26 June 2014

MILITARY DEPARTMENT
STATE of NEBRASKA
LINCOLN, NEBRASKA

NEBRASKA ARMY NATIONAL GUARD
CATS BLDG 56 SUSTAINMENT PROJECT

at

Camp Ashland Training Site
220 County Road A
Ashland, NE 68003

PROJECT NO. 31030118

A D D E N D U M N O. 1

The original specifications and drawings on the STATE OF NEBRASKA REQUEST for PROPOSAL FORM for the project noted above are amended as noted in this Addendum No. 1.

Receipt of this Addendum shall be acknowledged by inserting its number and date in the space provided on the Bid Form.

ADDENDUM NO. 1

NOTE TO ALL PLANHOLDERS: Please insert this Addendum into your copy of the Contract Documents for the above named project.

The following changes to the Contract Documents are issued by the CFMO-CMB and shall have the same force and affect as though a part of the original issue.

THE RECEIPT DATE, TIME and LOCATION of the BID PROPOSAL submission HAVE NOT CHANGED.

ITEM NO.

ADD 1-1 Pre-Bid Meeting Sign-In Sheet.

Refer to the sign-in sheet, attached at the end of this addendum.

ADD 1-2 Pre-Bid Meeting Owner Comments

A. Contractors must be on site to receive their own deliveries. The owner will not accept deliveries on behalf of the contractor.
B. Space will be provided around the building for staging of materials and contractor parking.
C. All work must be completed around the building user schedule. A schedule will be provided by the owner.

DRAWINGS

ADD 1-3 Sheet A0.01 – Building 56 Demolition Drawing

Contractor Question:
On sheet A0.01 note 6, the note on my sheet is only partial. Could I get the complete note please?
Response:
Demolition Key Note 6 reads as follows: "Remove existing siding system to stud framing; including but not limited to siding, trim, vapor barrier, sheathing, miscellaneous mech. & elec penetration covers; prepare existing framing for new sheathing."

ADD 1-4 Sheet A1.01 – Building 56 Proposed Drawings

This sheet has been reissued in its entirety as part of this addendum.

A. Refer to Floor Plan, note that control joints are required in the new concrete slab at 10' spacing in each direction. Contractor to provide a layout plan that identifies construction, contractor and isolation joints for review.
B. Refer to 3. West Elevation, provide a Butt Type Gutter Expansion Joint in the gutter per Architectural Sheet Metal Manual, 5th Edition.
C. Refer to 4. East Elevation, provide a Butt Type Gutter Expansion Joint in the gutter per Architectural Sheet Metal Manual, 5th Edition.
D. Refer to 6. Window Installation Detail Section. Note that the J flashing along the head of the windows with the hemmed edge is required at door locations as well.
E. Refer to 7. Typical Wall Section, provide a finished j-bead at the bottom of the GPDW / top of removable birch plywood transition.
F. Contractor Question:
Can you clarify the intent in the proposal that states "elevating the building approximately 12"". Is the intent to raise the ridge line of the roof by 12"?
Response:
Yes, the intent is to raise the wood framed portion of the building.
G. Contractor Question:
The plans seem to indicate that we are only adding a 12" curb at the perimeter of the building and raising the interior floor, with the ceiling elevation of 8 foot above new finished floor. The plans infer to me that there is 8' – 8 ¼ " between the existing floor and the existing ceiling.
Response:
The existing concrete slab to bottom of ceiling gypsum board dimension is 8'-0"(+/-), the existing concrete curb is 9" tall(+/-). From top of existing concrete curb to bottom of ceiling gypsum board is approximately 7'-3". With the addition of the 12" concrete curb, the floor to ceiling height should be 8'-3". Set the head height of the doors and windows at 7'-0" AFF, provide framing as required.

ADD 1-5 Sheet E0.01 – Electrical Site Plan

A. Contractor Question:
Note 4 on Page E0.01 is calling for a 2 ½" conduit to be installed with 3 3/0 conductors and a #6 Ground. I do not believe this ground is necessary since there is not a place to land it within the transformer and the building will have to be grounded at the new panel. Per NEC Table C.9 3-3/0 conductors fit in a rigid schedule 80 PVC conduit. Will this be ok to use the existing 2" conduit that is already under the road in lieu of boring a 2 ½" conduit underneath the road. We can still pull new conductors thru the existing conduit.
Response:
Correct, requirement to be 3-3/0, no ground conductor. Contractor may reuse the existing conduit if size is adequate per the NEC. Panelboard 'HP' shall be grounded in accordance with the NEC.

B. Refer to the Utility Room Telecom Riser Plan:
A new plan note number 10 shall be added and this shall be indicated next to the 110 blocks indicated by plan note number 6. Plan note number 10 shall have a line that follows that of the fiber optic cable routed from building #55. Plan note number 10 shall read the following: "ONE 25TP CATEGORY 5E CABLE SHALL BE ROUTED FROM 110 WALL MOUNTED BLOCKS TO 110 WALL MOUNTED BLOCKS LOCATED IN BUILDING #55. CONTRACTOR SHALL INSTALL 110 BLCOKS IN BUILDING #55 FOR TERMINATION. CONTRACTOR SHALL ALSO INSTALL PRIMARY PROTECTORS ONCE THE 25TP CABLE INTERS THIS BUILDING. COORDINATE EXACT LOCATION WITH OWNER."

C. Refer to the TELECOM EQUIPMENT LIST:
The following items shall be added to this list.
25TP CATEGORY 5E CABLE: PANDUIT = PUP5525IG-UY
Building Entrance Terminal: Porta Systems = 25050-110-M110-p (with factory installed protectors)

SPECIFICATIONS

ADD 1-6 Specification Section 01 33 00 Submittal Procedures

A. Refer to section 1.4, C, 1, Allow 15 days for Owner review and 15 days for Architect review of each submittal.
B. Refer to section 1.4, D, 1, a, add "testing agencies" to Subcontractors and Suppliers.
C. Refer to section 2.1, E, 1, provide samples to Owner and Architect.
D. Add section 3.3 OWNER'S ACTION

3.3 OWNER'S ACTION

A. Submittals: Owner will review each submittal, make marks to indicate corrections or revisions required, and return it. Owner will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

B. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

ADD 1-7 Specification Section 01 40 00 – Quality Control

Refer to section 1.8, E, add item 7. All testing agency reports shall be posted to Submittal Exchange.

ADD 1-8 Specification Section 01 77 00 – Closeout Procedures.

Refer to section 1.7, A, all warranties shall begin at Substantial Completion.

ADD 1-9 Specification Section 03 30 00 – Cast-In-Place Concrete

Refer to section 3.12 Field Quality Control, replace with the following:

3.12 FIELD QUALITY CONTROL

A. Testing and Inspecting: Contractor shall engage an independent qualified testing and inspecting agency as approved by Owner and Architect to perform field tests and inspections and prepare test reports.

B. Inspections:

1. Steel reinforcement placement.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof. One set of four specimens is required for concrete pours of an amount less than five cubic yards, if the concrete is to be part of the building structural system (i.e. footings, piers, walls, columns)

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
    b. Provide tests for each type of construction. i.e. interior concrete slab, perimeter concrete curb, exterior concrete slabs.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
6. Compressive Strength Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders as laboratory-cured specimens except when field-cured test specimens are required.
7. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at 7 days, two specimens at 28 days and retain one specimen in reserve for later testing if required.

    a. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test falls below specified compressive strength by more than 500 psi (3.4 MPa).

8. Test results shall be reported in writing to Owner, Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

    a. Post all tests to Submittal Exchange site.
9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 24 hours of finishing.

ADD 1-10 Specification Section 03 35 36 – Polished Concrete Floor System

Replace this section in its entirety with the attached section.

ADD 1-11 Specification Section 06 20 23 – Interior Finish Carpentry

Refer to section 2.2, delete reference to Fire-Retardant-Treated Materials. Interior removable panels shall be Finish grade (grade a, 7 ply) Birch plywood sanded and finish all surfaces with a clear sealer, attached with stainless steel screws and beauty washers.

ADD 1-12 Specification Section 07 31 13 – Asphalt Shingles

Refer to section 2.2, provide attic stock of one square of shingles for owner use.

ADD 1-13 Specification Section 07 62 00 – Sheet Metal Flashing and Trim

Refer to section 2.2, an acceptable alternative to metallic-coated sheet steel would be Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with a smooth surface. (0.032 inch minimum thickness)

ADD 1-14 Specification Section 08 11 13 – Hollow Metal Doors and Frames

Add this section in its entirety.

ADD 1-15 Specification Section 08 33 30 – Security Grilles

Add this section in its entirety.

ADD 1-16 Specification Section 08 52 00 – Wood Windows

Change the name of this section to "Aluminum Clad Wood Windows". (Refer to item 2.3, B, 1)

ADD 1-17 Specification Section 08 71 00 – Door Hardware

Add this section in its entirety.

ADD 1-18 Specification Section 09 91 23 – Interior Painting

Refer to section 3.5, add system SWD-12.

System SWD-12—MODIFIED for Application on Interior Woodwork

1. Transparent Stained Finish: 3 coats waterborne clear satin acrylic-based based satin varnish. Sand lightly between each succeeding varnish coat. **The finished product shall meet Class "C" or better with substrate materials/application method compliant with Class "C".**
2. Interior waterborne clear satin acrylic-based polyurethane varnish: Transparent factory-formulated waterborne clear satin acrylic-based polyurethane based varnish applied at spreading rate recommended by manufacturer.

    a. DV: Old Masters H²0 Interior Polyurethane—Satin Acrylic.
    b. GP: Wood Pride® Interior Polyurethane Water-Based Satin Varnish, 1802-0000.
    c. Moore: Coronado 70-270 Aqua-Plastic® Urethane VOC Compliant Clear Satin.
    d. PPG: Olympic, Premium Interior Water Based Polyurethane Clear, 42786.
    e. S-W: Wood Classics Waterborne Polyurethane Satin, A68 Series.

ADD 1-19 Specification Section 27 00 00 – Telecommunications Cable Plant

Add this section in its entirety.

ADD 1-20 Specification Section 31 20 00 – Earth Moving

A. Refer to section 1.2, A, delete lines 2 and 4.
B. Refer to section 2.1, A. Contractor shall provide all barrow material if required.
C. Refer to section 2.1, delete section M. Planting Bed Topsoil.
D. Refer to section 3.16, delete section B. Drainage Backfill.
E. Refer to Section 3.19, A, change word "Owner" to "Contractor" (Contractor will engage...)
F. Refer to Section 3.19, B, change word "Owner" to "Contractor" (Contractor will engage...)
G. Refer to section 3.19, E, add item 4. A test shall be provided for each area of work.
H. Refer to section 3.21, delete section B.

ADD 1-21 Specification Section 32 12 16 – Asphalt Paving

Delete this section in its entirety. All work crossing the road shall be bored, do not cut into the existing asphalt paving.

THIS ADDENDUM SHALL BE ATTACHED TO AND MADE A PART OF THE DRAWINGS AND SPECIFICATIONS AND SHALL BE ACKNOWLEDGED WITH THE BIDDER'S PROPOSAL.

DARYL L. BOHAC
MAJOR GENERAL The Adjutant General

End of Addendum No. 1

Attachments: Pre-Bid Sign-In Sheet, A1.01, 03 35 36, 08 11 13, 08 33 30, 08 71 00, 27 00 00

Nebraska Military Department

Construction and Facilties Management Office

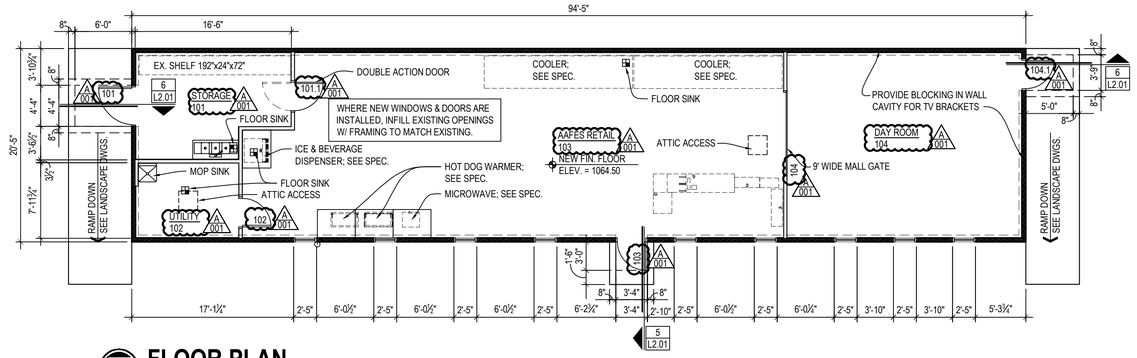
JFHQ Building, 2433 NW 24th Street, Lincoln, Nebraska 68524-1801

(402) 309-8450 (main) (402) 309-7480 (fax)

Pre-Bid Meeting - CATS Bldg 56 Sustainment Project

June 17, 2014 @ 10:00 AM

Name	Agency/Company	Phone Number	E-mail Address
Mr. Robert DeMoss	Nebraska Military Dept.	402-309-8464	robert.w.demoss2.nfg@mail.mil
MAJ Bryan Bettey	Nebraska Military Dept.	402-309-8453	bryan.p.bettey.mil@mail.mil
Mr. Marc McNally	CFMO Project Manager	402-309-8470	marc.d.mcnally.nfg@mail.mil
SFC David Nanfito	CATS Operations Specialist	402-309-7606	
Mr. Tim Ripp, AIA	Clark Enersen Partners	402-477-9291	
J.D. FARGO	DICKEY & BURHAM INC	402-610-0273	jd.fargo.dbi@gmail.com
Darren Thomas	Dickey & Burham, Inc.	402-610-7401	darren.thomas.dbi@gmail.com
MEL MORTON	LACEY CONSTRUCTION	402-443-1112	MEL@laceyinc.com
Jon Carpenter	IES Electric	402-890-4763	jon@ieselectricinc.com
Cori Wemhoff	IES Electric	402-890-4763	Cori@ieselectricinc.com
RUSS COOPER	MIDWEST CONSTRUCTION SVCS	402-537-3077	RCOOPER@MIDWEST-CO.COM.
Randy Winn	Winn Construction	402 650-6118	Randy@winnvet.com
Michael Ripp	Clark Enersen	402-477-9291	michael.ripp@clarkenersen.com
Alex Hansen	DR. Holtze Contracting	402-980-7274	ajhansen104@gmail.com
DENNIS MOY	HOFFMAN ELECTRIC	402-734-1196	dennis@hoffman-electric.com
Steve Rip	R/C Constr Inc	402-208-0153	Steve@RCreconstruction.com



FLOOR PLAN

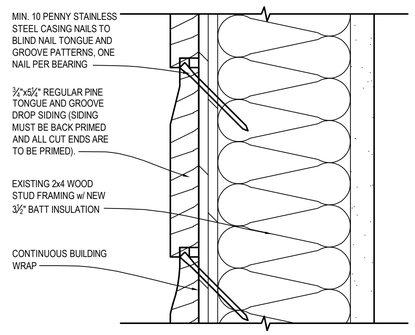
SCALE: 1/8"=1'-0"

GENERAL NOTES

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING DIMENSIONS.
2. ALL EXTERIOR WOOD TO BE FACTORY PRIMED WITH CUT EDGES FIELD PRIMED, WHEN APPLICABLE. FOR ITEMS NOT FACTORY PRIMED, ALL FACES AND ENDS TO BE FIELD PRIMED.
3. ALL SIDING MUST BE BACK PRIMED AND ALL CUT ENDS ARE TO BE PRIMED.
4. INFIL STUD CAVITIES W/ NEW 3½" BATT INSULATION.
5. SEAL ALL GAPS AT SIDING, SOFFITS AND FASCIA PRIOR TO PAINTING.
6. STOOPS ARE REQUIRED AT LOCATIONS INDICATED ON THE PLANS AND AT ALL OUTWARD-SWINGING EXTERIOR DOORS AT GRADE LEVEL. SEE LANDSCAPE SHEETS FOR STOOP DETAILS.
7. CASEWORK SHALL BE SUPPLIED AND INSTALLED BY OWNER.
8. EQUIPMENT SHALL BE SUPPLIED OWNER. CONTRACTOR TO PROVIDE CONNECTION FOR EQUIPMENT TO WALL/FLOOR (SEE MECH. & ELEC. DWGS.) OWNER TO MAKE FINAL HOOK UP/ INSTALLATION TO WALL OR FLOOR MOUNTED CONNECTIONS.

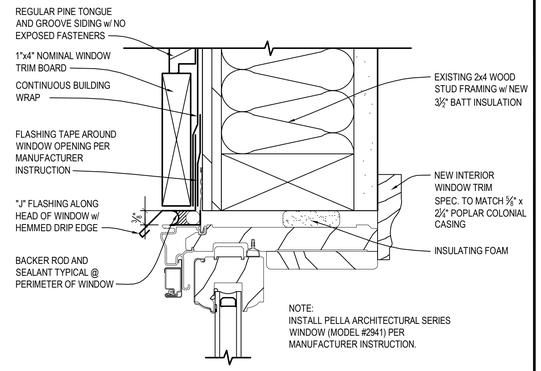
DOOR SCHEDULE

TCEP DOOR NO.	DOOR WIDTH	DOOR HEIGHT	DOOR TYPE	DOOR FINISH	DOOR FIRE RATING	DOOR HARDWARE SET	FRAME TYPE	FRAME FINISH	COMMENTS
101	4'-0"	7'-0"	HMD-1	PT.	--	HW-3.0	HMF-1	PT.	--
101.1	3'-0"	7'-0"	HMD-2	PT.	--	HW-1.0	HMF-1	PT.	180 SWING
102	3'-0"	7'-0"	HMD-1	PT.	--	HW-2.0	HMF-1	PT.	--
103	3'-0"	7'-0"	HMD-2	PT.	--	HW-3.0	HMF-1	PT.	--
104	9'-0"	7'-0"	-	NONE	--	-	-	NONE	ROLL-UP MALL GATE; PROVIDE LOCKS EA. SIDE
104.1	3'-0"	7'-0"	HMD-2	PT.	--	HW-3.0	HMF-1	PT.	--



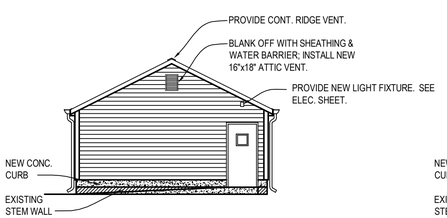
5 TOENAIL SIDING DETAIL SECTION

SCALE: 6"=1'-0"



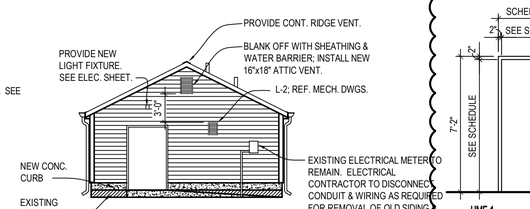
6 WINDOW INSTALL DETAIL SECTION

SCALE: 6"=1'-0"



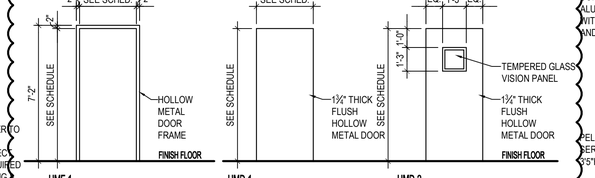
1 SOUTH ELEVATION

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



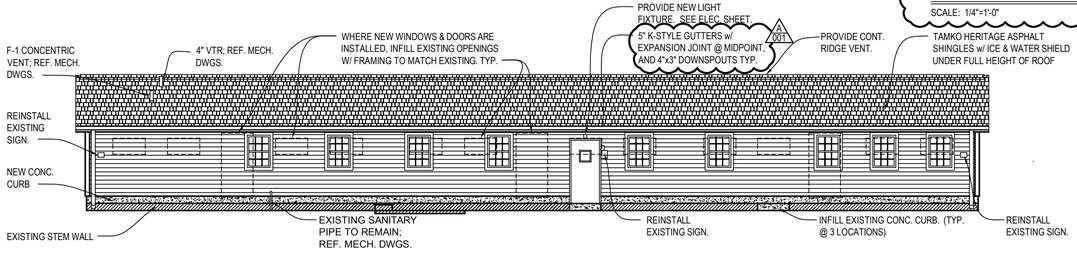
2 NORTH ELEVATION

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



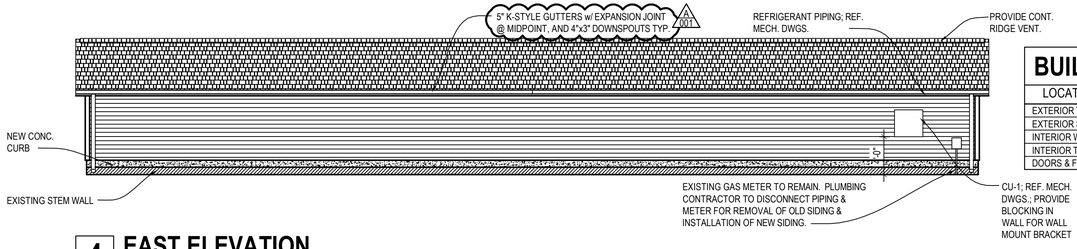
HM FRAME TYPE DOOR TYPES

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



3 WEST ELEVATION

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



4 EAST ELEVATION

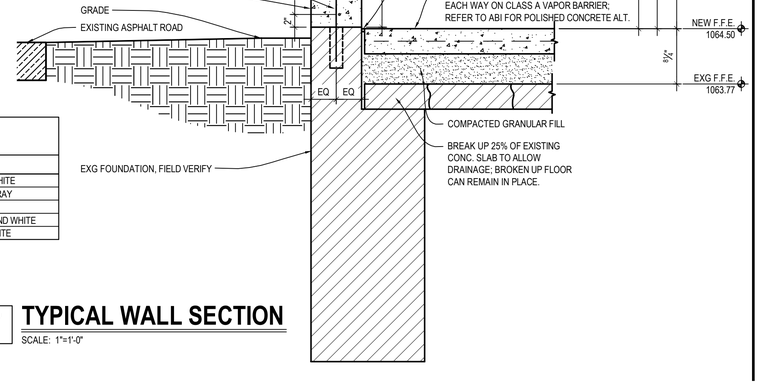
SCALE: 1/8"=1'-0"

GENERAL DOOR NOTES

1. PROVIDE SAFETY GLAZING OR FIRE-PROTECTION-RATED GLAZING IN LOCATIONS REQUIRED BY CURRENT LOCAL CODE. NOTIFY ARCHITECT OF CHANGES REQUIRED TO THE DRAWINGS. PROVIDE OBSCURE GLAZING AS INDICATED.
2. PROVIDE AND INSTALL SAFETY GLAZING IN LOCATIONS AS PER SECTION 2406 OF THE 2006 INTERNATIONAL BUILDING CODE.
3. ALL DIMENSIONS ARE NOMINAL, ACTUAL DIMENSIONS TO BE PROVIDED BY SUPPLIER W/ ADJUSTMENTS MADE FOR INSTALLATION TOLERANCES REQUIRED. VERIFY ALL EXISTING OPENINGS PRIOR TO ORDER OF ALL NEW DOORS AND DOOR FRAMES.
4. SEE FLOOR PLANS FOR ACTUAL DIRECTION OF DOOR SWING.
5. REFER TO WALL TYPE SCHEDULE FOR WALL THICKNESS TO DETERMINE THROAT DEPTHS OF HOLLOW METAL DOOR FRAMES.
6. ALL INTERIOR DOOR FRAMES BEGIN 4" FROM FINISH FACE OF THE ADJACENT GPDW WALLS, UNLESS OTHERWISE NOTED.
7. ALL DOOR AND FRAME FINISH SHALL BE CHOSEN AND COORDINATED WITH OWNER.

BUILDING PAINT SCHEDULE

LOCATION	MATERIAL	PAINT COLOR
EXTERIOR TRIM	WOOD	WE-OP-3L; COLOR BF 1541 - CAMP ASHLAND WHITE
EXTERIOR SIDING	WOOD	WE-OP-3L; COLOR BF 1542 - CAMP ASHLAND GRAY
INTERIOR WALLS	GYP. BD.	GI-OP-3LA; SEMI-GLOSS
INTERIOR TRIM	WOOD	WI-OP-3L; SEMI-GLOSS; BF 1541 - CAMP ASHLAND WHITE
DOORS & FRAMES	METAL	MI-OP-2L; COLOR BF 1541 - CAMP ASHLAND WHITE



7 TYPICAL WALL SECTION

SCALE: 1"=1'-0"

The Clark Enersen Partners
Architecture
Landscape Architecture
Engineering
Interiors
www.clarkenersen.com
Lincoln, Nebraska
1010 Lincoln Mall, Suite 200
Lincoln, NE 68508-2883
402 477.9291 Fax 402 477.6542
Kansas City, Missouri
Fairway, Kansas

? - #	SHEET HISTORY:	
ISSUED	06/03/2014	AS PER CONSTR. DOCUMENTS

NEARNG CATS Bldg 56
NEARNG Proj. 31090343

Nebraska Army National Guard
Ashland, NE

TCEP No.: 038-022-13

June 03, 2014

TIMOTHY A. RIPP A-3298 STATE OF NEBRASKA

Building 56
Proposed Drawings

A1.01

Plot Time Stamp: 6 / 26 / 2014 3:01:38 PM
File Location/Name: H:\038-022-13 NEARNG CATS Bldg 56 Sustain\3) Active Work\3) AutoCAD\038022-A1.01.dwg

SECTION 03 35 36 – POLISHED CONCRETE FLOOR SYSTEM

1. GENERAL

1.1 SECTION INCLUDES

A. Finishing slabs on grade and monolithic floor slabs.

B. Surface treatment with concrete hardener and sealer.

C. Grinding and polishing concrete floors.

D. Staining and curing of concrete floors.

1.2 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete For Polished Slabs: Prepared concrete floors ready to receive finish.

B. Section 079200 - Joint Sealants.

1.3 REFERENCE STANDARDS

A. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2005.

B. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (errata 2007).

C. ASTM C 309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2007.

D. ASTM C 494/C 494M - Standard Specification for Chemical Admixtures for Concrete; 2008.

E. ASTM E 1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 1996 (Reapproved 2008).

1.4 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on concrete hardener, sealer, and concrete stain, including information on compatibility of different products and limitations.

C. Samples (Stain and Aggregate): Submit actual concrete sample of selected stain colors on concrete with the specified grind and aggregate.

D. Samples (Aggregate): Submit samples of aggregate size and color for selection.

E. Submit installer qualifications and references.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301.

B. Floor Finisher:

1. Installer Qualifications: An installer with five (5) years experience with work of similar scope and quality.
2. Installer/applicator shall be thoroughly trained and experienced in the use of concrete finishing equipment.

C. Obtain materials from same source throughout project.

D. Concrete slabs to be polished shall be cured a minimum of 28 days prior to the placement of equipment on the slab so as not to displace aggregate.

E. Areas to receive concrete polish and stain shall be closed to traffic during finishing operation, including application of sealer coat.

1.6 MOCK-UP

A. Construct mock-up area of each type of polished concrete under conditions similar to those that will exist during actual placement, 4'-0" feet long by 4'-0" feet wide, with coatings applied.

1. Mock-up shall include control joints and construction joints.
2. Mock-up shall include aggregate to be used throughout project.
3. Mock-up shall include stain to be used throughout project.

B. Mock-up shall be produced by the same skilled workmen who will perform the work for the project.

C. Accepted field sample shall be the quality standard for the entire project.

D. Locate where directed.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer’s sealed packaging, including application instructions.

1.8 PROJECT CONDITIONS

A. Schedule placement of concrete stain to minimize exposure to wind and hot sun before curing materials are applied.

B. Maintain temperature and humidity range before, during and after placement of concrete stain as required by stain manufacturer.

C. Coordinate the work with concrete floor placement and concrete floor curing.

1.9 FIELD CONDITIONS

A. Maintain light level equivalent to minimum 200 W light source, placed 8 feet above the floor surface, for each 425 sq ft of floor being finished.

B. Maintain ambient temperature of 50 degrees F minimum.

C. Provide ventilation sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

2. PRODUCTS

2.1 MANUFACTURERS

A. Hardeners/Densifiers: Acceptable Manufacturers:

1. L. M. Scofield Co; Product: "Scofield Formula One Lithium Densifier". www.scofield.com.
2. Retroplate
3. Prosoco; Product Consolideck LS. www.prosoco.com.
4. Substitutions: See Section 016000 - Product Requirements.

B. Dyes: Acceptable Manufacturers:

1. Ameripolish
2. L.M. Scofield
3. Colors to be selected from manufacturers full range of colors.

C. Stain Inhibitors (Finish Coat):

1. Use product from same manufacturer as the hardener/densifier.

2.2 POLISHING EQUIPMENT

A. Grinding Machine: Floor grinding machine with 3-4 head with counter rotating variable speed and minimum 800 lbs. down pressure.

B. Duct Extraction System: System with pre-separator and squeegee attachments with minimum flow rate of 300 cu. ft/min.

C. Grinding Heads:

1. Metal bonded 16, 25, 40, 60, 80, 150 and 300 grits.
2. Resin bonded, phenolic diamonds, 100, 200, 400, 800, 1500 and 3000 grits.

D. Grinding Pads for Edges:

1. 40, 60, 100 and 200 grits.
2. 200, 400, 800, 1500 and 3000 grits.

E. Hand grinder with dust extraction equipment and pads.

3. EXECUTION

3.1 EXAMINATION

A. Verify that floor surfaces are acceptable to receive the work of this section.

B. Verify that floor flatness meets specified requirements.

3.2 FLOOR FINISHING

A. Refer to section 03 30 00 for slab finishing requirements.

3.3 POLISHED CONCRETE APPLICATION

A. Grind the concrete floor to within 2-3 inches of walls with 16, 25, 40, 60, 80 and/or 150 grit pad removing construction debris and floor slab imperfections to achieve a uniform scratch pattern and desired concrete aggregate exposure. See Schedule at the end of this section for different grades (amount of exposed aggregate) of floors.

B. Apply dye/stain as recommended by manufacturer to achieve desired color. Allow to dry per manufacturers recommendations.

C. After dye has dried, apply densifier at a rate of 300 square feet per gallon. Using a broom work the material into the floor for a minimum of 10 minutes. Squeegee the floor to remove any remaining material without leaving squeegee marks or puddles. Allow to cure for 12-24 hours.

D. Fill construction joints with approved filler per manufacturer's recommendations.

E. Apply densifier impregnator with a stiff, long bristled broom in the concentration and rate recommended by the manufacturer.

F. Grind the floor to within 2-3 inches of walls with metal bonded diamond grits of 150 and 300. Grind 90 degrees from each previous grind to remove all scratches from the previous grit. vacuum the floor thoroughly after each grind using a squeegee vacuum attachment.

G. Grind the edges with 40, 60, 120 and 220 grit grinding pads to remove all scratches from the previous grit. vacuum the floor thoroughly after each grind using a squeegee vacuum attachment. See Schedule at the end of this section for different grades (amount of exposed aggregate) of floors.

H. Polish the floor to desired sheen level with phenolic resin bonded diamond grits of 100, 400, 800, 1500 - first polishing the edges with pads of the same grit and then the field to remove all scratches from the previous grit. Clean the floor after each polishing operation using clean water and an auto scrubber or a mop and wet vacuum.

I. Polish with 1500-resin bond grind.

J. Apply stain inhibitor finish coat at rate recommended by manufacturer.

K. Use a high speed (2000-3000 rpm) burnishing machine and hogs hair burnishing pad to buff the surface to a high shine.

3.4 CURING

A. Allow slab to cure for 28 days.

3.5 TOLERANCES

A. Measure for F(F) and F(L) tolerances for floors in accordance with ASTM E 1155, within 48 hours after slab installation.

B. Finish concrete to achieve the following tolerances:

1. Exposed to View and Foot Traffic: Ff 50 and Fl 30.

C. Correct the slab surface if tolerances are less than specified.

D. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.6 CLEANING

A. Keep work area clean and free of debris at all times.

B. Remove slurry and dust from adjoining surfaces as necessary.

C. Dispose of material containers in accordance with state and local codes.

D. Protect finished work until fully cured per manufacturer's recommendations.

3.7 SCHEDULES

A. Cut and Shine Levels: See Section 03 30 00 Cast-In-Place Concrete for Polished Finish for concrete mix designs.

1. Cut Level (Depth of cut)

a. Grade 2 – "Salt and Pepper" exposure-gravel stones.

2. Sheen Level

a. Level 3 – 1500, High Gloss grit polish for all polished concrete floor.

3. Polished Concrete Stain Inhibitor (finish coat)

a. Apply two coats of stain inhibitor from the same manufacturer as the hardener/densifier.

1) L.M. Scofield Co.
2) Retroplate.
3) Prosoco.

b. Apply per manufacturer's instructions.

B. Dye Colors: To be chosen by Owner and Architect from manufacturer's full line of colors.

END OF SECTION 03 35 36

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes hollow-metal work.

B. Related Requirements:

1. Section 08 71 00 "Door Hardware" for door hardware for hollow-metal doors.

1.3 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.

B. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.

C. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

B. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ceco Door Products; an Assa Abloy Group company.
2. Curries Company; an Assa Abloy Group company.
3. Republic Doors and Frames.
4. Steelcraft; an Ingersoll-Rand company.
5. West Central Manufacturing
6. Or equal if and as specifically approved by Architect by Addendum during the bidding period.

B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 REGULATORY REQUIREMENTS

A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

B. Fire-Rated, Borrowed-Light Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

2.3 INTERIOR DOORS AND FRAMES

A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: SDI A250.8, Level 2. All interior locations.

1. Physical Performance: Level B according to SDI A250.4.
2. Doors:

    a. Type: As indicated in the Door and Frame Schedule.
    b. Thickness: 1-3/4 inches (44.5 mm).
    c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
    d. Edge Construction: Model 2, Seamless.
    e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.

3. Frames:

    a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
    b. Construction: Full profile welded.

4. Exposed Finish: Prime.

2.4 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3. All exterior locations.

1. Physical Performance: Level A according to SDI A250.4.

2. Doors:

a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches (44.5 mm.)
c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
d. Edge Construction: Model 2, Seamless.
e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
f. Core: Polyisocyanurate.

1) Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 2.1 deg F x h x sq. ft./Btu (0.370 K x sq. m/W) when tested according to ASTM C 1363.

3. Frames:

a. Materials: Metallic-coated steel sheet, minimum thickness of 0.067 inch (1.3 mm), with minimum A40 (ZF120) coating.
b. Construction: Full profile welded.

4. Exposed Finish: Factory.

2.5 FRAME ANCHORS

A. Jamb Anchors:
1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
2. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.6 MATERIALS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

D. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

E. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

F. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

G. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

H. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.

I. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

J. Glazing: Comply with requirements of manufacturer.

K. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.7 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:

1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch (0.66 mm), steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches (152 mm) apart. Spot weld to face sheets no more than 5 inches (127 mm) o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
2. Fire Door Cores: As required to provide fire-protection ratings indicated.
3. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches (3.2 mm in 51 mm).

4. Top Edge Closures: Close top edges of doors with inverted closures, except provide flush closures at exterior doors of same material as face sheets.
5. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
6. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
7. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch (19 mm) beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
1. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
2. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
3. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:

        1) Three anchors per jamb up to 60 inches (1524 mm) high.
        2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
        3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
        4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.

    b. Compression Type: Not less than two anchors in each frame.

4. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

    a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
3. Provide loose stops and moldings on inside of hollow-metal work.
4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.8 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.9 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

    a. At fire-rated openings, install frames according to NFPA 80.
    b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    c. Install frames with removable stops located on secure side of opening.
    d. Install door silencers in frames before grouting.
    e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

    a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. Grout jamb members full.
4. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
5. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Steel Doors:

a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
c. At Bottom of Door: [**3/4 inch (19.1 mm)**] [**5/8 inch (15.8 mm)**] plus or minus 1/32 inch (0.8 mm).
d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.

D. Glazing: Comply with hollow-metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

E. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.

F. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 08 11 13

SECTION 08 33 30 – SECURITY GRILLES

1. GENERAL

1.1 SECTION INCLUDES

A. Upcoiling Security Grilles, manually operated.

1.2 RELATED SECTIONS

A. Section 06 20 13 – Interior Finish Carpentry: Wood jamb and head trim.

B. Section 08 71 00 – Door Hardware: Product Requirements for cylinder core and keys.

1.3 REFERENCES

A. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

B. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

C. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.4 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

B. Shop Drawings: Include detailed plans, elevations, details of framing members, required clearances, anchors, and accessories. Include relationship with adjacent materials

C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

D. Verification Samples: For each finish product specified, two samples, representing actual product, color, and patterns.

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

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.

B. Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.

C. Store materials in a dry, warm, ventilated weathertight location.

1.7 COORDINATION

A. Coordinate Work with other operations and installation of adjacent finish materials to avoid damage to installed materials.

2. PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: info@overheaddoor.com.

B. Acceptable Manufacturers:

1. Clopay Building Products.
2. Cookson Company.
3. McKeon Rolling Steel Door Company, Inc.
4. Raynor.
5. Wayne-Dalton Corp.

2.2 UPCOILING SECURITY GRILLES

A. Overhead Coiling Aluminum Grilles: Overhead Door Corporation Model 670 with an Automatic Release for power operated doors.

1. Curtain: Horizontal 5/16 inch (7.8 mm) diameter rods with network of vertically interlocking links to form a pattern. Bottom bar extruded aluminum tubular shape.

a. Material: Aluminum.
b. Vertical Rod Spacing:

1) 2 inches (51 mm) on center.

c. Pattern:

1) Straight lattice; horizontal spacing 3 inches (76 mm) on center.

2. Finish: Aluminum mill finish:
3. Bottom Bar: Tubular extruded aluminum, mill finish.
4. Guides:

a. Extruded aluminum shapes with retainer grooves and continuous silicone treated wool-pile strips or PVC inserts to reduce noise and assist operation.
b. Guides face mounted on adjacent construction.

5. Brackets: Minimum 3/16 inch (4.8 mm) steel to support barrel, counterbalance and hood as applicable.
6. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with maximum deflection of 0.03 inches per foot of span. Counterbalance adjustable by means of an adjusting tension wheel.
7. Hood: Aluminum, mill finish with intermediate supports as required.

a. Locking: Key on both sides at base of unit.

3. EXECUTION

3.1 EXAMINATION

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

B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

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

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

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

E. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 079200.

F. Install perimeter trim and closures.

3.4 ADJUSTING

A. Test security grilles for proper operation and adjust as necessary to provide proper operation without binding or distortion.

B. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.

B. Remove labels and visible markings.

C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

A. Protect installed products until completion of project.

END OF SECTION 08 33 30

SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Mechanical door hardware for the following:

a. Swinging doors.

2. Cylinders for door hardware specified in other Sections.

B. Related Sections:

1. Section 08 11 13 "Hollow Metal Doors and Frames" for installation of door hardware, including cylinders.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Details of electrified door hardware, indicating the following:

1. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.

C. Other Action Submittals:

1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
b. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
c. Content: Include the following information:

1) Identification number, location, hand, fire rating, size, and material of each door and frame.
2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.
5) Fastenings and other pertinent information.
6) Explanation of abbreviations, symbols, and codes contained in schedule.
7) Mounting locations for door hardware.
8) List of related door devices specified in other Sections for each door and frame.

2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For electrified door hardware, from the manufacturer.

1. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.

B. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

C. Warranty: Special warranty specified in this Section.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of door hardware from a single manufacturer.

B. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

C. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22.2 N).
2. Comply with the following maximum opening-force requirements:

    a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
    b. Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
    c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

C. Deliver keys and permanent cores to Owner.

1.8 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of doors and door hardware.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.

a. Electromagnetic and Delayed-Egress Locks: Five years from date of Substantial Completion.
b. Exit Devices: Two years from date of Substantial Completion.
c. Manual Closers: 10 years from date of Substantial Completion.
d. Concealed Floor Closers: Five years from date of Substantial Completion.

1.10 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.

2. **Provide dust boxes for all doors compatible with scheduled hardware, whether scheduled or not**.

2.2 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
2. Fire-Rated Applications:

    a. Wood or Machine Screws: For the following:

        1) Hinges mortised to doors or frames
        2) Strike plates to frames.
        3) Closers to doors and frames.

    b. Steel Through Bolts: For the following unless door blocking is provided:

        1) Surface hinges to doors.
        2) Closers to doors and frames.
        3) Surface-mounted exit devices.

3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
5. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.3 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

B. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as directed by Owner.

2. Furnish permanent cores to Owner for installation.

E. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated,. Verify location with Architect.

F. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."

G. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

H. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

I. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

J. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.5 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Section 01 79 00 "Demonstration and Training."

3.7 DOOR HARDWARE SCHEDULE

1. MK - McKinney
2. RF - Rixson
3. BE - Stanley Security Solutions Inc
4. RO - Rockwood
5. SA - Sargent
6. PE - Pemko

Hardware Schedule

Set: HW-1.0

Doors: 101.1
Description: Interior Doubling Hollow Metal Door

1	Floor Closer	626 PH 40A 90		RF
2	Push Plates	70C 4x16	US32D	RO
2	Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO

Set: HW-2.0

Doors: 102
Description:

3	Hinge	TA2714 NRP 4-1/2" x 4-1/2"	US26D	MK
1	Mortise Lock (Classroom)	47H7R 15H	626	BE
1	Wall Stop	409	US32D	RO

Set: HW-3.0

Doors: 101, 103, 104

Description: Exterior Hollow Metal Door

1	Continuous Hinge	MCK-14HD 83"	CL	MK
1	Mortise Lock (Deadbolt)	47H7T 15H	626	BE
1	Closer	281 CPSH	EN	SA
1	Kick plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1	Threshold	171A		PE
1	Gasketing	294AV TKSP8		PE
1	Sweep	345CNB		PE

APPROVED MANUFACTURERS:

Hinges	McKinney, Hager, Stanley
Locks	Best (No Sub – to match owners keying system)
Closers	Sargent, Norton, Corbin Russwin
Floor Closers	Rixson, Dorma
Flatware & Stops	Rockwood, Hiawatha, Ives
Threshold & Weatherstrip	Pemko, Reese, Zero

END OF SECTION 08 71 00

SECTION 27 00 00 – TELECOMMUNICATIONS CABLE PLANT

1. GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification sections, apply to work of this Section.

B. Division 26 05 01 “Basic Materials and Methods” sections apply to work specified in this Section.

1.2 DESCRIPTION OF WORK

A. This document describes the products and execution requirements of the installation, labeling, and testing of a structured cabling system.

B. Quantities, types of cabling, telecommunications outlets, outlet locations and routing of cabling are provided within the construction documents of the telecommunications drawings package.

C. Route horizontal cabling through furnished pathways by others and contractor provided cable supports.

D. Furnish cabling, faceplates, mounting brackets, telecommunications outlet/connectors as indicated on system layout drawings and this specification.

1.3 QUALITY ASSURANCE

A. All cable and equipment shall be installed in a neat and workmanlike manner.

B. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the Owner and Owner’s representative’s.

C. Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based upon the acceptable manufacturers listed.

D. Strictly adhere to all Category 3, Category 5E, Category 6, and Optical Fiber (BICSI and TIA) installation practices when installing all cabling.

E. Installer shall conform in every way to the rules and requirements of the National Fire Protection Association, the local Electrical Code and with detailed manufacturer’s instruction sheets, applicable codes and standards.

F. This document does not replace any code, either partially or wholly. The contractor must be aware of all codes that impact this project.

G. Material and work specified herein shall comply with the applicable requirements of:

1. NFPA 70: National Electrical Code
2. NEC 250: Grounding and Bonding
3. NEC 300: Wiring Methods
4. NEC 725: Remote-Control, Signaling and Power Limited Circuits
5. NEC 770: Optical Fiber Cables and Raceways
6. NEC 800: Communications Circuits
7. ANSI-J-STD-607A, Commercial Building Grounding and Bonding Requirements for Telecommunications
8. ANSI/TIA/EIA – 569-B Commercial Building Standard for Telecommunications Pathway and Spaces
9. ANSI/TIA/EIA – 568-B.1, Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements, 2001
10. ANSI/TIA/EIA – 568-B.2, Commercial Building Telecommunications Cabling Standard (and all published addenda), Part 2: Balanced Twisted Pair Cabling Components, 2001
11. ANSI/TIA/EIA – 568-B.21, Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components, Addendum 1: Transmission Performance Specifications for 4-pair 100 Ohm Category 6 Cabling, 2002
12. ANSI/TIA/EIA – 568-B.3, Optical Fiber Cabling Components Standard, 2000
13. ANSI/TIA/EIA – 606-A, Administration Standard of Commercial Telecommunications Infrastructure, 2002
14. Federal Communications Commission (FCC), Code of Federal Regulations, Part 68: Connection of Terminal Equipment to the Telephone Network, 1998
15. U.S. Public Law 336, 101st Congress, ADA: Americans with Disabilities Act of 1992
16. BICSI Telecommunications Distribution Methods Manual
17. BICSI Information Transport Systems Installation Manual

1.4 INSTALLERS

A. Installer Qualifications: Minimum of 2 years experience installing products specified within this section.

B. All work shall be performed and supervised by managers and technicians qualified and certified to install and test the specified system.

1.5 MANUFACTURERS

A. Where other acceptable manufacturers are allowed, equipment shall be equivalent in every way to that of the equipment specified and subject to approval. This is the contractor's responsibility and will be verified upon shop drawing review. If the submitted documents of the shop drawings do not meet or exceed the performance levels of the specified equipment, the contractor will be required to provide a system that is.

1.6 WARRANTY

A. The systems products shall be warranted free of defects in material and workmanship.

B. The systems products shall be warranted to perform the intended function within the design limits.

C. This system shall be in compliance with the manufacturer's performance warranty status at completion of the project and receive verification of the warranty in writing from the manufacturer. This shall be included in the O&M manuals for the Owners records.

1.7 SUBMITTALS

A. Contractor shall submit copies of the certification of the company and staff members that will be performing the installation, terminations and testing of the system to provide compliance of this specification.

B. Contractor shall submit manufacturers cut sheets for all products, hardware and cabling specified within this document.

2. PRODUCTS

2.1 Connecting Blocks

A. Physical and Performance Characteristics:

1. Category 5e – 110 termination blocks shall meet or exceed Category 5e transmission requirements for connection hardware, as specified in ANSI/TIA/EIA-568-B.2.
2. Category 5e – 110 termination shall be UL LISTED 1863.
3. Category 5e – 110 termination shall exceed IEEE 802.3af DTE Power specification to 4 times the rated current limits with no degradation of performance or materials.
4. Category 5e – 110 termination shall be error free Gigabit Ethernet performance to IEEE 802.3ab.
5. Category 5e – 110 termination shall meet or exceed the 4-connector channel performance requirements of Category 5e, per the ANSI/TIA/EIA-568-B.2.
6. FCC Part 15, Electro-magnetic compatibility, Code of Federal Regulations: Title 47 – Telecommunications.
7. FCC Part 68, Connection of Terminal Equipment to the Telephone Network, Code of Federal Regulations: Title 47 – Telecommunications
8. Blocks shall be available in 100 or 300 pair sizes, with or without stand-off legs.
9. Blocks shall be constructed of two basic components, the Wiring Blocks and the Connecting Blocks.
10. Connecting Blocks shall be available in 3, 4 or 5 pair configurations.
11. Blocks shall be available as kits that include the wiring blocks, the proper number of connecting blocks and label strips.
12. Blocks shall be constructed of a UL94 V0 rated polycarbonate blend.

13. Connecting block IDC contacts shall be a spring temper phosphor bronze (alloy CA510), 0.032 in (0.813 mm), w/100 μin minimum solder plate (60% tin/40% lead) at contact point
14. Connecting block shall connect to the wiring block with a locking force of 35 lbs. (16 kg) minimum.
15. Connecting Blocks shall accept 22-26 (0.4-0.65mm) solid copper conductors and 22-26 (0.4-0.65mm) seven-stranded copper conductors.
16. Connecting blocks shall accept conductors with insulation O.D. of .050 in (1.27 mm) maximum (top side) and .070 in (1.78 mm) maximum (bottom side).
17. Connecting blocks shall accept a minimum of 200 re-terminations (top side) without degradation to the electrical or mechanical performance.
18. Blocks shall operate properly in an environment maintained between 14° F and 140 ° F and a humidity of 95% non-condensing.

2.2 Category 6 Patch Panels

A. Physical Characteristics

1. Panels shall be made of black anodized aluminum in 24-, 48 and 96-port configurations as indicated on the drawings.
2. Panels shall accommodate 24 ports for each rack mount space (1rms = 44.5 mm [1.75 in.]).
3. Panels shall be manufactured with a rolled-edge at the top and bottom for stiffness.
4. Panels shall be made of 8-port adapters modules removable by detaching two screws.
5. Panels shall have modular jacks employing staggered array contacts with a flat “hairpin” design made of Beryllium copper with a minimum 50-micro-inch gold plating on contact surfaces over 50-100 micro-inch of nickel compliant with FCC part 68.
6. Panels shall be available in a T568B wiring scheme. (coordinate with Owner)
7. Panels shall be equipped with 110-style termination made of fire retardant UL 94V0 rated thermoplastic and tin lead solder plated IDC contacts.
8. Panel circuit boards shall be fully enclosed front and rear for physical protection.
9. Panels shall have port identification numbers on both the front and rear of the panel.
10. Panels shall have optional rear cable support bar for strain relief.
11. Panels shall have self adhesive, clear label holders and white designation labels provided with the panel for each row of 24 ports.
12. Panels shall provide wiring identification & color code and maintain a paired punch down sequence that does not require the overlapping of cable pairs.
13. Panels shall terminate 22-26AWG solid conductors, maximum insulated conductor outside diameter 0.05”.

B. Performance Characteristics

1. Panels shall be ANSI/TIA/EIA-568-B.2-1 and ISO/IEC 11801 minimum category 6 compliant.
2. All transmission performance parameters shall be independently verified by a UL or ETL third party testing organization.
3. Panels shall be third party verified, error free Gigabit Ethernet performance to IEEE 802.3ab.
4. Panels shall be UL Listed 1863 and CSA certified.
5. Panels shall be made by an ISO 9002 Certified Manufacturer.

2.3 Patch Panels – Optical Fiber

A. Rack Mount Panels

1. Panels shall be constructed of cold rolled 16 ga. steel with a black powder paint finish and provide for fully enclosed fiber patching and termination.
2. Panels shall have a removable smoked Plexiglas front cover with optional lock kit. The panel shall have a removable rear cover. Panels shall come with rack mounting brackets that allow it to be mounted with the front cover flush with the front of the rack, or with the front of the panel extended 5.0” in front of the rack.
3. Panels shall be available in a 2 rack space, 36 port version accepting 6 six-pack standard adapter plates or a 2 rack-space 72 port version accepting 6 twelve-pack high density adapter plates.
4. Six and twelve pack adapter plates shall be available with SC multimode adapters. SC adapters shall have a phosphor bronze alignment sleeve. Provide adapters as indicated on the drawings.
5. Panel shall have a splice tray mounting stud incorporated into the base for mounting of mechanical or fusion splice trays. Adapter tray shall have cable management anchor points and come with cable anchors allowing for the maintenance of the incoming cable with the proper minimum bend radius.
6. Panels shall have 2 cable entrance ports on the top and 2 on the bottom with plastic dust covers. Panels shall have two jumper ports in the bottom at the front of the panel with plastic dust covers for routing of jumpers.

2.4 Category 6 Channel Compliant Jacks – UTP

A. Physical Characteristics

1. Jacks shall be 8 position un-keyed
2. Each jack shall be an individually constructed unit and shall snap mount in an industry standard keystone opening (.760” x 580”)
3. Jack housings shall be high impact 94 V0 rated thermoplastic.
4. Jacks shall have a temperature rating of -10 °C (14°F) to 60°C (140 °F) in conformance with ANSI/TIA/EIA-568-A
5. Jacks shall utilize a 6 layer printed circuit board to control NEXT
6. Jack housings shall fully encase and protect printed circuit boards and IDC fields.
7. Contacts will maintain a minimum vertical deflection force of 100 grams.
8. Modular jack contacts shall be formed flat for increased surface contact with mated plugs. These contacts shall be arranged on the PC board to provide a tri-plane contact array to maximize contact spacing and minimize crosstalk.
9. Modular jack contacts shall be constructed of Beryllium copper for maximum spring force and resilience.
10. Contact Plating shall be a minimum of 50 micro inches of gold in the contact area over 50 micro-inch of nickel, compliant with FCC part 68.5.
11. Jack termination shall be industry standard 110 insulation displacement contact, integral to the jack housing, laid out in 2 parallel arrays of 4 contacts.
12. Jacks shall utilize a paired punch down sequence. Cable pairs shall be maintained up to the IDC, terminating all conductors adjacent to its pair mate to better maintain pair characteristics designed by the cable manufacturer.

13. Jacks shall utilize tin lead plated (60% tin/40% lead) phosphor bronze 110 insulation displacement contacts.
14. Jacks shall terminate 22-26 AWG stranded or solid conductors.
15. Jacks shall terminate insulated conductors with outside diameters up to 0.05".
16. Jacks shall be compatible with single conductor 110 impact termination tools.
17. Jacks shall be compatible with EIA/TIA 606 color code labeling and accept snap on icons for identification or designation of applications.
18. Jacks shall be available in 10 colors for identification or designation of applications at the workstation or closet.
19. Jacks shall be marked as T568B wiring (coordinate with Owner)
20. Jacks shall have an attached color coded wiring instruction label.
21. Jacks shall be supplied with installed dust covers to protect the jack opening and internal elements during installation until the jack is in use.

B. Performance Characteristics

1. Jacks shall be designed for 100 Ohm UTP cable termination
2. Jacks shall be UL LISTED 1863 and CSA certified.
3. Jacks shall exceed IEEE 802.3af DTE Power specification to 4 times the rated current limits with no degradation of performance or materials.
4. Jacks shall meet or exceed Category 6 transmission requirements for connection hardware, as specified in ANSI/TIA/EIA-568-B.2-1, Transmission Performance Specifications for 4-Pair 100 ohm Category 6 cabling.
5. Jacks shall be made by an ISO 9002 Certified Manufacturer.

3. EXECUTION

3.1 Installation

A. 110 Connecting Blocks

1. Blocks shall be installed to provide minimal signal impairment by preserving wire pair twists as closely as possible to the point of mechanical termination. The amount of untwisting in a pair as a result of termination to the 110 block shall be no greater than 0.5 inches (13 mm). The cable jacket of each cable shall be maintained as close to the point of termination as possible and only stripped back as far as is required for proper termination.
2. Blocks shall be installed according to manufacturer's instructions and properly mounted on the wall or within the relay rack.
3. Blocks shall be installed such that cables terminated to the blocks maintain a minimum bend radius of at least 4 times the cable diameter. Cables shall be terminated on the blocks such that there is no tension on the conductors in the termination contacts.
4. Blocks shall be properly labeled with the cable number for each termination position.

B. Racks

1. Racks shall be assembled such that mounting rails are exactly perpendicular to the base.
2. Racks shall be secured to the floor using appropriate anchors.

3. Racks shall be grounded to the TMGB or TGB or appropriate building ground using a minimum #6 stranded, insulated grounding wire.
4. Racks shall be installed per the requirements specified by the manufacturer's installation guidelines.

C. Patch Panels – UTP

1. Panels shall be installed to provide minimal signal impairment by preserving wire pair twists as closely as possible to the point of mechanical termination. The amount of untwisting in a pair as a result of termination to the patch panel shall be no greater than 0.5 inches (13 mm)
2. Panels shall be installed according to manufacturer's instructions and properly mounted to a rack, cabinet, bracket or other appropriate mounting device.
3. Panels shall be installed such that cables terminated to the panel can maintain minimum bend radius of at least 4 times the cable diameter into the IDC contacts. Cables shall be terminated on the panels such that there is no tension on the conductors in the termination contacts.
4. Panels shall be properly labeled on front and back with the cable number and port connections for each port.

D. Patch Panels – Optical Fiber

1. Panel shall be installed according to manufacturer's instructions.
2. Adhesive or snap-in routing clips shall be secured to the inside of the adapter tray in such a fashion as to allow the maintenance of the minimum bend radius if the cable and the proper storage of at least 2 m of fiber cable inside the tray.
3. Incoming cable shall be properly anchored as it enters the rear or bottom of the tray. Anchor shall be attached to the cable jacket without excessive force and without crushing the cable jacket.

E. Category 6 channel compliant Jacks – UTP

1. Jacks shall be installed to provide minimal signal impairment by preserving wire pair twists as closely as possible to the point of mechanical termination. The amount of untwisting in a pair as a result of termination to the jack shall be no greater than 0.5 inches (13 mm)
2. Jacks shall be installed according to manufacturer's instructions and properly mounted in plates, frames, housings or other appropriate mounting device.
3. Jacks shall be installed such that cables terminated to the jacks maintain minimum bend radius of at least 4 times the cable diameter into the IDC contacts. Cables shall be terminated on jacks such that there is no tension on the conductors in the termination contacts.

F. Cable

1. All cables are to be supported by means secured to the building structure, either by conduit, cable tray or J-hooks. In some instances cables can be secured directly to the building structure by approved means. Cables are to be routed and run as high as possible; no cables are to be run on top of lay in ceilings. All cables routed below accessible floor system shall be neatly trained using appropriate supports.
2. Do not exceed the manufacturer's recommended pulling tension or minimum bend radius.
3. Avoid walking, stepping on or compressing cables in any way. Installed cable jacks shall have no abrasions with exposed conductor insulation or bare copper. The installer is responsible to replace damaged cables at no cost to the owner.
4. Do not over-tighten cable ties. Do not use staples, clamps or zip ties to anchor cables.
5. Use D-Rings, J-hooks, Velcro straps, Conduit, or Cable Tray for cable management. With the use of D-rings, J-hooks or Velcro, cable runs shall be supported every 4 to 5 feet. The manufacturer's specifications for cable loading shall be followed. For Velcro, ensure the minimum overlap on the strap meets the manufacturer requirement, 2" minimum unless manufacturer is greater. If Velcro straps are utilized in a plenum air space, the Velcro strap shall be rated as such. The preferred Velcro strap is of hook & loop type.
6. Do not route cables near heat sources and maintain a minimum spacing between cables and sources of EMI: power cables shall be a minimum of 6", florescent lights shall maintain a minimum of 12" and transformers or electrical enclosures shall be a minimum of 36".
7. Installed cable bend radius shall be greater than 4 times the cable diameter. Avoid kinking or twisting the cable during installation.

G. Labeling

1. The contractor will only use adhesive computer generated labels for labeling cables, station panels, wallplates, 110 blocks, and fiber optic enclosures.
2. Wallplate labeling will identify the TC or MC wiring closet and the type of cable (voice or data) and a unique three digit identifier. All cables that are voice will be labeled with the letter (V1) and all cables that are data will be labeled with a (D1) if there are more than one voice or data cables the second cable will be label with (D2) or (V2) or (D3) for the third data cable. The wallplate will look like V1-02-001 for the 1st voice cable in the wallplate wired from closet number 02 with a unique identifier or 001.
3. This labeling scheme shall be discussed with the owner to ensure acceptability prior to any work being completed.
4. This label will appear on the wallplate, patch panel, 110 block, the cable on both ends 5 to 10 inches from it's termination point, test result, and on the CAD drawing.
5. All labels will be easy to read so you can easily locate cables, cross connect equipment and move wallplate locations in the future.
6. All fiber and backbone cable will be labeled in the same manner, so you can locate each wiring closet from the label on the panel or block.
7. When job is complete, all test results will be checked back to the CAD drawings to make sure all labels are correct.

H. Grounding and Bonding

1. The facility shall be equipped with a Telecommunications Bonding Backbone (TBB). This backbone shall be used to ground all telecommunications cable shields, equipment, racks, cabinets, raceways and other associated hardware that has potential to act as a current carrying conductor. The TBB shall be installed in accordance with the recommendations contained in the ANSI/TIA/EIA-607 Telecommunications Bonding and Grounding Standard. Coordinate all work with the electrical contractor to ensure the grounding and bonding is installed in accordance.
2. The main entrance facility/equipment room in the building shall be equipped with a Telecommunications Main Grounding Bus Bar (TMGB). Each telecommunications room shall be provided with a telecommunications ground bus bar (TGB). The TMGB shall be connected to the building electrical entrance grounding facility. The intent of this system is to provide a grounding system that is equal in potential to the building electrical ground system. Therefore, ground loop current potential is minimized between telecommunications equipment and the electrical system to which it is attached. Coordinate all work with the electrical contractor to ensure the grounding and bonding is installed in accordance.
3. All racks, metallic backboards, cable sheaths, splice cases, cable trays, etc. entering or residing in the TR or ER shall be grounded to the respective TGB or TMGB using a minimum #6 AWG stranded copper bonding conductor and compression connectors. Coordinate all work with the electrical contractor to ensure the grounding and bonding is installed in accordance.
4. Coordinate locations of all grounding bus bars with all other trades and the owner.

I. Firestop

1. A firestop system is comprised of the item or items penetrating the fire rated structure, the opening in the structure and the materials and assembly of the materials used to seal the penetrated structure. Firestop systems comprise an effective block for fire, smoke, heat, vapor and pressurized water stream.
2. All penetrations trough fire-rated building structures (walls and floors) shall be sealed with an appropriate firestop system. This requirement applies to through penetrations (complete penetration) and membrane penetrations (through one side of a hollow fire rated structure). Any penetration item i.e., riser slots and sleeves, cables, conduit, cable tray, and raceways, etc. shall be properly firestopped.
3. Firestop systems shall be UL classified to ASTM E814 (UL 1479) and shall be approved by the AHJ in the state where the work is to be preformed.

3.2 Testing

A. 110 Connecting Blocks

1. Blocks shall be tested after horizontal or backbone cabling has been installed and terminated at both ends.
2. Blocks shall be tested as part of the link or channel. Link or Channels shall be tested for Length, DC continuity, NEXT, PSNEXT, Attenuation, Return Loss, ELFEXT, and PSELFEXT using a level IIe or level III tester for category 5e channel compliance.

3. Testers shall be correctly set to test the type and manufacturer of the horizontal cable used in the link or channel being tested, including the correct NVP.
4. A “PASS” indication shall be obtained for all link or channel tests.

B. Patch Panels – UTP

1. Patch Panels shall be tested after horizontal cabling has been installed and terminated to both the panel and the work area outlet.
2. Panels shall be tested as part of the link or channel for Length, DC continuity, NEXT, PSNEXT, Attenuation, Return Loss, ELFEXT, and PSELFEXT using a level IIe tester for enhanced category 5e, and a level III tester for category 6 channels.
3. Testers shall be correctly set to test the type and manufacturer of the horizontal cable used in the link or channel being tested, including the correct NVP.
4. A “PASS” indication shall be obtained for all link or channel tests when tested using the appropriate level tester for the appropriate category.

C. Category 6 channel compliant Jacks – UTP

1. Jacks shall be tested as part of horizontal cabling system.
2. Jacks shall be tested as part of the channel for Length, DC continuity, NEXT, PSNEXT, Attenuation, Return Loss, ELFEXT, and PSELFEXT using the specified hardware manufacturer's test heads and an industry standard level III tester.
3. Testers shall be correctly set to test the type and manufacturer of the horizontal cable used in the channel being tested, including the correct NVP.
4. A “PASS” indication shall be obtained for all channel tests when tested using the appropriate level tester for the appropriate category.

D. Backbone Fiber Testing

1. Fiber horizontal cables shall be 100% tested for insertion loss and length.
2. Insertion loss shall be tested at 850nm and 1300nm for 50/125um and 62.5/125um multimode cabling in at least one direction using the method B (1-jumper) test procedure as specified in ANSI/TIA/EIT-526-14A.
3. Insertion loss shall be tested at 1300 and 1550 for singlemode cabling in at least one direction using the method A.1 (1-jumper) test procedure as specified in ANSI/TIA/EIT-526-7.
4. Length shall be tested using an OTDR, optical length test measurement device or sequential cable measurement markings.

END OF SECTION 27 00 00