CITY OF NEWTON, MASSACHUSETTS
PURCHASING DEPARTMENT
purchasing@newtonma.gov
Fax (617) 796-1227

January 29, 2024

ADDENDUM #4
INVITATION FOR BID #24-39

MAIN LIBRARY HVAC SYSTEM IMPROVEMENTS

Bidders are hereby informed that Plans and Specifications for the above-mentioned project are modified, corrected and/or supplemented as follows, and that Addendum No. 4 consists of ITEMS NUMBERED 1 thru 3 below and is hereby deemed a part of the Contract Documents.

PROJECT MANUAL

ITEM NO.: 1 TABLE OF CONTENTS

CHANGE: **ADD** the following specification sections to the Table of Contents and Project Manual. The specification sections are attached to this Addendum.

- Section 017329 Cutting and Patching.
- Section 024119 Selective Demolition.
- Section 051200 Structural Steel Framing.
- Section 054000 Light Gauge Metal Framing.
- Section 071000 Waterproofing, Dampproofing and Caulking.
- Section 078410 Through Penetration Fire Stopping.
- Section 092500 Gypsum Drywall.
- Statement of Special Inspections.

DESIGN DRAWINGS

ITEM NO.: 2 STRUCTURAL DESIGN DRAWINGS

CHANGE: **ADD** the following drawings to the Title Sheet (T-1) and the Design Drawings. The Drawings are attached to this Addendum.

- S-001 GENERAL NOTES
- S-002 TYPICAL DETAILS
- S-101 PARTIAL FRAMING PLAN & SECTION DETAILS

ITEM NO.: 3 MECHANICAL DESIGN DRAWINGS

CHANGE: **UPDATE** the following mechanical drawings in the Design Drawings as noted.

- M 3.01 MECHANICAL – SCHEDULES AND DETAILS

- Update the 'Plate & Frame Heat Exchanger Schedule' to note that the fluid on the source side of the heat exchanger (which would be the heat pump loop) shall be 35% PG while the fluid on the building loop shall be water.

All other terms and conditions of the IFB remain unchanged.

PLEASE ENSURE THAT YOU ACKNOWLEDGE ALL ADDENDA ON YOUR BID FORM. FAILURE TO ACKNOWLEDGE ALL ADDENDA COULD RESULT IN REJECTION OF YOUR BID AS NONRESPONSIVE.

Thank you.

Nicholas Read
Chief Procurement Officer

A GENERAL

A0 THE TERM "ENGINEER" OR "ARCHITECT" REFERS TO PRIME DESIGNER OF THE PROJECT - C.A. CROWLEY ENGINEERING, INC.

A1 STRUCTURAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE MASSACHUSETTS BUILDING CODE, NINTH EDITION AND THE INTERNATIONAL BUILDING CODE, 2015.

A2 VERIFY AND COORDINATE ALL NEW AND EXISTING DIMENSIONS RELATED TO THIS PROJECT.

A3 TYPICAL DETAILS AND NOTES SHOWN ON STRUCTURAL DRAWINGS SHALL BE APPLICABLE TO ALL PARTS OF THE STRUCTURAL WORK EXCEPT WHERE SPECIFICALLY REQUIRED OTHERWISE BY CONTRACT DOCUMENTS.

A4 DETAILS NOT SPECIFICALLY SHOWN SHALL BE TAKEN AS BEING SIMILAR TO THOSE SHOWN FOR THE MOST NEARLY SIMILAR CONDITION AS DETERMINED BY THE ARCHITECT.

A5 EXAMINE ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR VERIFICATION OF LOCATION AND DIMENSIONS OF CHASES, INSERTS, OPENINGS, SLEEVES, WASHES, DRIPS, REVEALS, DEPRESSIONS, AND OTHER PROJECT REQUIREMENTS NOT SHOWN ON STRUCTURAL DRAWINGS.

A6 THE BASE BUILDING STRUCTURE IS DESIGNED TO RESIST THE LOADS DESCRIBED IN GENERAL NOTES SECTION STRUCTURAL DESIGN LOAD IN THE COMPLETED CONDITION OF THE PROJECT. DURING CONSTRUCTION THE CONTRACTOR IS RESPONSIBLE TO VERIFY THE CAPACITY OF THE PARTIALLY COMPLETED STRUCTURE TO RESIST LOADS DUE TO TEMPORARY CONDITIONS, CONSTRUCTION EQUIPMENT, STORED MATERIALS, SHORING, ETC.

A7 OPENINGS IN SLABS AND WALLS LESS THAN 12" MAXIMUM DIMENSION ARE GENERALLY NOT SHOWN ON STRUCTURAL DRAWINGS BUT SHALL REMAIN SUBJECT TO THE TYPICAL DETAILS PROVIDED. OPENINGS SHOWN ON STRUCTURAL DRAWINGS SHALL NOT BE REVISED WITHOUT PRIOR WRITTEN APPROVAL OF THE ARCHITECT.

A8 THE CONTRACTOR SHALL SUBMIT COMPLETE SHOP DRAWINGS FOR ALL PARTS OF THE WORK, INCLUDING DESCRIPTION OF DEMOLITION, AND CONSTRUCTION METHODS AND SEQUENCING WHERE APPLICABLE. NO PERFORMANCE OF THE WORK INCLUDING, BUT NOT LIMITED TO, DEMOLITION OF EXISTING STRUCTURE, OR FABRICATION OR ERECTION OF NEW STRUCTURAL ELEMENTS, SHALL COMMENCE WITHOUT APPROVED REVIEW OF THE SHOP DRAWINGS BY THE ARCHITECT.

A9 IF IN THE COURSE OF EXECUTION OF THE STRUCTURAL WORK, ANY PORTION OF THE COMPLETED STRUCTURE DOES NOT MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AS DETERMINED BY THE ARCHITECT, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF REMEDIAL ACTION TO ENSURE THAT THE COMPLETED WORK IS IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. A DESCRIPTION OF THE NON-CONFORMING WORK SHALL BE SUBMITTED ALONG WITH THE PROPOSED REMEDIAL ACTION TO THE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.

A10 UNLESS OTHERWISE SPECIFICALLY STATED IN WRITING, MARK-UPS ON REVIEWED OR APPROVED SHOP DRAWINGS OR SIMILAR SUBMISSIONS ARE TO COMMUNICATE AND CONFIRM THE INTENT OF CONTRACT DOCUMENTS AND SHALL NOT BE CONSTRUED AS AUTHORIZING OR REQUESTING A CHANGE TO ANY CONTRACT PRICE. IF A FABRICATOR OR CONTRACTOR BELIEVES THAT A CHANGE TO ANY CONTRACT PRICE SHOULD BE MADE, A WRITTEN REQUEST SHALL BE SUBMITTED FOR A RECOMMENDATION BY THE ARCHITECT AND ACTION BY THE OWNER ALONG WITH A COST PROPOSAL FOR ANY PROPOSED CHANGE PRIOR TO FABRICATION OR INSTALLATION OF ANY ITEM FOR WHICH A CHANGE IN CONTRACT PRICE IS REQUESTED. ANY CLAIM FOR ADDITIONAL COMPENSATION FOR AN ITEM FABRICATED OR INSTALLED WITHOUT PRIOR WRITTEN APPROVAL OF A CHANGE IN CONTRACT PRICE FOR SUCH FABRICATION AND/OR INSTALLATION WILL NOT BE ALLOWED.

A11 INFORMATION REGARDING EXISTING CONSTRUCTION IS BASED UPON AVAILABLE CONSTRUCTION DOCUMENTS PREPARED BY THE ARCHITECT, WHICH MAY OR MAY NOT REFLECT ALL AS BUILT CONDITIONS. NOTIFY ARCHITECT OF ANY DISCREPANCIES DISCOVERED DURING THE COURSE OF CONSTRUCTION BEFORE PROCEEDING WITH WORK IN THE AREA.

B CONCRETE

B1 CONCRETE WORK SHALL CONFORM TO "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" (ACI 318-14), AND "SPECIFICATIONS FOR STRUCTURAL CONCRETE" (ACI 301-05).

B2 CONCRETE SHALL BE CONTROLLED CONCRETE, PROPORTIONED, MIXED, AND PLACED IN THE PRESENCE OF A REPRESENTATIVE OF AN APPROVED TESTING AGENCY.

B3 UNLESS NOTED OTHERWISE, CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH AND BE OF A TYPE AS FOLLOWS:

(A)	GENERAL CONCRETE, U.N.O.	3000 PSI (LIGHTWEIGHT)

B4 ALLOW ADEQUATE TIME FOR CONCRETE TO CURE AND DRY TO PROPERLY BEFORE APPLYING ALL FINISHES DIRECTLY ADHERED TO FINISHED CONRETE SURFACES.

C STRUCTURAL STEEL

C1 STANDARD PRACTICE FOR STEEL BUILDINGS & BRIDGES" (AISC 303-10); "SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS, INCLUDING SUPPLEMENT NO.1 DATED 2006" (AISC 341-10); AND "STRUCTURAL WELDING CODE - STEEL" (AWS D1.1-11).

C2 STRUCTURAL STEEL SHALL BE DETAILED IN ACCORDANCE WITH "DETAILING FOR STEEL CONSTRUCTION 2ND EDITION (2002)" AND, WHERE REQUIRED, DESIGNED IN ACCORDANCE WITH REFERENCED STANDARDS.

C3 STRUCTURAL STEEL SHALL BE NEW STEEL CONFORMING TO THE FOLLOWING:

(A)	UNLESS NOTED OTHERWISE	ASTM A992 OR A588 GRADE 50 (Fy = 50 KSI)
(B)	ANGLES, CHANNELS, PLATES, BASE PLATES, AND BARS	ASTM A36 (Fy = 36 KSI), UNO
(C)	SQUARE AND RECTANGLE HOLLOW STRUCTURAL SECTIONS (HSS)	ASTM A500, GRADE B (Fy = 46 KSI)
(D)	HIGH STRENGTH BOLTS	ASTM A325, UNO

C4 STEEL CONNECTIONS SHALL BE DESIGNED CONSIDERING THAT BOLTS WILL NOT SHARE LOAD IN COMBINATION WITH WELDS.

C5 BOLTED CONNECTIONS SHALL BE AS FOLLOWS:

(A)	MINIMUM BOLT DIAMETER : 3/4"; TWO BOLTS MINIMUM
(B)	STANDARD, OVERSIZED, OR HORIZONTAL SHORT-SLOTTED HOLES IN WEBS OF BEAMS
(C)	SHEAR CONNECTIONS FOR MOMENT-CONNECTED MEMBERS - FRICTION TYPE HIGH STRENGTH BOLTS IN SINGLE SHEAR
(D)	SHEAR CONNECTIONS FOR OTHER MEMBERS - SIMPLE SHEAR CONNECTIONS WITH EITHER FRICTION-TYPE HIGH STRENGTH BOLTS IN SINGLE SHEAR OR BEARING-TYPE HIGH STRENGTH BOLTS (THREADS INCLUDED IN SHEAR PLANE) IN SINGLE OR DOUBLE SHEAR
(E)	SIMPLE SHEAR CONNECTIONS SHALL BE CAPABLE OF END ROTATION PER AISC REQUIREMENTS FOR "UNRESTRAINED MEMBERS"

C6 WELDED CONNECTIONS SHALL BE MADE BY APPROVED CERTIFIED WELDERS USING FILLER METAL CONFORMING TO E70XX OR F7X-EXXX WITH LOW HYDROGEN.

C7 WELDS SHALL DEVELOP THE FULL STRENGTH OF THE MATERIALS BEING WELDED, UNLESS NOTED OTHERWISE, EXCEPT FILLET WELDS SHALL BE A MINIMUM OF 1/4".

C8 REACTIONS FOR STEEL BEAMS SHOWN ON PLAN ARE GIVEN IN WORKING STRESS LEVELS (ASD) UNLESS NOTED OTHERWISE.

C9 BEAM CONNECTIONS, UNLESS NOTED OTHERWISE, SHALL PROVIDE CONNECTION CAPACITY AS FOLLOWS, OR AS SHOWN ON THE PLANS:

(A)	NON-COMPOSITE BEAMS: SUPPORT A REACTION "R" EQUAL TO ½ THE TOTAL UNIFORM LOAD CAPACITY OF BEAM FOR A GIVEN SHAPE, SPAN, AND GRADE OF STEEL PER TABLE 3-6 "MAXIMUM TOTAL UNIFORM LOAD" OF THE AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION.
(B)	ADD TO "R" OR "Rc": WHEN LOADS OR REACTIONS OF MEMBERS SUPPORTED BY THE BEAM ARE NOT SYMMETRICALLY APPLIED TO THE BEAM, ADD THE PORTION OF THE SUPPORTED LOAD THAT IS IN EXCESS OF THE VALUE "R" OR "Rc" (AS DEFINED ABOVE). ALSO ADD THE VERTICAL COMPONENTS OF FORCES IN DIAGONAL BRACING MEMBERS FRAMING INTO THE BEAM.

C10 BEAM AND GIRDER SHEAR CONNECTIONS TO COLUMNS SHALL CONSIST OF ONLY SIMPLE SHEAR CONNECTIONS CAPABLE OF END ROTATION PER AISC REQUIREMENTS. UNLESS DETAILED OTHERWISE ON THE DRAWINGS, ANY CONNECTION TO COLUMNS THAT ARE NOT CAPABLE OF END ROTATION SHALL BE DESIGNED SO THAT NO MOMENT RESULTS ABOUT THE COLUMN CENTERLINE. ANY MOMENT DEVELOPED DUE TO THE ECCENTRICITY OF THE CENTER OF GRAVITY OF THE CONNECTION GROUP ABOUT THE COLUMN CENTERLINE SHALL BE RESOLVED BY THE INCLUSION OF SUPPLEMENTAL BOLTS OR WELDS.

C11 PROVIDE STIFFENERS "FINISHED TO BEAR" UNDER ALL LOAD CONCENTRATIONS ON SUPPORTING MEMBERS, OVER COLUMNS, AND WHERE SHOWN ON DRAWINGS.

C12 STRUCTURAL STEEL IN CONTACT WITH OR ENCASED IN MASONRY SHALL BE COVERED WITH MASTIC COATING PER SPECIFICATIONS.

C13 STRUCTURAL STEEL MEMBERS SHALL BE FIREPROOFED PER SPECIFICATIONS.

C14 STRUCTURAL STEEL MEMBERS AND CONNECTIONS EXPOSED TO THE WEATHER SHALL BE GALVANIZED. REGIONS OF FIELD WELDS TO BE GALVANIZED SHALL BE TOUCHED UP WITH A ZINC RICH COATING AFTER COMPLETION AND INSPECTION OF THE WELD.

C15 BEAMS ARE NOT DESIGNED TO SUPPORT LATERAL LOADS AT THE BOTTOM FLANGE. BEAMS THAT ARE SUBJECTED TO OUT OF PLANE BENDING SHALL BE BRACED/SUPPORTED FOR SUCH FORCES, UNLESS SPECIFICALLY NOTED OTHERWISE. COORDINATE WITH RELATED TRADE FOR DESIGN FORCES AND SUBMIT FOR APPROVAL.

C16 STRUCTURAL STEEL FRAMING SHALL BE TRUE AND PLUMB BEFORE CONNECTIONS ARE FINALLY BOLTED OR WELDED.

C17 CANTILEVERS SHALL BE TEMPORARILY SHORED UNTIL MOMENT CONNECTION IS INSTALLED TO FULL STRENGTH.

C18 FIELD CUTTING OF STRUCTURAL STEEL OR ANY FIELD MODIFICATIONS OF STRUCTURAL STEEL SHALL NOT BE MADE WITHOUT PRIOR WRITTEN APPROVAL BY ARCHITECT FOR EACH SPECIFIC CASE.

C19 ALL BEAMS ARE TO BE LOCATED MIN 6" FROM EDGE OF SLAB UNO.

C20 PREVENT COLLECTION OF ENVIRONMENTAL OR OTHER WATER SOURCES IN CLOSED WALL, BOX-SHAPED OR OTHER BUILT-UP STEEL MEMBERS IN THE TEMPORARY CONDITION BEFORE BUILDING ENVELOPE IS ESTABLISHED. THESE STEEL SECTIONS SHALL BE SEALED ELSE A COVER SHALL BE PLACED OVER OPEN ENDS OF CLOSED WALL, BOX-SHAPED OR BUILT-UP MEMBERS. ADDITIONALLY, PROVIDE A DRAIN HOLE AT BASE OF MEMBER, TO ALLOW FOR ANY COLLECTED WATER TO ESCAPE. CONTRACTOR SHALL MONITOR ALL CLOSED WALL, BOX-SHAPED OR OTHER BUILT-UP MEMBERS TO ENSURE THAT NO WATER IS COLLECTED AND STANDING WITHIN THESE MEMBERS.

C21 COORDINATE WITH ARCHITECTURAL DRAWINGS FOR PAINT AND PRIMER LOCATIONS FOR ITEMS INCLUDING BUT NOT LIMITED TO THERMAL BREAK TREATMENT, FIRE PROOFING, AND WEATHER PROOFING.

C22 WELDS SHOWN MAY BE SHOP OR FIELD WELDED AS REQUIRED FOR CONSTRUCTIBILITY, COORDINATION AND MEANS AND METHODS

D STRUCTURAL DESIGN LOADS

D1 DEAD LOADS

(A)	WEIGHT OF BUILDING COMPONENTS	AS REQUIRED

D2 LIVE LOADS

(A)	OCCUPANCY CATEGORY	III
(B)	MECHANICAL EQUIPMENT ROOM	EQUIP WT

D3 SNOW LOADS

(A)	GROUND SNOW LOAD	35 PSF
(B)	IMPORTANCE FACTOR (Is)	1.1
(C)	EXPOSURE FACTOR (Ce)	1.0
(D)	THERMAL FACTOR (Ct)	1.0
(E)	ROOF SNOW LOAD	30 PSF + DRIFT (AS INDICATED ON PLAN)

D4 WIND LOADS

(A)	BASIC WIND SPEED	138 MPH
(B)	RISK CATEGORY	III
(C)	EXPOSURE CATEGORY	C
(D)	VELOCITY PRESSURE COEFFICIENT (Kh) ROOF	1.14
(E)	DIRECTIONALITY FACTOR (Kd)	0.85
(F)	TOPOGRAPHIC FACTOR (Kzt)	1.0
(G)	GUST FACTOR (G)	0.85
(H)	INTERNAL PRESSURE COEFFICIENT (GCpi)	+0.18/-0.18
(I)	EXTERNAL PRESSURE COEFFICIENT (Cp) (WINDWARD)	0.8
(J)	EXTERNAL PRESSURE COEFFICIENT (Cp) (LEEWARD) – SHORT DIRECTION	-0.5
(K)	EXTERNAL PRESSURE COEFFICIENT (Cp) (LEEWARD) – LONG DIRECTION	-0.3
(L)	AVERAGE DESIGN WIND PRESSURE	48 PSF
(M)	BASE SHEAR DUE TO WIND LOADS	518 KIPS (SHORT) / 329 KIPS (LONG)
(N)	MAIN WIND FORCE RESISTING SYSTEM – SHORT DIRECTION	STEEL BRACE FRAME (EXISTING)
(O)	MAIN WIND FORCE RESISTING SYSTEM – LONG DIRECTION	STEEL MOMENT FRAME (EXISTING)
(P)	DESIGN WIND PRESSURE FOR NON-STRUCTURAL COMPONENTS:	

WALL				ROOFS				ROOFTOP APPURTENANCES	
ZONE	EFF. WIND AREA (SF)	NET PRESSURE (PSF)		ZONE	EFF. WIND AREA (SF)	NET PRESSURE (PSF)		WIND DIRECTION	NET PRESSURE (PSF)
4	10	55.60	-60.20	1	10	22.55	-55.60	VERTICAL (UPLIFT)	-65.66
4	20	53.07	-57.80	1	20	21.12	-54.17	HORIZONTAL	±80.50
4	50	49.77	-54.50	1	50	19.38	-52.29		
4	100	47.27	-51.97	1	100	17.95	-50.87		
4	500	41.44	-46.14	2	10	22.55	-93.25		
5	10	55.60	-62.69	2	20	21.12	-83.33		
5	20	53.07	-59.88	2	50	19.38	-70.11		
5	50	49.77	-55.95	2	100	17.95	-60.20		
5	100	47.27	-53.01	3	10	22.55	-140.23		
5	500	41.44	-46.14	3	20	21.12	-116.25		
SEE TABLE 30.7-2 ASCE 7-10 FOR ZONE DIFINITION. a = 13'-0"				3	50	19.38	-84.30		
				3	100	17.95	-60.20		

D5 SEISMIC LOADS

(A)	Ss	.23
(B)	S1	.07
(C)	SITE CLASS	D (ESTIMATED)
(D)	Sds	.28
(E)	Sd1	.10
(F)	IMPORTANCE FACTOR (Ie)	1.25
(G)	SEISMIC DESIGN CATEGORY	B
(H)	BASIC LATERAL FORCE RESISTING SYSTEM – SHORT DIRECTION	STEEL BRACE FRAME (EXISTING)
(I)	BASIC LATERAL FORCE RESISTING SYSTEM – LONG DIRECTION	STEEL MOMENT FRAME (EXISTING)
(J)	RESPONSE MODIFICATION FACTOR (R)	3 (ESTIMATED)
(K)	OVERSTRENGTH FACTOR (Ωo)	3 (ESTIMATED)
(L)	DEFLECTION AMPLIFICATION FACTOR (Cd)	3 (ESTIMATED)
(M)	ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE
(N)	BUILDING FUNDAMENTAL PERIOD (T)	0.43 SEC (SHORT) / 0.74 SEC (LONG)
(O)	BUILDING SEISMIC WEIGHT	10545 KIPS (ESTIMATED)
(P)	SEISMIC RESPONSE COEFFICIENT (Cs)	0.1 (SHORT) / 0.06 (LONG)
(Q)	BASE SHEAR DUE TO SEISMIC LOADS	1060 KIPS (SHORT) / 618 KIPS (LONG)

E RENOVATION AND RESTORATION

E1 WORK SHALL CONFORM TO THE REQUIREMENTS OF THE BUILDING CODE STATED ABOVE.

E2 THE CONTRACTOR SHALL NOTIFY THE ARCHITECT WHEN, IN THE COURSE OF CONSTRUCTION OR DEMOLITION, CONDITIONS ARE UNCOVERED WHICH ARE UNANTICIPATED OR OTHERWISE APPEAR TO PRESENT A DANGEROUS CONDITION.

E3 INFORMATION REGARDING EXISTING CONSTRUCTION OR CONDITIONS IS BASED ON AVAILABLE RECORD DRAWINGS WHICH MAY OR MAY NOT TRULY REFLECT EXISTING CONDITIONS. SUCH INFORMATION IS INCLUDED ON THE ASSUMPTION THAT IT MAY BE OF INTEREST TO THE CONTRACTOR, BUT THE ARCHITECT ASSUMES NO REPONSIBILITY FOR ITS ACCURACY OR COMPLETENESS.

E4 VERIFY ALL DIMENSIONS AND CONDITIONS ON THE JOB. DISCREPANCIES SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ARCHITECT BEFORE PROCEEDING WITH THAT PART OF THE WORK.

E5 ROOFTOP EQUIPMENT AND SUPPORTING MEMBERS SHOULD HAVE ADEQUATE POSITIVE ANCHORAGE

E6 WHERE NEW WORK WILL BE ADJACENT TO OR FRAMING INTO EXISTING CONSTRUCTION, VERIFY DIMENSIONS OF EXISTING CONSTRUCTION PRIOR TO FABRICATION OF NEW MEMBERS.

E7 PROVIDE ALL LABOR AND MATERIAL FOR ANY FRAMING REQUIRED TO CONNECT NEW FRAMING TO EXISTING CONSTRUCTION. WHEREVER IT IS NECESSARY TO REMOVE EXISTING CONSTRUCTION IN ORDER TO CONSTRUCT NEW WORK, THE AFFECTED AREA SHALL BE PATCHED AND REBUILT TO MATCH EXISTING ADJACENT WORK TO SATISFACTION OF THE ARCHITECT.

E8 DETAILS SHOWN ON ANY DRAWINGS SHALL BE CONSIDERED TYPICAL FOR ALL SIMILAR CONDITIONS.

E9 NOTIFY ARCHITECT OF ANY CONTEMPLATED STRUCTURAL ALTERATION IN REASONABLE TIME TO RENDER AND DOCUMENT THE ARCHITECT'S DECISION.

E10 STRUCTURAL MATERIALS AND COMPONENTS SHALL HAVE PRIOR APPROVAL OF THE ARCHITECT.

E11 STRUCTURAL WORK ON THIS PROJECT SHALL BE PERFORMED UNDER THE SUPERVISION OF AN INSPECTOR APPROVED BY THE ARCHITECT. ALTERATIONS OR MODIFICATIONS NOT INDICATED ON THE DRAWINGS SHALL BE APPROVED BY THE ARCHITECT IN WRITING BEFORE SUCH WORK IS INITIATED. THE ARCHITECT WILL PERIODICALLY OBSERVE STRUCTURAL ELEMENTS TO ASSURE GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS, BUT DETAILED INSPECTION AND TESTING REQUIREMENTS WILL BE PREPARED BY AN INDEPENDENT TESTING AGENCY HIRED BY THE OWNER. DEFICIENCIES NOT INDICATED ON THE DRAWINGS OR EXPOSED DURING CONSTRUCTION SHALL BE CORRECTED AS DIRECTED BY THE ARCHITECT.

SPECIAL INSPECTION:
SPECIAL INSPECTION REQUIRED CH. 17 OF 780 CMR. THE FOLLOWING STRUCTURAL DISCIPLINES REQUIRE INSPECTION:
1. STRUCTURAL STEEL
SEE STATMENT OF SPECIAL INSPECTIONS FOR DETAILED PROGRAM

REVISION DATES	
ADDENDUM NO. 4	01-26-2024

NEWTON FREE LIBRARY
CHILLER REPLACEMENT PROJECT

GENERAL NOTES

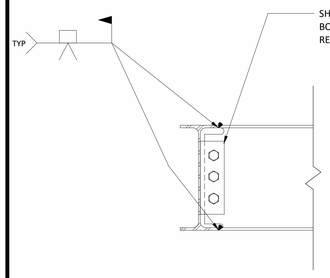
B+AC, LLC
25 B RALLISON STREET
CHELSEA, MA 021 50.
WWW.BPLUSAC.COM

STAMP

DATE:	12-13-2023
SCALE:	AS SHOWN
DRAWN BY:	ZYX
CHECKED BY:	BSC
PROJECT NO.	23021.00

c.a. crowley.
ENGINEERING, INC.
645 County Street . Suite 6
Taunton, MA 02780
tel . (508) 884.5094 WWW.CROWLEYENG.COM fax . (508) 884.5099

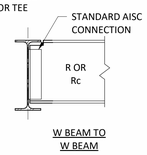
DRAWING NUMBER
S-001



1 BEAM TO BEAM MOMENT CONNECTION
N.T.S.

NOTES:

1. FOR R AND Rc, SEE REACTION ON PLAN.
2. PROVIDE ERECTION ANGLES AS REQUIRED PER OSHA.
3. PER AISC, TYPICAL BEAM CONNECTIONS SHALL GENERALLY CONSIST OF: DOUBLE ANGLE CONNECTIONS, END PL CONNECTIONS, SINGLE PL CONNECTIONS, OR TEE CONNECTIONS.

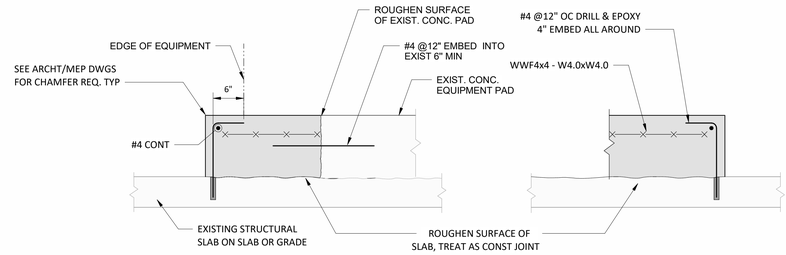


W BEAM TO
W BEAM

2 TYPICAL BEAM CONNECTIONS
N.T.S.

NOTES:

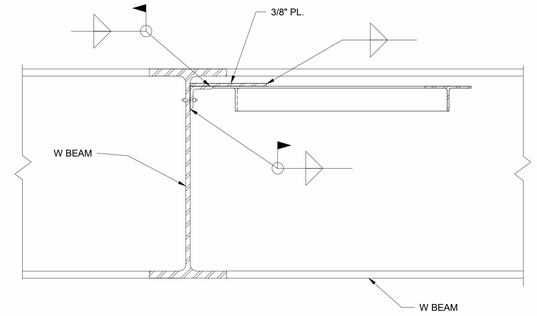
1. THE EXACT SIZE, SHAPE, AND LOCATION OF EQUIPMENT (HOUSEKEEPING) PAD(S) SHALL BE DETERMINED BY THE CONTRACTOR AFTER APPROVAL OF SHOP DRAWINGS FOR EQUIPMENT. ANCHOR BOLTS WHERE REQUIRED SHALL BE SIZED AND LOCATED ACCORDING TO MANUFACTURER'S REQUIREMENTS.
2. PADS ON FRAMED SLABS SHALL NOT BE THICKER THAN 6". WHEN THICKER PADS ARE REQUIRED, NOTIFY THE ENGINEER PRIOR TO PLACING PAD.



CONNECTION TO EXIST. EQUIPMENT PAD

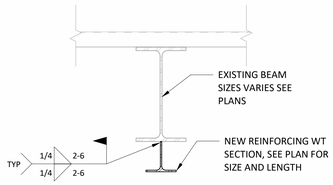
NEW EQUIPMENT PAD

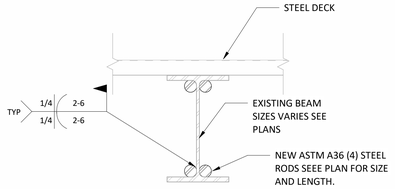
3 CONCRETE EQUIPMENT PAD ON EXISTING CONCRETE SLAB
N.T.S.



4 HORIZONTAL BRACING CONN. TO BEAM
N.T.S.

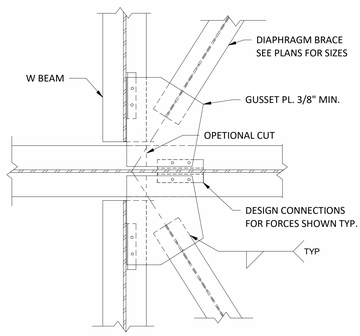
NOTES:
SHOWN ON PLAN AS (SIMILAR TO) - (E) W 16x26 + ROD 1"
DIA/ WT 4x12





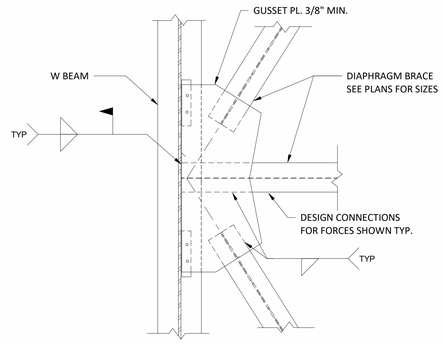
5 TYPICAL EXISTING BEAM REINFORCEMENT DETAIL
N.T.S.

NOTE:
1. BEAM TO BEAM SHEAR CONNECTION & OTHER DETAIL NOT SHOWN FOR CLARITY.
2. BOLT'S SHALL BE SLIP CRITICAL

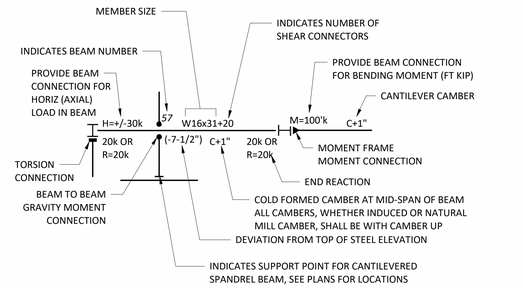


6 HORIZONTAL BRACE CONNECTION W/ BEAM WEB
N.T.S.

NOTE:
1. BEAM TO BEAM SHEAR CONNECTION & OTHER DETAIL NOT SHOWN FOR CLARITY.
2. BOLT'S SHALL BE SLIP CRITICAL

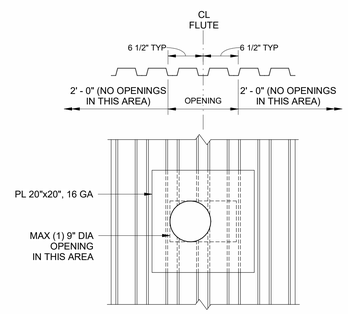


7 HORIZONTAL BRACE CONNECTION W/ WT
N.T.S.

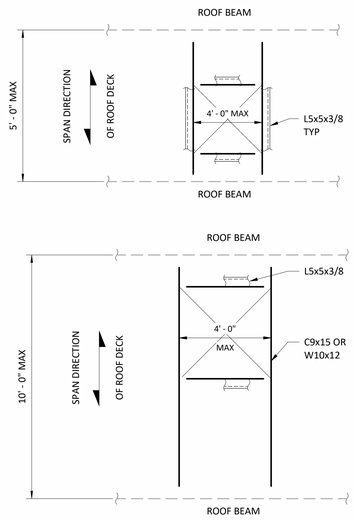


8 BEAM EXPLANATION DIAGRAM
N.T.S.

NOTES:
1. SEE ARCHT DWGS FOR LOCATIONS OF OPENINGS.

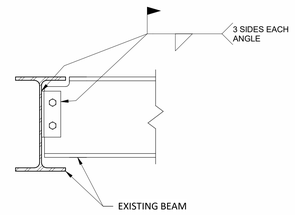


9 DECK REINFORCEMENT FOR SMALL PENETRATION
N.T.S.



10 FRAMING FOR OPENING IN ROOF DECK
N.T.S.

NOTE:
CONTRACTOR TO DESIGN CONNECTION REINFORCEMENT BASED ON REACTIONS SHOWN ON STRUCTURAL DWG AND FIELD CONDITIONS.



11 CONNECTION REINFORCEMENT CONCEPT
N.T.S.

REVISION DATES	
ADDENDUM NO. 4	01-26-2024

NEWTON FREE LIBRARY
CHILLER REPLACEMENT PROJECT

TYPICAL DETAILS

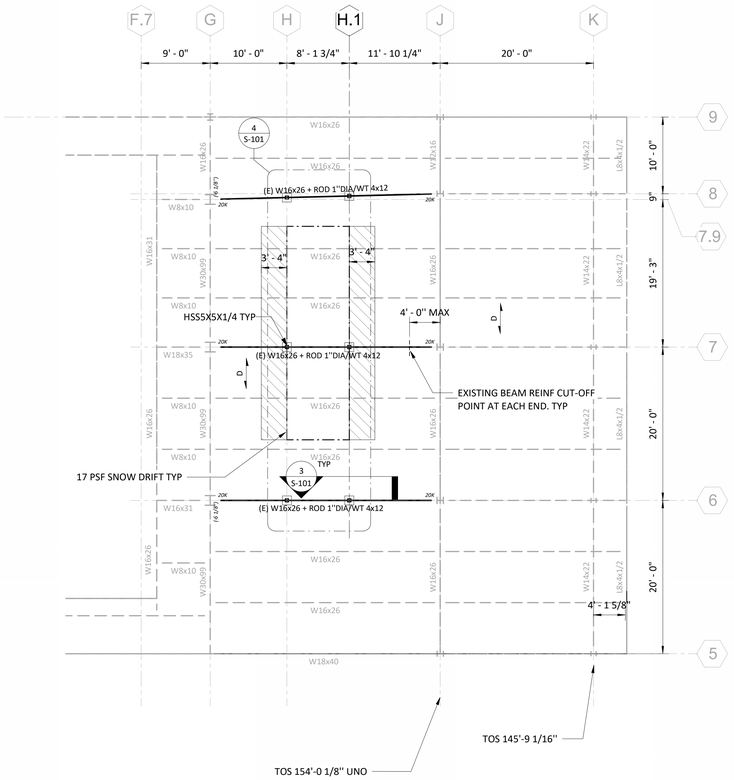
B+AC, LLC
214 MILLBROOK STREET
WORCESTER, MA 01610
WWW.BPLUSAC.COM

STAMP

DATE:	12-13-2023
SCALE:	AS SHOWN
DRAWN BY:	ZYX
CHECKED BY:	BSC
PROJECT NO.	23021.00

c.a. crowley.
ENGINEERING, INC.
645 County Street . Suite 6
Taunton, MA 02780
tel . (508) 884.5094 WWW.CROWLEYENG.COM fax . (508) 884.5099

DRAWING NUMBER
S-002



SHEET NOTES:

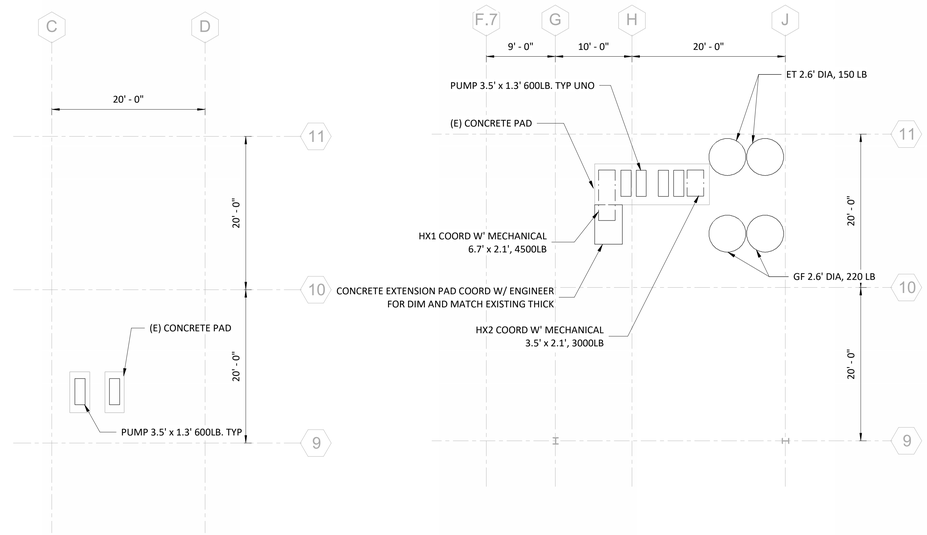
1. THE FOLLOWING LINEWORK REPRESENTS:

- EXISTING STRUCTURE
- NEW STRUCTURE
- INDICATES STRUCTURE COLUMN STARTS
- INDICATES STRUCTURE COLUMN STOPS
- INDICATES BEAM TO BEAM MOMENT CONNECTION

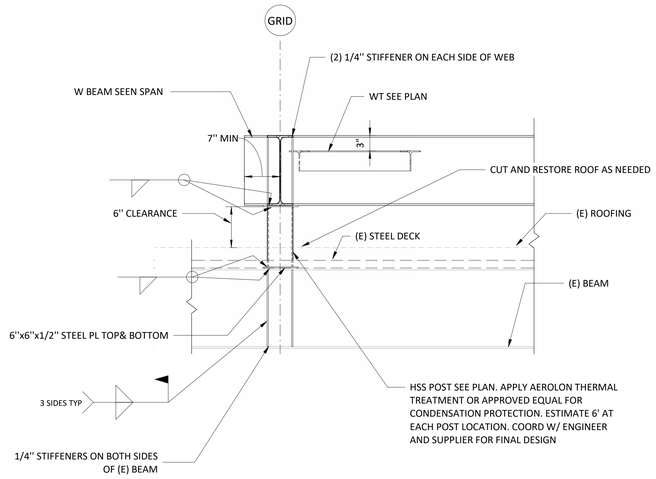
2. COORDINATES STRUCTURAL FRAMING LOCATION WITH EQUIPMENT ANCHORAGE REQUIREMENTS.
3. T.O.S SEE SELECTIONS AND COORDINATES IN FIELD.
4. FOR TYPICAL DETAILS SEE DRAWING S002
5. ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY. THE CONTRACTOR TO VERIFY EXISTING DIMENSIONS IN FIELD AND COORDINATING NEW FRAME LOCATIONS AS NOTED
6. ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ANY DAMAGE CAUSED IN CONSTRUCTION PROCESS.
7 TIMBER CURBS USED TO SUPPORT LIGHTER ROOF TOP UNITS SHALL BE LONG ENOUGH TO SPAN TO ROOF FRAMING BELOW AND ANCHORED TO THE DECK. SEE ENGINEER FOR ROOF PATCHING REQUIREMENTS. EQUIP SHALL BE ANCHORED TO CURB TO CORRESPOND WITH THE WIND SPEED AND EXPOSURE APPLICABLE TO THIS PROJECT
8. CONTRACTOR SHALL VERIFY EXISTING FRAME ELEVATIONS ON SITE
9. USE ROD OR WT SECTIONS FOR BEAM REINFORCEMENT AS APPROPRIATE DEPENDING ON EXISTING CONDITION
10. CONNECTION DESIGNER SHALL VERIFY EXISTING SHEAR CONNECTION W/ NEW REACTIONS INDICATED ON PLAN

1 ROOF PARTIAL FRAMING PLAN
1/8" = 1'-0"

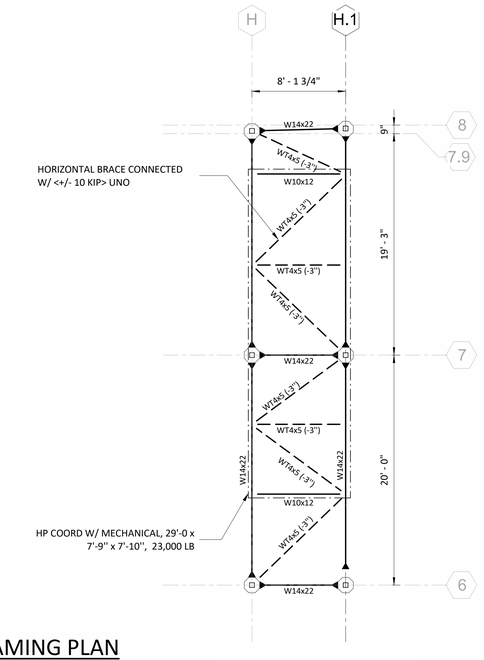
NOTE: COORD W/ MECH FOR SIZES AND LOCATIONS OF EUQIP



2 MECH ROOM PARTIAL PLANS
1/8" = 1'-0"



3 TYP DUNNAGE CONNECTION W/ BEAM AND COLUMN CONNECTIONS
1" = 1'-0"



4 DOUNNAGE FRAMING PLAN
3/16" = 1'-0"

REVISION DATES	
ADDENDUM NO. 4	01-26-2024

NEWTON FREE LIBRARY
CHILLER REPLACEMENT PROJECT

PARTIAL FRAMING PLAN
& SECTION DETAILS

STAMP

B+AC, LLC
37 W. BROADWAY
CHELSEA, MA 02150
WWW.BPLUSAC.COM

DATE:	12-13-2023
SCALE:	AS SHOWN
DRAWN BY:	ZYX
CHECKED BY:	BSC
PROJECT NO.	23021.00

c.a. crowley. ENGINEERING, INC.
645 County Street , Suite 6
Taunton, MA 02780
tel . (508) 884.5094 WWW.CROWLEYENG.COM fax . (508) 884.5099

DRAWING NUMBER
S-101
4

SECTION 017329

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Include General Conditions and applicable parts of Division 1 as part of this Section.

B. Examine all other Sections of the Specifications for any Requirements that affect Work of this Section, whether or not such Work is specifically mentioned in this Section.

C. Coordinate Work with that of all other Trades affecting, or affected by, Work of this Section. Cooperate with such Trades to assure the steady progress of all Work under the Contract.

1.02 SCOPE OF WORK

A. The Contractor shall be responsible for all cutting, fitting and patching, required to complete the Work or to:

1. Make its several parts fit together properly

2. Remove portions of existing construction to provide for installation of new Work

3. Remove and replace defective Work

4. Remove and replace Work not conforming to requirements of Contract Documents

5. Provide penetrations of existing construction for installation of piping, electrical conduit, and all other Work as indicated in the Contract Documents.

6. Repair of portions of existing construction removed to complete the Work of this Contract, including concrete and masonry.

B. Examine all Project Documents for any Requirements that affect Work of this Section, whether or not such Work is specifically mentioned in this Section.

1.03 RELATED WORK UNDER OTHER SECTIONS

A. Carefully examine all of the Contract Documents for requirements which effect the Work of this Section.

B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:

1. Section 017320 - Selective Demolition
Section 230000 - HVAC
Section 260000 - Electrical

1.04 SUBMITTALS
1

A. Submit a written request for approval to Architect well in advance of executing any cutting or alteration which effects:

1. The structural value or integrity of any element of the Project;

2. The integrity or effectiveness of weather-exposed or moisture resistant elements or systems.

3. The efficiency, operational life, maintenance or safety of operational elements;

4. The visual qualities of sight-exposed elements.

B. The request shall include the following:

1. Description of the effected Work.

2. The necessity for cutting, alteration or excavation.

3. The effect on the structural or weatherproof integrity of the project.

4. Description of the proposed Work:

a. The scope of cutting, patching, alteration, or excavation.

b. The trades who will execute the Work.

c. Products proposed to be used.

d. The extent of refinishing to be done.

5. Alternates to cutting and patching.

6. Cost proposal, when applicable

C. Should conditions of the Work or the schedule indicate a change of products from the original installation, Contractor shall submit a request substitution as specified in Supplementary Conditions.

D. Submit a written notice to Architect designating the date and time the Work will be uncovered.

1.05 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.

B. Obtain approval of the cutting and patching proposal from the Designer before cutting and patching the following structural elements:

Foundation construction
Bearing and retaining walls
Structural concrete
Structural steel
Lintels
Timber and primary wood framing
Structural decking
Stair systems
Miscellaneous structural metals
Exterior curtain wall construction
Equipment supports

Piping, ductwork, vessels and equipment.

C. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal from the Designer before cutting and patching the following operating elements or safety related systems:

Shoring, bracing, and sheeting
Primary operational systems and equipment
Air or smoke barriers
Water, moisture, or vapor barriers
Membranes and flashings
Fire protection systems
Noise and vibration control elements and systems
Control systems
Communication systems
Conveying systems
Electrical wiring systems
Special construction

D. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Designer's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Use materials which are identical to existing materials.

B. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible.

C. Use materials whose installed performance will equal or surpass that of the existing materials.

D. Comply with specifications and standards for each specific product involved. Suitability of materials for compatibility and matching of existing materials to be repaired shall be as determined by the Architect.

PART 3 - EXECUTION

3.01 INSPECTION

A. The General Contractor shall be responsible for all cutting and patching, including all cutting and patching required by sub-contractors.

1. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered. Report unsatisfactory or questionable conditions to the Architect in writing; do not proceed with the Work until the Architect has provided further instructions.

2. Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.02 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

1. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

2. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Where required to maintain an existing product or system warranty, such as a roof warranty, employ a manufacturer's approved and warranted Contractor to perform the cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.

1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine such as a Carborundum saw or diamond core drill.

4. Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.

5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

2. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.

3. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch, after the patched area has received primer and second coat.

4. Patch, repair or re-hang existing ceilings as necessary to provide an even plane surface of uniform appearance.

D. Plaster Installation: Comply with manufacturer's instructions and install thickness and coats as indicated.

1. Unless otherwise indicated provide 3-coat Work.

2. Finish gypsum plaster with smooth-troweled finish. Sand lightly to remove trowel marks.

3. Cut, patch, point-up and repair plaster to accommodate other construction and to restore cracks, dents and imperfections.

3.04 CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

B. Remove and legally dispose of off site daily, all waste and debris caused by the Work of this Section.

END OF SECTION

SECTION 024119

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Include General Conditions and applicable parts of Division 1 as part of this Section.

B. Examine all other Sections of the Specifications for any Requirements that affect Work of this Section, whether or not such Work is specifically mentioned in this Section.

C. Coordinate Work with that of all other Trades affecting, or affected by, Work of this Section. Cooperate with such Trades to assure the steady progress of all Work under the Contract.

1.02 SCOPE OF WORK

A. Work Included:

1. Demolition and removal of selected portions of buildings and structures and as required for new work. Refer to the Drawings for additional requirements.

2. Cutting of new openings in existing ceilings, floors, and walls as required to complete the Work.

3. Demolition and removal of selected site elements and as required for new work. Refer to the Drawings for additional requirements.

4. Salvage of existing items to be reused or turned over to the Owner, including all appliances.

5. Removal and legal disposal of demolished materials off site. Except those items specifically designated to be relocated, reused, or turned over to the facility, all existing removed materials, items, trash and debris shall become property of the Contractor and shall be completely removed from the site and legally disposed of at her/his expense.

6. Demolition and removal work shall properly prepare for alteration work and new construction to be provided under the Contract.

7. Scheduling and sequencing operations without interruption of utilities serving occupied areas. If interruption is required, obtain written permission from the utility company and the Owner. Provide temporary services as necessary to serve occupied and usable facilities when permanent utilities must be interrupted, or schedule interruption when the least amount of inconvenience will result.

B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 230000 - HVAC
Section 260000 - Electrical

1.03 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to the Owner, ready for reuse, at a location designated by the Owner. Protect from weather until accepted by Owner.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated. Protect from weather until reinstallation.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.04 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques, antiques, and other items of interest or value to the Owner that may be encountered during selective demolition remain property of the Owner. Carefully remove each item or object in a manner to prevent damage and deliver promptly to a location acceptable to the Owner.

1.05 SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with early and late starting and finishing dates for each activity.

2. Interruption of utility services. Indicate how long utility services will be interrupted.

3. Coordination for shutoff, capping, and continuation of utility services.

4. Locations of proposed dust- and noise-control temporary partitions and means of egress.

5. Means of protection for items to remain.

B. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged, and turned over the Owner.

1.06 QUALITY ASSURANCE

A. Examination of Existing Conditions: The Contractor shall examine the Contract Drawings for demolition and removal requirements and provisions for new work. Verify all existing conditions and dimensions before commencing work. The Contractor shall visit the site and examine the existing conditions as he finds them and shall inform herself/himself of the character, extent and type of demolition and removal work to be performed. Submit any questions regarding the extent and character of the demolition and removal work in the manner and within the time period established for receipt of such questions during the bidding period.

B. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Standards: Comply with ANSI A10.6 and NFPA 241.

E. Pre-demolition Conference: Conduct conference at Project site to review methods and procedures related to selective demolition including, but not limited to, the following:

1. Inspect and discuss condition of construction to be selectively demolished.

2. Review structural load limitations of existing structure.

3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

5. Review areas where existing construction is to remain and requires protection.

1.07 PROJECT CONDITIONS

A. Owner Occupancy:

1. The existing residence hall buildings will be occupied during portions of the Work of this Contract. The Contractor shall employ all measures necessary to protect the existing buildings and adjacent property from damage caused by the Work of this Contract.

B. Hazardous Materials:

1. There may be accessible or inaccessible Asbestos Containing Materials (ACM) in the existing buildings. The Contractor shall formally notify each sub-contractor that there may be ACM existing in the buildings. All remediation work of ACM discovered during the Work of this Project shall be conducted in accordance with the requirements of the Contract Documents and authorities having jurisdiction.

2. Provide and maintain records of disposal from a landfill licensed by the State of Massachusetts for disposal of hazardous wastes.

1.08 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.01 GENERAL

A. All Repair materials shall be compatible with existing materials to remain and shall be as approved by the Architect.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Designer.

E. Engage the services of a professional engineer registered in the State of Massachusetts to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

1. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

G. Utility Services:

1. Existing utility services shall be maintained to existing facilities. Provide a minimum three (3) day notice of service shutdown to the Owner.

2. Shut-off of all utilities shall be conducted by the Contractor in compliance with requirements of authorities having jurisdiction.

H. Site Access and Temporary Controls:

1. Existing streets and walks shall remain open at all times. Maintain all existing building access and egress capabilities as required by local authorities having jurisdiction

2. Provide and maintain temporary protection, including chain link fencing.

3. Provide and maintain protection around existing trees and plantings located on adjacent property.

I. Temporary Facilities:

1. Provide and maintain temporary barricades to prevent injury to people.

2. Provide and maintain temporary weather protection as required.

3. Provide and maintain protection of existing finish work to remain.

4. Provide and maintain protection of existing interior furnishings and equipment.

5. Provide and maintain protection of exterior site improvements to remain, including on adjacent property.

J. Provide and maintain temporary weather-tight enclosure for building exterior as required.

K. Provide and maintain temporary shoring of existing structural building components to remain, including but not limited to, structural steel, brick masonry walls, and concrete floors and wood roof framing.

L. Items to be removed and salvaged shall be cleaned, stored, and transported to the Owner's designated storage area.

M. Items to be removed and reinstalled shall be cleaned, repaired, stored, and reinstalled as required.

N. Existing items to remain shall be protected against damage during construction.

O. Saw cut all new openings as required for installation of all new work. Locations of required openings shall be marked by the respective trade. Marking and cutting of new floor and wall openings shall be completed prior to submittal of Coordination Drawings. Existing conditions negatively impacting installation of new Work, uncovered by cutting of new openings after submittal of Coordination Drawings, as a result of the Contractor’s failure to properly complete the Work of this Section in a timely manner, shall not be considered as cause for additional cost to the Contract.

P. Cleaning and Disposal: All waste and debris caused by the Work of this Section shall be legally disposed of off site, daily, at a facility licensed to receive and process building demolition debris. Burning shall not be permitted. Provide original Bills of Lading to the Owner.

3.02 MECHANICAL, ELECTRICAL, FIRE PROTECTION, AND PLUMBING DEMOLITION

A. All existing mechanical, electrical, fire protection, and plumbing fixtures, equipment, piping, valves, hangers, supports, and fittings shall be removed under the Work of this Section and legally disposed of off site.

B. Disconnect, cap, and make safe, all connections to equipment to be removed, in accordance with requirements of local authorities having jurisdiction and the Contract Documents. All caps or plugs to be installed shall be of like material as pipe being capped or plugged. Disconnecting and capping of connections shall be performed by the respective subcontractor.

C. Disconnected equipment and fixtures shall be removed from its existing mounted location and dropped to the floor by the respective subcontractor for removal and legal off site disposal by the General Contractor.

3.03 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Division 1 - TEMPORARY FACILITIES AND CONTROLS.

2. Maintain adequate passage to and from all exits at all times. Before any work is done which significantly alters access or egress patterns, consult with the Designer and obtain approval of code required egress. Under no condition block or interfere with the free flow of people at legally required exits, or in any way alter the required condition of such exits.

B. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

2. Remove temporary shoring, bracing and structural supports when no longer required.

3. Post warning signs and place barricades as applicable during placement and removal of temporary shoring.

C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area(s).

1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction. Provide temporary barricades as required to limit access to demolition areas.

2. Protect existing site improvements, appurtenances, and landscaping to remain.

D. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with demolition operations.

3.04 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.

2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding,

not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

5. Maintain adequate ventilation when using cutting torches.

6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

9. Dispose of demolished items and materials promptly. Comply with requirements in Division 1 – CONSTRUCTION WASTE MANAGEMENT AND DEMOLITION.

B. Removed and Salvaged Items:

1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until delivery to Owner.

4. Transport items to storage area designated by the Owner.

5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.

2. Pack or crate items after cleaning and repairing. Identify contents of containers.

3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Designer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

E. Items for Re-use and Preservation of Existing Surfaces to Remain:

1. The Contractor shall inspect closely each item specifically designated to be relocated, re-used, or turned over to the Owner prior to its removal, and immediately report damages and defects to the Designer and Owner. The Contractor shall be responsible for any subsequent damage to the same other than latent defects not readily apparent from close inspection, and shall bear responsibility for its repair or same replacement as directed by the Designer.

F. Unless special surface preparation is specified under other Specification Sections, leave existing surfaces that are to remain in a condition suitable to receive new materials and/or finishes.

3.05 PROTECTION OF PUBLIC AND PROPERTY

A. Provide all measures required by federal, state and municipal laws, regulations, and ordinances for the protection of surrounding property, the public, workmen, and Library's employees during all demolition and removal operations. Measures are to be taken, but not limited to installation of sidewalks, sheds, barricades, fences, warning lights and signs, trash chutes and temporary lighting.

B. Protect all walks, roads, streets, curbs, pavements, trees and plantings, on and off premises, and bear all costs for correcting such damage as directed by the Designer.

C. Demolition shall be performed in such a manner that will insure the safety of adjacent property. Protect adjacent property from damage and protect persons occupying adjacent property from injuries which might occur from falling debris or other cause and so as not to cause interference with the use of other portions of the building, of adjacent buildings or the free access and safe passage to and from the same.

D. Every precaution shall be taken to protect against movement or settlement of the building, of adjacent buildings, sidewalks, roads, streets, curbs and pavements. Provide and place at the Contractor's own expense, all necessary bracing and shoring in connection with demolition and removal work.

E. Remove portions of structures with care by using tools and methods that will not transfer heavy shocks to existing and adjacent building structures, both internal and external of the particular work area.

F. Provide and maintain in proper condition, suitable fire resistive dust barriers around areas where interior demolition and removal work is in progress. Dust barriers shall prevent the dust migration to adjacent areas. Remove dust barriers upon completion of major demolition and removal in the particular work area.

3.06 DISCOVERY OF HAZARDOUS MATERIALS

A. If hazardous materials, such as chemicals, asbestos-containing materials, or other hazardous materials are discovered during the course of the work, cease work in affected area only and immediately notify the Designer of such discovery. Do not proceed with work in such areas until instructions are issued by the Designer. Continue work in other areas.

B. If unmarked containers are discovered during the course of the work, cease work in the affected area only and immediately notify the Designer of such discovery. Do not proceed

with work in such areas until instructions are issued by the Designer. Take immediate precautions to prohibit endangering the containers integrity. Continue work in other areas.

3.07 CUTTING

A. Perform all cutting of existing surfaces in a manner which will ensure a minimal difference between the cut area and new materials when patched. Use extreme care when cutting existing surfaces containing concealed utility lines which are indicated to remain and bear full responsibility for repairing or replacement of all such utilities that are accidentally damaged.

B. Provide a flush saw cut edge where pavement, curb and concrete removals abut new construction work or existing surfaces to remain undisturbed.

3.08 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Comply with requirements of Division 1 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL and the following.

1. Do not allow demolished materials to accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.09 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by the Work of this Section. Premises shall be left in a clean condition and ready to accept alteration work and new construction.

END OF SECTION

SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Bidding Requirements, Contract Forms, and Conditions of the Contract and applicable parts of Division 1 - General Requirements, as listed in the Table of Contents, shall be included in and made a part of this Section.

1.2 WORK INCLUDED

A. Labor, materials, equipment, services and transportation required to complete structural steel work shown on Drawings, as specified herein, or both. Structural steel work is that work defined in AISC "Code of Standard Practice" plus steel work listed below and shown on the structural drawings.

1. Furnishing of anchor bolts, and loose leveling plates.
2. Furnishing and erection (including bolted and welded connections) of base plates, columns, tubes, channels, struts, beams, hangers, girders, bracing (temporary and permanent), brackets, pipe links, anchors, angles, stiffeners, plates, bolsters, clips, support angles for metal deck, lintels or relieving angles affixed to structure.
3. Furnishing and installation of openings (unreinforced and reinforced) in structural steel required to accommodate mechanical, plumbing, and electrical work.
4. Furnishing and installation of non-shrink grout under leveling and base plates.
5. Furnishing and application of shop paint, including finish coat(s) when required, and field touch-up paint for designated structural steel items.
6. Furnishing and application of hot-dip galvanizing for masonry lintels, masonry relieving angles, exposed mechanical equipment dunnage beams, and steel so designated on the drawings.
7. Design of bolted/welded structural connections.
8. Furnishing of structural steel items shown in structural drawings required to be built into or form part of work specified under other Sections, to appropriate trade at proper time with complete instructions and templates to facilitate installation. Verify proper installation of same.
9. Unless specifically excluded, furnishing and installation of any other items of structural steel work indicated on Drawings, specified or obviously needed to make work of this Section complete.

B. Exclusions from the Contract Documents are not allowed without prior written approval from the Structural Engineer-of-Record. The review process for exclusions shall follow the same general procedures as specified for shop drawing review.

1.3 RELATED WORK

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. Section 014325, Testing Agency Services
2. Section 070150, Modifications to Existing Roofing
3. Section 072100, Thermal Insulation
4. Section 230001, Heating, Ventilating and Air-Conditioning

1.4 REFERENCES

A. Except as otherwise specified herein, perform work in accordance with specifications noted below, including latest editions of applicable specifications, codes, and standards cited therein, and latest applicable addenda and supplements. Copies of these items shall be kept available in shop and field.

1. "The Commonwealth of Massachusetts State Building Code", 9th Edition.
2. "Specification for Structural Steel Buildings", AISC 360.
3. "Seismic Provisions for Structural Steel Buildings", American Institute of Steel Construction (AISC 341).
4. "Code of Standard Practice for Steel Buildings and Bridges", American Institute for Steel Construction, (AISC) except as modified herein by deletion of the following sentences: Paragraph 4.4 "These drawings shall be returned to the Fabricator within fourteen (14) calendar days."
5. "Structural Welding Code - Steel (AWS D1.1-04)", American Welding Society.
6. "Specification for Structural Joints Using ASTM A325 or A490 Bolts", Research Council on Structural Connections (RCSC).
7. "Painting Manual, Vol. 1, Good Painting Practice" and "Painting Manual, Vol. 2, Systems and Specifications", Steel Structures Painting Council.
8. American Society for Testing Materials (ASTM) Standards referenced in this Section.
9. Statement of Special Inspection.

B. Any material or operation specified by reference to published specifications of manufacturer or published standard shall comply with said specification or standard. In case of conflict between referenced specifications, most stringent requirement shall govern. In case of conflict between referenced specifications and Project Specifications, Project Specifications shall govern.

1.5 SUBSTITUTIONS

A. Substitutions for member sizes, type(s) of steel, connection details or any other modifications proposed by Contractor will be considered by Architect only under following conditions:
1. That request has been made and accepted prior to submission of Shop Drawings.
2. That there is a substantial cost advantage or time advantage to Owner; or that proposed revision is necessary to obtain required materials or methods at proper times to accomplish work in time scheduled.
3. That sufficient sketches, engineering calculations, and other data have been submitted to facilitate checking by Architect, including cost reductions or savings in time to complete work.

1.6 SUBMITTALS

A. Standard Shop Details and Connection Design Calculations: Submit to Architect prior to submitting detailed Shop Drawings, design calculations and details for connections not shown on the Drawings. Calculations shall be prepared under supervision of registered professional engineer.

B. Joint Welding Procedures: Submit to Architect joint welding procedures and program of welding sequence (for each component and for welding components together) before any welding is done. After return of submittal, welding procedures and sequences shall be followed without deviation. Architect may require re-qualification of these welding procedures by tests prescribed in AWS "Standard Qualification Procedure".

C. Quality Control Manual: Submit to Architect, prior to start of fabrication, description of field and plant inspection procedures including titles of responsible personnel, methods and equipment for non-destructive testing of specific typical joints, documentation of inspection results, and procedures for repairing or disposing of nonconforming materials. Results of tests during the course of work shall, upon request by Architect, be made available for review by Architect and/or Testing Agency.

D. Methods of Erection: Submit to Architect, in accordance with requirements of Contract Documents, prior to starting work, description of methods, sequence of erection, and type of equipment proposed for use in erecting structural steel work. Provide construction loads imposed on permanent structure.
   1. Architect's review is only for effects of methods on permanent structure. This submission shall not relieve Contractor of his responsibility for providing proper methods, equipment, workmanship, and safety precautions.

E. Shop Drawings: Submit to Architect detailed Shop Drawings, including erection drawings, schedules and index sheets showing: grades of steel; identification mark of members; orientation and relation of members to appropriate grid lines; setting elevations for column bases; framing to support metal deck; location and size of openings, slots, and holes; requirements, such as punched or drilled holes, for attachment of other materials or parts of construction; type, size, and location of shop and field connections; type, size, and extent of welds; joint welding procedures; welding sequences (use welding symbols adopted by American Welding Society); cleaning requirements prior to painting; type and dry thickness of paint. Shop drawings shall also indicate capacity of each connection designed by the contractor. Members to be galvanized shall be so noted on shop drawings.
   1. Architect's checking is a review for conformance with the design concept of the project and compliance with the information given in the Contract Documents. The Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.
   2. Do not proceed with fabrication of material or performance of work until corresponding item on Shop Drawing has been reviewed by Architect.

F. Samples: Submit to Architect, upon request by Architect, samples and/or descriptive literature of materials, products and methods.
   1. Do not proceed with fabrication of material/product or performance of work until Sample has been approved by Architect.

G. Submit to the Architect complete shop details (keyed to erection layouts) and technical data for all structural bearings specified or shown.

H. Submit to the Architect drawings and directions for the installation of anchor bolts, high strength bolts, direct tension indicator washers, torque control snap-off bolts, or items to be installed by others. Verify proper installation of same.

I. Items requiring field measuring shall have all dimensions verified in the field before fabrication. Field dimensions shall be shown on the Shop Drawings and shall be noted as having been verified in the field.

1.7 QUALITY ASSURANCE

A. Mill Test Certification for Structural Steel: Submit to Architect, prior to delivery of structural steel to job site, certified mill test reports of structural steel (including names and locations of mills and shops, and analyses of chemical and physical properties), properly correlated to structural steel to be used in this project. This submittal is for information and file record.

B. Mill Test Certifications for Connection Material: Submit to Architect, prior to delivery of structural steel to job site, certified mill test reports of bolts, nuts and washers (including names and locations of mills and shops, and analyses of chemical and physical properties), properly correlated to connections on this project. Submit manufacturer's certifications for filler metal for welding. This submittal is for information and file record.

C. Painting Certification: Submit to Architect certification stating that requirements pertaining to pre-paint cleaning and painting of steel have been performed in accordance with Contract Documents. This submittal is for information and file record.

D. Galvanizing Certification: Submit to Architect a copy of certification stating that requirements pertaining to pre-galvanizing cleaning and galvanizing of steel have been performed in accordance with Contract Documents. This submittal is for information and file record.

E. Corrective Work: Submit to Architect drawings showing details of proposed corrective work prior to performing corrective work.

F. Affidavit: Submit to Architect, on request by Architect, manufacturer's and/or fabricator's and/or erector's affidavit stating that material or product provided complies with Contract Documents.

G. Maintain records of shop and field welding procedures and records of welders employed, date of qualification and identification symbol or mark. Maintain records for each impact wrench used in shop and field, showing dates, sizes of bolts tested and the corresponding torque values. Certified copies of the records shall be made available to Contractor, Architect and Owner's testing laboratory.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide positive identification for each steel type and tensile strength classification, except A36 steel, by a uniform marking system on each piece. All steel shall be newly rolled steel.

2.2 MATERIALS

A. High strength low alloy steel: ASTM A992, or ASTM A588, of grades and to provide yield strengths shown on the drawings. Use A588 or A992 modified for plates over 1½ inch thick where Fy 50 ksi is required.

B. Carbon steel: shapes, plate and bar shapes, ASTM A36. Rectangular and Square HSS (Tubes), ASTM A500 Grade B (Fy = 46 ksi); Round HSS (pipe), ASTM A500, Grade C (Fy = 46 ksi).

C. Anchor Bolts: ASTM F1554, Grade 36, unless noted otherwise.

D. High Strength Bolts: ASTM A325 or ASTM A490 with ASTM A563, Heavy Hex Style Nuts, conforming to Table 2.1 of "Specification for Structural Joints Using High-Strength Bolts", 2009 RCSC, and compatible washers. Bolts shall be cold-forged with rolled threads. Bolts with Torque Control snap-off ends may be used.

E. Direct Tension Indicating Compressible Washers: ASTM F959-85, steel alloy washer with 5 to 6 circular protrusions on one side and selected to match bolt strength.

F. Filler Metal for Welding: E70XX low hydrogen as per Table J2.3 of LRFD Specification or as per Table J2.5 of the Allowable Stress Specification of AISC.

G. Headed Studs: ASTM A108, Grades 1010, 1015, 1017, or 1020, minimum yield point of 50,000 psi, and minimum tensile strength of 60,000 psi.

H. Structural Steel Protective Coatings:

1. Structural Steel Primer Paint: "Tnemec Series 10", "Dupont 761",or P&L Noxide 90".
2. Spray fireproofing compatible primer paint: Tnemec Perime Prime series 394.
3. Structural Steel Finish Paints: See Paragraph 3.5B below.
4. Galvanizing: Hot dip galvanize steel so designated herein and on the drawings and after fabrication in compliance with ASTM A-123. Hot-dip galvanized steel shall be inspected for compliance with ASTM A-123 and shall be marked with a stamp that indicates the name of the galvanizer, the ASTM Number, and the ounces of zinc per square foot of surface. A notarized Certificate of Compliance with all of the above shall be required from the galvanizer.

I. Coating for Finished Bearing Surfaces (e.g., columns): "Magnafilm 1043" by Magnus Chemical Co., Garwood, N.J.; "M-2658, Blue Lacquer" by U.S. Steel Corp., Pittsburgh, PA or approved equivalent.

J. Slide Bearings: Slide bearings shall comprise of sliding surfaces of 3/32 inch thick virgin tetrafluoroethylene polymer reinforced with glass fiber aggregate and bonded to 10 gage stainless steel backing plates. Bearings shall have a safe working load capacity of 2000 psi at 60 degrees F. and coefficient of friction not exceeding 0.1.

K. Bedding mortar for bearing and base plates:

1. Non-Shrink: CRD-C 621, factory pre-mixed grout, Type D, non-metallic, shall be one of the following or an approved equivalent:
   a. "Masterflow 713"; Master Builders.
   b. "Sonogrout"; Sonneborn-Contech.

c. "Euco-NS"; Euclid Chemical Co.
d. "Five Star Grout"; U.S. Grout Corp.

L. Expansion Anchors: Anchors shall be designed in accordance with ACI 318 Appendix D, which requires post-installed mechanical anchors to be qualified according to ACI 355.2. The stud shall be manufactured from carbon steel and the expansion clip shall have 2 undercutting embossments per segment and be manufactured from 316 stainless steel. Carbon steel anchors shall have an electroplated zinc finish in accordance with ASTM B633, Class SC1, Type I. Anchors shall have an evaluation report issued by ICC-ES and have been tested and qualified for performance in cracked and uncracked concrete in accordance with ACI 355.2 and ICC-ES AC193 for all mandatory tests. Use one of the following or equivalent approved by Architect:

1. “Power-Bolt +”; Powers Fasteners, Inc.
2. "Kwik Bolt TZ"; Hilti Inc.
3. "Strong-Bolt 2"; Simpson Strong-Tie Company, Inc.

M. Screw Anchors: Anchors shall be designed in accordance with ACI 318 Appendix D as amended by the specific design provisions of ICC-ES AC193. Anchors shall be manufactured from carbon steel which is subsequently heat-treated. Anchors shall be zinc-plated in accordance with ASTM B633 or mechanically galvanized in accordance with ASTM B695. Anchors shall have an evaluation report issued by ICC-ES and have been tested in accordance with ICC-ES AC193 for all mandatory test. Use one of the following or equivalent approved by Architect:

1. “Wedge-Bolt +”; Powers Fasteners, Inc.
2. "KWIK HUS-EZ"; Hilti Inc.
3. "Titen HD"; Simpson Strong-Tie Company, Inc.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine work prepared by other trades to receive work of this Section and report any defects affecting installation to Contractor for correction. Commencement of work will be construed as complete acceptance of preparatory work by others.

3.2 HANDLING AND STORAGE

A. Handle and stack materials carefully to prevent deformation or damage. Use fabric slings to transport finished, prepainted members. Store structural steel carefully on substantial timbers and blocking, so arranged that steel will be free from earth and properly drained, preventing any spattering with dirt or accumulation of water in or about steel. Take care to prevent damage to any shop painted surfaces and to prevent accumulation of mud, dirt, or other foreign matter on steel. Any accumulation shall be completely removed prior to erection.

B. All bolts shall be kept in dry storage until needed for installation. A325 bolts 1-1/8"and 1-1/4" and A490 bolts 1" and over must first have Johnson's Stick Wax #140 applied to their threads before being assembled in work. If bolts have been left out and have become rusty before use,

they shall be rejected and shall not be used until they have been cleaned and waxed with Johnson's Stick Wax.

3.3 SHOP FABRICATION

A. Except as otherwise indicated on Drawings or specified herein, fabricate structural steel in accordance with References in this Section.

B. Permissible tolerances for steel members shall conform to ASTM A6. The as-fabricated tolerances shall conform to the cited AISC Specifications, AISC Code and the AWS Code, except where closer tolerances and straightness of members are required for fitting of the work in fabrication or erection.

C. Provision for attachment of other materials: Punch and drill steel for attachment of other materials indicated on Drawings or noted in Specifications to be attached to steel.

D. The Contractor shall design and detail all connections required to resist the loads and reactions shown on the drawings and as specified. Fabrication and erection details shall supplement and be consistent with details shown on the drawings. Do not use one-sided or other eccentric connections, except in isolated cases where approval of Architect is obtained.

E. Welding:

1. Provide quality control and qualification of welders and welding procedures and operations as specified under "Inspection and Testing" in this Section.
2. Shop Welding Process: Use shielded metal-arc, submerged arc, gas metal-arc, and flux cored-arc, or other process approved by Architect.
3. Groove Welds: Provide complete penetration unless otherwise noted on Drawings.
4. Fillet Welds: Where weld symbol is not shown or welds are not dimensioned, provide continuous fillet welds all around and on both sides as appropriate. Minimum dimension shall be as shown in Table J2.5 of LRFD Specification or Table J2.4 of Allowable Stress Specification of AISC.
5. Base metal shall be checked by Contractor to insure absence of laminations or other defects. Welds shall be sound throughout and have no cracks.
6. Where structural joints are required to be welded, details of joints, technique of welding employed, appearance and quality of welds made, and methods used in correcting defective work shall conform to applicable requirements noted under References in this Section.
7. Prepare joint welding procedures and program of welding sequence (for each component and for welding jointing components to each other) and submit to Architect for approval before any welding is done. After approval, welding procedures and sequences shall be followed without deviation unless specific approval for change is obtained from Architect. Architect may require re-qualifications of these welding procedures by tests prescribed in AWS "Standard Qualification Procedures".
8. Each welder working on the project shall be assigned an identification symbol or mark. Each welder shall mark or stamp his identification symbol at each weldment completed, whether in shop or field.

F. Manual oxygen cutting shall be done only with a mechanically guided torch, except as permitted below.

1. Gas cut edges which are not welded and will be free of substantial stresses, as determined by the Architect, may be cut manually with an unguided torch provided that specified AISC edge distances to holes are maintained.
2. Gas cut edges which will be subjected to substantial stress (over one-half the allowable stress), as determined by the Architect, or which are to be welded may be cut manually with an unguided torch to a line within 1/8 inch of the finished dimension, with final removal of material completed by chipping or grinding to produce a surface quality equal to that of the base metal edges.

G. Openings in Structural Steel.

1. Cutting of openings differing from or in addition to those shown on approved shop drawings will not be permitted without written approval of Architect.

H. Corrective Work: Structural steel elements having fabrication errors and/or which do not satisfy tolerance limits shall not be incorporated in finished work. Such elements may be corrected if permitted by Architect and/or Testing Agency. Submit to Architect drawings showing details of proposed corrective work. These drawings shall be approved by Architect prior to performing corrective work. Corrective work shall be performed in accordance with requirements of Contract Documents. Corrective work and any retesting which may be required shall be at the Contractor's expense.

1. Identification: Structural steel members shall have an assigned position and identification mark or symbol, clearly indicated on each piece near one end. Marks shall correspond to that given on Shop Drawings and erection drawings related to specific members.

3.4 SHOP PAINTING

A. General: Verify that products listed below meet regulations of jurisdiction for Volatile Organic Compounds (VOC) emissions. Notify Architect if listed products do not comply and submit information about equivalent products that do comply.

B. Unexposed Steel:

1. Except as otherwise indicated on Drawings or specified herein, paint structural steel work in accordance with Reference Specifications in this Section.
2. Steel to be painted:
   a. Clean steel surfaces in accordance with SSPC-SP3, Power Tool Cleaning.
   b. Unless specifically excluded or modified, apply one shop coat of structural steel primer paint to steel. See Materials above for primer type.
   c. Apply paint to surfaces requiring paint only to within two inches of any field weld or high strength bolted friction-type connection. If for any reason surface to be field welded or bolted is painted, remove such paint completely to within limits before field welding or bolting.
3. Steel to be left unpainted:
   a. Surfaces to receive metal deck and/or shear connectors fastened by welding.
   b. Contact surfaces of high strength bolted connections.
   c. Finished Bearing Surfaces and Surfaces to be welded in field: Protect surfaces (e.g., bearing surfaces of columns and column base plates) against corrosion by use of rust-inhibiting coating that can be easily removed prior to erection or which has characteristics that make removal unnecessary prior to erection.
   d. Surfaces to receive sprayed-on fireproofing.

e. Member areas to be embedded in concrete or mortar.

4. Shop Coat Application:
   a. After steel has been properly prepared as specified above, apply structural steel primer paint to dry steel surfaces by brush, spray, or roller, assuring no running or sagging in accordance with manufacturer's directions as approved by Architect.
   b. Apply 2.0 to 3.0 d.m.t. of shop primer.
   c. Inspection of shop painting - as specified under "Inspection, Testing and Quality Control" in this Section.

C. Exposed Steel (Pre-finished)

1. Except as otherwise indicated on Drawings or specified herein, paint structural steel work in accordance with Reference specification in this Section.
2. Surface preparation:
   a. Exposed steel within protected environment, such as atrium pipe trusses and exposed framing members - SSPC SP-6, Commercial Blast Cleaning.
   b. Exposed steel subject to corrosive solutions or exterior atmosphere, such as water storage tank columns, shear heads, garage ramp beams, loading dock framing, cooling tower dunnage, relieving angles -- SSPC-SP6 - Commercial Blast Cleaning; or Galvanizing.
3. Primer Application - SPRAY ONLY
   a. Exposed steel within protected environment: single package epoxy urethane zinc-rich material such as "Tnemec 394 PerimePrime", “Dupont 62ZF” (80% zinc-rich), "Keeler & Long Methane Zinc Rich" or an approved performance equal at 3.0 to 3.5 mils d.f.t. Primer shall be rated Class B, and compatible with 25 pcf and higher spray-on fireproofing.
   b. Exposed steel subject to corrosive solutions or exterior atmosphere:
      1) SP-6 preparation: primer such as "Tnemec 27 Typoxy", "Dupont 25P”, “K & L 3700", or an approved performance equal; at 3.0 to 4.0 mils d.f.t.
4. Finish Coat - SPRAY ONLY
   a. Exposed steel within protected environment:
      1) First Coat: Epoxy-polyamide coating such as "Tnemec 27 Typoxy", “Dupont 25P”, "Keeler & Long 3500 Series", or an approved performance equal at 4.0 to 6.0 mils d.f.t.
      2) Second Coat: See Related Work sections.
5. Surfaces inaccessible to blast cleaning after assembly shall be blast cleaned and coated before assembly. Zinc-rich primers may be applied to friction type connections in accordance with AISC Specifications.
6. Contractor shall include complete details and description of coating operations on shop drawings for approval of the Architect.
7. A pre-production conference shall be arranged by the Contractor with the Architect, fabricator and representative of the paint manufacturer prior to work.

D. Notification: Notify Testing Agency five (5) days prior to shipment of any structural steel so paint inspection can be made. At these inspections dry mil thickness of paint film will be checked. Steel containing mill scale that can easily be removed with blade of pocket knife will be subject to re-cleaning and re-painting at no expense to the Owner.

3.5 GALVANIZING

A. Hot-dip Galvanizing: For steel exposed to the elements, weather or corrosive environments, and other steel indicated to be galvanized, provide coating for iron and steel fabrications applied by the hot-dip process.

1. Comply with ASTM A123 for fabricated products and ASTM A153 for hardware.
2. Provide thickness of galvanizing specified in referenced standards.
3. Galvanizing bath shall contain special high-grade zinc and other earthly materials.
4. Fill vent holes after galvanizing, if applicable, and grind smooth.

B. Certificate of Compliance for Shop Drawing Review by Galvanizer: If requested, submit galvanizer's certification that shop drawings for metal fabrications to receive metal coatings have been reviewed and that fabrications are acceptable to galvanizer for proper application of galvanizing and metal coatings. All drawings should be signed by the galvanizer to indicate acceptance of design for galvanizing.

C. Galvanizer shall supply a written warranty stating that the galvanized material shall remain free from 5% or more visible rust for a period of twenty years.

D. Coordination between Fabricator and Galvanizer: Prior to fabrication and final submittal of shop drawings to Architect, direct fabricators to submit shop drawings to the galvanizer for all metal fabrications to receive factory-applied metal coatings. Direct galvanizer to review fabricator's shop drawings for suitability of materials for galvanizing and coatings and coordinate any required modifications to fabrication required to be performed by the fabricator.

E. Rugosity: Factory-applied metal coatings shall exhibit a rugosity (smoothness) not greater than 4 rug (16-20 microns of variation) when measured by a profilometer over a 1 inch straight line on the surface of architectural and structural elements that are less than 24 pounds per running foot. Profilometer shall be capable of operating in 1 micron increments. Surface blasting prior to application of factory-applied post galvanizing wet coatings will produce a high rugosity and not be acceptable.

3.6 HEADED STUD WELDING REQUIREMENTS

A. Testing Agency shall conduct test welding procedure for welding of headed studs.

B. Headed studs shall be applied in accordance with manufacturer's printed instructions. Use only personnel and equipment authorized by manufacturer.

C. Check headed studs for indications of insufficient and improper weld:

1. Less than 360 degree fillet for headed studs.
2. Burn-off (reduction in length after welding) less than 1/8 inch.
3. Cold appearance of weld.

D. If, after welding of any headed stud, visual inspection indicates any imperfections listed above or any other questionable appearance, such shear connector shall be struck hard with three-pound hammer and bent 15 degrees off perpendicular to beam and toward nearest end of beam. Headed studs meeting this test shall be considered acceptable and left in this position. Headed studs failing under this test shall be replaced.

E. Personnel welding headed studs shall be qualified using elements of above procedure, prior to any production welding of headed studs.

3.7 FIELD ERECTION

A. Except as otherwise indicated on Drawings or specified herein, erect structural steel in accordance with Reference Specifications in this Section.

B. Surveys: Employ an engineer or surveyor for accurate erection of structural steel. Check elevations of concrete and masonry bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Architect. Do not proceed with erection until corrections have been made, or until compensating adjustments to structural steel work have been agreed upon with Architect. Establish required leveling and plumbing references with respect to expected service temperatures inside the building; compensate as required for difference between service temperature and erection temperature.

C. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds. Loads imposed during construction shall be determined by an Engineer employed by Contractor.

D. Field Connections: Beams shall have framed connections using 3/4 inch diameter (min.) high strength bolts in accordance with requirements of AISC "Manual of Steel Construction" and Contract Documents. Do not use one-sided or other eccentric connections, except in isolated cases where approval of Architect is obtained. Snug all nuts before applying final torque to any one.

1. High Strength Steel Bolts
    a. Perform installation by using pneumatic powered impact wrenches with sufficient capacity and adequate supply of compressed air. On large bolts (1-1/8" and 1-1/4" A325 and 1" or over A490) wrenches used shall be equivalent in capacity to a Chicago Pneumatic 6120. Air pressure shall be maintained at 100 psi at the wrench.
    b. Perform installation in accordance with turn-of-nut method outlined in RCSC "Specification for Structural Joints Using ASTM A325 or A490 Bolts", with modifications noted below.
2. Use hardened washer under bolt head or nut, whichever is turned in tightening, unless oversize holes have been approved which require such washer under both head and nut. Use not more than two washers.
3. Qualification of high strength bolting procedures and operations shall be as specified under "Inspection, Testing and Quality Control", in this Section.
4. Refer to this bolting installation method as "Modified Turn-of-nut Tightening Method".
    a. In lieu of "modified turn-of-nut" method, direct tension indicator washers or snap-off TC bolts may be used at Contractor's option provided it can be demonstrated by an accurate direct measurement procedure that bolt has been properly tensioned; written approval by Architect is required.
        1) If tension indicator washers are used, place protrusions against bolt head and tighten the nut. Do not tighten at head. All plies must first be brought into firm contact by partially compressing the direct tension indicator bumps. Tightening shall commence from the most rigid part of the connection to its

free edges. The part not being turned must be held by a spud wrench, as the bolt must not be allowed to spin.

2) If snap-off bolts are used for friction type connections, snug tight all bolts in connections before proceeding to apply final snap-off torque.

b. Make joints without use of erection bolts; high strength bolts required for joint shall serve that purpose.

c. Correct poor matching of holes by drilling to next larger size and using larger size bolt, if approved by Architect. Welding or enlarging with drift pins shall not be permitted without Architect's approval.

d. If top flange plates are used at girder moment connections, bolts at top flange plate shall be oriented nut-end down.

5. Field Welding: Execute in accordance with requirements under "SHOP FABRICATION" in this Section, excepting those requirements which apply to shop conditions only.

E. Errors in shop fabrication or deformations resulting from handling and/or transportation that prevent proper assembly and fitting of parts shall be reported immediately to Architect for approval of method of correction. Approved corrections shall be made at Contractor's expense.

F. Furnish templates and anchor bolts and instructions for setting of anchor bolts and other items to be embedded in cast-in-place concrete, in ample time so that this work will not be delayed.

G. Setting Base and Bearing Plates: Clean bearing surfaces of concrete and masonry and the bottom of the plates. Set plates level to correct elevations and support temporarily on steel wedges, shims, leveling devices, or as shown on Drawings, until corresponding supported member has been positioned, plumbed and anchor-bolted. Entire area under plates shall then be packed solidly with non-shrink bedding grout. Leave protruding leveling devices in place until after grout has attained required strength, and then cut off flush with top or edges of base plates, or both, except as otherwise noted.

H. Align, level, and adjust members accurately prior to final fastening. Fasten compression member splices only after abutting surfaces have been brought completely into contact. Splice members only where shown on the Drawings.

I. Top flanges of beams to receive shear connectors, shall be free of paint, water, dirt, rust, or any other material detrimental to welding.

J. Openings in structural steel required in field:

1. Make no openings without the specific written approval of the Architect. All re-entrant corners shall be shaped notch-free to a radius of at least 1/2 inch at blocks, copes, cuts and openings.
2. Openings in structural steel shall be cut and/or reinforced only by structural steel Contractor, and only with specific prior written approval of the Architect.
3. Field Oxygen Cutting: Not to be performed without written consent of Architect. Once approval is obtained, execute in accordance with requirements under "FABRICATION" in this Section.

3.8 FIELD PAINTING

A. Field Coat application:

1. Use same type of paint as used for shop coat.

2. After erection, touch-up field welds and connections and other surfaces required to be painted. Do not paint connections until after inspection and approval of Testing Agency.
3. Do not paint when ambient temperature is below 37 degrees F. or when conditions differ from paint manufacturer's recommendations, as approved by Architect.
4. Touch up damaged galvanizing with zinc-rich paint in accordance with ASTM A780.

3.9 INSPECTION AND TESTING

A. Inspection and testing of structural steel fabrication and erection will be performed by an independent Testing Agency, under a separate contract with the Owner. Materials and workmanship shall be subjected to inspection and testing in mill, shop and/or field by Testing Agency and shall be subjected to periodic observation by the Architect. Such inspection and testing shall not relieve Contractor of his responsibility to provide his own inspection, testing, and quality control as necessary to furnish materials and workmanship in accordance with requirements of Contract Documents.

B. Requirements of this Section are generally written for purpose of securing best workmanship and end result. Certain deviations may be desirable under certain project conditions, however, and may be allowed after examination by and upon written approval of Architect. Any such approved deviation shall not be construed as waiver of requirements of Specifications.

C. Contractor shall maintain his own inspection and quality control of shop and field work. Quality control and inspection of welding work shall consist of supervision by Contractor's own welding inspector using non-destructive spot testing, at rate of at least one test per 50 linear feet of weld by each welder, except that full penetration welds shall be tested 100 percent by the ultrasonic method. Results of such tests shall be provided to Architect and/or Testing Agency when requested.

D. Notify Architect and Testing Agency prior to start of any fabrication, erection, or other phases of work so as to afford them reasonable opportunity to visit the site. Such notification shall be made at least 36 hours in advance.

E. Facilitate inspection and testing by Testing Agency. Contractor shall, at his own expense, furnish Testing Agency, upon request, with:

1. Complete sets of approved Shop Drawings and corrective work procedures at fabricating shop(s) and in field.
2. Cutting lists, order lists, material bills, shipping lists, and mill reports.
3. Information as to time and place of all rollings and shipments of material to shops and field.
4. Representative sample pieces requested for testing.
5. Free and safe access and assistance for testing materials, and proper facilities for inspection of work, in mill, shop and field.

F. Do not remove any marks or tags applied by Testing Agency identifying rejected work.

G. Any work found deficient shall be corrected or replaced in accordance with these specifications. Deficient welds shall be cut out to sound material and rewelded. Deficient assemblies shall be taken apart, corrected and reassembled, using new materials as required. A490 bolts shall not be reused. A325 bolts may be retightened once only.

H. Structural steel work which has been rejected by Architect and/or Testing Agency in mill, shop, or field, shall be corrected by Contractor without delay and at no expense to the Owner. Additional tests shall be performed at Contractor's expense to confirm compliance of corrected work.

I. The acceptance of steel work at the shop shall not prevent its final rejection at the job site, or even after it has been erected, if it is found to be defective in any way.

J. Qualifications for Welding Work:

1. Qualify welding processes and welding operators in accordance with the latest edition AWS "Standard Qualification Procedure".
2. Provide certificates of welders to be employed in the work showing that they have satisfactorily passed AWS qualification tests for the specific types of welds they will be doing; where certification dates are older than 12 months before start of welding work, certify that affected welder(s) have been continuously employed doing the type(s) of welds since certification.

K. Sampling and testing for quality assurance of bolted and welded work by the Owner's testing agency may include the following, as directed by the Architect.

1. Shop and Field Bolted Connections:
   a. Inspect in accordance with RCSC specifications. Calibrate wrenches periodically.
   b. A minimum of two bolts in each connection shall be tested. If tension indicating washers are used, verify bolt tension in accordance with approved procedure for this project (see paragraph 3.8.D.1) and verify position of washers and method of tightening nut. If snap-off bolts are used, verify that all knurled ends have been snapped off. Periodically verify snap-off torques.
2. Shop and Field Welding: Inspect and test during fabrication of structural steel assemblies and in accordance with AWS Codes, as follows:
   a. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
   b. Perform visual inspection of all welds.
   c. Perform random verification ultrasonic testing of shop full penetration welds.
   d. Perform 100% ultrasonic testing, in accordance with ASTM E-164, on all field full penetration welds.
3. Camber: Inspect fabricator's procedures and material to ensure specified camber is achieved in accordance with referenced standards.

END OF SECTION

SECTION 054000

LIGHT GAUGE METAL FRAMING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All of the Contract Documents, including Drawings, General Conditions, and all Sections of Division 1 - General Requirements, apply to the Work of this Section.

1.02 DESCRIPTION OF WORK

A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:

1. Light gauge metal framing for support of masonry walls and finish ceilings

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Carefully examine all of the Contract Documents for requirements which effect the Work of this Section.

B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:

1. Section 092000 – Gypsum Drywall

1.04 SHOP DRAWINGS AND ENGINEERING COMPUTATIONS

A. The Contractor shall engage the services of a professional engineer, registered in the State of Massachusetts to prepare complete shop drawings and structural computations of all Work of this Section based on, and closely following, the layouts and details on the drawings. The shop drawings and the structural computations, with the Engineer's seal affixed thereto, shall be submitted to Architect for approval in accordance with the requirements of Division One. The shop drawings and structural computations shall be sufficient, in conjunction with this specification, to provide the complete basis for the fabrication and installation of the Work of this Section. Do not order materials or begin fabrication or erection of light gauge steel framing Work until Architect's approval of these submissions has been obtained.

B. The shop drawings shall show complete framing elevations and Sections of all installations, shall include complete large scale details of all typical and special conditions of construction; shall clearly indicate materials, sizes, shapes, Sections, gauges, thicknesses, and finishes of all members; shall clearly indicate all materials and methods used in the connecting and anchoring of the Work, including locations, and spacing of all welds and anchors; and shall indicate proposed Section tolerances.

C. The structural computations shall provide a complete structural analysis of all typical and special conditions of construction, and shall certify the various conditions as conforming to the applicable building code, with specific added statement that that seismic and wind forces have been taken into full account.

D. Wind loading shall be based on design pressure specified in the referenced Building Code. Seismic loading shall comply with Commonwealth of Massachusetts Building Code.

E. Framing system shall limit stud deflection to L/600, without consideration of the stiffness of attached plywood sheathing, nailable insulation, plywood fascia elements or perforated metal soffit materials.

F. Framing system shall incorporate a deflection type header track with slip connections to resist vertical deflection in combination with horizontal strapping to keep studs properly positioned and aligned in track during assembly.

G. Approval of shop drawings will be for size and arrangement of items and strength of connections. Errors in dimensions shown on the shop drawings shall be the responsibility of the light gauge metal Contractor.

H. Do not Work without approved shop drawings. Fabrication of any material or performing any Work prior to final approval of shop drawings shall be entirely at the Contractor's risk.

1.05 QUALITY ASSURANCE

A. Framing Identification: Each structural "C" stud component shall be identified with a factory applied marking denoting the manufacturer's name and gauge thickness of the steel. Studs manufactured from 33 ksi material shall be color coated with blue markings. Studs manufactured from 50 ksi steel shall be color coated red. The framing Contractor is responsible for notifying the manufacturer in writing of this requirement.

B. Qualifications/Certification:

1. The framing Contractor shall provide documentation of no less than three successfully completed projects which utilized framing systems similar in scope to the application shown on the Contract Documents.

2. Provide certification that welding procedures will be in accordance with requirements of the current edition of the American Welding Society (AWS) "Specification for Welding Sheet Steel in Structures", D1.3)

C. Pre-Construction Conference: A site meeting shall be held with representatives of the General Contractor, Architect, the Framing Contractor, and the Owner's Testing Laboratory Three days prior to the start of light gauge steel framing Work to inspect substrata and review installation requirements.

1.06 SUBMITTALS

A. Prior to commencement of Work, the Contractor shall submit the following items for the approval of the Architect and Engineer of record.

1. Drawings: For field assembled installations, the Contractor shall provide drawings addressing the construction of each unique framing condition and connection. The drawings shall include descriptions, locations and spacing of each framing component and fastener.

a. For prefabricated applications, include frame drawings depicting shape, dimensions, components, locations and construction sequence.

2. Structural Calculations: Structural calculations shall be submitted which include development of loading requirements and structural analysis of each unique framing and connection condition.

3. Literature: Submit current technical literature prepared by the framing manufacturer. The structural properties and load tables shall be prepared in accordance with contents of the current AISI “Specifications for the Design of Cold Rolled Steel Structural Members”.

4. Certifications: Submit written statements prepared by the framing manufacturer certifying conformance with the minimum requirements of Part 2 of these Specifications. Provide certification of welding procedures and personnel.

5. Samples: Submit 12" long Sections of all galvanized steel stud and runner members and full size samples of all connection accessories.

1.07 REFERENCE SPECIFICATIONS

A. In addition to other requirements, the Work for this Section shall comply with all applicable provisions of the following standards. Copies of these publications shall be kept available in the shop and field.

1. "Specification for Design of Cold Formed Steel Structural Members", American Iron and Steel Institute, Latest Edition.

2. "Code of Standard Practice for Steel Buildings and Bridges", American Institute for Steel Construction, Latest Edition.

3. "Code for Welding Sheet Steel in Structures", American Welding Society, D1.3.

4. "Painting Manual, Vol. 1, Good Painting Practice" and "Painting Manual, Vol. 2, System and Specifications", Steel Structures Painting Council.

5. "Commonwealth of Massachusetts State Building Code", Latest Edition.

6. ASTM C 1007, Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.

7. ASTM C 955, Load Bearing (Transverse and Axial) Steel Studs, Runners (Track), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.

8. ASTM C 754, Installation of Steel Framing Members to Receive Screw Attached Gypsum Board.

9. ASTM C 645, Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application Of Gypsum Board.

1.08 INSPECTION, TESTING AND QUALITY CONTROL

A. Field inspection and testing of Work performed under this Section shall be in accordance with testing requirements of 780 CMR, Chapter 17-Special Inspections and the Owner’s Statement of Special Inspections. The Owner’s testing agency shall be present when the Work of this Section is being constructed, and assisted while conducting their Work. Coordinate with the Owner’s designated representative and the testing agency as required to verify requirements for testing of Work performed under this Section.

B. Materials and Workmanship, including welding and anchoring, shall be subject to inspection and testing in mill, shop, and /or field by the Architect and /or Testing Agency. Such inspection and testing shall not relieve the Contractor of his responsibility to provide

his own inspection, testing, quality control and to furnish materials and Workmanship in accordance with the requirements of the Contract Documents.

C. Any material or workmanship rejected by the Architect and/or Testing Agency in mill, shop, or field, shall be replaced promptly by the Contractor to the satisfaction of the Architect and /or Testing Agency, and at the Contractor's expense.

D. Acceptance of Work in shop shall not prevent the final rejection of Work at the job site, even after erection, if Work is found to be defective in any way.

1.09 QUALIFICATIONS OF WELDERS

A. The Contractor shall only employ welders who qualify for the Work they are to do by tests as prescribed in AWS D1.3.

B. Certificates of qualification of welders from a recognized agency whose tests, procedures and requirements are at least equal to those of the American Welding Society may be accepted.

1.10 DELIVERY AND STORAGE OF MATERIALS

A. All manufactured materials shall be delivered to the site in original packages or containers bearing manufacturer's names and brand names, type of material and contents.

B. Protect materials against dampness. Store off the floor, under cover, away from sweating walls and other damp surfaces, and adequately protected against damage from all other sources.

1.11 COORDINATION

A. The Contractor shall examine all drawings as to the requirements for accommodations and/or the installation of Work of other trades and provide holes and connections as required for such Work and for site assembly of metal Work. Holes shall be drilled or punched and reamed in the shop. Show sizes and locations of all such holes on the shop drawings. Coordinate location and installation of wood blocking for through wall flashing nailer.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURER’S

A. Acceptable manufacturer’s of light gauge steel framing shall be as follows:

1. Dale Industries
2. Dietrich Industries Inc.
3. Superstud
4. Marino Ware

2.02 LIGHT GAUGE STEEL FRAMING SYSTEM

A. Steel Stud System: A complete proprietary framing system, consisting of:

1. Studs: Structural framing components shall be formed from steel meeting the requirements of ASTM A446 as follows:

a. Studs - 12, 14 and 16 gauge with track and accessories 12 and 14 gauge: Yield strength shall be Fy = 50 KSI.
b. Studs - 18 and 20 gauge with track and accessories 16, 18, and 20 gauge: Yield strength shall be Fy = 33 KSI.

2. Galvanized Coating: Steel framing products shall be zinc coated in accordance with ASTM A525 for min. G90 coating.

3. Fasteners: Fasteners for steel stud framing system shall consist of framing screws, nuts, bolts, washers and other fasteners, welding, powder actuated fasteners, expansion bolts and adhesive anchors.

a. Framing Screws: All framing screws incorporated into the Work shall be fluoropolymer coated. Screws shall be of diameter, length and drilling capacity as recommended by framing manufacturer for the intended application.

4. Sill and Track: 16 gauge minimum, 33 KSI yield strength steel channel sill and head runner track. Sill track shall have minimum 2” flange. Head tracks shall be deflection type with minimum 2-1/2” flanges.

5. Tension Straps, Bridging and Girts: 33 or 50 KSI yield strength steel flat strap steel in thickness and width as required for joist bridging, shear walls and backer plates. Tension straps shall be used in conjunction with deflection head track to keep studs properly positioned and aligned in track during assembly.

6. Deflection Clips: Provide deflection clips for Architect approval from manufacturer’s listed above for attachment of framing studs to primary structure. Deflection clips shall be capable of providing lateral support for framing members while allowing for vertical deflection of the primary structure. Deflection clips shall have rigid attachment to structure and screw attachment to stud web using step-bushings to permit frictionless vertical movement. Clip shall allow for a maximum 3/4” of vertical primary frame movement and as much as 2” of horizontal displacement between stud wall and support angle. Provide deflection heads, as required, and indicated on the Drawings.

7. Welding and Related Supplies: Provide all welding supplies and accessories, all anchors and fastening devices, and all other items required for complete installation.

8. Finishes: All parts of framing system including, but not limited to studs, bracing and bridging, sill and head channels shall be hot dipped galvanized in accordance with ASTM A525, G90 Coating Designation.

B. Hot-rolled steel angles shall conform to ASTM A36, of sizes indicated on drawings. All steel angles provided under this Section, except clip angles attached to rear flange of studs, shall be hot-dip galvanized in accordance with same requirements as specified under Section 05500 - Miscellaneous Metals.

PART 3 - EXECUTION

3.01 GENERAL

A. Fabricate and install light gauge steel framing in conformance with approved shop drawings, and structural computations, the printed materials and Workmanship standards

of the manufacturer of the light gauge steel framing materials, and applicable ASTM, AISC and AWS printed standards. Tolerances shall conform to AISC tolerance standards for steel Work except as otherwise shown on the approved shop drawings.

3.02 GENERAL INSTALLATION

A. Prefabricated wall panels shall be square, with components attached in a manner that will prevent racking and to minimize distortion while lifting.

B. Cutting of steel framing shall be by saw, shear or plasma cutting equipment. Conventional oxyacetylene torch cutting is not permitted.

C. Sheathing boards shall be installed in accordance with the most stringent requirement of the written specifications of the sheathing manufacturer or the current ASTM Specification addressing the same.

D. Temporary bracing shall be provided and remain in place until the Work is completely stabilized.

E. All framing components shall be plumbed, aligned and leveled.

F. Back blocking for wall mounted fixtures shall be designed and anchored to resist the applied loads.

G. Insulation equal to that specified elsewhere within the wall system shall be furnished at multiple boxed members inaccessible to the insulation Contractor.

3.03 WALL INSTALLATION

A. Provisions for Primary Frame Deflectors: The construction of the exterior wall assembly shall accommodate anticipated primary frame deflections.

1. Bypass Walls: Wall which bypass the primary frame shall be connected with accessories which accommodate the anticipated primary frame movements and provides for horizontal adjustments to assure a plumb and aligned installation of the stud. Furnish deflection clips by The Steel NetWork, Inc. Raleigh, NC (phone 888-474-4876) for connections to concrete slabs and deflection studs where attachment to structural steel members is required or as required by the steel stud manufacturer.

2. Infill Walls: Walls constructed between the primary frame shall be constructed using a deflection clips and deflection track as specified above. The studs shall be cut to a length equaling the wall height less the anticipated deflection allowance, with a cutting tolerance of +0, 1/8” maximum. A minimum 1-1/2” bearing width shall be provided at the end of the stud.

    a. The deflection clips shall be of gauge and steel grade as dictated by structural analysis. Continuous bridging shall be required by structural design calculations.

B. Mechanical bridging shall be installed prior to the attachment of sheathing materials. Bridging rows shall be spaced in accordance with manufacturer’s recommendations or as dictated by structural analysis.

C. Stud ends must be square cut and installed seated in the top and bottom tracks. An exception is made where the stud end terminates at a deflection track.

D. Uniform and level bearing support shall be provided for track members.

E. Splicing of framing, other than the continuous track at top and bottom of the wall is not permitted.

F. Multiple framing components required at posts and jambs, sills and head conditions of framed openings, shall assemble with intermediate connections between the members.

3.03 CONNECTIONS

A. Fasteners Types: Fasteners shall be designed and installed in accordance with the manufacturer's written instructions or industry accepted standards. Concrete fasteners shall be installed after the design compressive strength of the Concrete has been obtained.

1. Framing Screws: Screw penetrations through joined materials shall not be less than three exposed threads. When screw attachments are made to framing components of different thicknesses, attachment shall be made through the thinner component into the heavier component. Screws shall provide adequate cutting to accommodate the thickness to be drilled. Drilling must be completed before the threads engage the material.

2. Welds: Welded connections shall be performed in accordance with the current edition of the AWS D1.3 Specification for Welding Sheet Steel in Structures. The minimum weld throat thickness must match or exceed the base metal thickness of the thinnest connected part unless noted otherwise. Welds shall be cleaned and painted with galvanizing repair paint.

   a. Welding details shall be designated by the Professional Engineer specified hereinbefore, who shall be familiar with welding practice. In general, the standards in the AISC, "Manual of Steel Construction" (latest addition) and the AWS standards specified herein above, will be acceptable

3. Power Actuated Fasteners (PAF):

   a. To Steel: PAF's used for the attachment of the framing system to hot rolled steel components shall possess knurled shanks. Full tip-penetration through the steel component is required. A 3/4 inch minimum edge distance shall be maintained.

   b. To Concrete: PAF's used for the attachment of framing to concrete shall be of adequate length to ensure minimum embedment requirements. Unless noted otherwise, a 3 inch minimum edge distance shall be maintained. Multiple fasteners shall not spaced more than 4 inches apart.

4. Expansion Bolts or Adhesive Anchors to Concrete: Anchors shall be installed in accordance with manufacturer's current printed instructions.

3.04 REPAIR, PROTECTION AND CLEANING

A. Damage done to concrete decks and/or slabs, by spalling or other means, shall be repaired and made good to satisfaction of Architect as Work of this Section.

B. All shop and field welds, including those to structural steel members, shall be thoroughly cleaned of all flux and residue and given one touch-up coat of primer equivalent to shop

coat applied to the structural steel. All galvanized steel-to-galvanized steel welds only, use zinc rich primer equivalent to that specified under Section 05500.

C. During the erection of the light gauge steel framing Work, protect the Work of other trades against damage and soiling by the exercise of reasonable care and precautions. Repair or replace to the satisfaction of Architect any Work so damaged or soiled.

D. Upon completion of this Work, remove all rubbish, debris and tools from the Work and leave the premises broom clean.

END OF SECTION

SECTION 07100

WATERPROOFING, DAMPPROOFING, AND CAULKING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Include General Conditions and applicable parts of Division 1 as part of this Section.

B. Examine all other Sections of the Specifications for any Requirements that affect Work of this Section, whether or not such Work is specifically mentioned in this Section.

C. Coordinate Work with that of all other Trades affecting, or affected by, Work of this Section. Cooperate with such Trades to assure the steady progress of all Work under the Contract.

1.02 DESCRIPTION OF WORK

A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:

1. Joint fillers and sealers, including preparation, filling, sealing, and curing of joints

2. Protection of completed Work

3. Staging, scaffolding, hoists, and related equipment

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Carefully examine all of the Contracts Documents for requirements which effect the Work of this Section.

B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:

1. Section 078410 - Through Penetration Firestop Systems
Section 092500 - Gypsum Drywall
Section 230000 - HVAC
Section 260000 - Electrical

1.04 QUALITY ASSURANCE

A. The Work of this Section shall be performed by manufacturer approved applicators having a minimum of five (5) years application experience with the required materials.

B. For each type of material required for the Work of this Section, provide primary materials which are the products of one manufacturer. Provide secondary materials which are acceptable to the manufacturers of the primary materials.

C. Make all arrangements and payments necessary to have the approved manufacturer's authorized representative on-site at beginning of waterproofing to advise installer and to ensure compliance with manufacturer's requirements.
1. The Contractor shall make all arrangements and payments for an independent inspection service to monitor installation of composite sheet waterproofing material for compliance with requirements of the Contract Documents, and the

manufacturer's written requirements. The inspection service shall be an approved company participating with the waterproofing manufacturer's Certified Inspection Program, and shall produce reports and digital photographs documenting each inspection. Reports shall be made available to the Owner, Architect, manufacturer, and installer. Inspections should include substrate examination, beginning of waterproofing installation, periodic intervals, and final inspection prior to concrete or backfill placement against the waterproofing.

D. Contractor shall schedule a pre-installation conference with Architect and related sub trades, to establish procedures to maintain optimum working conditions and to coordinate the Work of this Section with related and adjacent Work. Advise other trades to ensure that no other Work adversely effects sealer bonding surfaces.

1. Verify that final composite sheet waterproofing and waterstop details comply with the approved manufacturer's current written installation requirements and recommendations.

2. Pre-installation conference attendees shall include the Contractor, Owner's designated representative, Architect, inspection firm, waterproofing contractor, concrete contractor, site contractor, and mechanical and electrical contractors if Work penetrates the waterproofing.

E. Provide materials suitable for the intended use and compatible with the materials with which they will be in contact. Compatibility of sealants and accessories shall be verified in writing by the manufacturer.

1.05 SUBMITTALS

A. Provide submittals in accordance with requirements of Section 01341 – Submittals.

B. Submit manufacturer's product data, installation instructions, use limitations and recommendations for each material and system required by the Work this Section.

1. Prior to ordering waterproofing materials, the Contractor shall submit the items listed below to the Architect for approval:

a. 3 copies of manufacturer's specifications for proposed products and installation instructions.

b. Written approval of manufacturers use of the products in the proposed system.

c. Specimen copy of membrane manufacturer's warranty.

2. Dimensioned shop drawings indicating areas of Work, membrane layout and profile details of flashing methods for penetrations and terminations. It shall be the manufacturer's responsibility to verify compatibility with surrounding materials, especially at interface with other types of waterproofing.

C. Provide samples as follows:

1. Submit representative samples of each control joint, sealant and expansion joint specified herein, showing the full range of color and finish variations expected. Provide actual samples having minimum length of 6 inches.

2. Provide samples of each waterproofing material to be used in the systems described herein, including primers, mastics, tapes, liquid waterproofing, termination bars and fasteners, protection and drainage composite boards.

D. Provide certifications as follows:

1. Provide manufacturer's certification of sealant and joint material performance, including compatibility with adjacent materials to which material will be applied. Provide certified test reports on aged performances, hardness, stain resistance, adhesion, cohesion and tensile strength, low temperature flexibility, elongation, modules of elasticity, water absorption, and the resistance to weight loss and deterioration due to heat, ozone and ultraviolet exposure.

2. Submit the approved manufacturer’s written certification demonstrating compliance with environmental material requirements in accordance with requirements of the Contract Documents, as required for completion of the High Performance School Initiatives Criteria Scorecard by the Owner.

1.06 TESTS

A. Submit samples of every material to be used in the Work including, but not limited to, glass, gaskets, glazing materials, framing members, and all other components such as precast concrete, brick, concrete block and other adjoining materials, and accessories, to glazing sealant manufacturer to verify sealant compatibility and to determine, by testing in accordance with requirements of ASTM C794, if primers and what type of primers are required to ensure adhesion to substrates.

1. Submit at least 6 pieces of each type, class, kind, condition, and form of glass including monolithic, laminated, coated and insulated glass for adhesion testing. Provide 6 pieces of each type of brick, precast concrete, concrete block, and other adjoining materials for adhesion and staining testing.

2. Schedule sufficient time for testing, analysis and reporting of results, understanding that long lead times are required by the sealant manufacturer.

3. Obtain manufacturer's written report and recommendations regarding proper sealant choice and use. Use sealants and substrates only in combinations for which favorable adhesion and compatibility results have been obtained.

4. Make all arrangements and pay all expenses related to these tests.

B. Periodically test sealants in place for adhesion using methods recommended by sealant manufacturer. Promptly replace all sealant which does not adhere or which fails to cure properly.

C. If manufacturers cannot or will not perform these tests, employ at Contractor's expense an independent testing agency acceptable to the Architect to perform tests and certifications indicated.

1.07 MOCK-UPS

A. Provide Mock-ups before beginning Work of this Section at location acceptable to Architect and obtain Architect's acceptance of visual qualities, functionality, and compatibility with adjacent construction. Protect and maintain acceptable mock-ups throughout the Work of this Section to serve as criteria for future acceptance of respective Work. Acceptable

mock-ups may be incorporated into the finish Work. Mock-ups shall include, but not be limited to, the following:

1. 10 Linear feet of each type of sealant, crack and joint control material specified.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver materials and products to the job site in original, unopened package, clearly labeled with the manufacturer's identification and printed instructions. All material shall be stored and handled in accordance with manufacturer's instructions and recommendations. Protect from damage

1.09 PROJECT CONDITIONS

A. Perform Work only when ambient conditions are within the limits established by manufacturers of the materials and products used.

B. Proceed with Work related to composite sheet waterproofing only when substrate construction and penetrating Work is complete and concrete or mortar has cured for at least 28 days.

C. Provide ventilation in accordance with the approved manufacturer's written requirements and recommendations throughout application and curing for all materials specified in this Section.

1.10 WARRANTY

A. Provide written warranty signed by manufacturer, installer and Contractor, agreeing to repair or replace Work which exhibits defects in materials or Workmanship. "Defects" is defined to include, but is not limited to, leakage of water, abnormal aging or deterioration, and failure to perform as required. Include requirement for removal and replacement of covering and connected adjacent Work. Warranty periods shall be as follows:

1. Sealants and Crack Control Materials: 5 years from date of Substantial Completion

2. Exterior sealants: 20 years from date of Substantial Completion

1.11 SCAFFOLDING AND EQUIPMENT

A. Provide, maintain, and remove safe and adequate interior and exterior staging, scaffolding, hoists, and all other related equipment, as required for proper and complete execution of the Work of this Section in accordance with requirements of the Contract Documents. Staging, scaffolding, hoists, and all other related equipment shall comply with all applicable Federal, State, and local regulations and codes.

B. Staging, scaffolding, hoists, and all other related equipment shall be maintained as long as required to complete the Work, and removed when no longer required.

PART 2 - PRODUCTS

2.01 SILICONE SEALANTS

A. General:

1. Each sealant shall be checked for adhesion and compatibility with all adjacent materials. Select a sealant that is recommended by the approved manufacturer for the specified application.

2. Color of the sealant shall be as selected by the Architect from the approved manufacturer's complete selection of standard and premium colors.

B. Provide single component, acetoxy silicone sealant, Tremsil 200 by Tremco, Inc. or Architect approved equal by Pecora or Sika, for all interior joints, conforming to the following requirements:

1. Type S, Grade NS, Class 50, Use NT, G, A and O; in accordance with requirements of ASTM C 920

2. Class A; in accordance with requirements of Federal Specification TT-S-230 and TT-S-001543A

3. Dynamic Movement Capability: +/- 50%; in accordance with requirements of ASTM C 719

4. FDA regulation 21 CFR 177. 2600

5. Shore A hardness of 25-35; in accordance with requirements of ASTM C 661

6. Elongation: 450%; in accordance with requirements of ASTM D 412

7. Tensile Strength @100% Elongation: 45-55 psi; in accordance with requirements of ASTM D 412

8. Ultimate Tensile Strength; 165 psi; in accordance with requirements of ASTM D 412

9. Peel Strength: 25-35 pli; in accordance with requirements of ASTM C 794

2.02 EXTERIOR SILICONE SEALANT

A. Provide single component, ultra low modulus, fire resistant, UV resistant, flexible sealant, 790 as manufactured by Dow-Corning, or Architect approved equal by Pecora or Sika, for all exterior expansion and control joints, curtain walls, perimeter caulking at wall openings, and bedding of mullions and frames. Sealant shall comply with the following requirements:

1. Type S, Grade NS, Class 25, Use NT, M, A and O; in accordance with requirements of ASTM C 920

2. Type II, Class A; in accordance with requirements of Federal Specification TT-S-00230C

3. Shore A Hardness: 15; in accordance with requirements of ASTM D 2240

4. Cyclic Movement: +100%/- 50%; in accordance with requirements of ASTM C 719

2.03 MISCELLANEOUS MATERIALS

A Provide primers in accordance with the approved manufacturer's written requirements, for surfaces to be adhered to.

B. Provide bond breaker tape No. 40 or No. 531 (heavy duty), as manufactured by Valley Industrial Products, or Architect approved equal by Decker, in accordance with the approved manufacturer's written requirements, appropriate for the sealant being used.

C. Provide backer rods compatible with the specified sealant, and as follows:

1. Backer rod for all building joints shall be nonabsorbent, with highly resistant interior network of closed and open cells, SOF ROD as manufactured by Applied Extrusion Technologies, or Architect approved equal.

2. Backer rod for paving and floor joints shall be closed cell polyethylene rod extruded in continuous lengths, GREEN ROD as manufactured by NMC, or Architect approved equal.

PART 3 - EXECUTION

3.01 INSPECTION

A. For each material the installer shall examine substrates, supports, and conditions under which this Work is to be performed and notify Contractor, in writing, of conditions detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected. Beginning Work means Installer accepts substrates and conditions.

B. Strictly comply with the approved manufacturer's written instructions and recommendations, except where more restrictive requirements are specified in this Section.

3.2 JOINT SEALANTS AND FILLERS

A. Clean joint surfaces immediately before installation of sealants, primers, tapes and fillers. Remove all substances which could interfere with bond. Prime, etch, or roughen joint surfaces as required to improve bond. Tape or mask adjoining surfaces to prevent spillage and migration problems. Provide backer rods for all liquid sealants except where specifically recommended against by sealant manufacturers. Prevent three sided adhesion by use of bond breaker tapes or backer rods.

B. Force sealant into joints to provide uniform, dense, continuous ribbons free from gaps and air pockets. Install sealants so that compressed sealants do not protrude from joints. Dry tool sealants to form a smooth dense surface with joint surfaces adhering equally on opposite sides. At horizontal joints form a slight cove to prevent trapping water. Except in hot weather, make sealant surface slightly concave.

1. Make sealant joint depth equal to joint width for joints up to 1/2" wide. For joints over 1/2" wide, make depth equal to one-half of the joint width. Joint depth at exterior silicone sealant shall not be greater than ½"

2. Fill all joints solidly and continuously with a sealant, neatly applied with a standard caulking gun in a continuous motion, using slight pressure. "Push" the sealant bead ahead of the nozzle; do not "drag" the nozzle.

3. Within 5 minutes of sealant application and before sealant skins over, dry tool the joint surface with a concave tool to insure intimate contact with substrate and to eliminate air bubbles. Do not use any liquid for tooling. Provide a smooth, uniform, finished surface.

4. Avoid contaminating adjacent surfaces with excess sealant. Remove all traces of smears and droppings on metal, stone, glass, or other surfaces promptly, using a solvent recommended by the sealant manufacturer and that will not damage or discolor the building surfaces. Remove smears and droppings on face surfaces by mechanical means after the initial cure of the sealant.

5. Coordinate Work with other trades to prevent contamination of fresh sealant by dust or other debris. Do not seal over any epoxy placements which are not cured.

6. Install internal wall joints so as to maintain connectivity between vertical and horizontal constructions. Extend internal sealant to the face of wall where indicated and as otherwise directed by Architect to compartmentalize waterproofing protection.

7. Install internal sealant materials at sufficient depth (2 1/2"+) to maintain 3/4" clear unobstructed cavity between finish face of internal sealant and back of external sealant backing material.

8. Internal joint integrity shall be equal to external joint integrity. Internal seals are primary seals to prevent internal building water intrusion.

C. Provide acoustical insulation and sealant as required to seal tightly and completely around all penetrating objects through non-fire rated gypsum drywall and masonry walls and concrete floors, including but not limited to, HVAC duct, fire protection piping, and electrical conduit penetrations, as indicated on the Drawings.

1. At all penetrations through gypsum drywall construction, provide a thin sheet metal sleeve as required to allow a minimum 3/4" wide gap between the penetrating object and adjacent gypsum drywall construction. Fit the sheet metal sleeve tightly to the surrounding drywall construction on all sides, or the entire perimeter, of the penetrating object. Pack the resulting 3/4" space between the sleeve and the penetrating object solidly with fibrous acoustical insulation. Provide resilient, non-hardening acoustical sealant as required to completely seal both sides of wall between the penetrating object and adjacent gypsum drywall construction.

2. At all penetrations through masonry walls wrap the penetrating object with 1" thick fibrous acoustic insulation and fill the space remaining between the acoustic insulation and masonry wall opening solid with cementitious grout prepared in accordance with Section 04200 – Unit Masonry. Provide resilient, non-hardening acoustical sealant as required to completely seal both sides of wall between the penetrating object and adjacent masonry construction and grout infill.

3. Installation of acoustic insulation and sealant is not required at locations of penetrating objects through fire rated gypsum drywall and masonry walls."

D. Seal all interior and exterior joints, seams, and intersections between dissimilar materials.

1. The Work of this Section shall include, but not be limited to, sealing of the following conditions:

   a. Perimeter of all steel and clad wood door frames

   b. Perimeter of all installed aluminum window framing

   c. All joints between metal and gypsum drywall surfaces

d. Top of wall base along masonry walls with irregular surfaces

e. Acoustical ceiling edge along masonry walls with irregular surfaces

f. Tile to metal joints and tile to gypsum drywall joints

g. Backsplash to counter joints and backsplash to wall joints at countertops

h. Completely around all plumbing fixtures, fittings, and trim to countertops, walls and floors

I. Perimeter of all exterior louvers.

E. Cure sealants in strict compliance with the approved manufacturers' instructions and recommendations to obtain highest quality surface and maximum adhesion. Make every effort to minimize accelerated aging effects and increase in modulus of elasticity.

3.04 FIELD QUALITY CONTROL/TESTING

A. Installation of concrete floor slab applied over the waterproofing shall not commence until the membrane is inspected and approved for its intended use by the Architect.

3.05 REPAIR AND CLEANING

A. Remove and replace Work which is damaged or deteriorated in any respect.

B. Clean adjacent surfaces using materials and methods recommended by system manufacturer. Remove and replace Work that cannot be successfully cleaned.

END OF SECTION 071000

SECTION 078410

THROUGH PENETRATION FIRESTOP SYSTEMS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Include General Conditions and applicable parts of Division 1 as part of this Section.

B. Examine all other Sections of the Specifications for any Requirements that affect Work of this Section, whether or not such Work is specifically mentioned in this Section.

C. Coordinate Work with that of all other Trades affecting, or affected by, Work of this Section. Cooperate with such Trades to assure the steady progress of all Work under the Contract.

1.02 SCOPE OF WORK

A. The Work of this Section shall include, but not be limited to, furnishing and installation of the following:

1. Through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.

2. Through-penetration firestop systems for penetrations through the existing roof.

3. Compressible filler firesafing insulation at all wall to floor and/or roof deck intersections.

4. Compressible filler firesafing insulation at new walls at existing stairs.

B. Examine all Project Documents for any Requirements that affect Work of this Section, whether or not such Work is specifically mentioned in this Section.

1.03 RELATED WORK UNDER OTHER SECTIONS

A. Carefully examine all of the Contract Documents for requirements which effect the Work of this Section.

B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:

1. Section 054000 - Light Gauge Metal Framing
Section 071000 - Waterproofing, Damproofing, and Caulking
Section 092500 - Gypsum Drywall
Section 230000 - HVAC
Section 260000 - Electrical

1.04 PERFORMANCE REQUIREMENTS

A. For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated,

resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated:

1. Fire-resistance-rated walls including firewalls, fire partitions, fire barriers, and smoke barriers.

2. Fire-resistance-rated horizontal assemblies including floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies.

B. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

C. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.

D. For floor penetrations, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.

E. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

F. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined in accordance with requirements of ASTM E 84.

G. Firesafing insulation at all wall to roof deck intersections shall be Type 1, complying with requirements of ASTM C 665, E 136, and E 184, and comply with FS HH-I-558B, Classes 1 and 2.

1.05 SUBMITTALS

A. Provide manufacturer’s product data or each type of product indicated.

B. Provide Shop Drawings for each through-penetration firestop system, indicating each type of construction condition penetrated, relationships to adjoining construction, and type of penetrating item. Include firestop design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.

C. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.

D. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular through-penetration firestop condition, submit illustration, with modifications marked, approved by through-penetration firestop system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

E. Provide schedule indicating locations of each through-penetration firestop system, along with the following information:

1. Types of penetrating items

2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.

3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.

F. Provide manufacturer qualification Data for Installer

G. Provide manufacturer product certificates for through-penetration firestop system products

H. Provide product test reports from a qualified testing agency indicating through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

1.06 QUALITY ASSURANCE

A. Installer Qualifications shall require a firm has been approved in accordance with FM 4991, "Approval of Firestop Contractors", with a minimum five (5) years experience in installing through-penetration firestop systems similar in material, design, and extent to that indicated on the Drawings, whose work has resulted in construction with a record of successful performance. Qualifications shall include having the necessary experience, staff, and manufacturer certified training to install the approved manufacturer's products in accordance with the specified requirements. The approved manufacturer's willingness to sell its through-penetration firestop system products to the Contractor or to an installer engaged by the Contractor does not in and of itself confer qualification on the Contractor.

B. The installation of all through-penetration firestop systems shall be assigned to a single manufacturer qualified installer.

C. All through-penetration firestop systems, for each kind of penetration and construction condition indicated, shall be obtained through one source from a single manufacturer.

D. Provide through-penetration firestop systems that comply with the following Fire-Test-Response Characteristics:

1. Acceptable firestopping tests shall be as performed by UL or other agency performing testing and follow-up inspection services for firestop systems and acceptable to authorities having jurisdiction.

2. Acceptable through-penetration firestop systems shall be identical to those tested per testing standard referenced in Paragraph 1.04 above. Provide rated systems complying with the following requirements:

3. Through-penetration firestop system products shall bear the required classification marking of the qualified testing and inspecting agency.

4. Through-penetration firestop systems shall correspond to those indicated by reference to through-penetration firestop system designations listed by the UL in its "Fire Resistance Directory."

5. The Contractor shall conduct an on-site, pre-installation, coordination meeting with all related subcontractors and provide 72 hour prior notice to the Owner and Architect.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver through-penetration firestop system products to the Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.08 PROJECT CONDITIONS

A. Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.09 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

C. Notify the Owner's inspecting agency at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.

D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by the Architect, Owner's inspecting agency and local authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with requirements, provide one of the through-penetration firestop systems indicated for each application that are produced by one of the following manufacturers:

Hilti
3M
Grace Construction Products
AD Fire Protection Systems
USG

2.02 FIRESTOPPING, GENERAL

A. Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with any items penetrating through-penetration firestop

systems, under conditions of service and application, as demonstrated by the approved through-penetration firestop system manufacturer based on testing and field experience.

B. Provide accessory components for each through-penetration firestop system as required by the approved manufacturer to install fill materials and in accordance with Paragraph 1.04 above. Use only components specified by the approved through-penetration firestop system manufacturer and approved by a qualified testing and inspecting agency for firestop systems indicated. Accessories shall include, but not be limited to, the following items:

1. Permanent forming/damming/backing materials, including, but not limited to, the following:

   a. slag or rock wool fiber insulation

   b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state

   c. Fire-rated form board

   d. Fillers for sealants

2. Temporary forming materials

3. Substrate primers

4. Intumescent Collars

5. Steel sleeves

2.3 FILL MATERIALS

A. Provide factory-assembled, cast-in-place, firestop devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

B. Provide single-component, latex sealants with formulations that after cure do not re-emulsify during exposure to moisture.

C. Provide factory-assembled, firestop collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of items penetrating the rated assembly.

D. Provide rigid, intumescent, composite sheet panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.

E. Provide non-hardening, dielectric, water-resistant, intumescent putties containing no solvents, inorganic fibers, or silicone compounds.

F. Provide single-component, intumescent, elastomeric, wrap strips with aluminum foil on one side.

G. Provide pre-packaged, dry mix mortar consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogeneous mortar.

H. Provide reusable, heat-expanding, pillows and/or bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.

I. Provide multi-component, silicone-based, liquid elastomer foams that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

J. Provide single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and other surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.

2. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.

3. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

K. Firesafing insulation shall be Thermafiber Safing Insulation, as manufactured by USG, or Architect approved equal by Fibrex or Insulation Distributors. Material shall be tested, listed, and labeled in accordance with UL designs for the required application, and shall be non-combustible in accordance with ASTM E 184, and comply with FS HH-I-558B for Classes 1 and 2, with the following performance characteristics:

1. K Value: 0.25 at 750 F

2. Thickness: 2-1/2” minimum, unless otherwise indicated, and not less than thickness necessary to provide the required fire rating.

3. Density: Nominal 4 lbs./cu.ft.

2.04 MIXING

A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.

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

3.02 PREPARATION

A. Clean out openings immediately before installing through-penetration firestop system in accordance with the approved firestop system manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials hat could interfere with adhesion of through-penetration firestop systems.

2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.

3. Remove laitance and form-release agents from concrete.

B. Prime substrates in accordance with the approved through-penetration firestop system manufacturer written requirements. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Mask adjacent surfaces as required to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.03 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

A. Install through-penetration firestop systems in accordance with the approved firestop system manufacturer's written installation instructions and the Contract Documents, for products and applications indicated.

B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.

2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

D. The Contractor shall install new firesafing at all new floor and wall openings larger than 4” in any dimension as required for installation of new Work, including but not limited to, mechanical, plumbing, and electrical. Installation of firesafing at all new openings 4” or less in any dimension shall be provided by the respective subcontractor, including but not limited to, mechanical, plumbing, and electrical.

E. Install new firesafing insulation at new walls and existing wall infill at existing stairs as indicated on the Drawings.

3.04 IDENTIFICATION

A. Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Include the following information on labels:

1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage"

2. Contractor's name, address, and phone number

3. Through-penetration firestop system designation of applicable testing and inspecting agency

4. Date of installation

5. Through-penetration firestop system manufacturer's name

6. Installer's name

3.05 FIELD QUALITY CONTROL

A. Inspecting Agency: Owner will engage a qualified, independent inspecting agency to inspect through-penetration firestops. Independent inspecting agency shall comply with ASTM E 2174 requirements including those related to qualifications, conducting inspections, and preparing test reports.

B. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.

C. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

3.06 CLEANING AND PROTECTING

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

C. Remove and legally dispose of off site daily, all waste and debris caused by the Work of this Section.

END OF SECTION

SECTION 092500

GYPSUM DRYWALL

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Include General Conditions and applicable parts of Division 1 as part of this Section.

B. Examine all other Sections of the Specifications for any Requirements that affect Work of this Section, whether or not such Work is specifically mentioned in this Section.

C. Coordinate Work with that of all other Trades affecting, or affected by, Work of this Section. Cooperate with such Trades to assure the steady progress of all Work under the Contract.

1.02 SCOPE OF WORK

A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:

1. Metal framing and support systems for abuse resistant gypsum panels, and water resistant, mold and mildew resistant interior gypsum panels

2. Abuse resistant gypsum panels and glass mat, water resistant, mold and mildew resistant interior gypsum panels

3. Sound attenuation insulation

4. Concealed acoustical sealants

5. Miscellaneous metal framing and blocking to support other Work

6. Surface finishing in preparation for painting and finishing including skim coats, tape, joint compounds, and veneer plaster

7. Patching to match of existing plaster walls and ceilings

B. Examine all Project Documents for any Requirements that affect Work of this Section, whether or not such Work is specifically mentioned in this Section.

1.03 RELATED WORK UNDER OTHER SECTIONS

A. Carefully examine all of the Contract Documents for requirements which effect the Work of this Section.

B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:

1 Section 054000 – Light Gauge Metal Framing
Section 230000 – HVAC
Section 260000 – Electrical

1.04 QUALITY ASSURANCE

A. Installation shall be performed by a firm with a minimum of ten (10) years experience in Work of the type required by this Section.

B. Provide materials which are the products of one manufacturer for each type of material required for the Work of this Section. Provide secondary accessory materials acceptable to the approved manufacturer of the primary materials and the Architect.

C. Comply with applicable requirements of Gypsum Association Publication GA-505, GA-201 and GA -216.

D. Mock-Ups:

1. Before beginning primary Work of this Section, provide minimum 100 s.f. mock-ups of each wall system, at locations acceptable to Architect and obtain Architect's acceptance of visual qualities. Protect and maintain acceptable mock-ups throughout the Work of this Section to serve as criteria for acceptance of this Work. Acceptable mock-ups may be incorporated into the finished Work.

E. Structural Performance:

1. For all interior Work, limit deflection to L/240 for all finishes. Lateral load is 5 psf.

F. Sound Transmission Performance:

1. New gypsum drywall assemblies shall provide a minimum STC value of 47 at all locations, when tested in accordance with ASTM E 90.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Provide products manufactured with the required recycled content:

B. Provide materials and products manufactured by manufacturer’s who accept scrap products for recycling.

C. Adhesives used on site must meet the Low Volatile Organic Compounds (VOC) limits of the California South Coast Air Quality Management District Rule No. 1168. Sealants used as filler must meet or exceed Bay Area Air Quality Management District Regulation 8, Rule 51.

1.06 TESTS

A. Where fire-resistance ratings are indicated or required by authorities having jurisdiction, provide materials and construction which are identical to assemblies whose fire-resistance rating has been tested in compliance with ASTM E119 and ASTM E136 by independent agencies acceptable to the Architect and authorities having jurisdiction.

1.07 SUBMITTALS

A. Submit manufacturer's product literature for all items with schedule of use, installation instructions, and recommendations for each material used.

B. Submit manufacturer's certificates demonstrating compliance with applicable code for fire-rated assemblies.

C. Provide professionally prepared calculations and certification of the performance of this Work. Show how design load requirements and other performance requirements have been satisfied.

D. Samples:

1. One-foot square samples of board materials.

2. One-foot-long Sections of all galvanized steel or zinc members and accessories.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver materials and products in unopened factory labeled packages. Store and handle in strict compliance with manufacturers' instructions and recommendations. Protect from damage. Adequately support stored gypsum panels to avoid sagging. Avoid overloading floor system. Protect metal lath, metal suspension materials and metal accessories from dampness and wetting. Keep plaster and other cementitious materials dry until ready to be used. Store off ground, under cover, and away from sweating walls and other damp surfaces.

B. Deliver fire-rated materials in original, unopened containers, bearing testing agency label and required fire classification numbers.

1.09 PROJECT CONDITIONS

A. Perform Work only when existing and forecasted weather conditions are within the limits established by manufacturers of the materials and products used. Comply with requirements of Gypsum Association publication 220.

B. Proceed with installation of gypsum board products provided under the Work of this Section only when steel framing Work is completed in accordance with installation tolerances specified in ASTM C 754 and this specification Section.

C. Do not expose gypsum boards or metal accessories to weather during storage.

D. Comply with the approved manufacturer's requirements and Gypsum Association publication 216. Avoid too rapid drying in hot weather.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Gypsum Board and Related Products: Provide products of one of the following manufacturers if they meet or exceed the requirements of these specifications:

1. United States Gypsum Company

2. James Hardie Building Products

3. National Gypsum Company

B. Metal Framing and Support: Provide products of one of the following manufacturers if they meet or exceed the requirements of these specifications:

1. United States Gypsum Company

2. Dale/Incor

3. Superstud

C. Grid Suspension Systems: Provide products of one of the following manufacturers if they meet or exceed the requirements of these specifications:

1. Chicago Metallic Corp.

2. USG Interiors, Inc.

3. National Rolling Mills

2.2 METAL FRAMING AND SUPPORTS

A. Provide steel studs, runners, furring, and channels, hot dip galvanized, in accordance with ASTM A 653 and C 645, as follows:

1. Depth shall be 3-5/8" and 6”, unless otherwise indicated

2. Gauge shall be 25, unless otherwise required by the approved manufacturer to comply with conditions, spans and deflection constraints indicated. Provide 20-gauge studs for walls supporting rigid finishes, including but not limited to, fiber cement panels, ceramic tile, and silicone treated, fiberglass reinforced, gypsum board at exterior walls.

3. Runner channel shall match stud type as recommended by the approved stud manufacturer.

4. Provide 25-gauge, G 60 galvanized furring in accordance with ASTM A 653 and C 645, and 20 gauge where spans exceed 4'. Furring shall be hat shaped or Z-shaped as required to complete the Work. Where indicated as "resilient", provide special sound transmission reducing type, USG RC-1, or Architect approved equal.

5. Cold rolled channels shall be 16-gauge, galvanized steel, as manufactured by USG, or Architect approved equal

6. Hanger Wire shall be 9-gauge, soft temper, Class 1, galvanized, complying with ASTM A 641.

B. Ceiling and Soffit Suspension Systems:

1. Conventional System:

a. Runner Channels shall be 1-1/2”, cold rolled, steel channels weighing 475 pounds per 1000 lineal feet, G 60 galvanized at areas of high humidity

b. Hanger Wire shall be 8-gauge, soft temper, galvanized, complying with ASTM A 641

c. Tie Wire shall be 16-gauge, soft temper, galvanized, complying with ASTM A 641

d. Channel clips shall be as manufactured by USG, or Architect approved equal

2.03 GYPSUM BOARD MATERIALS

A. Provide Abuse Resistant Gypsum Panels, Fiberock Brand Panels, VHI Abuse Resistant, as manufactured by United States Gypsum Company or Architect approved equal, as required to provide a Category 2, Moderate Duty assembly. Panels shall comply with the following:

1. Type: Non-combustible, combination of gypsum and cellulose fiber having no face-paper
2. Edges: Tapered
3. Thickness: 5/8"
4. Abrasion Resistance: 30 cycles to failure, per ASTM D 4977 Modified
5. Indentation Resistance: 0.13” depth, per ASTM D 5420 Modified
6. Soft Body Impact: 180 ft. lbs., per ASTM E 695
7. Hard Body Impact: 40 ft. lbs., per USG

B. Provide Glass mat, water resistant, mold and mildew resistant, interior panels, DensArmor Plus Fireguard, as manufactured by Georgia Pacific, or Architect approved equal. Panels shall be provided at all damp rooms. Panels shall comply with requirements of ASTM C 630, C 1177, C 1178, D 3273, and the following:

1. Types: Fire-resistant, Type X
2. Edges: Tapered
3. Surface: Coated glass mat on face, back, and long edges
4. Thickness: 5/8"

C. Cementitious backer board shall comply with requirements of ANSI A 118, and the following performance properties:

1. Thickness: 5/8"
2. Ends: Square cut
3. Edges: Formed and smooth
4. Matrix: Aggregated Portland Cement, reinforced with glass fiber mesh

2.04 METAL TRIMS AND ACCESSORIES

A. Provide galvanized steel trim units for all interior Work and zinc-alloy trim units at all areas subject to high humidity. Provide the following United States Gypsum trim and accessory types, or Architect approved equals, from a specified manufacturer:

1. Corner Bead: USG No. 103, 1-1/4”x1-1/4”, or Architect approved equal
2. Control Joint: USG No. 093, ¼” wide by 7/16” deep opening, or Architect approved equal
3. Edge Trim: USG No. 801-A and 801-B, or Architect approved equal

B. Channels:

1. Furring channels shall be USG No. DWC-25 and DWC-20 as required, or Architect approved equal

2. Resilient furring channels shall be USG No. RC-1, or Architect approved equal

3. Cold rolled channels shall be 16-gauge, galvanized steel, as manufactured by USG, or Architect approved equal

2.05 JOINT MATERIALS

A. Joint Compound shall be ready mixed compound for gypsum drywall and fiber cement panels complying with requirements of ASTM C 475.

B. Joint tape shall be perforated, cross-fiber paper complying with requirements of ASTM C 475.

C. Provide water resistant compound, USG Sheetrock Brand W/R, or Architect approved equal, at locations of water resistant, mold and mildew resistant, interior panels.

D. Provide Durabond 90, as manufactured by United States Gypsum, or Architect approved equal, for patching of existing plaster to remain, and new veneer plaster.

2.06 MISCELLANEOUS MATERIALS

A. Acoustical sealant shall be non-drying, non-hardening, non-bleeding, non-staining sealant complying with ASTM C 834 and C 919, USG Acoustical Sealant. Or Architect approved equal by Pecora orTremco.

B. Sound attenuation insulation shall be Type I, unfaced, inorganic fiber blankets, complying with ASTM C 665, with the following features and characteristics:

1. Thickness: 3-1/2" thickness, unless indicated otherwise.

2. Burning Characteristics: Flame Spread 25, Smoke developed 50; in accordance with ASTM E 84

C. Laminating adhesive shall be as recommended by the approved gypsum board manufacturer.

D. Fasteners shall be Type S, bugle head, for attaching gypsum panels to steel framing. Fasteners for fiber cement panels attached to steel framing shall be corrosion resistant, Hi-Lo, S-12, bugle head screws. Provide wafer head, "Climaseal" coated, Type S-12 self - drilling screws for attaching silicone treated sheathing to steel framing. Provide stainless steel fasteners for all fasteners in wet or humid areas. Provide other types as required by the approved gypsum board or fiber cement board manufacturer. All fasteners shall provide a minimum of ¾” penetration through steel framing.

E. Provide screws, bolts, powder actuated fasteners, inserts and other fasteners that are customarily used in standard construction practices and which are proven capable of supporting at least 3 times design load.

F. Grout for metal door frames shall be Structo-Base" Gypsum plaster, as manufactured by U. S. Gypsum or Architect approved equal, complying with ASTM C 28 and C 472.

G. Provide rigid vinyl trim at locations where gypsum board edge is exposed or abutting dissimilar materials. Trim shapes shall be RP-2, RP-4, and RP-46, as manufactured by USG, or Architect approved equal.

H. Provide the approved manufacturer's joint sealing tape for sealing of all horizontal and vertical joints in silicone treated gypsum sheathing.

I. Provide Sheetrock Brand, Tuff-Hide Primer-Surfacer, as manufactured by United States Gypsum, of Architect approved equal, as required to provide a Level 5 finish.

PART 3 - EXECUTION

3.01 INSPECTION

A. The Installer/Erector shall examine substrates, supports, and conditions under which this Work is to be performed and notify Contractor, in writing, of conditions detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected. Beginning Work means Installer accepts substrates and conditions.

3.02 INSTALLATION

A. Strictly comply with the approved manufacturer's written instructions and recommendations, except where more restrictive requirements are specified in this Section.

B. Framing:

1. Install and erect framing in accordance with requirements of ASTM C 754. Provide framing to comply with published details and recommendations of the approved manufacturer, and the Gypsum Construction Handbook , as published by USG.

a. Framing shall not bridge building construction or control joints; frame separately on both sides and allow for movement.

b. Isolate framing system from structural loading both horizontally and vertically.

c. Provide slip or cushioned joints at top of walls. Maintain lateral stability and acoustical performance.

d. All partitions, including framing and wallboard, shall be terminated at structural deck above, except as noted otherwise.

e. Space framing members at 12" o. c., unless indicated otherwise, as required to meet specified deflection requirements.

f. Cut metal studs 1/2" short of top track.

C. Secure ceiling framing to structure above using hangers and fasteners capable of supporting at least 3 times actual loads.

D. Installation of gypsum board and all related materials shall be in strict compliance with requirements of ASTM C 840 and Gypsum Association publication No. 216, "Recommended Specifications for the Application and Finishing of Gypsum Board", and the following:

1. Locate joints between boards as far from center of walls and ceilings as possible

2. Stagger vertical joints on opposite sides of walls and in multiple layer Work

3. Install gypsum and related board materials with face side out and with joints over framing members

4. Do not butt dissimilar board edges

5. Cover both faces of stud partitions, except at chase walls

6. Attach boards to framing with self-tapping, bugle head screws or fasteners recommended by manufacturer

7. Space fasteners as recommended by manufacturer

8. Install drywall ceilings prior to gypsum board walls

9. Provide glass mat, water resistant, mold resistant, interior wall panels at all damp Rooms.

10. Provide abuse resistant panels at all interior gypsum board partitions

11. In multiple layer walls, provide backing board or multiple layers of face board

12. Form control joints by preparing space between edges to receive metal control joint trim

13. Do not use tapered edges at doors, windows, or casing beads

E. Provide supplemental framing at openings in walls and ceilings as required to comply with written requirements of the approved manufacturer, and the Gypsum Construction Handbook , as published by USG.

F. Provide sound attenuation insulation where indicated and as required to obtain specified STC ratings. Provide sound blankets in all partitions as indicated on the Drawings.

G. Provide continuous bead of acoustical sealant at both faces of bottom runners, perimeters, openings, expansion and control joints. Close off all sound flanking paths and openings, including those above ceilings.

H. Strictly comply with manufacturer's instructions and recommendations for installation of metal trims and accessories. Meet installation tolerance requirements.

1. Provide corner bead trim at all external corners. Provide joint reinforcing tape at all internal corners.

2. Provide control joints where shown, or not less than 30' o.c., at locations approved by the Architect.

3. Provide edge trim wherever edge of gypsum board is exposed, revealed, sealant filled, abutting dissimilar materials.

4. Provide galvanized trim accessories at all Toilets.

I. Provide 3 coats joint compound treatment at all joints, flanges of trim accessories, penetrations, fastener heads and surface defects. Sand before and after second and third

coats. Provide joint reinforcing tape at joints between boards, except where trim accessories are required.

1. Extend joint finishing to floor behind wall base to provide a smooth flat surface for installation of wall base.

2. For water-resistant board applications, use special water-resistant joint compound to seal joints, cover fastener heads, fill surface defects and seal cut edges.

J. Fully grout metal door frames located in metal stud partitions that are rated wall assemblies. Mix grout to a thick, workable mix and completely fill heads and jambs. Rake out joints along back bend of door frame to depth of back edge of anchors. Width of raked joint shall be of sufficient size so that gypsum panels can be installed behind back bend of frame. Provide a fully grouted frame on site, which shall act as a prototype for the installation of all frames for the project. Such a prototype shall be approved by the Architect prior to the installation of any door frames in metal stud partitions.

K. Install joint sealant tape at all horizontal and vertical joints located in silicone treated gypsum sheathing at exterior walls in accordance with the approved manufacturer's written instructions.

L. Existing plaster walls and ceilings shall be patched to match existing adjacent plaster surfaces to remain. Materials and methods required to complete the required Work shall be as required to match existing thickness and appearance of surfaces to remain.

3.03 TOLERANCES

A. The following installed tolerances for gypsum drywall are allowable variations from locations and dimensions indicated by the Contract Documents and shall not be added to allowable tolerances indicated for other Work.

1. Allowable Variation from True Plumb, Level, & Line: ± 1/8" in 20'-0".

B. After finishing joints and screw heads shall be flush and invisible. Surfaces shall appear flush, smooth, seamless and uniform. Planes shall be flat. Corners shall be crisp and at true angles. Where gypsum drywall Work butts dissimilar materials, joints shall be tight and shall be accurately scribed to adjacent construction without gaps.

3.04 ADJUSTING, CLEANING, AND PROTECTION

A. Cut, patch, repair and point Work as needed to accommodate other Work and to repair cracks and defective surfaces. Eliminate blisters, check cracking, dried out spots and all other defects and problem areas. Repair minor damage to eliminate all evidence of repair. Leave Work including trims and accessories ready for finishing by others.

B. Clean adjacent surfaces using non-abrasive materials and methods to make adjacent Work in "as found" condition, undamaged by plaster operations. Remove and replace Work that cannot be successfully cleaned or repaired.

C. Provide temporary protection to ensure completed Work is without damage or deterioration at time of final acceptance. Remove protections and re-clean as necessary immediately before final acceptance.

D. Remove and legally dispose of off site daily, all waste and debris caused by the Work of this Section.

END OF SECTION 092500

Statement of Special Inspections

Project: HVAC Upgrades Project

Location: 330 Homer St, Newton, MA

Owner: Town Of Newton

Design Professional in Responsible Charge: *B+AC, LLC*

This *Statement of Special Inspections* is submitted as a condition for permit issuance in accordance with the Special Inspection and Structural Testing requirements of the Building Code. It includes a schedule of Special Inspection services applicable to this project as well as the name of the Special Inspection Coordinator and the identity of other approved agencies to be retained for conducting these inspections and tests. This *Statement of Special Inspections* encompass the following disciplines:

☒ Structural ☐ Mechanical/Electrical/Plumbing
☐ Architectural ☐ Other: _____

The Special Inspection Coordinator shall keep records of all inspections and shall furnish inspection reports to the Building Official and the Registered Design Professional in Responsible Charge. Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Building Official and the Registered Design Professional in Responsible Charge. The Special Inspection program does not relieve the Contractor of his or her responsibilities.

Interim reports shall be submitted to the Building Official and the Registered Design Professional in Responsible Charge.

A *Final Report of Special Inspections* documenting completion of all required Special Inspections, testing and correction of any discrepancies noted in the inspections shall be submitted prior to issuance of a Certificate of Use and Occupancy.

Job site safety and means and methods of construction are solely the responsibility of the Contractor.

Interim Report Frequency: *monthly* or ☐ per attached schedule.

Prepared by:

Balram S. Chamaria, P.E. MA#51274
(type or print name)

Signature Date

Design Professional Seal

Owner's Authorization:

Signature Date

Building Official's Acceptance:

Signature Date

Schedule of Inspection and Testing Agencies

This Statement of Special Inspections / Quality Assurance Plan includes the following building systems:

- ☐ Soils and Foundations
- ☐ Cast-in-Place Concrete
- ☐ Precast Concrete
- ☐ Masonry
- ☒ Structural Steel
- ☐ Cold-Formed Steel Framing
- ☐ Spray Fire Resistant Material
- ☐ Wood Construction
- ☐ Exterior Insulation and Finish System
- ☐ Mechanical & Electrical Systems
- ☐ Architectural Systems
- ☐ Special Cases

Special Inspection Agencies	**Firm**	**Address, Telephone, e-mail**
1. **Special Inspection Coordinator**	*To be determined*	
2. Inspector Geotechnical Engineer		
3. Inspector		
4. Testing Agency	*To be determined*	
5. Testing Agency		
6. Other		

Note: The inspectors and testing agencies shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official, prior to commencing work.

Quality Assurance Plan

Quality Assurance for Seismic Resistance

Seismic Design Category	*B*
Quality Assurance Plan Required (Y/N)	*N*

Description of seismic force resisting system and designated seismic systems:

For new dunnage - Steel Moment frame with horizontal braces.

Quality Assurance for Wind Requirements

Basic Wind Speed (3 second gust)	*138mph*
Wind Exposure Category	*B*
Quality Assurance Plan Required (Y/N)	*N*

Description of wind force resisting system and designated wind resisting components:

Same as seismic

Statement of Responsibility

Each contractor responsible for the construction or fabrication of a system or component designated above must submit a Statement of Responsibility.

Qualifications of Inspectors and Testing Technicians

The qualifications of all personnel performing Special Inspection and testing activities are subject to the approval of the Building Official. The credentials of all Inspectors and testing technicians shall be provided if requested.

Key for Minimum Qualifications of Inspection Agents:

When the Registered Design Professional in Responsible Charge deems it appropriate that the individual performing a stipulated test or inspection have a specific certification or license as indicated below, such designation shall appear below the *Agency Number* on the Schedule.

PE/SE	Structural Engineer – a licensed SE or PE specializing in the design of building structures
PE/GE	Geotechnical Engineer – a licensed PE specializing in soil mechanics and foundations
EIT	Engineer-In-Training – a graduate engineer who has passed the Fundamentals of Engineering examination

American Concrete Institute (ACI) Certification

ACI-CFTT	Concrete Field Testing Technician – Grade 1
ACI-CCI	Concrete Construction Inspector
ACI-LTT	Laboratory Testing Technician – Grade 1&2
ACI-STT	Strength Testing Technician

American Welding Society (AWS) Certification

AWS-CWI	Certified Welding Inspector
AWS/AISC-SSI	Certified Structural Steel Inspector

American Society of Non-Destructive Testing (ASNT) Certification

ASNT	Non-Destructive Testing Technician – Level II or III.

International Code Council (ICC) Certification

ICC-SMSI	Structural Masonry Special Inspector
ICC-SWSI	Structural Steel and Welding Special Inspector
ICC-SFSI	Spray-Applied Fireproofing Special Inspector
ICC-PCSI	Prestressed Concrete Special Inspector
ICC-RCSI	Reinforced Concrete Special Inspector

National Institute for Certification in Engineering Technologies (NICET)

NICET-CT	Concrete Technician – Levels I, II, III & IV
NICET-ST	Soils Technician - Levels I, II, III & IV
NICET-GET	Geotechnical Engineering Technician - Levels I, II, III & IV

Exterior Design Institute (EDI) Certification

EDI-EIFS	EIFS Third Party Inspector

Other

_____ _____

Structural Steel

Item	Agency # (Qualif.)	Scope
1. Fabricator Certification/ Quality Control Procedures ☐ Fabricator Exempt	*4* *AWS/AISC-SSI* *ICC-SWSI*	*Review shop fabrication and quality control procedures.*
2. Material Certification	*4* *AWS/AISC-SSI* *ICC-SWSI*	*Review certified mill test reports and identification markings on wide-flange shapes, high-strength bolts, nuts and welding electrodes*
3. Open Web Steel Joists	*4* *AWS/AISC-SSI* *ICC-SWSI*	~~*Inspect installation of joist reinforcement details in line with approved shop drawings. Welding, bolting, size and materials.*~~ *N/A*
4. Bolting	*4* *AWS/AISC-SSI* *ICC-SWSI*	*Inspect installation and tightening of high-strength bolts. Verify that splines have separated from tension control bolts. Verify proper tightening sequence. Continuous inspection of bolts in slip-critical connections.*
5. Welding	*4* *AWS-CWI* *ASNT*	*Visually inspect all welds. Inspect pre-heat, post-heat and surface preparation between passes. Verify size and length of fillet welds. Ultrasonic testing of all full-penetration welds.* *Continuous inspection of fillet welds > 5/16".*
6. Shear Connectors	*4* *AWS/AISC-SSI* *ICC-SWSI*	*N/A*
7. Structural Details	4 AWS/AISC-SSI ICC-SWSI	*Inspect steel frame for compliance with structural drawings, including bracing, member configuration and connection details. Continuous inspection of shear/web reinforcement details.*
8. Metal Deck	4 AWS/AISC-SSI ICC-SWSI	*N/A*
9. Other: Frequency		Periodic during task listed to provide complete inspection of scope except as noted