive brown; wet; stiff. (Peoria)					
1148.3	4.5		CL - LEAN CLAY; medium plasticity; light olive brown; wet; medium stiff to stiff. (Peoria)					5.0
1147.3	5.5		Boring Terminated at: 5.5ft					7.5
								10.0
								12.5
								15.0
								17.5
								20.0

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* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 7

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BORING LOG

BORING No.: B-8

SHEET 1 of 1

DATE: 2-1-2012

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1156.3	0.0		ASPHALT; 6" thick				0.0
1155.8	0.5		CL - LEAN CLAY; medium plasticity; brown; moist; very stiff. (Fill)				
1155.6	0.7		CH - FAT CLAY; 0-5% fine gravel; 5-10% fine to medium sand; high plasticity; very dark gray with black and yellowish red; moist; hard; blocky. (Fill)			8.5	
1155.1	1.2					8.3	
1154.6	1.7		CH - FAT CLAY; 0-5% fine sand; high plasticity; pale brown with very dark gray; moist; hard; blocky. (Upper Subsoil)	12	101.4	17.8	
1153.5	2.8		CH - FAT CLAY; 0-5% fine sand; high plasticity; dark grayish brown with dark olive brown; moist; hard. (Lower Subsoil)			17.9	2.5
1153.3	3.0		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; dark grayish brown with olive brown; moist; very stiff to hard. (Subsoil)				
1152.3	4.0		CL - LEAN CLAY; medium plasticity; olive brown; moist; very stiff. (Lower Subsoil)				
1150.8	5.5		CL - LEAN CLAY; medium plasticity; light yellowish brown; moist; very stiff. (Peoria)				5.0
							7.5
1146.3	10.0		Boring Terminated at: 10.0ft				10.0
							12.5
							15.0
							17.5
							20.0

BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

Figure C - 8

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BORING LOG

BORING No.: B-9

SHEET 1 of 1

DATE: 2-1-2012

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1156.5	0.0		ASPHALT; 6" thick					0.0
1156.0	0.5		CL - SANDY LEAN CLAY; 40-50% fine sand; medium plasticity; black; wet; soft. (Fill)					
1155.7	0.8		CL - SANDY LEAN CLAY; 35-45% fine sand; medium plasticity; black; wet; medium stiff. (Fill)		0.8*			
1155.3	1.2				0.5*			
1154.9	1.6		CL - SANDY LEAN CLAY; 40-50% fine sand; medium plasticity; black; wet; soft to medium stiff. (Fill)	13	1.25*	98.0	22.6	
1154.5	2.0							
1154.0	2.5		CL - LEAN CLAY with Sand; 15-25% fine sand; medium plasticity; dark yellowish brown with black; wet; medium stiff to stiff. (Fill)		2.25*			2.5
1153.5	3.0		CL/CH - LEAN TO FAT CLAY; 0-5% fine sand; medium to high plasticity; olive brown heavily mixed with black; wet; stiff to very stiff. (Fill)					
			CL - LEAN CLAY; medium plasticity; olive brown; wet; stiff to very stiff. (Peoria)					5.0
1151.0	5.5		Boring Terminated at: 5.5ft					7.5
								10.0
								12.5
								15.0
								17.5
								20.0

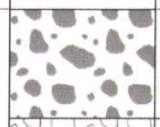
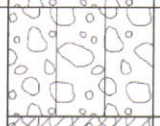
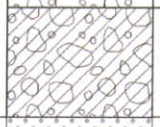
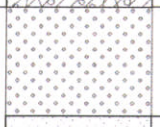
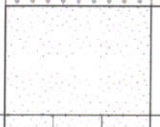
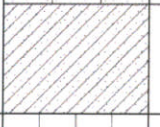
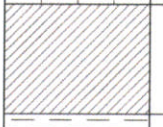
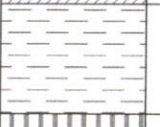
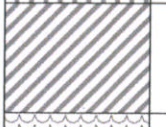
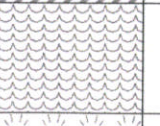
BORING LOG INNOVATION PARK BORING LOGS.GPJ HWS.GDT 5/31/12

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 9

APPENDIX D. CRITERIA USED FOR SOIL CLASSIFICATION

USCS SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LESS THAN 5% FINES)		GW	WELL-GRADED GRAVEL
				GP	POORLY-GRADED GRAVEL
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (MORE THAN 12% FINES)		GM	SILTY GRAVEL (LOW PLASTIC FINES)
				GC	CLAYEY GRAVEL (MEDIUM TO HIGH PLASTIC FINES)
	SAND AND SANDY SOILS	CLEAN SANDS (LESS THAN 5% FINES)		SW	WELL-GRADED SAND
MORE THAN 50% OF MATERIALS LARGER THAN NO. 200 SIEVE SIZE				SP	POORLY-GRADED SAND
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (MORE THAN 12% FINES)		SM	SILTY SAND (LOW PLASTIC FINES)
				SC	CLAYEY SAND (MEDIUM TO HIGH PLASTIC FINES)
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	SILT (0-15% SAND) SILT WITH SAND (15-30% SAND) SANDY SILT (30-50% SAND)
				CL	LEAN CLAY (0-15% SAND) LEAN CLAY WITH SAND (15-30% SAND) SANDY LEAN CLAY (30-50% SAND)
				OL	ORGANIC SILTS AND LEAN CLAYS
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	ELASTIC SILT (0-15% SAND) ELASTIC SILT WITH SAND (15-30% SAND) SANDY ELASTIC SILT (30-50% SAND)
				CH	FAT CLAY (0-15% SAND) FAT CLAY WITH SAND (15-30% SAND) SANDY FAT CLAY (30-50% SAND)
				OH	ORGANIC ELASTIC SILTS AND FAT CLAYS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

GENERAL NOTES

CRITERIA FOR DESCRIBING CLAY SOILS

MOISTURE CONDITION

Description	Criteria
Dry	Absence of moisture, dusty, dry to touch.
Moist	Damp, slightly wet, moisture content below plastic limit.
Wet	Moisture content above the plastic limit.
Saturated	Very wet. Usually soil is below the water table.

CONSISTENCY

Description	Penetration Resistance, N_{60} (blows/ft)[1]
Very Soft	Less than 3
Soft	3 to 4
Medium Stiff	5 to 8
Stiff	9 to 16
Very Stiff	16 to 32
Hard	Greater than 32

CRITERIA FOR DESCRIBING GRANULAR SOILS

MOISTURE CONDITION

Description	Criteria
Dry	Absence of moisture, dry to the touch.
Moist	Damp but no visible free water.
Wet	Visible free water.
Saturated	Usually soil is below water table.

DENSITY

Description	Penetration Resistance, N_{60} (blows/ft)[1]
Very Loose	Less than 5
Loose	5 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	Greater than 50

CRITERIA FOR DESCRIBING ROCK

STRENGTH/HARDNESS

Description	Criteria
Very Soft	Permits denting by moderate pressure of the fingers.
Soft	Resists denting by the fingers, but can be abraded and pierced to a shallow depth by a pencil point.
Moderately Soft	Resists a pencil point, but can be scratched and cut with a knife blade.
Moderately Hard	Resistant to abrasion or cutting by a knife blade, but can be easily dented or broken by light blows of a hammer.
Hard	Can be deformed or broken by repeated moderate hammer blows.
Very Hard	Can be broken only by heavy, and in some rocks, repeated hammer blows.

[1]Blow counts shown on the boring logs are those recorded directly in the field and have not been corrected for hammer efficiency. The boring log blow counts must be corrected to an equivalent hammer efficiency of 60% in order to use the criteria in this table.

ROCK QUALITY DESIGNATION (RQD)

This is a general method by which the quality of the rock at a site is obtained based on the relative amount of fracturing and alteration.

The Rock Quality Designation (RQD) is based on a modified core recovery procedure that, in turn, is based indirectly on the number of fractures (except those due directly to drilling operations) and the amount of softening or alteration in the rock mass as observed in the rock cores from a drill hole. Instead of counting the fractures, an indirect measure is obtained by summing the total length of core recovered by counting only those pieces of hard and sound core which are 4 inches or greater in length. The ratio of this modified core recovery length to the total core run length is known as the RQD.

An example is given below from a core run of 60 inches. For this particular case, the total core recovery is 50 inches yielding a core recovery of 83 percent. On the modified basis, only 38 inches are counted the RQD is 63 percent.

CORE RECOVERY, in	MODIFIED CORE RECOVERY, in
10	10
2	-
2	-
3	-
4	4
5	5
3	-
4	4
6	6
4	4
2	-
5	5
50	38

% Core Recovery = 50/60 = 83%; RQD = 38/60 = 63%

A general description of the rock quality can be made for the RQD value as follows:

RQD	DESCRIPTION OF ROCK QUALITY
0 – 25	Very Poor
25 – 50	Poor
50 – 75	Fair
75 – 90	Good
90 – 100	Excellent

APPENDIX E. CONSOLIDATION TEST REPORTS

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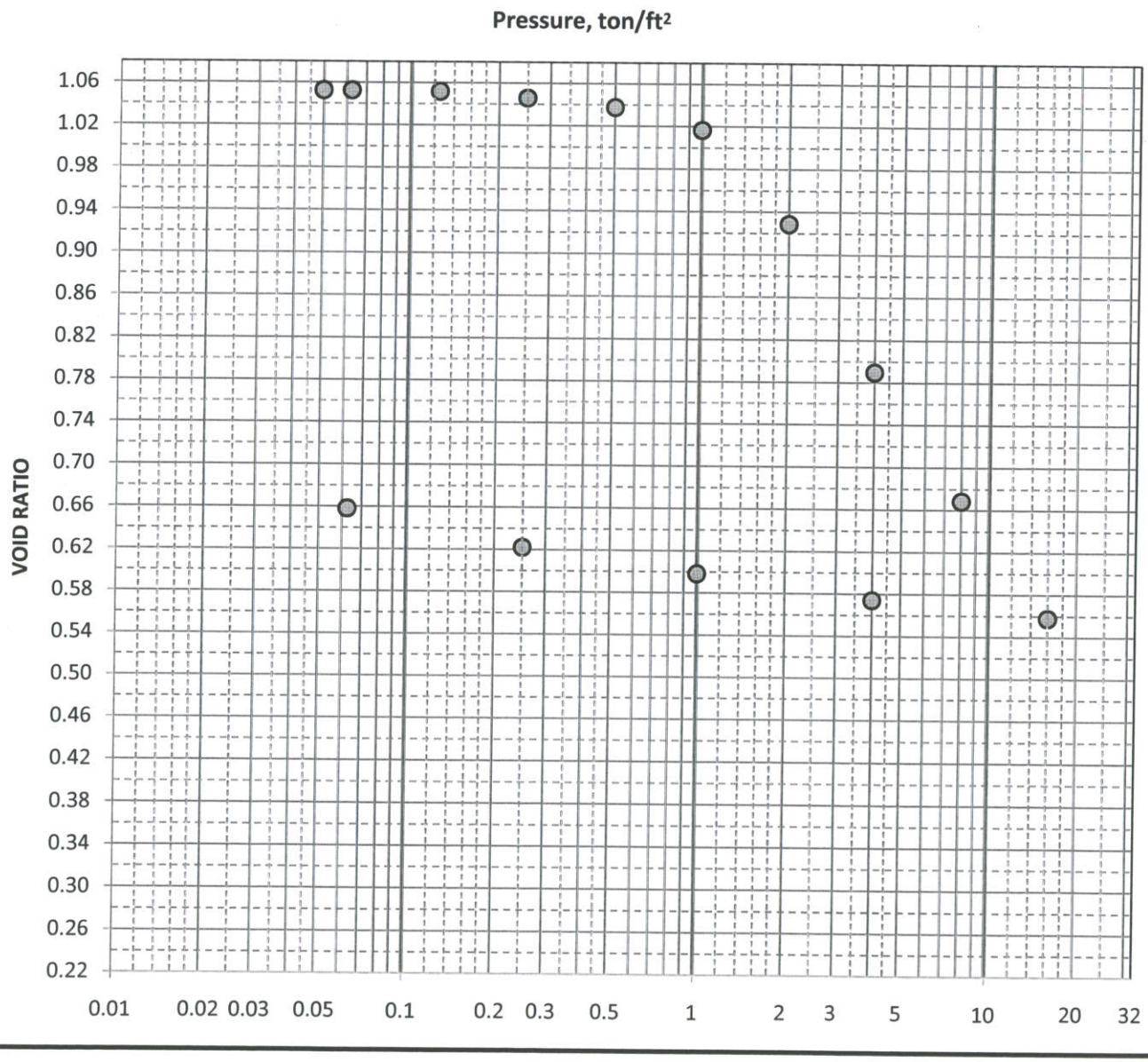
CONSOLIDATION TEST
ASTM D2435

Project:	Proposed NIC 4H & Companion Building	Project No.:	00110449.00
Boring No.:	B-1 Depth: 5.5'-6.0'	Lab No.:	31518
Type of Specimen:	3" Shelby Tube	Date:	2-9-2012
Remarks:	Saturated Test	Classification:	

Initial Saturation:	62.5	%	Overburden Pressure:	0.33	ton/ft^2
Final Saturation:	100.0	%	Preconsolidation Pressure:	1.55	ton/ft^2
Initial Dry Density:	82.1	lb/ft^3	Compression Index:	0.46	
Initial Water Content:	24.4	%	Recompression Index:	0.042	
Liquid Limit:			Specific Gravity:	2.70	
Plastic Limit:			Initial Void Ratio:	1.05	
Plasticity Index:			Final Void Ratio:	0.66	



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CONSOLIDATION TEST
ASTM D2435

Project:	Proposed NIC 4H & Companion Building	Project No.:	00110449.00
Boring No.:	B-6 Depth: 5.5'-6.0'	Lab No.:	31532
Type of Specimen:	3" Shelby Tube	Date:	2-9-2012
Remarks:	Saturated Test	Classification:	

Initial Saturation:	67.2	%	Overburden Pressure:	0.33	ton/ft^2
Final Saturation:	100.0	%	Preconsolidation Pressure:	1.7	ton/ft^2
Initial Dry Density:	79.2	lb/ft^3	Compression Index:	0.49	
Initial Water Content:	28.0	%	Recompression Index:	0.047	
Liquid Limit:			Specific Gravity:	2.70	
Plastic Limit:			Initial Void Ratio:	1.13	
Plasticity Index:			Final Void Ratio:	0.72