

Owner Occupied and Scattered Site Rehabilitation Programs

ADDENDUM ACKNOWLEDGEMENT

**Addendum #1
October 8, 2014**

Project # 2065 Property Address: 44 Washington Parkway, Stratford, CT

The undersigned acknowledges that he/she have reviewed and acknowledge receipt of the referenced addendum for the above mentioned project.

Addendum Description –

Attached drawings and specifications replace the issued drawings and specifications previous posted to the DOH Bid Notice portal and distributed to the prequalified contractors.

The bid due date is not extended by this addendum.

BIDDER ACKNOWLEDGEMENT:

All bids must be accompanied by this Addenda Acknowledgement or they will be rejected.

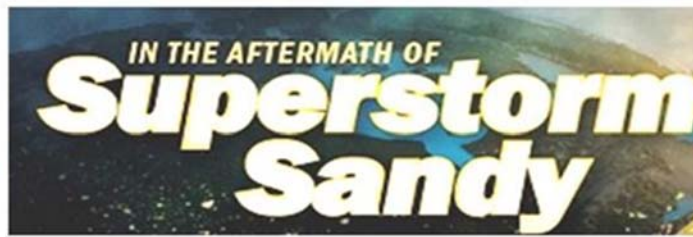
Name of Bidder

Signature

Date

Bidder's Title

Bidder's Company



Owner Occupied and Scattered Site Rehabilitation Programs

Addendum #1 – Attachment 1

Bid Drawings

PROJECT 2065 - 44 WASHINGTON PARKWAY, STRATFORD, CT

COMMUNITY DEVELOPMENT BLOCK GRANT
DISASTER RECOVERY PROGRAM
OWNER OCCUPIED REHABILITATION AND REBUILDING
CONNECTICUT DEPARTMENT OF HOUSING
HARTFORD, CONNECTICUT 06118



STREET VIEW
(N.T.S.)

GENERAL NOTES:

- 1. THE CONTRACTOR SHALL ABIDE BY ALL OSHA FEDERAL STATE AND LOCAL REGULATIONS.
- 2. THE CONTRACTOR SHALL POST ALL BONDS, PAY ALL FEES, PROVIDE PROOF OF INSURANCE, AND PROVIDE TRAFFIC CONTROL NECESSARY FOR THIS WORK.
- 3. REFER TO OTHER PLANS, DETAILS AND PROJECT MANUAL FOR ADDITIONAL INFORMATION. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS IN THE FIELD AND CONTACT MARTINEZ COUCH & ASSOCIATES IF THERE ARE ANY QUESTIONS OR CONFLICTS REGARDING THE CONSTRUCTION DOCUMENTS AND/OR FIELD CONDITIONS SO THAT APPROPRIATE REVISIONS CAN BE MADE PRIOR TO BIDDING. ANY CONFLICT BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE CONFIRMED WITH MARTINEZ COUCH & ASSOCIATES PRIOR TO BIDDING.

DRAWING INDEX

SHEET TITLE	SHEET NUMBER
TITLE SHEET	T-0.0
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DETAILS	C-2.1
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ELECTRICAL – SYMBOLS, SCHEDULES, NOTES, DETAILS, AND RISERS	E0.01
ELECTRICAL – FLOOR PLANS	E1.01
MECHANICAL – NOTES, DETAILS, AND CONCEPT DIAGRAM	M0.01
PLUMBING – SYMBOLS, SCHEDULES, NOTES, AND DETAILS	P0.01
PLUMBING – FLOOR PLANS	P1.01

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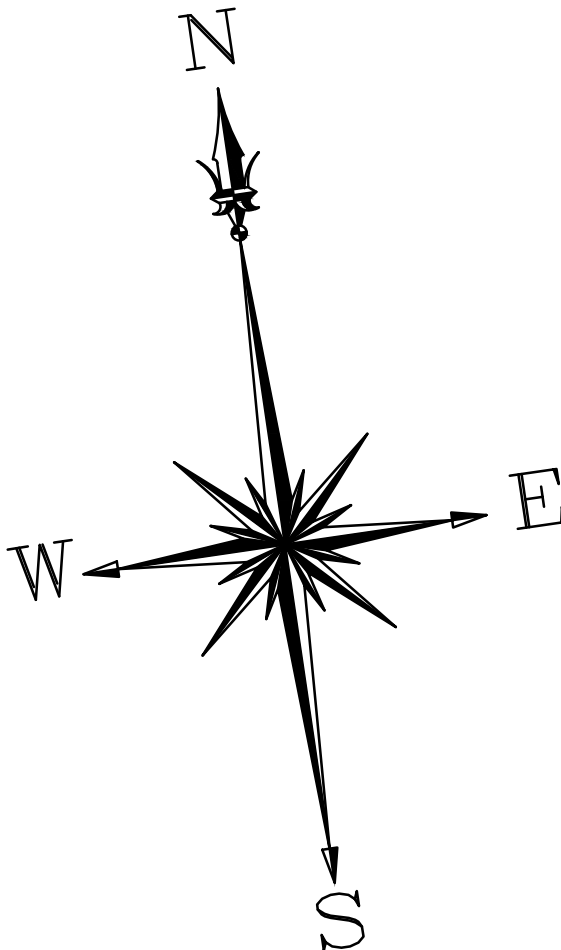
1084 Cromwell Avenue, Suite A-2
Rocky Hill, CT 06067
Telephone: (860) 436-4364
Fax: (860) 436-4626
www.martinezcouch.com

PROJECT 2065
44 WASHINGTON PARKWAY
STRATFORD, CONNECTICUT 06615

NO.	DATE	REVISIONS					BY	CHK	APPV
DRAWN BY: MBR		CHECKED BY: REC		SCALE: 1" = 5'		DATE: 9/24/2014			

TITLE SHEET

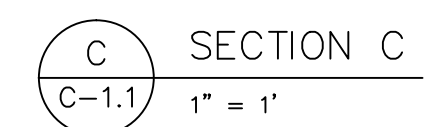
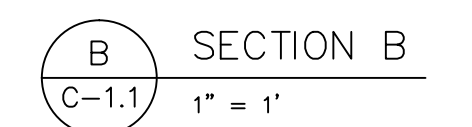
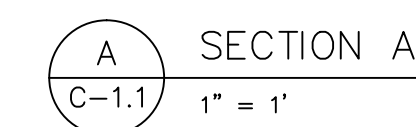
JOB NO.	DRAWING NUMBER	SHEET
33-262-2065	BASEMAP 33-262-2065 - VIGGIANO.dwg	T-0.0



SITE PLAN			
	JOB NO.	DRAWING NUMBER	SHEET
	33-262-2065	BASEMAP 33-262-2065 - VIGGIANO.dwg	C-1.0

ALL FASTENERS ON DECKING IN CONTACT WITH PRESSURE TREATED WOOD TO BE COMPOSITE ANCHORS OR STAINLESS STEEL.

- 1 PROVIDE COMPOSITE RAILING SYSTEM: AZEK COLONIAL/SELECT RAILING SYSTEM
INSTALLED PER MANUFACTURER INSTRUCTIONS AT DECK EDGE AND AT ALL STAIRS
- 2 4X4 SUPPORT TO SECOND FLOOR DECK
- 3 EXISTING CANTILEVERED SECOND FLOOR DECK, EL. ~~27~~
- 4 BLOCKING AND SUPPORT FOR STAIR STRINGERS AT 6X6 SUPPORT POSTS



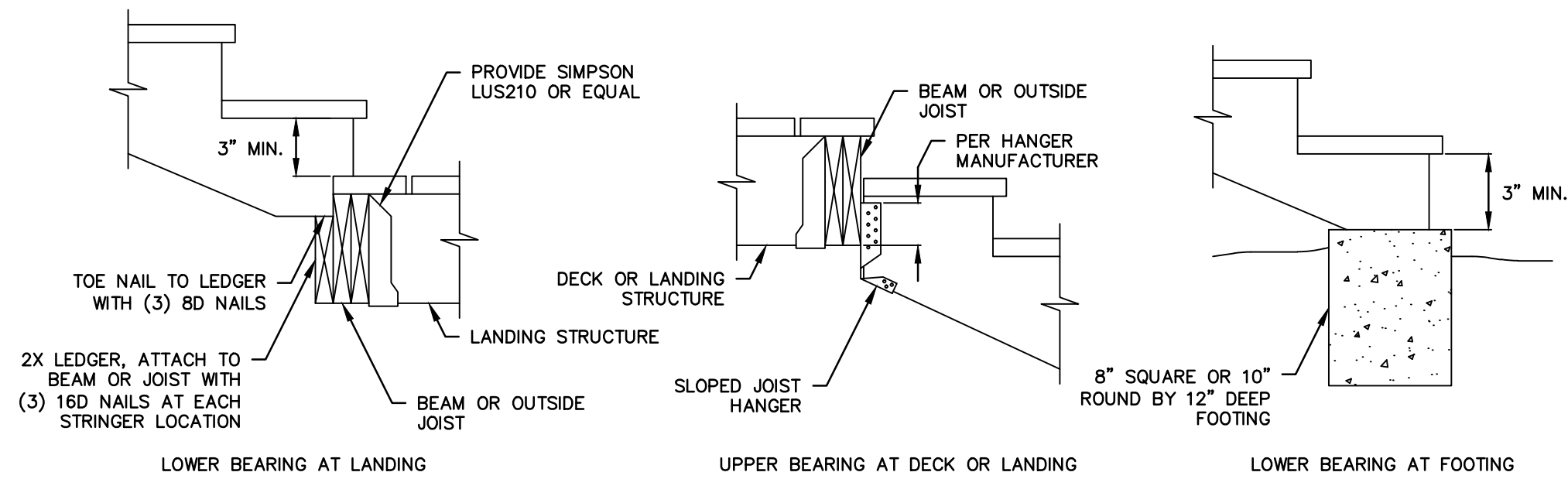
MCA
MARTINEZ COUCH & ASSOCIATES
ENGINEERING • LAND SURVEYING • ENVIRONMENTAL
CONSTRUCTION INSPECTION • GIS • WASTEWATER

PROJECT 2065
44 WASHINGTON PARKWAY
STRATFORD, CONNECTICUT 06615

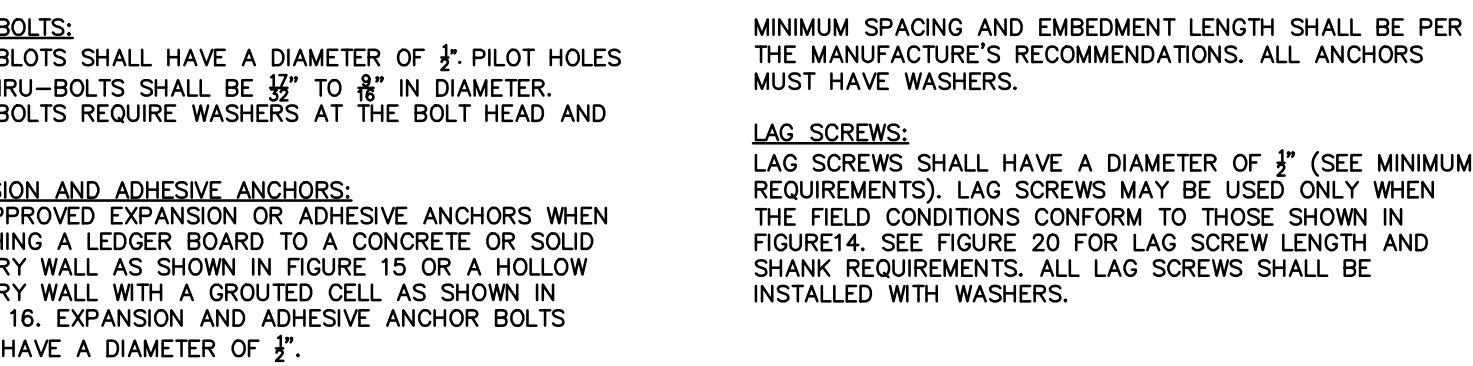
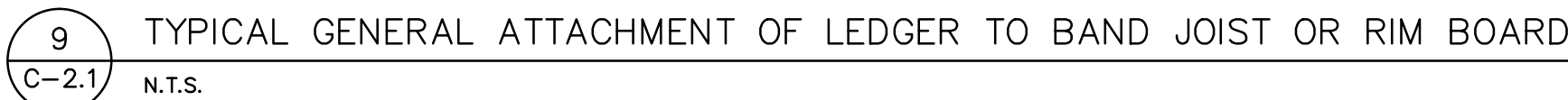
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DECK LAYOUT PLAN

JOB NO.	DRAWING NUMBER	SHEET
33-262-2065	BASEMAP 33-262-2065 - VIGGIANO.dwg	C-1.1



2 TYPICAL STAIR STRINGER BEARING
C-2.1 N.T.S.



10 TYPICAL LEDGER BOARD FASTENER SPACING AND CLEARANCE
C-2.1 N.T.S.



GENERAL NOTES

GOVERNING DESIGN CODES

- 1. 2005 STATE OF CONNECTICUT RESIDENTIAL BUILDING CODE (IRC 2009 WITH CONNECTICUT 2005, 2009, and 2013 MODIFICATIONS AND SUPPLEMENTS)
- 2. AISC 360-06 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS
- 3. ACI 318-08 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
- 4. NATIONAL DESIGN SPECIFICATION (NDS-05) FOR WOOD CONSTRUCTION W/ 2001 SUPPLEMENT
- 5. WFCM-2001 WOOD FRAME CONSTRUCTION MANUAL FOR ONE- AND TWO-FAMILY DWELLINGS

GENERAL

- 1. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, AND PROCEDURES FOR WORK UNDER HIS CONTRACT.
- 2. ALL WORK SHALL BE IN ACCORDANCE WITH THE STATE OF CONNECTICUT BUILDING CODE AND ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.

LOADS ON STRUCTURES DURING CONSTRUCTION

- 1. DETERMINATION OF DEAD LOADS, LIVE LOADS, ENVIRONMENTAL LOADS, CONSTRUCTION LOADS, AND THE EFFECTS THEREOF, ON STRUCTURES DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH ASCE 37-02 "DESIGN LOADS ON STRUCTURES DURING CONSTRUCTION."
- 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF TEMPORARY STRUCTURES, TEMPORARY SUPPORTS, OR FOR THE TEMPORARY USE OF INCOMPLETE STRUCTURES, UNLESS INDICATED IN THE CONTRACT DOCUMENTS.
- 3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DETERMINATION OF ALL CONSTRUCTION DESIGN LOADS AND THEIR EFFECTS ON ALL STRUCTURES THROUGHOUT THE PROGRESS OF THE WORK.
- 4. CONSTRUCTION LOADS IMPOSED, THE ADDITION OR REMOVAL OF TEMPORARY COMPONENTS OR ANY OTHER TEMPORARY CONDITION SHALL NOT ADVERSELY AFFECT THE SERVICEABILITY OR PERFORMANCE OF THE COMPLETED STRUCTURE.

DESIGN LOADS

FLOOR LIVE LOADS

OCCUPANCY / USE	UNIFORM (psf)
BEDROOM SPACES	30
ALL OTHER SPACES	40
ATTICS W/ STORAGE	20
BALCONIES (100 s.f. OR LESS)	60

ROOF SNOW LOADS: (IBC-02 SECTION 1608)

GROUND SNOW LOAD, Pg	30 psf
FLAT-ROOF SNOW LOAD, Pf	19 psf
MINIMUM ROOF SNOW LOAD:	30 psf
SNOW EXPOSURE FACTOR, Ce	0.9
SNOW LOAD IMPORTANCE FACTOR, Is:	1.0
THERMAL FACTOR, Ct	1.0

WIND DESIGN DATA: (IBC-02 SECTION 1609)

BASIC WIND SPEED (3 sec GUST):	100 mph
WIND LOAD IMPORTANCE FACTOR, Iw:	1.0
BUILDING EXPOSURE CATEGORY:	C
INTERNAL PRESSURE COEFFICIENTS:	+0.18 -0.18

SEISMIC DESIGN CATEGORY: B

OTHER DESIGN DATA:

SUBJECT TO DAMAGE FROM:	
WEATHERING:	5,000 psi
FROST LINE DEPTH:	42 INCHES
TERMITE:	MODERATE TO HEAVY
DECAY:	SLIGHT TO MODERATE
WINTER DESIGN TEMPERATURE:	7-deg F.
ICE SHIELD UNDERLAYMENT:	REQUIRED
FLOOD-HAZARD:	TBD LOCALLY - SEE BELOW
AIR-FREEZING INDEX:	1,500 OR LESS
MEAN ANNUAL TEMPERATURE:	50-deg F.

HYDROSTATIC PRESSURE AND FLOOD LOADS:

FLOOD HAZARD AREA ZONE:	AE (COASTAL)
DESIGN FLOOD ELEVATION:	EL. 15'
WATER VELOCITY:	11 ft / sec
BASE FLOOD DEPTH:	7 ft
EROSION AND SCOUR DEPTHS:	12" EROSION 32" SCOUR @ COLUMNS

FOUNDATION

- 1. FOUNDATIONS ARE DESIGNED FOR A PRESUMPTIVE BEARING VALUE OF 2000 psf AND SHALL BEAR ON NATIVE UNDISTURBED, INORGANIC SOIL OR PREPARED FOOTING BASE MATERIAL.
- 2. FOOTINGS SHALL EXTEND A MINIMUM OF 2'-0" BELOW EXISTING GRADE ELEVATIONS AND A MINIMUM OF 3'-6" BELOW FINISHED GRADE ELEVATIONS. THE CONTRACTOR SHALL VERIFY ALL FOOTING ELEVATIONS MEET THESE CRITERIA.
- 3. IF UNSUITABLE MATERIAL IS ENCOUNTERED, REMOVE ALL UNSUITABLE MATERIAL FROM BELOW THE PROPOSED STRUCTURE FOUNDATION AND PLACE APPROVED COMPACTED MATERIAL TO THE REQUIRED BOTTOM OF FOOTING ELEVATIONS.
- 4. NO CONCRETE SHALL BE PLACED IN WATER OR ON FROZEN GROUND.
- 5. BACK FILL SHALL BE PLACED IN 8" LIFTS AND COMPACTED TO 95% ASTM STANDARD PROCTOR COMPACTION.

CONCRETE

- 1. ALL CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF ACI 318 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE," LATEST EDITION.
- 2. ALL REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60, EXCEPT TIES, WHICH MAY BE GRADE 40.
- 3. ALL CONCRETE REINFORCEMENT SHALL BE EPOXY COATED.
- 4. ALL REINFORCING BARS SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH ACI 315 AND THE CONCRETE REINFORCING STEEL INSTITUTE RECOMMENDATIONS.
- 5. CONCRETE CURING PROCEDURES SHALL BE IN ACCORDANCE WITH ACI 301.
- 6. MINIMUM CONCRETE PROTECTION FOR REINFORCING UNLESS OTHERWISE NOTED SHALL BE:
CONCRETE PLACED AGAINST EARTH 3"
CONCRETE PLACED IN FORMS BUT EXPOSED TO WEATHER:
BARS LARGER THAN #5 2"
BARS #5 AND SMALLER 1-1/2"
CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:
SLABS, WALLS
#11 BARS AND SMALLER 3/4"
LARGER THAN #11 1-1/2"
BEAMS, COLUMNS 1-1/2"

STRUCTURAL STEEL (GENERAL)

- 1. ALL STRUCTURAL STEEL IS DESIGNED ACCORDING TO THE LATEST PROVISIONS OF AISC THE AISC MANUAL OF STEEL CONSTRUCTION.
- 2. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF THE AISC MANUAL OF STEEL CONSTRUCTION.
- 3. ALL STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING:
 - a. W-SHAPES SHALL CONFORM TO ASTM A-992.
 - b. M-, S-, C-, AND MC-SHAPES SHALL CONFORM TO ASTM A-36 OR ASTM A-572, GR. 50 AS INDICATED.
 - c. ANGLES AND PLATES SHALL CONFORM TO ASTM A-36.
 - d. HSS SECTIONS SHALL CONFORM TO ASTM A500 GRADE B.
- 4. ALL STRUCTURAL STEEL BOLTED CONNECTIONS SHALL BE MADE WITH ASTM A325 HIGH STRENGTH BOLTS UNLESS NOTED OTHERWISE.
- 5. ANCHOR BOLTS SHALL CONFORM TO ASTM A-449 WITH D-4 NUTS AND F-436 WASHERS.
- 6. STEEL COLUMNS SHALL BE SET ON CONCRETE OR STEEL UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
- 7. ALL WELDS SHALL BE MADE ONLY BY WELDERS WHO HAVE BEEN QUALIFIED AS PRESCRIBED IN THE "STANDARD CODE OF WELDING IN BUILDING CONSTRUCTION" OF THE AMERICAN WELDING SOCIETY (AWS D1.1)
- 8. ALL STRUCTURAL STEEL AND STRUCTURAL STEEL HARDWARE SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION.

STRUCTURAL LUMBER

- 1. UNLESS OTHERWISE SHOWN IN THE DRAWINGS, STRUCTURAL LUMBER SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:
 - a. INTERIOR EXPOSURE: ALL STRUCTURAL LUMBER PROTECTED FROM MOISTURE AND WEATHER SHALL BE DOUG FIR #2 OR BETTER. UNLESS NOTED OTHERWISE, STUDS MAY BE STUD GRADE.
 - b. EXTERIOR EXPOSURE: ALL STRUCTURAL LUMBER EXPOSED TO MOISTURE, THE WEATHER, WITHIN 8" OF SOIL, OR LESS THAN 18" FROM THE FLOOR OF A CRAWLSPACE SHALL BE PRESSURE-TREATED SOUTHERN YELLOW PINE #2 OR BETTER, WITH A MINIMUM RETENTION MEETING OR EXCEEDING THE REQUIREMENTS OF THE BUILDING CODE.
- 2. ALL LUMBER IN CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESSURE TREATED.
- 3. NAILING SHALL BE IN ACCORDANCE WITH THE "FASTENING SCHEDULE" CONTAINED IN THE IRC 2009 CODE, AND AS AMENDED BY THE CONNECTICUT SUPPLEMENT.

STRUCTURAL WOOD CONNECTORS

- 1. JOIST HANGERS, COLUMN CAPS OR BASES, AND OTHER METAL FABRICATIONS, AS REQUIRED OR INDICATED, SHALL BE OF APPROPRIATE SIZE AND TYPE FOR MEMBERS AND SUPPORT CONDITIONS. JOIST HANGERS AND OTHER METAL FABRICATIONS MAY REQUIRE SPECIAL ORDERING AND MAY HAVE LONG LEAD TIMES.
- 2. ALL NAILS, SCREWS, AND OTHER FASTENERS SHALL BE STAINLESS STEEL WHEN IN CONTACT WITH PRESSURE-TREATED LUMBER. ALTERNATELY, "Z-GALV" FINISHED FASTENERS BY SIMPSON STRONG-TIE MAY BE SUBSTITUTED WITH PRIOR APPROVAL.
- 3. ALL CONNECTORS (JOIST HANGERS, TIES, STRAPS, ETC.) SHALL HAVE A "Z-GALV" FINISH BY SIMPSON STRONG-TIE OR BETTER WHEN IN CONTACT WITH PRESSURE-TREATED LUMBER.
- 4. ALL CONNECTORS SHALL BE INSTALLED USING THE MANUFACTURER'S REQUIRED QUANTITY AND SIZE OF CONNECTORS PER THE MANUFACTURER'S PUBLISHED INSTRUCTIONS.

CERTIFICATION OF ELEVATION

MARTINEZ, COUCH & ASSOCIATES, LLC SHALL CERTIFY BUILDING ELEVATIONS AS FOLLOWS:

- 1. BOTTOM OF THE LOWEST HORIZONTAL STRUCTURAL MEMBER ELEVATION SHALL BE SURVEYED AND REPORTED TO AND APPROVED BY A REGISTERED DESIGN PROFESSIONAL PRIOR TO ANY FURTHER VERTICAL CONSTRUCTION PROCEEDING. (IRC-02 SECTIONS 109.1.3 & 323.1.9)
- 2. BOTTOM OF THE LOWEST HORIZONTAL STRUCTURAL MEMBER ELEVATION SHALL BE RE-SURVEYED AND REPORTED PRIOR TO FINAL INSPECTION.

SIMPSON STRONG-TIE CONNECTORS ARE SPECIFIED TO MEET THE STRUCTURAL REQUIREMENTS OF THE DESIGN. BEFORE SUBSTITUTING ANOTHER BRAND, CONFIRM LOAD CAPACITY BASED ON RELIABLE PUBLISHED TESTING DATA OR CALCULATIONS. A REGISTERED DESIGN PROFESSIONAL SHOULD EVALUATE AND GIVE WRITTEN APPROVAL FOR SUBSTITUTION PRIOR TO INSTALLATION.

HELICAL PILE NOTES

- THE PILE DESIGN IS BASED ON DANBRO DISTRIBUTORS "CHANCE" PRODUCTS OR APPROVED EQUAL:
DANBRO DISTRIBUTORS
STEVE P GENCORELLI, PE
CHANCE(TM) HELICAL PRODUCTS
215-271-7700
INFO@DANBRO.COM
- THE CONTRACTOR SHALL BE TRAINED AND CERTIFIED BY A. B. CHANCE COMPANY IN THE PROPER METHODS OF DESIGN AND INSTALLATION OF HELICAL PILES.
 - o THE CONTRACTOR SHALL PROVIDE NAMES OF ON-SITE PERSONNEL MATERIALLY INVOLVED WITH THE WORK, INCLUDING THOSE WHO CARRY DOCUMENTED CERTIFICATION FROM A. B. CHANCE COMPANY.
 - o THE CERTIFICATION CARD SHALL HAVE A VALID DATE, CURRENT COMPANY NAME AND APPEARANCE.
- THE HELICAL PILE CONTRACTOR SHALL NOT SUBLET THE WHOLE OR ANY PART OF THE CONTRACT WITHOUT THE EXPRESS WRITTEN PERMISSION OF MARTINEZ, COUCH & ASSOCIATES, LLC.
- REFER TO CHANGE PRODUCTS MANUFACTURER'S RECOMMENDATIONS.
- THE FOLLOWING ARE CHANCE APPROVED INSTALLER:

WOODFORD BROTHERS, INC.
6500 RTE 80
APULIA STATION, NY 1302
TOM WOODFROD JR.
1-800-653-2276

CONSTRUCTION SERVICES UNLIMITED
GUILFORD, CT
TOM TOLLA
(203) 475 1316

ROBERT BARNABEI CONTRACTING
155 OVERSHORES DRIVE, WEST
MADISON, CONNECTICUT
(203) 245 9300

CONTE COMPANY, LLC
MATTHEW CONTE, CPC
(203) 853 2400

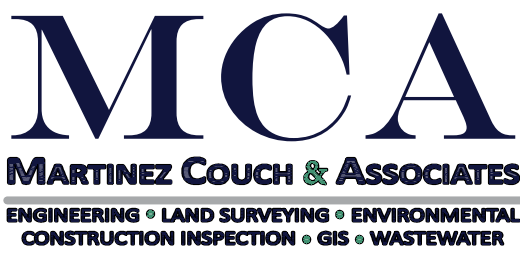
- THE PILE DESIGN IS BASED ON THE GEOTECHNICAL REPORT BY SOIL TESTING, INC., DATED 06/23/2014.
- GROUND WATER TABLE IS LOCATED 6 FEET BELOW TOP OF BORING B-1.
- THE DESIGN IS BASED ON THE REFERENCED BORING AND IS ANTICIPATED TO BE CONSISTENT WITH SITE SOIL CONDITIONS; HOWEVER, SOIL CONDITIONS MAY VARY WIDELY FROM LOCATION TO LOCATION AND FROM POINT TO POINT ON A SITE.
- THE SUBSURFACE ELEVATION OF THE REFERENCED BORING MAY VARY WITH RESPECT TO THE TOP OF PILE AND SHOULD BE ANALYZED BY THE CONTRACTOR.
- MAXIMUM SERVICE VERTICAL LOAD 25 KIPS
- CHANCE HELICAL PILE TYPE: SSS (GALVANIZED), HELIX GR 80, WITH 8-10-12 OR APPROVED EQUAL TO THE FOLLOWING DEPTHS:
 - o 12" HELIX AT 20 FT. DEEP.
 - o 10" HELIX AT 22.5 FT. DEEP.
 - o 8" HELIX AT 24.5 FT. DEEP.
- MINIMUM EMBEDMENT PILE LENGTH = 25 FEET
- TERMINATION: CONSTRUCTION CAP WITH BOLT HOLE FOR UPLIFT
 - o PLEASE NOTE THAT CUTTING OFF THE SOLID SQUARE SHAFT EXTENSION TO THE CORRECT ELEVATION WILL SEVER THE BOLT HOLE. THEREFORE, THE INSTALLER MUST GET THE LEVEL CORRECT WITHOUT CUT-OFF, DRILL A NEW BOLT HOLE, OR WELD, PER THE RECOMMENDATIONS OF A REGISTERED DESIGN PROFESSIONAL.
- REQUIRED FIELD INSTALLATION TORQUE = 5000 FT-LBS.
- FACTOR OF SAFETY = 2.0
- MINIMUM EMBEDMENT INTO THE FOOTINGS IS 12" FOR FIXED CONDITION.
- PRODUCTION LEAD TIMES SHOULD BE DISCUSSED WITH INSTALLER BEFORE SCHEDULING CONSTRUCTION.
- SHOULD THE CONTRACTOR ELECT TO PROVIDE AN APPROVED EQUAL PRODUCT, IT IS THE CONTRACTOR RESPONSIBILITY TO PROVIDE THE FOLLOWING: DESIGN COMPUTATIONS STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT, ALONG WITH PRODUCT CUT SHEETS, CATALOGS, AND DESIGN DATA TO A REGISTERED DESIGN PROFESSIONAL FOR HIS REVIEW AND APPROVAL PRIOR TO INSTALLATION.
- ALL HELICAL PILE MATERIAL SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153/A123.
- A TORQUE INDICATOR SHALL BE USED DURING HELICAL PILE INSTALLATION AND SHALL BE CAPABLE OF PROVIDING CONTINUOUS MEASUREMENT OF APPLIED TORQUE THROUGHOUT THE INSTALLATION.
 - o TORQUE INDICATORS SHALL BE CALIBRATED EITHER ON-SITE OR AT AN APPROPRIATELY EQUIPPED TEST FACILITY AND RE-CALIBRATED, IF IN THE OPINION OF A REGISTERED DESIGN PROFESSIONAL REASONABLE DOUBT EXISTS AS TO THE ACCURACY OF THE TORQUE MEASUREMENTS.
- IF THE MINIMUM INSTALLATION TORQUE AS SHOWN ON THE WORKING DRAWINGS IS NOT ACHIEVED AT THE MINIMUM OVERALL LENGTH, THE CONTRACTOR SHALL INSTALL THE HELICAL PILE DEEPER, ADD MORE OR LARGER HELIX PLATES, DE-RATE THE LOAD CAPACITY OF THE HELICAL PILE AND/OR INSTALL ADDITIONAL PILE(S) AT THE DISCRETION OF A REGISTERED DESIGN PROFESSIONAL.

CONCRETE MIX DESIGN

- NOTE: MAXIMUM WATER SOLUBLE CHLORIDE ION CONCENTRATIONS IN HARDENED CONCRETE SHALL NOT EXCEED 0.30 PERCENT (0.003) BY WEIGHT OF CEMENT. THIS INCLUDES, BUT IS NOT LIMITED TO, CONTRIBUTIONS FROM WATER, AGGREGATES, CEMENTITIOUS MATERIALS, AND ADMIXTURES.
- 1. PORTLAND CEMENT: ASTM C 150, TYPE I.
 - 2. NORMAL WEIGHT AGGREGATES: ASTM C 33. SAND SHALL BE CLEAN AND FREE OF CONTAMINANTS. COARSE AGGREGATE SHOULD BE WASHED AND GRADED. AGGREGATE SIZE SHALL NOT EXCEED ONE-FIFTH THE DISTANCE BETWEEN FORMS, ONE-THIRD THE DEPTH OF SLABS, NOR THREE-FOURTHS OF THE MINIMUM CLEAR SPACE BETWEEN REINFORCING BARS.
 - 3. WATER: POTABLE AND COMPLYING WITH ASTM C 94.
 - 4. AIR-ENTRAINING MIXTURE: ASTM C 260.
 - 5. WATER-REDUCING ADMIXTURE: ASTM C 494, TYPE A, D, E, OR F, CONTAINING NOT MORE THAN 0.1 PERCENT CHLORIDE IONS.
 - 6. FLY ASH: ASTM C 618, CLASS C or CLASS F. LOSS ON IGNITION FOR EITHER CLASS SHALL NOT EXCEED 6.0%. FLY ASH MAY BE USED TO REPLACE UP TO A MAXIMUM OF 25% (BY MASS OF CEMENTITIOUS MATERIAL) OF THE REQUIRED PORTLAND CEMENT. FEMA RECOMMENDS THE ADDITION OF FLY ASH FOR CONCRETE CONSTRUCTION ALONG THE COAST.
 - 7. PROHIBITED ADMIXTURES: CALCIUM CHLORIDE THYOCYANATES OR ADMIXTURES CONTAINING CHLORIDE IONS WHICH WILL EXCEED THE MAXIMUM TOTAL CONCENTRATIONS SPECIFIED HEREIN ARE NOT PERMITTED.
 - 8. DESIGN MIXES FOR STRUCTURAL ELEMENTS SHALL PROVIDE NORMAL WEIGHT CONCRETE WITH THE FOLLOWING PROPERTIES: 5,000 psi MINIMUM 28-DAY COMPRESSIVE STRENGTH, AIR ENTRAINMENT: 5 to 7% (±1%) BELOW GRADE; 3 to 5% (±1%) ABOVE GRADE. A MAXIMUM WATER/CEMENT RATIO OF 0.40
 - 8. DESIGN MIXES FOR SLABS-ON-GRADE SHALL PROVIDE NORMAL WEIGHT CONCRETE WITH THE FOLLOWING PROPERTIES: 3, 500 psi MINIMUM 28-DAY COMPRESSIVE STRENGTH, AIR ENTRAINMENT: 5 to 7% (±1%) FOR SLABS EXPOSED TO WEATHER; 3 to 5% (±1%) FOR SLABS PROTECTED FROM WEATHER. A MAXIMUM WATER/CEMENT RATIO OF 0.40
 - 9. RECOMMENDED SLUMP IS 3" (±1/2") AT GRADE BEAMS & FOOTINGS, AND 4" (±1/2") AT CONCRETE COLUMNS.
 - 10. CONCRETE MIX DESIGN SHALL CONFORM TO ACI CODE 4.2.1 EXPOSURE CATEGORY C, CLASS C2.

LEGEND

- 1. "V.I.F." INDICATES CONTRACTOR SHALL VERIFY THE IDENTIFIED CONDITION IN THE FIELD. ANY DISCREPANCIES OR VARIATIONS FROM DRAWINGS SHALL BE IMMEDIATELY REPORTED TO MARTINEZ, COUCH & ASSOCIATES FOR REVIEW AND COMMENT.



1084 Cromwell Avenue, Suite A-2
Rocky Hill, CT 06067
Telephone: (860) 436-4364
Fax: (860) 436-4626
www.martinezcouch.com

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STRATFORD, CONNECTICUT 06615



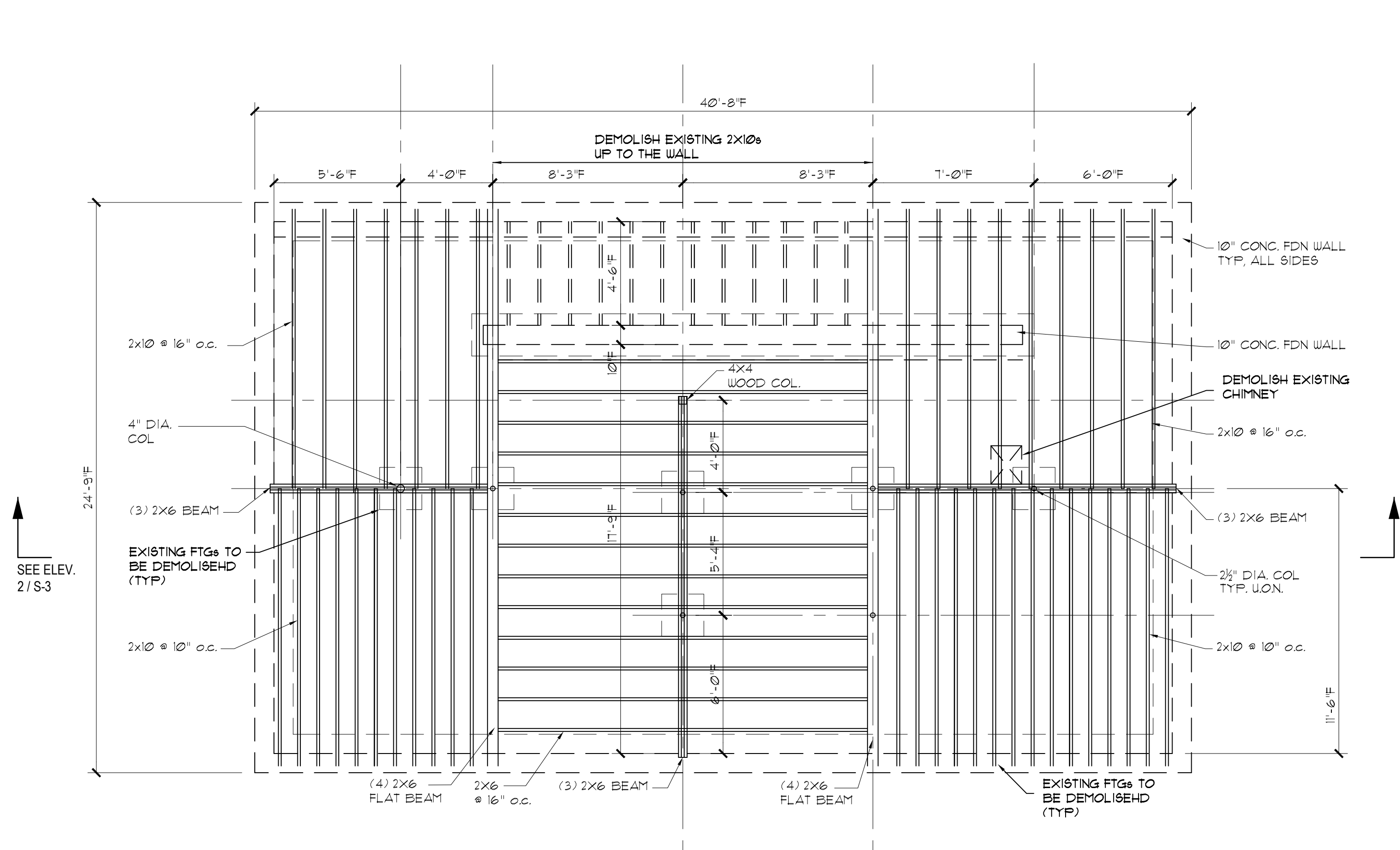
1	08/26/14	ISSUED FOR PERMITTING					AMM	TOD	RHS
NO.	DATE	REVISIONS					BY	CHK	APPV
DRAWN BY: ELR/TOD		CHECKED BY: RHS		SCALE: AS NOTED		DATE: 22 AUG 2014			

THIS MAP IS NOT VALID WITHOUT A LIVE SIGNATURE AND SEAL

RIFAT H. SALEH, P.E.

GENERAL NOTES

	JOB NO.	DRAWING NUMBER	SHEET
	2065	44 WASHINGTON.dwg	S-1

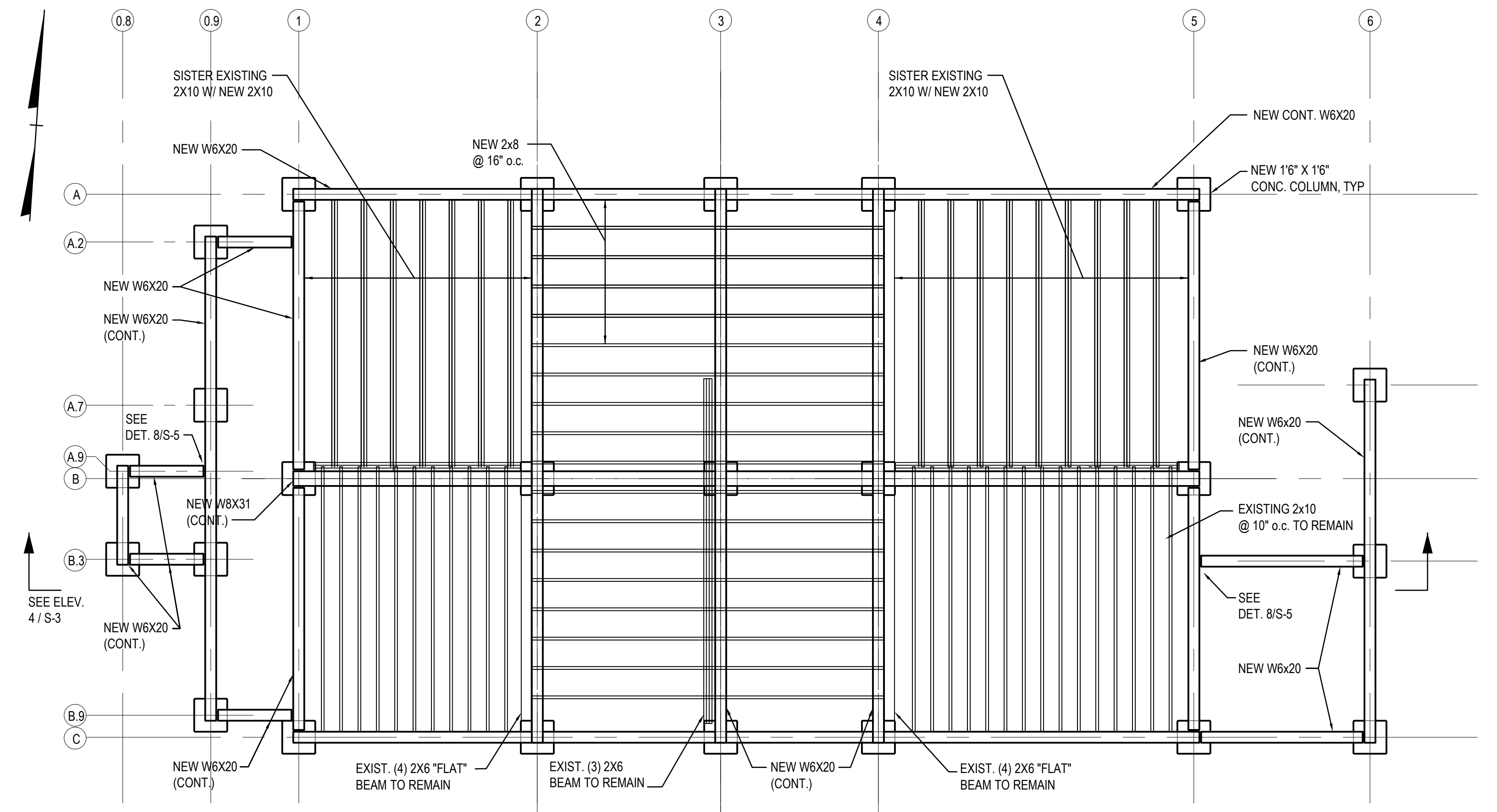


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S-3 **EXISTING FRAMING AND DEMOLITION PLAN**
1/4" = 1'-0"

- FRAMING NOTES:
- "DEMOLISH" INDICATES "DEMOLISH AND LEGALLY DISPOSE OF FROM THE SITE..."
 - CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AS REQUIRED.
 - CONTRACTOR SHALL COORDINATE ALL WORK WITH THE THE HOUSE LIFTING CONTRACTOR.
 - SEE GENERAL NOTES ON SHEET S-1 FOR ADDITIONAL INFORMATION.

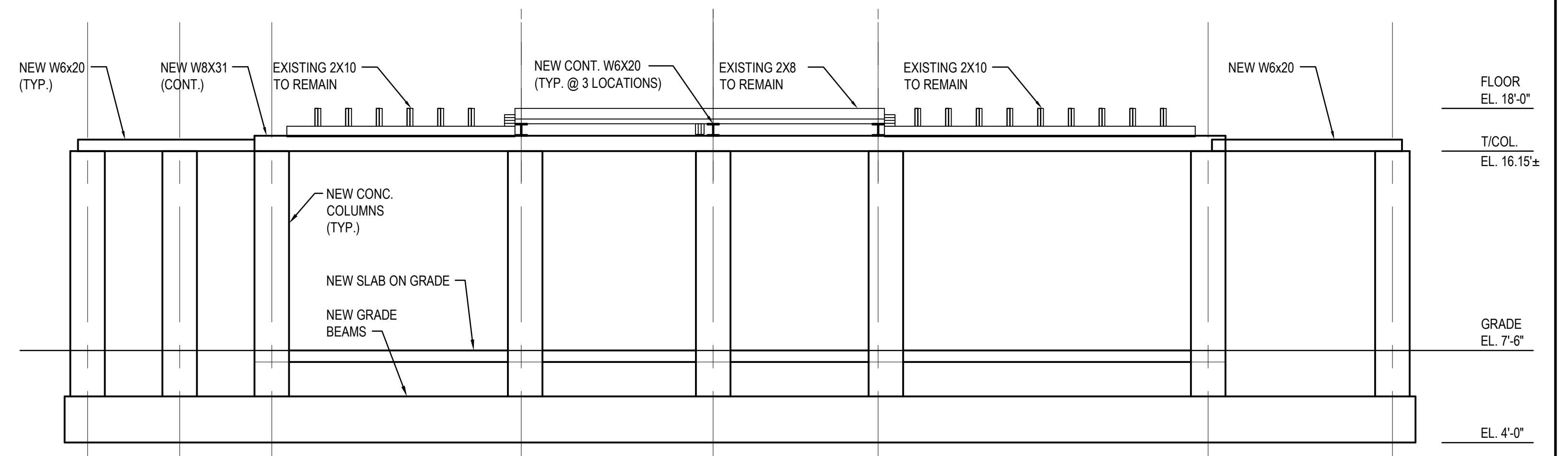


2
S-3 **EXISTING FRAMING ELEVATION**
1/4" = 1'-0"



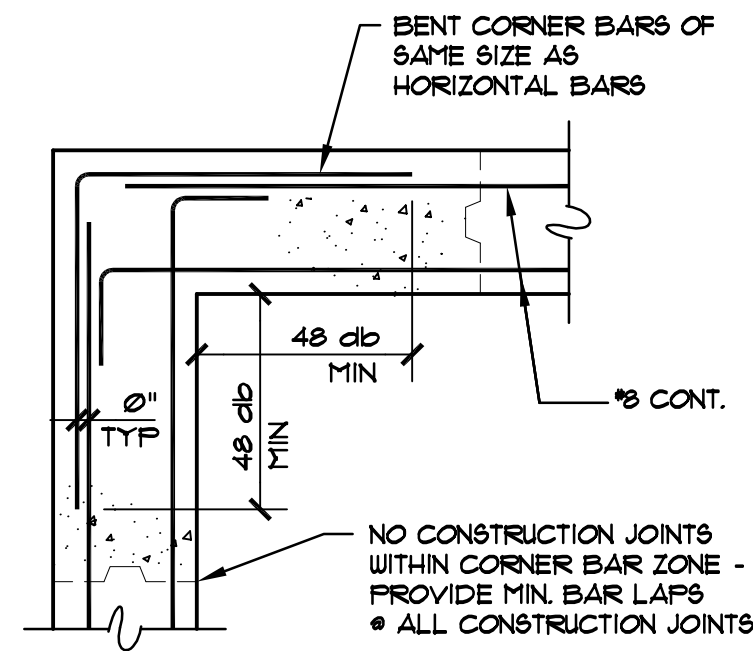
3
S-3 **PROPOSED FRAMING PLAN**
1/4" = 1'-0"

- FRAMING NOTES:
- COORDINATE NEW CONSTRUCTION WITH EXISTING UTILITIES. DO NOT CUT, NOTCH, OR ALTER ANY NEW OR EXISTING STRUCTURE WITHOUT PRIOR WRITTEN APPROVAL OF A REGISTERED DESIGN PROFESSIONAL.
 - CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AS REQUIRED. NO FABRICATION SHALL OCCUR BASED ON THE DIMENSIONS SHOWN ON THESE DRAWINGS WITHOUT PRIOR FIELD VERIFICATION.
 - SEE GENERAL NOTES ON SHEET S-1 FOR ADDITIONAL INFORMATION.

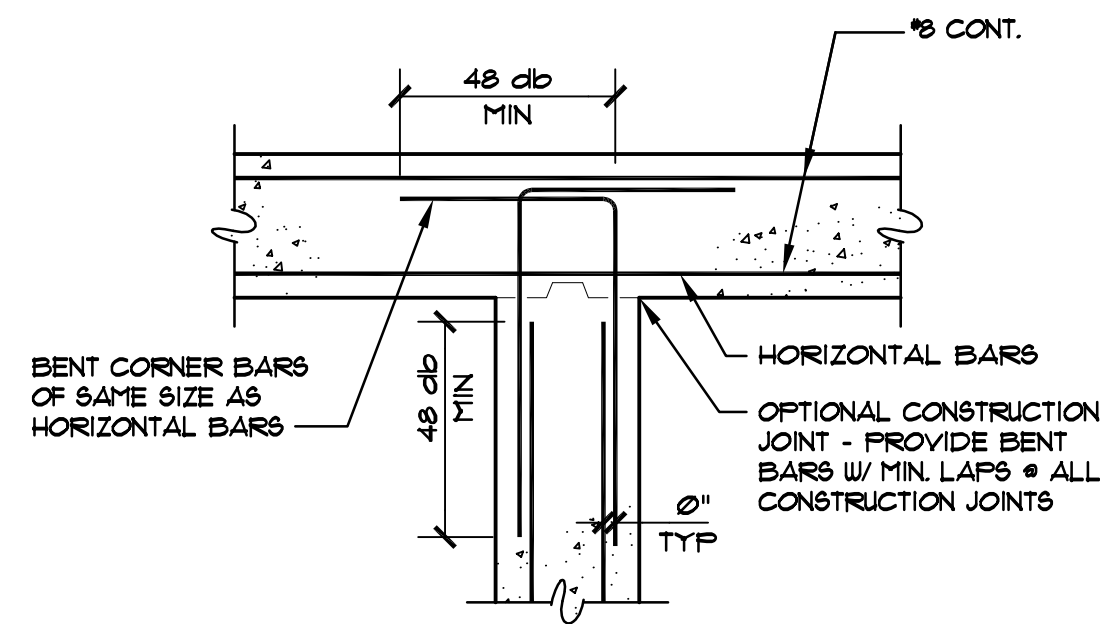


4
S-3 **PROPOSED FRAMING ELEVATION**
1/4" = 1'-0"

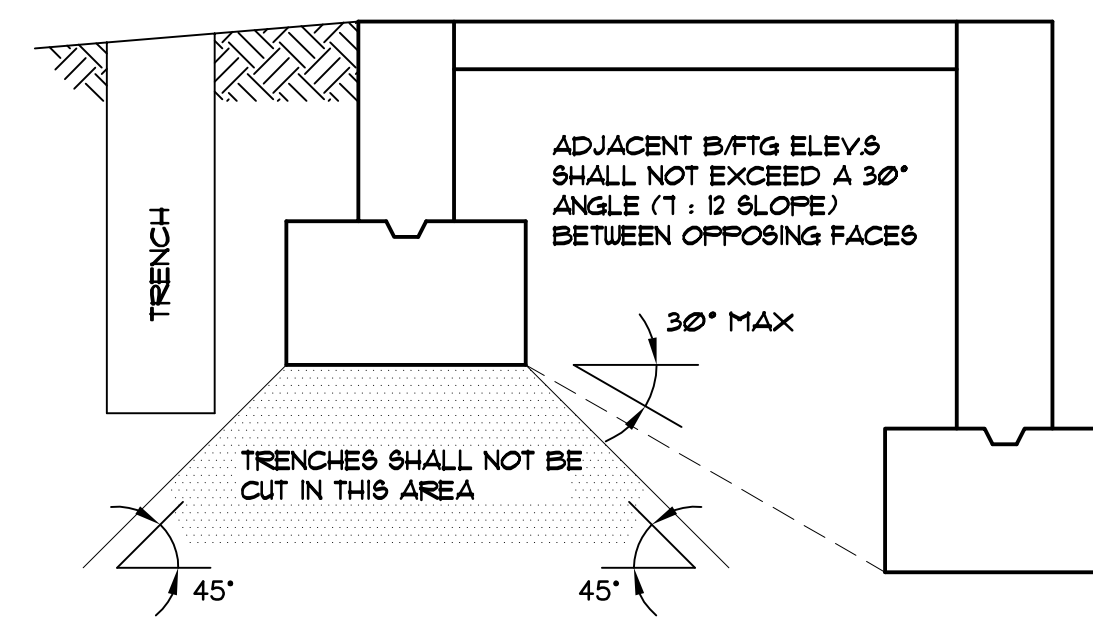
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NO.	DATE	REVISIONS	BY	CHK	APPV
DRAWN BY: ELR/TOD		CHECKED BY: RHS	SCALE: AS NOTED		DATE: 22 AUG 2014



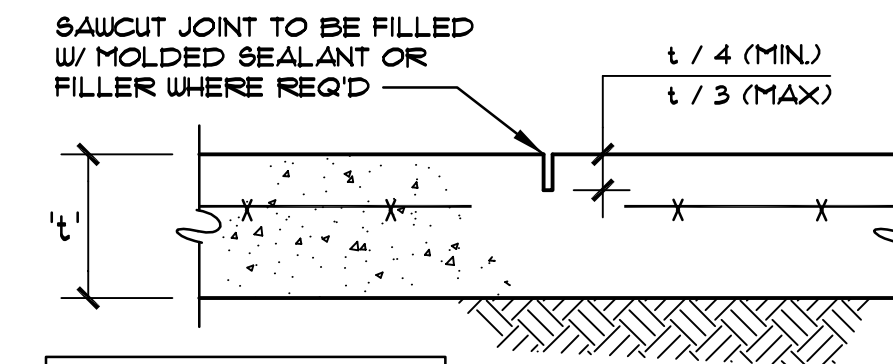
1
S-4
TYPICAL GRADE BEAM
CORNER REINFORCING DETAIL
NOT TO SCALE



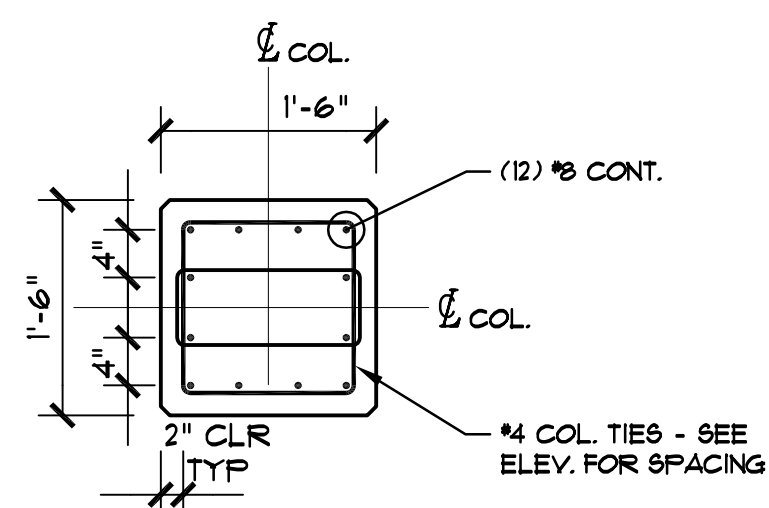
3
S-4
TYPICAL GRADE BEAM
INTERSECTION REINFORCING DETAIL
NOT TO SCALE



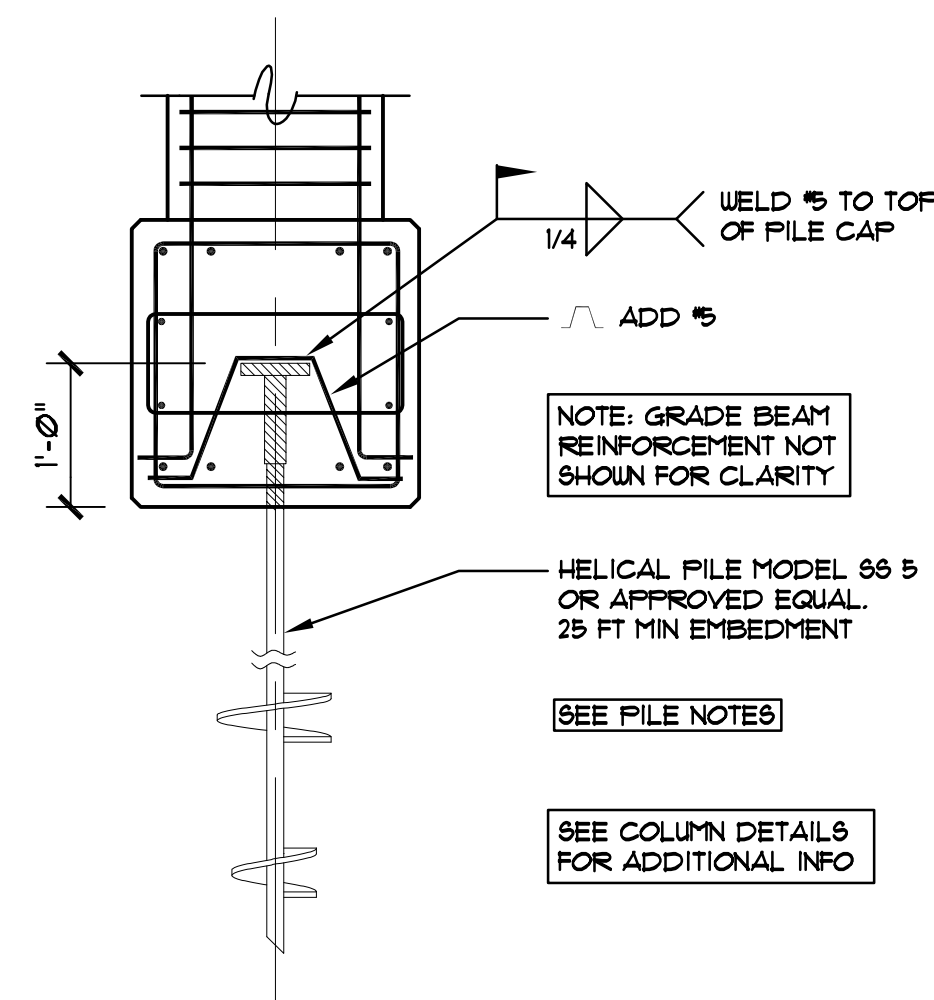
6
S-4
TYPICAL TRENCHING LIMITS
NOT TO SCALE



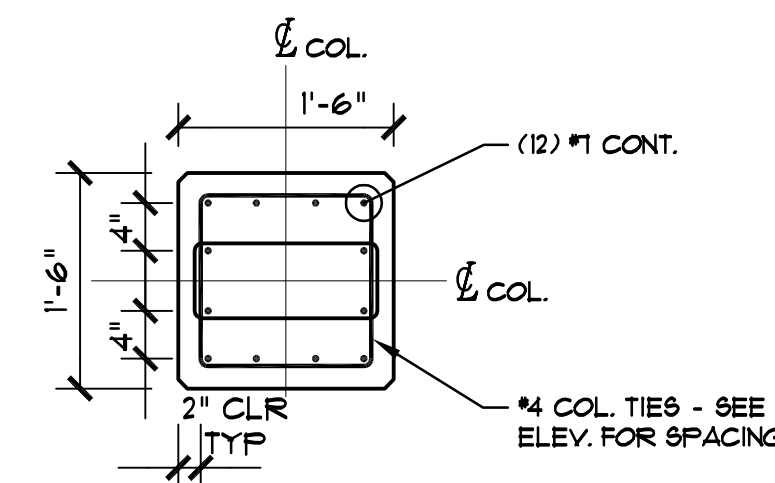
10
S-4
TYPICAL
SAWCUT CONTRACTION JOINT DETAIL
NOT TO SCALE



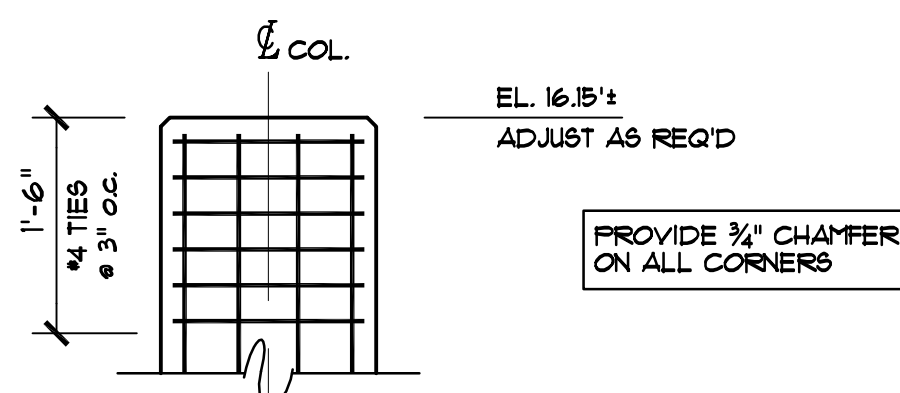
8
S-4
TYP. EXTERIOR COLUMN REINFORCEMENT
3/4" = 1'-0"



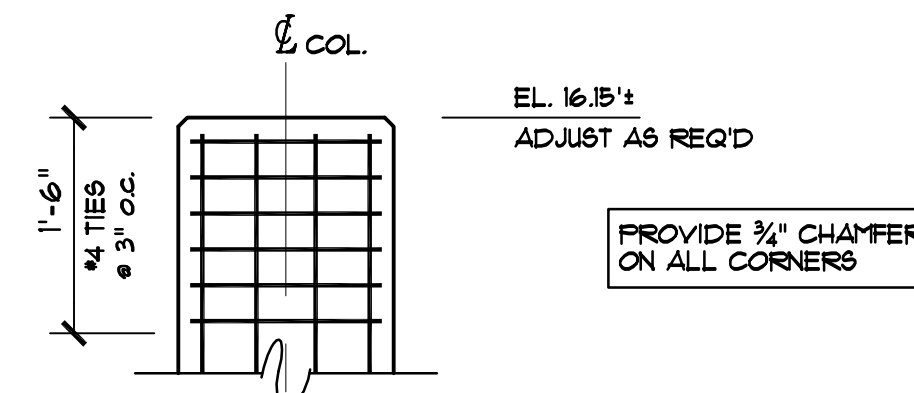
4
S-4
TYP. HELICAL PILE DET.
NOT TO SCALE



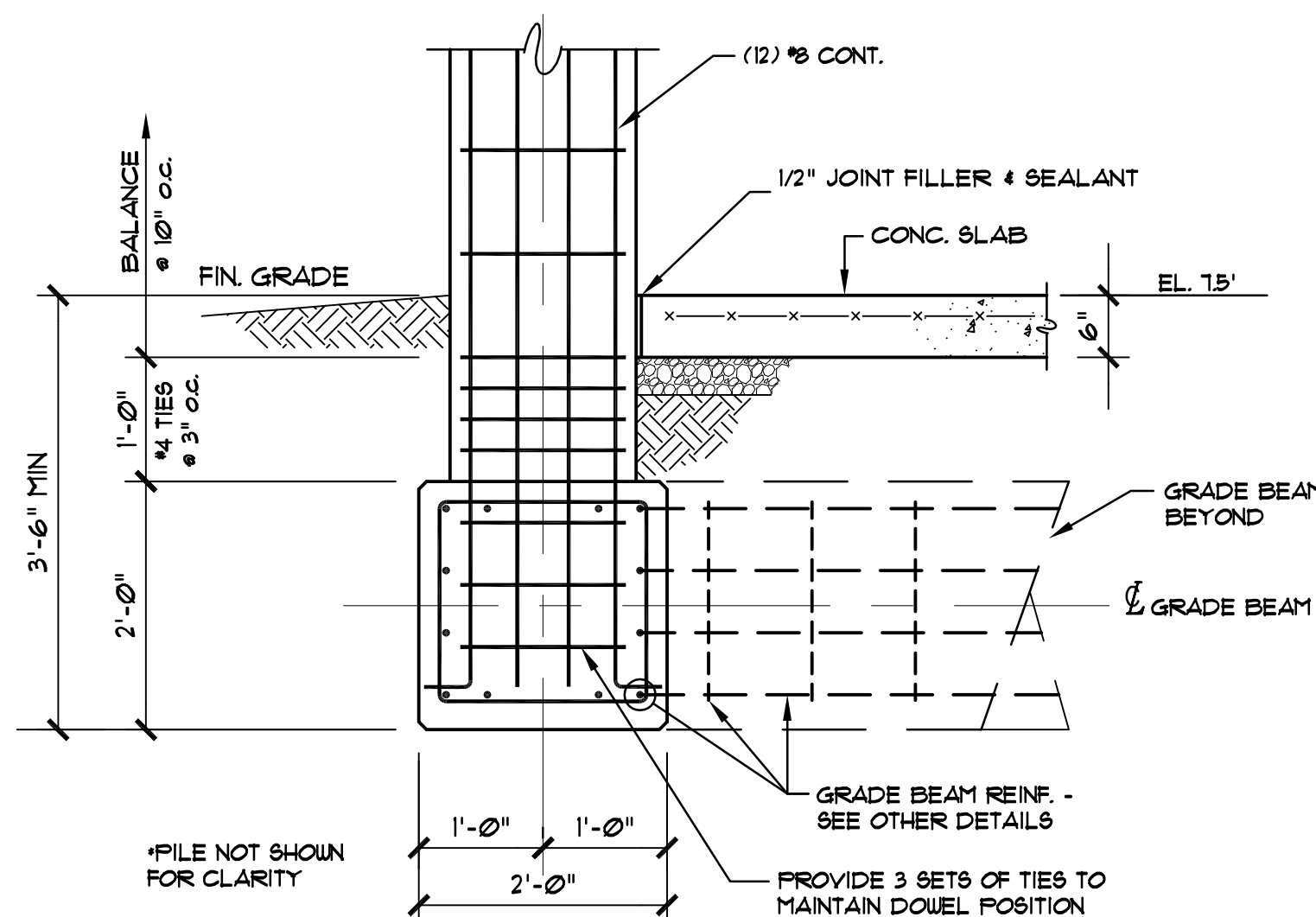
9
S-4
TYP. INTERIOR COLUMN REINFORCEMENT
3/4" = 1'-0"



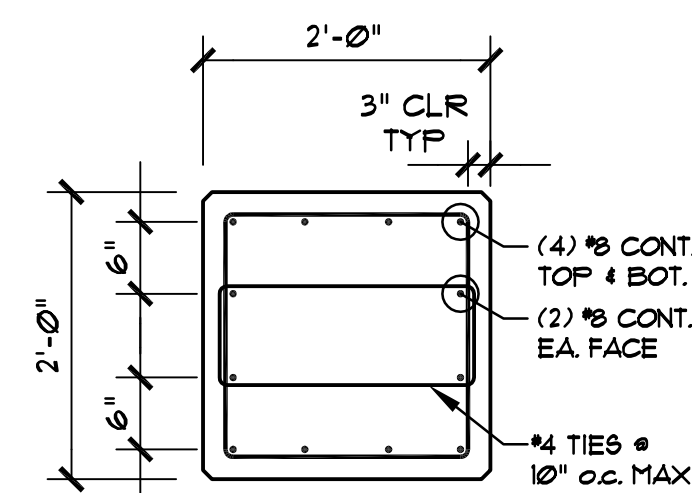
2
S-4
TYP. EXTERIOR COLUMN DETAIL
3/4" = 1'-0"



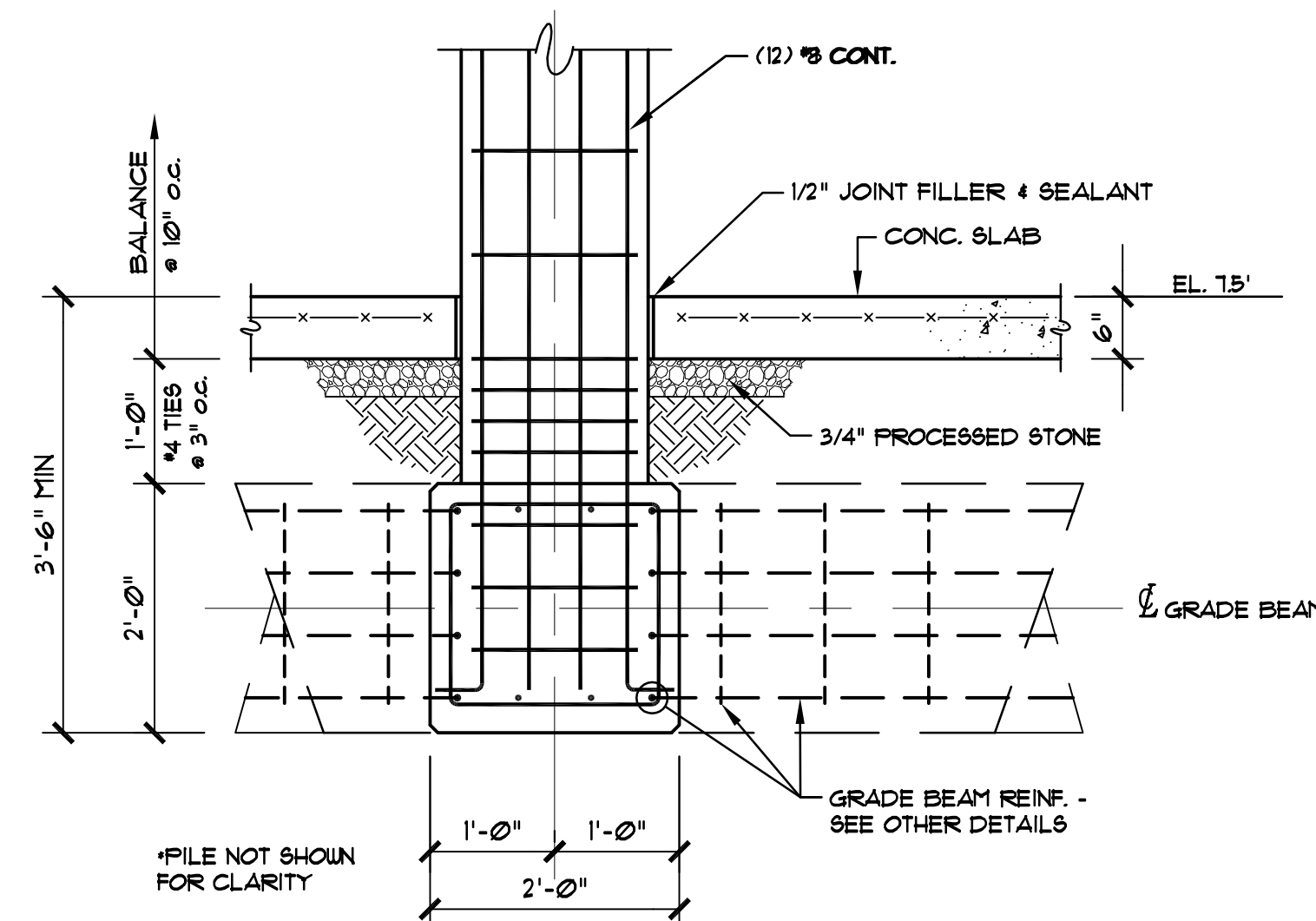
7
S-4
TYP. INTERIOR COLUMN DETAIL
3/4" = 1'-0"



2
S-4
TYP. EXTERIOR COLUMN DETAIL
3/4" = 1'-0"



5
S-4
TYP. GRADE BEAM REINFORCEMENT DET.
3/4" = 1'-0"



7
S-4
TYP. INTERIOR COLUMN DETAIL
3/4" = 1'-0"

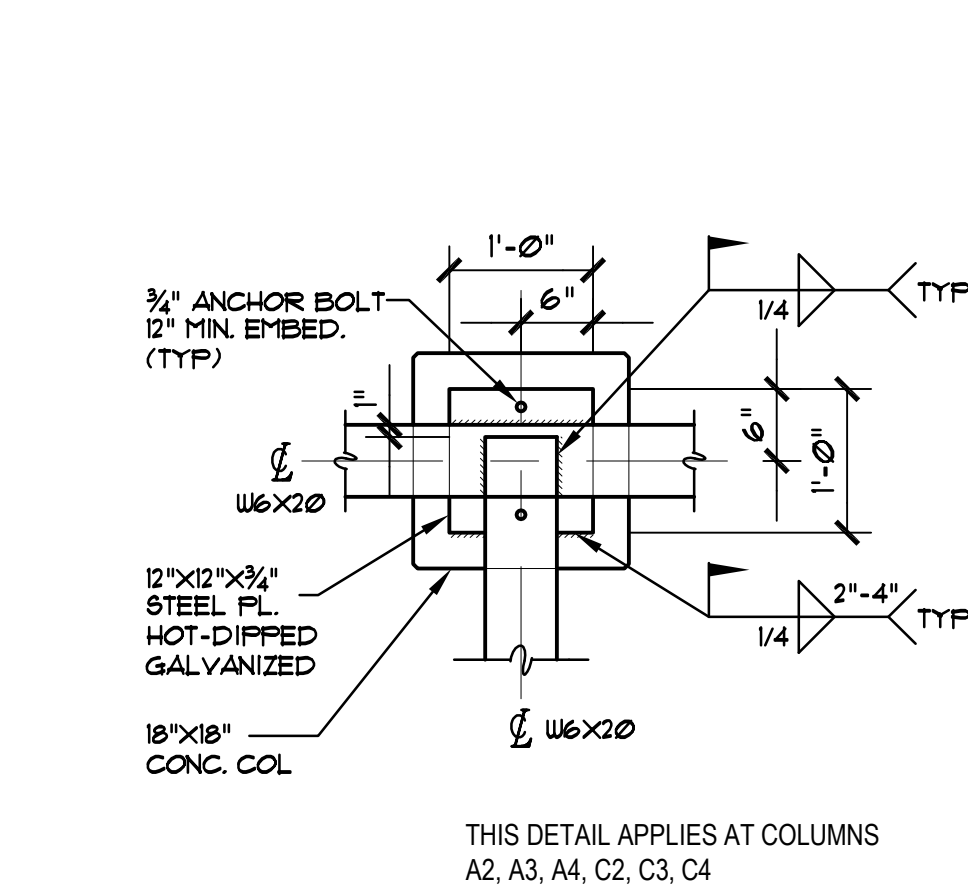
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NO.	DATE	REVISIONS	BY	CHK	APPV
DRAWN BY: ELR/TOD		CHECKED BY: RHS	SCALE: AS NOTED		DATE: 22 AUG 2014

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AND SEAL

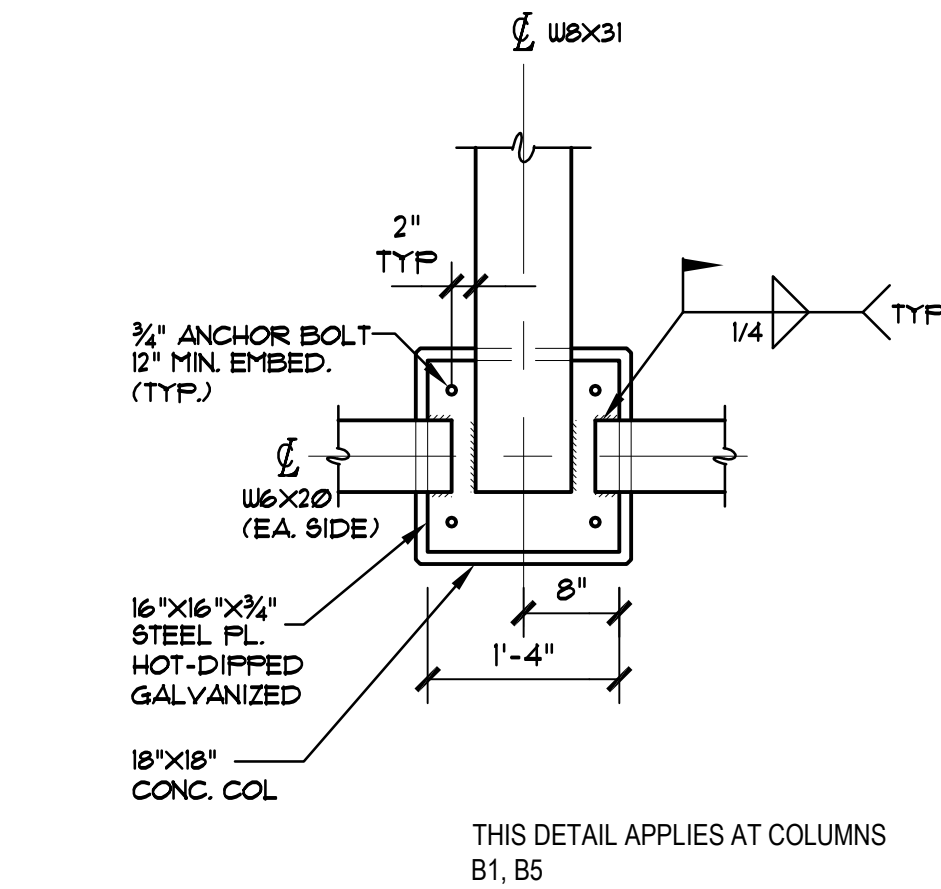
RIFAT H. SALEH, P.E.

MISC. FOUNDATION DETAILS

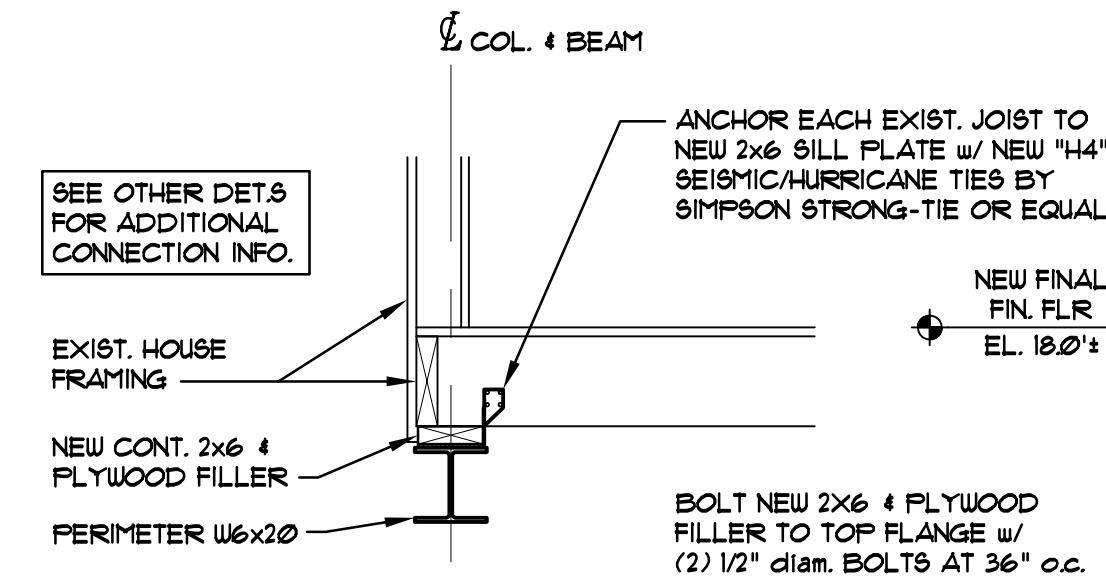
JOB NO.	DRAWING NUMBER	SHEET
2065	44 WASHINGTON.dwg	S-4



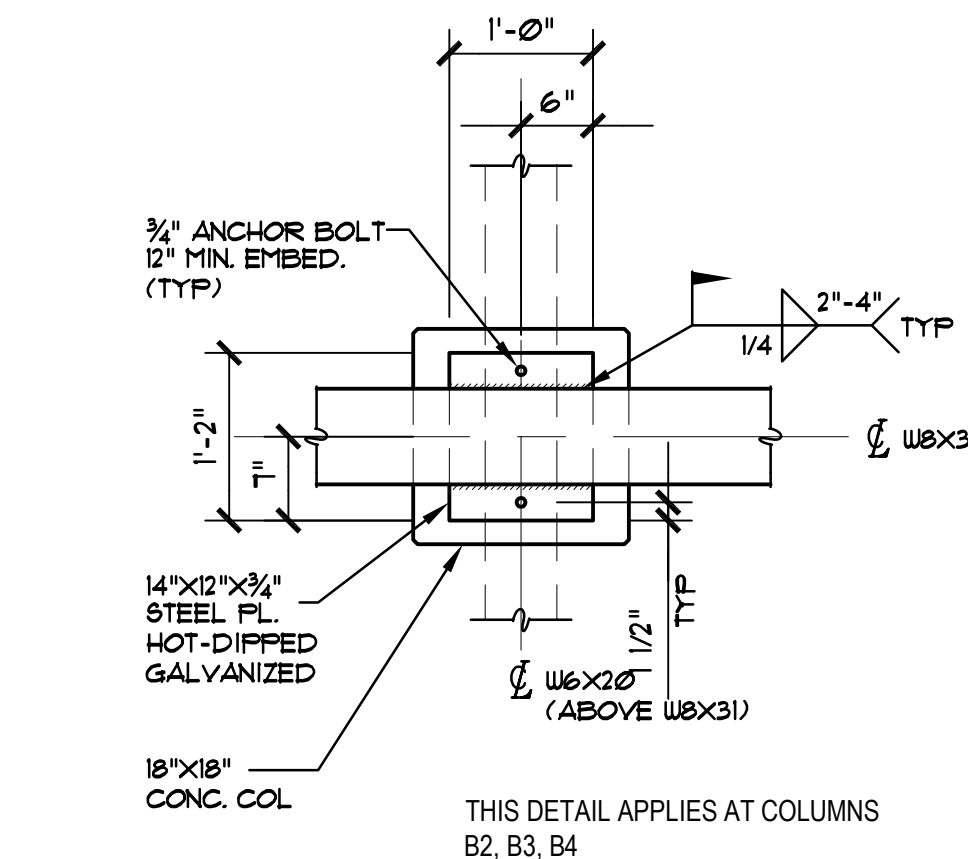
1
S-5
TYPICAL CONNECTION DETAIL
AT PERIMETER COLUMN
3/4" = 1'-0"



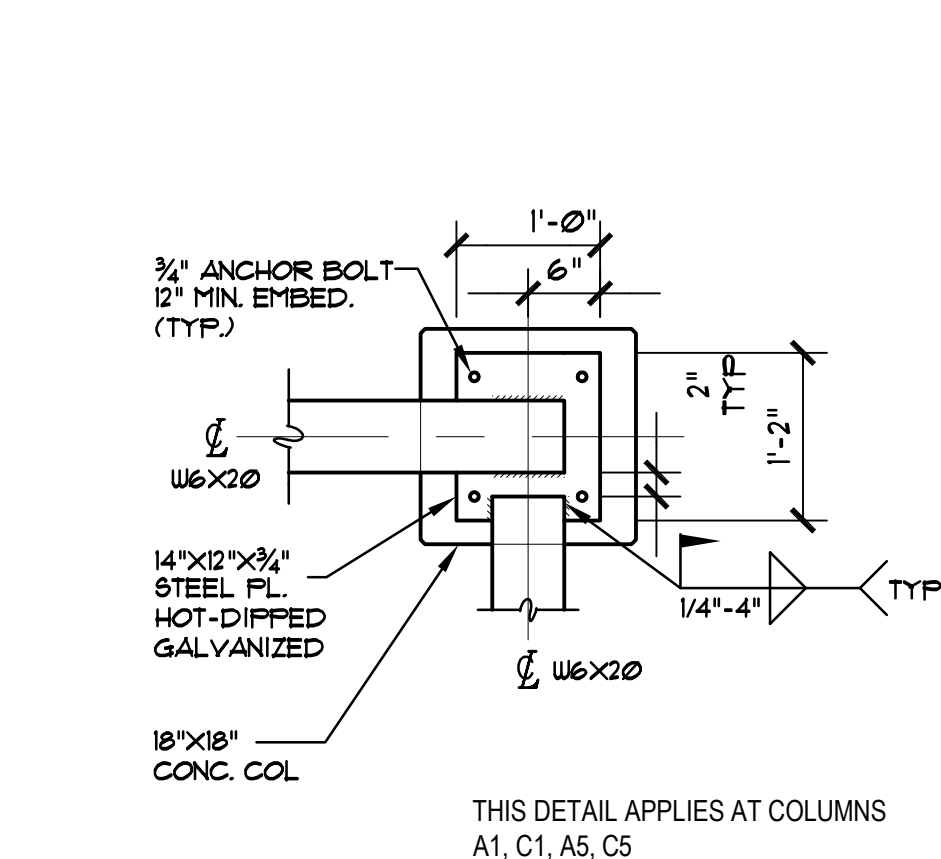
4
S-5
TYPICAL CONNECTION DETAIL
AT EAST & WEST PERIMETER COLUMN
3/4" = 1'-0"



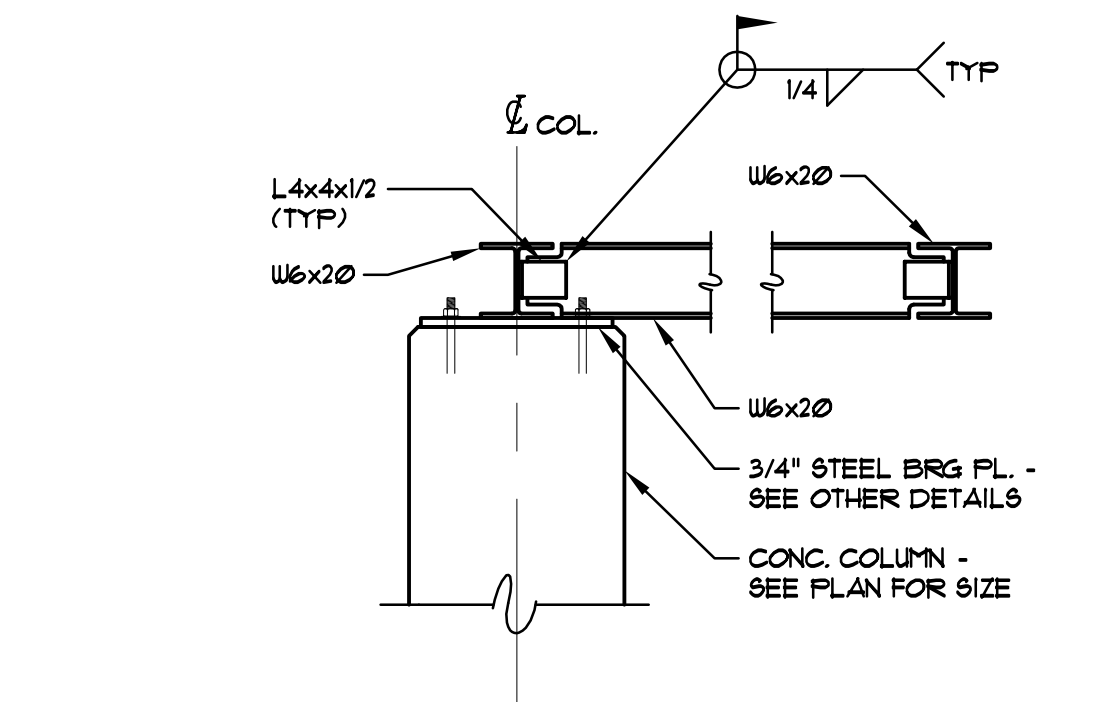
7
S-5
TYPICAL FRAMING DETAIL
3/4" = 1'-0"



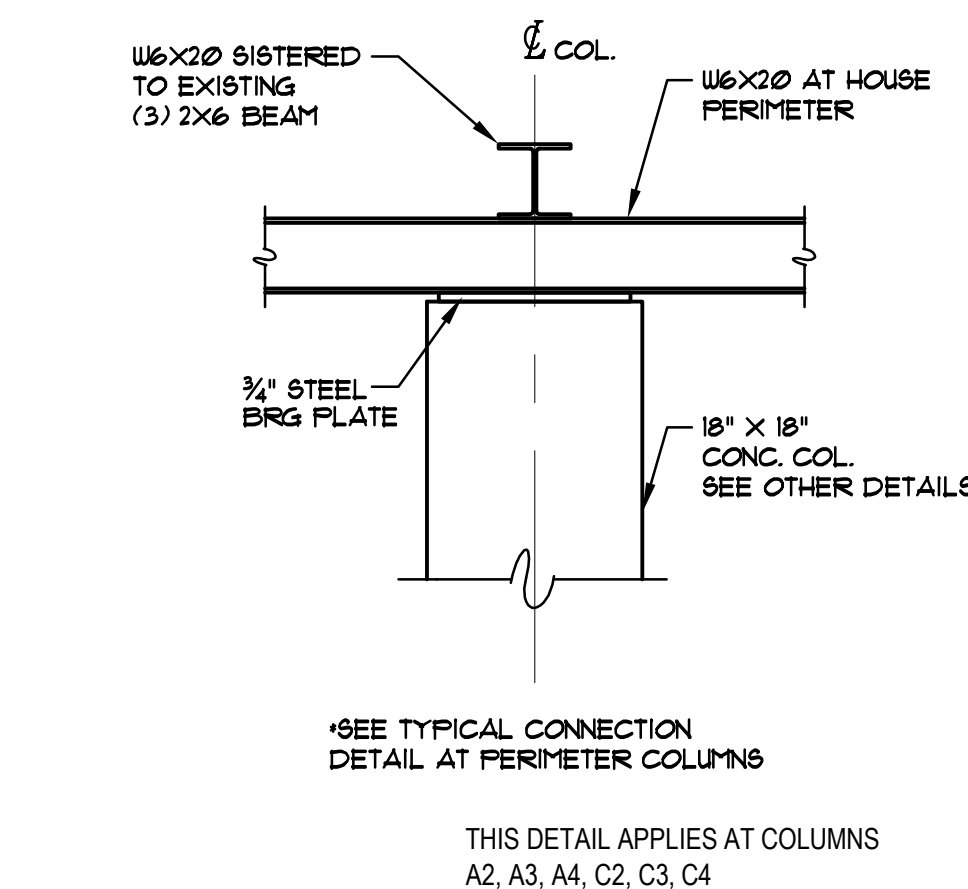
2
S-5
TYPICAL CONNECTION DETAIL
AT INTERIOR COLUMN
3/4" = 1'-0"



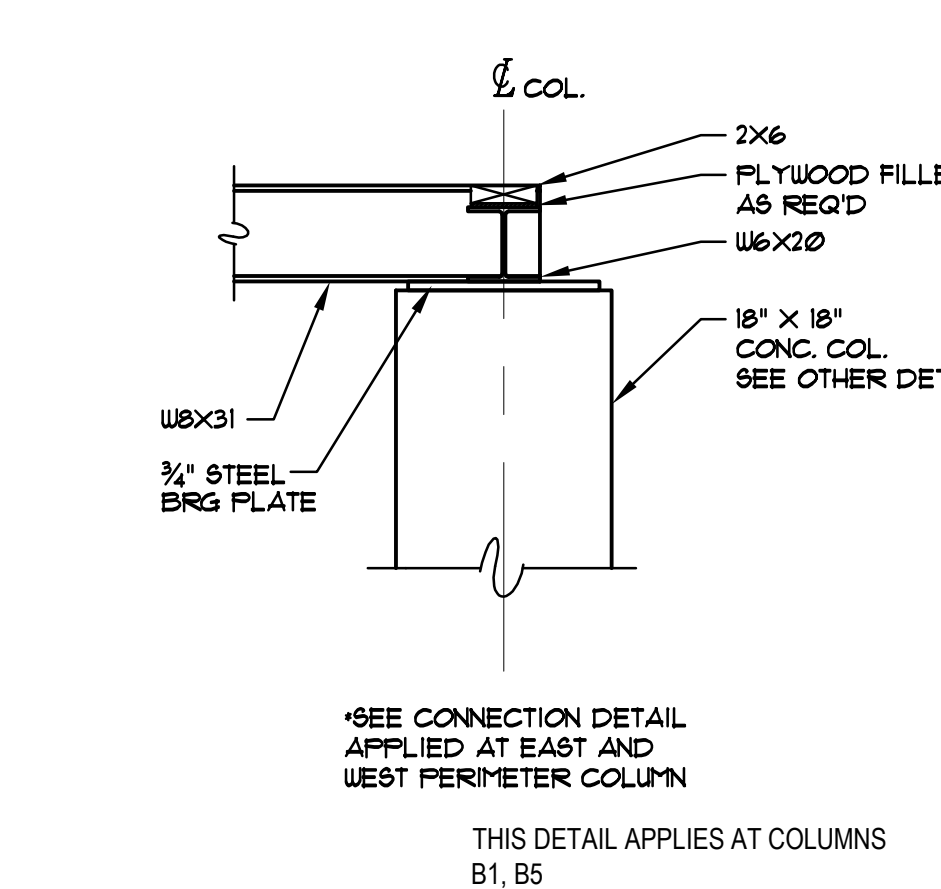
5
S-5
TYPICAL CONNECTION DETAIL
AT CORNER COLUMN
3/4" = 1'-0"



8
S-5
TYPICAL FRAMING DETAIL
AT FRONT & REAR DECKS
3/4" = 1'-0"



3
S-5
TYPICAL FRAMING DETAIL
AT PERIMETER COLUMN
3/4" = 1'-0"



6
S-5
TYPICAL FRAMING DETAIL
AT EAST & WEST PERIMETER COLUMN
3/4" = 1'-0"

1	08/26/14	ISSUED FOR PERMITTING	AMM	TOD	RHS
NO.	DATE	REVISIONS	BY	CHK	APPV
DRAWN BY: ELR/TOD		CHECKED BY: RHS	SCALE: AS NOTED		DATE: 22 AUG 2014

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STEEL DETAILS

JOB NO.	DRAWING NUMBER	SHEET
2065	44 WASHINGTON.dwg	S-5

JOB NO.	DRAWING NUMBER	SHEET
####		E1.01

SYMBOL	FIXTURE	SAN	VENT	H.W.	C.W.	DESCRIPTION
	EX. WATER CLOSET: (PRIVATE)	3"	2"	---	1/2"	EX. WATER CLOSET TO REMAIN, THOROUGHLY CLEAN AND SERVICE FIXTURE PRIOR TO TURNING OVER TO OWNER AT COMPLETION OF WORK.
	EX. BIDET: (PRIVATE)	3"	2"	---	1/2"	EX. BIDET TO REMAIN, THOROUGHLY CLEAN AND SERVICE FIXTURE AND FAUCET PRIOR TO TURNING OVER TO OWNER AT COMPLETION OF WORK.
	EX. SHOWER:	2"	1-1/4"	1/2"	1/2"	EX. SHOWER TO REMAIN, THOROUGHLY CLEAN AND SERVICE DRAIN, FIXTURE & FAUCET PRIOR TO TURNING OVER TO OWNER AT COMPLETION OF WORK.
	EX. LAVATORY: (PRIVATE)	1-1/4"	1-1/4"	1/2"	1/2"	EX. LAVATORY TO REMAIN, THOROUGHLY CLEAN AND SERVICE FIXTURE AND FAUCET PRIOR TO TURNING OVER TO OWNER AT COMPLETION OF WORK.
	EX. KITCHEN SINK: (PRIVATE)	2"	1-1/2"	1/2"	1/2"	EX. SINK TO REMAIN, THOROUGHLY CLEAN AND SERVICE FIXTURE AND FAUCET PRIOR TO TURNING OVER TO OWNER AT COMPLETION OF WORK.
	EX. UNDERCOUNTER DISHWASHER: (PRIVATE)	2"	1-1/2"	1/2"	1/2"	EX. DISHWASHER TO REMAIN, THOROUGHLY CLEAN AND SERVICE FIXTURE PRIOR TO TURNING OVER TO OWNER AT COMPLETION OF WORK.
	EX. ICE MAKER CONNECTION	---	---	---	1/2"	SIQX CHIEF NO-LEAD OX BOX ICEMAKER CONNECTION, COMPLETE WITH INTEGRAL MINI-RESTOR WATER HAMMER ARRESTOR MODEL 146-G100 SERIES WITH ALL ACCESSORIES.
	EX. WATER HEATER, TANKLESS, INTEGRAL W/ BOILER	---	---	1"	1"	EX. WATER HEATING BOILER TO REMAIN, REPIPE 1" GAS TO NEW METER.
	EX. HOSE BIBB: FROST PROOF	---	---	---	3/4"	EX. HOSE BIBB TO REMAIN, THOROUGHLY CLEAN AND SERVICE HOSE BIBB PRIOR TO TURNING OVER TO OWNER AT COMPLETION OF WORK.
	CLOTHES WASHER CONNECTION:	2"	1-1/2"	1/2"	1/2"	EX. CLOTHES WASHER CONNECTIONS TO REMAIN, THOROUGHLY CLEAN AND SERVICE CONNECTIONS PRIOR TO TURNING OVER TO OWNER AT COMPLETION OF WORK.

WATER METER W/ REMOTE ELECTRONIC READER ON EXTERIOR WALL TO LOCAL WATER COMPANY REQUIREMENTS.

PULL SIZE BYPASS

N.O. VALVE

N.C. VALVES

N.O. VALVE UNION (TYP)

T.C.W.

NEW COLUMNS BY GENERAL CONTRACTOR

NEW INSULATED CAVITY UNDER 1ST FL. BY GC

NEW INSULATED WATERPROOF ENCLOSURE BY GC. WITH CLEANOUTS.

SUB ON GRADE FLOOR

SEE TO SS WATER METER FLAME

NOTES:
1. PLUMBING CONTRACTOR SHALL INCLUDE ALL WATER CO. COSTS IN BASE BID.
2. COMPLETE INSTALLATION TO RECOMMENDATIONS OF LOCAL BUILDING AND FIRE DEPARTMENTS, LOCAL WATER COMPANY AND ALL AUTHORITIES HAVING JURISDICTION.

1. OFFSET ALL PIPING AS REQUIRED TO CLEAR ALL STRUCTURE, PIPING, CONDUITS, DUCTS, ETC.
2. CONTRACTOR SHALL COORDINATE AND PROVIDE ALL OFFSETS, BENDS, ALTERATIONS, ETC. TO INSTALL COMPLETE THE PLUMBING/FIRE PROTECTION SYSTEMS.
3. PROVIDE DIELECTRIC FITTINGS AS REQUIRED BETWEEN DISSIMILAR METALS.
4. PROVIDE ALL SYSTEMS TO THE REQUIREMENTS OF ALL APPLICABLE CODES AND STANDARDS. COORDINATE MEDICAL SUITES WITH RECOMMENDATIONS OF LOCAL AND STATE HEALTH DEPARTMENTS, NFPA 99 AND ALL AUTHORITIES HAVING JURISDICTION AS APPLICABLE.
5. ANY PVC OR NON-METALLIC PENETRATIONS OF FIRE OR SMOKE BARRIERS MUST BE SEALED WITH INTUMESCENT FIRE STOPPING (NOT FIRE CAULKING).
6. RUN ALL PIPING FULL SIZE TO FIXTURES, SEE RISERS AND SCHEDULES.
7. PAINT EXPOSED PIPING IN AN APPROVED MANNER; CHROMED WHERE SPECIFIED. SEE SPECIFICATION FOR COLORS, SUBJECT TO ARCHITECTURAL APPROVAL. INSULATE ALL PIPING AS SPECIFIED, SEE SPECIFICATION SECTION 15400.
8. COORDINATE ALL INTERFACING WITH OTHER TRADES PRIOR TO ORDERING OR FABRICATION; INCLUDE ALL DATA ON COORDINATION DIAG. SUBMISSION.
9. ABOVE GRADE WATER PIPING (HW, CU & RHW) SHALL BE TYPE "L" COPPER PIPING WITH WROUGHT COPPER FITTINGS. FULLY INSULATE PIPE AND FITTINGS, INCLUDING PREMOLDED PVC VALVE, ELBOW, TEE AND FITTING INSULATION COVERS WITH INSERTS EQUAL TO ZESTON. INSULATION SHALL BE 25/50 RATED. COMPLETELY SUPPORT PIPING AND PROVIDE VIBRATION ISOLATION, EXPANSION COMPENSATION, SOUND ATTENUATION AND SEISMIC RESTRAINT AT INTERVALS DETERMINED BY CODE. SEE SPECIFICATION SECTION 15010. PROVIDE INSULATION TAPE ON HANGERS IN DIRECT CONTACT WITH PIPING; SADDLES BENEATH PIPING INSULATION WHERE HANGERS ARE EXTERIOR TO PIPING INSULATION. PROVIDE EXPANSION LOOPS TO SUIT FINAL LAYOUT. NOTE THAT ALL FIXTURES AND COMPONENTS MUST BE VALVED FOR SERVICE AND REMOVAL.
10. SANITARY, WASTE AND VENT PIPING SHALL BE NO-HUB C.I. COMPLETE WITH NO-HUB FITTINGS. SEE SPECIFICATION SECTION 15020.
11. IT IS THE INTENT TO TURN OVER COMPLETE, FULLY OPERATIONAL SYSTEMS TO THE OWNER UPON COMPLETION AND REQUEST FOR FINAL PAYMENT.
12. TEST ALL PIPING AND SYSTEMS AS REQUIRED BY CODES AND LOCAL AUTHORITIES HAVING JURISDICTION. DISINFECT, FLUSH AND TEST WATER PIPING, FLUSH AND TEST FIRE PROTECTION PIPING. WATER AND FIRE PROTECTION PIPING SHALL BE FREE FROM CONTAMINATION AND DEBRIS. TEST SAN AND VENT PIPING BY APPLYING A HYDROSTATIC PRESSURE INTENDED FOR THAT PURPOSE. MANUFACTURER OR THEIR AUTHORIZED REPRESENTATIVE SHALL STARTUP ALL EQUIPMENT AND PROVIDE OWNER WITH DETAILED (8 HRS PER MFG) INSTRUCTION PERIOD.
13. COORDINATE ALL WORK WITH ARCHITECTURAL, STRUCTURAL, SITE AND WORK OF OTHER TRADES. SPACIAL REQUIREMENTS AND LAYOUTS SUPERCEDE INDICATIONS ON PLANS; ADJUST AND COORDINATE WITH OTHER DISCIPLINES ACCORDINGLY. REVISE AS REQUIRED TO THE APPROVAL OF THE ARCHITECT. COORDINATE SITE WORK WITH DIV. 2.
14. REFER TO ARCHITECTURAL DRAWINGS FOR DESIGNATIONS OF HANDICAP ACCESSIBLE UNITS.
15. CONTRACTOR SHALL NOTIFY ALL LOCAL BACKLOG PREVENTOR MUST COMPLY AND MEET ALL REQUIREMENTS. APPROVAL OF LOCAL WATER GOV. DEPARTMENT AND ALL AUTHORITIES HAVING JURISDICTION, CONTRACTOR TO COORDINATE AND PROVIDE.
16. EXCEPT AT SERVICE ENTRY, WHEREVER GATE VALVES SHOWN, PROVIDE BALL VALVING IN ITS PLACE TO THE SATISFACTION OF THE OWNER.
17. FINAL APPROVAL OF PLUMBING FIXTURES, ACCESSORIES, FAUCETS AND TRIM SHALL BE BY THE ENGINEER AND OWNER, AT NO ADDITIONAL COST TO THE CONTRACT.
18. UNLESS INDICATED OTHERWISE, EXTEND FIXTURE PIPING FULL SIZE SEPARATELY TO MAINS IN AN APPROVED MANNER. MINIMUM PIPE SIZES FOR FUTURE SUPPLIES ARE INDICATED IN THE SCHEDULE. MINIMUM MAIN PIPE SIZES SHALL BE 4" SAN, 2"V, 1"WC & 3/4"HW UNLESS NOTED OTHERWISE.
19. COMPLY WITH FEDERAL, STATE AND LOCAL LEAD FREE LAWS; APPLICABLE SUBMITTALS SHALL INDICATE ADEQUATE INFORMATION TO REFLECT COMPLIANCE.

[illegible]

SCALE: NONE

PROVIDE A NEW 1" CW SERVICE TO 5'-0" OUTSIDE OF BUILDING BY PLUMBING CONTRACTOR. CONTINUED BY SITE CONTRACTOR. MAINTAIN 4'-6" MIN COVER. VERIFY EXACT LOCATIONS, INVERTS AND DETAILS IN FIELD PRIOR TO ROUGHING.

Scale: N.T.S

NOTES:

1. SEE SYMBOLS, SCHEDULES, NOTES & DETAILS.
2. PROVIDE NEW OVERHEAD TELEPHONE & CABLE TV SERVICE DROPS (COORDINATE WITH LOCAL UTILITY COMPANIES).

1084 Cromwell Avenue, Suite A-2
Rocky Hill, CT 06067
Telephone: (860) 436-4364
Fax: (860) 436-4626
www.martinezcouch.com

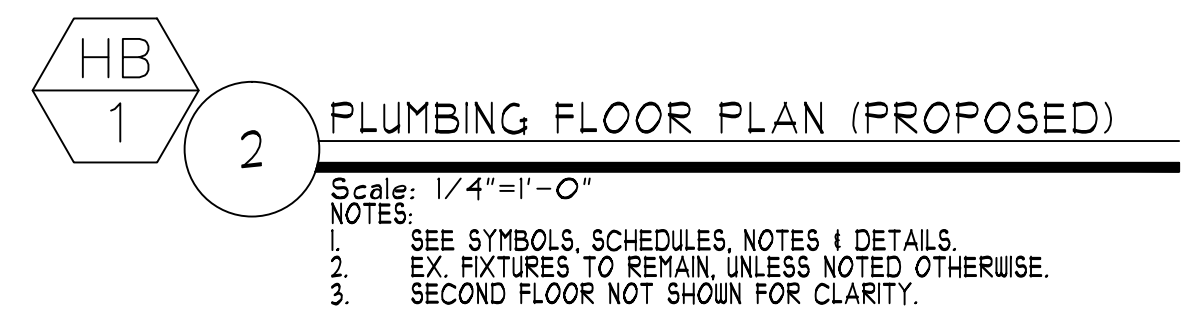
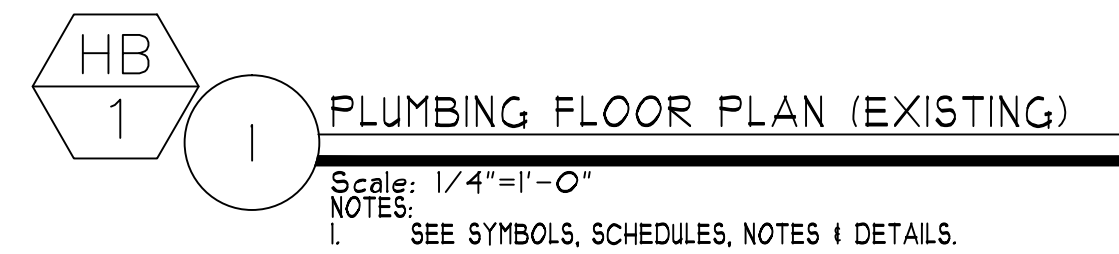
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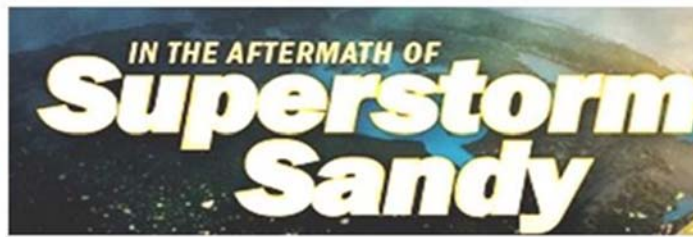
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[illegible]

PLUMBING SYMBOLS, SCHEDULES, NOTES AND DETAILS

JOB NO.	DRAWING NUMBER	SHEET
####		P0.01





Owner Occupied and Scattered Site Rehabilitation Programs

Addendum #1 – Attachment 2

Bid Specifications

Community Development Block Grant Disaster Recovery Program (CDBG-DR)

Owner Occupied Rehabilitation and Rebuilding Program (OORR)

BID PACKAGE

For

Rehabilitation/Reconstruction work for:

Maria Viggiano

44 Washington Parkway

Stratford, CT 06615

Prepared By:

Martinez Couch & Associates, LLC

1084 Cromwell Avenue Suite A-2

Rocky Hill, CT

860-436-4364

Project #: 2065 – 44 Washington Parkway



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Section 1

ADVERTISEMENT FOR BIDS

Project # 2065-44 Washington Parkway

DOH: _____

The State of Connecticut Department of Housing (DOH) is seeking proposals through a Request for Proposal (RFP) process for the rehabilitation, reconstruction and/or mitigation of residential structures damaged by Superstorm Sandy in compliance with all applicable local, federal, and state statutory requirements with special attention paid to requirements for Community Development Block Grants under the United States Department of Housing and Urban Development (“HUD”) Disaster Recovery grant program.

Separated sealed bids for 2065-44 Washington Parkway will be received by Martinez, Couch & Associates LLC until 4 o’clock PM on November 5, 2014, and then at said office publicly opened and read aloud.

The Information to Bidders, Form of Bid, Form of Contract, Plans, Specifications, and Form of Bid Bond, Performance and Payment Bond, and other contract documents may be examined on the Department of Housing Hurricane Sandy Recover website at www.ct.gov/doh/ and click on the “Hurricane Sandy” link.

Copies of plans may be downloaded directly from the Department of Housing website under bid notices or obtained at the office of Martinez, Couch and Associates LLC located at 1084 Cromwell Avenue Suite A-2, Rocky Hill, CT 06067 upon payment of \$50 for each set. Requests for copies of plans shall provide 2 business days notice to Martinez, Couch & Associates, LLC.

DOH reserves the right to waive any informalities or to reject any or all bids.

Each bidder must deposit with his bid, security in the amount, form and subject to the conditions provided in the Information to Bidders.

Attention to bidders is particularly called to the requirements as to conditions of employment to be observed and minimum wages rates to be paid under the contract (if applicable), Section 3, Segregated Facilities, Section 109 and E. O. 11246.

No bidder may withdraw his bid within 30 calendar days after the actual date of the bid opening thereof.

INFORMATION FOR BIDDERS

Receipt and Opening of Bids:

The State of Connecticut Department of Housing (herein called the "DOH"), invites bids on the form attached hereto, all blanks of which must be appropriately filled. Bids will be received by DOH at the office of Martinez, Couch and Associates, LLC until 5 o'clock PM on November, 5, 2014 and then at said office publicly opened and read aloud. The envelopes containing the bids must be sealed, addressed to Mr. Richard Couch, P.E. at Martinez, Couch and Associates, LLC and designated as bid for 2065 – 44 Washington Parkway, Stratford, CT.

DOH may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement there considered. NO bidder may withdraw a bid within 30 days after the actual date of the opening thereof.

Mandatory Walk Through: All bidders must attend a mandatory walk through of the property designated above. The date and time of the walk through is set for 9 o'clock AM on October 22 2014.

Preparation of Bids:

Each bid must be submitted on the prescribed form and accompanied by Certification by Bidder Regarding Equal Employment Opportunity, Form HUD-950.1, and Certification of Bidder Regarding Section 3 and Segregated Facilities. All blank spaces for bid process must be filled in, in ink or typewritten, in both words and figures, and the foregoing Certifications must be fully completed and executed when submitted.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his/her address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form.

Subcontracts: The bidder is specifically advised that any person, for, or other party to whom it is proposed to award a subcontract under this contract:

1. Must be acceptable to the DOH after verification by the State of the current eligibility status; and,
2. Must submit Form HUD-950.2, Certification by Proposed Subcontractor Regarding Equal Employment Opportunity and Certification of Proposed Subcontractor Regarding Section 3 and Segregated Facilities. Approval of the proposed subcontractor award cannot be given by the DOH unless and until the proposed subcontractor has submitted the Certifications and/or other evidence showing that it has fully complied with any reporting requirements to which it is or was subject. Although the bidder is not required to attach such Certifications by proposed subcontractors to his/her bid, the bidder is here advised of this requirement so that appropriate action can be taken to prevent subsequent delay in subcontract awards.

Method of Bidding: DOH invites the following bid(s):

Qualifications of Bidder: The DOH may make such investigations as he/she deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the DOH all such

information and date for this purpose as the DOH may request. The DOH reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the DOH that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids will not be accepted. The State's set Contractor Prequalifications are listed in Exhibit G and also are available at the Department of Housing's Hurricane Sandy Recovers website www.ct.gov/doh/ and click on the "Hurricane Sandy" link.

Bid Security: Each bid must be accompanied by an irrevocable letter of credit from the bank, certified check, or bank cashier's check in the amount not less than five percent (5%) of the bid. Bid bonds may be accepted as bid security. Such checks will be returned to all except the three lowest bidders within three days after the opening of bids, and the remaining cash, or checks will be returned promptly after DOH and the accepted bidder have executed the contract, or opening of bids, upon demand or the bidder at any time thereafter, so long as he/she has been notified of the acceptance of his/her bid.

Conditions of Work: Each bidder must inform him/herself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his/her obligation to furnish all material and labor necessary to carry out the provision of his/her contract. Insofar as possible the contractor, in carrying out the work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

Addenda and Interpretations: No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally.

Every request for such interpretation should be in writing addressed to: Mr. Richard Couch, P.E. at Martinez, Couch and Associates, LLC and to be given consideration must be received at least seven days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instruction will be in the form of written addenda to the specifications which, if issued, will be forwarded by electronic mail and posted on DOH's Hurricane Sandy website to all prospective bidders (at the respective email addresses furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his/her bid as submitted. All addenda so issued shall become part of the contract documents.

Security for Faithful Performance: Simultaneously with his/her delivery of the executed contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the DOH.

Performance and Payment Bonds: A performance and payment bond will be required of the successful bidder (contractor) for 100 percent of the contract price on contracts over \$100,000.

Contract Progress Schedule: Each bid shall be accompanied by a Contract Progress Schedule. Such Schedule shall list the bidder's timetable for completion of the contract.

Power of Attorney: Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

Notice of Special Conditions: Attention is particularly called to those parts of the contract documents and specifications which deal with the following:

1. Inspection and testing of materials
2. Insurance requirements
3. Wage rates (if applicable)
4. State allowances

Laws and Regulations: The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

Method of Award-Lowest Qualified Bidder: If at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds then estimated by the DOH as available to finance the contract; the contract will be awarded on the base bid only. If such bid exceeds such amount, the DOH may reject all bids or may award the contract on the base bid combined with such deductible alternatives applied in numerical order in which they are listed in the Form of Bids, as produces a net amount which is within the available funds.

If the homeowner wishes to select a prequalified bidding contractor other than the lowest and most responsible bidder, said owner is responsible for paying the difference between the lowest bidder and their chosen bidder from their own financing.

Obligation of Bidder: At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect to his/her bid.

Safety Standards and Accident Prevention: With respect to all work performed under this contract, the contractor shall:

1. Comply with the safety standards provision of applicable laws, building and construction codes and the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970 (Public Law 91-596), and the requirements of Title 29 of the Code of Federal Regulations, Section 1518 as published in the "Federal Register," Volume 36, No 75, Saturday, April 17, 1971.
2. Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) who may be injured on the job site before the employer has made a standing arrangement for removal of injured persons to a hospital or a doctor's care.

BID FORM

The undersigned, being familiarized with the local conditions affecting the cost of the work and with the Drawings, Specifications, Invitation to Bidders, Instructions to Bidders, General Conditions, Bid Form, Form of Contract and Form of Bonds for Project No. 2065 – 44 Washington Parkway, Stratford, CT and Addenda No. _____ and _____ thereto, as prepared by Martinez, Couch and Associates, LLC, Connecticut, and on file in the office of DOH, hereby proposes to furnish all permits, labor, materials, tools, equipment, and related items required for the rehabilitation and reconstruction for said Project No. 2065 – 44 Washington Parkway located at 44 Washington Parkway in Stratford, CT, State of Connecticut, all in accordance with the Drawings and Specifications, for the sum of:

_____ Dollars (\$ _____)			
	General Requirements & Temporary Facilities	Subcontractor	Lump Sum Price (\$)
02 83 13	Lead Hazard Remediation		
02 85 00	Mold Remediation		
03 30 00	Concrete		
	Building Lifting		
	Helical Piles		
05 12 00	Structural Steel		
	Wood Framing		
06 15 33	Wood/Composite Decking		
	Insulation		
07 71 23	Gutters and Downspouts		
	Finishes		
	Plumbing		
	H.V.A.C		
	Electrical		
	Site Clearing/Earth Moving		
	Turfs and Grasses/Plants		
	Asphalt Paving		
	Allowance 1		
	Allowance 2		
	Allowance 3		

Total Lump Sum _____

Unit Price	Rate (\$/Per)
Unit Price 1	/C.Y.
Unit Price 2	/C.Y.

The undersigned agrees to commence the work on a date to be specified in the contract and to complete such work within 270 consecutive calendar days.

The undersigned agrees that if within the period of thirty (30) calendar days after the opening of bids, or when extended to the next work day immediately following said period, notice of the acceptance of this bid shall be mailed, or delivered to him/her at the business address given below, or at any time thereafter before this bid is withdrawn, _____, will within fifteen (15) calendar days thereafter deliver to DOH, where directed, a contract properly executed in such number of counterparts as may be required by said DOH, on the forms annexed, with such changes therein as shall have been made by the DOH, prior to the time named for delivery of this proposal, together with a 100% Performance Bond of a Surety Company, which Surety must be authorized to transact business in the State of Connecticut, and duly qualified therefore, and in the form constituting part of the Specification and a letter indicating those Small/Minority Business Enterprises that will perform work and/or provide materials, equipment or services as part of the contract.

In submitting this bid, it is understood that the right is reserved by the abovementioned DOH to reject any and all bids; and it is agreed that this bid may not be withdrawn for a period of thirty calendar (30) days from the date of bid opening or until the next work day immediately following said period if such period ends on weekend or a State holiday.

Security in the sum of _____ Dollars (\$ _____)
in the form of _____ is submitted herewith in accordance with the Specifications.

The undersigned bidder agrees to comply with the Section 3 plan included herein and all Federal requirements pertaining to conditions of employment to be observed and minimum wage rates to be paid under the contract, Segregated Facilities, Section 109 and Executive Order 11246.

Attached hereto is an affidavit, in proof that the undersigned has not entered into any collusion with any person in respect to this proposal, or any other proposal, or the submitting of proposals for the above Project. Also attached is a statement of contractor's qualifications, Certification of Bidder Regarding Equal Employment Opportunity, Certification of Bidder Regarding Section 3 and Segregated Facilities.

Date

Firm Name

Address

By: _____

Title: _____

(Bank Letterhead)

BID SECURITY

IRREVOCABLE LETTER OF CREDIT

Dear _____:

We hereby authorize you to draw on us to the aggregate amount of \$_____ (five percent of the amount of the bid) in the event _____ withdraws its bid within the bid holding period, or upon being awarded a contract, fails to provide adequate performance and payment security as required by the Contract documents.

Such drafts must be accompanied by the following document:

A written certification by you that the proceeds of any draft drawn on this Letter of Credit will be used solely to indemnify the DOH against loss or damage suffered by it resulting from any act or omission described in the above paragraph.

We warrant to you that all drafts drawn in compliance with the terms of this Letter of Credit will be unconditionally and duly honored upon delivery of the documentation specified and presented to this office.

This Letter of Credit is irrevocable and shall be in full force and effect until notification in writing is received from you that a contract for Project 2065 – 44 Washington Parkway, Stratford, CT has been awarded and executed, whereupon this Letter of Credit shall automatically be canceled.

This Letter of Credit shall not be modified or amended except upon the written agreement of this Bank and the DOH.

Sincerely yours,

President

FORM OF NON-COLLUSIVE AFFIDAVIT

AFFIDAVIT

State of _____)

County of _____)

_____, being first duly sworn, deposes and says:

That he/she is, _____ the party making the foregoing proposal for bid, that such proposal or bid is genuine and not collusive or sham; that said bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not, in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or of any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against DOH or any person interested in the proposed contract, and that all statements in said proposal for bid are true.

Project No. 2065 – 44 Washington Parkway

Location : 44 Washington Parkway, Stratford, CT

Signature

Name and Title

Date

(Signature should be notarized.)

BIDDER'S CERTIFICATION OF ELIGIBILITY

By the submission of this bid, the bidder certifies that to the best of its knowledge and belief, neither it, nor any person or firm which has an interest in the bidder's firm, nor any of the bidder's subcontractors, is ineligible to:

(1) Be awarded contracts by any agency of the United States Government or HUD; or,

(2) Participate in HUD programs pursuant to 24 CFR part 24.

(Name of Bidder)

(Address)

BY: _____

Title: _____

NOTE: This certification is a material representation of fact upon which reliance is placed when making award. If it is later determined that the bidder knowingly rendered an erroneous certification, the contract may be terminated for default, and the bidder may be debarred or suspended from participation in HUD programs and other Federal programs.

CERTIFICATION OF GENERAL BIDDERS ON CDBG-DR CONSTRUCTION PROJECTS

I. CERTIFICATION REGARDING HEALTH AND SAFETY

The undersigned hereby certifies that he/she is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

II. CERTIFICATION REGARDING NON-COLLUSION AND DEBARMENT

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies that neither he/she nor any firm, corporation, partnership or association in which he/she has a substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6 (b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5), or pursuant to Section 3 (a) of the Davis-Bacon Act, as amended (40 USC 276a). The undersigned further certifies that said undersigned is not presently debarred from doing public construction work in the State of Connecticut.

Date: _____

Name of General Bidder

By _____

Signature

Print name and Title

Business Address

Street Address City and State

OSHA-10 OSHA-10

CERTIFICATION OF SUB- BIDDERS (IF ANY) ON CDBG-DR CONSTRUCTION PROJECTS

I. CERTIFICATION REGARDING HEALTH AND SAFETY

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupation Safety and Health Administration that is at least ten hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards of subcontracts subject to section 44F.

II. CERTIFICATION REGARDING NON-COLLUSION AND DEBARMENT

The undersigned further certifies under penalties of perjury that this subbid is in all responses bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the “person” shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies that neither he/she nor any firm, corporation, partnership or association in which he/she has a substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6 (b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5), or pursuant to Section 3 (a) of the Davis-Bacon Act, as amended (40 USC 276a). The undersigned further certifies that said undersigned is not presently debarred from doing public construction work in the State of Connecticut.

Date _____

Name of Sub-bidder

By _____

Signature

Print Name and Title

Business Name

Street Address, City and State

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,

_____ as Principal,
and _____ Surety, are hereby held and firmly bound unto
_____ as DOH in the penal sum of
_____, for the payment of which, well and truly be made,
we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and
assigns. Signed this _____ day of _____, 2014.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted to
_____ a certain Bid, attached hereto and hereby
made a part hereof to enter into a contract in writing, for the _____

NOW, THEREFORE,

1. If said Bid shall be rejected, or in the alternate,
2. If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with the Bid) and shall furnish a bond for this faithful performance of said contract, and for the payment of all person performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid,

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any or all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time which the DOH may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____ (L.S)
Principal

Surety

SEAL

By: _____

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: THAT we,

_____, as

PRINCIPAL, and _____, as SURETY,

are held firmly bound unto _____

_____ hereinafter called the DOH, in the penal
sum of _____

_____ (\$ _____), for the payment

of which sum we bind ourselves, our heirs, executors, administrators, and successors, jointly and
severally.

WHEREAS, Principal has entered into a certain Contract with DOH, dated _____, a copy of
which is hereto attached and made a part hereof.

NOW, THEREFORE, the condition of this obligation is such that if the Principal shall in all respects fully
perform the Contract and all duly authorized modifications thereof, during its original term and any
extensions thereof that may be granted and during any guaranty period for which the Contract provides,
and if the Principal shall fully satisfy all claims arising out of the prosecution of the work under the
Contract and shall fully indemnify DOH for all expenses which it may incur by reason of such claims,
including its attorney's fees and court costs, and if the Principal shall make full payment to all persons
supplying labor, services, materials, or equipment in the prosecution of the work under the Contract, in
default of which such persons shall have a direct right of action hereupon; and if the Principal shall pay or
cause to be paid all sales and use taxes payable as a result of the performance of the Contract as well as
payment of gasoline and special motor fuel taxes in the performance of the Contract and all motor vehicle
fees required for commercial motor vehicles used in connection with the performance of the Contract,
then this obligation shall be void; otherwise, it shall remain in full force and effect. No modification of the
Contract or extension of the term thereof, nor any forbearance on the part of DOH shall in any way
release the Principal or the Surety from liability hereunder. Notice to the Surety of any such modification,
extension, or forbearance is hereby waived.

IN WITNESS WHEREOF, the aforesaid Principal and Surety have executed this instrument and affixed
their seals hereto, this _____ day of _____.

Principal

Surety

Name and Title

Name and Title

(Signatures must be notarized.)

(Power-of-Attorney for person signing for Surety Company must be attached to bond.)

The rate of premium on this bond is \$_____ per thousand.

The total amount of premium charge is \$_____.

(The above is to be filled in by Surety Company.)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the

_____ Secretary of the corporation

named as Principal in the foregoing bond; that _____, who

signed the bond on behalf of the Principal, was then _____ of said

corporation; that I know his/her signature thereto is genuine; and that said bond was fully signed, sealed,

and attested for and in behalf of said corporation by authority of its governing body.

SUBCONTRACTOR IDENTIFICATION

(Provide additional forms for more subcontractors, as needed prior to execution.)

This form is a part of your bid package and must be submitted along with the itemized and formal bid forms at the time of the bid opening. Failure to submit a completed document could result in the disqualification of your bid.

Name of Subcontractor: _____

Address: _____

Trade: _____

Hourly Wage: _\$_____ Full Contract Price: _\$_____

Federal Tax# or SSN #: _____

Male Owned Business _____ Female Owned Business _____

Is he/she of Hispanic or Latino ethnicity? Yes_____ No_____

Race: (Please check one)

____White ____American Indian/Alaskan Native

____Black/African American ____Hasidic Jew

____Asian/Pacific American

Name of Subcontractor: _____

Address: _____

Trade: _____

Hourly Wage: _\$_____ Full Contract Price: _\$_____

Federal Tax# or SSN #: _____

Male Owned Business _____ Female Owned Business _____

Is he/she of Hispanic or Latino ethnicity? Yes_____ No_____

Race: (Please check one)

____White ____American Indian/Alaskan Native

____Black/African American ____Hasidic Jew

____Asian/Pacific American

Name of Subcontractor: _____

Address: _____

Trade: _____

Hourly Wage: _\$_____ Full Contract Price: _\$_____

Federal Tax# or SSN #: _____

Male Owned Business _____ Female Owned Business _____

Is he/she of Hispanic or Latino ethnicity? Yes_____ No_____

Race: (Please check one)

____White ____American Indian/Alaskan Native

____Black/African American ____Hasidic Jew

____Asian/Pacific American

Contractor's Signature

Date

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
CERTIFICATION OF BIDDER REGARDING EQUAL EMPLOYMENT
OPPORTUNITY

INSTRUCTIONS

This certification is required pursuant to Executive Order 11246 (30 F R 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless such report is submitted.

CERTIFICATION OF BIDDER

Name and address of Bidder (include zip code)

-
1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.
☐ YES ☐ NO
 2. Compliance reports were required to be filed in connection with such contract or subcontract.
☐ YES ☐ NO
 3. Bidder has filed all compliance reports due under applicable instructions, including SF.100.
☐ YES ☐ NO ☐ NOT REQUIRED
 4. Have you ever seen or are you being considered for sanction due to violation of Executive Order 11246, as amended?
☐ YES ☐ NO

NAME AND TITLE OF SIGNER (Please type.)

SIGNATURE

DATE

CERTIFICATION OF BIDDERS REGARDING SECTION 3 AND SEGREGATED FACILITIES

Project Name:

Project No:

Name of Prime Contractor:

The undersigned hereby certifies that:

1. Section 3 provisions are included in the Contract
2. A written Section 3 plan was prepared and submitted as part of the bid proceedings (if bid equals or exceeds \$100,000.00)
3. No segregated facilities will be maintained.

Name and Title of Signer (Print or Type)

Signature

Date

CONTRACTOR

Section 3 Plan Format

_____ agrees to implement the following specific affirmative action steps directed at increasing the utilization of lower income residents and business within the _____.

- A. To ascertain from the DOH the exact boundaries of the Section 3 covered project area and where advantageous, seek the assistance of local officials in preparing and implementing the affirmative action plans.
- B. To attempt to recruit from within the city the necessary number of lower income residents through: local advertising media, signs placed at the proposed site for the project, and community organizations and public or private institutions operating within or serving the project area such as Service Employment and Redevelopment (SER), Opportunities Industrialization Center (OIC), Urban League, Concentrated Employment Program, Hometown Plan, or the U. S. Employment Service.
- C. To maintain a list of all lower income residents who have applied either on their own or on referral from any source, and to employ such persons, if otherwise eligible and if a vacancy exists.
- D. To insert this Section 3 plan in all bid documents, and to require all bidders on subcontracts to submit a Section 3 Affirmative Action Plan including utilization goals and the specific steps planned to accomplish these goals.
- E. To insure that contracts which are typically let on a negotiated rather than a bid basis in areas other than Section 3 covered project areas, are also let on a negotiated basis, wherever feasible, when let in a Section 3 covered project area.
- F. To formally contact unions, subcontractors and trade associations to secure their cooperation for this program.
- G. To insure that all appropriated project area business concerns are notified or pending subcontractural opportunities
- H. To maintain records, including copies of correspondence, memoranda, etc., that document all above affirmative action steps have been taken.
- I. To appoint or recruit an executive official of the company or agency as Equal Opportunity Officer to coordinate the implementation of the Section 3 plan.
- J. To list on Table A, information related to subcontracts to be awarded.
- K. To list on Table B, all projected workforce needs for all phases of this project by occupation, trade, skill level and number of positions.

As officers and representatives of _____

We, the undersigned, have read and fully agree to this Affirmative Action Plan, and become a party to the full implementation of this program.

Signature

Title

Date

Loans, grants, contracts and subsidies for less than \$100,000.00 will be exempt.

Table A

Proposed Subcontracts Breakdown

For Period Covering _____, 20____ Through _____, 20____
(Duration of CDBG-DR OORR Assisted Project)

Column 1	Column 2	Column3	Column 4	Column 5
Type of Contract (Business of Profession)	Total Number of Contracts	Total Approximate Dollar Amount	Estimated Number of Contracts to Project Area Businesses*	Estimated Dollar Amount to Project Area Businesses*

*The Project Area is defined as the Town/City boundaries in which the assisted project resides.

Company

Project Name/Residence

Project Number

EEO Officer or Designee's Signature

Date

Table B**Estimated Project Workforce Breakdown**

<i>Column 1</i>	<i>Column 2</i>	<i>Column 3</i>	<i>Column 4</i>	<i>Column 5</i>
Job Category	Total Estimated Population	No. Positions Currently Occupied by Permanent Employees	No. Positions Not Currently Occupied	No. Positions to be filled with LIPAR*
Officers/Supervisors				
Professionals				
Technicians				
Housing Sales/Rental Management				
Office Clerical				
Service Workers				
Others				
TRADE:				
Journeyman				
Helpers				
Apprentices				
Maximum No. of Trainees				
Others				
TRADE:				
Journeyman				
Helpers				
Apprentices				
Maximum No. of Trainees				
Others				
TRADE:				
Journeyman				
Helpers				
Apprentices				
Maximum No. of Trainees				
Others				
Total				

**Lower Income Project Area Residents. Individuals residing within the project area whose family income does not exceed 80% of the area median income in the SMSA.*

Company

Green Building Standards Checklist

HUD CPD Green Building Retrofit Checklist

The CPD Green Retrofit Checklist promotes energy efficiency and green building practices for residential retrofit projects. Grantees must follow the checklist in its entirety and apply all measures within the Checklist to the extent applicable to the particular building type being retrofitted. The phrase “when replacing” in the Checklist refers to the mandatory replacement with specified green improvements, products, and fixtures only when replacing those systems during the normal course of the retrofit.

WATER AND ENERGY CONSERVATION MEASURES

N/A

Water-Conserving Fixtures

Install or retrofit water conserving fixtures in any unit and common facility, use the following specifications: Toilets-- 1.28 gpf; Urinals-- 0.5 gpf; Showerheads-- 2.0 gpm; Kitchen faucets-- 2.0 gpm; and Bathroom faucets-- 1.5gpm. [gpf = gallons per flush; gpm = gallons per minute]

N/A

ENERGY STAR Appliances

Install ENERGY STAR-labeled clothes washers, dishwashers, and refrigerators, if these appliance categories are provided in units or common areas.

N/A

Air Sealing: Building Envelope

Seal all accessible gaps and penetrations in the building envelope. If applicable, use low VOC caulk or foam.

N/A

Insulation: Attic (if applicable to building type)

For attics with closed floor cavities directly above the conditioned space, blow in insulation per manufacturer's specifications to a minimum density of 3.5 Lbs. per cubic foot (CF). For attics with open floor cavities directly above the conditioned space, install insulation to meet or exceed IECC levels.

N/A

Insulation: Flooring (if applicable to building type)

Install $\geq$ R-19 insulation in contact with the subfloor in buildings with floor systems over vented crawl spaces. Install a 6-mil vapor barrier in contact with 100% of the floor of the crawl space (the ground), overlapping seams and piers at least 6 inches.

N/A

Duct Sealing (if applicable to building type)

In buildings with ducted forced-air heating and cooling systems, seal all penetrations of the air distribution system to reduce leakage in order to meet or exceed ENERGY STAR for Homes' duct leakage standard.

N/A

Air Barrier System

Ensure continuous unbroken air barrier surrounding all conditioned space and dwelling units. Align insulation completely and continuously with the air barrier.

N/A

Radiant Barriers: Roofing

When replacing or making a substantial repair to the roof, use radiant barrier sheathing or other radiant barrier material; if economically feasible, also use cool roofing materials.

N/A	Windows When replacing windows, install geographically appropriate ENERGY STAR rated windows.
X	Sizing of Heating and Cooling Equipment When replacing, size heating and cooling equipment in accordance with the Air Conditioning Contractors of America (ACCA) Manuals, Parts J and S, or 2012 ASHRAE Handbook--HVAC Systems and Equipment or most recent edition.
N/A	Domestic Hot Water Systems When replacing domestic water heating system(s), ensure the system(s) meet or exceed the efficiency requirements of ENERGY STAR for Homes' Reference Design. Insulate pipes by at least R-4.
X	Efficient Lighting: Interior Units Follow the guidance appropriate for the project type: install the ENERGY STAR Advanced Lighting Package (ALP); OR follow the ENERGY STAR MFHR program guidelines, which require that 80% of installed lighting fixtures within units must be ENERGY STAR-qualified or have ENERGY STAR-qualified lamps installed; OR when replacing, new fixtures and ceiling fans must meet or exceed ENERGY STAR efficiency levels.
X	Efficient Lighting: Common Areas and Emergency Lighting (if applicable to building type) Follow the guidance appropriate for the project type: use ENERGY STAR-labeled fixtures or any equivalent high-performance lighting fixtures and bulbs in all common areas; OR when replacing, new common space and emergency lighting fixtures must meet or exceed ENERGY STAR efficiency levels. For emergency lighting, if installing new or replacing, all exist signs shall meet or exceed LED efficiency levels and conform to local building codes.
N/A	Efficient Lighting: Exterior Follow the guidance appropriate for the project type: install ENERGY STAR-qualified fixtures or LEDs with a minimum efficacy of 45 lumens/watt; OR follow the ENERGY STAR MFHR program guidelines, which require that 80% of outdoor lighting fixtures must be ENERGY STAR-qualified or have ENERGY STAR-qualified lamps installed; OR when replacing, install ENERGY STAR compact fluorescents or LEDs with a minimum efficacy of 45 lumens/watt.

INDOOR AIR QUALITY

N/A	Air Ventilation: Single Family and Multifamily (three stories or fewer) Install an in-unit ventilation system capable of providing adequate fresh air per ASHRAE 62.2 requirements.
N/A	Air Ventilation: Multifamily (four stories or more) Install apartment ventilation systems that satisfy ASHRAE 62.2 for all dwelling units and common area ventilation systems that satisfy ASHRAE 62.1 requirements. If economically feasible, consider heat/energy recovery for 100% of corridor air supply.
N/A	Composite Wood Products that Emit Low/No Formaldehyde

Composite wood products must be certified compliant with California 93120. If using a composite wood product that does not comply with California 93120, all exposed edges and sides must be sealed with low-VOC sealants.

X

Environmentally Preferable Flooring

When replacing flooring, use environmentally preferable flooring, including the FloorScore certification. Any carpet products used must meet the Carpet and Rug Institute's Green Label or Green Label Plus certification for carpet, pad, and carpet adhesives.

X

Low/No VOC Paints and Primers

All interior paints and primers must be less than or equal to the following VOC levels: Flats--50 g/L; Non-flats--50 g/L; Floor--100 g/L. [g/L = grams per liter; levels are based on a combination of the Master Painters Institute (MPI) and GreenSeal standards.]

X

Low/No VOC Adhesives and Sealants

All adhesives must comply with Rule 1168 of the South Coast Air Quality Management District. All caulks and sealants must comply with regulation 8, rule 51, of the Bay Area Air Quality Management District.

N/A

Clothes Dryer Exhaust

Vent clothes dryers directly to the outdoors using rigid-type duct work.

X

Mold Inspection and Remediation

Inspect the interior and exterior of the building for evidence of moisture problems. Document the extent and location of the problems, and implement the proposed repairs according to the Moisture section of the EPA Healthy Indoor Environment Protocols for Home Energy Upgrades.

X

Combustion Equipment

When installing new space and water-heating equipment, specify power-vented or direct vent combustion equipment.

N/A

Mold Prevention: Water Heaters

Provide adequate drainage for water heaters that includes drains or catch pans with drains piped to the exterior of the dwelling.

X

Mold Prevention: Surfaces

When replacing or repairing bathrooms, kitchens, and laundry rooms, use materials that have durable, cleanable surfaces.

N/A

Mold Prevention: Tub and Shower Enclosures

When replacing or repairing tub and/or shower enclosures, use non-paper-faced backing materials such as cement board, fiber cement board, or equivalent in bathrooms.

N/A

Integrated Pest Management

Seal all wall, floor, and joint penetrations with low-VOC caulking or other appropriate sealing methods to prevent pest entry. [If applicable, provide training to multifamily buildings staff.]

X

Lead-Safe Work Practices

For properties built before 1978, if the project will involve disturbing painted surfaces or cleaning up lead contaminated dust or soil, use certified renovation or lead abatement contractors and workers using lead-safe work practices and clearance examinations consistent with the more stringent of EPA's Renovation, Repair, and Painting Rule and HUD's Lead Safe Housing Rule.

N/A

Radon Testing and Mitigation (if applicable based on building location)

For buildings in EPA Radon Zone 1 or 2, test for radon using the current edition of American Association of Radon Scientists and Technologists (AARST)'s Protocols for Radon Measurement in Homes Standard for Single-Family Housing or Duplexes, or AARST's Protocol for Conducting Radon and Radon Decay Product Measurements in Multifamily Buildings. To install radon mitigation systems in buildings with radon level of 4 pCi/L or more, use ASTM E 2121 for single-family housing or duplexes, or AARST's Radon Mitigation Standards for Multifamily Buildings. For new construction, use AARST's Reducing Radon in New Construction of 1 & 2 Family Dwellings and Townhouses, or ASTM E 1465.

Section 2: General Conditions for Construction Contracts

Based on HUD form 5370

Applicability. This form is applicable to any construction/development contract greater than \$100,000.

This form includes those clauses required by OMB's common rule on grantee procurement, implemented at HUD in 24 CFR 85.36, and those requirements set forth in Section 3 of the Housing and Urban Development Act of 1968 and its amendment by the Housing and Community Development Act of 1992, implemented by HUD at 24 CFR Part 135.

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1. Definitions

- (a) "Architect" means the person or other entity engaged by DOH to perform architectural, engineering, design, and other services related to the work as provided for in the contract. When DOH uses an engineer to act in this capacity, the terms "architect" and "engineer" shall be synonymous. The Architect shall serve as a technical representative of the Contracting Officer. The Architect's authority is as set forth elsewhere in this contract.
- (b) "Contract" means the contract entered into between DOH and the Contractor. It includes the forms of Bid, the Bid Bond, the Performance and Payment Bond or Bonds or other assurance of completion, the Certifications, Representations, and Other Statements of Bidders (form HUD-5370), these General Conditions of the Contract for Construction (form HUD-5370), the applicable wage rate determinations from the U.S. Department of Labor (when applicable), any special conditions included elsewhere in the contract, the specifications, and drawings. It includes all formal changes to any of those documents by addendum, change order, or other modification.
- (c) "Contracting Officer" means the person delegated the authority by DOH to enter into, administer, and/or terminate this contract and designated as such in writing to the Contractor. The term includes any successor Contracting Officer and any duly authorized representative of the Contracting Officer also designated in writing. The Contracting Officer shall be deemed the authorized agent of DOH in all dealings with the Contractor.
- (d) "Contractor" means the person or other entity entering into the contract with DOH to perform all of the work required under the contract.
- (e) "Drawings" means the drawings enumerated in the schedule of drawings contained in the Specifications and as described in the contract clause entitled Specifications and Drawings for Construction herein.
- (f) "DOH" means the State Department of Housing including the Commissioner, or any other person designated to act on its behalf.
- (g) "HUD" means the United States of America acting through the Department of Housing and Urban Development including the Secretary, or any other person designated to act on its behalf. HUD has agreed, subject to the provisions of an Annual Contributions Contract (ACC), to provide financial assistance to DOH, which includes assistance in financing the work to be performed under this contract. As defined elsewhere in these General Conditions or the contract documents, the determination of HUD may be required to authorize changes in the work or for release of funds to DOH for payment to the Contractor. Notwithstanding HUD's role, nothing in this contract shall be construed to create any contractual relationship between the Contractor and HUD.
- (h) "Grantee" means the State of Connecticut Department of Housing (DOH).
- (i) "Homeowner" means the owner(s) of the real property for which project is taking place and is a party to the contract.
- (j) "Project" means the entire project, whether construction or rehabilitation, the work for which is provided for in whole or in part under this contract.
- (k) "Specifications" means the written description of the technical requirements for construction and includes the criteria and tests for determining whether the requirements are met.
- (l) "Work" means materials, workmanship, and manufacture and fabrication of components.

2. Contractor's Responsibility for Work

- (a) The Contractor shall furnish all necessary labor, materials, tools, equipment, and transportation necessary for performance of the work. The Contractor shall also furnish all necessary water, heat, light, and power not made available to the Contractor by the Homeowner pursuant to the clause entitled Access to the Premises Section 5.3 of Homeowner Rehabilitation Agreement herein.
- (b) The Contractor shall perform on the site, and with its own organization, work equivalent to at least 15 percent of the total amount of work to be performed under the order. This percentage may be reduced by a supplemental agreement to this order if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of DOH.

- (c) At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the work site a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.
- (d) The Contractor shall be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence, and shall take proper safety and health precautions to protect the work, the workers, the public, and the property of others. The Contractor shall hold and save DOH, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.
- (e) The Contractor shall lay out the work from base lines and bench marks indicated on the drawings and be responsible for all lines, levels, and measurements of all work executed under the contract. The Contractor shall verify the figures before laying out the work and will be held responsible for any error resulting from its failure to do so.
- (f) The Contractor shall confine all operations (including storage of materials) on Homeowner premises to areas authorized or approved by the Contracting Officer.
- (g) The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. After completing the work and before final inspection, the Contractor shall (1) remove from the premises all scaffolding, equipment, tools, and materials (including rejected materials) that are not the property of the Homeowner and all rubbish caused by its work; (2) leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer; (3) perform all specified tests; and, (4) deliver the installation in complete and operating condition.
- (h) The Contractor's responsibility will terminate when all work has been completed, the final inspection made, and the work accepted by the Contracting Officer. The Contractor will then be released from further obligation except as required by the warranties specified elsewhere in the contract.

3. Architect's Duties, Responsibilities, and Authority

- (a) The Architect for this contract, and any successor, shall be designated in writing by the Contracting Officer.
- (b) The Architect shall serve as the Contracting Officer's technical representative with respect to architectural, engineering, and design matters related to the work performed under the contract. The Architect may provide direction on contract performance. Such direction shall be within the scope of the contract and may not be of a nature which: (1) institutes additional work outside the scope of the contract; (2) constitutes a change as defined in the Changes clause herein; (3) causes an increase or decrease in the cost of the contract; (4) alters the Construction Progress Schedule; or (5) changes any of the other express terms or conditions of the contract.
- (c) The Architect's duties and responsibilities may include but shall not be limited to:
 - (1) Making periodic visits to the work site, and on the basis of his/her on-site inspections, issuing written reports to DOH which shall include all observed deficiencies. The Architect shall file a copy of the report with the Contractor's designated representative at the site;
 - (2) Making modifications in drawings and technical specifications and assisting the Contracting Officer in the preparation of change orders and other contract modifications for issuance by the Contracting Officer;
 - (3) Reviewing and making recommendations with respect to - (i) the Contractor's construction progress schedules; (ii) the Contractor's shop and detailed drawings; (iii) the machinery, mechanical and other equipment and materials or other articles proposed for use by the Contractor; and, (iv) the Contractor's price breakdown and progress payment estimates; and,
 - (4) Assisting in inspections, signing Certificates of Completion, and making recommendations with respect to acceptance of work completed under the contract.

4. Other Contracts

DOH may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with DOH employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by DOH employees

5. Pre-construction Conference and Notice to Proceed

- (a) Upon scheduling of the contract execution, and prior to the commencement of work, the Contractor shall attend a preconstruction conference with representatives of DOH, its Architect, and other interested parties convened by DOH. The conference will serve to acquaint the participants with the general plan of the construction operation and all other requirements of the contract. DOH or its Architect will provide the Contractor with the date, time, and place of the conference.
- (b) The contractor shall begin work upon receipt of a written Notice to Proceed from the Contracting Officer or designee. The Contractor shall not begin work prior to receiving such notice. Such notice shall not be prior to the homeowners three (3) day Notice of Cancellation period.

6. Site Investigation and Conditions Affecting the Work

- (a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to, (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by DOH, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to DOH.
- (b) DOH assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by DOH. Nor does DOH assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in the contract.

7. Differing Site Conditions

- (a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of (1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or (2) unknown physical conditions at the site(s), of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.
- (b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. Work shall not proceed at the affected site, except at the Contractor's risk, until the Contracting Officer has provided written instructions to the Contractor. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work

under this contract, whether or not changed as a result of the conditions, the Contractor shall file a claim in writing to DOH within ten days after receipt of such instructions and, in any event, before proceeding with the work. An equitable adjustment in the contract price, the delivery schedule, or both shall be made under this clause and the contract modified in writing accordingly.

- (c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required; provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.
- (d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

8. Specifications and Drawings for Construction

- (a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.
- (b) Wherever in the specifications or upon the drawings the words “directed”, “required”, “ordered”, “designated”, “prescribed”, or words of like import are used, it shall be understood that the “direction”, “requirement”, “order”, “designation”, or “prescription”, of the Contracting Officer is intended and similarly the words “approved”, “acceptable”, “satisfactory”, or words of like import shall mean “approved by”, or “acceptable to”, or “satisfactory to” the Contracting Officer, unless otherwise expressly stated.
- (c) Where “as shown”, “as indicated”, “as detailed”, or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word “provided” as used herein shall be understood to mean “provide complete in place” that is “furnished and installed”.
- (d) “Shop drawings” means drawings, submitted to DOH by the Contractor, subcontractor, or any lower tier subcontractor, showing in detail (1) the proposed fabrication and assembly of structural elements and (2) the installation (i.e., form, fit, and attachment details) of materials of equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract. DOH may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.
- (e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with other contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor’s approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate DOH’s reasons therefore. Any work done before such approval shall be at the Contractor’s risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.
- (f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Architect approves any such variation and the Contracting Officer concurs, the Contracting Officer shall issue an appropriate modification to the contract, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.
- (g) It shall be the responsibility of the Contractor to make timely requests of DOH for such large scale and full size drawings, color schemes, and other additional information, not already in his possession, which

shall be required in the planning and production of the work. Such requests may be submitted as the need arises, but each such request shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay.

- (h) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by DOH and one set will be returned to the Contractor. As required by the Contracting Officer, the Contractor, upon completing the work under this contract, shall furnish a complete set of all shop drawings as finally approved. These drawings shall show all changes and revisions made up to the time the work is completed and accepted.
- (i) This clause shall be included in all subcontracts at any tier. It shall be the responsibility of the Contractor to ensure that all shop drawings prepared by subcontractors are submitted to the Contracting Officer.

9. Material and Workmanship

- (a) All equipment, material, and articles furnished under this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the contract to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of, and as approved by the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.
- (b) Approval of equipment and materials.
 - (1) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.
 - (2) When required by the specifications or the Contracting Officer, the Contractor shall submit appropriately marked samples (and certificates related to them) for approval at the Contractor's expense, with all shipping charges prepaid. The Contractor shall label, or otherwise properly mark on the container, the material or product represented, its place of origin, the name of the producer, the Contractor's name, and the identification of the construction project for which the material or product is intended to be used.
 - (3) Certificates shall be submitted in triplicate, describing each sample submitted for approval and certifying that the material, equipment or accessory complies with contract requirements. The certificates shall include the name and brand of the product, name of manufacturer, and the location where produced.
 - (4) Approval of a sample shall not constitute a waiver of DOH right to demand full compliance with contract requirements. Materials, equipment and accessories may be rejected for cause even though samples have been approved.
 - (5) Wherever materials are required to comply with recognized standards or specifications, such specifications shall be accepted as establishing the technical qualities and testing methods, but shall not govern the number of tests required to be made nor modify other contract requirements. The Contracting Officer may require laboratory test reports on items submitted for approval or may approve materials on the basis of data submitted in certificates with samples. Check tests will be made on materials delivered for use only as frequently as the Contracting Officer determines necessary to insure compliance of materials with the specifications. The Contractor will assume all costs of

retesting materials which fail to meet contract requirements and/or testing materials offered in substitution for those found deficient.

- (6) After approval, samples will be kept in the Project office until completion of work. They may be built into the work after a substantial quantity of the materials they represent has been built in and accepted.
- (c) Requirements concerning lead-based paint. The Contractor shall comply with the requirements concerning lead-based paint contained in the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821-4846) as implemented by 24 CFR Part 35, HUD's Lead Safe Housing Rule and EPA's Repair Renovation, and Painting Rule at 40 CFR.80 Subpart E.

10. Permits and Codes

The Contractor shall give all notices and comply with all applicable laws, ordinances, codes, rules and regulations. Notwithstanding the requirement of the Contractor to comply with the drawings and specifications in the contract, all work installed shall comply with all applicable codes and regulations as amended by any waivers. Before installing the work, the Contractor shall examine the drawings and the specifications for compliance with applicable codes and regulations bearing on the work and shall immediately report any discrepancy it may discover to the Contracting Officer. Where the requirements of the drawings and specifications fail to comply with the applicable code or regulation, the Contracting Officer shall modify the contract by change order pursuant to the clause entitled Changes herein to conform to the code or regulation.

- (a) The Contractor shall secure and pay for all permits, fees, and licenses necessary for the proper execution and completion of the work. Where DOH can arrange for the issuance of all or part of these permits, fees and licenses, without cost to the Contractor, the contract amount shall be reduced accordingly.

11. Health, Safety, and Accident Prevention

- (a) In performing this contract, the Contractor shall:
 - (1) Ensure that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his/her health and/or safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation;
 - (2) Protect the lives, health, and safety of other persons;
 - (3) Prevent damage to property, materials, supplies, and equipment; and,
 - (4) Avoid work interruptions.
- (b) For these purposes, the Contractor shall:
 - (1) Comply with regulations and standards issued by the Secretary of Labor at 29 CFR Part 1926. Failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat. 96), 40 U.S.C. 3701 et seq.; and
 - (2) Include the terms of this clause in every subcontract so that such terms will be binding on each subcontractor.
- (c) The Contractor shall maintain an accurate record of exposure data on all accidents incident to work performed under this contract resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment, and shall report this data in the manner prescribed by 29 CFR Part 1904.

- (d) The Contracting Officer shall notify the Contractor of any noncompliance with these requirements and of the corrective action required. This notice, when delivered to the Contractor or the Contractor's representative at the site of the work, shall be deemed sufficient notice of the noncompliance and corrective action required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to take corrective action promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not base any claim or request for equitable adjustment for additional time or money on any stop order issued under these circumstances.
- (e) The Contractor shall be responsible for its subcontractors' compliance with the provisions of this clause. The Contractor shall take such action with respect to any subcontract as DOH, the Secretary of Housing and Urban Development, or the Secretary of Labor shall direct as a means of enforcing such provisions.

12. Temporary Heating

The Contractor shall provide and pay for temporary heating, covering, and enclosures necessary to properly protect all work and materials against damage by dampness and cold, to dry out the work, and to facilitate the completion of the work. Any permanent heating equipment used shall be turned over to the Homeowner in the condition and at the time required by the specifications.

13. Availability and Use of Utility Services

- (a) The Homeowner shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The Contractor shall carefully conserve any utilities furnished without charge.
- (b) The Contractor, at its expense and in a manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines. Before final acceptance of the work by DOH, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

14. Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements

- (a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed under this contract, and which do not unreasonably interfere with the work required under this contract.
- (b) The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during performance of this contract, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.
- (c) The Contractor shall protect from damage all existing improvements and utilities (1) at or near the work site and (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. Prior to disturbing the ground at the construction site, the Contractor shall ensure that all underground utility lines are clearly marked.
- (d) The Contractor shall shore up, brace, underpin, secure, and protect as necessary all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be affected by the excavations or other operations connected with the construction of the project.
- (e) Any equipment temporarily removed as a result of work under this contract shall be protected, cleaned,

and replaced in the same condition as at the time of award of this contract.

- (f) New work which connects to existing work shall correspond in all respects with that to which it connects and/or be similar to existing work unless otherwise required by the specifications.
- (g) No structural members shall be altered or in any way weakened without the written authorization of the Contracting Officer, unless such work is clearly specified in the plans or specifications.
- (h) If the removal of the existing work exposes discolored or unfinished surfaces, or work out of alignment, such surfaces shall be refinished, or the material replaced as necessary to make the continuous work uniform and harmonious. This, however, shall not be construed to require the refinishing or reconstruction of dissimilar finishes previously exposed, or finished surfaces in good condition, but in different planes or on different levels when brought together by the removal of intervening work, unless such refinishing or reconstruction is specified in the plans or specifications.
- (i) The Contractor shall give all required notices to any adjoining or adjacent property owner or other party before the commencement of any work.
- (j) The Contractor shall indemnify and save harmless DOH from any damages on account of settlement or the loss of lateral support of adjoining property, any damages from changes in topography affecting drainage, and from all loss or expense and all damages for which DOH may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.
- (k) The Contractor shall repair any damage to vegetation, structures, equipment, utilities, or improvements, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

15. Temporary Buildings and Transportation of Materials

- (a) Temporary buildings (e.g., storage sheds, shops, offices, sanitary facilities) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to DOH. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- (b) The Contractor shall, as directed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any federal, state, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

16. Clean Air and Water

The contractor shall comply with the Clean Air Act, as amended, 42 USC 7401 et seq., the Federal Water Pollution Control Water Act, as amended, 33 U.S.C. 1251 et seq., and standards issued pursuant thereto in the facilities in which this contract is to be performed.

17. Energy Efficiency

The Contractor shall comply with mandatory standards and policies relating to energy efficiency which are contained in the energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub.L. 94-163) for the State in which the work under the contract is performed.

18. Green Building Standards

DOH will require that all replacement of residential properties, including reconstruction and new construction of substantially damaged properties meet the Enterprise Green Communities Standard.

For those buildings that are non-substantially damaged, DOH will require that they be rehabilitated following the HUD CPD Green Buildings Retrofit Checklist. The requirement for rehabilitation is that to the extent possible strive to meet the checklist standard where there are Energy Star, Water Sense and Federal Management Program-designed products available.

DOH strongly encourages the use of green infrastructure techniques to mitigate against storm water run-off and flooding and incorporate EPA's Green Infrastructure resources to the extent feasible.

19. Inspection and Acceptance of Construction

- (a) Definitions. As used in this clause -
 - (1) "Acceptance" means the act of an authorized representative of DOH by which DOH approves of the work performed under this contract. Acceptance may be partial or complete.
 - (2) "Inspection" means examining and testing the work performed under the contract (including, when appropriate, raw materials, equipment, components, and intermediate assemblies) to determine whether it conforms to contract requirements.
 - (3) "Testing" mean that element of inspection that determines the properties or elements, including functional operation of materials, equipment, or their components, by the application of established scientific principles and procedures.
- (b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. All work is subject to DOH inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.
- (c) DOH inspections and tests are for the sole benefit of DOH and do not: (1) relieve the Contractor of responsibility for providing adequate quality control measures; (2) relieve the Contractor of responsibility for loss or damage of the material before acceptance; (3) constitute or imply acceptance; or, (4) affect the continuing rights of DOH after acceptance of the completed work under paragraph (j) below.
- (d) The presence or absence of DOH inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specifications without the Contracting Officer's written authorization. All instructions and approvals with respect to the work shall be given to the Contractor by the Contracting Officer.
- (e) The Contractor shall promptly furnish, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. DOH may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. DOH shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.
- (f) DOH may conduct routine inspections of the construction site on a daily basis.
- (g) The Contractor shall, without charge, replace or correct work found by DOH not to conform to contract requirements, unless DOH decides that it is in its interest to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

- (h) If the Contractor does not promptly replace or correct rejected work, DOH may (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor, or (2) terminate for default the Contractor's right to proceed.
- (i) If any work requiring inspection is covered up without approval of DOH, it must, if requested by the Contracting Officer, be uncovered at the expense of the Contractor. If at any time before final acceptance of the entire work, DOH considers it necessary or advisable, to examine work already completed by removing or tearing it out, the Contractor, shall on request, promptly furnish all necessary facilities, labor, and material. If such work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray all the expenses of the examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the Contracting Officer shall make an equitable adjustment to cover the cost of the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.
- (j) The Contractor shall notify the Contracting Officer, in writing, as to the date when in its opinion all or a designated portion of the work will be substantially completed and ready for inspection. If the Architect determines that the state of preparedness is as represented, DOH will promptly arrange for the inspection. Unless otherwise specified in the contract, DOH shall accept, as soon as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines and designates can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or DOH's right under any warranty or guarantee.

20. Use and Possession Prior to Completion

- (a) If applicable, the Homeowner may have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the Homeowner intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The Homeowner's possession or use shall not be deemed an acceptance of any work under the contract.
- (b) While the Homeowner has such possession or use, the Contractor shall be relieved of the responsibility for (1) the loss of or damage to the work resulting from the Homeowner's possession or use, notwithstanding the terms of the clause entitled Permits and Codes herein; (2) all maintenance costs on the areas occupied; and, (3) furnishing heat, light, power, and water used in the areas occupied without proper remuneration therefore. If prior possession or use by the Homeowner delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

21. Warranty of Title

The Contractor warrants good title to all materials, supplies, and equipment incorporated in the work and agrees to deliver the premises together with all improvements thereon free from any claims, liens or charges, and agrees further that neither it nor any other person, firm or corporation shall have any right to a lien upon the premises or anything appurtenant thereto.

22. Warranty of Construction

- (a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (j) of this clause, that work performed under this contract conforms to the contract

requirements and is free of any defect in equipment, material, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. This warranty shall continue for a period of **one year** from the date of final acceptance of the work. If the Homeowner takes possession of any part of the work before final acceptance, this warranty shall continue for a period of (one year unless otherwise indicated) from the date that the Homeowner takes possession.

- (b) The Contractor shall remedy, at the Contractor's expense, any failure to conform, or any defect. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to Homeowner-owned or controlled real or personal property when the damage is the result of—
 - (1) The Contractor's failure to conform to contract requirements; or
 - (2) Any defects of equipment, material, workmanship or design furnished by the Contractor.
- (c) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for (one year unless otherwise indicated) from the date of repair or replacement.
- (d) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect or damage.
- (e) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, DOH shall have the right to replace, repair or otherwise remedy the failure, defect, or damage at the Contractor's expense.
- (f) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall:
 - (1) Obtain all warranties that would be given in normal commercial practice;
 - (2) Require all warranties to be executed in writing, for the benefit of the homeowner; and,
 - (3) Enforce all warranties for the benefit of the homeowner.
- (g) In the event the Contractor's warranty under paragraph(a) of this clause has expired, the homeowner may bring suit at its own expense to enforce a subcontractor's, manufacturer's or supplier's warranty.
- (h) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defect of material or design furnished by the homeowner nor for the repair of any damage that results from any defect in DOH furnished material or design.
- (i) Notwithstanding any provisions herein to the contrary, the establishment of the time periods in paragraphs (a) and (c) above relate only to the specific obligation of the Contractor to correct the work, and have no relationship to the time within which its obligation to comply with the contract may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to its obligation other than specifically to correct the work.
- (j) This warranty shall not limit DOH's/Homeowner's rights under the Inspection and Acceptance of Construction clause of this contract with respect to latent defects, gross mistakes or fraud.

23. Contract Period

The Contractor shall complete all work required under this contract within 120 calendar days of the effective date of the contract, or within the time schedule established in the notice to proceed issued by the Contracting Officer.

24. Order of Provisions

In the event of a conflict between these General Conditions and the Specifications, the General Conditions shall prevail. In the event of a conflict between the contract and any applicable state or local law or regulation, the state or local law or regulation shall prevail; provided that such state or local law or regulation does not conflict with, or is less restrictive than applicable federal law, regulation, or Executive Order. In the event of such a conflict, applicable federal law, regulation, and Executive Order shall prevail.

25. Payments

- (a) DOH/Homeowner shall pay the Contractor the price as provided in this contract.
- (b) DOH shall make progress payments approximately every 30 days as the work proceeds, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer. DOH may, subject to written determination and approval of the Contracting Officer, make more frequent payments to contractors which are qualified small businesses.
- (c) Before the first progress payment under this contract, the Contractor shall furnish, in such detail as requested by the Contracting Officer, a breakdown of the total contract price showing the amount included therein for each principal category of the work, which shall substantiate the payment amount requested in order to provide a basis for determining progress payments. The breakdown shall be approved by the Contracting Officer and must be acceptable to DOH. The values and quantities employed in making up this breakdown are for determining the amount of progress payments and shall not be construed as a basis for additions to or deductions from the contract price. The Contractor shall prorate its overhead and profit over the construction period of the contract.
- (d) The Contractor shall submit, on AIA forms provided by DOH, periodic estimates showing the value of the work performed during each period based upon the approved breakdown of the contract price. Such estimates shall be submitted not later than 14 days in advance of the date set for payment and are subject to correction and revision as required. The estimates must be approved by the Contracting Officer with the concurrence of the Architect prior to payment. If the contract covers more than one project, the Contractor shall furnish a separate progress payment estimate for each.
- (e) Along with each request for progress payments and the required estimates, the Contractor shall furnish lien waivers and labor releases as good and sufficient evidence that the premises are free from all liens, damages, and anything chargeable to said contractor.
- (f) Except as otherwise provided in State law, DOH shall retain five (5) percent of the amount of progress payments until completion and acceptance of all work under the contract; except, that if upon completion of 50 percent of the work, the Contracting Officer, after consulting with the Architect, determines that the Contractor's performance and progress are satisfactory, DOH may make the remaining payments in full for the work subsequently completed. If the Contracting Officer subsequently determines that the Contractor's performance and progress are unsatisfactory, DOH shall reinstate the five (5) percent retainage until such time as the Contracting Officer determines that performance and progress are satisfactory. Retainage will be released 90 days after project completion.
- (g) The Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration when computing progress payments. Material delivered to the Contractor at locations other than the site may also be taken into consideration if the Contractor furnishes satisfactory evidence that (1) it has acquired title to such material; (2) the material is properly stored in a bonded warehouse, storage yard, or similar suitable place as may be approved by the Contracting Officer; (3) the material is insured to cover its full value; and (4) the material will be used to perform this contract. Before any progress payment which includes delivered material is made, the Contractor shall furnish such documentation as the Contracting Officer may require to assure the protection of DOH's/Homeowner's interest in such materials. The Contractor shall remain responsible for such stored material notwithstanding the transfer of title to the Homeowner.
- (h) All material and work covered by progress payments made shall, at the time of payment become the sole property of the Homeowner, but this shall not be construed as (1) relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or, (2) waiving the right of DOH/Homeowner to require the fulfillment of all of the terms of the contract. In the event the work of the Contractor has been damaged by other contractors or persons other than employees of DOH in the course of their employment, the Contractor shall restore such damaged work without cost to DOH/Homeowner and to seek redress for its damage only from those who directly caused it.
- (i) DOH shall make the final payment due the Contractor under this contract after (1) completion and final

acceptance of all work; and (2) presentation of release of all claims against DOH/Homeowner arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. Each such exception shall embrace no more than one claim, the basis and scope of which shall be clearly defined. The amounts for such excepted claims shall not be included in the request for final payment. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned.

- (j) Prior to making any payment, the Contracting Officer may require the Contractor to furnish receipts or other evidence of payment from all persons performing work and supplying material to the Contractor, if the Contracting Officer determines such evidence is necessary to substantiate claimed costs.
- (k) DOH shall not; (1) determine or adjust any claims for payment or disputes arising there under between the Contractor and its subcontractors or material suppliers; or, (2) withhold any moneys for the protection of the subcontractors or material suppliers. The failure or refusal of DOH to withhold moneys from the Contractor shall in nowise impair the obligations of any surety or sureties under any bonds furnished under this contract.

26. Contract Modifications

- (a) Only the Contracting Officer has authority to modify any term or condition of this contract. Any contract modification shall be authorized in writing.
- (b) The Contracting Officer may modify the contract unilaterally (1) pursuant to a specific authorization stated in a contract clause (e.g., Changes); or (2) for administrative matters which do not change the rights or responsibilities of the parties (e.g., change in DOH/homeowner's address). All other contract modifications shall be in the form of supplemental agreements signed by the Contractor and the Contracting Officer.
- (c) When a proposed modification requires the approval of DOH prior to its issuance (e.g., a change order that exceeds DOH's approved threshold), such modification shall not be effective until the required approval is received by DOH.

27. Changes

- (a) The Contracting Officer may, at any time, without notice to the sureties, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract including changes:
 - (1) In the specifications (including drawings and designs);
 - (2) In the method or manner of performance of the work;
 - (3) Directing the acceleration in the performance of the work.
- (b) Any other written order or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating (1) the date, circumstances and source of the order and (2) that the Contractor regards the order as a change order.
- (c) Except as provided in this clause, no order, statement or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.
- (d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for a adjustment based on defective specifications, no proposal for any change under paragraph (b) above shall be allowed for any costs incurred more than 20 days (5 days for oral

orders) before the Contractor gives written notice as required. In the case of defective specifications for which DOH is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

- (e) The Contractor must assert its right to an adjustment under this clause within 30 days after (1) receipt of a written change order under paragraph (a) of this clause, or (2) the furnishing of a written notice under paragraph(b) of this clause, by submitting a written statement describing the general nature and the amount of the proposal. If the facts justify it, the Contracting Officer may extend the period for submission. The proposal may be included in the notice required under paragraph (b) above. No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.
- (f) The Contractor's written proposal for equitable adjustment shall be submitted in the form of a lump sum proposal supported with an itemized breakdown of all increases and decreases in the contract in at least the following details:
 - (1) Direct Costs. Materials (list individual items, the quantity and unit cost of each, and the aggregate cost); Transportation and delivery costs associated with materials; Labor breakdowns by hours or unit costs (identified with specific work to be performed); Construction equipment exclusively necessary for the change; Costs of preparation and/ or revision to shop drawings resulting from the change; Worker's Compensation and Public Liability Insurance; Employment taxes under FICA and FUTA; and, Bond Costs when size of change warrants revision.
 - (2) Indirect Costs. Indirect costs may include overhead, general and administrative expenses, and fringe benefits not normally treated as direct costs.
 - (3) Profit. The amount of profit shall be negotiated and may vary according to the nature, extent, and complexity of the work required by the change.

The allowability of the direct and indirect costs shall be determined in accordance with the Contract Cost Principles and Procedures for Commercial Firms in Part 31 of the Federal Acquisition Regulation (48 CFR 1-31), as implemented by HUD Handbook 2210.18, in effect on the date of this contract. The Contractor shall not be allowed a profit on the profit received by any subcontractor. Equitable adjustments for deleted work shall include a credit for profit and may include a credit for indirect costs. On proposals covering both increases and decreases in the amount of the contract, the application of indirect costs and profit shall be on the net- change in direct costs for the Contractor or subcontractor performing the work

- (g) The Contractor shall include in the proposal its request for time extension (if any), and shall include sufficient information and dates to demonstrate whether and to what extent the change will delay the completion of the contract in its entirety.
- (h) The Contracting Officer shall act on proposals within 30 days after their receipt, or notify the Contractor of the date when such action will be taken.
- (i) Failure to reach an agreement on any proposal shall be a dispute under the clause entitled Disputes herein. Nothing in this clause, however, shall excuse the Contractor from proceeding with the contract as changed.
- (j) Except in an emergency endangering life or property, no change shall be made by the Contractor without a prior order from the Contracting Officer.

28. Suspension of Work

- (a) The Contracting Officer may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of DOH/Homeowner.

If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified (or within a reasonable time if not specified) in this contract an adjustment may be made for any increase in the cost of performance of the contract

(excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor or for which any equitable adjustment is provided for or excluded under any other provision of this contract.

(b) A claim under this clause shall not be allowed without prior written approval of the Contracting Officer.

29. Disputes

- (a) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to the contract. A claim arising under the contract, unlike a claim relating to the contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim. The submission may be converted to a claim by complying with the requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.
- (b) Except for disputes arising under the clauses entitled Labor Standards - Davis Bacon and Related Acts, herein, all disputes arising under or relating to this contract, including any claims for damages for the alleged breach thereof which are not disposed of by agreement, shall be resolved under this clause.
- (c) All claims by the Contractor shall be made in writing and submitted to the Contracting Officer for a written decision.
- (d) A claim by the Homeowner against the Contractor shall be subject to a written decision by the Contracting Officer.
- (e) The Contracting Officer shall, within 60 (unless otherwise indicated) days after receipt of the request, decide the claim or notify the Contractor of the date by which the decision will be made.
- (f) The Contracting Officer's decision shall be final unless the Contractor (1) appeals in writing to a higher level in DOH in accordance with DOH's policy and procedures, (2) refers the appeal to an independent mediator or arbitrator, or (3) files suit in a court of competent jurisdiction. Such appeal must be made within (30 unless otherwise indicated) days after receipt of the Contracting Officer's decision.
- (g) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under or relating to the contract, and comply with any decision of the Contracting Officer.

30. Default

- (a) If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with the diligence that will insure its completion within the time specified in this contract, or any extension thereof, or fails to complete said work within this time, the Contracting Officer may, by written notice to the Contractor, terminate the right to proceed with the work (or separable part of the work) that has been delayed. In this event, DOH may take over the work and complete it, by contract or otherwise, and may take possession of and use any materials, equipment, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to DOH/Homeowner resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by DOH/Homeowner in completing the work.
- (b) The Contractor's right to proceed shall not be terminated or the Contractor charged with damages under this clause if—

- (1) The delay in completing the work arises from unforeseeable causes beyond the control and without

the fault or negligence of the Contractor. Examples of such causes include (i) acts of God, or of the public enemy, (ii) acts of DOH or other governmental entity in either its sovereign or contractual capacity, (iii) acts of another contractor in the performance of a contract with DOH, (iv) fires, (v) floods, (vi) epidemics, (vii) quarantine restrictions, (viii) strikes, (ix) freight embargoes, (x) unusually severe weather, or (xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

- (2) The Contractor, within days (5 days unless otherwise indicated) from the beginning of such delay (unless extended by the Contracting Officer) notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of the delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, time for completing the work shall be extended by written modification to the contract. The findings of the Contracting Officer shall be reduced to a written decision which shall be subject to the provisions of the Disputes clause of this contract

- (c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been for convenience of DOH.

31. Liquidated Damages

- (a) If the Contractor fails to complete the work within the time specified in the contract, or any extension, as specified in the clause entitled Default of this contract, the Contractor may pay to DOH as liquidated damages, the sum of \$100.00 for each day of delay. If different completion dates are specified in the contract for separate parts or stages of the work, the amount of liquidated damages shall be assessed on those parts or stages which are delayed. To the extent that the Contractor's delay or nonperformance is excused under another clause in this contract, liquidated damages shall not be due DOH. The Contractor remains liable for damages caused other than by delay.
- (b) If DOH terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned DOH in completing the work.
- (c) If DOH does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

32. Termination for Convenience

- (a) The Contracting Officer may terminate this contract in whole, or in part, whenever the Contracting Officer determines that such termination is in the best interest of DOH/Homeowner. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which the performance of the work under the contract is terminated, and the date upon which such termination becomes effective.
- (b) If the performance of the work is terminated, either in whole or in part, DOH/Homeowner shall be liable to the Contractor for reasonable and proper costs resulting from such termination upon the receipt by DOH of a properly presented claim setting out in detail: (1) the total cost of the work performed to date of termination less the total amount of contract payments made to the Contractor; (2) the cost (including reasonable profit) of settling and paying claims under subcontracts and material orders for work performed and materials and supplies delivered to the site, payment for which has not been made by DOH to the Contractor or by the Contractor to the subcontractor or supplier; (3) the cost of preserving and protecting the work already performed until DOH or assignee takes possession thereof or assumes responsibility therefore; (4) the actual or estimated cost of legal and accounting services reasonably necessary to prepare and present the termination claim to DOH/Homeowner; and (5) an amount constituting a reasonable profit on the value of the work performed by the Contractor.
- (c) The Contracting Officer will act on the Contractor's claim within days (60 days unless otherwise

indicated) of receipt of the Contractor's claim.

- (d) Any disputes with regard to this clause are expressly made subject to the provisions of the Disputes clause of this contract.

33. Assignment of Contract

The Contractor shall not assign or transfer any interest in this contract; except that claims for monies due or to become due from DOH/Homeowner under the contract may be assigned to a bank, trust company, or other financial institution. Such assignments of claims shall only be made with the written concurrence of the Contracting Officer. If the Contractor is a partnership, this contract shall inure to the benefit of the surviving or remaining member(s) of such partnership as approved by the Contracting Officer.

34. Insurance

- (a) Before commencing work, the Contractor and each subcontractor shall furnish DOH with certificates of insurance listing DOH and the Homeowner as additionally insured A.T.I.M.A. showing the following insurance is in force and will insure all operations under the Contract:
 - (1) Workers' Compensation, in accordance with state or Territorial Workers' Compensation laws.
 - (2) Commercial General Liability with a combined single limit for bodily injury and property damage of not less than \$1,000,000 per occurrence to protect the Contractor and each subcontractor against claims for bodily injury or death and damage to the property of others. This shall cover the use of all equipment, hoists, and vehicles on the site(s) not covered by Automobile Liability under (3) below. If the Contractor has a "claims-made" policy, then the following additional requirements apply: the policy must provide a "retroactive date" which must be on or before the execution date of the Contract; and the extended reporting period may not be less than five years following the completion date of the Contract.
 - (3) Automobile Liability on owned and non-owned motor vehicles used on the site(s) or in connection therewith for a combined single limit for bodily injury and property damage of not less than \$1,000,000 per occurrence.
 - (4) Cargo Insurance in the amount of \$250,000 is required when the project involves raising the structure above the Base Flood Elevation.
- (b) Before commencing work, the Contractor shall furnish DOH with a certificate of insurance evidencing that Builder's Risk (fire and extended coverage) Insurance on all work in place and/or materials stored at the building site(s), including foundations and building equipment, is in force. The Builder's Risk Insurance shall be for the benefit of the Contractor, the Homeowner and DOH as their interests may appear and each shall be named in the policy or policies as an insured. The Contractor in installing equipment supplied by DOH shall carry insurance on such equipment from the time the Contractor takes possession thereof until the Contract work is accepted by DOH. The Builder's Risk Insurance need not be carried on excavations, piers, footings, or foundations until such time as work on the superstructure is started. It need not be carried on landscape work. Policies shall furnish coverage at all times for the full cash value of all completed construction, as well as materials in place and/or stored at the site(s), whether or not partial payment has been made by DOH. The Contractor may terminate this insurance on buildings as of the date taken over for occupancy by the Homeowner. The Contractor is not required to carry Builder's Risk Insurance for modernization work which does not involve structural alterations or additions and where the Homeowner's existing fire and extended coverage policy can be endorsed to include such work.
- (c) All insurance shall be carried with companies which are financially responsible and admitted to do business in the State in which the project is located with a minimum Best rating of A-. If any such insurance is due to expire during the construction period, the Contractor (including subcontractors, as applicable) shall not permit the coverage to lapse and shall furnish evidence of coverage to the

Contracting Officer. All certificates of insurance, as evidence of coverage, shall provide that no coverage may be canceled or non-renewed by the insurance company until at least 30 days prior written notice has been given to the Contracting Officer.

35. Subcontracts

(a) Definitions. As used in this contract -

- (1) "Subcontract" means any contract, purchase order, or other purchase agreement, including modifications and change orders to the foregoing, entered into by a subcontractor to furnish supplies, materials, equipment, and services for the performance of the prime contract or a subcontract.
 - (2) "Subcontractor" means any supplier, vendor, or firm that furnishes supplies, materials, equipment, or services to or for the Contractor or another subcontractor.
- (b) The Contractor shall not enter into any subcontract with any subcontractor who has been temporarily denied participation in a HUD program or who has been suspended or debarred from participating in contracting programs by any agency of the United States Government or of the state in which the work under this contract is to be performed.
- (c) The Contractor shall be as fully responsible for the acts or omissions of its subcontractors, and of persons either directly or indirectly employed by them as for the acts or omissions of persons directly employed by the Contractor.
- (d) The Contractor shall insert appropriate clauses in all subcontracts to bind subcontractors to the terms and conditions of this contract insofar as they are applicable to the work of subcontractors.
- (e) Nothing contained in this contract shall create any contractual relationship between any subcontractor and DOH or between the subcontractor and HUD.

36. Subcontracting with Small and Minority Firms, Women's Business Enterprise, and Labor Surplus Area Firms

The Contractor shall take the following steps to ensure that, whenever possible, subcontracts are awarded to small business firms, minority firms, women's business enterprises, and labor surplus area firms:

- (a) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
- (b) Ensuring that small and minority businesses and women's business enterprises are solicited whenever they are potential sources;
- (c) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses and women's business enterprises;
- (d) Establishing delivery schedules, where the requirements of the contract permit, which encourage participation by small and minority businesses and women's business enterprises; and
- (e) Using the services and assistance of the U.S. Small Business Administration, the Minority Business Development Agency of the U.S. Department of Commerce, and State and local governmental small business agencies.

37. Equal Employment Opportunity

During the performance of this contract, the Contractor agrees as follows:

- (a) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, or handicap.
- (b) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, national origin, or

handicap. Such action shall include, but not be limited to, (1) employment, (2) upgrading, (3) demotion, (4) transfer, (5) recruitment or recruitment advertising, (6) layoff or termination, (7) rates of pay or other forms of compensation, and (8) selection for training, including apprenticeship.

- (c) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.
- (d) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, or handicap.
- (e) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.
- (f) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.
- (g) The Contractor shall furnish all information and reports required by Executive Order 11246, as amended, Section 503 of the Rehabilitation Act of 1973, as amended, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto. The Contractor shall permit access to its books, records, and accounts by the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (h) In the event of a determination that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part, and the Contractor may be declared ineligible for further Government contracts, or Federally assisted construction contracts under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended, the rules, regulations, and orders of the Secretary of Labor, or as otherwise provided by law.
- (i) The Contractor shall include the terms and conditions of this clause in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor. The Contractor shall take such action with respect to any subcontract or purchase order as the Secretary of Housing and Urban Development or the Secretary of Labor may direct as a means of enforcing such provisions, including sanctions for noncompliance; provided that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.
- (j) Compliance with the requirements of this clause shall be to the maximum extent consistent with, but not in derogation of, compliance with section 7(b) of the Indian Self-Determination and Education Assistance Act and the Indian Preference clause of this contract.

38. Employment, Training, and Contracting Opportunities for Low-Income Persons, Section 3 of the Housing and Urban Development Act of 1968.

- (a) The work to be performed under this contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (Section 3). The purpose of Section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by Section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- (b) The parties to this contract agree to comply with HUD's regulations in 24 CFR Part 135, which implement Section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the Part 135 regulations.
- (c) The contractor agrees to send to each labor organization or representative of workers with which the

contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this Section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the Section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.

- (d) The contractor agrees to include this Section 3 clause in every subcontract subject to compliance with regulations in 24 CFR Part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this Section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR Part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR Part 135.
- (e) The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR Part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR Part 135.
- (f) Noncompliance with HUD's regulations in 24 CFR Part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
- (g) With respect to work performed in connection with Section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of Section 3 and Section 7(b) agree to comply with Section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

39. Interest of Members of Congress

No member of or delegate to the Congress of the United States of America shall be admitted to any share or part of this contract or to any benefit that may arise therefrom.

40. Interest of Members, Officers, or Employees and Former Members, Officers, or Employees

No member, officer, or employee of DOH, no member of the governing body of the locality in which the project is situated, no member of the governing body of the locality in which DOH was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the project, shall, during his or her tenure, or for one year thereafter, have any interest, direct or indirect, in this contract or the proceeds thereof.

41. Limitations on Payments made to Influence Certain Federal Financial Transactions

- (a) The Contractor agrees to comply with Section 1352 of Title 31, United States Code which prohibits the use of Federal appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.
- (b) The Contractor further agrees to comply with the requirement of the Act to furnish a disclosure (OMB Standard Form LLL, Disclosure of Lobbying Activities) if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be

paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

42. Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringement of any patent rights and shall save DOH/Homeowner harmless from loss on account thereof; except that DOH shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified and the Contractor has no reason to believe that the specified design, process, or product is an infringement. If, however, the Contractor has reason to believe that any design, process or product specified is an infringement of a patent, the Contractor shall promptly notify the Contracting Officer. Failure to give such notice shall make the Contractor responsible for resultant loss.

43. Examination and Retention of Contractor's Records

- (a) DOH, HUD, or Comptroller General of the United States, or any of their duly authorized representatives shall, until 3 years after final payment under this contract, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audit, examination, excerpts, and transcriptions.
- (b) The Contractor agrees to include in first-tier subcontracts under this contract a clause substantially the same as paragraph (a) above. "Subcontract," as used in this clause, excludes purchase orders not exceeding \$10,000.
- (c) The periods of access and examination in paragraphs (a) and (b) above for records relating to (1) appeals under the Disputes clause of this contract, (2) litigation or settlement of claims arising from the performance of this contract, or (3) costs and expenses of this contract to which DOH, HUD, or Comptroller General or any of their duly authorized representatives has taken exception shall continue until disposition of such appeals, litigation, claims, or exceptions.

44. Labor Standards - Davis-Bacon and Related Acts

Except for housing rehabilitation/reconstruction projects designed to contain fewer than eight (8) units, if the total amount of this contract exceeds \$2,000, the Federal labor standards set forth in the clause below shall apply to the development or construction work to be performed under the contract.

(a) Minimum Wages.

- (1) All laborers and mechanics employed under this contract in the development or construction of the project(s) involved will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof (if applicable), regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the regular weekly period, are deemed to be constructively made or incurred during such weekly period. If applicable, such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR

5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers (if applicable).

- (2) (i) Any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met: (A) The work to be performed by the classification requested is not performed by a classification in the wage determination; and (B) The classification is utilized in the area by the construction industry; and (C) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (ii) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employee Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.
- (iii) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.
- (iv) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (a)(2)(ii) or (iii) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in classification.
- (3) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (4) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.
- (b) Withholding of funds. HUD or its designee shall, upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working in the construction or development of the project, all or part of the wages required by the contract, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee

may, after written notice to the Contractor, disburse such amounts withheld for and on account of the Contractor or subcontractor to the respective employees to whom they are due.

(c) Payrolls and basic records.

(1) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working in the construction or development of the project. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under 29 CFR 5.5(a)(1)(iv), that the wages of any laborer or mechanic include the amount of costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(2)

(i) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Contracting Officer for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under subparagraph (c)(1) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The Contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1214-0149.)

(ii) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

- a. That the payroll for the payroll period contains the information required to be maintained under paragraph (c) (1) of this clause and that such information is correct and complete;
- b. That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3; and
- c. That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(iii) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirements for submission of the "Statement of Compliance" required by subparagraph (c)(2)(ii) of this clause.

(iv) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.

(3) The Contractor or subcontractor shall make the records required under subparagraph (c)(1) available for inspection, copying, or transcription by authorized representatives of HUD or its designee, the Contracting Officer, or the Department of Labor and shall permit such representatives to interview

employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

- (d) (1) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship and Training, Employer and Labor Services (OATELS), or with a State Apprenticeship Agency recognized by OATELS, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by OATELS or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator of the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event OATELS, or a State Apprenticeship Agency recognized by OATELS, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (2) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program,

- the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (3) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.
 - (e) Compliance with Copeland Act requirements. The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.
 - (f) Contract termination; debarment. A breach of this contract clause may be grounds for termination of the contract and for debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.
 - (g) Compliance with Davis-Bacon and related Act requirements. All rulings and interpretations of the Davis-Bacon and related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.
 - (h) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this clause shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and DOH, HUD, the U.S. Department of Labor, or the employees or their representatives.
 - (i) Certification of eligibility.
 - (1) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - (2) No part of this contract shall be subcontracted to any person or firm ineligible for award of a United States Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - (3) The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C. 1001.
 - (j) Contract Work Hours and Safety Standards Act. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.
 - (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics, including watchmen and guards, shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.
 - (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the provisions set forth in subparagraph (j)(1) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic (including watchmen and guards) employed in violation of the provisions set forth in subparagraph (j)(1) of this clause, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by provisions set forth in subparagraph (j)(1) of this clause.
 - (3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the provisions set forth in subparagraph (j)(2) of this clause.
 - (k) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts all the provisions contained

in this clause, and such other clauses as HUD or its designee may by appropriate instructions require, and also a clause requiring the subcontractors to include these provisions in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all these provisions

45. . Non-Federal Prevailing Wage Rates

- (a) Any prevailing wage rate (including basic hourly rate and any fringe benefits), determined under State or tribal law to be prevailing, with respect to any employee in any trade or position employed under the contract, is inapplicable to the contract and shall not be enforced against the Contractor or any subcontractor, with respect to employees engaged under the contract whenever such non-Federal prevailing wage rate exceeds:
 - (1) The applicable wage rate determined by the Secretary of Labor pursuant to the Davis-Bacon Act (40 U.S.C. 3141 et seq.) to be prevailing in the locality with respect to such trade;
- (b) An applicable apprentice wage rate based thereon specified in an apprenticeship program registered with the U.S. Department of Labor (DOL) or a DOL- recognized State Apprenticeship Agency; or
- (c) An applicable trainee wage rate based thereon specified in a DOL-certified trainee program.

46. Procurement of Recovered Materials.

- (a) In accordance with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, the Contractor shall procure items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR Part 247 that contains the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition. The contractor shall procure items designated in the EPA guidelines that contain the highest percentage of recovered materials practicable unless the Contractor determines that such items: (1) are not reasonably available in a reasonable period of time; (2) fail to meet reasonable performance standards, which shall be determined on the basis of the guidelines of the National Institute of Standards and Technology, if applicable to the item; or (3) are only available at an unreasonable price.
- (b) Paragraph (a) of this clause shall apply to items purchased under this contract where: (1) the Contractor purchases in excess of \$10,000 of the item under this contract; or (2) during the preceding Federal fiscal year, the Contractor: (i) purchased any amount of the items for use under a contract that was funded with Federal appropriations and was within a Federal agency or a State agency of a political subdivision of a State; and (ii) purchased a total of in excess of \$10,000 of the item both under and outside that contract

SECTION 000115

LIST OF DRAWING SHEETS

1.LIST OF DRAWINGS

- A. Drawings: Drawings consist of the Contract Drawings and other drawings listed on the Table of Contents page of the separately bound drawing set titled 'Project 2065 – 44 Washington Parkway, Connecticut Department of Housing, Community Development Block Grant, Disaster Recovery Program , Owner Occupied Rehabilitation and Rebuilding Program, dated 9/30/2014, as modified by subsequent Addenda and Contract modifications.
- B. List of Drawings: Drawings consist of the following Contract Drawings and other drawings of type indicated:
1. Title Sheet – Sheet T0.00
 2. Site Plan – Sheet C-1.0
 3. Deck Layout Plan – Sheet C-1.1
 4. Details – Sheet C-2.0
 5. Details – Sheet C-2.1
 6. General Notes –Sheet S-1
 7. Foundation with Slab Plan – Sheet S-2
 8. Existing and Proposed Framing Plans – Sheet S-3
 9. Foundation Details – Sheet S-4
 10. Steel Details – Sheet S-5
 11. Electrical – Symbols, Schedules, Notes, Details and Risers – Sheet E0.01
 12. Electrical – Floor Plans – Sheet E1.01
 13. Mechanical – Notes, Details & Concept Diagram – Sheet M0.01
 14. Plumbing – Symbols, Schedules, Notes and Details – Sheet P0.01
 15. Plumbing – Floor Plans – Sheet P1.01

END OF SECTION

The State of Connecticut Department of Housing
Community Development Block Grant
Disaster Recovery Program (CDBG-DR)
Owner Occupied Rehabilitation and Rebuilding Program

Bid Documents
Project# 2065
44 Washington Parkway
Stratford, CT

SECTION 00 31 26

EXISTING HAZARDOUS MATERIAL INFORMATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. "Hazardous Material Inspection Report, 44 Washington Parkway" August 7, 2014

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION



Facility Support Services, LLC

Environmental & Safety Consulting Engineers

**Connecticut Department of Housing
Community Development Block Grant – Disaster Recovery
Owner Occupied Recovery and Rehabilitation Program**

**Hazardous Materials
Inspection Report**

**44 Washington Parkway
Stratford, Connecticut**

PREPARED FOR:

Martinez Couch & Associates, LLC
1084 Cromwell Ave. Suite A-2
Rocky Hill, CT 06067

PREPARED BY:

Facility Support Services, LLC
2685 State Street
Hamden, CT 06517
Phone (203) 288-1281

August 7, 2014

SIGNATURES OF REPORT AUTHORS

The employees of Facility Support Services, LLC whose names appear below prepared this report. Requests for information on the content of this document should be directed to these individuals.

A handwritten signature in blue ink that reads "Kevin Bogue".

Kevin S. Bogue, LEP, CHMM
Project Manager
CTDPH Asbestos Inspector #000157

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TABLES

Table 1	Summary of Laboratory Analysis of Spore Types

ATTACHMENTS

Attachment A	Mold Analytical Data
Attachment B	FSS Licensure
Attachment C	Asbestos Laboratory Analytical Data
Attachment D	Lead Analytical Data
Attachment E	PCB Analytical Data

I. Introduction

Facility Support Services, LLC (FSS) was contracted by Martinez, Couch & Associates, LLC (MCA) to perform a limited scope hazardous materials survey of 44 Washington Parkway in Stratford, Connecticut (the “Site”). The purpose of this inspection was to identify the presence of asbestos, PCBs, lead paint and mold in certain building materials proposed for removal/demolition that qualify for the repair/replacement of items damaged by the October 2012 Tropical Storm Sandy under the Connecticut Department of Housing (DOH), Community Development Block Grant – Disaster Recovery Owner Occupied Recovery and Rehabilitation Program. FSS did not perform radon testing due to the proposed raising of the residence.

FSS utilized best industry practices to identify all suspect materials associated with the structures. Any material that has not been identified during this inspection or discovered during renovation/demolition activities must be presumed to be hazardous until such time that samples of the material can be collected and analyzed.

II. Mold

FSS conducted sampling for mold on July 31, 2014. Testing for total spores in the air was conducted for the following areas of the Site to identify concerns with indoor air quality related to mold and fungi:

- 1st Floor
- Outside of House
- Basement

The outside ambient air sample provided a background reference sample (collected from a location in the front yard). Mr. Kevin Bogue of FSS conducted the spore sampling utilizing an air sampling pump and sample media. Air was collected at a rate of 15.0 liters of air per minute. The samples were collected on Air-O-Cell type sampling cartridges located in line with the sampling pump, which ran for 10 minutes at each sampling location.

The spore samples were analyzed by EMSL Analytical of Wallingford, Connecticut for the identification and enumeration of spores (EMSL Method M001). EMSL is a State of Connecticut, Department of Public Health certified laboratory (Accreditation Number 165118). Analytical reports for mold are included in Attachment A.

The analysis for total spore counts is a direct microscopic examination and does not include culturing or growing fungi. Therefore, the results include both viable and non-viable spores. Spore trap results are reported in spores per cubic meter of air. See Table 1 below for an outline of the mold analytical results.

Table 1
Summary of Laboratory Analysis of Spore Types
44 Washington Parkway, Stratford, Connecticut

Sample Number & Location	Raw Count	Total Fungi (Count/m³)	Spore Types Present
20140731_22214_2065_MS1 1 st Floor	215	4,550	Alternaria, Ascospores, Aspergillus/Penicillium, Basidiospores, Cladosporium, Fusarium, Ganoderma, Myxomycetes
20140731_22214_2065_MS2 Outside	251	5,290	Alternaria, Ascospores, Aspergillus/Penicillium, Basidiospores, Cladosporium, Ganoderma, Myxomycetes, Torula, Polythrincium
20140731_22214_2065_MS3 Basement	302	6,390	Ascospores, Aspergillus/Penicillium, Basidiospores, Cladosporium, Ganoderma, Myxomycetes, Pestalotia

The primary mold species in the 1st Floor sample was Ascospores; in the outside and basement samples it was Aspergillus/Penicillium. Ascospores encompass a wide range of genera worldwide and associated with member of the Phylum Ascomycota.

This spore type is found everywhere in nature. *Aspergillus*/*Penicillium* can be associated with hay fever and asthma, and can grow on a wide range of substrates indoors, and are prevalent in water-damaged buildings and where foods are stored.

In Connecticut, there are currently no regulatory standards directly governing mold/fungal spore concentrations. Although no standards for mold exist, some information regarding levels have been published, including the following:

Baxter, et al considers mold contamination present in a building when the total mold spore concentration per cubic meter is above 10,000. However in special cases, even low quantitative levels of certain particles or particle types (such as *Penicillium*/*Aspergillus* spore chains in an un-treated building) may be diagnostic and may indicate a hidden mold reservoir that merits further investigation.

FSS's investigation found total spore concentrations inside the Site residence of up to 6,390/m³, which is below the 10,000/m³ level noted above.

The American Conference of Government Industrial Hygienists (ACGIH) stated that indoor mold levels are generally less than 1/3 the outdoor level and that when indoor mold is at more than this level remedial action should be taken to find the source of the elevated counts and to clean it up. However, this is a general rule and may be inaccurate and unreliable method for screening buildings for mold.

FSS's investigation found a total spore concentration in the interior sample at a level well above the 1/3 ratio level noted in the previous paragraph.

III. Asbestos

FSS conducted a limited scope asbestos inspection and bulk sampling on July 31, 2014 of suspect building materials that are proposed for renovations. The inspection was conducted by Kevin Bogue, a State of Connecticut licensed Asbestos Inspector. Mr. Bogue's Connecticut Asbestos Inspectors/Management Planner license is provided in Attachment B.

The following suspect materials were indentified during the inspection:

- Brown paper with black tar (insulation)
- Sheetrock (type #1)
- Sheetrock (type #2)
- Joint Compound associated with Sheetrock (type #1)
- TSI paper wrap
- Grey chimney mortar (basement)
- Interior window glazing (basement)

This asbestos inspection was performed in accordance with the EPA, NESHAP regulations for building renovations and demolition, 40 CFR Part 61, Amended 11/20/1990. The bulk asbestos samples collected during this inspection were delivered under full chain of custody and analyzed by EMSL Analytical, Inc., via EPA/600/R-93/116. This is currently the approved EPA test method, which uses Polarized Light Microscopy (PLM). EMSL Analytical, Inc. is an accredited asbestos laboratory (NVLAP # 200700-0) and is a State of Connecticut approved public health laboratory for asbestos analysis. Copies of the laboratory analytical results can be found in Attachment C of this report.

Laboratory results have revealed that the asbestos content of the tested materials are below the 1% required to confirm a material as asbestos containing.

IV. PCBs

Following an inspection of building materials proposed for renovations, one suspected PCB-containing materials was identified and sampled:

- Interior window glazing (basement)

Copies of the laboratory analytical results can be found in Attachment E of this report.

Laboratory results have revealed that the PCB content of the tested material is 6.1 ppm, above the 1 ppm level that requires this material to be abated.

V. Lead

The subject residential structure was built prior to 1978 (1950) and therefore the likelihood that lead painted surfaces are present is increased. As a residential structure

built prior to 1978 the removal of lead painted materials where a child under 6 is housed, or may visit, would trigger the EPA Renovation, Repair and Painting (RRP) rule. Furthermore, adherence to the requirements of The Lead-Safe Housing Rule (US Department of Housing and Urban development, HUD) are stipulated by the Connecticut Department of Housing (DOH) as part of the Community Development Block Grant – Disaster Recovery Owner Occupied Recovery and Rehabilitation Program.

A building wide XRF inspection was conducted by Maureen Monaco of Gilberto Lead Inspections, LLC (Gilbertco) utilizing a Scitec Map4 Portable X-Ray Fluoroscope Spectrum Analyzer with a Cobalt 57 source. The findings of the investigation determined none of the building components contain lead based paint ($>1.0 \text{ mg/cm}^2$).

Non-Intact Materials

A copy of the Gilbertco Lead Inspection Report is provided in Attachment D. Following the HUD Lead-Safe Housing Guidelines, on-intact materials should undergo interim measures to abate the hazard. No lead containing (and therefore non non-intact lead containing materials) have been identified at the residence.

Demolition Materials

When toxic wastes are land disposed, contaminated liquid may leach from the waste and pollute ground water. Toxicity is defined through a laboratory procedure called the Toxicity Characteristic Leaching Procedure (TCLP) (Method 1311). The TCLP helps identify wastes likely to leach concentrations of contaminants that may be harmful to human health or the environment.

None of the materials tested positive for lead, therefore, further consideration for hazardous levels of lead in the demolition/renovation materials is not required.

VI. Conclusions & Recommendations

When the structure is renovated, all removed debris should be sent to an appropriate landfill for final disposal following all appropriate regulations. Any work

involving lead-containing paints should be conducted under the EPA's RRP Renovation, Repair and Painting Rule. Any material discovered during renovation activities which have not been included in this survey must be presumed to contain asbestos, lead and PCBs until such time that the material can be evaluated and sampled.

Asbestos – No asbestos containing materials (>1% asbestos) were identified in materials proposed for renovation or demolition.

PCBs - One suspected PCB-containing materials was identified in proposed renovation materials. This material (interior basement window glazing) tested positive for PCBs (5.1 ppm), therefore, special disposal requirements are required for these materials. Follow-up PCB testing of substrates that contacted the PCB-containing caulk will not be required if the window can be disposed of as a whole.

Mold – Mold spore count analysis indicates accelerated mold growth in the residence (when comparing indoor mold spore count numbers to exterior spore count numbers). A mold abatement plan should be incorporated into proposed renovations for this residence.

Lead – No lead containing paints were identified in the residence, therefore, further consideration for hazardous levels of lead in the demolition/renovation materials is not required.

ATTACHMENTS

ATTACHMENT A
MOLD ANALYTICAL DATA



EMSL Analytical, Inc.

29 North Plains Highway, Unit # 4 Wallingford, CT 06492
Phone/Fax: 203-284-5948 / (203) 284-5978
<http://www.EMSL.com> / wallingfordlab@emsl.com

Order ID: 241403077
Customer ID: FSS93
Customer PO:
Project ID:

Attn: Kevin Bogue
Facility Support Services, LLC
2685 State Street
Hamden, CT 06517

Phone: (203) 288-1281
Fax: (203) 248-4409
Collected: 07/31/2014
Received: 08/01/2014
Analyzed: 08/06/2014

Proj: 22214-2065, 44 WASHINGTON

Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	241403077-0001			241403077-0002			241403077-0003		
Client Sample ID:	20140731_22214_2065_MS1			20140731_22214_2065_MS2			20140731_22214_2065_MS3		
Volume (L):	150			150			150		
Sample Location:	1st floor			1st floor			1st floor		
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria	4	80	1.8	2	40	0.8	-	-	-
Ascospores	63	1300	28.6	52	1100	20.8	13	270	4.2
Aspergillus/Penicillium	26	550	12.1	81	1700	32.1	263	5550	86.9
Basidiospores	50	1100	24.2	43	910	17.2	10	210	3.3
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	34	720	15.8	39	820	15.5	8	200	3.1
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	3	60	1.3	-	-	-	-	-	-
Ganoderma	21	440	9.7	17	360	6.8	3	60	0.9
Myxomycetes++	14	300	6.6	15	320	6	4	80	1.3
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	1	20	0.4	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Pestalotia	-	-	-	-	-	-	1	20	0.3
Polythrincium	-	-	-	1	20	0.4	-	-	-
Total Fungi	215	4550	100	251	5290	100	302	6390	100
Hyphal Fragment	11	230	5	12	250	4.7	3	60	0.9
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	1	-	-	2	-
Fibrous Particulate (1-4)	-	2	-	-	1	-	-	2	-
Background (1-5)	-	2	-	-	2	-	-	3	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut

No discernable field blank was submitted with this group of samples.

Gloria V. Oriol, Laboratory Manager
or Other Approved Signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Wallingford, CT AIHA-LAP, LLC--EMLAP Lab 165118

Initial report from: 08/06/2014 15:07:29

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com



Microbiology Chain of Custody

EMSL Order Number (Lab Use Only):

241403077

Wallingford, CT 06492
PHONE: (203) 284-5948
FAX: (203) 284-5978

Company: Facility Support Services, LLC		EMSL-Bill to: ☐ Different ☒ Same If Bill to is Different note instructions in Comments**			
Street: 2685 State Street		Third Party Billing requires written authorization from third party			
City: Hamden	State/Province: CT	Zip/Postal Code: 06517	Country: United States		
Report To (Name): Kevin Bogue		Telephone #: 203-288-1281			
Email Address: kbogue.fss@snet.net		Fax #:	Purchase Order:		
Project Name/Number: 22214 - 2065, 44 Washington		Please Provide Results: ☐ FAX ☒ E-mail ☐ Mail			
U.S. State Samples Taken: CT		Connecticut Samples: ☐ Commercial ☒ Residential			
Turnaround Time (TAT) Options* - Please Check					
☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☒ 72 Hour ☐ 96 Hour ☐ 1 Week ☐ 2 Week					
*Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide. TATs are subject to methodology requirements					
Non Culturable Air Samples (Spore Traps) - Test Codes					
- M001 Air-O-Cell - M049 BioSIS - M030 Micro 5 - M173 Allegro M2 - M003 Burkard - M174 MoldSnap - M004 Allergenco - M043 Cyclex - M176 Relle Smart - M032 Allergenco-D - M002 Cyclex-d - M130 Via-Cell - M172 Versa Trap					
Other Microbiology Test Codes					
- M041 Fungal Direct Examination - M005 Viable Fungi ID and Count - M006 Viable Fungi ID and Count (Speciation) - M007 Culturable Fungi - M008 Culturable Fungi (Speciation) - M009 Gram Stain Culturable Bacteria - M010 Bacterial Count and ID - 3 Most Prominent - M011 Bacterial Count and ID - 5 Most Prominent - M013 Sewage Contamination in Buildings - M014 Endotoxin Analysis - M015 Heterotrophic Plate Count - M180 Real Time Q-PCR-ERMI 36 Panel - M018 Total Coliform (Membrane Filtration) - M020 Fecal Streptococcus (Membrane Filtration) - M210-215 Legionella Detection - M026 Recreational Water Screen - M027 Mycotoxin Analysis - M029 Enterococci - M019 Fecal Coliform - M133 MRSA Analysis - M028 Cryptococcus neoformans Detection - M120 Histoplasma capsulatum Detection - M033-39 Allergen Testing - M044 Group Allergen (Cat, Dog, Cockroach, Dustmites) - Other See Analytical Price Guide					
Preservation Method (Water):					
Name of Sampler: Kevin Bogue		Signature of Sampler: Ken Bogue			
Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
Example: A1	Kitchen	Air	M001	75L	1/1/12 4:00 PM
20140731-22214-2065.M51	1st Floor	AIR	M001	150L	7/31/14 10:50am
20140731-22214-2065.M52		↓	↓	150L	↓
20140731-22214-2065.M53		↓	↓	150L	↓
Client Sample # (s):	ms1 - ms3		Total # of Samples:	3	
Relinquished (Client):	Ken Bogue		Date: 7/31/14	Time:	
Received (Client):			Date:	Time:	
Comments:					



ATTACHMENT B

FSS LICENSURE

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH

PURSUANT TO THE PROVISIONS OF THE GENERAL STATUTES OF CONNECTICUT
THE INDIVIDUAL NAMED BELOW IS LICENSED
BY THIS DEPARTMENT AS A

ASBESTOS CONSULTANT - INSP/MGMT PLANNER

KEVIN S. BOGUE

LICENSE NO
000157

CURRENT THROUGH
08/31/14

VALIDATION NO
03-628349

Kevin Bogue
SIGNATURE

James Muller
COMMISSIONER

ATTACHMENT C

ASBESTOS LABORATORY ANALYTICAL DATA

**EMSL Analytical, Inc.**

29 North Plains Highway, Unit # 4, Wallingford, CT 06492

Phone/Fax: 203-284-5948 / (203) 284-5978

<http://www.EMSL.com>wallingfordlab@emsl.com

EMSL Order: 241403070

CustomerID: FSS93

CustomerPO:

ProjectID:

Attn: **Kevin Bogue**
Facility Support Services, LLC
2685 State Street

Hamden, CT 06517Project: **22214-2065, 44 WASHINGTON**

Phone: (203) 288-1281
 Fax: (203) 248-4409
 Received: 08/01/14 11:50 AM
 Analysis Date: 8/5/2014
 Collected: 7/31/2014

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance		<u>Non-Asbestos</u>		<u>Asbestos</u>
				% Fibrous	% Non-Fibrous	% Type
20140731_22214_2_065_S1A 241403070-0001	Brown paper and black tar	Brown/Black Fibrous Homogeneous	50% 3%	Cellulose Glass	47% Non-fibrous (other)	None Detected
20140731_22214_2_065_S1B 241403070-0002	Brown paper and black tar	Brown/Black Fibrous Homogeneous	50% 3%	Cellulose Glass	47% Non-fibrous (other)	None Detected
20140731_22214_2_065_S1C 241403070-0003	Brown paper and black tar	Brown/Black Fibrous Homogeneous	80%	Cellulose	20% Non-fibrous (other)	None Detected
20140731_22214_2_065_S2A 241403070-0004	Sheetrock + paper (type #1)	White Non-Fibrous Homogeneous	7%	Cellulose	35% Gypsum 58% Non-fibrous (other)	None Detected
20140731_22214_2_065_S2B 241403070-0005	Sheetrock + paper (type #1)	White Non-Fibrous Homogeneous	5%	Cellulose	35% Gypsum 60% Non-fibrous (other)	None Detected
20140731_22214_2_065_S2C 241403070-0006	Sheetrock + paper (type #1)	White Fibrous Homogeneous	5%	Cellulose	35% Gypsum 60% Non-fibrous (other)	None Detected
20140731_22214_2_065_S3A 241403070-0007	Sheetrock + paper (type #2)	White Fibrous Homogeneous	10%	Cellulose	30% Gypsum 60% Non-fibrous (other)	None Detected

Analyst(s)

Kristin Lopez (10)
Lauren Brennan (11)

Gloria V. Oriol, Laboratory Manager
 or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. Wallingford, CT NVLAP Lab Code 200700-0.

Initial report from 08/05/2014 10:29:22

**EMSL Analytical, Inc.**

29 North Plains Highway, Unit # 4, Wallingford, CT 06492

Phone/Fax: 203-284-5948 / (203) 284-5978

<http://www.EMSL.com>wallingfordlab@emsl.com

EMSL Order: 241403070

CustomerID: FSS93

CustomerPO:

ProjectID:

Attn: **Kevin Bogue**
Facility Support Services, LLC
2685 State Street

Hamden, CT 06517Project: **22214-2065, 44 WASHINGTON**

Phone: (203) 288-1281
 Fax: (203) 248-4409
 Received: 08/01/14 11:50 AM
 Analysis Date: 8/5/2014
 Collected: 7/31/2014

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>	
			%	Type	%	Type
20140731_22214_2_065_S3B 241403070-0008	Sheetrock + paper (type #2)	White Fibrous Homogeneous	12%	Cellulose	30% Gypsum 58% Non-fibrous (other)	None Detected
20140731_22214_2_065_S3C 241403070-0009	Sheetrock + paper (type #2)	White Fibrous Homogeneous	7%	Cellulose	35% Gypsum 58% Non-fibrous (other)	None Detected
20140731_22214_2_065_S4A 241403070-0010	Type 1 sheetrock joint compound	White Non-Fibrous Homogeneous			65% Ca Carbonate 35% Non-fibrous (other)	None Detected
20140731_22214_2_065_S4B 241403070-0011	Type 1 sheetrock joint compound	White Non-Fibrous Homogeneous			60% Ca Carbonate 40% Non-fibrous (other)	None Detected
20140731_22214_2_065_S4C 241403070-0012	Type 1 sheetrock joint compound	White Non-Fibrous Homogeneous	<1%	Cellulose	50% Ca Carbonate 50% Non-fibrous (other)	None Detected
20140731_22214_2_065_S5A 241403070-0013	TSI paper wrap	White/Black Fibrous Homogeneous	10% 5%	Cellulose Glass	85% Non-fibrous (other)	None Detected
20140731_22214_2_065_S5B 241403070-0014	TSI paper wrap	White/Silver Fibrous Homogeneous	30% 15%	Cellulose Glass	55% Non-fibrous (other)	None Detected

Analyst(s)

Kristin Lopez (10)
Lauren Brennan (11)

Gloria V. Oriol, Laboratory Manager
 or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Wallingford, CT NVLAP Lab Code 200700-0.

Initial report from 08/05/2014 10:29:22

**EMSL Analytical, Inc.**

29 North Plains Highway, Unit # 4, Wallingford, CT 06492

Phone/Fax: 203-284-5948 / (203) 284-5978

<http://www.EMSL.com>wallingfordlab@emsl.com

EMSL Order: 241403070

CustomerID: FSS93

CustomerPO:

ProjectID:

Attn: **Kevin Bogue**
Facility Support Services, LLC
2685 State Street

Hamden, CT 06517

Project: 22214-2065, 44 WASHINGTON

Phone: (203) 288-1281
 Fax: (203) 248-4409
 Received: 08/01/14 11:50 AM
 Analysis Date: 8/5/2014
 Collected: 7/31/2014

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos	
			% Fibrous	% Non-Fibrous	% Type	
20140731_22214_2_065_S5C 241403070-0015	TSI paper wrap	White Fibrous Homogeneous	15% Glass 30% Cellulose	55% Non-fibrous (other)	None Detected	
20140731_22214_2_065_S6A 241403070-0016	Grey chimney mortar	Gray Non-Fibrous Homogeneous	<1% Cellulose	30% Ca Carbonate 70% Non-fibrous (other)	None Detected	
20140731_22214_2_065_S6B 241403070-0017	Grey chimney mortar	Gray Non-Fibrous Homogeneous		15% Quartz 85% Non-fibrous (other)	None Detected	
20140731_22214_2_065_S6C 241403070-0018	Grey chimney mortar	Gray Non-Fibrous Homogeneous		15% Quartz 85% Non-fibrous (other)	None Detected	
20140731_22214_2_065_S7A 241403070-0019	Window glazing	Gray Non-Fibrous Homogeneous		30% Ca Carbonate 70% Non-fibrous (other)	<1% Chrysotile	
20140731_22214_2_065_S7B 241403070-0020	Window glazing	Gray Non-Fibrous Homogeneous		35% Ca Carbonate 65% Non-fibrous (other)	<1% Chrysotile	
20140731_22214_2_065_S7C 241403070-0021	Window glazing	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	<1% Chrysotile	

Analyst(s)

Kristin Lopez (10)
 Lauren Brennan (11)

Gloria V. Oriol, Laboratory Manager
 or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Wallingford, CT NVLAP Lab Code 200700-0.

Initial report from 08/05/2014 10:29:22

77

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

241403070

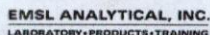
Wallingford, CT 06492

PHONE: (203) 284-5948

FAX: (203) 284-5978

Company: Facility Support Services, LLC		EMSL-Bill to: ☐ Different ☒ Same If Bill to is Different note instructions in Comments**	
Street: 2685 State Street		Third Party Billing requires written authorization from third party	
City: Hamden	State/Province: CT	Zip/Postal Code: 06517	Country: United States
Report To (Name): Kevin Bogue		Telephone #: 203-288-1281	
Email Address: kbogue.fss@snet.net		Fax #:	Purchase Order:
Project Name/Number: 22214-2065, 44 Washington		Please Provide Results: ☐ FAX ☒ E-mail ☐ Mail	
U.S. State Samples Taken: CT		Connecticut Samples: ☐ Commercial ☐ Residential	
Turnaround Time (TAT) Options* - Please Check			
☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☒ 48 Hour ☐ 72 Hour ☐ 96 Hour ☐ 1 Week ☐ 2 Week			
*For TEM Air 3 hr through 6 hr, please call ahead to schedule. There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.			
PCM - Air ☐ Check if samples are from NY ☐ NIOSH 7400 ☐ w/ OSHA 8hr. TWA PLM - Bulk (reporting limit) ☒ PLM EPA 600/R-93/116 (<1%) ☐ PLM EPA NOB (<1%) Point Count ☐ 400 (<0.25%) ☐ 1000 (<0.1%) Point Count w/Gravimetric ☐ 400 (<0.25%) ☐ 1000 (<0.1%) ☐ NYS 198.1 (friable in NY) ☐ NYS 198.6 NOB (non-friable-NY) ☐ NIOSH 9002 (<1%)		TEM - Air ☐ 4-4.5hr TAT (AHERA only) ☐ AHERA 40 CFR, Part 763 ☐ NIOSH 7402 ☐ EPA Level II ☐ ISO 10312 TEM - Bulk ☐ TEM EPA NOB ☐ NYS NOB 198.4 (non-friable-NY) ☐ Chatfield SOP ☐ TEM Mass Analysis-EPA 600 sec. 2.5 TEM - Water: EPA 100.2 Fibers >10µm ☐ Waste ☐ Drinking All Fiber Sizes ☐ Waste ☐ Drinking	
TEM - Dust ☐ Microvac - ASTM D 5755 ☐ Wipe - ASTM D6480 ☐ Carpet Sonication (EPA 600/J-93/167) Soil/Rock/Vermiculite ☐ PLM CARB 435 - A (0.25% sensitivity) ☐ PLM CARB 435 - B (0.1% sensitivity) ☐ TEM CARB 435 - B (0.1% sensitivity) ☐ TEM CARB 435 - C (0.01% sensitivity) ☐ TEM Qual. via Filtration Technique ☐ TEM Qual. via Drop-Mount Technique Other: ☐			
☐ Check For Positive Stop - Clearly Identify Homogenous Group		Filter Pore Size (Air Samples): ☐ 0.8µm ☐ 0.45µm	
Samplers Name: Kevin Bogue		Samplers Signature: Kevin Bogue	
Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
20140731-22214-2065-S1A	brown paper and black tar	1 + 2	7/31/14
S1B	↓	↓	↓
S1C	↓	↓	↓
20140731-22214-2065-S2A	sheetrock + paper (type #1)	3 + 4	↓
S2B	↓	↓	↓
S2C	↓	↓	↓
Client Sample # (s): S1A - S7C		Total # of Samples: 21	
Relinquished (Client): Kevin Bogue		Date: 7/31/14 Time:	
Received (Lab):		Date: Time:	
Comments/Special Instructions:			



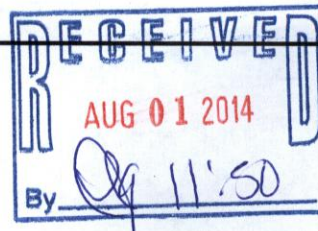


EMSL Order Number *(Lab Use Only)*:

241403070

[illegible]

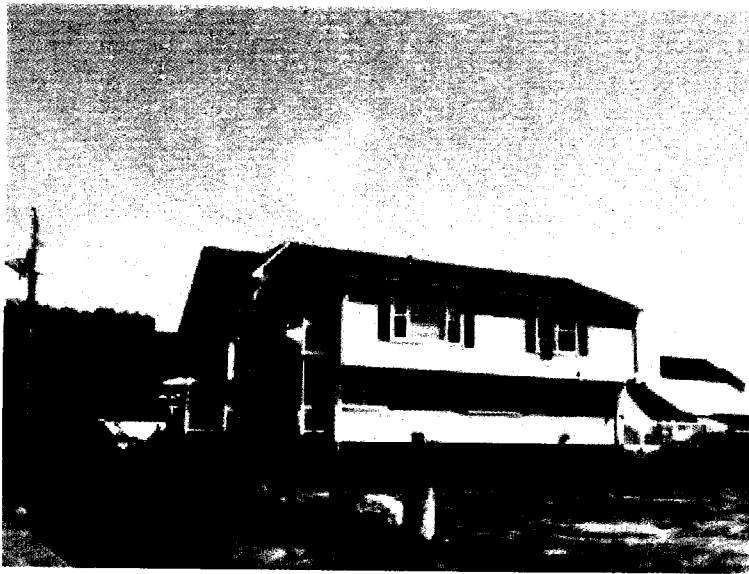
Page _____ of _____ pages



ATTACHMENT D
LEAD ANALYTICAL DATA

**LEAD BASED PAINT INSPECTION
REPORT OF FINDINGS
OF:**

**44 WASHINGTON PARKWAY
STRATFORD, CONNECTICUT**



DATE:
July 31, 2014

**PREPARED BY:
GILBERTCO LEAD INSPECTIONS LLC
287 MAIN STREET
ANSONIA, CONNECTICUT 06401**



GILBERTCO

LEAD INSPECTIONS, LLC

“LEAD BASED PAINT SPECIALIST”

July 31, 2014

Job 9928-14-44

Kevin Bogue, LEP, CHMM
Facility Support Services, LLC
2685 State Street
Hamden, Connecticut 06517

Re: Lead Based Paint Inspection: 44 Washington Parkway, Stratford, Connecticut

Gilbertco Lead Inspections LLC performed a limited XRF inspection for the presence of lead based paint at 44 Washington Parkway, Stratford, Connecticut. The inspection was requested by Facility Support Services in response to planned renovations to the site by State of Connecticut Department of Housing Community Block Grant Disaster Recovery Program.

The site inspected consists of a two story, single family home with a studio apartment. The home was in good repair and enjoys excellent housekeeping.

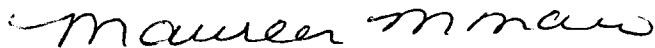
In accordance with HUD/EPA guidance issued June 26, 1996, the Scitec Map 4 Spectrum Analyzer was used in the “Unlimited” assaying mode. This enables the equipment to accurately determine whether the result is “Positive”, above the 1.0 mg/cm² action level or “Negative”, below the action level regardless of precision or operator bias. In accordance with the above guidance, values of 0.91 mg/cm² through 1.19 mg/cm² are considered “Inconclusive”, meaning the value level of lead in paint was so close to the 1.0 mg/cm² action level that further analysis by XRF would not result in a “Positive” or “Negative” answer. Only laboratory analysis of the paint film can determine actual values in this range. Chip sampling of inconclusive was not included in the scope of this report, therefore, any results above 0.9 mg/cm² are considered positive. Results are arranged floor plan style with the substrate and condition noted. Orientation of rooms places side ‘one’ as street side, with side ‘two’ to the left, side ‘three’ opposite, and wall ‘four’ to the right. Rooms were tested in a clockwise pattern.

In regards to the above mentioned property, *no lead based paint surfaces were identified*. A lead based paint hazard is “any condition that causes lead exposure to lead from lead-contaminated dust, lead contaminated soil, or lead-contaminated paint that is deteriorated or present in accessible surfaces, friction surfaces, or impact surfaces that would result in adverse human health effects...” (The Residential Lead Based Paint Hazard Reduction Act of 1992 – Title X).

Lead in dust was not included in the scope of this report. Only laboratory analysis can insure that no lead dust hazards remain after renovations or from everyday use of the home.

Although soil was not tested for lead, it can be presumed positive unless proven otherwise. Vegetable plants should not be planted near the perimeter of the house or in water runoff areas. Children should not be allowed to play in bare soil areas adjacent to the house. Asphalt, bushes, mulch, or good quality grass covering are acceptable deterrents. These deterrents are in place.

Please feel free to call if any questions arise,

A handwritten signature in cursive script that reads "Maureen Monaco".

Maureen Monaco

Director of Operations

Consultant Contractor #270

Lead Inspector Risk Assessor #1172

Lead Abatement Supervisor #2383

CERTIFICATION
LEAD IN PAINT RESULTS

AGENCY: GILBERTCO LEAD INSPECTIONS LLC
287 MAIN STREET
ANSONIA, CONNECTICUT 06401

PROJECT ADDRESS: 44 WASHINGTON PARKWAY
STRATFORD, CONNECTICUT

PROJECT NUMBER: 9928-14-44

TEST DATE: JULY 31, 2014

REQUIREMENTS: CHAPTER 7 HUD GUIDELINES
LEAD INSPECTION- SURFACE BY SURFACE

INSTRUMENTATION: SCITEC MAP4 PORTABLE X-RAY (BRUKER HANDHELD)
FLUOROSCOPE SPECTRUM ANALYZER
(XRF) COBALT 57 SOURCE

REPORT MEDIUM: MG PB/CM2 (MILLIGRAMS OF LEAD
PER SQUARE CENTIMETER)

CALIBRATION: TO MEASURE LEAD K-SHELL EMISSIONS.
FACTORY CALIBRATED WITH HUD APPROVED
REFERENCE STANDARDS. CALIBRATION FIELD
CHECKED HOURLY AS RECOMMENDED BY
MANUFACTURER

OPERATORS CERTIFICATION: LEAD CONSULTANT CONTRACTOR-CC270
LEAD INSPECTOR RISK ASSESSOR- IR 1172
LEAD ABATEMENT SUPERVISOR- 2383

I hereby certify to the best of my knowledge and capabilities that this report reflects the true lead content of the surfaces tested in this report on this date.

Maurer m m m *7/31/2014*

44 Washington Parkway, Stratford, Connecticut
July 31, 2014

Room Type	Room #	Wall #	Component	Substrate	Condition	K Shell	Decision
Calibration						1.24	Okay
Living Room	1	1	Door	Wood	Stain/varnish	-0.16	Negative
Living Room	1	1	Door Casing	Wood	Stain/varnish	-0.1	Negative
Living Room	1	1	Wall	Sheetrk	Intact	-0.34	Negative
Living Room	1	1	Radiator	Metal	Intact	0	Negative
Living Room	1	1	Window Sill	Wood	Stain/varnish	0.11	Negative
Living Room	1	1	Window Trim	Wood	Stain/varnish	-0.06	Negative
Living Room	1	1	Ceiling	Sheetrk	Intact	0.05	Negative
Living Room	1	4	Wall	Sheetrk	Intact	-0.08	Negative
Living Room	1	4	Window Sill	Wood	Stain/varnish	0.34	Negative
Living Room	1	4	Window Trim	Wood	Stain/varnish	-0.06	Negative
Living Room	1	2	Closet Door	Wood	Stain/varnish	0.83	Negative
Living Room	1	2	Clo Dr Csng	Wood	Stain/varnish	-0.2	Negative
Living Room	1	2	Wall	Sheetrk	Intact	0.12	Negative
Living Room	1	3	Wall	Sheetrk	Intact	0.22	Negative
Kitchen	2	1	Wall	Sheetrk	Intact	0.26	Negative
Kitchen	2	1	Ceiling	Sheetrk	Intact	0.31	Negative
Kitchen	2	2	Cabinet-upper	Wood	Intact	0.02	Negative
Kitchen	2	2	Cabinet-lower	Wood	Intact	-0.07	Negative
Kitchen	2	1	Radiator	Metal	Intact	-0.22	Negative
Kitchen	2	3	Wall	Wood	Intact	-0.23	Negative
Kitchen	2	3	Door Casing	Wood	Intact	-0.08	Negative
Kitchen	2	4	Cabinet	Wood	Intact	0.14	Negative
Kitchen	2	4	Cabinet	Wood	Intact	0	Negative
Kitchen	2	4	Cabinet	Wood	Intact	0.15	Negative
Rear Left BR	3	4	Door	Wood	Intact	-0.03	Negative
Rear Left BR	3	4	Door Casing	Wood	Stain/varnish	0.13	Negative
Rear Left BR	3	4	Wall	Sheetrk	Intact	-0.12	Negative
Rear Left BR	3	3	Wall	Sheetrk	Intact	0.03	Negative
Rear Left BR	3	3	Window Sill	Wood	Stain/varnish	-0.07	Negative
Rear Left BR	3	3	Window Trim	Wood	Stain/varnish	0.15	Negative
Rear Left BR	3	3	Window Apron	Wood	Stain/varnish	-0.11	Negative
Rear Left BR	3	3	Radiator	Metal	Intact	-0.09	Negative
Rear Left BR	3	2	Wall	Sheetrk	Intact	-0.09	Negative
Rear Left BR	3	2	Window Sill	Wood	Intact	-0.01	Negative
Rear Left BR	3	2	Window Trim	Wood	Stain/varnish	-0.07	Negative
Rear Left BR	3	2	Window Apron	Wood	Stain/varnish	-0.01	Negative
Rear Left BR	3	1	Wall	Sheetrk	Intact	-0.14	Negative
Rear Left BR	3	1	Door Casing	Wood	Stain/varnish	-0.02	Negative
Rear Left BR	3	1	Door	Wood	Stain/varnish	-0.44	Negative
Rear Left BR	3	1	Ceiling	Sheetrk	Intact	0.02	Negative

44 Washington Parkway, Stratford, Connecticut
July 31, 2014

Bathroom	4	3	Door	Wood	Stain/varnish	-0.34	Negative
Bathroom	4	3	Door Casing	Wood	Stain/varnish	0.23	Negative
Bathroom	4	1	Ceiling	Sheetrk	Intact	-0.36	Negative
Bathroom	4	2	Wall	Sheetrk	Intact	0.07	Negative
Bathroom	4	4	Cabinet	Wood	Intact	-0.51	Negative
Bathroom	4	1	Clo Dr Csng	Wood	Intact	-0.16	Negative
Bathroom	4	1	Wall	Sheetrk	Intact	0.25	Negative
Bathroom	4	1	Ceiling	Sheetrk	Intact	0.45	Negative
Bathroom	4	2	Window Sill	Wood	Intact	-0.08	Negative
Bathroom	4	2	Window Trim	Wood	Intact	-0.07	Negative
Bathroom	4	2	Window Apron	Wood	Intact	0.12	Negative
Bathroom	4	2	Radiator	Metal	Intact	0.24	Negative
2nd Fl MBR	5	2	Wall	Sheetrk	Intact	0.07	Negative
2nd Fl MBR	5	1	Window Trim	Wood	Intact	-0.33	Negative
2nd Fl MBR	5	1	Threshold	Wood	Intact	0.3	Negative
2nd Fl MBR	5	4	Wall	Sheetrk	Intact	-0.16	Negative
2nd Fl MBR	5	4	Window Sill	Wood	Stain/varnish	0.11	Negative
2nd Fl MBR	5	4	Widnwo Trim	Wood	Stain/varnish	0.1	Negative
2nd Fl MBR	5	4	Radiator	Metal	Intact	0.07	Negative
2nd Fl MBR	5	1	Ceiling	Sheetrk	Intact	-0.3	Negative
2nd Fl MBR	5	2	Wall	Sheetrk	Intact	0.4	Negative
2nd Fl MBR	5	2	Door Casing	Wood	Stain/varnish	-0.03	Negative
2nd Fl MBR	5	2	Door Jamb	Wood	Stain/varnish	0.18	Negative
2nd Fl MBR	5	2	Door	Metal	Stain/varnish	0.47	Negative
2nd Fl MBR	5	3	Wall	Sheetrk	Intact	0.04	Negative
2nd Fl Left Front BR	6	4	Wall	Sheetrk	Intact	-0.11	Negative
2nd Fl Left Front BR	6	1	Door Casing	Wood	Stain/varnish	0.17	Negative
2nd Fl Left Front BR	6	1	Wall (bath)	Sheetrk	Intact	0.02	Negative
2nd Fl Left Front BR	6	1	Ceiling	Sheetrk	Intact	-0.1	Negative
2nd Fl Left Front BR	6	1	Door Jamb	Wood	Stain/varnish	-0.09	Negative
2nd Fl Left Front BR	6	3	Wall	Sheetrk	Intact	-0.34	Negative
2nd Fl Left Front BR	6	3	Baseboard	Wood	Stain/varnish	-0.06	Negative
2nd Fl Left Front BR	6	2	Wall	Sheetrk	Intact	0.26	Negative
2nd Fl Left Front BR	6	2	Window Trim	Wood	Stain/varnish	0.07	Negative
2nd Fl Left Front BR	6	2	Window Sill	Wood	Stain/varnish	-0.17	Negative
2nd Fl Left Front BR	6	2	Radiator	Metal	Intact	0.01	Negative
2nd Fl Left Front BR	6	3	Door	Wood	Stain/varnish	-0.06	Negative
2nd Fl Left Front BR	6	3	Clo Dr Csng	Wood	Stain/varnish	-0.05	Negative
2nd Fl Left Front BR	6	3	Shelf	Wood	Intact	0.05	Negative
2nd Fl Bath	7	2	Door	Wood	Stain/varnish	-0.02	Negative
2nd Fl Bath	7	2	Door Casing	Wood	Stain/varnish	0.01	Negative
2nd Fl Bath	7	2	Wall	Sheetrk	Intact	-0.23	Negative
2nd Fl Bath	7	3	Wall	Sheetrk	Intact	0.17	Negative
2nd Fl Bath	7	3	Radiator	Metal	Intact	0.31	Negative

44 Washington Parkway, Stratford, Connecticut
July 31, 2014

2nd Fl Bath	7	4	Cabinet	Wood	Stain/varnish	-0.07	Negative
2nd Fl Bath	7	4	Wall	Sheetrk	Intact	-0.01	Negative
2nd Fl Bath	7	1	Wall	Sheetrk	Intact	0	Negative
2nd Fl Bath	7	1	Ceiling	Sheetrk	Intact	0.06	Negative
2nd Fl Rear BR	8	1	Wall	Sheetrk	Intact	0.09	Negative
2nd Fl Rear BR	8	4	Wall	Sheetrk	Intact	0	Negative
2nd Fl Rear BR	8	4	Baseboard	Wood	Stain/varnish	0.06	Negative
2nd Fl Rear BR	8	3	Wall	Sheetrk	Intact	0.17	Negative
2nd Fl Rear BR	8	3	Window Trim	Wood	Stain/varnish	-0.05	Negative
2nd Fl Rear BR	8	3	Wall	Sheetrk	Intact	-0.25	Negative
2nd Fl Rear BR	8	2	Wall	Sheetrk	Intact	-0.06	Negative
2nd Fl Rear BR	8	2	Window Trim	Wood	Stain/varnish	0.22	Negative
2nd Fl Rear BR	8	2	Window Sill	Wood	Stain/varnish	-0.05	Negative
2nd Fl Rear BR	8	2	Radiator	Metal	Intact	0.03	Negative
2nd Fl Rear BR	8	2	Closet Door	Wood	Stain/varnish	0.06	Negative
2nd Fl Rear BR	8	2	Clo Dr Csng	Wood	Stain/varnish	-0.17	Negative
2nd Fl Rear BR	8	2	Shelf	Wood	Stain/varnish	-0.25	Negative
2nd Fl Rear BR	8	2	Shelf Support	Wood	Stain/varnish	0.05	Negative
2nd Fl Rear BR	8	1	Ceiling	Sheetrk	Intact	0.4	Negative
Exterior	9	1	Door	Wood	Intact	0.13	Negative
Exterior	9	1	Door Jamb	Wood	Intact	0.35	Negative
Exterior	9	1	Kick plate	Wood	Intact	-0.04	Negative
Exterior	9	1	Porch Floor	Wood	Non-intact	-0.08	Negative
Exterior	9	3	Post/column	Wood	Intact	0.13	Negative
Exterior	9	1	Stair Tread	Wood	Non-intact	-0.04	Negative
Exterior	9	1	Stair Riser	Wood	Intact	0.01	Negative
Exterior	9	1	Wall	Masonry	Non-intact	0.07	Negative
Exterior	9	1	Stair Stringer	Wood	Intact	0.39	Negative
Exterior	9	1	Lattice	Wood	Intact	-0.15	Negative
Exterior	9	1	Lower trim	Wood	Intact	-0.21	Negative
Exterior	9	3	Porch Floor	Masonry	Non-intact	-0.8	Negative
Exterior	9	3	Stair Riser	Masonry	Intact	-0.18	Negative
Exterior	9	3	Wall	Masonry	Intact	-0.77	Negative
Exterior	9	3	Sidng	Other	Intact	-0.21	Negative
Exterior	9	2	Wall	Masonry	Non-intact	-0.42	Negative
Exterior	9	2	Siding	Other	Intact	0.03	Negative
Exterior	9	2	Door Casing	Wood	Non-intact	0.25	Negative
Exterior	9	2	Door Casing	Wood	Non-intact	0.37	Negative
Exterior	9	2	Trap Door	Wood	Intact	0.15	Negative
Exterior	9		Screw Jack	Metal	Non-intact	0.86	Negative
Exterior	9		Screw Jack	Metal	Non-intact	0.84	Negative
Exterior	9		Screw Jack	Metal	Non-intact	0.62	Negative
Exterior	9	2	Door Casing	Wood	Non-intact	0.05	Negative
Exterior	9	4	Wall	Masonry	Non-intact	0.56	Negative
Exterior	9	4	Siding	Other	Intact	-0.23	Negative

44 Washington Parkway, Stratford, Connecticut
July 31, 2014

Exterior	9	4	Siding	Other	Intact	-0.26	Negative
Exterior	9	4	Window Trim	Metal	Non-intact	0.58	Negative
2nd Fl apt	10	3	Wall	Sheetrk	Intact	0.01	Negative
2nd Fl apt	10	3	Baseboard	Wood	Intact	0.15	Negative
2nd Fl apt	10	2	Wall	Sheetrk	Intact	0.23	Negative
2nd Fl apt	10	2	Baseboard	Wood	Stain/varnish	0.03	Negative
2nd Fl apt	10	1	Wall	Sheetrk	Intact	0.13	Negative
2nd Fl apt	10	1	Door Casing	Wood	Stain/varnish	-0.06	Negative
2nd Fl apt	10	1	Baseboard	Wood	Stain/varnish	0.19	Negative
2nd Fl apt	10	1	Ceiling	Sheetrk	Intact	0.1	Negative
2nd Fl apt	10	4	Wall	Sheetrk	Intact	-0.37	Negative
2nd Fl apt	10	4	Window Sill	Wood	Stain/varnish	0.31	Negative
2nd Fl apt	10	4	Window Trim	Wood	Stain/varnish	0.03	Negative
2nd Fl apt	10	4	Radiator	Metal	Intact	0.16	Negative
2nd Fl Apt Bath	11	3	Door	Wood	Stain/varnish	0.14	Negative
2nd Fl Apt Bath	11	3	Door Jamb	Wood	Stain/varnish	-0.12	Negative
2nd Fl Apt Bath	11	3	Door Casing	Wood	Stain/varnish	-0.12	Negative
2nd Fl Apt Bath	11	3	Wall	Sheetrk	Intact	0.22	Negative
2nd Fl Apt Bath	11	3	Window Sill	Wood	Stain/varnish	0.03	Negative
2nd Fl Apt Bath	11	4	Wall	Sheetrk	Intact	-0.15	Negative
2nd Fl Apt Bath	11	4	Radiator	Metal	Intact	0.3	Negative
2nd Fl Apt Bath	11	1	Wall	Sheetrk	Intact	0.24	Negative
2nd Fl Apt Bath	11	2	Wall	Sheetrk	Intact	0	Negative
2nd Fl Apt Bath	11	1	Ceiling	Sheetrk	Intact	-0.29	Negative
2nd Fl Apt Bath	11	1	Ceiling Trim	Wood	Intact	-0.11	Negative

ATTACHMENT E
PCB ANALYTICAL DATA



Client: Mr. Kevin Bogue
Facility Support Services
2685 State Street
Hamden, CT 06517

Analytical Report

CET# 4080050

Report Date: August 05, 2014
Project: 22214-2065
Project Number: 44 Washington

Connecticut Laboratory Certificate: PH 0116
Massachusetts laboratory Certificate.: M-CT903



New York Certification: 11982
Rhode Island Certification: 199

CET #:4080050

Project: 22214-2065

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SAMPLE SUMMARY

The sample(s) were received at 4.2°C.

This report contains analytical data associated with following samples only.

Sample ID	Laboratory ID	Matrix	Collection Date/Time	Receipt Date

20140731-22214-2065-P1	4080050-01	Solid	7/31/2014 0:00	08/01/2014

Client Sample ID 20140731-22214-2065-P1

Lab ID: 4080050-01

PCBs by Soxhlet

Method: EPA 8082A

Analyst: SJ

Matrix: Solid

Analyte	Result (mg/kg (As Rec))	RL (mg/kg (As Rec))	Dilution	Prep Method	Batch	Prepared	Date/Time Analyzed	Notes
PCB-1016	ND	0.50	2.5	EPA 3540C	B4H0126	08/01/2014	08/03/2014 21:59	
PCB-1221	ND	0.50	2.5	EPA 3540C	B4H0126	08/01/2014	08/03/2014 21:59	
PCB-1232	ND	0.50	2.5	EPA 3540C	B4H0126	08/01/2014	08/03/2014 21:59	
PCB-1242	1.5	0.50	2.5	EPA 3540C	B4H0126	08/01/2014	08/03/2014 21:59	
PCB-1248	1.8	0.50	2.5	EPA 3540C	B4H0126	08/01/2014	08/03/2014 21:59	
PCB-1254	2.8	0.50	2.5	EPA 3540C	B4H0126	08/01/2014	08/03/2014 21:59	
PCB-1260	ND	0.50	2.5	EPA 3540C	B4H0126	08/01/2014	08/03/2014 21:59	
PCB-1268	ND	0.50	2.5	EPA 3540C	B4H0126	08/01/2014	08/03/2014 21:59	
PCB-1262	ND	0.50	2.5	EPA 3540C	B4H0126	08/01/2014	08/03/2014 21:59	
<i>Surrogate: TCMX</i>	<i>89.8 %</i>	<i>50 - 150</i>			B4H0126	08/01/2014	<i>08/03/2014 21:59</i>	
<i>Surrogate: DCB</i>	<i>102 %</i>	<i>50 - 150</i>			B4H0126	08/01/2014	<i>08/03/2014 21:59</i>	

CET #:4080050

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QUALITY CONTROL SECTION**Batch B4H0126 - EPA 8082A**

Analyte	Result (mg/kg (As Rec))	RL (mg/kg (As Rec))	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Blank (B4H0126-BLK1)					Prepared: 8/1/2014 Analyzed: 8/3/2014				
PCB-1016	ND	0.20							
PCB-1221	ND	0.20							
PCB-1232	ND	0.20							
PCB-1242	ND	0.20							
PCB-1248	ND	0.20							
PCB-1254	ND	0.20							
PCB-1260	ND	0.20							
PCB-1268	ND	0.20							
PCB-1262	ND	0.20							
<i>Surrogate: TCMX</i>					83.3	50 - 150			
<i>Surrogate: DCB</i>					115	50 - 150			
LCS (B4H0126-BS1)					Prepared: 8/1/2014 Analyzed: 8/3/2014				
PCB-1016	0.830	0.20	1.000		83.0	50 - 150			
PCB-1260	0.929	0.20	1.000		92.9	50 - 150			
<i>Surrogate: TCMX</i>					83.6	50 - 150			
<i>Surrogate: DCB</i>					113	50 - 150			
Calibration Check (B4H0126-CCV1)					Prepared: 8/1/2014 Analyzed: 8/3/2014				
PCB-1016	1.08	0.20	1.000		108	80 - 120			
PCB-1260	0.998	0.20	1.000		99.8	80 - 120			
<i>Surrogate: TCMX</i>					104	50 - 150			
<i>Surrogate: DCB</i>					95.0	50 - 150			



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Quality Control Definitions and Abbreviations

Internal Standard (IS)	An Analyte added to each sample or sample extract. An internal standard is used to monitor retention time, calculate relative response, and quantify analytes of interest.
Surrogate Recovery	The % recovery for non-tarar organic compounds that are spiked into all samples. Used to determine method performance.
Continuing Calibration Batch	An analytical standard analyzed with each set of samples to verify initial calibration of the system. Samples that are analyzed together with the same method, sequence and lot of reagents within the same time period.
ND	Not detected
RL	Reporting Limit
Dilution	Multiplier added to detection levels (MDL) and/or sample results due to interferences and/or high concentration of target compounds.
Duplicate Result	Result from the duplicate analysis of a sample. Amount of analyte found in a sample.
Spike Level	Amount of analyte added to a sample
Matrix Spike Result	Amount of analyte found including amount that was spiked.
Matrix Spike Dup	Amount of analyte foun in duplicate spikes including amount that was spike.
Matrix Spike % Recovery	% Recovery of spiked amount in sample.
Matrix Spike Dup % Recovery	% Recovery of spiked duplicate amount in sample.
RPD	Relative percent difference between Matrix Spike and Matrix Spike Duplicate.
Blank	Method Blank that has been taken through all steps of the analysis.
LCS % Recovery	Laboratory Control Sample percent recovery. The amount of analyte recovered from a fortified sample.
Recovery Limits	A range within which specified measurements results must fall to be compliant.
CC	Calibration Verification

Flags:

- H- Recovery is above the control limits
- L- Recovery is below the control limits
- B- Compound detected in the Blank
- P- RPD of dual column results exceeds 40%
- #- Sample result too high for accurate spike recovery.



Connecticut Laboratory Certification PH0116
Massachussets Laboratory Certification M-CT903
Rhode Island Certification 199

New York Certification 11982
Florida Laboratory Certification E871064

Questions related to this report should be directed to David Ditta, Timothy Fusco, or Robert Blake at 203-377-9984.

Sincerely,



David Ditta
Laboratory Director

Report Comments:

ND is None Detected at the specified detection limit

All analyses were performed in house unless a Reference Laboratory is listed.

Samples will be disposed of 30 days after the report date.

Sample Result Flags:

E- The result is estimated, above the calibration range.

H- The surrogate recovery is above the control limits.

L- The surrogate recovery is below the control limits.

B- The compound was detected in the laboratory blank.

P- The Relative Percent Difference (RPD) of dual column analyses exceeds 40%.

D- The RPD between the sample and the sample duplicate is high. Sample Homogeneity may be a problem.

+ - The Surrogate was diluted out.

*- The analyte has a QC outlier. Please refer to QC section of the report for details.

All results met standard operating procedures unless indicated by a data qualifier next to a sample result, or a narration in the QC report.

Complete Environmental Testing is only responsible for the certified testing and is not directly responsible for the integrity of the sample before laboratory receipt.



CUSTODY RECORD

95

REV. 12/11

SECTION 011000

SUMMARY OF WORK

General Conditions

The following provisions are intended to supplement and complement each other and shall, where possible, be thus interpreted. If, however, any provision of the Project Documents irreconcilably conflicts with one or more of the following provisions, the provision imposing the greater duty or obligation on the Contractor shall govern. Where referenced in this document MCA be defined as Martinez, Couch & Associates, LLC.

1. Contractor shall supply all materials (except where indicated), labor, tools, equipment, and supplies required to complete the total Project in accordance with the drawings, specifications and other Contract Documents. Prior to beginning Work, Contractor shall list any deficiencies in scope and report to the DOH.
2. Contractor shall provide all coordination of all Work with Owner, Owner Vendors, DOH, DOH Agencies as required for project completion.
3. Contractor will develop a comprehensive logistics plan for all activities that affect the Owner.
4. Contractor is responsible on a daily basis to submit a Daily Construction Report (DCR) indicating subcontractors, total number of people working, description of Work completed that day, total hours worked that day, and any major deliveries.
5. Contractor shall secure and pay for a dumpster for all refuse and waste material. The dumpster location will be determined by the property Owner.
6. If required for the Project (as reasonably determined by Owner) Contractor shall erect and maintain dust-barriers to separate living areas from areas of construction.
7. In the event of a required utility shutdown, Contractor will diligently schedule work with the Owner. Contractor will give the Owner Project Manager at least three (3) days advance notice of any proposed utility shutdown.
8. Contractor shall comply with all of the legal regulations, including, but not limited to, OSHA safety regulations and regulations of municipal, city, local, and other government agencies having jurisdiction concerning the Work. Contractor shall give all notices and comply with all laws, ordinances, codes, rules and regulations bearing on the conduct of the Work. If Contractor performs any Work that is contrary to such laws, ordinances, codes, rules, and regulations, it shall make all changes to comply therewith and bear all costs arising therefrom.
9. All permits, required for any part of Contractor's Work, including those to be obtained in the Owner's name, shall be procured and paid for by Contractor.

GENERAL SCOPE

1. Inspect all areas, including those not affected by the repair scope, for damage to the finishes, fixtures, appliances, furnishings, etc. Document and report any and all damage to Owner for acceptance, and to DOH for notice, prior to commencing work.
2. Furnish and install any temporary supports or bracing as required to properly complete the work.
3. Provide all floor preparation as required including any flashing, skimming, or patching to provide for a suitable substrate for flooring work.
4. Contractor is responsible to detach and reset any items to properly perform all work, including but not limited to: trim, hardware, fixtures, door slabs, electrical components, mechanical components, etc.

PROJECT SCOPE

Prepare for initiate, elevate an existing residential structure sufficient to construct a new foundation with 5,000 Psi concrete and epoxy coated rebar, founded on helical piles. Lower home onto new foundation and remove lifting equipment, and provide all utility coordination and connection, and the construction of new access stairs from all existing means of egress. Contractor is responsible for obtaining and all costs associated with required permits from authorities having jurisdiction. All disturbed surfaces are to be restored to property owners satisfaction. All work to be performed in accordance with contract drawings, specifications, and applicable codes. Contractor is expected to complete their own due diligence during the bid process. Any need for clarification shall be presented to MCA for resolution prior to bid submission. Bid submission is statement of understanding work required for successful completion at the stipulated fee.

SECTION 012100

ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Testing and inspecting allowances.
- C. Related Requirements:
 - 1. Section 014000 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise MCA of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by MCA from the designated supplier.

1.4 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by MCA under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials selected by MCA under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by MCA, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 TESTING AND INSPECTING ALLOWANCES

- A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.
- B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.
- C. Costs of services not required by the Contract Documents are not included in the allowance.
- D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.9 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
 - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
 - 3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
 - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
 - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
 - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1:

1. Anticipated costs and charges originating from utility companies for coordination with, connection, all costs of work from the face of the building to the provided utility
- B. Allowance No.2:
 1. Testing and Material Inspections.
- C. Allowance No. 3:
 1. Restoration of Turfs and Grasses, Plants, Pavements, and other surface improvements disturbed by construction activities.

END OF SECTION 012100

SECTION 012200

UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Section 014000 "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Unit Price 1: Removal of unsatisfactory soil and replacement with satisfactory soil material.

1. Description: Unsatisfactory soil excavation and disposal off site and replacement with satisfactory fill material or engineered fill from off site, as required, according to Section 312000 "Earth Moving."
2. Unit of Measurement: Cubic yard (Cubic meter) of soil excavated, based on survey of volume removed.

B. Unit Price No. 2: Rock excavation and replacement with satisfactory soil material.

1. Description: Classified rock excavation and disposal off site and replacement with satisfactory fill material or engineered fill from off site, as required, according to Section 312000 "Earth Moving."
2. Unit of Measurement: Cubic yard (Cubic meter) of rock excavated, based on survey of volume removed.

END OF SECTION 012200

SECTION 012500

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for products selected under an allowance.
 - 2. Section 012300 "Alternates" for products selected under an alternate.
 - 3. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

- a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of MCA's and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. MCA's Action: If necessary, MCA will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. MCA will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Change Order, Construction Change Directive, or MCA's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if MCA does not issue a decision on use of a proposed substitution within time allocated.

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: MCA will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, MCA will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution provides sustainable design characteristics that specified product provided.
 - c. Substitution request is fully documented and properly submitted.
 - d. Requested substitution will not adversely affect Contractor's construction schedule.
 - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - f. Requested substitution is compatible with other portions of the Work.
 - g. Requested substitution has been coordinated with other portions of the Work.
 - h. Requested substitution provides specified warranty.
 - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: MCA will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of MCA.
 - 1. Conditions: MCA will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, MCA will return requests without action, except to record noncompliance with these requirements:

- a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to MCA for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
- b. Requested substitution does not require extensive revisions to the Contract Documents.
- c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- d. Substitution request is fully documented and properly submitted.
- e. Requested substitution will not adversely affect Contractor's construction schedule.
- f. Requested substitution has received necessary approvals of authorities having jurisdiction.
- g. Requested substitution is compatible with other portions of the Work.
- h. Requested substitution has been coordinated with other portions of the Work.
- i. Requested substitution provides specified warranty.
- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012900 –
PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to MCA at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
 4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
 5. Subschedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide subschedules showing values coordinated with the scope of each design services contract as described in Section 011000 "Summary."
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of AIA Document G703 or EJCDC Document C-620 Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
 3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 - a. Include separate line items under principal subcontracts for project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
 4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
8. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
9. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
10. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by MCA.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: Submit Application for Payment to MCA by the 7th day of the month. The period covered by each Application for Payment is one month in accordance with Section 2 of the general conditions section of this document.
 1. Submit draft copy of Application for Payment 10 days prior to due date for review by Architect.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application for Payment Forms: Use forms acceptable to MCA and Owner for Applications for Payment. Submit forms for approval with initial submittal of schedule of values.

- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. MCA will return incomplete applications without action.
1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- G. Transmittal: Submit three signed and notarized original copies of each Application for Payment to MCA by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to MCA.

- I. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to MCA.
- J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 1. List of subcontractors.
 2. Schedule of values.
 3. LEED submittal for project materials cost data.
 4. Contractor's construction schedule (preliminary if not final).
 5. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
 6. Products list (preliminary if not final).
 7. LEED action plans.
 8. Schedule of unit prices.
 9. Submittal schedule (preliminary if not final).
 10. List of Contractor's staff assignments.
 11. List of Contractor's principal consultants.
 12. Copies of building permits.
 13. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 14. Initial progress report.
 15. Report of preconstruction conference.
 16. Certificates of insurance and insurance policies.
 17. Performance and payment bonds.
 18. Data needed to acquire Owner's insurance.
- K. Application for Payment at Substantial Completion: After MCA issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

L. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 01 31 00 –

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.

2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of subcontractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
 - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - f. Indicate required installation sequences.
 - g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to MCA indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.

3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
 4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
 6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
 8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
 9. Review: MCA will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If MCA determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, MCA will so inform Contractor, who shall make changes as directed and resubmit.
 10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."
- C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
 2. File Preparation Format: DWG, Version 2013, operating in Microsoft Windows operating system.
 3. File Submittal Format: Submit or post coordination drawing files using format same as file preparation format and Portable Data File (PDF) format.

4. MCA will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
 - a. MCA makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
 - b. Digital Data Software Program: Drawings are available in AutoCAD 2013.
 - c. Contractor shall execute a data licensing agreement in the form of AIA Document C106 or other Agreement form acceptable to MCA.

1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. MCA will return RFIs submitted to MCA by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Contract
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: AIA Document G716 or Software-generated form with substantially the same content as indicated above, acceptable to MCA.
 1. Attachments shall be electronic files in Adobe Acrobat PDF format.

- D. MCA's Action: MCA will review each RFI, determine action required, and respond. Allow seven working days for MCA's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of MCA's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. MCA's action may include a request for additional information, in which case MCA's time for response will date from time of receipt of additional information.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly Use CSI Log Form 13.2B. Include the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of MCA.
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date MCA's response was received.
- F. On receipt of MCA's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify MCA within seven days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

1.8 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and MCA of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including MCA, within three days of the meeting.

- B. Preconstruction Conference: MCA will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and MCA, but no later than 10 days after a notice to proceed.
1. Conduct the conference to review responsibilities and personnel assignments.
 2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, MCA, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Preparation of record documents.
 - m. Use of the premises and existing building.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for moisture and mold control.
 - s. Procedures for disruptions and shutdowns.
 - t. Construction waste management and recycling.
 - u. Parking availability.
 - v. Office, work, and storage areas.
 - w. Equipment deliveries and priorities.
 - x. First aid.
 - y. Security.
 - z. Progress cleaning.
 4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and MCA, but no later than 90 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.

2. Attendees: Authorized representatives of Owner, MCA and its consultants, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for delivery of material samples, attic stock, and spare parts.
 - f. Requirements for demonstration and training.
 - g. Preparation of Contractor's punch list.
 - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - i. Submittal procedures.
 - j. Coordination of separate contracts.
 - k. Owner's partial occupancy requirements.
 - l. Installation of Owner's furniture, fixtures, and equipment.
 - m. Responsibility for removing temporary facilities and controls.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- D. Progress Meetings: Conduct progress meetings at biweekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and MCA and its consultants, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.

- 2) Sequence of operations.
 - 3) Deliveries.
 - 4) Off-site fabrication.
 - 5) Access.
 - 6) Site utilization.
 - 7) Temporary facilities and controls.
 - 8) Progress cleaning.
 - 9) Quality and work standards.
 - 10) Status of correction of deficient items.
 - 11) Field observations.
 - 12) Status of RFIs.
 - 13) Status of proposal requests.
 - 14) Pending changes.
 - 15) Status of Change Orders.
 - 16) Pending claims and disputes.
 - 17) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 - RELATED DOCUMENTS

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

1.2 - SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 000115 "List of Drawings Sheets"

1.3 - DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Martinez Couch & Associates LLC (MCA) is the Project Manager and for this project. MCA will provide technical consultation, review of all materials, and project management. All references in this specification and in all other specifications references, MCA is Martinez Couch & Associates.
 - 1. All submittals shall be mailed to:
Martinez Couch & Associates
1084 Cromwell Avenue
Rocky Hill, CT 06067

Phone Number: (860) 436-4364

Fax Number: (860) 436-4626

- E. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

All submittals shall be submitted in PDF via electronic mail (email) to

1. recouch@martinezcouch.com
2. mranando@martinezcouch.com

1.4 - ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by MCA and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 10 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 4. Format: Arrange the following information in a tabular format:
 - a. Add information, such as scheduled dates for purchasing and installation and the activity or event number, if using a CPM construction schedule.
 - b. Scheduled date for first submittal.
 - c. Specification Section number and title.
 - d. Submittal category: Action; informational.
 - e. Name of subcontractor.
 - f. Description of the Work covered.
 - g. Scheduled date for MCA final release or approval.
 - h. Scheduled date of fabrication.
 - i. Retain three subparagraphs below if CPM construction schedules are required.
 - j. Scheduled dates for purchasing.
 - k. Scheduled dates for installation.
 - l. Activity or event number.

1.5 - SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. MCA's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Engineer for Contractor's use in preparing submittals.
- a. Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Engineer and to Engineer's consultants, allow 15 days for review of each submittal. Submittal will be returned to Engineer before being returned to Contractor.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.

- d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of subcontractor.
 - g. Name of supplier.
 - h. Name of manufacturer.
 - i. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Other necessary identification.
4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will discard submittals received from sources other than Contractor.
- a. Transmittal Form for Paper Submittals: Use AIA Document G810.
 - b. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
 - 1) Project name.
 - 2) Date.
 - 3) Destination (To:).
 - 4) Source (From:).
 - 5) Name and address of Engineer.
 - 6) Name of Contractor.
 - 7) Name of firm or entity that prepared submittal.
 - 8) Names of subcontractor, manufacturer, and supplier.
 - 9) Category and type of submittal.
 - 10) Submittal purpose and description.
 - 11) Specification Section number and title.
 - 12) Specification paragraph number or drawing designation and generic name for each of multiple items.
 - 13) Drawing number and detail references, as appropriate.
 - 14) Indication of full or partial submittal.
 - 15) Transmittal number numbered consecutively.
 - 16) Submittal and transmittal distribution record.
 - 17) Remarks.
 - 18) Signature of transmitter.

E. Options: Identify options requiring selection by Engineer.

F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than

those requested by Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer action stamp.

PART 2 - PRODUCTS

2.1 - SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. MCA will return two copies.
 - 2. Informational Submittals: Submit paper copies of each submittal unless otherwise indicated. Engineer will not return copies.
 - 3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.

- f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 - 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 - 5. Submit Product Data before or concurrent with Samples.
 - 6. Submit Product Data in the following format:
 - a. Three paper copies of Product Data unless otherwise indicated. Engineer will return two copies.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal based on Engineer's digital data drawing files is otherwise permitted.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 - 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm)
 - 3. Retain subparagraph below unless default submittal format specified elsewhere in this article applies.
 - 4. Submit Shop Drawings in the following format:
 - a. Three opaque copies of each submittal. Engineer will retain two copies; remainder will be returned.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line to Engineer. Engineer will provide sample to property owner for their use to select option to be used.
 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line to Engineer. Engineer will provide sample to property owner for their use to select option to be used.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule in the following format:
 - a. Three paper copies of product schedule or list unless otherwise indicated. Engineer will return two copies.
- F. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Engineers and owners, and other information specified.
- G. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

- H. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- I. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- J. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- K. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- L. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- M. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- N. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- O. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- P. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

2.2 – DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 - CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 - ENGINEER'S ACTION

- A. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
 - 1. Action Code 1 - No Exceptions Taken
 - 2. Action Code 2 - Correct as Noted
 - 3. Action Code 3 - Revise and Resubmit
 - 4. Action Code 4 - Rejected
- B. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

The State of Connecticut Department of Housing
Community Development Block Grant
Disaster Recovery Program (CDBG-DR)
Owner Occupied Rehabilitation and Rebuilding Program

Bid Documents
Project# 2065
44 Washington Parkway
Stratford, CT

- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Engineer.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Engineer without action.

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.
- C. The contractor shall bear sole responsibility for the costs of complying with quality requirements Section 01 40 00.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Architect: Where referenced in this section, Architect is defined as MCA
- C. MCA: Where referenced in this section, MCA is defined as Martinez Couch and Associates, LLC.

- D. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by MCA or Construction Manager.
- E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- G. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- K. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to the Construction Manager for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to MCA for a decision before proceeding.

1.5 ACTION SUBMITTALS

1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data : For Contractor's quality-control personnel.
- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system.
 - 2. Main wind-force-resisting system.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 15 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect and MCA. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent.

- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated in paragraph 1.11 of this section
 - 3. Verification of architectural features by the Architect.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.

- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.9 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to MCA, the Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

- F. Testing Agency Responsibilities: Cooperate with MCA, the Architect, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify MCA, the Architect, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services as required by Martinez Couch and Associates, LLC, the Construction Manager Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Martinez Couch and Associates, LLC the Construction Manager, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:
1. Cast in Place Concrete –
 - a. Mix Design – Inspector Certification shall be ACI-CCT or ICC-RCSI. Inspector scope shall review concrete batch tickets and verify compliance with approved mix design. Verification that water added at the site does not exceed that allowed by mix design.
 - b. Reinforcement Installation – Inspector certification shall be ACI-CCI or ICC-RCSI. Inspection scope shall include size, spacing, cover, positioning and grade of reinforcing steel. Verification that reinforcing bars are free from deleterious materials, adequate bar ties, chair supports or bolsters, bar laps, and mechanical splices shall be included in inspection scope.
 - c. Welding of Reinforcing – Inspector certification shall be AWS-CWI. Inspection scope shall include visual inspection of all reinforcing steel welds, verification of weldability of reinforcing steel, and preheating of steel when required.
 - d. Concrete Placement – Inspector certification shall be ACI-CCI or ICC-RCSI. Inspection scope shall include the verification of concrete conveyance and depositing avoids segregation or contamination, proper consolidation, and placement of concrete
 - e. Sampling and Testing of Concrete – Inspector certification shall be ACI-CFTT, ACI-STT to sample;
 - 1) Concrete Compressive Strength, ASTM C31 & C39
 - 2) Concrete Slump, ASTM C143
 - 3) Concrete Air Content, ASTM C231 or ASTM C173
 - 4) Temperature, ASTM C1064
 - f. Curing and Protection – Inspector Certification shall be ACI-CCI or ICC-RCSI. Inspection scope shall verify cold weather protection and hot weather protection procedures as necessary.
 2. Structural Steel –
 - a. Material Certification – Inspector Certification shall be AWS/AISC-SSI or ICC-SWSI. Inspection scope shall include review certified mill test reports and identification marking on wide flange shapes, high strength bolts, nuts and welding electrodes.
 - b. Bolting – Inspector certification shall be AWS/AISC-SSI or ICC-SWSI. Inspection scope shall include installation and tightening of high strength bolts and verification of proper tightening sequence.
 - c. Welding – Inspector certification shall be AWS-CWI or ASNT. Inspection scope shall include visual inspection of all welds, surface preparation between passes, and verification of size and length of fillet welds.
 3. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
 4. Notifying MCA and the Architect, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 5. Submitting a certified written report of each test, inspection, and similar quality-control service to MCA and the Architect, with copy to Contractor and to authorities having jurisdiction.

6. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
7. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
8. Retesting and reinspecting corrected work.
9. Where appropriate a Professional Engineer, P.E., designated by MCA or the Architect shall be allowed to inspect structural steel and cast in place concrete work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to MCA.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for the Construction Manager's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. General: During the construction period various types of services are necessary to record or support the construction process, which are not an integral part of the final construction. Provide temporary facilities and controls in accordance with the Contract Documents.
- B. Scope of Work includes but is not limited to:
 - a) Layout and measurements.
 - b) Staging areas.
 - c) Rubbish removal.
 - d) Safety, protection and security.
 - e) Temporary toilets.
 - f) Water Service
 - g) Temporary scaffolding, ladders, stairs, hoists, etc.
 - h) Site fence.
 - i) Temporary closures
 - j) Labor disputes
 - k) Temporary light and power
 - l) Temporary heat
 - m) Ventilation and Humidity Control

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Ladders, scaffolds, planks, hoists and similar items required for a specific item of work shall be part of that Scope of Work

1.3 QUALITY ASSURANCE

- A. Codes: Comply with applicable Building Code and Standards.
- B. Standards: Comply with the State and Local Board of Health, Environmental Protection Agency, Fire Department and other applicable standards.

- C. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- D. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.4 SUBMITTALS

- A. Refer to Section 01330 or certain individual items of this section.

1.5 PRODUCT HANDLING

- A. Maintain temporary facilities and controls in proper safe condition throughout progress of the Work.

1.6 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

PART 2 - PRODUCTS AND EXECUTION

2.1 TEMPORARY FACILITIES INSTALLATION

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to Martinez Couch and Associates, testing agencies, and authorities having jurisdiction.
- B. Layout and Measurements:
 - 1. Use of Data Furnished: Boring, and survey data made available to the Contractor is for information only, and the Contractor shall use his own judgment as to the actual conditions. He is warned that reliance on the information presented is at his own risk, and neither the Owner, State, nor the Engineer and his consultants will be liable for errors relating to such data.
 - 2. Additional Data Required By Contractor: The Contractor may make borings or drive test pits he requires to verify the conditions at the site at his own expense. The location and size of such exploratory holes will be subject to approval by the Engineer.

3. Protection of Survey: Land monuments, bench marks, survey points and other such references shall be protected from damage unless and until their removal is authorized. If they are disturbed, they shall be replaced in their proper positions.
 4. Measurements: Take measurements of the work and be responsible for it.
 - a. Discrepancies: Thoroughly examine the drawings and specifications, carefully checking the figured dimensions, before commencing work, and report to the Engineer if any discrepancy, error, or defect appears.
 - b. Dimensions: If figured dimensions are lacking on the drawings, the Engineer will supply them.
- C. Staging Area:
1. Scope: Access and staging areas for purposes of this Contract shall be confined to areas as directed by the Owner or Engineer within the property boundary.
 2. Location of Apparatus: The locations of material, apparatus, equipment, fixtures, piping outlets, etc., are not specified. The actual location shall be as directed or as required to suit the conditions at the time of installation. Before installation, the Contractor shall consult the Engineer and ascertain the actual location.
 3. Provide temporary storage sheds if necessary, and other storage facilities on the job site for the storage of materials that may be subject to weather damage when interior or covered space is not available.
 4. Provide for adequate timber bridging and planking or other suitable means as required for legal egress, and for the safeguarding of existing paving, walks and curbs, structures and utilities from damage due to construction vehicle traffic. Safeguard existing conditions from damage during construction. Repair or replace the damaged existing surroundings within the designated access and staging areas which is needed to remain in place and which is damaged by operations under this Contract.
 5. Do not encumber the premises nor overload the structures beyond their allowable design live load with his/her apparatus, storage of materials and the operation of his/her workmen, and shall be confined within the limits designated by the Owner or Engineer.
- D. Rubbish Removal:
1. Clean-up debris, rubbish and old materials resulting from the Work on a daily basis.
 2. Cleaning Responsibility: Remove from the work area of building and site debris, resulting from the work daily or as often as necessary if it interferes with the work or staging area under the contract or presents a fire hazard. No rubbish or debris shall be dropped from a height of more than 6 feet, or thrown out of windows or openings without a chute. An adequate number of cleaning personnel shall be provided during working hours, who shall keep areas within and adjacent to the building free from dust and loose dirt by sweeping and wet mopping.
 3. Rubbish Disposal: Furnish containers at central collection locations as designated by the Owner or Engineer on the site to receive construction debris. Cost of containers, removal and disposal charges shall be paid by the Contractor. Containers shall be removed as often as necessary to minimize interference with work in progress.
 4. Clean the site around the building and maintain it clean and free from food and beverage containers, waste and other debris. Provide and rigidly enforce the use of waste receptacles by construction personnel. Burning of refuse is not permitted.

5. **Salvage Materials:** Construction salvage materials, not indicated items elsewhere to be returned to the Owner, shall become the property of the Contractor and shall be taken from the premises. Storage of materials and equipment on the site, other than for this project, will not be permitted.

E. **Safety, Protection and Security:**

1. Provide safety and protection in accordance with Contract Documents.
2. **Protection:** Protection shall be maintained for the duration of the Project and shall include:
 - a. **Weather Protection:** Arrange to provide protection against rain, wind, storms, frost, heat and other weather conditions, so as to maintain work, materials, apparatus and fixtures free from injury or damage. At the end of each day's work items likely to be damaged shall be covered. Remove snow and ice for the proper protection and/or execution of the construction work.
 - b. **Protection of Finished or Existing Work:** Provide protection for the finished work. Finished or Existing floors that will remain shall be protected from traffic or construction work by covering with materials approved by the finish manufacturer. Finished construction and materials shall be protected from rain, snow and windstorm damage throughout the construction period.
 - c. **Fire Protection:** Maintain fire-fighting equipment for the duration of construction in accordance with the requirements of the Fire Department and the Insurance Underwriters and subject to approval of the Owner's insurance agent. Provide fire extinguishers as required by the local Fire Department and the Building Code. Coordinate with existing firefighting equipment in existing building.
 - d. **Volatile Liquids:** Bulk storage of volatile liquids shall be outside the building at designated location. Only as much volatile liquid shall be allowed within the building at any given time as is needed for that day's operation.
 - e. **Vermin and Rodent Control:** Prevent the infestation and multiplication of vermin and rodents, and, if necessary, employ an exterminator to rid the premises of them if there is evidence that they exist.
 - f. **Dust Protection:** Prevent the nuisance of dust to the surrounding areas, and provide coverings or water sprinkling materials and equipment as required for such dust prevention for the work.
 - g. **Structural Alterations:** Do not permit endangering work by excavation or otherwise and shall not cut or alter the work without the consent of the Structural Engineer. Written instruction shall be obtained from the Structural Engineer's representatives before cutting beams or other structural members, arches, lintels, etc.
3. **Protection of Adjacent Property:**
 - a. **Scope:** Take necessary precautions to protect public and private property on or adjacent to the job site, including utilities, street signs, light standards, hydrants, pavements and walks, planting and natural features, against damage or injury including settlement or collapse.

- b. Building Damage: Should damage result to structures or property, the Contractor shall correct or repair it without undue delay and to the complete satisfaction of the Owner. No "Waiver of Responsibility" for incomplete, inadequate or defective adjoining work will be accepted unless otherwise stated by the Engineer.
 - c. Excavation Damage: Maintain the existing and adjoining structures safety. Concrete or rock excavation in the proximity of the adjoining structures shall be done by line drilling. Existing footings and foundation work exposed shall be underpinned as directed by Engineer. Prevent damage to pipes, conduits, wires, cables or structures above or below ground.
 - d. Site Damage: Repair and restoration of existing roads, pavements, walks, curbs, manholes, hydrants, light standards, street signs, catch basins, railings and plantings, and other construction or surfaces required due to the work under this contract shall be included in the work under the Contract even if not specifically called for in the various sections of the Specifications. Repair and restoration work shall match existing work. Costs incurred in repair work, including permits, bonds and supervision by public authorities, shall be borne by the Contractor causing the damage.
4. Welding & Cutting:
- a. Handling of Welding Materials: The handling and storage of welding materials, acetylene and oxygen tanks, burners, and other equipment required for the execution of welding and cutting work at the job shall be subject to the approval of the Building Department and Fire Marshal.
 - b. Welding Standards: Work shall be performed in accordance with the standard specifications of the American Welding Society.
 - c. Fire Protection: Welders shall take precautions required to prevent fires as a result of his/her operations. When welding tools or torches are in used, the Contractor shall have available, in the immediate vicinity of the work, a fire extinguisher of the CO₂ type. The fire extinguisher shall be provided and maintained by the Installer. Fuel for cutting and heating torches shall be gas only, and shall be contained in Underwriters Laboratory listed containers. Storage of gas shall be in locations approved by the Fire Department. Provide fireproofed tarpaulins where applicable at welding and cutting operations.
 - d. Power: The Owner will not provide power for electric welders.
5. Tree Protection: Trees identified by the Owner or Engineer to remain must be protected by the Contractor during the construction period. Avoid driving vehicles or storing materials within the tree root area and excavating in the root area unless accepted by the Owner or Engineer.
6. Security: The Contractor shall secure his/her tools, materials and assemblies. Claims shall not be made against the Owner or Engineer for equipment or tool losses or damage to installed assemblies.

F. Temporary Toilets:

1. Chemical Toilets: The Contractor shall provide and maintain temporary enclosed and weatherproof chemical toilets located on the site. Use of the owner's toilets by construction personnel within occupied areas of the building is not permitted.
 2. Cleaning of Toilets: Toilets shall be maintained in a clean and sanitary condition and shall conform to the requirements of the local Department of Health and Labor requirements. Toilets shall be pumped and cleaned a minimum of once per week.
- G. Water Service:
1. Water shall be available for the various trades as coordinated with the property Owner. Prevent freeze-ups. Have water available for the various trades during the normal working periods and for fire prevention purposes.
 2. Cost: the Owner shall pay the cost of water.
- H. Temporary Scaffolding, Ladders, Stairs, Hoists, Etc.:
1. Scope: Coordinate the installation and maintenance and safety of temporary stairs, ladders, ramps, scaffolds, runways, sidewalk bridges, fences, derricks, hoists, chutes, and other such operational facilities as may be needed for the proper execution of the work. Apparatus, equipment and construction shall meet the requirements of the Labor Law and other State and local Building Department Requirements.
 2. Scaffolding: Coordinate the location, erection, maintenance and removal of scaffolding and other temporary facilities as required for the proper installation of the work.
 3. Hoists and/or Crane: (for General Use) Coordinate and maintain the use of conventional construction hoists of sufficient size and capacity to raise materials and equipment and give access to construction levels.
- I. Site Fence, if applicable:
1. Location: A site fence shall be installed by the Contractor at the construction site perimeter and adjacent staging areas if required by the contract documents. New construction work, including trailer and staging shall be contained within the site fence.
 2. Type: Provide either of the following types:
 - a. Woven Wire Mesh: 6'-0" high with gates and required bracing.
 - b. Maintain fence and gates during entire construction period in a neat and orderly way free of graffiti or unauthorized signs.
- J. Temporary Closures:
1. Take special precautions against damage to materials and work installed in cold or freezing weather, by providing adequate special heat and/or covering to prevent damage by the elements.
 2. Temporary Partitions: (adjacent to occupied areas) after relocation of occupancy from spaces requiring access, provide temporary partitions to isolate occupied areas from work areas. Temporary partitions shall be of gypsum board on suitable studs and shall not interfere with the emergency exit requirements of occupied areas.
 3. Exterior partitions shall be suitably weather protected insulated and otherwise sealed off to prevent dirt and weather infiltration.
 4. Interior partitions shall be suitably sealed to limit noise and dirt infiltration.

K. Labor Disputes:

1. Notifications: Immediately notify the Engineer of actual or impending labor disputes that may affect or is affecting the schedule of the Work. Take appropriate measures to eliminate or minimize the effect of such labor dispute on the schedule, including but not limited to, such measures as: promptly seeking appropriate injunctive relief; filing appropriate charges with the National Labor Relations Board under the applicable provisions of the Labor Management Relations Act of 1947, as amended; filing appropriate damage actions; taking such measures as establishing a reserved gate, where appropriate; seek other sources or supply or service; and other measures that may be appropriately utilized to limit or eliminate the effect of the labor dispute.
2. Damage - Time Extension: To the extent the Contractor fails to promptly initiate measures that are appropriate, no extension of time for completion shall be allowed. In addition, any delay impact on any Contractor's schedule or on the schedule for the Project, which is a direct result of such failure, shall be considered as a Contractor caused delay under applicable provisions of the Contract. The rights and remedies provided in this paragraph are in addition to other rights or remedies provided by law or under this Contract. The Contractor shall include this clause in every Contract, together with a requirement that Sub-Subcontractors include a substantially similar clause in each lower tier subcontract.

L. Temporary Light and Power:

1. Scope: The Contractor shall provide labor, materials, tools, appliances, and equipment and perform operations necessary for the complete execution of a separate system of temporary electric light and power throughout the project suitable for supplying electrical energy for illumination and for power tools and equipment. Such system shall be installed and maintained in place as needed and removed promptly as its necessity ceases to exist. Maintaining shall and include energizing and de-energizing the electrical systems each working day, and turning on and off of lights daily.
- 2.
3. Lighting Standards: The minimum temporary lighting to be provided, and maintained in each room and changed as needed when interior walls are being erected as directed by OSHA standards. Temporary lighting must be maintained for twenty-four (24) hours a day, and seven (7) days a week at stairs and corridors below ground. In other spaces, temporary lighting and power shall be energized approximately thirty (30) minutes before the starting time and after the quitting time of the latest stopping unless otherwise directed by code.
4. Wiring Standards: Temporary wiring and equipment shall conform to the requirements of the National Electrical Code, regulations of the Building Code.
5. Energy Costs: The Owner shall pay the Electric Utility bills, as they become due, for electric energy used for temporary lighting and power to perform work in the building.
6. Other Costs: The Contractor responsible for the other costs in connection with providing and maintaining the temporary electrical power system.

M. Temporary Heat:

1. Scope of Enclosed Building Protection: Prior to the winter weather protection as required to accomplish the following:
2. To protect the finish work.
3. If the heat not available from existing heating plant, the Contractor is responsible to provide sufficient heat so that the work can be accomplish in accordance with the Contract.
4. Cost: If the other than existing plant used for heat the Contractor shall pay for temporary heat equipment, safety provisions and fuel charges.
5. Damage Due to Lack of or Improperly Operated Temporary Heat: Maintain heat to prevent damage due to frost and freezing during the period when temporary heat is needed. Prevent damage due to defective equipment or the use of equipment, including but not limited to damage such a stains, smudges, soot or fire, and repair damage in a manner satisfactory to the Owner and Engineer.

N. Ventilation and Humidity Control (Where necessary for project work): Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

2.2 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Maintain support facilities until MCA schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

2.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."
- B. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- C. Barricades and Warning Signs: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs.
- D. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- E. Prohibit smoking in construction areas.
- F. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

2.4 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.
 4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard, replace, or clean stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use temporary dehumidifiers or permanent HVAC system, if available to control humidity.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to MCA.
 - c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

2.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 1. Materials and facilities that constitute temporary facilities are property of Contractor.
 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for products selected under an allowance.
 - 2. Section 012300 "Alternates" for products selected under an alternate.
 - 3. Section 012500 "Substitution Procedures" for requests for substitutions.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other

characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. MCA's Action: If necessary, MCA will request additional information or documentation for evaluation within one week of receipt of a comparable product request. MCA will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 10 days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
 - b. Use product specified if MCA does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, MCA will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," MCA will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 3. Products:
 - a. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
 4. Manufacturers:
 - a. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
 5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable

Products" Article for consideration of an unnamed product by one of the other named manufacturers.

- C. Visual Matching Specification: Where Specifications require "match MCA's sample", provide a product that complies with requirements and matches MCA's sample. MCA's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by MCA from manufacturer's full range" or similar phrase, select a product that complies with requirements. MCA will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: MCA will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, MCA may return requests without action, except to record noncompliance with these requirements:
 - 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects with project names and addresses and names and addresses of MCAs and owners, if requested.
 - 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300

EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 013300 "Submittal Procedures" for submitting surveys.
 - 3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of-accepted deviations from indicated lines and levels, and final cleaning.
 - 4. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.
 - 5. Section 078413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor or professional engineer.
- B. Certificates: Submit certificate signed by land surveyor and professional engineer where applicable certifying that location and elevation of improvements comply with requirements.
- C. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- E. Certified Surveys: Submit two copies signed by land surveyor.
- F. Final Property Survey: Submit 5 copies showing the Work performed and record survey data.

1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: New Structural elements shall not be cut as part of project work unless approved by MCA or its consultants.
 - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Mechanical systems piping and ducts.
 - f. Control systems.
 - g. Communication systems.

- h. Fire-detection and -alarm systems.
 - i. Conveying systems.
 - j. Electrical wiring systems.
 - k. Operating systems of special construction.
 - l. Home Security Systems
- 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
- 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Cutting and Patching Conference: Before proceeding, meet at Project 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.
- D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to MCA for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to

other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to MCA according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify MCA promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify MCA when deviations from required lines and levels exceed allowable tolerances.
 - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by MCA.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of MCA. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to MCA before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of one Insert number permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Engage a **[land surveyor]** **[professional engineer]** to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by **[land surveyor]** **[professional engineer]**, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 - 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by MCA.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. Cutting: Where Authorized by MCA or its consultants, cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.

2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

- A. If indicated in "Section 011000 – Summary" comply with this section.
- B. Site Access: Provide access to Project site for Owner's construction personnel.
- C. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 - 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls." And Section 017419 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017419

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Section 024116 "Structure Demolition" for disposition of waste resulting from demolition of buildings, structures, and site improvements.
 - 2. Section 024119 "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements.
 - 3. Section 311000 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials.

1.5 ACTION SUBMITTALS

- A. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.6 INFORMATIONAL SUBMITTALS

- A. Waste Management Plan: Submit plan within 30 days of date established for commencement of the Work.

1.7 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan. Plan shall distinguish between demolition and construction waste.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 - 2. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
- B. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, and reused.
 - 2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 - 3. Store items in a secure area until installation.
 - 4. Protect items from damage during transport and storage.
 - 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 4. Store components off the ground and protect from the weather.
 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

- A. Asphalt Paving: Break up and transport paving to asphalt-recycling facility at contractors option.
- B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
1. If concrete is to be recycled, pulverize concrete to maximum 1-1/2-inch (38-mm) size.
- C. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
1. If masonry is to be recycled, pulverize masonry to maximum 1-inch (25-mm) size.
- D. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 2. Polystyrene Packaging: Separate and bag materials.
 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 017419

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Substantial Completion Procedures.
- B. Final Completion Procedures.
- C. Requirements for Operating and Maintenance Manuals.
- D. Requirements for Warranties.
- E. Requirements for Commissioning , Testing, and Inspection Records.
- F. Final Cleaning.

1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Manufacturer's data sheets on each cleaning product to be used, including:
 - 1. Material descriptions, dimensions, and profiles.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Application methods.
- C. Material Safety Data Sheets (MSDS), where applicable.
- D. Contractor's List of Incomplete Items.
- E. Certified List of Incomplete Items.
- F. Labor Warranties.
- G. Product Warranties.
- H. Product Operating and Maintenance Manuals.
- I. Project Records: Commissioning, Testing, and Inspection Records.
- J. Owner Acceptance Letter.

1.3 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's Punch List), indicating the value of each item on the list and reasons why the work is incomplete.

- B. Submittals Prior to substantial Completion: Complete the following prior to requesting inspection for determining date of substantial completion. List items below that are incomplete at time of request.
 - 1. Submit closeout submittals, including project record documents, operation and maintenance manuals, warranties, final certifications, and similar final record information.
- C. Procedures prior to Substantial Completion: Complete the following prior to requesting inspection for determining date of substantial completion. List items below that are incomplete at time of request.
 - 1. Instruct owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 - 2. Terminate and remove temporary facilities from project site, along with mockups, construction tools, and similar elements.
 - 3. Complete final construction cleaning (broom sweep), including touch up painting.
 - 4. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

1.4 FINAL COMPLETION PROCEDURES

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
 - 1. List of incomplete items: Submit certified copy of MCA substantial completion inspection list of items to be completed or corrected (punch list), endorsed and dated by MCA. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
- B. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, MCA will either proceed with inspection or notify contractor of unfulfilled requirements. MCA will prepare a final certificate for payment after inspection or will notify contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Request reinspection when the work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment's, and building systems.
 - 3. Submit list of incomplete items, including item values, in MS excel electronic file format.

1.6 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of submittal: Submit written warranties on request of MCA for designated portions of work where commencement of warranties other than date of substantial completion is

indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

- B. Warranty documents to be provided to Owner in hard copy format. Photo copies or scanned PDF versions of the warranty documents shall be provided to MCA for file submission to

PART 2 PRODUCTS

2.1 CLEANING AGENTS AND MATERIALS, GENERAL

- A. Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished or unfinished surfaces.

PART 3 EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average residential building. Comply with manufacturer's written instructions.
 - 1. Clean project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - 2. Remove tools, construction equipment, machinery, and surplus material from project site.
 - 3. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - 4. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - 5. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damages transparent materials.
 - 6. Remove labels that are not permanent.
 - 7. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - 8. Leave project clean and ready for occupancy.

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of final completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be

repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
3. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Demolition and removal of selected portions of building or structure.
- B. Demolition and removal of selected site elements.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. State of Connecticut Department of Energy and Environmental Protection (CTDEEP).
- C. State of Connecticut Department of Environmental Protection (CTDEP).
- D. State of Connecticut Department of Public Health (CTDPH).
- E. Occupational Safety and Health Administration (OSHA).

1.3 SUBMITTALS

- A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.4 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work unless otherwise noted in the contract documents.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify MCA and Owner. Hazardous materials will be removed per the written directive of the CTDOH and under separate specification.
- C. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

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

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that utilities scheduled to remain have been properly protected before starting selective demolition operations.
- B. Verify that utilities scheduled to be removed have been disconnected and capped before starting selective demolition operations.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- 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 MCA.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

3.3 PREPERATION

- 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 properties.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent properties.
- C. 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.

3.4 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. 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.
 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 3. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 4. Dispose of demolished items and materials promptly.
- B. Removed and Reinstalled Items:
1. Clean salvaged items.
 2. Store items in area as coordinated with Owner.
 3. Protect stored items until reinstallation.
 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 intended use.
- C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner, 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.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
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.
- B. Disposal: Transport demolished materials off Owner's property and legally dispose of them at a licensed transfer station.

3.6 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

The State of Connecticut Department of Housing
Community Development Block Grant
Disaster Recovery Program (CDBG-DR)
Owner Occupied Rehabilitation and Rebuilding Program

Bid Documents
Project# 2065
44 Washington Parkway
Stratford, CT

SECTION 02 84 13

ABATEMENT OF PCB CONTAINING MATERIALS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. “PCB (<50 PPM) Containing Materials Removal/Disposal Plan”, 44 Washington Parkway, Stratford, CT 06615”

PART 2 - PRODUCTS

PART 3 - EXECUTION

All work, labor, and materials shall conform to PCB (<50 PPM) Containing Materials Removal/Disposal Plan”, 44 Washington Parkway, Stratford, CT 06615” prepared by Chris Hudacek CT DPH Asbestos Project Designer License #000239



Facility Support Services, LLC

Environmental & Safety Consulting Engineers

PCB (<50 ppm) Containing Materials Removal/Disposal Work Plan

Community Development Block Grant – Disaster Recovery Owner Occupied Recovery and Rehabilitation Program

Applicant #2065

**Basement Windows
44 Washington Avenue
Stratford, CT**

Prepared For:

Martinez Couch & Associates, LLC
1084 Cromwell Ave. Suite A-2
Rocky Hill, Connecticut 06067

Prepared By:

Facility Support Services, LLC
2685 State Street
Hamden, Connecticut 06517

Kevin Bogue, CHMM, LEP
Project Manager

August 11, 2014

**PCB (<50 ppm) Containing Materials
Removal/Disposal Work Plan
44 Washington Avenue
Stratford, CT**

The following work plan outlines the removal of PCB-containing interior window glazing from a damaged basement windows proposed to be replaced. An approximately 1'x 2' (single pane) window with less than 50 ppm Polychlorinated Biphenyl (PCB) containing glazing shall be disposed of as part of this work. The exact quantity shall be confirmed at the time of the pre-bid walkthrough. The site is located at 44 Washington Avenue in Stratford, Connecticut. The removal shall be conducted by properly trained contractors, including adequate HAZWOPER training. The removal of the window should not generate visible emissions and does not require the use of a negative pressure enclosure. If at any time during the removal process the glazing material becomes friable and visible dust is generated, all removal work must cease and the material must then be removed from with a negative pressure enclosure exhausted to the atmosphere. All applicable sections of OSHA, EPA, and State of Connecticut Regulations shall be adhered to as part of this project including 29CFR 1926.1101. Prior to the commencement of site work; the Contractor, Project Engineer, and any other necessary personnel involved in the project shall attend the pre-removal meeting. The exact date and time of this meeting shall be determined by the Project Engineer.

PCB DISPOSAL PROCEDURE – BASEMENT WINDOWS

- A. Containerize the window glazing material and all remaining portions of the window unit that was in contact with the window glazing. Work shall be conducted in accordance with C.G.S, Sections 22a-463 through 22a-469.
- B. All waste shall be labeled and disposed of in accordance with C.G.S, Sections 22a-463 through 22a-469 that regulate caulking or other building materials containing PCBs <50 ppm but ≥ 1 ppm. Facility proposed for disposal shall be permitted to accept waste with PCB <50 ppm
- C. HEPA vacuum and wet wipe area following disposal to ensure no visible dust and/or debris remains, dispose of vacuum and wipe materials with window debris.
- D. Proper PPE shall be worn at all times.
- E. Provide all waste disposal documentation to Martinez Couch & Associates within 5 days of removal of waste from the residence.

SECTION 02 85 00

MOLD REMEDIATION

1. The Contractor shall have a designated Competent Person: on the job at all times to ensure proper work practices throughout the project.
2. Prior to beginning the clean-up and decontamination process, the contractor shall install at a minimum, a one-stage decontamination unit at the entrance to the area.
3. Workers shall don the proper PPE following 29 CFR 1910.120 prior to beginning the removal. This may include respiratory protection and, or disposable full body coveralls.
4. Microbial abatement shall be implemented using the following procedure:
 - a. If visible mold growth is observed:
 - i. Mold contaminated waste materials shall be handled and removed from specified locations for proper disposal.
 - ii. Materials shall be removed in a manner which does not breakdown the materials into fine dust or powder to the extent feasible. Equipment and tools to be utilized shall include hand tools only to remove materials from adjacent substrates.
 - iii. Any dry or brittle materials shall be removed with additional engineering controls such as use of a HEPA vacuum to removed accumulated dust or debris during removal.
 - iv. Waste shall be immediately placed in disposal containers/storage trailers. The containers shall not be emptied into other containers to avoid dispersal of dust or fugitive emissions.
 - v. The use of minimal but sufficient quantities of water to wet the generated waste prior to collection shall be utilized. Under no circumstances shall the mold waste show evidence of free liquid water, pooling or ponding with the waste stream. Any liquid used to wet the dust and debris to control fugitive emission shall be properly containerized and decontaminated in accordance with CHS Section 22a-463 through 22a-469.
 - b. All remaining surfaces that are disturbed during renovation or demolition.
 - i. Spray one coat of Shockwave Disinfectant & Cleaner (or similar) to all surfaces per the manufacturer's specifications. This includes all floors, walls, and ceilings. Alternate products must be approved by the project consultant.
 - ii. Spray one coat of Aftershock fungicidal coating (or similar) to all surfaces per the manufacturer's specifications. This includes all floors, walls, and ceilings. Alternate products must be approved by the project consultant.

SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

PART 2 - PRODUCTS

- 2.1 All products in accordance with drawings and specifications

PART 3 - EXECUTION

- 3.1 All work, labor and materials in accordance with drawings and specifications

END OF SECTION 033000

SECTION 051200

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

PART 2 - PRODUCTS

- 2.1 All products in accordance with drawings

PART 3 - EXECUTION

- 3.1 All work, labor, and materials in accordance with drawings and specifications

END OF SECTION 051200

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Dimensional Lumber.
- B. Wall, Floor, and Roof Sheathing.
- C. Miscellaneous Lumber.
- D. Related Accessories.

1.2 REFERENCES

- A. American Forest and Paper Association (AF&PA).
- B. American Lumber Standard Committee (ALSC).
- C. American National Standards Institute (ANSI/ASSE).
- D. ASTM International (ASTM).
- E. American Wood Preservers Association (AWPA).
- F. Douglas Fir Protection Association (DFPA).
- G. National Fire Protection Association (NFPA).
- H. National Lumber Grades Authority (NLGA).
- I. Northeastern Lumber Manufacturers Association (NeLMA).
- J. Occupational Safety and Health Administration (OSHA).
- K. Underwriters Laboratories (UL).
- L. West Coast Lumber Inspection Bureau (WCLIB).
- M. Western Wood Products Association (WWPA).

PART 2 PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules

indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
 3. Provide dressed lumber, ss per local and national governing industry standards.
- B. Maximum Moisture Content of Lumber: As per local and national governing industry standards.
- C. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 DIMENSION LUMBER FRAMING

- A. Non-Load-Bearing Interior Partitions: As per local and national governing industry standards.
1. Application: Interior partitions not indicated as load-bearing.
 2. Species:
 - a. Mixed southern pine.
 - b. Northern species.
 - c. Eastern softwoods.
 - d. Western woods.
- B. Framing Other Than Non-Load-Bearing Interior Partitions: As per local and national governing industry standards.
1. Application: Framing other than interior partitions.
 2. Species:
 - a. Hem-fir (north).
 - b. Southern pine.
 - c. Douglas fir-larch.
 - d. Mixed southern pine.
 - e. Spruce-pine-fir.
 - f. Douglas fir-south.
 - g. Hem-fir.
 - h. Douglas fir-larch (north).
 - i. Spruce-pine-fir (south).

2.3 WALL, FLOOR, AND ROOF SHEATHING

- A. Sheathing: As per local and national governing industry standards.
1. Application: Wall sheathing.
 2. Application: Subflooring.
 3. Application: Roof decking.
 4. Material: Match existing materials or comply with final install product instructions,

specified industry standards and recommendations application.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Cants.
 - 4. Furring.
 - 5. Grounds.
- B. For items of dimension lumber size, provide lumber per local and national governing industry standards.
- C. For concealed boards, provide lumber per local and national governing industry standards. following species and grades:
 - 1. Mixed southern pine.
 - 2. Eastern softwoods.
 - 3. Northern species.
 - 4. Western woods.

2.5 FASTENERS

- A. General: Provide fasteners as per local and national governing industry standards.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- D. Do not splice structural members between supports unless otherwise indicated.
- E. Comply with, specified industry standards and recommendations for installation of all applications.

END OF SECTION

SECTION 061533

WOOD PATIO DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Wood decking.
 - 2. Plastic decking.
 - 3. Stairs for elevated decks.
 - 4. Railings for elevated decks.
 - 5. Wood benches for elevated decks.
- B. Related Requirements:
 - 1. Refer to drawings for sheet metal flashings on tops of deck framing and ledgers

1.3 DEFINITIONS

- A. Boards: Lumber of less than 2 inches nominal (38 mm actual) in thickness and 2 inches nominal (38 mm actual) or greater in width.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.
- C. Timber: Lumber of 5 inches nominal (114 mm actual) or greater in least dimension.
- D. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 - 2. NLGA: National Lumber Grades Authority.
 - 3. RIS: Redwood Inspection Service.
 - 4. SPIB: The Southern Pine Inspection Bureau.
 - 5. WCLIB: West Coast Lumber Inspection Bureau.
 - 6. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

- A. Product Data: For preservative-treated wood products, plastic decking, and metal framing anchors.
 - 1. For preservative-treated wood products. Include chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
 - 2. For plastic decking and metal framing anchors. Include installation instructions.
- B. Samples: For plastic decking, not less than 24 inches (600 mm) long, showing the range of variation to be expected in appearance of decking, including surface texture.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates:
 - 1. For lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by ALSC's Board of Review.
 - 2. For preservative-treated wood products. Indicate type of preservative used and net amount of preservative retained. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
- B. Certificates of Inspection: Issued by lumber grading agency for exposed wood products not marked with grade stamp.
- C. Evaluation Reports: For the following, from ICC-ES:
 - 1. Preservative-treated wood products.
 - 2. Plastic decking.
 - 3. Expansion anchors.
 - 4. Metal framing anchors.
 - 5. Decking fasteners.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials under cover and protected from weather and contact with damp or wet surfaces. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.
- B. Handle and store plastic lumber to comply with manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 LUMBER, GENERAL

- A. Comply with DOC PS 20 and with grading rules of lumber grading agencies certified by ALSC's Board of Review as applicable. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by ALSC's Board of Review.
 - 1. Factory mark each item with grade stamp of grading agency.
 - 2. For items that are exposed to view in the completed Work, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
 - 3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
 - 4. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Certified Wood: Wood products shall be made from certified wood tracked through a chain-of-custody process. Certified wood documentation shall be provided by sources certified through a forest certification system with principles, criteria, and standards developed using ISO/IEC Guide 59 or the World Trade Organization's "WTO Agreement on Technical Barriers to Trade."
- C. Maximum Moisture Content:
 - 1. Boards: 15 percent.
 - 2. Dimension Lumber: 15 percent for 2-inch nominal (38-mm actual) thickness or less; 19 percent for more than 2-inch nominal (38-mm actual) thickness.
 - 3. Timber. 19 percent.

2.2 WOOD DECKING AND STAIR TREADS

- A. Hand select wood for freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot holes, shake, splits, torn grain, and wane.
- B. Dimension Lumber Decking: No. 2 grade and any of the following species:
 - 1. Hem-fir or hem-fir (North); NLGA, WCLIB, or WWPA.
 - 2. Douglas fir-larch, Douglas fir-larch (North), or Douglas fir-south; NLGA, WCLIB, or WWPA.
 - 3. Mixed southern pine; SPIB.
- C. Board Decking: Shall be 1-1/4-inch (32-mm), 1-inch (25-mm), or 3/4-inch (19-mm) actual thickness radius-edged decking as indicated or to match existing construction dimensions and be of any of the following species and grades:

1. Douglas fir-larch or Douglas fir-south, Patio 1 or Patio 2; WWPA.
2. Douglas fir-larch, Select Dex; WCLIB.
3. Douglas fir-larch (North), Select Patio; NLGA.
4. Hem-fir, Patio 1; WWPA.
5. Hem-fir, Select Dex; WCLIB.
6. Hem-fir (North), Select Patio; NLGA.
7. Southern pine, Premium; SPIB.

D. Board Stair Treads: Shall be 1-1/4-inch (32-mm), 1-inch (25-mm), or 3/4-inch (19-mm) actual thickness as indicated or to match existing construction dimensions, stepping with half-round or rounded-edge nosing and one of the following species and grades:

1. Douglas fir, C & Btr VG (Vertical Grain) stepping; NLGA, WCLIB, or WWPA.
2. Hem-fir, C & Btr VG (Vertical Grain) stepping; NLGA, WCLIB, or WWPA.

2.3 WOOD RAILINGS

A. Hand select wood for freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot holes, shake, splits, torn grain, and wane.

B. Dimension Lumber Railing Members: Select Structural, No. 1, or No. 2 grade and any of the following species:

1. Hem-fir or hem-fir (North); NLGA, WCLIB, or WWPA.
2. Douglas fir-larch, Douglas fir-larch (North), or Douglas fir-south; NLGA, WCLIB, or WWPA.
3. Mixed southern pine; SPIB.
4. Spruce-pine-fir or spruce-pine-fir (South); NeLMA, NLGA, WCLIB, or WWPA.

C. Railing Boards: Any of the following species and grades:

1. Douglas fir, C & Btr finish or C Select; NLGA, WCLIB, or WWPA.
2. Hem-fir, C & Btr finish or C Select; NLGA, WCLIB, or WWPA.
3. Southern pine, B & B finish; SPIB.

2.4 WOOD BENCHES

A. Dimension Lumber for Benches: Select Structural or No. 1 grade and any of the following species:

1. Hem-fir or hem-fir (North); NLGA, WCLIB, or WWPA.
2. Douglas fir-larch, Douglas fir-larch (North), or Douglas fir-south; NLGA, WCLIB, or WWPA.
3. Mixed southern pine; SPIB.
4. Spruce-pine-fir or spruce-pine-fir (South); NeLMA, NLGA, WCLIB, or WWPA.

B. Boards for Benches: Any of the following species and grades:

1. Douglas fir, C & Btr finish or C Select; NLGA, WCLIB, or WWPA.
2. Hem-fir, C & Btr finish or C Select; NLGA, WCLIB, or WWPA.
3. Southern pine, Near Rift B & B finish; SPIB.

2.5 DIMENSION LUMBER FRAMING

A. Deck and Stair Framing: Select Structural, No. 1, or No. 2 grade and the following species:

1. Douglas fir-larch; WCLIB or WWPA.
2. Douglas fir-south; WWPA.
3. Douglas fir-larch (North); NLGA.

B. Deck and Stair Framing: Any species and grade with a modulus of elasticity of at least 1,700,000 psi (11 721 MPa) and an extreme fiber stress in bending of at least 1050 psi (7.3 MPa) for 2-inch nominal (38-mm actual) thickness and 12-inch nominal (286-mm actual) width for single-member use.

2.6 POSTS

A. Dimension Lumber Posts: No. 2 grade and the following species:

1. Douglas fir-larch, Douglas fir-larch (North), or Douglas fir-south; NLGA, WCLIB, or WWPA.

B. Timber Posts: Douglas fir-larch, Douglas fir-larch (North), No. 1; NeLMA, NLGA, SPIB, WCLIB, or WWPA.

2.7 PRESERVATIVE TREATMENT

A. Use pressure treated wood or treat wood according to this section.

B. Pressure treat boards and dimension lumber with waterborne preservative according to AWPA U1; Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

C. Pressure treat timber with waterborne preservative according to AWPA U1; Use Category UC4a.

D. Pressure treat poles with waterborne preservative according to AWPA U1; Use Category UC4a.

E. Preservative Chemicals: Acceptable to authorities having jurisdiction.

1. Do not use chemicals containing arsenic or chromium.

F. Use process for boards and dimension lumber that does not include water repellents or other substances that might interfere with application of indicated finishes.

- G. After treatment, redry boards, dimension lumber, timber, and poles to 19 percent maximum moisture content.
- H. Mark treated wood with treatment quality mark of an inspection agency approved by ALSC's Board of Review.
 - 1. For items indicated to receive a stained or natural finish, mark each piece on surface that will not be exposed or omit marking and provide certificates of treatment compliance issued by inspection agency.
- I. Application: Treat all wood unless otherwise indicated.

2.8 PLASTIC DECKING

- A. Plastic Lumber, General: Products acceptable to authorities having jurisdiction with current model code evaluation reports that show compliance with building code in effect for Project for indicated type of construction.
 - 1. Allowable loads and spans, as documented in evaluation reports or in information referenced in evaluation reports, shall not be less than design loads and spans indicated.
- B. Composite Plastic Lumber: Solid shapes made from a mixture of cellulose fiber and polyethylene or polypropylene.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. AZEK Building Products, Inc.
 - b. TimberTech.
 - 2. Decking Standard: ICC-ES AC109 and ICC-ES AC174.
 - 3. Decking Size: Shall be as indicated on drawings or one of the following to match existing,
 - a. 7/8 by 5-1/2 inches (22 by 140 mm) actual.
 - b. 1-1/4 by 6 nominal, 1 by 5-1/2 inches (25 by 140 mm) actual.
 - c. 1-1/2 by 6 nominal, 1-1/4 by 5-1/2 inches (32 by 140 mm) actual.
 - d. 1-1/4 by 6 inches (32 by 152 mm) actual.
 - e. 1-3/8 by 3-1/2 inches (35 by 89 mm) actual.
 - f. 1-3/8 by 5-1/2 inches (35 by 140 mm) actual.
 - g. 2 by 6 nominal, 1-1/2 by 5-1/2 inches (38 by 140 mm) actual.
 - 4. Configuration: Provide product compliant to match existing construction method.
 - 5. Surface Texture: Match existing material surface texture.
 - 6. Color: As selected by MCA from manufacturer's full range to match existing.
- C. All-Plastic Lumber: Solid shapes made from high-density polyethylene (HDPE), PVC, polystyrene, or cellular PVC with no cellulose fiber.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Inteplast Group.
 - b. L.B. Plastics, Inc.
 - c. Renew Plastics.
2. Decking Standard: ICC-ES AC174.
3. Decking Size: Shall be one of the following to match existing,
 - a. 1 by 6 inches (25 by 152 mm) actual
 - b. 1-1/4 by 6 nominal, 1 by 5-1/2 inches (25 by 140 mm) actual
 - c. 1-1/2 by 6 nominal, 1-1/4 by 5-1/2 inches (32 by 140 mm) actual
 - d. 2 by 4 nominal, 1-1/2 by 3-1/2 inches (38 by 89 mm) actual
 - e. 2 by 6 nominal, 1-1/2 by 5-1/2 inches (38 by 140 mm) actual
 - f. 1-5/8 by 5-3/4 inches (41 by 146 mm) actual
4. Configuration: Provide product compliant to match existing construction method.
5. Surface Texture: Match existing material surface texture.
6. Color: As selected by MCA from manufacturer's full range to match existing decking color.

2.9 FASTENERS

- A. General: Provide fasteners of size and type indicated, acceptable to authorities having jurisdiction, and that comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches (38 mm) into wood substrate.
 1. Use stainless steel or fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or ASTM F 2329 unless otherwise indicated.
 2. For pressure-preservative-treated wood, use stainless-steel fasteners.
 3. For plastic and wood decking, use stainless-steel fasteners where fasteners are exposed to view.
- B. Nails: ASTM F 1667.
- C. Power-Driven Fasteners: ICC-ES AC70.
- D. Wood Screws and Lag Screws: ASME B18.2.1, ASME B18.6.1, or ICC-ES AC233.
- E. Carbon-Steel Bolts: ASTM A 307 (ASTM F 568M) with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers all hot-dip zinc coated.
- F. Stainless-Steel Bolts: ASTM F 593, Alloy Group 1 or 2 (ASTM F 738M, Grade A1 or Grade A4); with ASTM F 594, Alloy Group 1 or 2 (ASTM F 836M, Grade A1 or Grade A4) hex nuts and, where indicated, flat washers.

- G. Postinstalled Anchors: Stainless-steel, chemical or torque-controlled expansion anchors with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing according to ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Stainless-steel bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or Grade A4).

2.10 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Simpson Strong-Tie Co., Inc.
- B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated on Drawings. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G185 (Z550) coating designation.
- D. Stainless-Steel Sheet: ASTM A 666, Type 316.
- E. Joist Hangers: As indicated at minimum shall be, U-shaped, with 2-inch- (50-mm-) long seat and 1-1/4-inch- (32-mm-) wide nailing flanges at least 85 percent of joist depth.
- F. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.
- G. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch (25 mm) above base and with 2-inch- (50-mm-) minimum side cover, socket 0.062 inch (1.6 mm) thick, and standoff and adjustment plates 0.108 inch (2.8 mm) thick.
- H. Joist Ties: Flat straps, with holes for fasteners, for tying joists together over supports shall be as indicated.

2.11 CONCEALED DECKING FASTENERS

- A. Deck Splines: Corrosion-resistant metal or plastic splines that fit in grooves routed into the sides of decking material and are fastened to deck framing with screws. Splines provide uniform spacing of decking material.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Blue Heron Enterprises, LLC.
- b. Grabber Construction Products.
- c. Ipe Clip Fastener Company Inc. (The).
- d. KK Mfg. Co., Inc.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Prime wood indicated to be painted, including both faces and edges. Cut to required lengths and prime ends. Comply with requirements in Section 099000 "Painting."
- C. Stain wood indicated to be stained, including both faces and edges. Cut to required lengths and stain ends. Comply with requirements in Section 099300 "Staining and Transparent Finishing."

3.3 INSTALLATION, GENERAL

- A. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit work to other construction; scribe and cope as needed for accurate fit.
- B. Framing Standard: Comply with AF&PA WCD1 unless otherwise indicated.
- C. Install wood decking and stair treads with crown up (bark side down).
- D. Install plastic lumber to comply with manufacturer's written instructions.
- E. Secure decking to framing with deck splines or screws to match existing construction methods for decks to be rebuilt.
- F. Install metal framing anchors to comply with manufacturer's written instructions.
- G. Do not splice structural members between supports unless otherwise indicated.
- H. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

- I. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of members or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- J. Apply copper naphthenate field treatment to comply with AWPAC M4, to cut surfaces of preservative-treated lumber.
- K. Securely attach exterior rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. ICC-ES AC708 for power-driven fasteners.
 - 2. "Fastening Schedule" in ICC's International Building Code and as indicated on drawings.
- L. Use common wire nails unless otherwise indicated. Select fasteners of size that do not fully penetrate members where opposite side is exposed to view. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads unless otherwise indicated.
- M. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced and with adjacent rows staggered.

3.4 ELEVATED DECK JOIST FRAMING INSTALLATION

- A. General: Install joists with crown edge up and support ends of each member with not less than 1-1/2 inches (38 mm) of bearing on wood or metal, or 3 inches (76 mm) on masonry. Attach floor joists where framed into wood supporting members by using wood ledgers as indicated or, if not indicated, by using metal joist hangers. Do not notch joists.
- B. Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 48 inches (1200 mm).
- C. Lap members framing from opposite sides of beams or girders not less than 4 inches (102 mm,) or securely tie opposing members together. Provide solid blocking of 2-inch nominal (38-mm actual) thickness by depth of joist over supports.
- D. Provide solid blocking of 2-inch nominal (38-mm actual) thickness by depth of joist at intervals of 96 inches (2438 mm) o.c., between joists.

3.5 STAIR INSTALLATION

- A. Provide stair framing members of size, space, and configuration indicated or, if not indicated, to comply with the following requirements:
 - 1. Stringer Size: 2 by 12 inches nominal (38 by 286 mm actual), minimum.

2. Notching: Notch stringers to receive treads, risers, and supports; leave at least 5 inches (127 mm) of effective depth.
 3. Stringer Spacing: At least three stringers for each 36-inch (914-mm) clear width of stair.
- B. Provide stair framing with no more than 3/16-inch (4.7-mm) variation between adjacent treads and risers and no more than 3/8-inch (9.5-mm) variation between largest and smallest treads and risers within each flight.
- C. Treads and Risers: Secure as indicated on drawings.

3.6 RAILING INSTALLATION

- A. Balusters: Secure and install as indicated on drawings.
- B. Newel Posts: Secure to stringers and risers as indicated on drawings.
- C. Railings: Secure wall rails as indicated on drawings.

END OF SECTION 061533

SECTION 06 40 00

ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cabinetry and Cabinetry Hardware.
- B. Wood Paneling.
- C. Exterior and Interior Wood Trim and Casing.
- D. Related Accessories.

1.2 REFERENCES

- A. Minimum standards for work in this Section shall be in conformity with the Architectural Woodwork Standards, latest edition, published jointly by the Architectural Woodwork Institute and the Woodwork Institute (AWI).
- B. American National Standards Institute (ANSI/ASSE).
- C. ASTM International (ASTM).
- D. Occupational Safety and Health Administration (OSHA).
- E. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Product Data: For each type of factory-fabricated product.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials only when the project is ready for installation and the general contractor has provided a clean storage area.
 - 1. Delivery of architectural millwork shall be made only when the area of operation is enclosed, all plaster and concrete work is dry and the area broom clean.
 - 2. Maintain indoor temperature and humidity within the range recommended by the Architectural Woodwork Standards for the location of the project.

1.5 WARRANTY

- A. Standard Manufacturers warranty for each type of factory-fabricated product.

PART 2 PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber shall be sound, kiln dried, and in accordance with the Architectural Woodwork

Standards requirements for its use and the Grade specified.

- B. Shall be lumber or sheet products of the species and Grade to match existing materials.
- C. Shall conform in finish width, thickness, and profile of lumber to match existing materials.
- D. Particleboard, MDF, and Plywood shall meet the requirements of the AWS for the Grade specified and their intended.
- E. Veneered components shall be in accordance with the Architectural Woodwork Standards requirements for the Grade specified use.
- F. Adhesives shall meet the requirements of the Architectural Woodwork Standards for its intended use.

2.2 CABINENTRY

- A. Cabinetry components to match existing, including the following:
 - 1. Shelving configuration.
 - 2. Drawer configuration.
 - 3. Trims, moldings, toe kicks and end panel configuration.
- B. Countertops to match existing, including the following:
 - 1. Cut-out configurations.
 - 2. Backsplash.
 - 3. Plywood substrates.
 - 4. Counter supports.
- C. Cabinetry hardware to match existing, including the following:
 - 1. Pulls.
 - 2. Drawer guides.
 - 3. Hinges.
 - 4. Door catches.
 - 5. Shelf supports.
- D. Plastic Laminates shall meet the requirements of the Architectural Woodwork Standards for its intended use.
- E. All finishes/colors of cabinetry and countertops to match existing.

2.3 EXTERIOR TRIM

- A. Waterproof Type I adhesive is required.
- B. Sheet products shall be of exterior type.
- C. Nails and screws shall be corrosion-resistant.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify the adequacy and proper location of any required backing or support framing.

3.2 INSTALLATION

- A. All work shall be secured in place, square, plumb, and level.
- B. All work abutting other building components shall be properly scribed.
- C. Mechanical fasteners used at exposed and semi-exposed surfaces, excluding installation attachment screws and those securing cabinets end to end, shall be countersunk.
- D. All nicks, chips and scratches shall be sanded out, filled and re-touched. Damaged items which cannot be repaired shall be replaced.

END OF SECTION

SECTION 07 21 00

BUILDING INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Glass-fiber blanket insulation.
- B. Spray Foam insulation.
- C. Vapor Retarders.
- D. Related Accessories.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. ASTM International (ASTM).
- C. North American Insulation Manufacturers Association (NAIMA).
- D. Occupational Safety and Health Administration (OSHA).
- E. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- B. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- C. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging with labeling intact including material name, production date and product code, until ready for installation.
- B. Protect insulation from physical damage and from becoming wet, soiled, or covered with ice or snow.
- C. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
 - 1. CertainTeed Corporation.
 - 2. Guardian Building Products, Inc.
 - 3. Johns Manville.
 - 4. Knauf Insulation.
 - 5. Owens Corning.
 - 6. Reef Industries, Inc.
- B. Substitutions: or equal.
- C. Requests for substitutions will be considered in accordance with Section 01 60 00.
 - 1. When submitting request for substitution, provide complete product data and MSDS sheet for each substitute product.

2.2 GLASS-FIBER BLANKET INSULATION

- A. Unfaced and Kraft Faced Batt Insulation: ASTM C 665, Type I (Unfaced) or Type II (Faced), Class A (Unfaced) or Class C (Faced); non-combustible when tested in accordance with ASTM E 136; extra wide stapling flanges.
 - 1. Physical and Mechanical Properties
 - a. R-value to match existing conditions or meet local building codes. The greater duty or obligation on the R-value shall govern.
 - b. Size: Maximum sizes available, to avoid jointing to greatest extent possible.
 - c. Width for Metal Framing Application: Same as framing center to center dimension.
 - d. Width for Wood Framing Application: Maximum of 1 inch (25 mm) less than framing center to center dimension.
 - e. Vapor Retarder Perm Rating (For Faced Batt Insulation): Maximum 1.0 perms (57 ng/(Pa s sq m)) when tested in accordance with ASTM E 96.
 - f. Surface Burning Characteristics (For Unfaced Batt Insulation): Maximum flame spread of 25, maximum smoke developed of 50, when tested in accordance with ASTM E 84.
 - g. Properties:
 - 1) Free of Formaldehyde: Insulation is manufactured with bio-based binder and no formaldehyde.
 - 2) VOC Emission: Low VOC emission certified by GreenGuard Environmental Institute for Children and Schools.
 - 3) Recycled Content: Minimum of 40% "post-consumer" recycled material.
- B. Accessory Materials and Fasteners: Provide all materials required for complete and proper installation of insulation, whether specified or not.

- C. Polyethylene Vapor Retarders: ASTM D 4397, 6 mils thick, with maximum permeance rating of 0.13 perm.
- D. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by manufacturer for sealing joints and penetrations in vapor retarder.

2.3 SPRAY FOAM INSULATION

- A. Open-Cell and Closed-Cell Spray Foam Insulation: Low density, MDI-based semi-rigid polyurethane water-blown type Open Cell Foam: foam OR Medium-density, MDI-based polyurethane thermoset rigid HFC-blown type Closed Cell Foam:
 - 1. Physical and Mechanical Properties:
 - a. Thermal Performance (Open-Cell AND Closed-Cell): Thicknesses and R-value to match existing conditions or meet local building codes. The greater duty or obligation on the R-value shall govern.
 - b. Core Density: 0.45-0.55pcf (Open-Cell) OR 1.9-2.4pcf (Closed-Cell) when tested in accordance with ASTM D 1622.
 - c. Thermal Resistance: 3.6 (Open-Cell) OR 6.4(Initial) and 5.8(Aged) less than or equal to 2-1/2 inches / 6.4 when greater than 2-1/2 inches (Closed-Cell) when tested in accordance with ASTM C 518.
 - d. Open Cell Content: Greater than 95% when tested in accordance with ASTM D 2842.
 - e. Closed Cell Content: 88-95% when tested in accordance with ASTM D 2842.
 - f. Compressive Strength: Greater than 2.4psi (Open-Cell) OR Greater than 25psi (Closed-Cell) when tested in accordance with ASTM D 1621.
 - g. Tensile Strength: 5.2psi (Open-Cell) OR 23psi (Closed-Cell) when tested in accordance with ASTM D 1623.
 - h. Water Absorption: Less than 30% by volume (Open-Cell) OR Less than 2% by volume (Closed-Cell) when tested in accordance with ASTM D 2842.
 - i. Dimensional Stability: Less than 12% by volume (Open-Cell) OR Less than 9% by volume (Closed-Cell) when tested in accordance with ASTM D 2126
 - j. Water Vapor Transmission: 33 perm/inch (Open-Cell) OR 1.3 perm/inch (Closed-Cell) when tested in accordance with ASTM E 96.
 - k. Air Permeability (Open-Cell AND Closed-Cell): 0.013 when tested in accordance with ASTM E 283.
 - l. Fungi Resistance (Open-Cell AND Closed-Cell): Pass, with no growth when tested in accordance with ASTM C 1338.
 - 2. Fire performance
 - a. Flame Spread (Open-Cell AND Closed-Cell): Less than 25 when tested in accordance with ASTM E 84.
 - b. Smoke: Less than 350 (Open-Cell) OR Less than 450 (Closed-Cell) when tested in accordance with ASTM E 84.
- B. Accessory Materials and Fasteners: Provide all materials required for complete and proper installation of spray foam insulation, whether specified or not.

2.4 VAPOR RETARDERS

- A. Vapor Retarder (Fire Retardant Reinforced, Reinforced, and Standard):
 - 1. Physical and Mechanical Properties:

- a. Material (Minimums): 3-ply fire retardant laminate (Fire Retardant Reinforced) OR 3-ply laminate (Reinforced) OR Extruded polyethylene Film
 - b. Weight (Minimums): 33lbs/1,000sq.ft. (Fire Retardant Reinforced), 40lbs/1,000sq.ft. (Reinforced), 49lbs/1,000sq.ft. (Standard), when tested in accordance with ASTM D 3776.
 - c. Puncture Propagation Tear (Minimums): 26lb (Fire Retardant Reinforced) OR 30lb (Reinforced) OR 34lb (Standard), when tested in accordance with ASTM D 2582.
 - d. Permeance (Perm) (Minimums): 0.062grains/hr-sq ft-in Hg (Fire Retardant Reinforced), 0.038grains/hr-sq ft-in Hg (Reinforced), 0.018grains/hr-sq ft-in Hg (Standard), when tested in accordance with ASTM E 96.
 - e. Drop Dart (Minimums): 450g (Fire Retardant Reinforced), 475g (Reinforced), 2270g (Standard), when tested in accordance with ASTM D 1709.
 - f. Tensile Strength (1" Tensile) (Minimums): 90lb/5050psi (Fire Retardant Reinforced), 35lb/4560 psi (Reinforced), 44lb/4400 psi (Standard), when tested in accordance with ASTM D 882.
 - g. Puncture Strength (Minimums): 30lb (Fire Retardant Reinforced), 35lb (Reinforced), 24lb (Standard), when tested in accordance with ASTM D 4833.
 - h. Usable Temperature Range: Minus 25 to 170 degrees F (minus 32 to 77 degrees C).
 - i. Application(s):
 - 1) Use on roof decks under insulation.
 - 2) Use on exterior walls on inside face of framing.
 - 3) Use under concrete slabs, over aggregate fill.
 - 4) Use under concrete slabs, under aggregate fill.
- B. Accessory Materials and Fasteners: Provide all materials required for complete and proper installation of vapor retarders, whether specified or not.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify that adjacent materials are dry and ready to receive insulation.

3.2 INSTALLATION , GENERAL

- A. Install in accordance with NAIMA "Recommendations for Installation in Residential and Other Light-Frame Construction - Fiber Glass Building Insulation" and manufacturer's instructions.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time
- C. Extend insulation to envelope entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thickness, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.3 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacture's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units
- B. Glass-Fiber Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill cavities formed by framing members. If more than one length is required to fill cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation
 - 4. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:
 - a. With faced blankets having stapling flanges, secure insulation by inset, stapling flanges to sides of framing members
 - b. With faced blankets having stapling flanges, lap blanket over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
- C. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Loose-Fill Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

3.4 INSTALLATION OF VAPOR RETARDERS

- A. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs.
 - 1. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches O.C.
 - 2. Before installing vapor retarders, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
 - 3. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.

- C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- D. Repair punctures or tears in vapor retarder facing by taping. Follow tape manufacturer's application recommendations.
- E. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.
- F. Protect insulation from damage and from becoming wet before, during and after installation.

END OF SECTION

SECTION 072119

FOAMED-IN-PLACE INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Closed-cell spray polyurethane foam.
- B. Related Requirements:

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Evaluation Reports: For spray-applied polyurethane foam-plastic insulation, from ICC-ES.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

PART 2 - PRODUCTS

2.1 CLOSED-CELL SPRAY POLYURETHANE FOAM

- A. Closed-Cell Spray Polyurethane Foam: ASTM C 1029, Type II, minimum density of 1.5 lb/cu. ft. and minimum aged R-value at 1-inch thickness of 6.0 deg F x h x sq. ft./Btu at 75 deg F.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation.
 - b. CertainTeed Corporation.
 - c. Dow Chemical Company (The).
 - d. Gaco Western LLC.
 - e. Henry Company.
 - f. Icynene Inc.
 - g. Johns Manville; a Berkshire Hathaway company.
 2. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 3. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by insulation manufacturer where required for adhesion of insulation to substrates.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that substrates are clean, dry, and free of substances that are harmful to insulation.
- B. Priming: Prime substrates where recommended by insulation manufacturer. Apply primer to comply with insulation manufacturer's written instructions. Confine primers to areas to be insulated; do not allow spillage or migration onto adjoining surfaces.

3.2 INSTALLATION

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Spray insulation to envelop entire area to be insulated and fill voids.
- C. Apply in multiple passes to not exceed maximum thicknesses recommended by manufacturer. Do not spray into rising foam.
- D. Framed Construction: Install into cavities formed by framing members to achieve thickness indicated on Drawings.
- E. Cavity Walls: Install into cavities to fully fill void.
- F. Miscellaneous Voids: Apply according to manufacturer's written instructions.

3.3 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

END OF SECTION 072119

SECTION 07 31 00

ASPHALT ROOF SHINGLES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Asphalt Roofing Shingles.
- B. Leak Barrier and Moisture Shedding Roof Deck Protection.
- C. Metal Flashing Associated with Shingle Roofing.
- D. Related Accessories.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. Asphalt Roofing Manufacturers Association (ARMA).
- C. American Society of Civil Engineers (ASCE).
- D. ASTM International (ASTM).
- E. National Roofing Contractors Association (NRCA).
- F. Occupational Safety and Health Administration (OSHA).
- G. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).
- H. Underwriters Laboratories (UL).
- I. U.S. Green Building Council (USGBC).

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Manufacturer's data sheets on each product to be used, including:
 - 1. Material descriptions, dimensions, and profiles.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- C. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- D. Selection Samples: Two complete sets of color cards representing manufacturer's full range of available colors and patterns.

1.4 QUALITY ASSURANCE

- A. Installer Minimum Qualifications:
 - 1. Installer shall be classified as an Authorized contractor as defined and certified by manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened labeled packaging until ready for installation.
- B. Store products in a covered, ventilated area, at temperature not more than 110 degrees F (43 degrees C); do not store near steam pipes, radiators, or in sunlight.
- C. Store bundles on flat surface to maximum height recommended by manufacturer; store rolls on end.
- D. Store and dispose of solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.6 WEATHER CONDITIONS

- A. Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with manufacturer recommendations.

1.7 WARRANTY

- A. Provide Manufacturer's standard warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
 - 1. Atlas Roofing Corporation.
 - 2. CertainTeed Corporation.
 - 3. GAF.
 - 4. Owens Corning.
 - 5. PABCO Roofing Products.
- B. Substitutions: or approved equal.
- C. Requests for substitutions will be considered in accordance with Section 01 60 00.
 - 1. When submitting request for substitution, provide complete product data and sample warranty specified above under submittals, for each substitute product.

2.2 ASPHALT SHINGLES

- A. Style: 3 Tab asphalt shingle or match existing.
 - 1. Shingle Thickness: Match existing.
 - 2. Color: Match existing or selected by Owner.
 - 3. Warranty: Match original warranty of existing materials.

2.3 HIP AND RIDGE SHINGLES

- A. Hip and ridge cap shingle field fabricated from the same color and type of field shingle.

2.4 STARTER STRIP

- A. Self sealing starter shingle designed for all roof shingles.

2.5 UNDERLAYMENT

- A. #15 Roofing Underlayment: Water repellent breather type cellulose fiber building paper. Meets or exceeds the requirements of ASTM D 4869 Type I.
- B. Plywood Sheathing; replacement and/or repair of existing sheathing as required during course of construction.

2.6 ACCESSORY PRODUCTS

- A. Fasteners
 - 1. Standard round wire shingle type, zinc-coated steel or aluminum; 10 to 12 gauge (3.416 mm to 2.657 mm for steel) (2.588 mm to 2.052 mm for aluminum), barbed or deformed shank, with heads 3/8 inch (9.5 mm) to 7/16 inch (11 mm) in diameter; length sufficient to penetrate at least 3/4 inch (19 mm) into solid wood or just through plywood or oriented strand board.
- B. Roofing Cement:
 - 1. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- C. Metal Flashing:
 - 1. 16 oz/sq ft (0.56 mm) copper sheet, complying with ASTM B 370.
 - 2. 0.032 inch (0.8 mm) aluminum sheet, complying with ASTM B 209.
 - 3. Use metal flashings at:
 - a. Eave edges: Match existing materials.
 - b. Rake edges: Match existing materials.
 - c. Step flashing at chimneys, side walls and dormers: Match existing materials.
 - d. Valleys: Match existing materials.
- D. Metal Flashing:
 - 1. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions metal, and other characteristics of the item.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until roof deck has been properly prepared.

3.2 REMOVAL OF EXISTING ROOFING

- A. Remove all existing roofing down to the roof deck.

- B. Verify that deck is dry, sound, clean and smooth, free of depressions, waves and projections.
- C. Cover with sheet metal all holes over 1 inch (25 mm) diameter, cracks over 1/2 inch (12 mm) in width, loose knots and excessively resinous areas.
- D. Replace damaged deck with new materials.
- E. Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment

3.3 PREPARATION

- A. Clean deck surfaces thoroughly prior to installation of leak barrier and roof deck protection.
- B. At areas to receive leak barrier, fill knot holes and cracks with latex filler.

3.4 INSTALLATION OF UNDERLAYMENT

- A. Install using methods recommended by manufacturer in accordance with local building code. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.
- B. Eaves:
 - 1. Place eave edge metal flashing tight with fascia boards; lap joints 2 inches (50 mm) and seal with plastic cement; nail at top of flange.
 - 2. Install leak barrier up the slope from eave edge to 36 inches from the edge or at least 24 inches (610 mm) beyond the interior face of the warm exterior wall, whichever is greater; lap ends 6 inches (150 mm) and bond.
- C. Valleys:
 - 1. Install leak barrier at least 36 inches wide centered on valley; lap ends 6 inches (150 mm) and seal.
 - 2. Where valleys are indicated to be "open valleys", install metal flashing over leak barrier before roof deck protection is installed; DO NOT NAIL THROUGH metal flashing; secure by nailing at 18 inches (457 mm) on center just beyond edge of flashing so that nail heads hold down edge.
- D. Hip and Ridge:
 - 1. Install leak barrier along entire lengths. If ridge vents are to be installed, position the leak barrier so that the ridge slots will not be covered.
- E. Penetrations:
 - 1. At vent pipes, install a 24 inch (610 mm) square piece of leak barrier lapping over roof deck protection; seal tightly to pipe.
 - 2. At vertical walls, install leak barrier extending at least 6 inches (150 mm) up the wall and 12 inches (305 mm) on to the roof surface lapping over roof deck protection.
 - 3. At skylights and roof hatches, install leak barrier up the sides of the frame and 12 inches (305 mm) on to the roof surface on all sides, lapping over roof deck protection.
 - 4. At chimneys, install leak barrier around entire chimney extending at least 6 inches (152 mm) up the wall and 12 inches (305 mm) on to the roof surface lapping over roof deck protection.

5. At rake edges, install metal edge flashing over leak barrier and roof deck protection; set tight to rake boards; lap joints at least 2 inches (50 mm) and seal with plastic cement; secure with nails.
6. At hips and ridges, install leak barrier along entire lengths. If ridge vents are to be installed, position the leak barrier so that the ridge slots are not covered.

3.5 INSTALLATION OF SHINGLES

- A. Install in accordance with manufacturer's instructions and requirements of local building code.
 1. Avoid breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully (not by "breaking" over ridge or bundles), and by taking extra precautions in temperatures below 40 degrees F (4 degrees C).
 2. Handle carefully in hot weather to avoid damaging shingle edges.
 3. Secure with 4 to 6 nails per shingle; use number of nails required by manufacturer or by code, whichever is greater. Nails must be long enough to penetrate through plywood or OSB, or 3/4 inch (19 mm) into dimensional lumber.
- B. Install hip, ridge, and valley shingles as required by the manufacturer.
 1. At ridges, install hip and ridge shingles over ridge or ridge vent material.
- C. All penetrations are to be flashed according to manufacturer, ARMA and NRCA application instructions and construction details.
- D. For skylights, consult the manufacturer of the skylight or roof hatch for specific installation recommendations. Skylights and roof hatches shall be installed with pre-fabricated metal flashings specifically designed for the application of the unit.

END OF SECTION

SECTION 07 46 33

VINYL SIDING PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preformed Vinyl Siding, Trim, and Accessories for Facing Exterior Walls.
- B. Preformed Vinyl Soffit Panels, Trim, and Accessories for Facing Exterior Roof Overhangs, Eaves and Fascia.
- C. Air Moisture Barriers.
- D. Related Accessories.

1.2 REFERENCES

- A. American Architectural Manufacturers Association (AAMA).
- B. Air Barrier Association of America (ABAA).
- C. American National Standards Institute (ANSI/ASSE).
- D. ASTM International (ASTM).
- E. Occupational Safety and Health Administration (OSHA).
- F. Underwriters Laboratories (UL).
- G. Vinyl Siding Institute (VSI).

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Manufacturer's data sheets on each product to be used, including:
 - 1. Material descriptions, dimensions, and profiles.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- C. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- D. Selection Samples: Submit a complete set of color chips that represent the full range of manufacturer's products, colors and sheens available.
- E. Maintenance Data: Include recommended cleaning methods and cleaning materials.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver siding in manufacturer's protective cartons and clearly labeled as to specific products contained.
- B. During delivery and storage keep siding cartons flat and supported along entire length.
- C. Store materials off ground, out of weather, in dry place. Provide ventilation. Protect from falling objects and construction activities.

1.5 WARRANTY

- A. Provide Manufacturer's standard warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
 - 1. Associated Materials, Inc
 - 2. CertainTeed Corporation.
 - 3. Gentek Building Products, Inc.
 - 4. Ply Gem Siding Group.
 - 5. The Foundry.
- B. Substitutions: or equal.
- C. Requests for substitutions will be considered in accordance with Section 01 60 00.
 - 1. When submitting request for substitution, provide complete product data and MSDS sheet for each substitute product.

2.2 VINYL SIDING

- A. Style: Match existing.
 - 1. Dimensions: Match existing.
 - 2. Thickness: Match existing.
 - 3. Surface finish: Match existing.
 - 4. Color: Match existing.

2.3 SOFFITS, FASCIA, TRIM, AND ACCESSORIES

- A. Standard Materials:
 - 1. Consistent with shape, size, and properties as existing and as required for complete installation.
 - 2. Produced from the same compound materials and with comparable properties as the siding.
 - 3. Color: Matching or color coordinated with siding.

2.4 AIR MOISTURE BARRIER

- A. Spunbonded Polypropylene Weather Membrane with a microporous coating, Non-woven, Nonperforated. Materials to match existing installed product or siding manufacturer recommended product,

- B. All sealing tape and fasteners per air moisture barrier manufacturer requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Confirm that all critical dimensions are as specified on the drawings
- B. Beginning installation indicates Installer's acceptance of substrate as suitable to accept siding and soffits.

3.2 PREPARATION

- A. Repair substrate flaws or defects before applying siding or soffits.
- B. Where necessary, fur surfaces to an even plane and free from obstructions before application.
- C. Where necessary, patch or replace air moisture barrier before installing siding.

3.3 INSTALLATION

- A. Install vinyl siding and vinyl soffits in accordance with the latest edition of "Vinyl Siding Installation Manual," published by the Vinyl Siding Institute (VSI) and special details from the drawings.
- B. Install siding, soffits, and accessories in accordance with best practice, with all joint members plumb and true.
- C. Install air moisture barrier in accordance with Manufacturer's instruction over exterior sheathing or open studs. Seal joints and penetrations through weather resistive barrier with specified tape and fasteners prior to installation of finish material. Air infiltration barrier shall be air tight and free from holes, tears, and punctures. All window and door penetrations are to be flashed and sealed per ASTM 2112, AMMA guidelines and manufacturer instructions. Cover with exterior cladding within 6 months of installation.

END OF SECTION

SECTION 07 71 23

GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Gutters and Downspouts.
- B. Related Accessories.

1.2 REFERENCES

- A. American Architectural Manufacturers Association (AAMA).
- B. ASTM International (ASTM).
- C. Occupational Safety and Health Administration (OSHA).
- D. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Manufacturer's data sheets on each product to be used, including:
 - 1. Material descriptions, dimensions, and profiles.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- C. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- D. Maintenance Data: Include recommended cleaning methods and cleaning materials.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products to prevent twisting, bending, and abrasion, and to provide ventilation. Slope stored materials to drain.
- C. During storage prevent contact with materials capable of causing discoloration, staining, or other damage.

1.5 WARRANTY

- A. Provide Manufacturer's standard warranty.

PART 2 PRODUCTS

2.1 GENERAL

- A. Gutter Material Thickness: Match existing materials.
- B. Downspout Material Thickness: Match existing materials.

2.2 GUTTERS

- A. Gutter Stock (Aluminum, Vinyl, Etc): Match existing materials.
 - 1. Gutter Size: Match existing.
 - 2. Profile: Match existing.
 - 3. Texture: Match existing.
 - 4. Finish: Match existing finish; applied to sides as matching.
 - 5. Color: Match existing.
- B. Accessories:
 - 1. Gutter Protection System: Match existing. Size and shape as required for gutter size, style and gutter support. Provide factory fabricated inside and outside corners.
 - 2. Miscellaneous Components: Provide all necessary inside and outside corners, corner reinforcing, eave tubes, and end caps required for a complete installation.

2.3 DOWNSPOUTS

- A. Downspout Stock (Aluminum, Vinyl, Etc): Match existing materials.
 - 1. Downspout Size: Match existing.
 - 2. Profile: Match existing.
 - 3. Texture: Match existing.
 - 4. Finish: Match existing finish; applied to sides as matching.
 - 5. Color: Match existing.
- B. Accessories:
 - 1. Downspout Support: Match existing materials. Profile and color to match existing.
 - 2. Miscellaneous components: Provide all necessary elbows, downspout offset sections, and pop rivets as required for a complete installation. All miscellaneous components shall match downspouts.

2.4 RELATED ACCESSORIES

- A. Fasteners: Match existing materials.
 - 1. Finish: Match existing finish.
 - 2. Size: As recommended by manufacturer.
- B. Flashings: Match existing or where installation is recommended by Manufacturer. Colors to match existing.
- C. Sealants: Mildew-Resistant Joint Sealant as recommended by Manufacturer at gutter joints. Color shall match existing.
- D. Splash Pans: Match existing in materials, size, shape, and color.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrates are in place and ready for installation of gutters and downspouts.

3.2 INSTALLATION

- A. General: Install gutters and downspouts per manufacturer's written installation instructions. Install Work securely in place and provide for expansion and contraction of components using lapped and sealed joints.
- B. Install roof apron flashings at roof edge conditions as required for proper installation, and matching existing conditions.
- C. Gutters:
 - 1. Install gutter supports as per Manufacturer recommendations.
 - 2. Slope gutters evenly to downspouts; provide end caps at gutter ends and seal watertight per Manufacturer's instructions.
 - 3. Install eave tubes at all downspout locations, seal watertight.
 - 4. Apply joint sealants at gutter joints per Manufacturer's installation instructions.
 - 5. Install gutter protection per manufacturer's instructions; provide factory fabricated corners at all inside and outside corners.
- D. Downspouts:
 - 1. Install downspouts, provide elbows and offsets, and secure downspouts to wall construction using downspout supports spaced as per Manufacturer's instructions. Provide 45 degree elbow at bottom of downspout to direct water away from wall surface or foundation.
 - 2. Where downspout connects to building perimeter drainage system, lap downspout and perimeter drainage pipe a minimum of 3 inches. At concrete perimeter drainage pipe, grout downspout in place, slope grout to shed rain away from downspout.
 - 3. Install splash pans under downspouts.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Silicone Joint Sealants.
- B. Urethane Joint Sealants.
- C. Latex Joint Sealants.
- D. Related Accessories.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. ASTM International (ASTM).
- C. Occupational Safety and Health Administration (OSHA).
- D. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Manufacturer's data sheets on each product to be used, including:
 - 1. Material descriptions, dimensions, and profiles.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- C. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.

1.4 DELIVERY, STORAGE, AND HANDLING

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

1.5 WARRANTY

- A. Provide Manufacturer's standard warranty.

PART 2 PRODUCTS

2.1 SILICONE JOINT SEALANTS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available

manufactures offering products that may incorporated into the Work include the following:

1. BASF Building Systems.
 2. Dow Corning Corporation.
 3. GE Advanced Materials - Silicones.
 4. May National Associates, Inc.
 5. Pecora Corporation.
 6. Polymeric Systems, Inc.
 7. Schnee-Morehead, Inc.
 8. Sika Corporation; Construction Products Division.
 9. Tremco Incorporated.
- B. Type: Single component (S).
- C. Grade: Pourable (P).
- D. Class: 100/50.
- E. Uses Related to Exposure: Traffic (T) and Nontraffic (NT).

2.2 URETHANE JOINT SEALANTS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
1. BASF Building Systems.
 2. Bostik, Inc.
 3. Lymtal. International. Inc.
 4. May National Associates, Inc.
 5. Pacific Polymers International. Inc.
 6. Pecora Corporation.
 7. Polymeric Systems, Inc.
 8. Schnee-Morehead, Inc.
 9. Sika Corporation; Construction Products Division.
 10. Tremco Incorporated.
- B. Type: Single component (S).
- C. Grade: Pourable (P).
- D. Class: 100/50.
- E. Uses Related to Exposure: Traffic (T) and Nontraffic (NT).

2.3 LATEX JOINT SEALANTS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
1. BASF Building Systems.
 2. Bostik, Inc.
 3. May National Associates, Inc.
 4. Pecora Corporation.
 5. Schnee-Morehead, Inc.

6. Tremco Incorporated.

B. Latex: Acrylic latex or siliconized acrylic latex.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 1 EXECUTION

1.1 PREPERATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

1. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

1.1 INSTALLATION

A. Install sealant types compatible with adjacent surfaces, materials, and finishes to which sealant may come in contact with.

B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.

2. Do not stretch, twist, puncture, or tear sealant backings.

3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- F. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION

SECTION 09 26 00

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Gypsum Board and Joint Treatments.
- B. Mold and Mildew Resistant Gypsum Board.
- C. Related Accessories.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. ASTM International (ASTM).
- C. Gypsum Association (GA).
- D. Occupational Safety and Health Administration (OSHA).
- E. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.
- B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
 - 1. American Gypsum.
 - 2. CertainTeed Gypsum, Inc.
 - 3. Georgia-Pacific Gypsum
 - 4. National Gypsum Co.
 - 5. Pabco Gypsum, Inc.
 - 6. USG Corporation.
- B. Substitutions: or equal.
- C. Requests for substitutions will be considered in accordance with Section 01 60 00.
 - 1. When submitting request for substitution, provide complete product data and MSDS sheet for each substitute product.

2.2 GYPSUM PRODUCTS, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area that correspond with the support system indicated.
- B. Recycled Content: Provide gypsum panel products with recycled content such that post consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum 50 percent by weight.

2.3 INTERIOR GYPSUM MATERIALS

- A. Regular Gypsum Board: Gypsum core panel surfaced with paper on front and back edges and complying with ASTM C 1396 and ASTM C 36.
 - 1. Thickness: 1/2 inch (12.7 mm), unless otherwise indicated.
 - 2. Width: 48 inches (1219 mm).
 - 3. Length: Use longest length available, avoiding unnecessary joints.
 - 4. Edges: Use square, rounded tapered, or tapered per required application.
- B. Regular Mold Resistant Gypsum Board: Gypsum core panel enhanced with moisture-resistant wax emulsion and chemically treated to resist mold and mildew in the core and surfaced with mold and mildew resistant paper on front, back and long edges and complying with ASTM C 1396 Section 7 and ASTM C 630.
 - 1. Thickness: 1/2 inch (12.7 mm), unless otherwise indicated.
 - 2. Width: 48 inches (1219 mm).
 - 3. Length: Use longest length available, avoiding unnecessary joints.
 - 4. Edges: Use square, rounded tapered, or tapered per required application.
 - 5. Mold and Mildew Resistance: Panel score of 10 when tested in accordance with ASTM D 3273.

2.4 GYPSUM JOINT TREATMENT AND FINISH PRODUCTS

- A. Joint Treatment Tape: Complying with ASTM C 475 and GA-216.

- B. Joint Compound: Vinyl type pre-mixed compound; complying with ASTM C 475.
- C. Joint Compound: Level Five vinyl type pre-mixed compound; off-white color or tinted gray color; complying with ASTM C 475 and fulfilling ASTM C 840; designed for joint finishing of Level Five gypsum board.

2.5 ACCESSORY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Corner Bead: Formed galvanized steel angle, min. base steel 0.014 in. thick, and complying with ASTM C 1047.
- C. Casing Bead: Formed galvanized steel or vinyl trim, matching existing application and complying with ASTM C 1047, type(s) as follows:
 - 1. J-shaped U-bead, for face nailing and finishing with joint treatment.
 - 2. J-shaped U-bead, requiring no finishing.
 - 3. L-shaped, for application over edge and finishing with joint treatment.
- D. Control Joint: Extruded vinyl formed with V-shaped slot covered with removable flexible vinyl strip; complying with ASTM C 1047.
- E. Control Joint: Bent zinc sheet formed with V-shaped slot, covered with plastic tape, with perforated flanges; complying with ASTM C 1047.
- F. Screws: ASTM C 954 or ASTM C 1002 or both with heads, threads, points, and finish as recommended by panel manufacturer.
- G. Nails: ASTM C 514 with heads, lengths, configurations, and finish as recommended by panel manufacturer.
- H. Acoustical Sealant: Nondrying, nonhardening, nonskinning, nonstaining, nonbleeding, gunnable type as recommended by panel manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

- A. Application: Apply and maintain conditions during installation in accordance with GA-216 and GA-238 and as follows:
 - 1. Keep gypsum board dry throughout application.
 - 2. Do not use gypsum board that has visible mold growth.
 - 3. Apply gypsum board on walls with a minimum 1/4 inch (6.4 mm) gap between the gypsum board and the floor.
 - 4. Do not apply gypsum board over other building materials where conditions exist that are favorable to mold growth.

5. Maintain a sound weather-tight building envelope including, such elements as the roof, sealants, windows, etc.
 6. Immediate and appropriate remediation measures must be taken as soon as water leaks or condensation sources are identified.
 7. If gypsum board is damaged by water, assess the need for replacement in accordance with GA-231.
- B. Install accordance with GA 216 and the following:
1. Gypsum Sheathing Board: ASTM C 1280 and GA-253.
 2. Gypsum Board and Joint Treatment: ASTM C 840 and GA-214.
 3. Gypsum panel manufacturer's published recommendations.
- C. Finishing: Tape, fill, sand and finish joints in accordance with ASTM C 840 and GA-214.
1. Level 2: Water resistant gypsum backing board indicated to receive tile.
 2. Level 4: Gypsum board indicated to receive light textured coatings and light-grade wall coverings.
 3. Level 5: All other gypsum board.

END OF SECTION

SECTION 09 90 00

PAINTS AND COATINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior Paint and Coatings Systems Including Surface Preparation.
- B. Exterior Paint and Coatings Systems Including Surface Preparation.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. ASTM International (ASTM).
- C. Master Painters Institute (MPI)
- D. Occupational Safety and Health Administration (OSHA).
- E. Painting and Decorating Contractors of America (PDCA).
- F. The Society for Protective Coatings (SSPC).
- G. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Product Data: For each paint system indicated, including.
 - 1. Product characteristics.
 - 2. Surface preparation instructions and recommendations.
 - 3. Primer requirements and finish specification.
 - 4. Storage and handling requirements and recommendations.
 - 5. Application methods.
 - 6. Cautions for storage, handling and installation.
- B. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacturer's products, colors and sheens available.
- D. Coating Maintenance Manual: upon conclusion of the project, the Contractor or paint manufacture/supplier shall furnish a coating maintenance manual. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.
- E. Field Coating of Vinyl Siding Methods and Procedures:

1. Manufacturer Guarantee: Submit letter from Manufacturer with acceptable product and application methods for coatings used on vinyl siding systems.
2. Quality Assurance Plan: Submit methods and procedure plan for protection of adjacent environmental items, equipment, vehicles, adjacent structures, etc.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information.
 1. Product name, and type (description).
 2. Application and use instructions.
 3. Surface preparation.
 4. VOC content.
 5. Environmental handling.
 6. Batch date.
 7. Color number.
- B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

1.5 EXTRA MATERIALS

- A. Furnish Owner with any unused materials. Properly seal canisters and label with finish and finish location for proper Owner storage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
 1. BEHR Process Corporation.
 2. Benjamin Moore & Co.
 3. Dunn-Edwards Corporation.
 4. The Sherwin-Williams Company.
- B. Substitutions: or equal.
- C. Requests for substitutions will be considered in accordance with Section 01 60 00.
 1. When submitting request for substitution, provide complete product data and MSDS sheet for each substitute product.

2.2 PAINT MATERIALS - GENERAL

- A. Paints and Coatings.
 1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless

- such procedure is specifically described in manufacturer's product instructions.
2. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color. Or follow manufactures product instructions for optimal color conformance.
- B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
 - C. Coating Application Accessories: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.
 - D. Application to Materials: Apply paints and coatings manufacturer's specifications for application to Wood, Drywall, Plaster, Metals, etc.
 - E. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.
 - F. Color: Refer to existing finishes or as selected by Owner.

2.3 INTERIOR PAINT SYSTEMS

- A. Interior Painting:
 1. Finish: Gloss, Semi-Gloss, Satin or Flat to match existing. If matching is not required, finish per Manufacturer or industry requirements for interior applications.
 2. Coats: Apply quantity of coats to match existing. If matching is not required, finish per Manufacturer or industry requirements for interior applications.
- B. Interior Primers/Sealers:
 1. Interior primers/sealers to be latex or as per Manufacturer/Industry requirements for interior applications.
- C. Interior Wood Sealers:
 1. Wood primers to be latex or as per Manufacturer/Industry requirements for interior applications.

2.4 EXTERIOR PAINT SYSTEMS

- A. Exterior Painting:
 1. Finish: Gloss, Semi-Gloss, Satin or flat to match existing. If matching is not required, finish per Manufacturer or industry requirements for exterior applications.
 2. Coats: Apply quantity of coats to match existing. If matching is not required, finish per Manufacturer or industry requirements for exterior applications.
- B. Exterior Primers/Sealers:
 1. Water based primers/sealers to be alkali resistant and/or bonding or as per Manufacturer or industry requirements for exterior applications.
- C. Exterior Wood Sealers:
 1. Wood primers to be alkyd and/or latex or as per Manufacturer or industry requirements for exterior applications.

- D. Vinyl Siding:
 - 1. Primers and finishes as per manufacturer or industry requirements for vinyl application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared; notify MCA of unsatisfactory conditions before proceeding. If substrate preparation is the responsibility of another installer, notify MCA of unsatisfactory preparation before proceeding.
- B. Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.
 - 1. Previously Painted Surfaces: Verify that existing painted surfaces do not contain lead based paints, notify MCA immediately if lead based paints are encountered.

3.2 SURFACE PREPARATION

- A. General: Surfaces shall be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
 - 1. Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry a minimum of 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.
 - 2. Remove items including but not limited to thermostats, electrical outlets, switch covers and similar items prior to painting. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
 - 3. No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50 degrees F (10 degrees C), unless products are designed specifically for these conditions. On large expanses of metal siding, the air, surface and material temperatures must be 50 degrees F (10 degrees F) or higher to use low temperature products.
- B. Drywall - Interior: Must be clean and dry. All nail heads must be set and spackled. Joints must be taped and covered with a joint compound. Spackled nail heads and tape joints must be sanded smooth and all dust removed prior to painting.
- C. Plaster: Must be allowed to dry thoroughly for at least 30 days before painting, unless the products are designed to be used in high pH environments. Room must be ventilated while drying; in cold, damp weather, rooms must be heated. Damaged areas must be repaired with an appropriate patching material. Bare plaster must be cured and hard. Textured, soft, porous, or powdery plaster should be treated with a solution of 1 pint household vinegar to 1 gallon of water. Repeat until the surface is hard, rinse with clear water and allow to dry.
- D. Vinyl Siding, Architectural Plastics, EIFS and Fiberglass: Clean vinyl siding thoroughly by

scrubbing with a warm, soapy water solution. Rinse thoroughly. Do not paint vinyl siding with any color darker than the original color unless approved by Manufacturer.

- E. Wood: Must be clean and dry. Prime and paint as soon as possible. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth.

3.3 INSTALLATION

- A. Apply all coatings and materials with the manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendations.
- B. Apply primer to all materials receiving a finish coat of paint.
- C. Do not apply to wet or damp surfaces. Wait at least 30 days before applying to new concrete or masonry. Or follow manufacturer's procedures to apply appropriate coatings prior to 30 days. Test new concrete for moisture content. Wait until wood is fully dry after rain or morning fog or dew.
- D. Apply coatings using methods recommended by manufacturer and uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.
- E. Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness. Regardless of number of coats specified, apply as many coats as necessary for complete hide, and uniform appearance.
- F. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.
- G. Comply with the manufacturer's instructions, specified industry standards and recommendations for cleaning, traffic, furnishings installation and equipment installation.

END OF SECTION

SECTION 09 93 00

STAINING AND TRANSPARENT FINISHING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Exterior Coating With Transparent and Semi-Transparent Finishes.
- B. Interior Coating With Transparent and Semi-Transparent Finishes.

1.2 REFERENCES

- A. American National Standards Institute (ANSI/ASSE).
- B. ASTM International (ASTM).
- C. Occupational Safety and Health Administration (OSHA).
- D. The Society for Protective Coatings (SSPC).
- E. Underwriters Laboratories (UL).

1.3 SUBMITTALS

- A. Product Data: For each paint system indicated, including.
 - 1. Product characteristics.
 - 2. Surface preparation instructions and recommendations.
 - 3. Primer requirements and finish specification.
 - 4. Storage and handling requirements and recommendations.
 - 5. Application methods.
 - 6. Cautions for storage, handling and installation.
- B. Submit Material Safety Data Sheets (MSDS) prior to commencement of work for review and for filing at job site as required.
- C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacturer's products, colors and sheens available.
- D. Coating Maintenance Manual: upon conclusion of the project, the Contractor or paint manufacture/supplier shall furnish a coating maintenance manual. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information.
 - 1. Product name, and type (description).

2. Application and use instructions.
 3. Surface preparation.
 4. VOC content.
 5. Environmental handling.
 6. Batch date.
 7. Color number.
- B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

1.5 EXTRA MATERIALS

- A. Furnish Owner with any unused materials. Properly seal canisters and label with finish and finish location for proper Owner storage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufactures offering products that may incorporated into the Work include the following:
1. Dura Seal.
 2. Minwax Company.
 3. Rust-Oleum Corporation.
 4. The Sherwin-Williams Company.
 5. United Gilsonite Laboratories.
- B. Substitutions: or equal.
- C. Requests for substitutions will be considered in accordance with Section 01 60 00.
1. When submitting request for substitution, provide complete product data and MSDS sheet for each substitute product.

2.2 STAIN MATERIALS - GENERAL

- A. Stains and Coatings - General:
1. Unless otherwise indicated, provide factory-mixed materials. Mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials unless such procedure is specifically described in manufacturer's product instructions.
 2. Supply each material in quantity required to complete entire project's work from a single production run.
- B. Back Primer for Transparent-Finished Woodwork:
1. Same as finish coat.
 2. 1 coat nitrocellulose lacquer sanding sealer (for use under lacquer).
 3. 1 coat vinyl toluene copolymer(for use under polyurethane).

- C. Wood Filler: Use products as appropriate to repair per Manufacturer's instructions.
- D. Stain Touch-Up: Use products as appropriate to repair per Manufacturer's instructions.
- E. Shellac, Lacquer, and Varnish Remover: Use products as appropriate to repair per Manufacturer's instructions.
- F. Application Accessories: Provide all primers, sealers, cleaning agents, tools, cleaning cloths, sanding materials, and clean-up materials required and per Manufacturer recommendations.

2.3 INTERIOR FINISH SYSTEMS

- A. Interior Wood:
 - 1. Finish: Low Luster, Satin, Semi-Gloss, or High-Gloss to match existing. If matching is not required, finish per Manufacturer or industry requirements for interior applications.
 - 2. Coats: Apply quantity of coats to match existing. If matching is not required, finish per Manufacturer or industry requirements for interior applications.
 - 3. Color: Match existing and per Owner's approval.

2.4 EXTERIOR PAINT SYSTEMS

- A. Exterior Wood:
 - 1. Finish: Gloss, Semi-Gloss, Satin or flat to match existing. If matching is not required, finish per Manufacturer or industry requirements for exterior applications.
 - 2. Coats: Apply quantity of coats to match existing. If matching is not required, finish per Manufacturer or industry requirements for exterior applications.
 - 3. Color: Match existing and per Owner's approval.

2.5 EXAMINATION

- A. Do not begin application of coatings until substrates have been properly prepared.

2.6 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

2.7 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Stir before and during application as recommended by manufacturer.
- C. Do not apply to wet or damp surfaces.
- D. Apply using methods recommended by manufacturer.
- E. Apply without runs, drips, or sags, without brush marks, and with consistent sheen.

- F. Apply at spreading rate required to achieve the manufacturer's recommended film thickness.
- G. Regardless of number of coats specified, apply as many coats as necessary for complete hide, and uniform appearance.
- H. Exterior Woodwork: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 2 weeks.
- I. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.
- J. Comply with the manufacturer's instructions, specified industry standards and recommendations for cleaning, traffic, furnishings installation and equipment installation.

END OF SECTION

SECTION 22 00 10 –

PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 01 Specification Sections, apply to work of this Section.
- B. The requirements specified in Section 23 00 01, "Basic Mechanical Requirements," apply to this Section.
- C. Codes and Standards (comply with applicable editions) shall include, but are not limited to:
 - 1. Comply with the Safe Drinking Water Act, the Reduction of Lead in Drinking Water Act and NSF 91 no-lead requirements for all applicable equipment, piping, fittings, valving, solder, materials.
 - 2. Comply with the State Building, Plumbing, Fire, Mechanical and Energy Codes.
 - 3. Comply with NFPA 54, National Fuel Gas Code.

1.2 SCOPE OF WORK:

- A. This Section includes the providing of all labor, materials, fixtures, equipment, accessories, services and tests necessary to complete and make ready for operation by the Owner all plumbing work as shown on the Drawings and described in these Specifications. It is the intent of these Documents to terminate with complete, tested and operational plumbing systems within the house. Existing sanitary, water and gas services that enter the building shall be cut back and capped away from the foundation demolition and away from the grade beam excavations.
- B. Provide new sanitary, water and gas services to the house. Provide positive means of protecting the sanitary, waste and water piping from damage and from freezing. Sanitary and water services shall be run in new enlarged, waterproof, insulated vertical chases from beneath the slab up to the new insulated and waterproof cavity created beneath the first floor and the Electrical Contractor shall heat trace the water and sanitary vertical piping to prevent freezing.
- C. Piping in the new insulated cavity beneath the first floor shall be coordinated so as to not conflict with the new structural work or other work of other trades and shall be properly supported or replaced. Provide access to heat trace, valves and cleanouts.

- D. Material finishes exposed to occupants, including materials above finish ceilings where plenums are used, shall meet all applicable UL requirements and shall have a flame spread rating not exceeding 25 and smoke developed rating not exceeding 50.
- E. The work shall include but not be limited to the following:
 - 1. Modifications to suit new work and to retain a complete sanitary system including fixtures, drains, and vent connections. Terminate this piping 5'-0" outside of building for continuation by Other Divisions.
 - 2. Modifications to suit new work and to retain a complete system of cold water piping as shown on the plans or as required for fixture connections. Terminate this piping 5'-0" outside of building for continuation by other Divisions.
 - 3. Modifications to suit new work and to retain a complete system of domestic service hot water and recirculating hot water piping from the domestic water heating plant, including recirculating pumps and controls.
 - 4. Modifications to suit new work and to retain a complete set of plumbing fixtures, fittings and trim.
 - 5. Insulation of piping and equipment.
 - 6. Modifications to suit new work and to retain a complete system of roughing and connections to existing Owner's fixtures and equipment.
 - 7. Sleeves, inserts, anchor bolts.
 - 8. Pipe expansion compensation.
 - 9. Seismic requirements.
 - 10. Plastic pipe markers.
 - 11. Access doors.
 - 12. Testing and instruction of Owner's representatives.
 - 13. Provide a complete natural gas piping system to recommendations of NFPA 54, local gas utility and all authorities having jurisdiction.

1.3 WORK BY OTHERS:

- A. The following paragraphs list the only items of labor and materials incident to or related to the installation of the plumbing work which will be provided by others at no cost to this Section.

- B. All paper holders, towel bars, grab bars, mirrors, medicine cabinets and other accessories will be provided by other Divisions.
- C. Installation of base flashing around all vent stacks and soil stacks will be by other Divisions.
- D. All chases and furred spaces will be furnished by other Divisions. Notify well in advance of all requirements.
- E. Finish painting of exposed work installed under this contract will be by other Divisions unless specifically noted otherwise.
- F. All electric wiring to equipment installed under this Section will be by the Division 26. Coordinate all requirements in advance.
- G. Demolition, cutting, patching, excavation and backfill outside and inside the building shall be by other Divisions.
- H. Access panels shall be furnished by this Section for installation by the other Divisions unless otherwise indicated.
- I. Temporary services and facilities shall be by other Divisions.

1.4 SHOP DRAWINGS:

- A. Submit five (5) copies of Product Data to the Architect in accordance with Section 23 00 01, "Basic Mechanical Requirements."
- B. Submittals shall be given for the following materials and equipment.
 - 1. Plumbing fixtures, fittings and trim where modified.
 - 2. Fixture supports, drains and cleanouts where modified.
 - 3. Backflow preventers, pressure reducing valves and mixing valves.
 - 4. Piping, cleanouts, valves, fittings, coupling assemblies and piping specialties.
 - 5. Piping and fitting insulation and covering.
 - 6. Fabrication Drawings showing sizes and layouts of modified systems.

PART 2 - PRODUCTS

2.1 SANITARY, WASTE AND VENT PIPING MATERIAL:

- A. Soil, waste and vent piping and stacks shall be of sizes indicated on Drawings, shall be run in no hub cast iron complying with the latest edition of ASTM A888 or the latest edition of the Cast Iron Soil Pipe Institute Standard 301. The piping shall be marked with the Collective Trademark of the Cast Iron Soil Pipe Institute, listed by NSF International and as indicated on Drawings.
- B. All offsets shall be made at an angle of not more than 45 degrees and all horizontal piping shall have a pitch of not less than 1/8" per foot. Branch soil, waste and vent connections shall be run to the soil stack, waste stack, house drain or vent stack as shown on plans. Where practical, two or more vent pipes shall be connected together and extended as one pipe through the roof. Vertical vent pipes may be connected to main vent riser above fixtures vented. Where an end-circuit vent pipe from any fixture, or line of fixtures, is to be connected to a vent line serving other fixtures, the vent line shall be extended above the highest flood rim before being connected to the other vent lines, so as to prevent the use of any vent line as a waste pipe.
- C. All changes in pipe size on soil, waste and drain lines shall be made with reducing fittings or recessed reducers. Y-fittings and 1/8 or 1/16 bends or combination Y and 1/8 bends shall be used where possible.
- D. Sanitary long-sweep bends and T's shall be used for connection to branch lines for fixtures. On vertical runs of pipe, long-turn fittings shall be used wherever conditions permits.
- E. All horizontal lines not assigned invert elevations shall run at 1/4" per foot pitch. Check carefully all existing elevations before proceeding so as to keep within areas shown on Architectural Drawings.
- F. Where vent piping is run concealed in partitions, use special care to insure that all lines are maintained in their proper locations in the partitions so that no bends, fittings or parts of the piping will be visible.
- G. Wherever new 3" or less soil or vent stacks pass through the roof, they shall be increased to 4" in size. New vent piping through the roof shall be 4".
- H. Vent or soil stacks run adjacent to the exterior walls of the building shall be offset back so that their roof penetrations will be inconspicuous from the street.
- J. Stainless steel coupling assemblies used in conjunction with No-Hub cast iron soil, waste and vent pipe in buildings up through two storys shall be tightened to 60 inch-pounds torque on each nut or bolt head with a torque wrench specifically designed for the purpose. Each nut or bolt head shall be retorqued after not less than four (4) hours. The use of screwdrivers or other types of wrenches shall not be permitted for this purpose.

- K. For all other applications, heavy duty stainless steel couplings used in conjunction with No-Hub cast iron soil, waste and vent pipe shall be tightened to 80 inch-pounds or torque per band (Husky), 125 inch-pounds or torque (Clamp-All per band, MG per screw).

2.2 WATER PIPING MATERIALS:

- A. Water piping below ground shall be Type K copper to local water company's requirements.
- B. Water piping above grade shall be hard drawn copper tubing, Type L, in strict accordance with Federal Specification WE-T-799.
- C. All new exposed water supply piping to fixtures, including piping within cabinets or vanities shall be chrome plated copper or polished chrome plated brass. Provide chromed escutcheons at piping penetrations of walls and cabinets.

2.3 PIPE JOINTS AND CONNECTIONS:

- A. Compression type gaskets, as manufactured by Husky Technologies, a Division of Anaheim Foundry Co., Clamp-All Manufacturing Corp., MG Coupling Co., or Tyler Pipe & Foundry Company conforming to ASTM Spec. C1540, are permitted in conjunction with cast iron soil piping below grade for buildings up through two storys. Provide "heavy duty" No-Hub couplings for all other applications as manufactured by Husky Technologies, a Division of Anaheim Foundry Co. (Husky SD-4000 "orange shield"), or clamp-all manufacturing (Hy-Torq 125) or MG Coupling Co. (MG Cast Iron Coupling).
- B. Coupling assemblies for No-Hub cast iron soil pipe shall consist of a stainless steel corrugated shield and tightening device, conforming to CISPI Std. 310-95, and a neoprene sealing sleeve, conforming to ASTM Spec. C564, assembled at the factory as a complete unit.
- C. Heavy duty no-hub couplings shall be type 304 stainless steel or cast iron and provide a minimum shield thickness of 0.015" and width of 3" for pipe sizes through 4", 4" width for pipes 5" and larger.
- D. Copper tubing shall be soldered with 95-5 and noncorrosive flux. Thoroughly clean inside and outside surfaces with sandpaper or wire brush before assembly. Defective joints shall be dismantled, cleaned and resoldered.
- E. All joints between steel or iron and copper shall be made with approved isolating fittings equal to Epoxo, or Walter Vallett Company 'V' line insulating couplings.
- F. All joints in threaded pipe shall be made with approved components. The ends of each pipe shall be reamed free from burrs and kept free from scale and dirt. A thin coat of approved pipe compound shall be applied to male fittings.

2.4 CLEANOUTS:

- A. Finished Floor: J.R. Smith 4023-U-PB, cast iron body, round adjustable polished bronze top with vandal proof screws. Provide J.R. Smith suffix DX wide flange when cleanouts are located in framed upper levels.
- B. Carpeted Floor: J.R. Smith 4025-U-X-PB, cast iron body, round adjustable polished bronze top with vandal proof screws and carpet marker. Provide J.R. Smith suffix DX wide flange when cleanouts are located in framed upper levels.
- C. VCT or Linoleum Type Floors: J.R. Smith 4143-U-PB, cast iron body, round adjustable polished bronze top with vandal proof screws, recessed for vinyl composite tile, linoleum and similar sheet floors. Where required to support cleanouts to manufacturer recommendations in framed floors, provide J.R. Smith suffix -F flashing flange and flashing clamp suffix -C.
- D. Terrazzo Floor: J.R. Smith 4183-U-NB, cast iron body, round adjustable nickel bronze top with vandal proof screws, recessed for terrazzo and similar poured floors. Provide J.R. Smith suffix DX wide flange when cleanouts are located in framed upper levels.
- E. Unfinished Floors: J.R. Smith 4243-U, cast iron body, round adjustable scoriated cast iron top with vandal proof screw. Provide J.R. Smith suffix DX wide flange when cleanouts are located in framed upper levels.
- F. Wall: J.R. Smith 4553-U-PB, cast iron cleanout tee with No Hub outlet, vandal proof screws and polished bronze frame and cover. Provide factory fabricated extension to wall as required.

2.5 UNIONS:

- A. Where union connections are installed on pipe 2" in diameter and smaller, they shall be of brass composition 'B' in accordance with Federal Specification WW-U-516.
- B. In general, all piping shall be provided at intervals with unions to permit alterations and repairs.

2.6 VALVES:

- A. Ball valves, 2" and smaller, shall be Jenkins figure 32-A, or equal, having two piece bronze body (ASTM B584), integral body bolts, TFE seat, threaded ends and rated for 400 PSI-WOG. Ball valves shall be full port and suitable for the WOG duty indicated.
- B. Gate valves 2-1/2" and smaller shall be Fairbanks figure 0280 C-C or equal. 3" and larger shall be Fairbanks figure 0403 F.E. or equal.
- C. Stop and waste gate valves 2" and smaller, shall be Fairbanks figure 0284, bronze body, solid wedge, non-rising stem, solder ends, rated for 300 PSI non-shock.

- D. Check valves 2" and smaller, shall be Jenkins figure 4093, bronze, rated for 300 PSI-WOG, solder ends, bronze disc, horizontal swing.
- E. Pressure reducing valves, 2" and smaller, shall be Watts U5B, bronze body, union inlet with threaded tailpiece, integral stainless steel strainer, built in thermal expansion bypass check valve and rated for 300 PSI.
- F. Pressure reducing valves, 3" size, shall be Watts No. N223 with auxiliary regulator tappings piped to 3/4" Watts No. 223.
- G. Hose end drain valves, 1-1/2" and smaller, shall be Jenkins 112 or 113, bronze body, threaded inlet and hose outlet, rated for 300 PSI non-shock water.

2.7 HANGERS:

- A. Hangers for copper tubing shall be copper plated, equal to Tolco Fig. 81. All other hangers shall be adjustable clevis or trapeze hangers. Hanger rods shall have machine threads.
- B. Hangers shall include seismic restraint devices indicated elsewhere in these specifications.

2.8 FLASHING:

- A. Where new plumbing pipes projecting through the roof, the piping shall be made tight with a 16 oz. counter flashing. Counter flashing shall be of recommended type to match the roofing construction and shall be as approved by the Architect. Counter flashing shall lap base flashing by at least 3". Base flashing shall be by other Divisions.

2.9 INSULATION:

- A. Cover all new piping scheduled below with Owens Corning Fiberglas 25 ASJ insulation with sealed vapor barrier jacket. Cover all sanitary, waste and water piping in the new cavity below the first floor with Owens Corning Fiberglas 25 ASJ insulation with sealed vapor barrier jacket.

<u>SERVICE</u>	<u>PIPE SIZE</u>	<u>THICKNESS</u>
Cold Water	1-1/2" and smaller	1.0"
	2" and larger	1.5"
Hot Water	2" and smaller	1.0"
	2-1/2" and larger	1.5"
Recirc. Hot Water	2" and smaller	1.0"
	2-1/2" and larger	1.5"

- B. Cover all fittings and valve bodies with Zeston premolded PVC insulated pipe fittings. Glass fiber blanket in the Zeston fitting shall be compressed to the thickness of the adjacent insulation. On cold water fittings, the Zeston jacket shall be vapor sealed and banded to the adjacent covering. On hot water fittings, the jacket shall be banded only. With prior approval from the Architect, the following option may be exercised on cold water fittings in constricted work areas: cover with fiberglass blanket insulation with vapor barrier jacket lapping adjacent pipe insulation.

2.10 PLUMBING FIXTURES:

- A. It is the intent to retain use of the existing plumbing fixtures unless damaged by the overall work of the Project. Where the existing plumbing fixtures are damaged, replace with new matching plumbing fixtures, supports, supplies, stops, traps and drains as applicable. Unless indicated otherwise, provide complete installation of new plumbing work to manufacturer's recommendations.
- B. Lavatory Supports: Unless indicated otherwise, provide adjustable cast iron, with thin concealed arms and sleeves, and complete with escutcheons and mounting fasteners.
- C. Water Closet Supports: Unless indicated otherwise, provide adjustable, factory painted, cast iron face plate, support base, and appropriate type waste fitting having face plate gasket; zinc plated steel fixture studs and fasteners; coated and threaded adjustable wall coupling with neoprene closet outlet gasket; and chrome plated fixture cap nuts and fiber fixture washers. Provide an appropriate model to suit deep or shallow rough-in, siphon jet water closet, and type of sanitary piping system to which it is connected.
- D. Toilet Seats: Unless indicated otherwise, provide elongated, solid white heavy duty, plastic comfort curve seat having stainless steel check hinge and replaceable bumpers. Residential water closets shall include a cover on seat and non-residential water closets shall be less cover.
- E. Supplies and Stops for Lavatories and Sinks: Unless indicated otherwise, provide polished chrome-plated, loose-keyed angle stop having 1/2" inlet and 3/8" O.D. x 12" long flexible tubing outlet, and wall flange and escutcheon.
- F. Supplies and Stops for Water Closets and Bidet: Unless noted otherwise for new tank type, provide polished chrome-plated, loose-keyed angle stop having 1/2" inlet and 3/8" O.D. x 12" long flexible tubing outlet with collar, and wall flange and escutcheon. Unless noted otherwise, for flush valve type, provide concealed, individual, in-line ball valve for isolation purposes where no other means of individual flush valve isolation is provided. Provide access door where valves are not easily accessible.
- G. Traps: Unless indicated otherwise, provide new traps of cast brass, 1-1/4" adjustable "P" trap with cleanout and waste to wall.
- H. Escutcheons: Unless indicated otherwise, provide chrome-plated cast brass with set screw.

- J. Unless noted otherwise, new showers shall be complete with vented trap, grid strainer and lever type, tight sealing, vented trap drain stop with lever located in overflow trim.
- K. Fixture supports, where modified, shall be of the best quality of manufacturer and shall be suitable for the location and duty proposed. Drains shall be located at low points of the floors, where indicated on the Architectural Drawings. Supports shall be securely anchored and supported from the building structure in an approved manner. Provide offsets, extensions, flanges, blocking and adapters as required.

2.12 GAS PIPING:

- A. All gas piping shall be Steel Pipe: ASTM A 53, Schedule 40, seamless, black steel pipe, beveled ends. For house line pressure 14" w.c. or less:
 - 1. Screwed through 2".
 - 2. Welded 2-1/2" and over.

2.13 ACCEPTABLE MANUFACTURERS:

- A. Subject to compliance with requirements, provide equipment or material of one of the following manufacturers listed.
- B. Water Closets, Urinals, Lavatories and Service Sinks shall be of the same manufacturer when located in the same room.
 - 1. American Standard, Inc.
 - 2. Kohler Co.
 - 3. Zurn
 - 4. Crane/Fiat
- C. Sinks:
 - 1. Elkay Manufacturing Company
 - 2. Just Manufacturing Company
 - 3. American Standard, Inc.
 - 4. Kohler Co.
 - 5. Moen Incorporated

D. Fixture Trim:

1. Symmons Industries, Inc.
2. Moen Incorporated
3. American Standard, Inc.
4. The Chicago Faucet Co.
5. Delta Faucet Co.
6. Elkay Manufacturing Company

E. Water Closets Seats:

1. Olsonite Corporation
2. Church Seat Company
3. Bemis Manufacturing Company

F. Cleanouts, Fixture Supports and Floor Drains:

1. Jay R. Smith Mfg. Co.
2. Wade Division/Tyler Pipe
3. Zurn Industries, Inc., Hydromechanics Div.
4. Josam
5. Watts Drainage Products, USA

G. Valves:

1. Apollo
2. Jenkins
3. Fairbanks
4. Milwaukee
5. Nibco Inc.
6. Watts Regulator Co.

7. Hammond Valve Corp.
8. Jomar International
- H. Piping and Equipment Insulation:
 1. Owens-Corning Fiberglas Corporation
 2. Manville
 3. Knauf Fiber Glass
 4. CertainTeed Corporation
- J. No-Hub Cast Iron Pipe:
 1. Charlotte Pipe and Foundry Company
 2. Tyler Pipe and Foundry
 3. AB&I Foundry
- K. No-Hub Coupling Assemblies:
 1. Up through Two Stories
 - a. Tyler Pipe & Foundry Company
 - b. Husky Technologies, Anaheim Foundry Company
 - c. Clamp-All Manufacturing Corp.
 - d. MG Coupling Company
 2. Over Two Stories, Heavy Duty:
 - a. Husky Technologies, Anaheim Foundry Company (Orange Shield HD 4000)
 - b. Clamp-All Manufacturing Corp. (Hy-Torq 125)
 - c. MG Coupling Company (MG Cast Iron Couplings)
- L. Fixture Supports:
 1. J.R. Smith

2. Tyler Pipe
 3. Zurn Industries, Inc.
 4. Wade
 5. Josam
- M. Showers:
1. Lasco
 2. Aquarius
 3. American Standard, Inc.
 4. AquaGlass
 5. Aker

PART 3 - EXECUTION

3.1 SANITARY, WASTE AND VENT PIPING INSTALLATION:

- A. New Soil, waste and vent stacks of sizes indicated on Drawings shall be run as indicated on Drawings. All offsets shall be made at an angle of not more than 45 degrees and all horizontal piping shall have a pitch of 1/4" per foot (with specific Architectural approval, specific horizontal piping may have a pitch of not less than 1/8" per foot to local/state codes). Branch soil, waste and vent connections shall be run to the soil stack, waste stack, house drain or vent stack as shown on plans. Where practical, two or more vent pipes shall be connected together and extended as one pipe through the roof. Vertical vent pipes may be connected to main vent riser above fixtures vented. Where an end-circuit vent pipe from any fixture, or line of fixtures, is to be connected to a vent line serving other fixtures, the vent line shall be extended above the highest flood rim before being connected to the other vent lines, so as to prevent the use of any vent line as a waste pipe.
- B. All changes in pipe size on soil, waste and drain lines shall be made with reducing fittings or recessed reducers. Y-fittings and 1/8 or 1/16 bends or combination Y and 1/8 bends shall be used where possible.
- C. Sanitary long-sweep bends and T's shall be used for connection to branch lines for fixtures. On vertical runs of pipe, long-turn fittings shall be used wherever conditions permits.

- D. All horizontal lines not assigned invert elevations shall run at 1/4" per foot pitch. Check carefully all existing elevations before proceeding so as to keep within areas shown on Architectural Drawings. Where specific locations require less pitch, and where specific Architectural approval is received, specific horizontal piping may have a pitch of not less than 1/8" per foot to local/state codes).
- E. Where vent piping is run concealed in partitions, use special care to insure that all lines are maintained in their proper locations in the partitions so that no bends, fittings or parts of the piping will be visible.
- F. Minimum vent piping through the roof (VTR), where new, shall be 4". New VTR shall be elevated so the minimum opening elevation above the roof plane shall be to code, above the snow load and clear from windows, doors and intakes. Minimum VTR opening elevation, where new, shall be thirty (30") inches on flat roofs (where flat roofs may be considered to have a pitch not exceeding three-quarter inch per linear foot) and eighteen (18") inches on pitched roofs. Wherever 3" or less soil or vent stacks pass through the roof, they shall be increased to 4" in size.
- G. New vent or soil stacks run adjacent to the exterior walls of the building shall be offset back so that their roof penetrations will be inconspicuous from the street.
- H. Stainless steel coupling assemblies used in conjunction with No-Hub cast iron soil, waste and vent pipe in buildings up through two storys shall be tightened to 60 inch-pounds torque on each nut or bolt head with a torque wrench specifically designed for the purpose. Each nut or bolt head shall be retorqued after not less than four (4) hours. The use of screwdrivers or other types of wrenches shall not be permitted for this purpose.
- I. For all other applications, heavy duty stainless steel couplings used in conjunction with No-Hub cast iron soil, waste and vent pipe shall be tightened to 80 inch-pounds or torque per band (Husky), 125 inch-pounds or torque (Clamp-All per band, MG per screw).
- J. In all cases, unless specifically indicated otherwise, pipes shall be installed within the heated building envelope and as close to overhead construction as conditions will permit to give maximum headroom and avoid structural members. Check all structural, architectural, electrical and heating/ventilating/air conditioning drawings to confirm that piping will not conflict with such work. Ensure all piping, valves and appurtenances are on the heated side of building insulation, unless specifically indicated otherwise.

3.2 WATER SERVICE:

- A. Make arrangements with the local authorities for the new domestic water service entrance. Complete installation shall be in accordance with local water company's requirements.
- B. Provide concrete thrust blocks and retaining clamps at all changes of direction and wall penetrations when required by Architect or other authorities having jurisdiction.

3.3 WATER PIPING INSTALLATION:

- A. All branches from mains shall be supplied with ball valves. Connections shall be made from the top of the mains, unless otherwise specified; branches shall drain toward the mains. The piping installation shall be so arranged that the entire system can be drained through accessible valves at low points; provide the necessary valves.
- B. Furnish and install a stop valve at each fixture supply. Also provide a water hammer arrester at each hot and cold water supply for each fixture. Where a branch supply serves more than one fixture piped within the same plumbing chase, one water hammer arrester may service the group of fixtures. Water hammer arresters shall be by Precision Plumbing Products, Inc. and shall be sized in accordance with the manufacturer's recommendations. Provide access doors to allow replacement of arresters.
- C. All piping shall be run concealed throughout finished spaces, either in furred spaces, shafts or above false ceilings, furred beams, etc., as indicated. Piping shall be run exposed in Mechanical Room and other areas where concealment is not possible.
- D. In all cases, pipes shall be installed within the heated building envelope and as close to overhead construction as conditions will permit to give maximum headroom and avoid structural members. Check all structural, architectural, electrical and heating/ventilating/air conditioning drawings to confirm that piping will not conflict with such work. Ensure all piping, valves and appurtenances are on the heated side of insulation.
- E. Provide chromed escutcheon plates at all exposed piping penetrations of walls, floors, ceilings and partitions.
- F. Water piping is not permitted in stairwells, except for piping directly supplying fixtures in these areas.

3.4 CLEANOUT INSTALLATION:

- A. Provide cleanouts of the same size as the line served up to 4", or of 4" size for larger lines, at the following locations: at base of each subsoil and waste stack, at changes in direction greater than 45 degrees in soil, waste, and drain lines in the building, at intervals not to exceed 50' in all runs of soil, waste, and drain lines, and elsewhere as shown on the drawings or as required by the State Building and Plumbing Codes. Final locations of visible finishes and locations shall be reviewed with and have approval of the Architect. Relocate as directed by the Architect at no additional cost to the owner.
- B. Cleanouts shall be extra heavy cast iron, with heavy brass or bronze plugs, and shall be extended to and brought flush with floor or wall surfaces. Plugs shall have countersunk nuts and shall be coated and installed so that they are readily accessible and removable for cleaning the lines.

3.5 VALVE INSTALLATION:

- A. Furnish and install valves where shown on the plans and where necessary to make the system complete in its operation. A valve shall be installed at the base of each new hot and cold water riser. All valves shall be located to permit easy system operation, replacement and repair, and to permit complete control of all plumbing systems.

3.6 HANGERS, ANCHORS, GUIDES AND SUPPORTS IN BUILDING:

- A. All piping shall be supported from the building structure by means of approved hangers and supports. Piping shall be supported to maintain required grading and pitching of lines, to prevent vibration, and to secure piping in place. Piping shall also be so arranged as to provide for expansion and contraction.
- B. Vertical cast iron soil pipe shall be secured at sufficiently close intervals to keep pipe in alignment and to support the weight of the pipe and its contents. Support stacks at their bases and at each floor interval using approve metal clamps or hangers for this purpose.
- C. Horizontal PVC piping suspended above grade shall be supported at four foot intervals to maintain alignment and prevent sagging or grade reversal. Hangers shall be located not more than 18" from the joints.
- D. Vertical copper tubing shall be supported at each floor interval for piping 1-1/2" and larger, and at not more than four foot intervals for piping 1-1/4" and smaller.
- E. Horizontal copper tubing shall be supported at six foot intervals for piping 1-1/2" and smaller and ten foot intervals for piping 2" and larger.

3.7 GROUNDS AND SUPPORTS:

- A. Unless otherwise specified, plumbing fixtures and accessories are to be secured to grounds or other woodwork with heavy, countersunk, steel wood screws.
- B. Coordinate the exact locations of wood blocking, backing or metal framing for the proper hanging of all fixtures.

3.8 PLUMBING FIXTURES - GENERAL REQUIREMENTS:

- A. Provide all fixtures in accordance with the Drawings and with the Plumbing Fixture Schedule.
- B. All materials specified as chromium plated shall be thoroughly cleaned and polished before plating. Plate shall be heavily, thoroughly and evenly applied, and guaranteed not to strip or peel.
- C. Provide escutcheons when they are not furnished with plumbing fixtures. Polished chrome escutcheons shall be installed at all exposed piping penetrations of walls.

- D. Each fixture shall be separately trapped, using the type and size of trap required by the State Plumbing Code.
- E. Unless otherwise specified, faucets and all exposed fittings and trim shall be chromium plated.
- F. Flush controls for handicap accessible water closets shall be mounted for use from the wide side of the area and mounted at heights shown on architectural drawings.
- G. Plumbing fixtures shall be of the best quality as fabricated by manufacturers of established reputation.
- H. All fixtures shall have the manufacturer's guarantee label or trademark indicating first quality. All acid resisting enameled ware shall bear the manufacturer's symbol signifying acid resisting material.
- I. Brass shall conform to Federal Specification QQ-B-611 'A' (composition 'A'). Brass tubing shall not be lighter than #17 gauge.
- J. Chromium plating for brass shall be applied on a base plating of nickel. Chromium plating shall be in accordance with Federal Specification WW-P-541.
- K. All fixtures requiring hot and cold water shall have cold water supply on the right hand side of the fixture and hot water supply on the left hand side of the fixture.
- L. The Architect shall be the final judge as to whether fixtures fulfill the requirements of the specifications and as to whether they are of a suitable quality.
- M. Electrical characteristics (voltage and phase) of all electrical equipment, including pumps and water heaters, shall be verified with the Electrical Contractor before ordering.
- N. Install plumbing fixtures level and plumb, in accordance with fixture manufacturer's written instructions, rough-in drawings, and pertinent codes and regulations, the original design, and the referenced standards.
- O. Fasten plumbing fixtures securely to supports or building structure. Secure supplies behind or within wall construction to provide rigid installation.
- P. Install a stop valve in an accessible location in all water connections to each fixture.
- Q. Install escutcheons at each wall, floor, and ceiling penetration in exposed finished locations even within and beneath cabinets and millwork.
- R. Seal fixtures to walls and floors using approved sealant; match sealant color to fixture color.

- S. Test fixtures to demonstrate proper operation upon completion of installation and after units are water pressurized. Replace malfunctioning units, then retest.
- T. Inspect each installed unit for damage. Replace damaged fixtures.
- U. Adjust water pressure at service for drinking fountains, faucets, shower valves, flush valves, etc. to provide proper flow and stream.
- V. Replace washers and/or cartridges of leaking or dripping faucets and stops.
- W. Clean fixtures, trim, and strainers using manufacturer's recommended cleaning methods and materials.
- X. Provide protective covering for installed fixtures, water coolers, and trim; remove protective coverings prior to final review and reclean as necessary.
- Y. Do not allow use of fixtures for temporary facilities unless expressly approved in writing by the Owner.
- Z. Rough-in sizing shall be as noted in Plumbing Fixture Schedule on drawings.

3.9 PROTECTION OF FIXTURES:

- A. Protect against injury from building materials, acids, tools and equipment, all plumbing fixtures included in this section of the Specifications, with suitable and substantial covers. Any damage to, or replacement of, fixtures or equipment made necessary by failure of this Contractor to provide suitable protection, shall be paid for by this Contractor.

3.10 INSULATION:

- A. All insulation shall be applied in accordance with the recommendations of the manufacturer and in a neat and workmanlike manner by personnel regularly employed at this trade.
- B. Hangers in direct contact with cold water piping shall be insulated from the pipe to a distance of 6" along the hanger and rod with Zeston PVC tape, 10 mil thick, with pressure sensitive adhesive backing. Tape shall be spiral-wound with overlapping edges.
- C. Hangers on the exterior of insulated piping shall be supported by a rigid insert, minimum 12" long, to protect the insulation.

3.11 GAS PIPING/SYSTEM INSTALLATION:

- A. Provide all gas systems in strict accordance with the requirements of NFPA 54 and local gas utility.

- B. Exterior gas piping shall be painted by other Divisions with one prime coat and two finish coats. Color shall be approved by Architect prior to painting.
- C. The contractor shall provide all regulators or devices as required on the main gas service to ensure all gas systems are low pressure and do not exceed connected equipment operating ranges.
- D. Coordinate with the Southern Connecticut Gas Company (attention Mike Simoneau) the discontinuation of service until the grade beams are installed and the new gas service to suite the elevated house.

3.12 TESTING:

- A. After sanitary, waste and vent stacks are in place and before being concealed, plug lower ends and fill with water up to roof. Piping is to be left tight under these conditions and water level shall be maintained intact for a period of at least four (4) hours, but no less than as required by Local Authority.
- B. Test all water piping by applying a hydrostatic pressure of 125 PSI, using a pump for this purpose. Make sure that all lines are properly plugged or capped and their air has been vented before applying pressure which shall remain constant without pumping for one (1) hour. Provide testing at a higher pressure and/or for a longer period of time as required by the Authority having jurisdiction.
- C. Any leaks in joints or evidence of defective pipe or fittings disclosed by these tests shall be immediately corrected by replacing defective parts with new joints or materials and retested. Makeshift repairs effected by caulking threaded pipe with lead wool, or by application of wicking or patented compounds, shall not be permitted.
- D. Test gas piping to the recommendations of NFPA 54, local gas utility and all authorities having jurisdiction. Test piping for tightness by filling piping with an inert gas or dry air to a pressure measured with a manometer or an approved pressure measuring device calibrated to read and indicate pressure loss due to leakage during the test period. Test pressures shall be no less than 1-1/2 times the proposed maximum working pressure, but not less than 3 psig irrespective of design pressure. Test pressures shall not exceed 125 psig. Test duration for system volumes less than 10 cubic feet of pipe volume shall be 10 minutes; durations for larger systems shall exceed 1/2 hour per 500 cubic feet of pipe volume, or fraction thereof. Provide procedures recommended by NFPA 54, local gas utility and all authorities having jurisdiction to place equipment in operation, including burner input adjustments, primary air adjustments, checking proper operation and adjustment of safety shutoff devices protective devices (such as limit control, fan control to blower, temperature and pressure relief valve, low water cutoff device, manual operating features, pilot burners, etc.) where provided, automatic ignition, and re-verifying operating conditions when placed in service. Following completion of all testing, advise the supplying gas utility of the completion of all modifications to existing systems and the results of the testing and safety inspections.

The State of Connecticut Department of Housing
Community Development Block Grant
Disaster Recovery Program (CDBG-DR)
Owner Occupied Rehabilitation and Rebuilding Program

Bid Documents
Project# 2065
44 Washington Parkway
Stratford, CT

- E. Clean and disinfect all water piping by using the purging and disinfecting procedure described in AWWA C651, AWWA C652, or as prescribed by the Authority Having Jurisdiction.

END OF SECTION 15400

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33-262-2065

Plumbing
22 00 10

SECTION 23 00 01 –

BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 INCLUDED IN THIS SECTION:

- A. General Requirements for Mechanical Work
- B. Nameplates
- C. Access Doors
- D. Tags and Charts
- E. Electrical Motors
- F. Sleeves, Inserts and Anchor Bolts
- G. Firestopping
- H. Plastic Pipe Markers

1.3 DESCRIPTION OF WORK:

- A. This Section specifies general requirements for mechanical work. Definitions, intent, drawings, interpretation of documents, approvals, submittals, substitutions, code requirements, permits, fees, royalties, patents, record drawings, instruction of Owner's personnel, and warranty are described.
- B. Operation and maintenance manuals shall be submitted to the Architect prior to the scheduled instruction of Owner's representatives. These manuals shall contain equipment lists, manufacturer's literature, valve charts, and time schedule for recommended maintenance.
- C. Brass tags shall be securely attached to each valve. Valve charts shall list each valve and describe its function. One copy of each valve chart shall be placed under glass, framed, and hung in a conspicuous location in the main mechanical equipment room.

- D. Plastic pipe markers shall be provided on exterior of piping for identification purposes. These markers shall be manufacturer's standard pre-printed, color-coded, pressure-sensitive vinyl type.

1.4 DEFINITIONS:

- A. "Provide" means to supply, erect, install, and connect up in complete readiness for regular operation, the particular work referred.
- B. "Furnish" means to supply and deliver to the job.
- C. "Install" means to erect, install and connect up in complete readiness for regular operation.
- D. "Conduit" includes, in addition to conduit, all fittings, sleeves, connections, hangers, and other accessories related to such conduit.
- E. "Wiring" means, in addition to wire, all needed connectors, circuit breakers, switches and devices, junction boxes and other items necessary for normal operation of the item being referred to.
- F. "Piping" includes, in addition to pipe, all fittings, valves, hangers, and other accessories related to such piping.
- G. "Concealed" means hidden from sight, as in chases, furred spaces, shafts, hung ceilings, or embedded in construction.
- H. "Exposed" means not concealed as defined above. Trenches, crawl spaces, and tunnels shall be considered exposed.
- I. "Governmental" means all municipal, state, and federal governmental agencies.
- J. "Owner" means the tenant who shall occupy the space after final acceptance.
- K. "Extend" means to supply, erect, install and connect up on complete readiness for regular operation the particular work referred.

1.5 INTENT:

- A. It is the intention of the Drawings and Specifications to call for finished work, tested and ready for operation. All materials, equipment and apparatus shall be new and of first class quality.
- B. Any apparatus, appliance, material, or work not shown on the Drawings, but mentioned in the Specifications, or vice versa, or any incidental accessories, or minor details not shown, but necessary to make the work complete and perfect in all respects, and ready for operation, even if not particularly specified, shall be provided by the Contractor without additional expense to the Owner.

- C. With the submission of bid, the Contractor shall give written notice to the Architect of any materials, apparatus or omissions believed to be in violation of laws, ordinances, rules or regulations or authorities having jurisdiction. In the absence of such written notice it is mutually agreed that the Contractor shall include the cost of providing all systems in accordance with applicable regulations without extra compensation.

1.6 DRAWINGS:

- A. The Drawings are generally diagrammatic and are intended to convey the scope of work and indicate general arrangement of equipment, ducts, conduits, piping, fixtures and connections.
- B. Consider architectural and structural drawings part of this work insofar as these drawings furnish information relating to design and construction of the building.
- C. The Drawings do not indicate all offsets, fittings, and accessories which may be required. Investigate structural and finish conditions affecting this work, and arrange work accordingly, providing such fittings, valves, and accessories required to meet the conditions.
- D. The locations of all items shown on the Drawings or called for in the Specifications, that are not definitely fixed by dimensions, are approximate only. The exact locations necessary to secure the best conditions and results must be determined at the project, and shall have the approval of the Architect before being installed. DO NOT SCALE DRAWINGS.
- E. Follow Drawings as closely as actual building conditions will permit in laying out work. Check Drawings for other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions throughout. Where headroom or space conditions appear inadequate, the Architect shall be notified before proceeding with installation.
- F. If directed by the Architect, the Contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.

1.7 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS:

- A. Any questions or disagreements arising as to the true intent of this Specification or the Drawings, or the kind and quality of work required thereby, shall be decided by the Architect, whose interpretations thereof shall be final, conclusive and binding on all parties.
- B. In the case of disagreement between Drawings and Specifications, or within either document itself, the better quality, greater quantity or more costly work shall be included in the contract price, and the matter referred to the Architect's attention for decision and/or adjustment.

1.8 APPROVALS:

- A. The materials, workmanship, design and arrangement of all work installed under the Contract shall be subject to the approval of the Engineer. If material or equipment is installed before it is approved, the Contractor shall be liable for removal and replacement, at no extra cost to the Owner, if, in the opinion of the Architect, the material or equipment does not meet the intent of the Drawings and Specifications.

1.9 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES:

- A. The Contractor shall submit five (5) copies of Shop Drawings, Product Data and/or Samples to the Architect for review prior to releasing an order for fabrication and/or shipment. These submittals shall be given for materials and equipment and as called for under each particular Section of the Specifications.
- B. Product Data submittals shall consist of complete catalog data clearly indicating all applicable items, in the following manner:
 - 1. State sizes, capacities, brand names, motor HP, accessories, materials, gauges, dimensions, and other pertinent information.
 - 2. List on catalog covers page numbers of submitted items.
 - 3. Underline applicable data. Highlighting applicable data is not sufficient.
- C. Incomplete or unclear submittals will be returned unreviewed for correction and resubmission. Additional copies beyond five (5), or submittals of items other than what is called for under each particular Section, will be returned unreviewed.
- D. Submittals of equipment or materials other than those indicated on the Drawings or in the Specifications will be returned unreviewed, except for reasons as noted under SUBSTITUTIONS.

1.10 SUBSTITUTIONS:

- A. Substitutions of equipment or materials other than those shown on the Drawings or called for in the Specifications will be considered for review only under one or more of the following conditions.
 - 1. Less than three (3) acceptable manufacturers are indicated on the Drawings or in the Specifications.
 - 2. Substitution is required for compliance with subsequent interpretations of code requirements or insurance regulations.

3. Substitution is required due to unavailability of special products, through no fault of the Contractor. Excluded is lack of availability within a desired time frame due to Contractor's failure to order equipment or material early enough.
 4. Manufacturer/fabricator refuses to certify or guarantee performance of specified product as required.
 5. Within fifteen (15) days of Award of Contract, the Contractor and Subcontractors under this Division shall submit to the Architect a complete list of manufacturers and model numbers proposed for the work of Division 22 and 23. Refer to the Paragraphs of this Section regarding: Approvals; Shop Drawings, Product Data and Samples; and Substitutions. The intent by the Contractor or Subcontractors to use the exact manufacturers and/or model numbers specified does not void the requirement for this Submission for Approval.
- B. The particular condition necessitating a substitution must be clearly indicated on the substitution's transmittal or it will be returned unreviewed.
- C. The Contractor shall submit a substitution for review before releasing an order for fabrication and/or shipment. The Architect reserves the right to reject such substitution, provided the item offered, in his opinion, is not equal to the item specified.
- D. When a Contractor proposes to use an item of equipment other than that specified or detailed on the Drawings, and which requires any redesign of structure, partitions, foundations, piping, wiring, or of any other part of the mechanical, electrical, or architectural layout, the Contractor shall assume responsibility for additional costs incurred in planning, design and construction to accommodate the substitution. If approved by the Architect, redesigned drawings and details to accommodate the substitution may be prepared by the Contractor at his own expense.
- E. If a substitution requires a different quantity and arrangement of piping, wiring, conduit, and equipment from that specified or indicated on the Drawings, subject to approval of the Architect, the Contractor shall provide any such piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

1.11 CODE REQUIREMENTS, PERMITS AND FEES:

- A. Perform work in accordance with applicable provisions of the accepted version of the International Plumbing Code, International Mechanical Code, International Building Code, State Fire Code, NFPA codes including the National Electric Code and Life Safety Code, ASHRAE Handbooks/Standards, SMACNA Technical Manuals/Standards, American National Standards Institute, Inc. (ANSI) Standards, National Sanitation Foundation, applicable edition, and all state and local codes. All work shall also be in compliance with utility companies' requirements. Comply with all applicable lead-free state and federal requirements.
- B. In cases of differences between building codes, state laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Promptly notify Architect in writing of such differences.
- C. Include in the work, without extra cost to the Owner, any labor, material, service, test, apparatus, or drawing (in addition to Contract Drawings and Documents) in order to comply with applicable laws, ordinances, rules, regulations, and local authority's requirements, whether or not shown on Drawings and/or specified.
- D. Give all necessary notices, obtain all permits before commencing work, and pay all governmental taxes, fees and other costs in connection with the work. File all necessary plans, prepare all documents, and obtain all necessary approvals of the authorities having jurisdiction. Obtain all required Certificates of Inspection for the work, and deliver them to the Owner before requesting final payment for the work.
- E. The Contractor shall ensure that all system components, methods of installation, and materials complies with ASTM, OSHA, and Owners' standards for off-gassing.
- F. The Contractor shall be licensed in accordance with the guidelines of the Department of Consumer Protection. The workers employed by the Contractor shall be skilled and licensed to perform the work involved.

1.12 ROYALTIES AND PATENTS:

- A. The Contractor shall pay all royalties and shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof.
- B. If the Contractor observes that a process or article specified is an infringement of a patent, the Contractor shall promptly notify the Architect in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work. If the Contractor performs any work specified, knowing it to be an infringement of a patent, the Contractor shall bear all costs arising there from.

1.13 RECORD DRAWINGS:

- A. Clearly record differences between mechanical and electrical work as installed and as shown or called for in the Contract Documents. Accurate notations of all locations, sizes and inverts of all concealed materials shall be made. These records shall be marked, concurrent with progress, on a set of prints labeled "RECORD DRAWINGS."
- B. On completion of project, mark a set of prints with data transferred from the Record Drawings, and submit them to the Architect for review for legibility and clearness of presentation of the recorded conditions of construction.

1.14 INSTRUCTION OF OWNER'S PERSONNEL:

- A. After completion of all work and all tests and at such time as designated by the Owner's representative, the Contractor shall provide the necessary skilled personnel to operate each entire installation for a period of two (2) days of eight hours each day.
- B. During the operating period, the Contractor shall fully instruct the Owner's representative in the complete operation, adjustment, and maintenance of the entire installation.

1.15 OPERATION AND MAINTENANCE MANUALS:

- A. Prepare a manual of operation and maintenance instructions, in draft form, and submit to the Architect for review.
- B. The Manual shall contain the following items:
 - 1. Brief description of each system covering its basic operating characteristics.
 - 2. List of all equipment with manufacturer's name and model number for each item.
 - 3. Contractor's own written operating and maintenance instructions, including detailed step-by-step instruction for starting, summer operation, winter operation, and shutdown of each system.
 - 4. Copies of submittals having final review stamps.
 - 5. Manufacturer's bulletins, data, parts lists, operating and maintenance instructions, guarantees and any other information pertinent to the proper operation of each system and item of equipment installed.
 - 6. Copy of each automatic control diagram with respective sequence of operation.

7. Copy of each valve chart.
 8. Information of actions to be taken in the event of a malfunction or other emergency.
 9. Time schedule for recommended maintenance operation.
- C. At least two weeks prior to the scheduled instruction of Owner's representatives, provide the Architect with five (5) complete copies of the final form of the Operation and Maintenance Manual, bound in booklet form in durable binders, suitable indexed with labelled tabs for each item.

1.16 WARRANTY:

- A. The Contractor shall warrant that all work installed will be free from any and all defects, and that all apparatus will develop capacities and characteristics specified, and that if, during a period of one (1) year from date of completion and acceptance of the work, any such defects in workmanship, materials, or performance appear, the Contractor shall immediately replace, repair or otherwise correct the defect or deficiency without cost and within a reasonable time to be specified in writing to the Owner.
- B. The Contractor shall also replace or repair, to the satisfaction of the Owner and Architect, all damage done to any material or finish in consequence of work performed in fulfilling the warranty.
- C. In the case of default on this warranty by the Contractor, the Owner may have such work done as required, and charge the cost to the Contractor.

1.17 VISITING THE SITE:

- A. Before submitting a final proposal, the Contractor shall examine the site of the proposed work to determine the existing conditions that affect the work. The Contractor will be held responsible for any assumptions made by him in regard thereto. Time for this examination must have prior approval of the Owner.
- B. No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions. All existing systems shall remain in operation at all times except as otherwise arranged under shutdowns.

1.18 EXISTING SYSTEMS:

- A. Prior to bid, the Contractor shall make a detailed examination of the existing building(s) including all existing services and systems to become thoroughly familiar with the scope of work and working conditions. Contractor shall pay particular attention to all existing services and interconnecting systems. All existing systems shall remain in operation at all times except as otherwise arranged under SHUTDOWNS.

- B. The Contractor shall include, in his proposal, for all necessary relocation or revamping of such services and systems, where necessitated by the renovation work, to provide a finished final project. All relocation or revamping shall be provided by the Contractor without additional cost to the Owner, and shall be arranged, as directed by the Owner in the field, to be encased in a finished manner within the building. Any equipment or material to remain or be reused that may be damaged during construction shall be replaced by the Contractor at no additional cost to the Owner. Any existing equipment or material to be removed shall be disposed of by the Contractor or stored by the Contractor, as directed by the Owner.

1.19 SHUTDOWNS:

- A. When installation of a new system, or modification of an existing system, requires the temporary shutdown of an existing operation, the connections of the new system, or modified system, shall be performed at such time as designated by the Owner, in writing. Shutdowns shall be staged for minimum downtime.
- B. The Owner shall be notified of the estimated duration of the shutdown period at least five (5) days in advance of the date the work is to be performed.
- C. Work shall be arranged for continuous performance, including overtime if required, to assure that existing operating services will be shut down only during the time actually required to make necessary connections.
- D. Where any disruption of systems or services serving life safety or critical functions are necessary, the Contractor shall provide and pay for outside additional services, equipment and operations as may be required by the Authority Having Jurisdiction, to provide constant, around-the-clock protection throughout the entire affected areas.
- E. Where required by the Authority Having Jurisdiction, provide the services, personnel, vehicles, equipment and operations as may be required including, but not limited to: local fire department personnel, vehicles and equipment for an approved "fire watch"; on-site local fire department equipment, tankers, pumpers, trucks and aerial vehicles; local police department personnel, vehicles and equipment; ambulance personnel, vehicles and equipment; and utility company's personnel, vehicles and equipment, etc., as may be required or necessary.

1.20 EXISTING FACILITY:

- A. All work within the existing facility shall be done at a time prearranged with occupants so as to minimize disturbing the facility's operation.
- B. As the buildings will remain occupied during the course of construction, extreme care shall be exercised by the Contractor to protect the occupants and their furnishings and belongings from damage due to the renovation and modernization work being performed.

1.21 FINAL ACCEPTANCE:

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following list:
1. Submit the final payment request to the Architect with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 2. Submit an updated final statement to the Architect, accounting for final additional changes to the Contract Sum.
 3. Submit a certified copy of the Architect's Final Inspection list of items to be completed or corrected, stating that each item has been completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
 4. Submit consent of surety to final payment.
 5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Reinspection Procedure: The Architect will reinspect the Work upon receipt of notice from the Contractor that the Work, including Final Inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.
1. Upon Completion of reinspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, reinspection will be repeated, and the Contractor will bear the cost.

1.22 COORDINATION DRAWINGS:

- A. The contractor is to prepare and submit for review and approval coordination drawings for each trade detailing all systems and components including but not limited to:
- Ductwork fabrication
 - Piping Fabrication
 - Mechanical equipment components and all associated accessories.
 - Electrical Fixtures
 - Electrical Components
 - Conduits, Junctions boxes and all associated accessories.

- B. Drawings are to be to scale: (1/4" = 1'-0" Min.) Drawings are to include all spaces above and below ceilings including all boiler rooms, mechanical rooms, electrical rooms, water rooms, and all specific and common spaces and indicating all the latest architectural and structural components. Coordination drawings are to be in addition to any individual submittals of associated items. Each trade must sign-off on coordination drawings indicating respective trade disciplines have been coordinated. Each trade contractor must include in their bid all associated cost for such coordination drawings. Contractor to indicate respective costs on billing schedule of values.
- C. Contractor shall prepare coordination drawings and installation layouts. Such drawings shall consist of dimensioned plans and elevations (above and below ceilings), and shall give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc. Such drawings shall incorporate all trades.
 - 1. Accurate structural steel locations shall be represented on the composite shop drawings, as the basis for coordination by the trades.
- D. These coordination shop drawings and field installation layouts shall be coordinated in field by Contractor and his subcontractors for proper relationship to work of other trades, based on field conditions, and shall be checked for accuracy and accepted by them before submission to Architect for his final acceptance. Contractor shall have competent technical personnel readily available for such coordination and checking as well as for supervision of field installation of work in accordance with shop drawings and field installations as determined by the Contractor to be correct and carrying Architect's submittal review stamp.

1.23 FABRICATION DRAWINGS:

The contractor shall provide plain view 1/4" scale shop (fabrication) drawings of all plumbing systems and all mechanical systems (pipe and air). Fabrication drawings shall indicate and include all materials and accessories (fittings, adapters, flexible connections, equipment, connections, etc) to completely define how the contractor proposes to provide such mechanical systems. Fabrication drawings are to be submitted in conjunction with contractors submission of coordinate drawings.

PART 2 – PRODUCTS

2.1 MANUFACTURER'S IDENTIFICATION:

- A. Manufacturer's nameplate, name, or trademark shall be permanently affixed to all equipment and material furnished under this Specification. The nameplate of a subcontractor or distributor will not be acceptable.

2.2 NAMEPLATES:

- A. Provide for each item of equipment, including controls, a permanently attached nameplate made of laminated bakelite with incised letters; nameplate shall have black surface and white core.
- B. Nameplates shall be a minimum of 3" long by 1-1/2" wide and shall bear the equipment name and item as designated in the equipment schedule.

2.3 ACCESS DOORS:

- A. Furnish access doors to provide access to valves, cleanouts, dampers, controls, junction boxes, etc. concealed behind finished construction. Doors shall have a fire-resistance rating classification to match the construction which they are installed in. Doors shall be of the flush type with slot head-operated cam lock, 16-gage anchor frame, and hinged panel, as manufactured by Goal Inc., Karp Associates Inc., Elmdor Mfg. Co., or Milcor. Minimum size shall be 12" x 12". Doors shall be furnished by each Section of Division 22 and 23 for installation by other Divisions.

2.4 TAGS AND CHARTS:

- A. The Contractor shall furnish and attach to each valve a 1-1/2" diameter brass tag with 1/2" indented numerals filled with durable black compound. Tags shall be securely attached to stems of valves with copper wire and "S" hooks.
- B. Valves charts shall list each valve and describe its function. Upon completion of the work, one (1) copy of each chart, sealed to rigid backboard with clean lacquer, placed under glass and framed, shall be hung in a conspicuous location in the main equipment room, unless otherwise directed by the Architect. Two (2) additional unmounted copies shall be delivered to the Architect.
- C. Provide tags for the following valves:
 - 1. Zone control, bypass, shut-off and balancing valves.
 - 2. Control, bypass, shut-off, balancing and drain valves for major pieces of equipment.
 - 3. Building and area shut-off and balancing valves.
 - 4. System drain valves.

2.5 ELECTRICAL MOTORS:

- A. All electric motors shall conform to requirements of IEEE, NEMA, UL, NEC, and shall be suitable for required load, duty, voltage, phase, frequency, service and location.

- B. All motors shall be suitable for continuous duty at rated horsepower with temperature rise not to exceed 40°C for drip-proof motors, 50°C for splash-proof motors, and shall be capable of withstanding momentary overloads of 25% without injurious overheating.
- C. Motors 1/2 horsepower and larger shall have ball or roller bearings with pressure grease lubrication, except where otherwise noted.
- D. Direct connected motors shall be furnished without an adjustable base. All motors connected to driven equipment by belt or chain shall be furnished with adjustable sliding bases, except fractional motors with slotted mounting holes.
- E. All motor leads shall be permanently identified and supplied with connectors.
- F. Motors shall have nameplates giving manufacturer's name, serial number, horsepower, speed and current characteristics.
- G. Motors smaller than 1/2 horsepower shall be capacitor-start or split-phase type designed for 120 volts, single phase, 60 cycles alternating current. Motors 1/2 horsepower and larger shall be squirrel cage induction or wound motor, induction type for 3 phase, 60 cycles, alternating current as noted on the plans.

2.6 SLEEVES, INSERTS AND ANCHOR BOLTS:

- A. Each Section of Division 22 and 23 shall be responsible for the location and proper position of sleeves and anchor bolts. If failure to do so requires cutting and patching of finished work, it shall be done at no extra cost to the Owner.
- B. Piping or conduits passing through concrete, masonry, and fire rated or smoke rated floors/walls/ceilings/partitions shall be provided with sleeves having an internal diameter 1/2" larger than the outside of the conduit. Seal for acoustical purposes and to maintain fire and smoke ratings.
- C. Sleeves through concrete floors or interior masonry walls shall be Schedule 40 black steel pipe, set flush with wall, floor or ceiling surface. Sleeves through floors shall be sealed with a fireproof, resilient material to maintain the fire rating integrity of the assembly.
- D. Sleeves through floors of wet areas such as equipment rooms, toilet rooms, etc., shall extend 2" above finished floor surface and be sealed as noted above. In addition, caulk with waterproof compound to the approval of the Architect.

2.7 FIRESTOPPING:

- A. Requirements: Conduits, cables, busways plumbing and mechanical piping, HVAC or mechanical ducting that penetrate fire rated walls or floors shall be sealed by means of a UL listed system. Refer to the UL Fire Resistance Directory, Vol.II, 1996 edition. Other equivalent third party testing agencies, such as Factory Mutual Systems Approval, are acceptable. Piping penetrating framed walls shall meet UL No. 187, and piping penetrating concrete floors or block walls shall meet UL No. 281.
- B. Failure of the Architect or Engineer to designate a required firestop does not relieve the Contractor of the responsibility to provide an approved system.
- C. Design: Unless otherwise specified, the "F" rating (burn thru time) of the system(s) shall be equal to or longer than the wall or floor being penetrated. Where penetrants pass thru finished walls and floors, the firestop materials when cured shall be compatible with the wall or floor finish. (For example, a firestop thru a painted block wall shall be sandable and paintable.) Where open (as opposed to closed piping) penetrants such as cable tray or busway are fire-stopped, the individual conductors shall be properly sealed by means of a cable sealant or factory installed, UL listed internal (in the case of busway) firestop or other approved method.
- D. Installation: All seals shall be installed in accordance with the manufacturer's design and instructions. Demonstrate to the Owner that the installer is capable of installing each system properly by submitting samples or by performing one or more installations in the presence of the Owner. Include with the Record Drawings a UL system number for each firestop.
- E. Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. Dow Corning Corporation
 - 2. 3M Fire Protection Products
 - 3. International Protective Coatings
 - 4. HILTI, Inc.

2.8 PLASTIC PIPE MARKERS:

- A. Provide manufacturer's standard pre-printed, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers, complying with ANSI A13.1.
- B. Markers shall be fastened to pipe (or insulation) by adhesive lap joint in pipe marker overlap, or by color-coded plastic adhesive tape, not less than 3/4" wide, full circle at both ends of pipe marker, tape lapped 1-1/2".

- C. Lettering: Manufacturer's standard preprinted nomenclature which best describes piping system in each case.
- D. Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. Seton Name Plate Company
 - 2. W.H. Brady Company
 - 3. Allen Systems
 - 4. Emed Co., Inc.
 - 5. Marking Services, Inc.

2.9 LIMITED-COMBUSTIBLE MATERIAL:

- A. All materials installed in concealed spaces shall have a Btu content not exceeding 1000 Btu per square foot or shall be classed as limited-combustible having a potential heat value not exceeding 3500 Btu per lb.

2.10 MATERIALS AND EQUIPMENT:

- A. Prior to ordering or use of any material or equipment, it shall be the sole responsibility of the Contractor to ensure that the manufacturer certifies in writing that all material and equipment supplied is suitable and approved by code, and in accordance with the manufacturer's recommendations and installation instructions for use in the particular manner and location intended. Contractor shall make due allowance for this in the bid and shall include any accessories or revisions required at no additional charge.
- B. New materials and equipment installed into existing work shall be compatible with the existing work. The Contractor shall advise the Architect before ordering and/or installing any materials or equipment if he disputes those items and/or methods specified. Otherwise, the Contractor shall take full responsibility for their performance and suitability. Only new materials and/or equipment shall be used.

PART 3 - EXECUTION

3.1 PROTECTION OF WORK AND PROPERTY:

- A. The Contractor shall be responsible for the maintenance and protection of all equipment, materials and tools supplied by the Contractor and stored or installed on the job site, from loss or damage of all causes, until final acceptance by the Owner.

- B. The Contractor shall be responsible for the protection of any finished work of other trades from damage or defacement by the Contractor's operation and must remedy any such injury at the Contractor's own expense.

3.2 SCAFFOLDING, RIGGING, AND HOISTING:

- A. The Contractor shall provide all scaffolding, rigging, hoisting and services necessary for erection and delivery into the premises for all equipment and materials furnished, and remove same from premises when no longer required.

3.3 CUTTING, PATCHING, EXCAVATION AND BACKFILL:

- A. All cutting, patching, excavation and backfill shall be provided by other Divisions. Coordinate all requirements well in advance.

3.4 ACCESSIBILITY:

- A. The Contractor shall install all items so that parts requiring inspection, maintenance and repair are readily accessible. Minor deviations from the Drawings may be made to accomplish this, but changes of magnitude shall not be made without prior written approval of the Engineer.

3.5 PIPE EXPANSION:

- A. All pipe connections shall be installed to allow for freedom of movement of the pipe during expansion and contraction without springing. Swing joints, expansion loops and expansion joints with proper anchors and guides shall be provided by the Contractor where necessary, and/or where shown on the Drawings. Anchors and guides shall be subject to the approval of the Architect.
- B. The Contractor shall provide all bases and supports not part of the building structure, of required size, type, and strength, as approved by the Architect, for all equipment and materials furnished by the Contractor.
- C. All equipment, bases and supports shall be adequately anchored to the building structure to prevent shifting of position under operating conditions.

3.6 SEISMIC REQUIREMENTS:

- A. All new mechanical and electrical machinery, equipment, piping, ductwork, wiring and conduit shall be installed to resist vertical and lateral forces in accordance with the State Building Code and applicable regional seismic codes, with the exception of the following:
 - 1. Piping (excluding natural or propane gas piping) in boiler and mechanical rooms less than 1-1/4" inside diameter.
 - 2. All other piping (excluding natural or propane gas piping) less than 2-1/2" inside diameter.

3. All electrical conduit less than 2-1/2" inside diameter.
 4. All rectangular air-handling ducts less than 6 square feet in cross-sectional area.
 5. All round air-handling ducts less than 28" in diameter.
 6. All piping suspended by individual hangers 12" or less in length from the top of the pipe to the bottom of the support for the hanger.
 7. All ducts suspended by hangers 12" or less in length from the top of the duct to the bottom of the support for the hanger.
- B. New ductwork and piping shall be provided with seismic restraints in accordance with Seismic Hazard Level (SHL) B of the latest edition of SMACNA "Seismic Restraint Manual Guidelines For Mechanical Systems" and in accordance with the State Building Code.
- C. Where seismic restraints are installed, the spring vibration isolators or other restraint assemblies shall be designed and installed in accordance with the manufacturer's specifications. The restraint assembly shall be designed to withstand the seismic lateral forces established in the State Building Code for a Zone 2 seismic area.
- D. Provide seismic snubbers, separate from or integral with spring isolators, for attachment to machinery and equipment bases, designed to provide seismic restraint in all modes (directions) in accordance with the State Building Code and applicable regional seismic codes. These snubbers shall have no contact with equipment during normal operation and shall have minimum clearances of 1/4" in all directions. Seismic snubbers shall be installed in strict accordance with the manufacturer's recommendations.
- E. Spring Isolators shall have the following characteristics.
1. Minimum outside diameter to overall height ratio of 0.8:1.0.
 2. Corrosion resistance where exposed to corrosive environment with:
 - a. Springs cadmium plated or electro-galvanized.
 - b. Hardware cadmium plated.
 - c. All other metal parts hot-dip or hot spray galvanized for outdoor applications.
 3. Reserve deflection (from published load ratings to solid height) of 50% of the rated deflection.

4. Minimum 1/4" thick neoprene acoustical base pad or cup on underside.
 5. Designed and installed so that ends of springs remain parallel.
 6. Mason Industries Type SLF or similar type by other acceptable manufacturer.
- F. Anchorage of Housekeeping Pads: All concrete housekeeping pads must be anchored to the structure to meet acceleration criteria. This Contractor shall coordinate this with other Divisions.
- G. Acceptable Manufacturers: Subject to compliance with requirements, provide seismic restraint and isolation products of one of the following manufacturers.
1. Mason Industries, Inc.
 2. Vibration Eliminator Co., Inc.
 3. Vibration Mountings and Controls, Inc.
- H. Submit product data and details of all seismic restraints and isolators.

3.7 QUIET OPERATION:

- A. All equipment and material provided by the Contractor shall operate under all conditions of load without any sound or vibration which in the opinion of the Architect is objectionable. Where sound or vibration is objectionable in the opinion of the Engineer, the Contractor shall eliminate it in a manner approved by the Architect.

3.8 PAINTING:

- A. Other Divisions shall clean and paint all new exposed, unpainted, non-galvanized, metal surfaces of pipes, conduits, equipment, hangers, supports and accessories with one (1) prime coat and two (2) finish coats. Coordinate all requirements well in advance.
- B. Other Divisions shall also paint exposed surfaces of inertia bases and housekeeping pads.
- C. Paint colors shall be as follows. Confirm colors with Architect, including for items not listed.
1. Natural Gas Piping (Outdoors) Medium Grey
 2. Natural Gas Piping (Indoors) Safety Yellow
 3. Drain or Relief Piping Medium Green

8.	Sanitary or Waste Piping	Medium Green
9.	Vent Piping	Medium Blue
10.	Inertia Base/Housekeeping Pad	Medium Blue
11.	Equipment	Light Grey

3.9 CLEANING OF PIPING AND EQUIPMENT:

- A. Clean exposed piping, ductwork, equipment and fixtures. Repair damaged finishes and leave everything in working order satisfactory to the Architect.
- B. Thoroughly clean all equipment inside and outside of all foreign substances before being placed into operation. If any part of a system should be stopped by any foreign matter after being placed in operation, the system shall be disconnected, cleaned and reconnected wherever necessary to locate and remove obstructions. Any work damaged in the course of removing obstructions shall be repaired or replaced when the system is reconnected, at no additional cost to the Owner.

3.10 PLASTIC PIPE MARKERS:

- A. Install pipe markers on each mechanical system, and include arrows to show normal direction of flow.
- B. Locate pipe markers and color bands as follows wherever piping is exposed to view, as well as above removable acoustical ceilings.
 - 1. Near each valve and control device.
 - 2. Near each branch, excluding short take-offs for fixtures and terminal units. Mark each pipe at branch where there could be question of flow pattern.
 - 3. Near locations where pipes pass through walls or floors/ceilings, or enter non-accessible enclosures. Omit this on piping above removable acoustical ceilings.
 - 4. At access doors, and similar access points which permit view of concealed piping.
 - 5. Near major equipment items and other points of origination and termination.
 - 6. Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.

3.11 TESTS:

- A. All equipment shall be tested as determined by all authorities having jurisdiction, but in no case less than that specified under each section of the Specifications. Labor, materials, instruments and power required for testing shall be furnished by the Contractor, unless otherwise indicated under the particular section of the Specifications.
- B. Tests shall be performed to the satisfaction of the Architect and such other parties as may have legal jurisdiction.
- C. All defective work shall be promptly repaired or replaced and the tests shall be repeated until the particular system and component parts thereof receive the approval of the Architect.
- D. Any damages resulting from tests shall be repaired and damaged materials replaced, all to the satisfaction of the Architect.
- E. Equipment and systems which normally operate during certain seasons of the year shall be tested during the appropriate season. Tests shall be performed on individual equipment, systems and their controls. Whenever the equipment of a system under test is interrelated with, and depends upon, the operation of other equipment, systems and controls for proper operation, functioning and performance, the latter shall be operated simultaneously with the equipment or system being tested.

3.12 SUSPECTED EXISTING MATERIALS:

- A. Should asbestos or suspected asbestos be encountered during the course of the work, immediately discontinue all work in that area and report the condition to the Owner for resolution.
- B. All such suspected asbestos shall be reviewed and removed as required by the Owner under a separate contract by other contractors engaged directly by the Owner.
- C. No work in the area shall proceed until suspected asbestos is reviewed, all work on such has been completed, and the Owner notifies the Contractor to proceed accordingly.

3.13 REMOVED EQUIPMENT:

- A. All existing material or equipment replaced or superseded by the Contractor's work shall be removed by the Contractor in an approved manner and the existing structure and surfaces shall be restored by the Contractor to match the finished product. All removed equipment shall remain the property of the Owner and shall be carefully stored at the job site or removed from the premises by the Contractor as directed by the Owner.

3.14 RELOCATED EQUIPMENT:

- A. All equipment, scheduled for relocation, shall be carefully removed by the Contractor and stored in a protected manner until relocated. Any damage done to relocated equipment during removal, storage or relocation shall be corrected by the Contractor in an approved manner, including repair or replacement, as directed by the Architect.

END OF SECTION 23 00 01

SECTION 23 00 10 –

H.V.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, apply to work of this Section.
- B. The requirements specified in Section 23 00 01, "Basic Mechanical Requirements," apply to this Section.

1.2 INCLUDED IN THIS SECTION:

- A. Piping
- B. Breeching
- C. Ductwork
- D. Insulation
- E. Hot Water Heating Piping

1.3 DESCRIPTION OF WORK:

- A. This Section includes the providing of all labor, materials, equipment, accessories, services and tests necessary to complete and make ready for operation by the Owner all heating, ventilating and air conditioning work as shown on the Drawings and called for in these Specifications. It is the intent of these Documents to terminate with complete, operational HV systems within the building.
- B. Also included, but not limited to, are the following items subject to applicable provisions of Section 23 00 01, "Basic Mechanical Requirements," which are to be provided under this Section of the Specifications.
 - 1. Nameplates.
 - 2. Access doors: furnish to other Divisions.
 - 3. Tags and charts.
 - 4. Electric motors, magnetic starters and thermal protection.
 - 5. Sleeves, inserts and anchor bolts.

6. Pipe expansion compensation.
7. Seismic requirements.
8. Plastic pipe markers.

1.4 WORK BY OTHERS:

- A. The following work is included under other Divisions of the Specifications, except where otherwise indicated.
 1. Concrete and masonry work.
 2. Setting of access doors.
 3. Finish painting.
 4. Flashing of roof curbs or wall louvers.
 5. Temporary heat.
 6. Cutting and patching.
 7. Excavation and backfill.
 8. Disconnect switches for all motors: Division 26.
 9. Thermal starting switches for all single phase motors: Division 26.
 10. Manually operated devices such as pushbuttons and manual starters: Division 26.
 11. Electric power wiring for all motors, starters and controls: Division 26.
 12. Mounting of all magnetic starters, except where furnished as an integral part of factory assembled equipment: Division 26.

1.5 SHOP DRAWINGS:

- A. Furnish shop drawings (including product data) in accordance with the provisions set forth in Section 23 00 01, "Basic Mechanical Requirements." Shop drawings (including product data) shall be submitted on the following material, and equipment and systems.
 1. Ductwork Fabrication Shop Drawings
 2. Piping Fabrication Shop Drawings

3. Boiler Flue and Fabrication Shop Drawings
4. Insulation

1.6 ACCEPTABLE MANUFACTURERS:

- A. Subject to compliance with requirements, provide equipment or material of one of the following manufacturers.
- B. Insulation:
 1. Owens-Corning Fiberglas Corp.
 2. Johns Manville
 3. Knauf Fiber Glass
 4. CertainTeed Corporation
- C. Breeching (METAL):
 1. Metal-Fab, Inc.
 2. American Metal Products, Inc. (Div. of MASCO Corp.)
 3. Van Packer

PART 2 - PRODUCTS

2.1 DUCTWORK:

- A. All ducts shall be constructed as shown on plans. Unless otherwise noted, ductwork shall be Wheeling 'Soltite' galvanized steel or equal, constructed, supported and installed in strict accordance with SMACNA Standards.
- B. Sheet metal duct construction shall conform to the latest recommendation in the ASHRAE Handbook or SMACNA Standards and NFPA 90A. All ducts shall have tight joints with all interior surfaces smooth. All joints must be made in direction of flow. Bends shall be made with at least 50% radius or with correctly designed interior vanes as directed or approved.
- C. The sizes and approximate locations are shown on the Drawings. Check all architectural drawings as well as those of other trades to make sure that there will be no conflict between this work and that of other trades. Any and all deviations shall be included to clear obstructions while maintaining full free area. Adjust duct sizes as required to fit systems within available space provided. Submit fabrication drawings.

- D. Ducts may be offset to clear structural members as required. Offsets shall be made with smooth flowing fittings and will not be approved if they alter the dimensions in such a manner as to decrease the cross-sectional area.
- E. Seal all ductwork in accordance with SMACNA "HVAC Air Duct Leakage Test Manual" with a minimum of Seal Class A.
- F. Drier exhaust ductwork (where indicated or applicable) shall be soldered aluminum.

2.4 DUCTWORK HANGERS AND SUPPORTS:

- A. Sheet metal horizontal ducts less than 30" wide shall be supported by means of 1" X 1/2" bent galvanized steel strap on 8'-0" or less, fastened and held in place by metal screws at the sides on the ducts with 2" turned under the duct.
- B. Sheet metal ducts 30" wide or over shall be supported by angle iron suspended by 3/8" rods.
- C. No hangers formed by wires, chains, horizontal pieces of pipe or perforated metal bands will be permitted in any part of the work.

2.5 INSULATION AND THERMAL ACOUSTICAL LINING:

- A. General: Thermal acoustical lining and all insulation work shall be done by workers regularly employed in this field. Insulating work that does not present a workmanlike appearance will not be acceptable.
 - 1. Insulation, jackets and finish shall meet all applicable UL requirements and shall have a flame spread rating not exceeding 25 and smoke developed rating not exceeding 50.
 - 2. Insulation shall be installed in strict accordance with the manufacturer's recommendations.
 - 3. No covering shall be applied until all materials have been tested and approved.
- B. Piping Insulation:
 - 1. Insulate all hot and chilled water supply and return piping, condensate drain piping, steam piping, steam condensate piping and cold water make-up piping with Owens Corning Fiberglass ASJ pipe insulation having a factory applied all service jacket. Insulate refrigerant suction (RS) and liquid (RL) piping with weatherproof AP Armaflex insulation. Thickness of insulation shall be as follows. Runouts refer to piping to individual terminal units not exceeding 12'-0" in length.

Piping

Insulation

<u>Service</u>	<u>Piping Size</u>	<u>Thickness</u>
HWS,HWR 141-200°F	Runouts Up to 1-1/2" Over 1-1/2"	1" 1-1/2" 2"
CW, , Condensate Drain	Up to 1" Over 1"	1" 1 1/2"

2. All flanges, valves bodies, pump bodies and fittings shall be insulated with molded or fabricated mitered segments of pipe insulation of a thickness equal to that off the adjoining pipe insulation, securely fastened in place and covered with Zeston covers.
3. Insulation shall be applied to clean, dry pipe with side and end joints butted tightly. Seal lap of jacket and butt joint strips with an approved lagging adhesive.
4. All piping shall be insulated and shall have color coded flow directional arrows added to ANSI Standards.
5. All heating supply and return piping, valves, hangers and accessories shall be on the heated inside of the building.

2.6 PIPING AND VALVES:

- A. Provide all necessary water specialties of B & G Manufacturer as shown or as required for the complete systems.
- B. Valves shall be as follows:
 1. Gate Valves 2" and smaller: 125 lbs. brass, screwed.
 2. Globe Valves 2" and smaller: 150 lbs. screwed bronze.
 3. Angle Valves 2" and smaller: 150 lbs. bronze, screwed.
 4. Check Swing 2: and smaller: 125 lbs. bronze, screwed.
 5. Check Silent, all sizes: 125 lbs. flanged, semi-steel.
 6. Drain Valves 2" and smaller: 200 lbs. hose end, bronze.
 7. Blow-off Valves 2" and smaller: 150 lbs. bronze, Y-type.
 8. Strainer 2" and smaller: 225 lbs. screwed, bronze.
- C. Triple duty valves shall be as manufactured by Bell and Gossett, Armstrong or Tour Anderson.
- D. Provide drain valves at all low points of all water systems and where shown on Drawings. Provide air vents at all high points.
- E. Pipe and Fittings (unless specifically noted otherwise):

<u>Service</u>	<u>Component</u>
Cold Water Make-up, copper tubing ASTM B-88 Condensate Drain	Pipe: Type 'L' hard tempered Lines/Fittings: Forged copper with recessed ends for solder joints. Drain Traps: Deep seal suitable for system static pressure.
Water Piping Supply and Return (Heated)	Pipe: Schedule 40 black carbon steel ASTM A-53A or A-20. Fittings: Standard weight best grey cast iron, 125 lbs., screwed ends, 2- 1/2" and smaller. Long turn welding fittings 3" and larger.

F. Piping run underground shall be listed for such service .

2.7 METAL PIPE FABRICATION:

- A. All piping shall be fabricated and tested in accordance with the latest revision of Section 1 of the ASA-B31.1 "Code for Pressure Piping."
- B. All reductions in sizes of piping in the direction of downward pitch shall be installed with eccentric fittings to maintain a level top for water.
- C. Face bushings, close nipples or street ells shall not be used, except where specifically indicated.
- D. Outside surface at ends of copper pipe and inside surfaces of fittings shall be thoroughly cleaned with steel wool or emery cloth and all burrs shall be removed. After cleaning, surfaces to be jointed shall be evenly and completely covered with flux.
- E. Joints shall be well supported during the heating process and shall not be strained during the cooling period.
- F. All soldered joints shall be made with 95-5 wire solder. Paste or liquid solder will not be allowed. Excess solder shall be removed while still in a plastic state, leaving a fillet around the cup as it cools.

2.8 PRESSURE GAUGES:

- A. Pressure gauges shall be steel encased Bourdon type with snubber orifice and all working parts of corrosion resistant metal. They shall be four inches (4") in diameter, suitable for service in all cases and have easily read properly graduated faces in both PSI and feet of head for the systems pressures. It shall be possible to see and read all gauges from normal viewing angles and heights. Provide snubbers and petcock shutoff for all gauges.
- B. Pressure gauges shall be provided where noted on the plans and at each piece of equipment (both supply and return side).

2.9 THERMOMETERS:

- A. Thermometers shall be of the bimetal dial type with a four inch (4") face and separable socket suitable for the system pressure and temperature ranges. Faces shall be graduated in the largest suitable increments for each service and shall be installed to allow easy reading from normal viewing angles and heights. Remote capillary types shall be used where direct type cannot be read.
- B. Thermometers shall be installed where noted on the plans and at each piece of equipment (both supply and return side).

2.10 VIBRATION ISOLATION:

- A. All mechanical equipment shall be mounted and isolated from the building structure by vibration isolators. All vibration isolators shall be as manufactured by Mason Industries or approved equal.
- B. Rubber-in-shear isolators shall be properly housed and provided with adequate facilities for bolting. Spring isolators shall be equipped with sound deadening pads, snubbers and leveling bolts and shall be free standing for deflections over 1". All spring isolators shall be properly sized by the manufacturer according to load and deflection. Efficiency of isolation shall not be less than 95%.
- C. Refer also to "Seismic Requirements" in Section 23 00 01.

2.11 COMPRESSION TANK AND HOT WATER SPECIALTIES:

- A. Provide compression tank for water systems of size and capacity noted on the Drawings. Tank shall be fabricated and tested in accordance with the ASME Code for "Unfired Pressure Vessels" and shall be so stamped. Test pressure: 188 psi.
- B. Manual vents shall be provided wherever necessary throughout the water system for initial venting of the system.
- C. Provide all necessary water specialties as shown or as required for complete system. In-line air separator shall be installed to serve each water system.

2.12 BREECHING (FLUE / INTAKE):

- A. The gas vent systems shall be so arranged and constructed as to develop a positive flow adequate to exhaust all flue gases to outside atmosphere, without condensation within the vent or spillage at any appliance draft hood.
- B. All parts of vent systems shall be Underwriters' Laboratories, Inc. listed double wall insulating type gas vent piping, and such piping shall be continuous from the appliance outlets into the vent top or housing. Vent systems shall be complete with all necessary supports, storm collar, sloping roof and ceiling plate support assembly, connections, counter flashing weatherhood and all accessories to form a final finished product.
- C. The gas vent piping shall be installed in full compliance with the terms of its listing, with the manufacturer's installation instructions, and with the local and state building codes representing such installations.
- D. Prior to manufacture the Contractor shall provide complete manufacturer's shop drawings showing the particular systems complete with all accessories, clearances and capacities and submit these to the Architect for approval prior to proceeding.
- E. Complete installation shall be in strict accordance with NFPA-54, NFPA-211, UL standards when listed with the Underwriter's Laboratory, SMACNA Standards and ASHRAE Guide latest edition.
- F. Flue shall be model 'IPIC-2' double wall insulating type UL listed flue by Metal-Fab complete with UL labelled tees, elbows, increasers, draft hood connectors, supports thimbles, weatherhood, wall bands and roofskirt, and all accessories required.
- G. Provide protection of flues from construction dust and debris by providing temporary closures of ends not completed or connected to appliance until installation is finished. Prior to startup, thoroughly clean flues of all dust or foreign matter.

PART 3 – EXECUTION

3.1 PIPING INSTALLATION AND SUPPORT:

- A. All piping shall be grouped wherever practical and properly aligned in straight parallel lines. Pipe shall be spaced to allow for full insulation and to permit access for service and operation of valves and other accessories. The exact locations of piping and related equipment are not necessarily as indicated on the Drawings and shall be determined by actual field conditions to permit maximum ease of service and accessibility consistent with a neat and workmanlike installation. It shall be understood that the locations of piping, valves, controls, equipment, etc., are subject to such modifications as may be found necessary or desirable at the time of the installation in order to meet any structural or mechanical conditions. Such changes shall be made by this Section, upon approval by the Architect, without extra charges.
- B. Connections of dissimilar metals between pipe, fittings, hangers, equipment, etc. shall be avoided wherever practical. Wherever such connections are unavoidable they shall be insulated against direct contact with high grade dielectric fittings.
- C. Piping shall be cut accurately to measurements established at the site and shall be worked into place without springing or forcing.
- D. Piping shall be pitched for proper circulation and drainage. Supply runouts shall pitch upward in the direction of flow. Drain piping shall pitch a minimum of 1/4" per foot down in the direction of flow, unless noted otherwise.
- E. Piping shall be supported, guided and anchored to prevent creeping, sagging, buckling, vibration or misalignment.
- F. Pipes shall not be hung from other piping or from equipment of other trades, and hanger rods shall not pierce ducts without specific approval.
- G. Wire, chain, bank iron, tape or wood hangers shall not be used to support piping.
- H. Pipe supports shall be capable of vertical adjustments after installation of piping.
- I. Piping of all equipment and control valves shall be supported to prevent strains or distortions in the connected equipment and control valves. Piping shall be supported to allow for removal of equipment, valves and accessories with a minimum of dismantling and without requiring additional supports after these items are removed.
- J. Pipes shall be supported at all changes in direction and at intervals of not more than 10 feet on straight runs. Supports shall be subject to the Architect's approval.

- K. Piping at ceiling shall be supported on clevis, roller or trapeze hangers, with rods suspended for inserts.
- L. Piping at floor shall be supported on offset clamps, floor stands or roller stands fastened to concrete piers.
- M. Piping at walls shall be supported on hook plates, offset clamps or wall brackets with U bolts or roller stands.
- N. Where building construction is not suited to these methods of supporting piping, supports shall be as detailed on the Drawings or as approved by the Architect.
- O. Trapeze hangers shall consist of two (2) structural steel channels bolted back to back with space between for hanger rods and hold down bolts or one of the formed steel systems with appropriate clamps and fittings.
- P. Hanger rods shall be fully threaded and galvanized and shall be secured in place with double nuts and lock washers.
- Q. Anchors shall be as approved by the Architect.
- R. Wherever insulated piping is to be installed on supports, protection saddles shall be welded to bottom of pipe to provide a bearing surface and to protect the insulation.
- S. Wherever cold insulated pipe is installed, curved steel plate half-sleeves shall be cemented to the lower half of the outside surface of the insulation to provide a bearing surface and to protect the insulation.
- T. All hangers and supports shall be finished by other Divisions with two (2) coats of zinc chromate paint. Coordinate all quantities and locations.
- U. Vertical pipes shall be supported at the bottom on base elbows or floor stands fastened to concrete piers.

3.2 METAL PIPE FABRICATION

- A. All piping shall be fabricated and tested in accordance with the latest revision of Section 1 of the ASA-B31.1 "Code for Pressure Piping."
- B. All reductions in sizes of piping in the direction of downward pitch shall be installed with eccentric fittings to maintain a level top for water.
- C. Face bushings, close nipples or street ells shall not be used, except where specifically indicated.

- D. Outside surface at ends of copper pipe and inside surfaces of fittings shall be thoroughly cleaned with steel wool or emery cloth and all burrs shall be removed. After cleaning, surfaces to be jointed shall be evenly and completely covered with flux.
 - E. Joints shall be well supported during the heating process and shall not be strained during the cooling period.
 - F. All soldered joints shall be made with 95-5 wire solder. Paste or liquid solder will not be allowed. Excess solder shall be removed while still in a plastic state, leaving a fillet around the cup as it cools.
- 3.3 ANCHORS AND GUIDES:
- A. Provide anchors and guides, Fee & Mason or approved equal, on hot water heating supply and return piping throughout the buildings. Furnish and install these items in accordance with manufacturer's recommendations. Coordinate all locations with General Contractor prior to installation.
- 3.4 AUTOMATIC TEMPERATURE CONTROLS
- A. Ensure all controls completely operative.
- 3.5 STARTING UP:
- A. Prior to starting up the system, flush all system piping and ducts until clean. Any damage to the building or system components caused by failure to clean the system properly, shall be corrected to the satisfaction of the Architect and the cost shall be paid for by this Section. Eliminate all noise and vibration, and take all measures to secure proper circulation.
- 3.8 TESTS:
- A. Equipment: Demonstrate that all equipment and apparatus fulfill the requirements of the Drawings and the Specifications. All equipment shall be operated and tested for rated capacities and specified characteristics. Voltage and amperage readings shall be taken on all electric motors.
 - B. Test Log: Five (5) copies of a complete tabulated log of all test readings including pressures, temperatures, R.P.M., electric motor voltage and current shall be submitted to the Owner for approval. Water balancing shall be performed to achieve even temperature drops throughout the systems. Pump readings shall also be taken and submitted.

END OF SECTION 23 00 10

SECTION 23 00 99 –

TESTING, ADJUSTING, & BALANCING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, apply to work of this Section.
- B. The requirements specified in Section 23 00 01, "Basic Mechanical Requirements," apply to this Section.
- C. Related Sections:
 - 1. Other Division 23 Sections specify balancing devices and their installation, and materials and installation of mechanical systems.
 - 2. Individual Division 23 system sections specify leak testing requirements and procedures.

1.2 INCLUDED IN THIS SECTION:

- A. Testing, adjusting, and balancing of mechanical systems.
- B. Verification of temperature control system operation.
- C. Testing systems for proper sound and vibration levels.

1.3 DESCRIPTION OF WORK:

- A. This Section specifies the requirements and procedures for total mechanical systems testing, adjusting, and balancing. Requirements include measurement and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, and recording and reporting the results.
- B. Test, adjust, and balance the following mechanical systems:
 - 1. Hydronic systems.
 - 2. Temperature control system: verify operation.
- C. Test systems for proper sound and vibration levels.

D. This Section does not include:

1. Specifications for materials for patching mechanical systems.
2. Specifications for materials and installation of adjusting and balancing devices. If devices must be added to achieve proper adjusting and balancing, refer to the respective system sections for materials and installation requirements.
3. Requirements and procedures for piping and ductwork systems leakage tests.
4. Testing boilers and pressure vessels for compliance with safety codes.

1.4 DEFINITIONS:

- A. Systems testing, adjusting, and balancing is the process of checking and adjusting all the building environmental systems to produce the design objectives. It includes:
1. The balance of air and water distribution.
 2. Adjustment of total system to provide design quantities.
 3. Electrical measurement.
 4. Verification of performance of all equipment and automatic controls.
 5. Sound and vibration measurement.
- B. Test: To determine quantitative performance of equipment.
- C. Adjust: To regulate the specified fluid flow rate and air patterns at the terminal equipment (e.g., reduce fan speed, throttling).
- D. Balance: To proportion flows within the distribution system (submains, branches, and terminals) according to specified design quantities.
- E. Procedure: Standardized approach and execution of sequence of work operations to yield reproducible results.
- F. Report Forms: Test data sheets arranged for collecting test data in logical order for submission and review. These data should also form the permanent record to be used as the basis for required future testing, adjusting, and balancing.
- G. Terminal: The point where the controlled fluid enters or leaves the distribution system. These are supply inlets on water or steam terminals, supply outlets on air terminals, return outlets on water terminals, condensate outlets on steam terminals, and exhaust or return inlets on air terminals such as registers, grilles, diffusers, louvers, and hoods.

- H. Main: Duct or pipe containing the system's major or entire fluid flow.
- I. Submain: Duct or pipe containing part of the systems' capacity and serving two or more branch mains.
- J. Branch Main: Duct or pipe serving two or more terminals.
- K. Branch: Duct or pipe serving a single terminal.

1.5 SUBMITTALS:

- A. Agency Data: Submit proof that the proposed testing, adjusting, and balancing agency meets the qualifications specified below.
- B. Engineer and Technicians Data: Submit proof that the Test and Balance Engineer assigned to supervise the procedures, and the technicians proposed to perform the procedures, meet the qualifications specified below.
- C. Procedures and Agenda: Submit a synopsis of the testing, adjusting, and balancing procedures and agenda proposed to be used for this project.
- D. Maintenance Data: Submit maintenance and operating data that include how to test, adjust, and balance the building systems. Include this information in maintenance data specified in Division 1 and Section 23 00 01.
- E. Sample Forms: Submit sample forms, if other than those standard forms prepared by the AABC or NEBB are proposed.
- F. Certified Reports: Submit testing, adjusting, and balancing reports bearing the seal and signature of the Test and Balance Engineer. The reports shall be certified proof that the systems have been tested, adjusted, and balanced in accordance with the referenced standards; are an accurate representation of how the systems have been installed; are a true representation of how the systems are operating at the completion of the testing, adjusting, and balancing procedures; and are an accurate record of all final quantities measured, to establish normal operating values of the systems. Follow the procedures and format specified below:
 - 1. Final Reports: Upon completion of testing, adjusting, and balancing procedures, prepare final reports on the approved forms. Final reports must be complete, factual, accurate, type written, and organized and formatted as specified below. Submit 5 complete sets of final reports.

2. Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted, and balanced. Bind report forms complete with schematic systems diagrams and other data in reinforced, vinyl, three-ring binders. Provide binding edge labels with the project identification and a title descriptive of the contents. Divide the contents of the binder into the below listed divisions, separated by divider tabs:
 - a. General Information and Summary.
 - b. Air Systems.
 - c. Hydronic Systems.
 - d. Temperature Control Systems.
 - e. Special Systems.
 - f. Sound and Vibration Systems.
 3. Report Contents: Provide the following minimum information, forms and data.
 - a. General Information and Summary: Inside cover sheet to identify testing, adjusting, and balancing agency, Contractor, Owner, Architect, Engineer, and Project. Include addresses, contact names, and telephone numbers. Also include a certification sheet containing the seal, name, address, telephone number, and signature of the Certified Test and Balance Engineer. Include in this division a listing of the instrumentations used for the procedures along with the proof of calibration.
 - b. The remainder of the report shall contain the appropriate forms containing as a minimum, the information indicated on the standard report forms prepared by the AABC and NEBB, for each respective item and system. Prepare a schematic diagram for each item of equipment and system to accompany each respective report form.
- G. Calibration Reports: Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards, within a period of six months prior to starting the project.

1.6 QUALITY ASSURANCE:

- A. Agency Qualifications:

1. Employ the services of an independent testing, adjusting, and balancing agency meeting the qualifications specified below, to be the single source of responsibility to test, adjust, and balance the building mechanical systems identified above, to produce the design objectives. Services shall include checking installations for conformity to design, measurement and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, and recording and reporting the results.
2. An independent testing, adjusting, and balancing agency certified by Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB) in those testing and balancing disciplines required for this project. Agency shall have at least one Professional Engineer registered in the state in which the services are to be performed, and certified by AABC or NEBB as a Test and Balance Engineer.

B. Codes and Standards:

1. AABC: "National Standards for Total System Balance."
2. ASHRAE: ASHRAE Handbook, 1984 Systems Volume, Chapter 37, Testing, Adjusting, and Balancing.
3. NEBB: "Procedural Standards for Testing, Adjusting, Balancing of Environmental Systems."

1.7 PROJECT CONDITIONS:

- A. Systems Operation: Systems shall be fully operational prior to beginning procedures.
- B. Sequencing and Scheduling: Test, adjust, and balance the air systems before hydronic systems.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 PRELIMINARY PROCEDURES FOR HYDRONIC SYSTEM BALANCING:

- A. Before operating the system perform these steps:
 1. Open valves to full open position. Close coil bypass valves.
 2. Remove and clean all strainers.
 3. Examine hydronic systems and determine if water has been treated and cleaned.

4. Check pump rotation.
5. Clean and set automatic fill valves for required system pressure.
6. Check expansion tanks to determine that they are not air bound and that the system is completely full of water.
7. Check air vents at high points of systems and determine if all are installed and bleed air completely.
8. Set temperature controls so all coils are calling for full flow.
9. Check operation of automatic bypass valves.
10. Lubricate all motors and bearings.
11. Check and set operating temperatures of chillers to design requirements.

3.2 MEASUREMENTS:

- A. Provide all required instrumentation to obtain proper measurements, calibrated to the tolerances specified in the referenced standards. Instruments shall be properly maintained and protected against damage.
- B. Provide instruments meeting the specifications of the referenced standards.
- C. Use only those instruments which have the maximum field measuring accuracy and are best suited to the function being measured.
- D. Apply instrument as recommended by the manufacturer.
- E. Use instruments with minimum scale and maximum subdivisions and with scale ranges proper for the value being measured.
- F. When averaging values, take a sufficient quantity of readings which will result in a repeatability error of less than 5 percent. When measuring a single point, repeat readings until 2 consecutive identical values are obtained.
- G. Take all reading with the eye at the level of the indicated value to prevent parallax.
- H. Use pulsation dampeners where necessary to eliminate error involved in estimating average of rapidly fluctuation readings.
- I. Take measurements in the system where best suited to the task.

3.3 PERFORMING TESTING, ADJUSTING, AND BALANCING:

- A. Perform testing and balancing procedures on each system identified, in accordance with the detailed procedures outlined in the referenced standards.
- B. Cut insulation, ductwork, and piping for installation of test probes to the minimum extent necessary to allow adequate performance of procedures.
- C. Patch insulation, ductwork, and housings, using materials identical to those removed.
- D. Seal ducts and piping, and test for and repair leaks.
- E. Seal insulation to re-establish integrity of the vapor barrier.
- F. Mark equipment settings, including damper control positions, valve indicators, fan speed control levers, and similar controls and devices, to show final settings. Mark with paint or other suitable, permanent identification materials.
- G. Retest, adjust, and balance systems subsequent to significant system modifications, and resubmit test results.
- H. This Contractor shall include for changing all pulleys, shives, belts, drives, etc., as may be required to ensure that systems meet listed capacities with no objections. This Contractor shall then retest and adjust as required such systems.

3.4 RECORD AND REPORT DATA:

- A. Record all data obtained during testing, adjusting, and balancing in accordance with, and on the forms recommended by the referenced standards, and as approved on the sample report forms. Specific test results for outdoor air flow rates must be included; values listed on the Drawings are minimum requirements.
- B. Prepare report of recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced.

3.5 TESTING FOR SOUND AND VIBRATION:

- A. Test and adjust mechanical systems for sound and vibration in accordance with the detailed instructions of the referenced standards.

3.6 DEMONSTRATION:

- A. Training:
 - 1. Train the Owner's maintenance personnel on troubleshooting procedures and testing, adjusting, and balancing procedures. Review with the Owner's personnel, the information contained in the Operating and Maintenance Data specified in Section 23 00 01.

The State of Connecticut Department of Housing
Community Development Block Grant
Disaster Recovery Program (CDBG-DR)
Owner Occupied Rehabilitation and Rebuilding Program

Bid Documents
Project# 2065
44 Washington Parkway
Stratford, CT

2. Schedule training with Owner through the Architect with at least 7 days prior notice.

END OF SECTION 23 00 99

MCA Project No.
33-262-2065

Testing, Adjusting, & Balancing
23 00 99

SECTION 26 00 01 –

BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 INCLUDED IN THIS SECTION:

- A. General Requirements for Electrical Work
- B. Nameplates
- C. Access Doors
- D. Sleeves, Inserts, and Anchor Bolts
- E. Firestopping

1.3 DESCRIPTION OF WORK:

- A. This Section specifies general requirements for electrical work. Definitions, intent, drawings, interpretation of documents, approvals, submittals, substitutions, code requirements, permits, fees, royalties, patents, record drawings, instruction of Owner's personnel, and warranty are described.
- B. Operation and maintenance manuals shall be submitted to the Architect prior to the scheduled instruction of Owner's representatives. These manuals shall contain equipment lists, manufacturer's literature, and time schedule for recommended maintenance.

1.4 DEFINITIONS:

- A. "Provide" means to supply, erect, install, and connect up in complete readiness for regular operation, the particular work referred.
- B. "Furnish" means to supply and deliver to the job.
- C. "Install" means to erect, install and connect up in complete readiness for regular operation.

- D. "Conduit" includes, in addition to conduit, all fittings, sleeves, connections, hangers, and other accessories related to such conduit.
- E. "Wiring" means, in addition to wire, all needed connectors, circuit breakers, switches and devices, junction boxes and other items necessary for normal operation of the item being referred to.
- F. "Concealed" means hidden from sight, as in chases, furred spaces, shafts, hung ceilings, or embedded in construction.
- G. "Exposed" means not concealed as defined above. Trenches, crawl spaces, and tunnels shall be considered exposed.
- H. "Governmental" means all Municipal, State, and Federal governmental agencies.
- I. "Owner" means the tenant who shall occupy the space after final acceptance.
- J. "Extend" means to supply, erect, install and connect up in complete readiness for regular operation the particular work referred.

1.5 INTENT:

- A. It is the intention of the Drawings and Specifications to call for finished work, tested and ready for operation. All materials, equipment and apparatus shall be new and of first class quality.
- B. Any apparatus, appliance, material, or work not shown on the Drawings, but mentioned in the Specifications, or vice versa, or any incidental accessories, or minor details not shown, but necessary to make the work complete and perfect in all respects, and ready for operation, even if not particularly specified, shall be provided by the Contractor without additional expense to the Owner.
- C. With the submission of bid, the Contractor shall give written notice to the Architect of any materials, apparatus or omissions believed to be in violation of laws, ordinances, rules or regulations or authorities having jurisdiction. In the absence of such written notice it is mutually agreed that the Contractor shall include the cost of providing all systems in accordance with applicable regulations without extra compensation.

1.6 DRAWINGS:

- A. The Drawings are generally diagrammatic and are intended to convey the scope of work and indicate general arrangement of equipment, conduits, piping, fixtures and connections.
- B. Consider architectural and structural drawings part of this work insofar as these drawings furnish information relating to design and construction of the building.

- C. The drawings do not indicate all offsets, fittings, and accessories which may be required. Investigate structural and finish conditions affecting this work, and arrange work accordingly, providing such fittings, valves, and accessories required to meet the conditions.
- D. The locations of all items shown on the Drawings or called for in the Specifications that are not definitely fixed by dimensions, are approximate only. The exact locations necessary to secure the best conditions and results must be determined at the project, and shall have the approval of the Architect before being installed. DO NOT SCALE DRAWINGS.
- E. Follow Drawings as closely as actual building construction will permit in laying out work. Check Drawings for other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions throughout. Where headroom or space conditions appear inadequate, the Architect shall be notified before proceeding with installation.
- F. If directed by the Architect, the Contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.

1.7 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS:

- A. Any questions or disagreements arising as to the true intent of this Specification or the Drawings, or the kind and quality of work required thereby, shall be decided by the Architect, whose interpretations thereof shall be final, conclusive and binding on all parties.
- B. In the case of disagreement between Drawings and Specifications, or within either document itself, the better quality, greater quantity or more costly work shall be included in the contract price, and the matter referred to the Architect's attention for decision and/or adjustment.

1.8 APPROVALS:

- A. The materials, workmanship, design and arrangement of all work installed under the Contract shall be subject to the approval of the Architect. If material or equipment is installed before it is approved, the Contractor shall be liable for removal and replacement, at no extra cost to the Owner, if, in the opinion of the Architect, the material or equipment does not meet the intent of the Drawings and Specifications.

1.9 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES:

- A. The Contractor shall submit five (5) copies of Shop Drawings, Product Data and/or Samples to the Architect for review prior to releasing an order for fabrication and/or shipment. These submittals shall be given for materials and equipment and as called for under each particular Section of the Specifications.
- B. Product Data submittals shall consist of complete catalog data clearly indicating all applicable items, in the following manner:
 - 1. State sizes, capacities, brand names, motor HP, accessories, materials, gauges, dimensions, and other pertinent information.
 - 2. List on catalog covers page numbers of submitted items.
 - 3. Underline applicable data. Highlighting applicable data is not sufficient.
 - 4. Job specific wiring diagrams and riser diagrams showing all equipment, devices, and wiring.
 - 5. Lay outs of Equipment Room.
 - 6. Submit Fault Current Calculation for each panel.
 - 7. Submit product information systems as a complete package (ie..submit all lighting fixture types as one submittal).
- C. Incomplete or unclear submittals will be returned unreviewed for correction and resubmission. Additional copies beyond five (5), or submittals of items other than what is called for under each particular Section, will be returned unreviewed.
- D. Submittals of equipment or materials other than those indicated on the Drawings or in the Specifications will be returned unreviewed, except for reasons as noted under SUBSTITUTIONS.
- E. This Division shall coordinate all aspects of respective subsections with the contractor including material data, overall drawings, installation sequencing, etc. See Division 1 requirements.

1.10 SUBSTITUTIONS:

- A. Substitutions of equipment or materials other than those shown on the Drawings or called for in the Specifications will be considered for review only under one or more of the following conditions.
 - 1. Less than three (3) acceptable manufacturers are indicated on the Drawings or in the Specifications.

2. Substitution is required for compliance with subsequent interpretations of code requirements or insurance regulations.
 3. Substitutions is required due to unavailability of special products, through no fault of the Contractor. Excluded is lack of availability within a desired time frame due to Contractor's failure to order equipment or material early enough.
 4. Manufacturer/fabricator refuses to certify or guarantee performance of specified product as required.
- B. The particular condition necessitating a substitution must be clearly indicated on the substitution's transmittal or it will be returned unreviewed.
- C. The Contractor shall submit a substitution for review before releasing an order for fabrication and/or shipment. The Architect reserves the right to reject such substitution, provided the item offered, in his opinion, is not equal to the item specified.
- D. When a Contractor proposes to use an item of equipment other than that specified or detailed on the Drawings, and which requires any redesign of structure, partitions, foundations, piping, wiring, or of any other part of the electrical, or architectural layout, the Contractor shall assume responsibility for additional costs incurred in planning, design and construction to accommodate the substitution. If approved by the Architect, redesigned drawings and details to accommodate the substitution may be prepared by the Contractor at his own expense.
- E. If a substitution requires a different quantity and arrangement of wiring, conduit, and equipment from that specified or indicated on the Drawings, subject to approval of the Architect, the Contractor shall provide any such piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

1.11 CODE REQUIREMENTS, PERMITS AND FEES:

- A. Perform work in accordance with applicable provisions of the accepted version of NFPA codes, including the National Electric Code (NFPA-70 NEC), ICC codes including the International Building Code (IBC), International Fire Code (IFC), International Energy Conservation Code (IECC) and all state and local codes. All work shall also be in compliance with utility companies' requirements.
- B. In cases of differences between building codes, state laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Promptly notify Architect in writing of such differences.

- C. Include in the work, without extra cost to the Owner, any labor, material, service, test, apparatus, or drawing (in addition to Contract Drawings and Documents) in order to comply with applicable laws, ordinances, rules, regulations, and local authority's requirements, whether or not shown on Drawings and/or specified.
- D. Give all necessary notices, obtain all permits and pay all governmental taxes, fees and other costs in connection with the work. File all necessary plans, prepare all documents, and obtain all necessary approvals of the governmental departments having jurisdiction. Obtain all required Certificates of Inspection for the work, and deliver them to the Architect before request for final payment for the work.
- E. Contractor shall ensure that all system components, methods of installation and materials complies with ASTM, OSHA and Owner's standards for off-gassing.
- F. The Contractor shall be licensed in accordance with the guidelines of the Department of Consumer Protection. The workers employed by the Contractor shall be skilled and licensed to perform the work involved.

1.12 ROYALTIES AND PATENTS:

- A. The Contractor shall pay all royalties and shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof.
- B. If the Contractor observes that a process or article specified is an infringement of a patent, the Contractor shall promptly notify the Architect in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work. If the Contractor performs any work specified, knowing it to be an infringement of a patent, the Contractor shall bear all costs arising there from.

1.13 RECORD DRAWINGS:

- A. Clearly record differences between mechanical and electrical work as installed and as shown or called for in the Contract Documents. Accurate notations of all locations, sizes and inverts of all concealed materials shall be made. These records shall be marked, concurrent with progress, on a set of prints labeled "RECORD DRAWINGS."
- B. On completion of project, mark a set of prints with data transferred from the Record Drawings, and submit them to the Architect for review for legibility and clearness of presentation of the recorded conditions of construction.

1.14 INSTRUCTION OF OWNER'S PERSONNEL:

- A. After completion of all work and all tests and at such time as designated by the Owner's representative, the Contractor shall provide the necessary skilled personnel to operate each entire installation for a period of two (2) days of eight hours.

- B. During the operating period, the Contractor shall fully instruct the Owner's representative in the complete operation, adjustment, and maintenance of the entire installation.

1.15 OPERATION AND MAINTENANCE MANUALS:

- A. Prepare a manual of operation and maintenance instructions, in draft form, and submit to the Architect for review.
- B. The Manual shall contain the following items:
 - 1. Brief description of each system covering its basic operating characteristics.
 - 2. List of all equipment with manufacturer's name and model number for each item.
 - 3. Contractor's own written operating and maintenance instructions.
 - 4. Copies of submittals having final review stamps.
 - 5. Manufacturer's bulletins, data, parts lists, operating and maintenance instructions, guarantees and any other information pertinent to the proper operation of each system and item of equipment installed, including service manual which covers disassembly, reassembly of the equipment and trouble shooting.
 - 6. Information of actions to be taken in the event of a malfunction or other emergency.
 - 7. Provide a programming ability (CD, etc.) literature.
 - 8. Provide a copy of the original program.
 - 9. Time schedule for recommended maintenance operation.
 - 10. Programming software for fire alarm equipment.
- C. At least two weeks prior to the scheduled instruction of Owner's representatives, provide the Architect with five (5) complete copies of the final form of the Operation and Maintenance Manual, bound in booklet form in durable binders and suitable indexed.

1.16 WARRANTY:

- A. The Contractor shall warrant that all work installed will be free from any and all defects, and that all apparatus will develop capacities and characteristics specified, and that if, during a period of one (1) year from date of completion and acceptance of the work, any such defects in workmanship, materials, or performance appear, the Contractor shall immediately replace, repair or otherwise correct the defect or deficiency without cost and within a reasonable time to be specified in writing to the Owner.

- B. The Contractor shall also replace or repair, to the satisfaction of the Owner and Architect, all damage done to any material or finish in consequence of work performed in fulfilling the warranty.
- C. In the case of default on this warranty by the Contractor, the Owner may have such work done as required, and charge the cost to the Contractor.

1.17 VISITING THE SITE:

- A. Before submitting a final proposal, the Contractor shall examine the site of the proposed work to determine the existing conditions that affect the work. The Contractor will be held responsible for any assumptions made by him in regard thereto. Time for this examination must have prior approval of the Owner.
- B. No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions.

1.18 EXISTING SYSTEMS:

- A. Prior to bid, the Contractor shall make a detailed examination of the existing building including all existing services and systems to become thoroughly familiar with the scope of work and working conditions. Contractor shall pay particular attention to all existing services and interconnecting systems. All existing systems shall remain in operation at all times except as otherwise arranged under SHUTDOWNS.
- B. The Contractor shall include, in his proposal, for all necessary relocation or revamping of such services and systems, where necessitated by the renovation work, to provide a finished final project. All relocation or revamping shall be provided by the Contractor without additional cost to the Owner, and shall be arranged, as directed by the Architect in the field, to be encased in a finished manner within the building. Any equipment or material to remain or be reused that may be damaged during construction shall be replaced by the Contractor at no additional cost to the Owner. Any existing equipment or material to be removed shall be disposed of by the Contractor or stored by the Contractor, as directed by the Owner.
- C. Prior to performing any work on an existing system, this Contractor shall test to ensure operational said system and submit a written report to the Architect stating the status of the system.

1.19 SHUTDOWNS:

- A. When installation of a new system, or modification of an existing system, requires the temporary shutdown of an existing operation, the connections of the new system, or modified system, shall be performed at such time as designated by the Owner, in writing. Shutdowns shall be staged for minimum downtime.

- B. The Owner shall be notified of the estimated duration of the shutdown period at least ten (10) days in advance of the date the work is to be performed.
- C. Work shall be arranged for continuous performance, including overtime if required, to assure that existing operating services will be shut down only during the time actually required to make necessary connections.
- D. Where any disruption of systems or services serving life safety or critical functions are necessary, the Contractor shall provide and pay for outside additional services, equipment and operations as may be required by the Authority Having Jurisdiction, to provide constant, around-the-clock protection throughout the entire affected areas.

1.20 SPECIAL PROVISIONS DURING CONSTRUCTION

- A. During the course of construction when and where required by the Authority Having Jurisdiction, the contractor shall provide the services, personnel, vehicles, equipment and operations as may be required including, but not limited to: local fire department personnel, vehicles and equipment for an approved "fire watch"; on-site local fire department equipment, tankers, pumpers, trucks and aerial vehicles; local police department personnel, vehicles and equipment; ambulance personnel, vehicles and equipment; and utility company's personnel, vehicles and equipment, etc., as may be required or necessary.

1.21 EXISTING FACILITY:

- A. All work within the existing facility shall be done at a time prearranged with occupants so as to minimize disturbing the facility's operation.
- B. As the buildings will remain occupied during the course of construction, extreme care shall be exercised by the Contractor to protect the occupants and their furnishings and belongings from damage due to the renovation and modernization work being performed.

1.22 FINAL ACCEPTANCE:

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following list exceptions in the request.
 - 1. Submit the final payment request to the Architect with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 - 2. Submit an updated final statement to the Architect, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Architect's Final Inspection list of items to be completed or corrected, stating that each item has been completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
 4. Submit consent of surety to final payment.
 5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Reinspection Procedure: The Architect will reinspect the Work upon receipt of notice from the Contractor that the Work, including Final Inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.
1. Upon Completion of reinspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, reinspection will be repeated, and the Contractor will bear the cost.

1.23 COORDINATION DRAWINGS:

- A. The contractor is to prepare and submit coordination drawings for each trade detailing all systems and components including but not limited to:
- Electrical equipment components and all associated accessories.
 - Electrical Fixtures
 - Conduits, Junctions boxes and all associated accessories.
 - Lay out of Electric Rooms.
- B. Drawings are to be to scale: (1/4" = 1'-0" Min.) indicating all the latest architectural and structural components. Coordination drawings are to be in addition to any individual submittals of associated items. Each trade must sign-off on coordination drawings indicating respective trade disciplines have been coordinated. Each trade contractor must include in their bid all associated cost for such coordination drawings. Contractor to indicate respective costs on billing schedule of values.
- C. Contractor shall prepare coordination drawings and installation layouts. Such drawings shall consist of dimensioned plans and elevations, and shall give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc. Such drawings shall incorporate all trades.
1. Accurate structural steel locations shall be represented on the composite shop drawings, as the basis for coordination by the trades.

- D. These coordination shop drawings and field installation layouts shall be coordinated in field by Contractor and his subcontractors for proper relationship to work of other trades, based on field conditions, and shall be checked for accuracy and accepted by them before submission to Architect for his final acceptance. Contractor shall have competent technical personnel readily available for such coordination and checking as well as for supervision of field installation of work in accordance with shop drawings and field installations as determined by the Contractor to be correct and carrying Architect's submittal review stamp.

PART 2 - PRODUCTS

2.1 MANUFACTURER'S IDENTIFICATION:

- A. Manufacturer's nameplate, name, or trademark shall be permanently affixed to all equipment and material furnished under this Specification. The nameplate of a subcontractor or distributor will not be acceptable.

2.2 NAMEPLATES:

- A. The Contractor shall provide for each item of equipment, including panels, a permanently attached nameplate made of laminated bakelite with incised letters; nameplate shall have black surface and white core.
- B. Nameplates shall be a minimum of 3" long by 1-1/2" wide and shall bear the equipment name and item as designated in the equipment schedule.
- C. All panel directories shall be typed, indicating what each circuit breaker or fuse controls.
- D. Tape Labels: Embossed adhesive tape with 3/16" white letters on black background.
- E. Wire and cable markers: Cloth markers split sleeve or tubing type.

2.3 ACCESS DOORS:

- A. Furnish access doors to provide access to pull boxes and junction boxes, etc. concealed behind finished construction. Doors shall have a fire-resistance rating classification to match the construction which they are installed in. Doors shall be of the flush type with Allen head-operated cam lock, 16-gage anchor frame, and hinged panel, as manufactured by Goal Inc., Karp Associates Inc., or Milcor. Minimum size shall be 12" x 12". Doors shall be furnished by Division 26 for installation by other Divisions.

2.4 SLEEVES, INSERTS AND ANCHOR BOLTS:

- A. Each section of Division 26 shall be responsible for the location and proper position of sleeves and anchor bolts. If failure to do so requires cutting and patching of finished work, it shall be done at no extra cost to the Owner.

- B. Conduits passing through concrete or masonry floors, walls or partitions shall be provided with sleeves having an internal diameter 1/2" larger than the outside of the conduit. Seal to maintain fire ratings.
- C. Sleeves through concrete floors or interior masonry walls shall be Schedule 40 black steel pipe, set flush with wall, floor or ceiling surface. Sleeves through floors shall be sealed with a fireproof, resilient material to maintain the fire rating integrity of the assembly.
- D. Sleeves through floors of wet areas such as equipment rooms, toilet rooms, etc., shall extend 2" above finished floor surface and be sealed as noted above. In addition, caulk with waterproof compound to the approval of the Architect.

2.5 FIRESTOPPING:

- A. Requirements: Conduits, cables, and busways that penetrate fire rated walls or floors shall be sealed by means of a U.L. listed system. Refer to the U.L. Fire Resistance Directory, Vol.II, 1993 edition. Other equivalent third party testing agencies, such as Factory Mutual Systems Approval, are acceptable. Conduit penetrating framed walls shall meet UL No. 187 requirements, and conduit piping penetrating concrete floor or block walls shall meet UL No. 281 requirements.
- B. Submittals: Submit manufacturer's literature, specifications, installation instructions and material safety data sheets for the product(s) intended for use. Include with the submittal a list of all walls and floors that are to be penetrated, cross referenced to the U.L. system to be used. Where designated on the plans, use a system that is capable of retrofit without damage to the system. Failure of the Architect or Engineer to designate a required firestop does not relieve the Contractor of the responsibility to provide an approved system.
- C. Design: Unless otherwise specified, the "F" rating (burn thru time) of the system(s) shall be equal to or longer than the wall or floor being penetrated. Where penetrants pass thru finished walls and floors, the firestop materials when cured shall be compatible with the wall or floor finish. (For example, a firestop thru a painted block wall shall be sandable and paintable.) Where open (as opposed to closed piping) penetrants such as cable tray or busway are fire-stopped, the individual conductors shall be properly sealed by means of a cable sealant or factory installed, U.L. listed internal (in the case of busway) firestop or other approved method. Fire stop system shall meet the following: ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops, ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials and ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

- D. Installation: All seals shall be installed in accordance with the manufacturer's design and instructions. Demonstrate to the Architect that the installer is capable of installing each system properly by submitting samples or by performing one or more installations in the presence of the Architect. Include with the Record Drawings a U.L. system number for each firestop.
- E. Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. Dow Corning Corporation
 - 2. 3M Fire Protection Products
 - 3. International Protective Coatings
 - 4. HILTI, Inc.

2.6 MATERIALS AND EQUIPMENT:

- A. Prior to ordering or use of any material or equipment, it shall be the sole responsibility of the Contractor to ensure that the manufacturer certifies in writing that all material and equipment supplied is suitable and approved by code, and in accordance with the manufacturer's recommendations and installation instructions for use in the particular manner and location intended. Contractor shall make due allowance for this in the bid and shall include any accessories or revisions required at no additional charge.
- B. New materials and equipment installed into existing work shall be compatible with the existing work. The Contractor shall advise the Architect before ordering and/or installing any materials or equipment if he disputes those items and/or methods specified. Otherwise, the Contractor shall take full responsibility for their performance and suitability.
- C. All equipment shall be Year 2000 compliant, tested and proven by manufacturer. Provide owner with manufacturer's certification of Year 2000 compliance.

PART 3 - EXECUTION

3.1 PROTECTION OF WORK AND PROPERTY:

- A. The Contractor shall be responsible for the maintenance and protection of all equipment, materials and tools supplied by the Contractor and stored or installed on the job site, from loss or damage of all causes, until final acceptance by the Owner.
- B. The Contractor shall be responsible for the protection of any finished work of other trades from damage or defacement by the Contractor's operation and must remedy any such injury at the Contractor's own expense.

3.2 SCAFFOLDING, RIGGING, AND HOISTING:

- A. The Contractor shall provide all scaffolding, rigging, hoisting and services necessary for erection and delivery into the premises for all equipment and materials furnished, and remove same from premises when no longer required.

3.3 CUTTING, PATCHING, EXCAVATION AND BACKFILL:

- A. All cutting, patching, excavation and backfill shall be provided by other Divisions. Coordinate all requirements well in advance.

3.4 ACCESSIBILITY:

- A. The Contractor shall install all items so that parts requiring inspection, maintenance and repair are readily accessible. Minor deviations from the Drawings may be made to accomplish this, but changes of magnitude shall not be made without prior written approval of the Architect.

3.5 SEISMIC REQUIREMENTS:

- A. All new electrical equipment, wiring and conduit shall be installed to resist vertical and lateral forces in accordance with the State Building Code and applicable regional seismic codes, with the exception of the following: All electrical conduit less than 2-1/2" inside diameter.
- B. Where seismic restraints are installed, the spring vibration isolators or other restraint assembly shall be designed and installed in accordance with the manufacturer's specifications. The restraint assembly shall be designed to withstand the seismic lateral forces established in the State Building Code for a Zone 2 seismic area.
- C. Provide seismic snubbers, separate from spring isolators, for attachment to machinery and equipment bases, designed to provide seismic restraint in all modes (directions) in accordance with the State Building Code and applicable regional seismic codes. These snubbers shall have no contact with equipment during normal operation and shall have minimum clearances of 1/4" in all directions. Seismic snubbers shall be installed in strict accordance with the manufacturer's recommendations.
- D. Anchorage of Equipment to Housekeeping Pads: Place floor mounted equipment on 4" high concrete housekeeping pads properly doweled or expansion shielded to the floor to meet acceleration criteria. Anchor isolators and/or bases to housekeeping pads. Concrete work shall be provided by other Divisions.
- E. Anchorage of Housekeeping Pads: All concrete housekeeping pads must be anchored to the structure to meet acceleration criteria. This Contractor shall coordinate this with other Divisions.

F. Acceptable Manufacturers: Subject to compliance with requirements, provide seismic restraint and isolation products of one of the following manufacturers.

1. Mason Industries, Inc.
2. Vibration Eliminator Co., Inc.
3. Vibration Mountings and Controls, Inc.

G. Submit product data and details of all seismic restraints and isolators.

H. Each recessed fluorescent light fixture installed on four sides in a seismically supported suspended ceiling grid shall be secured to the ceiling grid with four hazard clips.

3.6 QUIET OPERATION:

A. All equipment and material provided by the Contractor shall operate under all conditions of load without any sound or vibration which in the opinion of the Architect is objectionable. Where sound or vibration is objectionable in the opinion of the Architect, the Contractor shall eliminate it in a manner approved by the Architect.

3.7 PAINTING:

A. Other Divisions shall clean and paint all new exposed, unpainted, non-galvanized, ferrous metal surfaces of pipes, conduits, equipment, hangers, supports and accessories with one (1) prime coat and two (2) finish coats. Coordinate all requirements well in advance.

3.8 CLEANING OF EQUIPMENT:

- A. Clean exposed equipment and fixtures. Repair damaged finishes and leave everything in working order satisfactory to the Architect.
- B. Thoroughly clean all equipment inside and outside of all foreign substances before being placed into operation. If any part of a system should be stopped by any foreign matter after being placed in operation, the system shall be disconnected, cleaned and reconnected wherever necessary to locate and remove obstructions. Any work damaged in the course of removing obstructions shall be repaired or replaced when the system is reconnected, at no additional cost to the Owner.

3.9 TESTS:

- A. All equipment shall be tested as determined by all authorities having jurisdiction, but in no case less than that specified under each section of the Specifications. Labor, materials, instruments and power required for testing shall be furnished by the Contractor, unless otherwise indicated under the particular section of the Specifications.
- B. Tests shall be performed to the satisfaction of the Architect and such other parties as may have legal jurisdiction.

- C. All defective work shall be promptly repaired or replaced and the tests shall be repeated until the particular system and component parts thereof receive the approval of the Architect.
- D. Any damages resulting from tests shall be repaired and damaged materials replaced, all to the satisfaction of the Architect.
- E. Equipment and systems which normally operate during certain seasons of the year shall be tested during the appropriate season. Tests shall be performed on individual equipment, systems and their controls. Whenever the equipment of a system under test is interrelated with, and depends upon, the operation of other equipment, systems and controls for proper operation, functioning and performance, the latter shall be operated simultaneously with the equipment or system being tested.

3.10 SUSPECTED EXISTING MATERIALS:

- A. Should asbestos or suspected asbestos be encountered during the course of the work, immediately discontinue all work in that area and report the condition to the Owner for resolution.
- B. All such suspected asbestos shall be reviewed and removed as required by the Owner under a separate contract by other contractors engaged directly by the Owner.
- C. No work in the area shall proceed until suspected asbestos is reviewed, all work on such has been completed, and the Owner notifies the Contractor to proceed accordingly.
- D. Should PCB be encountered during the course of the work in existing ballasts, transformers, etc., the Contractor shall remove from the site and properly dispose of, in accordance with all State and local codes.

3.11 REMOVED EQUIPMENT:

- A. All existing material or equipment replaced or superseded by the Contractor's work shall be removed by the Contractor in an approved manner and the existing structure and surfaces shall be restored by the Contractor to match the finished product. All removed equipment shall remain the property of the Owner and shall be carefully stored at the job site or removed from the premises by the Contractor as directed by the Owner.

3.12 RELOCATED EQUIPMENT:

- A. All equipment, scheduled for relocation, shall be carefully removed by the Contractor and stored in a protected manner until relocated. Any damage done to relocated equipment during removal, storage or relocation shall be corrected by the Contractor in an approved manner, including repair or replacement, as directed by the Architect.

3.13 INSTALLATION OF LABELS AND MARKERS:

- A. Decrease and clean surfaces to receive nameplates and labels.
- B. Install nameplates (and tape labels) parallel to equipment lines.
- C. Secure nameplates to equipment fronts using screws, rivets, or adhesive. Secure nameplate to inside face of recessed panelboard doors in finished locations.
- D. Embossed tape will not be permitted for any applications.
- E. Apply typed tape labels to inside of all receptacles and light switchplates to indicate panel and circuit that items is fed from.
- F. Provide wire markers on each conductor in panelboard gutters, pullboxes, junction boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits.
- G. Nameplate Engraving Schedule
 - 1. Provide nameplates of minimum letter height as schedule below.
 - 2. Panelboards, switchboards and motor control centers: 1/4 inch; identify equipment designation 1/8 inch; identify voltage rating and source.
 - 3. Individual circuit breakers, switches, and motor starters in panelboards, switchboards, and motor control centers: 1/8 inch; identify circuit and load served, including location.
 - 4. Individual circuit breakers, enclosed switches, and motor starters: 1/8 inch; identify load served.
 - 5. Transformers: 1/4 inch; identify equipment designation. 1/8 inch; identify primary and secondary voltages, primary source and secondary load and location.

3.14 DESIGNATIONS:

- A. This contractor shall confirm in writing all rooms, name, number and area designations with the Architect prior to final usage for any system. Contractor may utilize designations on drawings as a temporary measure but final usage must be confirmed with the Architect.

END OF SECTION 26 00 01

SECTION 26 00 10 –

ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1, General Requirements, apply to work specified in this Section.
- B. The requirements specified in Section 26 00 01, "Basic Electrical Requirements", apply to this Section.

1.2 INCLUDED IN THIS SECTION:

- A. Complete Secondary Distribution System
- B. Panelboards, and Circuit Breakers
- C. Feeders and Branch Circuits
- D. Wiring for all electrical equipment being furnished by others, including temperature control panels (low voltage wiring shall be provided by the Division supplying the equipment)
- E. Testing and Load Balancing
- F. Removal of Existing Electrical Equipment
- G. Cable Television
- H. Telephone

1.3 DESCRIPTION OF WORK:

- A. This Section includes furnishing all labor and material to complete and make ready for operation by the Owner all electrical work as shown on the Drawings and as described in these specifications. It is the intent of these documents to terminate with complete, operational electrical systems within the building and on the project site.
- B. Panelboards shall be dead front type equipped with thermal-magnetic molded case circuit breakers designed for operation on 120/240 volt system as manufactured by Square D, General Electric, or Cutler Hammer.

- C. Wiring devices shall be of the type as indicated on the Drawings, and shall be manufactured by P&S, Hubbell, or Leviton.
- D. Lighting fixtures shall be in strict compliance with the latest National Electric Code and Local Utilities' Energy Conscious Construction Program.
- E. For use by the Owner's telephone system vendor, provide a telephone conduit system consisting of outlets and conduit.

1.4 CODES, REGULATIONS AND STANDARDS:

- A. The electrical installation shall be in accordance with the current rules, regulations and recommendations of the local electrical inspection authority, the National Fire Protection Association, The National Electric Code, the Electric Utility Company furnishing service, Local and State Ordinances. In the event of a conflict in code requirements, the local code shall apply. All permits and certificates as required shall be obtained and paid for by this Contractor. Approved Inspection Certificates by the authorities having jurisdiction shall be furnished with request for final payment.
- B. All material and equipment shall conform to the applicable standards (current edition) of the following organizations.
 - 1. National Electrical Manufacturers Assoc. (NEMA)
 - 2. Underwriters Laboratories (UL)
 - 3. Insulated Power Cable Engineers Assoc. (IPCEA)
 - 4. Institute of Electrical & Electronics Engineers (IEEE)
 - 5. American Society for Testing Materials (ASTM)
 - 6. Federal Specifications (U.S. Department of Commerce)
 - 7. Illuminating Engineers Society (IES)

1.5 SCOPE OF WORK:

- A. This Section includes the providing of all labor, materials, fixtures, equipment, accessories, services and tests necessary to complete and make ready for operation by the Owner all electrical work as shown on the Drawings and described in these Specifications. It is the intent of these Documents to terminate with complete, operational electrical systems within the building.

- B. The work shall include but not be limited to the following:
1. Secondary Distribution System complete.
 2. Panelboards and Circuit Breakers.
 3. Feeders and Branch Circuits.
 4. Wiring for all electrical equipment being furnished by Owner or other Divisions including temperature control panel (low voltage wiring shall be provided by the Division supplying the equipment).
 5. Testing and load balancing.
 6. Shop drawings and Record Drawings.
 7. Removal of existing Electrical Equipment as noted on the Drawings and as indicated in Specifications.
 8. New overhead cable television service.
 9. New overhead telephone service.
- C. Furnish all labor, materials, tools, transportation, equipment, services and facilities required for the complete and proper installation of all electrical work. All fixtures, devices and equipment shown, noted or required on the drawings and/or contained herein shall be connected from the source of electric power to the final connection, tested and made ready for satisfactory operation.
- D. This Section shall be responsible for knowledge of the areas that may affect his work for coordinating with the local inspection authorities and with all other trades on this project. This Section shall thoroughly coordinate all work with other Divisions and shall ensure that all equipment requiring electrical work be wired and incorporated as required in the basic work of the project.
- E. Make all field measurements and shall be responsible for their accuracy.
- F. The Specifications and Drawings are complimentary each to the other and that which is called for on one shall be as binding as if called for on both. In the event of a conflict, it shall be resolved by the Architect.
- G. Any violation of the applicable electrical code standards or conflict between Drawings and Specifications not called to the attention of the Architect before the contract is executed shall be corrected at this Contractor's expense.

- H. This Section hereby waives all claim to extra compensation for work performed and materials furnished beyond the scope of the contract without written authorization by the Architect.

1.6 WORK BY OTHERS:

- A. Temporary light and power shall be furnished by other Divisions. Similarly, for installation of temperature control wiring, refer to other Divisions. Finish painting, cutting, patching, excavation and backfilling shall by other Divisions.

1.7 INSPECTIONS:

- A. This Section shall be responsible for the proper inspection of his work during its installation by all lawful authorities, shall take out and pay for all necessary permits, inspection fees and comply with all laws relating to persons employed on this work.

1.8 SHOP DRAWINGS:

- A. Submit five (5) copies of Product Data to the Architect in accordance with Section 26 00 01 Basic Electrical Requirements.
- B. Submittals shall be given to the Architect for the following materials.
 - 1. Panelboards & Meter socket
 - 2. Devices.
 - 3. NM Cable.
 - 4. Nema 4X pull/splice boxes.
 - 5. Heat Trace System (Complete).

PART 2 - PRODUCTS

2.1 CIRCUIT BREAKER PANELBOARDS:

- A. Furnish and install circuit breaker panelboards as indicated in the panelboard schedule and where shown on the plans. Panelboards shall be equipped with thermal-magnetic molded case circuit breakers with frame and trip ratings as shown on the schedule.

1. **Circuit Breakers:** Circuit breakers shall be quick-make, quick-break, thermal-magnetic, trip indicating, and have common trip on all multipole breakers. Trip indication shall be clearly shown by the breaker handle taking position between ON and OFF when the breaker is tripped. Branch circuit breakers feeding convenience outlets shall have sensitive instantaneous trip settings of not more than 10 times the trip rating of the breaker to prevent repeated arcing shorts resulting from frayed appliance cords. UL Class A (5 milliamperes sensitivity) ground fault circuit protection shall be provided on 120 Volt AC branch circuits as specified on the plans or panelboard schedule. This protection shall be an integral part of the branch circuit breaker which also provides overload and short circuit protection for branch circuit wiring. Tripping of a branch circuit breaker containing ground fault circuit interruption shall not disturb the feeder circuit to the panelboard.

A single pole circuit breaker with integral ground fault circuit interruption shall require no more panelboard branch circuit space than a conventional single pole circuit breaker. Connections to the bus shall be plug-on. (Provide interrupting capacity for all circuit breakers equal to or greater than the panel bus interrupting capacity).

2. **Panelboard Bus Assembly:** Bus bar connections to the branch circuit breakers shall be the "distributed phase" or "phase sequence" type. Single phase, three-wire panelboard bussing shall be such that any two adjacent single-pole breakers are connected to opposite polarities in such a manner that two-pole breakers can be installed in any location. Three-phase, four-wire bussing shall be such that any three adjacent single-pole breakers are individually connected to each of the three different phases in such a manner that two or three-pole breakers can be installed at any location. All current-carrying parts of the buss assembly shall be plated. Mains ratings shall be as shown in the panelboard schedule or on the plans.
3. **Wiring Terminals:** Terminals for feeder conductors to the panelboard mains and neutral shall be UL listed as suitable for the type of conductor specified. Terminals for branch circuit wiring, both breaker and neutral, shall be UL listed as suitable for the type of conductor specified.
4. **Circuit Numbering:** Panelboard circuit numbering shall be such that starting at the top, odd numbers shall be used in sequence down the left and side and even numbers shall be used in sequence down the right-hand side.

5. Equipment Short Circuit Rating: Each panelboard, as a complete unit, shall have a short circuit current rating equal to or greater than the Utility Company rating at the secondary side of the transformer (no series ratings). In the event that equipment with a short circuit rating equal to or greater than the Utility Company rating at the secondary side of the transformer is unavailable, the contractor shall provide a detailed short circuit analysis for any equipment not meeting the required rating. The short circuit analysis shall indicate the available short circuit current at the transformer, the primary line to line voltage of the transformer, KVA rating of the transformer, impedance (%Z) of the transformer, the length of each cable run including the number of conductors and the available short circuit current at each piece of equipment.
7. UL Listing: Panelboards shall be listed by Underwriters Laboratories and bear the UL label. Panelboards shall be Square D, Cutler Hammer or General Electric, and designed for operation on 120/208, 277/480 volts.
8. Panelboards shall have main ratings and branch circuit breaker ratings sized and numbered as indicated on the drawings. Panelboards shall be plug-on type construction. All current carrying parts of the bus assembly shall be plated. Terminals for feeder conductors to mains and branch neutral shall be UL listed as suitable for the type conductor specified. The load center bus assembly shall be enclosed in a steel cabinet. The size of the wiring gutters and gauge steel shall be in accordance with UL Standards No. 67 and No. 50. Fronts shall include door and be provided with a directory for circuit identification. Load center boxes and fronts shall have corrosion resisting phosphate treatment and a gray baked enamel finish. Load centers shall be UL listed and meet Federal Specification W-P-115b as Type 1, Class 2.
 - a. Branch circuit breakers up to 150 amperes shall be Square D type QO, Q1 or approved equal. All breakers shall be plug-on type, toggle action with quick-make quick-break mechanism. Trip indication shall be clearly shown on the breaker handle taking a position between "ON" and "OFF" when the breaker is tripped. All multi-pole breakers shall be single operating handle, common trip variety. Branch circuit breakers feeding convenience outlets shall have sensitive, instantaneous trip in order to give "flash protection" for frayed, stranded wire cords.

2.2 CONDUIT - RACEWAY AND FITTINGS:

- A. All raceways under slab on grade or in soil shall be Schedule 40 PVC.
- B. All raceways in masonry, not noted otherwise, shall be run in rigid steel conduit. Raceways above ceilings or within new insulated ceiling space below the first floor shall be Schedule 40 PVC.

- C. Armored cable type MC with ground wire may be used in furred ceiling and hollow stud wall construction as approved by local inspection authorities for power and lighting branch circuits only.
- D. Minimum size shall be 3/4" trade size unless otherwise noted.
- E. Exterior exposed raceways shall not be permitted unless specifically indicated otherwise.
- F. Nonmetallic cable type NM with ground wire may be used in furred ceiling and hollow stud wall construction as approved by N.E.C. and by local inspection authorities. Apartment feeders shall be Type SER cable as approved by the local inspection authorities.

2.3 GROUNDING AND BONDING:

- A. Furnish and install an electrical grounding and bonding systems with assembly of materials, including, but not limited to, cables/wires, connectors, solderless lug terminals, grounding electrodes and plate electrodes, bonding jumper braid, surge arresters, and additional accessories needed for a complete installation. Where materials or components are not indicated, provide products which comply with NEC, UL, AND IEEE requirements.

2.4 WIRING:

- A. Single conductor cables shall be used for feeders and branch circuit wiring. Minimum wire size shall be No. 12 A.W.G. unless indicated otherwise. Wire sizes No. 8 A.W.G. and smaller shall be solid. No. 6 A.W.G. and larger shall be stranded. All conductors shall be of 98 percent conductivity copper only.
- B. All wiring shall be 600 volt dual coded type "THHN/THWN". Wire of higher temperature ratings shall be used where required by National Electrical Code, Special Conditions and as described in the contract Drawings. Wiring shall be kept clear of heating and hot water lines a minimum of 6 inches.

2.5 WIRING DEVICES:

- A. Where shown on the plans, furnish and install wiring devices indicated by the symbols and symbol list.
- B. Wiring devices shall be of the type as specified herein and shall be as manufactured by Pass & Seymour, Hubbell, or Cooper. Numbers specified refer to Pass & Seymour. Color ivory, confirm color with Architect.

Wall Switches, 20A, 120/277V	20ACI-1 Series
Receptacles (Grounding)	
15 AMP 125V, Duplex	TR5262-I
20 AMP 125V, Duplex	TR5362-I

20 AMP, 208V, Single Pole	5871-I
20 AMP, 120V, Ground Fault	2095 TR-I
30 AMP, 208V, 2-Pole, Single	3801
50 AMP, 208V, 2-Pole, Single	3890
60 AMP, 208V, 3-Pole, 4 Wire	3871
20 AMP, 125V, Exterior Duplex	2095TRWR-I

- C. Plates shall be stainless steel, satin finish, Pass & Seymour S-IN Series.
- D. Provide draft barriers on all devices mounted or located in an exterior wall (Lessco Box #5700.01).

2.6 OUTLET BOXES:

- A. Outlet boxes and covers shall be plastic.
- B. Outlet boxes shall be of sizes and type to accommodate: (1) structural conditions, (2) size and number of raceways and conductors or cables entering, and (3) device or fixture for which required. Size of box to match size of device with no overhang. Surface mounted equipment shall be furnished with applicable surface type box semi-flush mounted equipment shall be furnished with applicable semi-flush type box and trim.
- C. Pull and splice boxes are not indicated on drawings but shall be provided as required for splice and ease of pulling conductors and NEC requirements.

2.7 MISCELLANEOUS STEEL AND HARDWARE:

- A. Furnish and install all the necessary steel for supporting lighting fixtures, panels, starters, disconnects, conduit etc. "Kindorf" framing systems, rods, channels, and fittings with galvanized or cadmium finish shall be used. Unprotected ferrous metals shall not be permitted.

2.8 CABLE TELEVISION:

- A. The local cable company will provide exterior wiring. This contractor shall be responsible for all inter conduit, exterior conduit, weather heads and masts.
- B. Coaxial Cables from Outlets to Termination Points: Furnish and install cable purchased from the local cable company.
- C. Outlets and Boxes: Furnish and install miscellaneous electrical equipment as directed by the local cable company.

2.9 TELEPHONE

- A. The local Telephone Company will provide all exterior wiring, instruments, and make connection complete for the telephone installation.

- B. Furnish and install all interior cables, outlet boxes, exterior conduit, interior conduit from telephone outlet boxes to terminal boxes and/or terminal board as indicated on the Drawings.
- C. Contractor shall be responsible for the entire service installation and shall include all interior conduit, exterior conduit, weather head and masts and all charges as directed by the Utility Company for service installation, including inspection fee, if any, in the bid.
- D. Telephone cables shall be plenum rated Category 6 as manufactured by Belden, General Cable or Mohawk Cable

2.10 TENANT SERVICE METERING EQUIPMENT

- A. Metering Equipment:
 - 1. Enclosures shall be constructed of formed and welded code gauge steel. No device disassembly is to be required before mounting. Mounting shall be accomplished by using a separate mounting channel in conjunction with enclosure for vertical support. Final mounting shall be by the use of external mounting feet for attaching to walls. All devices must be bonded together with bolted connections. Meter units shall be provided with individual, removable covers for each meter position. All compartments containing unmetered circuits shall be provided with a sealing means.
 - 2. All components shall be factory assembled and all current carrying parts shall be plated bus bars. Individual units shall be constructed with an integral sliding one bolt joint-pak assembly for a completely bussed meter center. This single bolt is to be a Visi-Tite bolt for tightening without a torque wrench.
 - 3. Meter sockets shall be 4-jaw non-circuit closing type with 5-jaw provisions or 5-jaw type with lever bypass and jaw release for use on 3 phase network systems. Sockets shall be rated 200 ampere continuous duty. Meter socket jaws are spring reinforced and front removable.
 - 4. Two pole branch circuit breakers for 100 ampere devices shall be current limiting type.
 - 5. Main device and meter/breaker components must be of such design to permit arrangement to allow wiring at the top or bottom in the same assembly. Equipment shall be so arranged as to permit the installation of units with different branch ratings in the same meter center.
 - 6. The meter center shall be UL listed with a short circuit current rating equal to or greater than the AIC Rating of the main service switch, shall be Square D, Cutler Hammer or General Electric.

PART 3 - EXECUTION

3.1 CONDUIT - RACEWAY AND FITTINGS:

- A. All metal conduit, enclosures and raceways for conductors shall be mechanically joined together to form a continuous electrical continuity and bond and shall be grounded as required by National Electrical Code.
- B. All conduit shall be concealed where possible and so installed so as not to damage or run through structural members.
- C. In unfinished areas, when conduits can not be concealed, exposed conduit shall be run parallel with or at right angles to the walls of the building. Check the structural details and plans so that all conduits can be concealed, except conduits on surface-mounted panels and boxes and other locations as outlined in these specifications.
- D. In finished areas, when conduits can not be concealed, furnish and install surface metal raceway as manufactured by Wiremold. Raceways, elbows, and fittings shall be designed for use together. They shall be sized as approved for the number of wires as indicated. Runs shall be parallel or at right angles to walls or partitions.
- E. All conduit shall be supported by approved hangers, racks, clamps or clips fastened to expansion inserts or lead anchors. Spacing of supports for conduits and raceways shall be in accordance with the National Electrical Code.
- F. All conduit runs in slab shall be separated as much as possible.
- G. Conduits shall be in full lengths wherever possible. All conduits shall be plugged with approved discs during construction and be dry and clean before pulling wires.
- H. All conduits that are laid underground, in concrete floor slabs and in building walls shall be approved by authorized inspectors before they are covered up in any way. Conduits installed in concrete shall be in accordance with standards of the American Concrete Institute. The size of conduit and locations which can be installed in any slab shall be determined by the Structural Engineer's requirements of the amount of concrete over and under the slab reinforcements, allowing a minimum cover of 1" over surface. Check the Structural and Architectural drawings and specifications before time of bidding, to verify all conditions.
- I. The inside and outside of all steel and flexible conduit, including factory-make elbows, and of all boxes and fittings, including bolts and screws, shall be protected against corrosion by an even coating of zinc.
- J. Where raceways are cut in the field, they shall be square cut using approved cutter. The cut ends shall be reamed to remove burrs and sharp edges. Threads cut on conduit in the field shall have the same effective length and the same thread dimensions and taper as the factory-cut conduit threads.

- K. Raceways shall be joined by means of threaded couplings or unions. Joints shall be set up tight. Runs shall be straight and true. Elbows, offsets and bends shall be uniform and symmetrical.
- L. All raceways shall be cleaned, prior to pulling in wire and cable. This cleaning shall remove all foreign matter, including water, from the raceways. All boxes in which the raceway terminates shall be cleaned of all concrete, mortar or other foreign matter and all threads in boxes shall be left clean and true upon completion of the work.
- M. Wiring above ceiling from junction box to lighting fixtures may be run in flexible metal conduit not exceeding 72" length.
- N. Conduits going through expansion joints of the building shall be equipped with expansion fittings as manufactured by O-Z, or approved equal.
- O. Joints shall be set up tight. Couplings, connectors and fittings shall be approved types designed for the purpose.
- P. Furnish and install separate ground wire in all EMT to ground all equipment and devices.

3.2 BRANCH CIRCUITS AND FEEDERS:

- A. Furnish and install all conduits, outlets and wiring for all power, lighting, control, equipment and motor circuits as shown on plans and/or as herein specified. Final connections to all equipment shall be made under this Division unless otherwise specifically noted elsewhere.
- B. The Minimum size of wire for light or power shall be as scheduled below for the entire distance of the circuit. (Circuits to have hot leg, neutral and ground unless otherwise noted). Wire sizes #14 through #10 shall be solid except as otherwise indicated. Wire sizes #8 and larger shall be stranded. All sizes called for in the specifications or on the plans are American Wire Gauge sizes.

1.	120V/240V 1P & 3P 20A Circuits:	
	LENGTH OF BRANCH CIRCUITS	REQUIRED WIRE SIZE
	0 - 80'	#12's
	81' - 140'	#10's
	141' - 225'	#8's
	226' - 360'	#6's

NOTES:

- 1. Wire sizes indicated shall be for the entire length of the circuit (from the circuit breaker in the panel board to the last device connected to the circuit).

2. Minimum wire size indicated unless otherwise noted on plans.
 3. All other Branch Circuit, panel and equipment wire sizes shall be calculated to maintain a maximum voltage drop of 3% (from the circuit breaker in the panel to the first device connected to the circuit) as recommended by article 210.19(A) Informational note No. 4 of the 2011 National Electrical Code. Voltage drop shall be calculated using thermal resistances derived from table 310.15(B)(16) from the 75 degree column, using the Neher - McGrath equation and using an ambient temperature rating of 30 degree C (86 degree F) with an amperage based on 80% of the branch over current protection device in the panel schedule.
 4. When running more than 3 current carrying conductors in a conduit or raceway. Contractor to ensure all requirements for derating are met per article 310.15(B)(3) using table 310.15(B)(3)(a) of the 2011 National Electrical Code.
- C. All wire shall be factory color-coded with a separate color for phase, switch and neutral used consistently throughout. The neutral wire of all branch circuits shall be white. Green shall be used for equipment grounding conductors. Feeders shall be phase color coded at all access points.
- D. The installation of wires and cables includes all splicing of the wiring and cables to each other an connecting them to panelboards, receptacles, switches, controls, lighting fixtures, motors and all other electrical apparatus.
- E. Branch circuits shall be arranged to balance the loads on the phases of the panelboard feeders. Where 120 volt, three or four wire circuits are indicated, the circuit shall consist of separate phases and a common neutral. (Circuit numbers shown on drawings are for identification only.) Maximum unbalance shall not exceed 10 percent.
- F. All wires and cables shall be continuous from origin to destination without running splices. At the end of these wires and cables a sufficient slack shall be left as may be required for making proper connections.
- G. Flexible conduit shall be installed at all motor connections to prevent transmission of noise and vibration; 24" maximum length.
- H. Starters and controls shall be rigidly secured and installed plumb and level.
- I. Manually operated devices such as pushbuttons and manual starters shall be provided under this Division and shall be located to permit convenient operation and be readily accessible and shall have pilot light for "ON" operation. Furnish engraved plastic nameplates for each control station.
- J. Disconnect devices shall be provided under this Division of the specifications to comply with all requirements of the National Electrical Code. Disconnects shall be horsepower rated, quick-make, quick-break mechanisms with provisions for locking the operating handle in the open position.

- K. Joints, taps, and splices in wires #8 AWG and larger shall be made by solderless pressure lug. Joints, taps and splices in wires #10 AWG or smaller, shall be made by solderless connectors.
- L. Conduits must be swabbed out and made thoroughly dry before pulling wire and cable.
- M. No grease or other compound which contains acids shall be used in pulling wires and cables.
- N. Where solid conductors are to be connected directly to the devices without the use of lugs, such as occurs at lighting switches and plug receptacles, the wire shall be formed into a loop to fit around the screw.
- O. All switches controlling lighting fixtures or split wired receptacles for portable lighting equipment shall be provided with a neutral wire located in the switch box for connection of future electronic lighting control equipment. Neutral wire shall be capped for future use, provide tag with permanent marking "Neutral conductor".
- O. This Division shall snake all existing block, wall and wood wall for installation of new wiring and conduits as required to extend new work in existing areas.

3.3 WIRING DEVICES:

- A. Where more than one switch is shown at one outlet, they shall be installed under one plate in an order appropriate to the location of the outlet controlled.
- B. All devices installed back to back in a common partition shall be offset by 18" minimum.

3.4 GROUNDING AND BONDING:

- A. All non-current carrying metallic parts of electrical equipment, machines, appliances and conduits shall be securely grounded to a common ground bus and ground shall be connected to the water main, with a copper or brass pipe clamp, on the street side of the water service; jumpers shall be installed by-passing all valves.
- B. All grounding conductors shall be made with as few connections as possible. All connections shall be made with an approved type of solderless connector and shall be protected from mechanical injury.
- C. All contact surfaces shall be thoroughly cleaned before connection is made so as to insure a good metal-to-metal contact. Connections shall be readily accessible for inspection.
- D. The ground and bonding systems shall be in strict accordance with the latest edition of the National Electrical Code.

3.5 OUTLET BOXES:

- A. Outlet boxes and fittings shall be installed at each outlet switch or junction point of conduit.
- C. Boxes shall set plumb and true in building surface and furnished with suitable plaster rings where so required.

3.6 LOCATION OF OUTLETS:

- A. Coordinate work with other trades involved so that exact locations may be obtained for all outlets, apparatus, appliances and wiring. The locations shown on the plans are subject to modifications due to conditions arising as construction progresses, such as swing or doors, layout of furnishings, locations of partitions, etc. Such changes shall be observed and executed as part of this contract. Verify all locations shown in accordance with the General Plans before installing work, correcting such discrepancies as they arise during the installation, without additional cost to the Owner.
- B. Dimensions shall be given by the Architect where same are necessary to suit equipment layouts. Verify the locations of work with all other trades previous to installation, and assign space requirements and locations so that there will be no conflicts in space requirements of each trade. The accompanying plans indicate approximately the layout of the work to be done. Exact locations shall be, in all instances, as designed or as centered on the job from measurements given by the Architect. Installation and location of outlets in equipment rooms shall be made after other locations of piping and equipment have been established to avoid interferences.

3.7 SERVICE:

- A. The service shall be as indicated on the Drawings and shall meet all National and Local Codes and the Utility Company's requirements.
- B. The Utility Company will provide overhead facilities, underground primary cables, main transformers, primary protective and disconnect devices, and current metering transformers, all generally as indicated on the plans. The Electrical Contractor shall provide secondary work from main transformer and ground grid. However, this Contractor shall be responsible for the entire service installation and shall include therefore all charges from the Utility Company for service installation, including inspection fee, if any, in the bid.
- C. Provide metering sockets, current transformer provisions, all in type and style as approved by the Utility Company and located as shown on the drawings.
- D. Secondary service characteristics shall be 120/240 volt, 1 phase, 3 wire.

3.8 PANELBOARDS:

- A. Panels shall be flush mounted with type, size, and number of branch circuit breakers as shown on Plans. All panelboards shall be aligned leveled and securely fastened to the building as recommended by the manufacturer and in accordance with State seismic requirements. Surface mounted panels shall be mounted at least 1" off the wall on suitable backboard which shall not block the vertical flow of air in back of panel. Flush mounted panels shall be installed to align with finished wall surfaces.
- B. Identify panelboards with laminated plastic name plates with engraved letters. Attach with screws.
- C. Typewritten circuit schedules in panelboard shall identify panelboard and each branch breaker.
- D. All new panels replacing existing panels shall be aligned, leveled and securely fastened to the building. Surface mounted panels shall be mounted at least 1" off the wall on suitable backboard which shall not block the vertical flow of air in back of panel. Flush mounted panels shall be installed to align with finished wall surfaces.

3.9 CABLE TELEVISION:

- A. The Electrical Subcontractor shall furnish and install all exterior conduit, interior cables, interior conduit, miscellaneous hardware and boxes as directed by the local cable company as indicated on the drawings and required for a complete distribution system in accordance with Article 820 of the NEC (Cables shall be purchased from the local cable company).
- B. Coaxial cables shall be run in continuous lengths except for terminations and no splices shall be permitted in any run. Cables shall be installed to avoid sharp bends or physical distortion. All cables shall be tagged at each terminating point to describe function and destination.
- C. Do not run any cable exposed. Provide raceway only where required and called for.
- D. The cable company will furnish and install all exterior cables, splicers and amplifiers, etc. necessary for a complete and operational system.
- E. The Electrical Subcontractor shall be responsible for coordinating installation with local cable company and providing the necessary conduit and equipment including scheduling.
- F. The Electrical Subcontractor shall include all charges by the cable company for service installation in their bid.

3.10 TELEPHONE CABLES

- A. The Electrical Subcontractor shall furnish and install all interior conduit, exterior conduit, interior cables and boxes as directed by the Telephone Company as indicated on the drawings and required for a complete distribution system in accordance with Article 800 of the N.E.C.
- B. Cables shall be run in continuous lengths except for terminations and no splices shall be permitted in any run. Cables shall be installed to avoid sharp bends or physical distortion. All cables shall be tagged at each terminating point to describe function and destination.
- C. The electrical subcontractor shall be responsible for coordinating installation with local telephone company and providing the necessary conduit and equipment including scheduling.

3.11 WIRING FOR EQUIPMENT:

- A. Whether specifically indicated or not, furnish and install all wiring and connect to all equipment and controls as required, and in accordance with the shop drawings and diagrams to be provided by other divisions and other manufacturers.
- B. All roughing work shall be installed in accordance with final dimensioned equipment shop drawings.

3.12 CUTTING AND PATCHING:

- A. All necessary cutting and patching of the existing structures for the reception of the work under this contract shall be by the General Contractor. All patching of existing structure shall be by the General Contractor. All patching of existing structure shall be by the general contractor.
- B. Provide all required sleeves, forms and inserts before new walls, partitions, floors or roof are built. All cutting and patching of walls, partitions, ceilings and floors necessary for reception of work, caused by failure to provide or properly locate sleeves, forms and inserts, or caused by incorrect location of work shall be done at the expense of this Contractor. No cutting of finished or structural work may be done without approval of Owner.
- C. This Contractor shall locate all sleeves and shall cooperate with other contractors so that all conduit runs shall be coordinated and arranged in a neat and workmanlike manner.
- D. When it is necessary to have finished material cut, drawings shall be submitted to the Architect showing work required, and his approval shall be obtained before doing such cutting.

- C. Openings in walls and floors, in new construction for electrical work shall be provided by this Contractor, but this Contractor shall furnish exact dimensions and locations of these openings to suit the type of unit to be used.

3.14 ALTERATIONS:

- A. Certain removals and relocations of existing electrical work will be necessary to the satisfactory performance of the general work. All changes cannot be completely detailed on the drawings, but shall be taken into consideration in making up the work proposal.
- B. Continuous service is required on all circuits and outlets affected by these changes, except where the Owner will permit outage for a specific time. Obtain Owner's written consent before removing any circuit from continuous service.
- C. Wherever it is required to disconnect or remove any part of an existing circuit, reconnect that circuit to re-establish service in the remaining portion of the circuit. Cut back to below floor, wall or ceiling and plug both ends of the concealed conduits made obsolete by alterations. Remove exposed conduits, wireways, outlet boxes, pull boxes, and hangers made obsolete by the alterations, unless specifically designated to remain.
- D. All thermostats, unit heaters, fans, etc., shall be removed or relocated by others. Electrical Contractor shall terminate and secure wiring where equipment is removed.
- E. The Electrical Contractor shall extend wiring and conduit and reconnect to any equipment relocated by other trades, like Division 23. All necessary hardware shall be provided under this Division to provide continuity in service of the circuit to be relocated equipment.
- F. The Electrical Contractor shall remove all existing lighting fixtures in areas where indicated on plans, and will be replaced by new. Provide suitable cover plates for each fixture outlet box where existing fixtures are removed. Terminate and secure wiring if required, or maintain continuity of service in circuit where other outlets are served by the circuit. All fixtures removed shall be stored or disposed of as directed by the Owners.
- G. All existing fixtures called for to be reused, shall be refurbished; clean, relamp and reballast the fixture and install at location as indicated, complete and in first class operating condition, providing all required accessories and hardware for a complete installation.
- H. Any outlet or switch occurring in a partition or wall being demolished shall be relocated to the nearest suitable location by extending the wiring and reconnecting as required at no cost to the Owner. Exact location of such an outlet shall be determined by the Architect.
- I. Verify conduit and cable sizes and capabilities of the existing installations with the information on the drawings.

- J. Where discrepancies between existing installations and data indicated on the drawings exist, notify Architect before the extension or replacement of existing conduit and cable work is started.
- K. Take possession and remove from the premises all abandoned materials and equipment not specified as returned to the Owner.
- L. Return to Owner portable equipment connected to outlets.

END OF SECTION 26 00 10

SECTION 311000

SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Stripping and stockpiling rock.
6. Removing above- and below-grade site improvements.
7. Disconnecting, capping or sealing, site utilities.
8. Temporary erosion and sedimentation control.

- B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for temporary erosion- and sedimentation-control measures.

1.3 DEFINITIONS

- A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches (50 mm) in diameter; and free of weeds, roots, toxic materials, or other nonsoil materials.

- D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to reasonably able to be protected during construction.
- E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to reasonably able to be protected during construction.
- F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 MATERIAL OWNERSHIP

- A. Except for materials indicated to be stockpiled or otherwise to remain on Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.6 INFORMATIONAL SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs or video recordings.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.
- B. Topsoil stripping and stockpiling program.
- C. Rock stockpiling program.
- D. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.7 CLOSE OUT SUBMITTALS

- A. Prepare an accurate plan showing abandoned in place and new utilities

1.8 QUALITY ASSURANCE

- A. Topsoil Stripping and Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

- B. Rock Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

1.9 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.
- B. Improvements on Adjoining Property: No work is to take place on adjoining property.
- C. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises contractor located and identified storage area..
- D. Utility Locator Service: Notify Call Before You Dig for area where Project is located before site clearing.
- E. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.
- F. Tree- and Plant-Protection Zones: Protect according to requirements in Section 015639 "Temporary Tree and Plant Protection."
- G. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.
- B. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with MPI #23 (surface-tolerant, anticorrosive metal primer) or SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner and MCA.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

- A. Protect trees and plants remaining on-site as directed by MCA and identified in the pre-construction conference.
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain and those that are damaged by construction operations.

3.4 EXISTING UTILITIES

- A. Contractor will arrange for location and disconnecting and sealing indicated utilities that serve existing structures before site clearing.
 - 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

- B. Locate, identify, disconnect, and seal or cap utilities.
 - 1. Arrange with utility companies to shut off indicated utilities.
- C. Locate, identify, and disconnect utilities indicated to be abandoned in place.
- D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify MCA not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without MCA's written permission.
 - 3. Prepare and accurate plan showing the location of existing utilities.
- E. Excavate for and remove underground utilities necessary for project work as directed by MCA.

3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Grind down stumps and remove roots larger than 3 inches (75 mm) in diameter, obstructions, and debris to a depth of 18 inches (450 mm) below exposed subgrade.
 - 3. Use only hand methods or air spade for grubbing within protection zones.
 - 4. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer to a density equal to adjacent original ground.
 - 2. Return to site three (3) seasons after substantial completion and repair depressions.

3.6 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth of 6 inches (150 mm) in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches (50 mm) in diameter; trash, debris, weeds, roots, and other waste materials.

- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
 - 1. Limit height of topsoil stockpiles to 72 inches (1800 mm).
 - 2. Do not stockpile topsoil within protection zones.
 - 3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity to be stockpiled or reused.
 - 4. Stockpile surplus topsoil to allow for resspreading deeper topsoil.

3.7 STOCKPILING ROCK

- A. Remove from construction area naturally formed rocks that measure more than 1 foot (300 mm) across in least dimension. Do not include excavated or crushed rock.
 - 1. Separate or wash off non-rock materials from rocks, including soil, clay lumps, gravel, and other objects larger than 2 inches (50 mm) in diameter; trash, debris, weeds, roots, and other waste materials.
- B. Stockpile rock away from edge of excavations without intermixing with other materials. Cover to prevent windblown debris from accumulating among rocks.
 - 1. Limit height of rock stockpiles to 36 inches (900 mm).
 - 2. Do not stockpile rock within protection zones.
 - 3. Dispose of surplus rock. Surplus rock is that which exceeds quantity indicated to be stockpiled or reused.

3.8 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
 - 2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

- B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials, and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 311000

SECTION 312000

EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for slabs-on-grade, walks, pavements, turf and grasses, and plants.
3. Excavating and backfilling for buildings and structures.
4. Drainage course for concrete slabs-on-grade.
5. Subbase course for concrete walks and pavements.
6. Subbase course and base course for asphalt paving.
7. Subsurface drainage backfill for walls and trenches.

- B. Related Requirements:

1. Section 013200 "Construction Progress Documentation" for recording preexcavation and earth-moving progress.
2. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
3. Section 312319 "Dewatering" for lowering and disposing of ground water during construction.
4. Section 315000 "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.
5. Section 329200 "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.

1.3 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.

2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 1. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by MCA. Unauthorized excavation, as well as remedial work directed by MCA, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.
- H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 1.5 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches (97 blows/50 mm) when tested by a geotechnical testing agency, according to ASTM D 1586.
- I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- J. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- K. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- L. Unauthorized Excavation: Excavation beyond indicated elevations, dimensions, and lines
- M. Unsatisfactory Soil: Soil determined not to meet the intent of the project needs
- N. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

- L. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct preexcavation conference at Project site.
 - 1. Review methods and procedures related to earthmoving, including, but not limited to, the following:
 - a. Personnel and equipment needed to make progress and avoid delays.
 - b. Coordination of Work with utility locator service.
 - c. Coordination of Work and equipment movement with the locations of tree- and plant-protection zones.
 - d. Extent of trenching by hand or with air spade.
 - e. Field quality control..

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
 - 1. Geotextiles.
 - 2. Controlled low-strength material, including design mixture.
 - 3. Geofoam.
 - 4. Warning tapes.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
 - 1. Classification according to ASTM D 2487.
 - 2. Laboratory compaction curve according to ASTM D 1557.
- C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

1.7 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.8 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Not Allowed
- C. Utility Locator Service: Notify "Call Before You Dig" for area where Project is located before beginning earth-moving operations.
- D. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified in Section 015000 "Temporary Facilities and Controls" and Section 311000 "Site Clearing" are in place.
- E. Do not commence earth-moving operations until plant-protection measures are in place as specified in drawings and Section 311000 "Site Clearing".
- F. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- G. Do not direct vehicle or equipment exhaust towards protection zones.
- H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 294/D 2940M 0; with at least 95 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and zero to 5 percent passing a No. 8 (2.36-mm) sieve.
- I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and zero to 5 percent passing a No. 4 (4.75-mm) sieve.
- J. Sand: ASTM C 33/C 33M; fine aggregate.
- K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 GEOTEXTILES

- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 - 1. Survivability: Class 2; AASHTO M 288.
 - 2. Survivability: As follows:
 - a. Grab Tensile Strength: 157 lbf (700 N); ASTM D 4632.
 - b. Sewn Seam Strength: 142 lbf (630 N); ASTM D 4632.
 - c. Tear Strength: 56 lbf (250 N); ASTM D 4533.
 - d. Puncture Strength: 56 lbf (250 N); ASTM D 4833.

3. Apparent Opening Size: No. 60 (0.250-mm) sieve, maximum; ASTM D 4751.
4. Permittivity: 0.5 per second, minimum; ASTM D 4491.
5. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Survivability: As follows:
 - a. Grab Tensile Strength: 247 lbf (1100 N); ASTM D 4632.
 - b. Sewn Seam Strength: 222 lbf (990 N); ASTM D 4632.
 - c. Tear Strength: 90 lbf (400 N); ASTM D 4533.
 - d. Puncture Strength: 90 lbf (400 N); ASTM D 4833.
3. Apparent Opening Size: No. 60 (0.250-mm) sieve, maximum; ASTM D 4751.
4. Permittivity: 0.02 per second, minimum; ASTM D 4491.
5. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.3 CONTROLLED LOW-STRENGTH MATERIAL

A. Controlled Low-Strength Material: Self-compacting, low-density, flowable concrete material produced from the following:

1. Portland Cement: ASTM C 150/C 150M, Type I, Type II, or Type III.
2. Fly Ash: ASTM C 618, Class C or F.
3. Normal-Weight Aggregate: ASTM C 33/C 33M, 3/8-inch (10-mm) nominal maximum aggregate size.
4. Foaming Agent: ASTM C 869/C 869M.
5. Water: ASTM C 94/C 94M.
6. Air-Entraining Admixture: ASTM C 260/C 260M.

B. Produce low-density, controlled low-strength material with the following physical properties:

1. As-Cast Unit Weight: 30 to 36 lb/cu. ft. (480 to 576 kg/cu. m) 36 to 42 lb/cu. ft. (576 to 675 kg/cu. m) or as specified by MCA, at point of placement, when tested according to ASTM C 138/C 138M.
2. Compressive Strength: 80 psi (550 kPa) or as specified when necessary for project work, when tested according to ASTM C 495/C 495M.

C. Produce conventional-weight, controlled low-strength material with 140-psi (965-kPa) or as specified by MCA, when compressive strength when tested according to ASTM C 495/C 495M.

2.4 GEOFOAM

A. Extruded-Polystyrene Board Insulation: ASTM C 578 shall be one of the following,

1. Type IV, 1.55-lb/cu. ft. (25-kg/cu. m) density, 25-psi (173-kPa) compressive strength
 2. Type X, 1.30-lb/cu. ft. (21-kg/cu. m) density, 15-psi (104-kPa) compressive strength
 3. Type VI, 1.80-lb/cu. ft. (29-kg/cu. m) density, 40-psi (276-kPa) compressive strength
 4. Type VII, 2.20-lb/cu. ft. (35-kg/cu. m) density, 60-psi (414-kPa) compressive strength
 5. Type V, 3.00-lb/cu. ft. (48-kg/cu. m) density, 100-psi (690-kPa) compressive strength.
- B. Molded-Polystyrene Board Insulation: ASTM C 578 shall be one of the following
1. Type I, 0.90-lb/cu. ft. (15-kg/cu. m) density, 10-psi (69-kPa) compressive strength
 2. Type VIII, 1.15-lb/cu. ft. (18-kg/cu. m) density, 13-psi (90-kPa) compressive strength
 3. Type II, 1.35-lb/cu. ft. (22-kg/cu. m) density, 15-psi (104-kPa) compressive strength.
 4. Manufacture molded polystyrene with an inorganic mineral registered with the EPA and suitable for application as a termite deterrent.
- C. Rigid Cellular Polystyrene Geofoam: ASTM D 6817, shall be one of the following
1. Type EPS 19, 1.15-lb/cu. ft. (18.4-kg/cu. m) density, 5.8-psi (40-kPa) compressive strength at 1 percent deformation; 16-psi (110-kPa) compressive strength at 10 percent deformation
 2. Type EPS 39, 2.40-lb/cu. ft. (38.4-kg/cu. m) density, 15-psi (103-kPa) compressive strength at 1 percent deformation; 40-psi (276-kPa) compressive strength at 10 percent deformation Insert requirement.
- D. Connectors: Geofoam manufacturer's multibarbed, galvanized-steel sheet connectors or Deformed steel reinforcing bars, 3/4 inch (19 mm) in diameter.

2.5 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility; colored as follows:
1. Red: Electric.
 2. Yellow: Gas, oil, steam, and dangerous materials.
 3. Orange: Telephone and other communications.
 4. Blue: Water systems.
 5. Green: Sewer systems.
- B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:
1. Red: Electric.
 2. Yellow: Gas, oil, steam, and dangerous materials.
 3. Orange: Telephone and other communications.
 4. Blue: Water systems.
 5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth-moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation, unauthorized excavation, or removal of obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
 - 2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
 - a. 24 inches (600 mm) outside of concrete forms other than at footings.
 - b. 16 inches (450 mm) outside of concrete forms at footings.
 - c. 6 inches (150 mm) outside of minimum required dimensions of concrete cast against grade.

- d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
- e. 6 inches (150 mm) beneath bottom of concrete slabs-on-grade.
- f. 6 inches (150 mm) beneath pipe in trenches and the greater of 24 inches (600 mm) wider than pipe or 42 inches (1065 mm) wide.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 2. Pile Foundations: Stop excavations 6 to 12 inches (150 to 300 mm) above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
- B. Excavations at Edges of Tree- and Plant-Protection Zones:
 1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
 2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.
 1. Clearance: 12 inches (300 mm) each side of pipe or conduit.

- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
 - 1. For pipes and conduit less than 6 inches (150 mm) in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 - 2. For pipes and conduit 6 inches (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
 - 3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
 - 4. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.
- D. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.
 - 1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.
- E. Trenches in Tree- and Plant-Protection Zones:
 - 1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
 - 2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
 - 3. Cut and protect roots.

3.8 SUBGRADE INSPECTION

- A. Notify MCA when excavations have reached required subgrade.
- B. If MCA determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade beneath pavements to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction. Limit vehicle speed to 3 mph (5 km/h).
 - 2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by MCA, and replace with compacted backfill or fill as directed.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for Section 01 22 00 - "Unit Prices".

- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by MCA, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by MCA.
 - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by MCA at no additional cost.

3.10 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring, bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

- C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 "Cast-in-Place Concrete." And Section 033053 "Miscellaneous Cast-in-Place Concrete."
- D. Backfill voids with satisfactory soil while removing shoring and bracing.
- E. Initial Backfill: Shall be one of the following;
 - 1. Soil Backfill: Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the pipe or conduit.
 - a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
 - 2. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches (300 mm) over the pipe or conduit. Coordinate backfilling with utilities testing.
- F. Final Backfill :Shall be one of the following;
 - 1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
 - 2. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.

3.13 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under walks and pavements, use satisfactory soil material.
 - 3. Under steps and ramps, use engineered fill.
 - 4. Under building slabs, use engineered fill.
 - 5. Under footings and foundations, use engineered fill.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 12 inches (200 mm) in loose depth for material compacted by heavy compaction equipment and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 95 percent.
 2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 92 percent.
 3. Under turf or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 85 percent.

3.16 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations to restore site substantially to the condition it existed prior to commencement of construction activity.
 1. Provide a smooth transition between adjacent existing grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve restoration of site to conditions that existed prior to the commencement of construction, within the following subgrade tolerances:
 1. Turf or Unpaved Areas: Plus or minus 1 inch (25 mm) and as directed by MCA.
 2. Walks: Plus or minus 1 inch (25 mm) and as directed by MCA.
 3. Pavements: Plus or minus 1 inch (25 mm) and as directed by MCA.
- C. Grading inside Building Lines: As directed by MCA.

3.17 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course if directed by MCA under pavements and walks as follows:
 - 1. Place base course material over subbase course under hot-mix asphalt pavement.
 - 2. Shape subbase course and base course to required crown elevations and cross-slope grades.
 - 3. Place subbase course and base course 6 inches (150 mm) or less in compacted thickness in a single layer.
 - 4. Place subbase course and base course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
 - 5. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.
- C. Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12 inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.18 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
 - 2. Determine that fill material classification and maximum lift thickness comply with requirements.
 - 3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.
- B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by MCA.

- E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:
1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 500 square feet or less of paved area or building slab but in no case fewer than three tests.
 2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 50 feet (15 m) or less of wall length but no fewer than two tests.
 3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 75 feet (23 m) or less of trench length but no fewer than two tests.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.19 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
1. Scarify or remove and replace soil material to depth as directed by MCA; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.20 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

SECTION 312319

DEWATERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes technical provisions for construction dewatering that are not anticipated to be necessary for project work. Any construction dewatering and other provisions of this section shall be provided by the contractor at no additional cost
- B. Related Requirements:
 - 1. Section 312000 "Earth Moving" for excavating, backfilling, site grading, and controlling surface-water runoff and ponding.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Verify availability of Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review condition of site to be dewatered including coordination with temporary erosion-control measures and temporary controls and protections.
 - 3. Review geotechnical report.
 - 4. Review proposed site clearing and excavations.
 - 5. Review existing utilities and subsurface conditions.
 - 6. Review observation and monitoring of dewatering system.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: For dewatering system, prepared by or under the supervision of a qualified professional engineer.
 - 1. Include plans, elevations, sections, and details.
 - 2. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, and disposal of water.

3. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
4. Include written plan for dewatering operations including sequence of well and well-point placement coordinated with excavation shoring and bracings and control procedures to be adopted if dewatering problems arise.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor and professional engineer.
- B. Field quality-control reports.
- C. Existing Conditions: Using photographs or video recordings, show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by dewatering operations. Submit before Work begins.
- D. Record Drawings: Identify locations and depths of capped wells and well points and other abandoned-in-place dewatering equipment.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer that has specialized in design of dewatering systems and dewatering work.

1.7 FIELD CONDITIONS

- A. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from this data.
 1. Make additional test borings and conduct other exploratory operations necessary for dewatering according to the performance requirements.
 2. The geotechnical report is included elsewhere in Project Manual.
- B. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.
 - 1. Design dewatering system, including comprehensive engineering analysis by a qualified professional engineer.
 - 2. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, prevention of flooding in excavation, and prevention of damage to subgrades and permanent structures.
 - 3. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 4. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
 - 5. Remove dewatering system when no longer required for construction.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning dewatering. Comply with water- and debris-disposal regulations of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.
 - 1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site or surrounding area.
 - 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- C. Provide temporary grading to facilitate dewatering and control of surface water.

- D. Protect and maintain temporary erosion and sedimentation controls as directed by MCA and as specified in Section 015000 "Temporary Facilities and Controls," Section 311000 "Site Clearing," during dewatering operations.

3.2 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
 - 1. Space well points or wells at intervals required to provide sufficient dewatering.
 - 2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.
- B. Place dewatering system into operation to lower water to specified levels before excavating below ground-water level.
- C. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
- D. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails.

3.3 OPERATION

- A. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.
- B. Operate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
 - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
 - 2. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
 - 3. Maintain piezometric water level a minimum of 24 inches (600 mm) below bottom of excavation.
- C. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.
- D. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches (900 mm) below overlying construction.

3.4 FIELD QUALITY CONTROL

- A. Observation Wells: Provide observation wells or piezometers, take measurements, and maintain at least the minimum number indicated; additional observation wells may be required by authorities having jurisdiction.
 - 1. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
 - 2. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. In areas where observation wells are not functioning properly, suspend construction activities until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.
 - 3. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.
- B. Survey-Work Benchmarks: Resurvey benchmarks biweekly during dewatering and maintain an accurate log of surveyed elevations for comparison with original elevations. Promptly notify MCA if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.
- C. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.
- D. Prepare reports of observations.

3.5 PROTECTION

- A. Protect and maintain dewatering system during dewatering operations.
- B. Promptly repair damages to adjacent facilities caused by dewatering.

END OF SECTION 312319

SECTION 315000

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes technical provisions for temporary excavation support and protection systems that are not anticipated to be necessary for project work. Any excavation support and protection systems and other provisions of this section shall be provided by the contractor at no additional cost
- B. Related Requirements:
 - 1. Section 312000 "Earth Moving" for excavating and backfilling and for controlling surface-water runoff and ponding.
 - 2. Section 312319 "Dewatering" for dewatering excavations.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review geotechnical report.
 - 2. Review existing utilities and subsurface conditions.
 - 3. Review coordination for interruption, shutoff, capping, and continuation of utility services.
 - 4. Review proposed excavations.
 - 5. Review proposed equipment.
 - 6. Review monitoring of excavation support and protection system.
 - 7. Review coordination with waterproofing.
 - 8. Review abandonment or removal of excavation support and protection system.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. Include construction details, material descriptions, performance properties, and dimensions of individual components and profiles, and calculations for excavation support and protection system.
- B. Shop Drawings: For excavation support and protection system, prepared by or under the supervision of a qualified professional engineer.
 1. Include plans, elevations, sections, and details.
 2. Show arrangement, locations, and details of soldier piles, piling, lagging, tiebacks, bracing, and other components of excavation support and protection system according to engineering design.
 3. Indicate type and location of waterproofing.
 4. Include a written plan for excavation support and protection, including sequence of construction of support and protection coordinated with progress of excavation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor and professional engineer.
- B. Contractor Calculations: For excavation support and protection system. Include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Existing Conditions: Using photographs and video recordings, show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by inadequate performance of excavation support and protection systems. Submit before Work begins.
- D. Record Drawings: Identify locations and depths of capped utilities, abandoned-in-place support and protection systems, and other subsurface structural, electrical, or mechanical conditions.

1.6 FIELD CONDITIONS

- A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
 1. Notify MCA no fewer than three days in advance of proposed interruption of utility.
 2. Do not proceed with interruption of utility without MCA's written permission.
- B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. MCA is not responsible for interpretations or conclusions drawn from the data.
 1. Make additional test borings and conduct other exploratory operations necessary for excavation support and protection according to the performance requirements.

2. The geotechnical report is included elsewhere in Project Manual.
- C. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. The contractor shall either,
- B. Be responsible for the design, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting earth and hydrostatic pressures and superimposed and construction loads. The system shall;
 1. Prevent surface water from entering excavations by grading, dikes, or other means.
 2. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
 3. Continuously monitor vibrations, settlements, and movements to ensure stability of excavations and constructed slopes and to ensure that damage to permanent structures is prevented.
- C. Delegate design services for the design of excavation support and protection systems including a comprehensive engineering analysis to a qualified professional engineer. The contractor shall then, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting earth and hydrostatic pressures and superimposed and construction loads to a qualified professional engineer. The contractor shall also;
 1. Prevent surface water from entering excavations by grading, dikes, or other means.
 2. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
 3. Continuously monitor vibrations, settlements, and movements to ensure stability of excavations and constructed slopes and to ensure that damage to permanent structures is prevented.

2.2 MATERIALS

- A. General: Provide materials that are either new or in serviceable condition.
- B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.
- C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.
 1. Corners: Roll-formed corner shape with continuous interlock.

- D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of size and strength required for application.
- E. Shotcrete: Comply with American Concrete Institute (ACI) 506.2-13 – “Specification for Shotcrete”
- F. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.
- G. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- H. Tiebacks: Steel bars, ASTM A 722/A 722M.
- I. Tiebacks: Steel strand, ASTM A 416/A 416M.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
 - 1. Shore, support, and protect utilities encountered.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- C. Locate excavation support and protection systems clear of permanent construction so that construction and finishing of other work is not impeded.

3.2 FIELD QUALITY CONTROL

- A. Survey-Work Benchmarks: Resurvey benchmarks weekly during installation of excavation support and protection systems, excavation progress, and for as long as excavation remains open. Maintain an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify MCA if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.
- B. Promptly correct detected bulges, breakage, or other evidence of movement to ensure that excavation support and protection system remains stable.

- C. Promptly repair damages to adjacent facilities caused by installation or faulty performance of excavation support and protection systems.

3.3 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and earth and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils and rock or damaging structures, pavements, facilities, and utilities.
 - 1. Remove excavation support and protection systems to a minimum depth of 48 inches (1200 mm) below overlying construction and abandon remainder.
 - 2. Fill voids immediately with approved backfill compacted to density specified in Section 312000 "Earth Moving."
 - 3. Repair or replace, as approved by MCA, adjacent work damaged or displaced by removing excavation support and protection systems.
- B. Leave excavation support and protection systems permanently in place.

END OF SECTION 315000

SECTION 316615

HELICAL PILES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

PART 2 - PRODUCTS

- 2.1 All products in accordance with drawings

PART 3 - EXECUTION

- 3.1 All work, labor, and materials in accordance with drawings and specifications

END OF SECTION 316615

SECTION 32 12 16

ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Hot-mix asphalt patching.
 - 2. Hot-mix asphalt paving.
 - 3. Hot-mix asphalt overlay.
 - 4. Asphalt curbs.
 - 5. Asphalt surface treatments.
- B. Related Requirements:
 - 1. Drawings.
 - 2. Section 312000 "Earth Moving" for subgrade preparation, fill material, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:
 - a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
 - b. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include technical data and tested physical and performance properties.

2. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
3. Job-Mix Designs: For each job mix proposed for the Work.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer and testing agency.
- B. Material Certificates: For each paving material.
- C. Material Test Reports: For each paving material, by a qualified testing agency.
- D. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction.
- B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.
- C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of Connecticut DOT form 816 for asphalt paving work.
 1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 1. Prime Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
 2. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
 3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
 4. Asphalt Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
 5. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.6 deg C) at time of placement.

PART 2 - PRODUCTS

- 2.1 All products shall conform the Connecticut Department of Transportation Form 816 Asphalt Paving Provisions.

PART 3 - EXECUTION

- 3.1 All work shall conform to the Connecticut Department of Transportation Form 816 Asphalt Paving Provisions.

3.2 WASTE HANDLING

- A. General: Handle asphalt-paving waste according to approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."

END OF SECTION 321216

SECTION 329200

TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Seeding.
 - 2. Sodding.
 - 3. Turf renovation.
 - 4. Erosion-control material(s).

1.3 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For landscape Installer.

- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
 - 1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.
- C. Product Certificates: For fertilizers, from manufacturer.
- D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of turf during a calendar year. Submit before expiration of required maintenance periods.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf establishment.
 - 1. Pesticide Applicator: State licensed, commercial.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.
- B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.
- C. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 - 3. Accompany each delivery of bulk materials with appropriate certificates.

1.8 FIELD CONDITIONS

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of planting completion.
 - 1. Spring Planting: Shall occur when the average daily temperature reaches 60 degrees Fahrenheit for 7 consecutive days and all chance of frost has passed.
 - 2. Fall Planting: Shall occur when the average daily temperature drops below 75 degrees Fahrenheit for 7 consecutive days.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species:
 - 1. Quality: State-certified seed of grass species as listed below for solar exposure.
 - 2. Quality: Seed of grass species as listed below for solar exposure, with not less than 85 percent germination, not less than 95 percent pure seed, and not more than 0.5 percent weed seed:
 - 3. Full Sun: Kentucky bluegrass (*Poa pratensis*), a minimum of three cultivars.
 - 4. Sun and Partial Shade: Proportioned by weight as follows:
 - a. 50 percent Kentucky bluegrass (*Poa pratensis*).
 - b. 30 percent chewings red fescue (*Festuca rubra* variety).
 - c. 10 percent perennial ryegrass (*Lolium perenne*).
 - d. 10 percent redtop (*Agrostis alba*).
 - 5. Shade: Proportioned by weight as follows:
 - a. 50 percent chewings red fescue (*Festuca rubra* variety).
 - b. 35 percent rough bluegrass (*Poa trivialis*).
 - c. 15 percent redtop (*Agrostis alba*).

2.2 TURFGRASS SOD

- A. Turfgrass Sod: Certified Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.
- B. Turfgrass Species: Sod of grass species as follows, with not less than 85 percent germination, not less than 95 percent pure seed, and not more than 0.5 percent weed seed:
 - 1. Full Sun: Kentucky bluegrass (*Poa pratensis*), a minimum of three cultivars.
 - 2. Sun and Partial Shade: Proportioned by weight as follows:
 - a. 50 percent Kentucky bluegrass (*Poa pratensis*).
 - b. 30 percent chewings red fescue (*Festuca rubra* variety).
 - c. 10 percent perennial ryegrass (*Lolium perenne*).
 - d. 10 percent redtop (*Agrostis alba*).
 - 3. Shade: Proportioned by weight as follows:
 - a. 50 percent chewings red fescue (*Festuca rubra* variety).
 - b. 35 percent rough bluegrass (*Poa trivialis*).
 - c. 15 percent redtop (*Agrostis alba*).

2.3 FERTILIZERS

- A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.4 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- B. Sphagnum Peat Mulch: Partially decomposed sphagnum peat moss, finely divided or of granular texture, and with a pH range of 3.4 to 4.8.
- C. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

- D. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.
- E. Asphalt Emulsion: ASTM D 977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

2.5 PESTICIDES

- A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
- B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.6 EROSION-CONTROL MATERIALS

- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.
- B. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd. (0.5 kg/sq. m), with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.
- C. Erosion-Control Mats: Cellular, nonbiodegradable slope-stabilization mats designed to isolate and contain small areas of soil over steeply sloped surface, of 3-inch (75-mm) nominal mat thickness. Include manufacturer's recommended anchorage system for slope conditions.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Tenax Corporation - USA.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

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

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by MCA and replace with new planting soil.

3.2 PREPARATION

A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

A. General: Prepare planting area for soil placement and mix planting soil according to industry accepted methods.

B. Placing Planting Soil: Place and mix planting soil in place over exposed subgrade or Place manufactured planting soil over exposed subgrade.

1. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

D. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

A. Prepare area as specified in "Turf Area Preparation" Article.

B. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.

- C. Fill cells of erosion-control mat with planting soil and compact before planting.
- D. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.
- E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.5 SEEDING

- A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h).
 - 1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
 - 2. Do not use wet seed or seed that is moldy or otherwise damaged.
 - 3. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Sow seed at a total rate of 2 lb/1000 sq. ft. (0.9 kg/92.9 sq. m) or as recommended by the seed manufacturer..
- C. Rake seed lightly into top 1/8 inch (3 mm) of soil, roll lightly, and water with fine spray.
- D. Protect seeded areas with slopes exceeding 1:6 with erosion-control fiber mesh installed and stapled according to manufacturer's written instructions.
- E. Protect seeded areas with erosion-control mats where directed by MCA; install and anchor according to manufacturer's written instructions.
- F. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre (42 kg/92.9 sq. m) to form a continuous blanket 1-1/2 inches (38 mm) or as required to protect seeded areas in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.
 - 1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.
- G. Protect seeded areas from hot, dry weather or drying winds by applying planting soil within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 3/16 inch (4.8 mm), and roll surface smooth.

3.6 TURF RENOVATION

- A. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
 2. Install new planting soil as required.
- B. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.
- C. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.
- D. Mow, dethatch, core aerate, and rake existing turf.
- E. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.
- G. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches (150 mm).
- H. Apply initial fertilizer required for establishing new turf and mix thoroughly into top 4 inches (100 mm) of existing soil. Install new planting soil to fill low spots and meet finish grades.
1. Initial Fertilizer: Slow-release fertilizer applied according to manufacturer's recommendations.
- I. Apply seed and protect with straw mulch or sod as required for new turf.
- J. Water newly planted areas and keep moist until new turf is established.

3.7 TURF MAINTENANCE

- A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
 2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
 3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.
- B. Watering: Maintain a system to convey water from sources and to keep turf uniformly moist to a depth of 4 inches (100 mm).
1. Water turf with fine spray at a minimum rate of 1 inch (25 mm) per week unless rainfall precipitation is adequate.

- C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
 - 1. Mow perennial ryegrass to a height of 1 to 2 inches (25 to 50 mm).
 - 2. Mow Kentucky bluegrass, buffalograss annual ryegrass, and chewings red fescue to a height of 1-1/2 to 2 inches (38 to 50 mm).
- D. Turf Postfertilization: Apply slow-release fertilizer after initial mowing and when grass is dry.
 - 1. Use fertilizer that provides actual nitrogen of at least 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) to turf area.

3.8 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by MCA:
 - 1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches (125 by 125 mm).
 - 2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
- B. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

3.9 PESTICIDE APPLICATION

- A. Apply pesticides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.10 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

- C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.
- D. Remove nondegradable erosion-control measures after grass establishment period.

3.11 MAINTENANCE SERVICE

- A. Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in "Turf Maintenance" Article. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:
 - 1. Sodded Turf: 60 days after the end of the first occurrence of either the spring or the fall planting season.

END OF SECTION 329200