

GENERAL NOTES

1. THE IMPROVEMENTS, AS SHOWN ON THESE PLANS, SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF YALE STANDARD SPECIFICATIONS AND STANDARD DETAILS, AND THE OKLAHOMA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 1999.
2. STANDARD DRAWINGS REFER TO THE STANDARD DRAWINGS OF THE CITY OF YALE UNLESS NOTED OTHERWISE.
3. THE CONTRACTOR AGREES THAT IT SHALL ASSUME THE SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER, THE CITY, AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER, CITY, OR ENGINEER.
4. NO CHANGES SHALL BE MADE TO THESE PLANS WITHOUT THE WRITTEN APPROVAL OF THE OWNER AND THE ENGINEER. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION METHODS OR TECHNIQUES OR FOR THE PROSECUTION OF THE WORK AS SHOWN ON THESE PLANS. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS, OR OTHER PERSONS PERFORMING ANY OF THE WORK OR FOR THE FAILURE OF ANY OF THEM TO CARRY OUT THE WORK IN ACCORDANCE WITH CONTRACT DOCUMENTS.
5. IF A TRAFFIC CONTROL PLAN IS NOT PROVIDED WITH THIS PLAN SET, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ONE IF REQUIRED BY GOVERNING AUTHORITIES.
6. THE CONTRACTOR SHALL DESIGNATE AT LEAST ONE EMERGENCY CONTACT PERSON, AND SHALL PROVIDE TELEPHONE NUMBERS WHERE THIS PERSON CAN BE CONTACTED AT ANY TIME. THIS INFORMATION SHALL BE PROVIDED TO THE OWNER, THE ENGINEER, AND THE CITY OF TULSA WHEN PERFORMING WORK IN THE RIGHT-OF-WAY.
7. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED CONSTRUCTION PERMITS, INCLUDING EARTH CHANGE PERMIT, PRIOR TO START OF CONSTRUCTION.
8. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.
9. THE CONTRACTOR SHALL NOT INSTALL ITEMS AS SHOWN ON THESE PLANS WHEN IT IS APPARENT THAT FIELD CONDITIONS ARE DIFFERENT THAN SHOWN IN THE DESIGN. SUCH CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER. IN THE EVENT THE CONTRACTOR DOES NOT NOTIFY THE ENGINEER, THE CONTRACTOR ASSUMES FULL RESPONSIBILITY AND EXPENSE FOR ANY REVISIONS NECESSARY.
10. EXISTING SITE IMPROVEMENTS WHICH ARE DAMAGED OR DISPLACED BY THE CONTRACTOR SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S OWN EXPENSE. REPAIRS SHALL BE APPROVED BY THE OWNER PRIOR TO CONSTRUCTION OF THE REPAIRS. FINAL PAYMENT SHALL NOT BE MADE BY THE OWNER UNTIL AFTER THE REPAIRS MEET WITH THE OWNER'S APPROVAL.
11. EXISTING FENCING THAT IS NOT DESIGNATED FOR REMOVAL SHALL NOT BE DISTURBED. ANY FENCING THAT IS DESIGNATED FOR REMOVAL OR ALTERED BY THE CONTRACTOR SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. IF THE CONTRACTOR WOULD LIKE TO REMOVE FENCING TO FACILITATE CONSTRUCTION OPERATIONS, THIS MAY BE DONE WITH THE OWNER'S PERMISSION, AND THE CONTRACTOR SHALL RESTORE THE FENCE TO ITS ORIGINAL CONDITION PRIOR TO THE CLOSE OF THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SECURITY OF THE SITE UNTIL THE FENCE IS REPLACED.
12. ALL STATIONING REFERS TO THE CENTERLINE OF THE RIGHT-OF-WAY UNLESS NOTED OTHERWISE. STATIONING OF CHANNELS OR PIPES IN DRAINAGE EASEMENTS REFERS TO THE CENTERLINE OF CHANNEL OR PIPE, UNLESS NOTED OTHERWISE.
13. UNLESS NOTED OTHERWISE, ALL ITEMS CALLED OUT FOR REMOVAL SHALL BE DISPOSED OFF-SITE BY THE CONTRACTOR.
14. THE CONTRACTOR SHALL USE THE AREA DESIGNATED ON THE PLANS FOR STAGING OF MATERIALS AND EQUIPMENT. IF NO STAGING AREA IS DESIGNATED ON THE PLANS, THE CONTRACTOR MAY CREATE ONE ON-SITE, TO BE SIZED AND LOCATED AS APPROVED BY THE OWNER. THE CONTRACTOR SHALL BEAR ALL RESPONSIBILITY FOR THE SECURITY OF MATERIALS AND EQUIPMENT IN THE STAGING AREA, AND PRIOR TO FINAL PROJECT ACCEPTANCE, SHALL BE RESPONSIBLE FOR RETURNING THE STAGING AREA TO CONDITIONS EQUAL TO OR BETTER THAN PRE-PROJECT CONDITIONS.

GRADING

1. IF EARTHWORK QUANTITIES ARE SHOWN ON THESE PLANS, THEY ARE FOR INFORMATION ONLY. THE CONTRACTOR SHALL COMPUTE ITS OWN QUANTITIES FOR BIDDING AND NEGOTIATION PURPOSES. OTHERWISE, PAYMENT FOR EARTHWORK SHALL BE BASED ON THE ENGINEER'S ESTIMATED QUANTITIES.
2. WHERE CONCRETE BLOCK OR REINFORCED CONCRETE WALLS ARE INSTALLED, WEEP HOLES SHALL BE PROVIDED IN THE PORTION OF THE WALL THAT IS RETAINING DIRT OF 6" OR MORE IN DEPTH, TO RELIEVE THE HYDROSTATIC PRESSURE FROM THE UPPER DIRT MASS. IN LIEU OF WEEP HOLES IN THE CONCRETE BLOCK WALLS, THE MORTAR MAY BE ELIMINATED FROM EVERY THIRD VERTICAL JOINT.
3. WHERE CONCRETE BLOCK WALLS ARE INSTALLED ADJACENT TO STREETS OR DRAINAGE WAYS, HOLES FOR THE CONVEYANCE OF SURFACE RUNOFF THROUGH THE WALL SHALL BE PROVIDED AT LOW POINTS AND AT APPROXIMATELY 20' INTERVALS. THESE HOLES MAY BE FORMED BY TURNING ONE BLOCK CROSSWAYS IN THE LOCATION NORMALLY OCCUPIED BY ONE BLOCK.

ROADS

1. ALL UNDERGROUND UTILITIES SHALL BE INSTALLED PRIOR TO SURFACING OF THE STREETS AND PAVED PARKING LOTS. ALL WATER VALVE BOXES AND ELECTRICAL, TELEPHONE, TELEVISION AND SEWER MANHOLES SHALL BE ADJUSTED TO GRADE AND CONCRETE COLLARS INSTALLED AROUND THEM AS REQUIRED PRIOR TO THE COMPLETION OF THE PROJECT.
2. ALL SIGNS, BARRICADES, CHANNELIZATION DEVICES, PAVEMENT MARKINGS, SIGN FRAMES AND ERECTION OF SUCH DEVICES SHALL CONFORM TO THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS," LATEST EDITION. ALL ADVANCE WARNING SIGNS SHALL BE EQUIPPED WITH TYPE A FLASHING WARNING LIGHTS. ALL CHANNELIZATION DEVICES SHALL BE EQUIPPED WITH TYPE C STEADY BURN WARNING LIGHTS.
3. WHEN ABUTTING NEW PAVEMENT TO EXISTING, CUT BACK EXISTING PAVEMENT TO A NEAT, STRAIGHT LINE AS REQUIRED TO REMOVE ANY BROKEN OR CRACKED PAVEMENT, APPLY TACK COAT, AND MATCH NEW PAVEMENT TO EXISTING.

SOILS

1. EARTHWORK PREPARATION AND EXECUTION SHALL BE PERFORMED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT PREPARED FOR THIS PROJECT. IN THE EVENT OF CONFLICTS BETWEEN THESE PLANS AND THE GEOTECHNICAL REPORT, THE GEOTECHNICAL REPORT SHALL GOVERN.
2. WHERE PROOF ROLLING IS SPECIFIED BY THE GEOTECHNICAL REPORT, IT SHALL BE PERFORMED IN ACCORDANCE WITH THE DIRECTIONS THEREIN. IF NO DIRECTIONS ARE PROVIDED IN THE REPORT, PROOF-ROLLING SHALL BE PERFORMED IN ACCORDANCE WITH ODOT SPEC 203. EARTH-MOVING AND COMPACTION OPERATIONS SHALL NOT PROCEED FURTHER UNTIL TESTED, OBSERVED AND FOUND TO BE SATISFACTORY BY A QUALIFIED REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER OR HIS DESIGNEE.
3. UNLESS OTHERWISE SPECIFIED, SUBGRADE SOILS AND STRUCTURAL FILL MATERIALS SHALL BE COMPACTED TO THE FOLLOWING PERCENTAGES OF MAXIMUM DENSITY:

MATERIAL	COMPACTION (%)
STRUCTURAL FILL FOR THE BUILDING	95
SUB-BASE UNDER AREAS TO BE PAVED	95
BACKFILL BELOW STRUCTURAL FILL OR AREAS TO BE PAVED	95
BACKFILL BELOW UNPAVED, NON-BUILDING AREAS	90
ROAD PAVEMENT SUBGRADE	95
SIDEWALK SUBGRADE	90
CURB AND GUTTER SUBGRADE	95

ACCESSIBLE FACILITIES

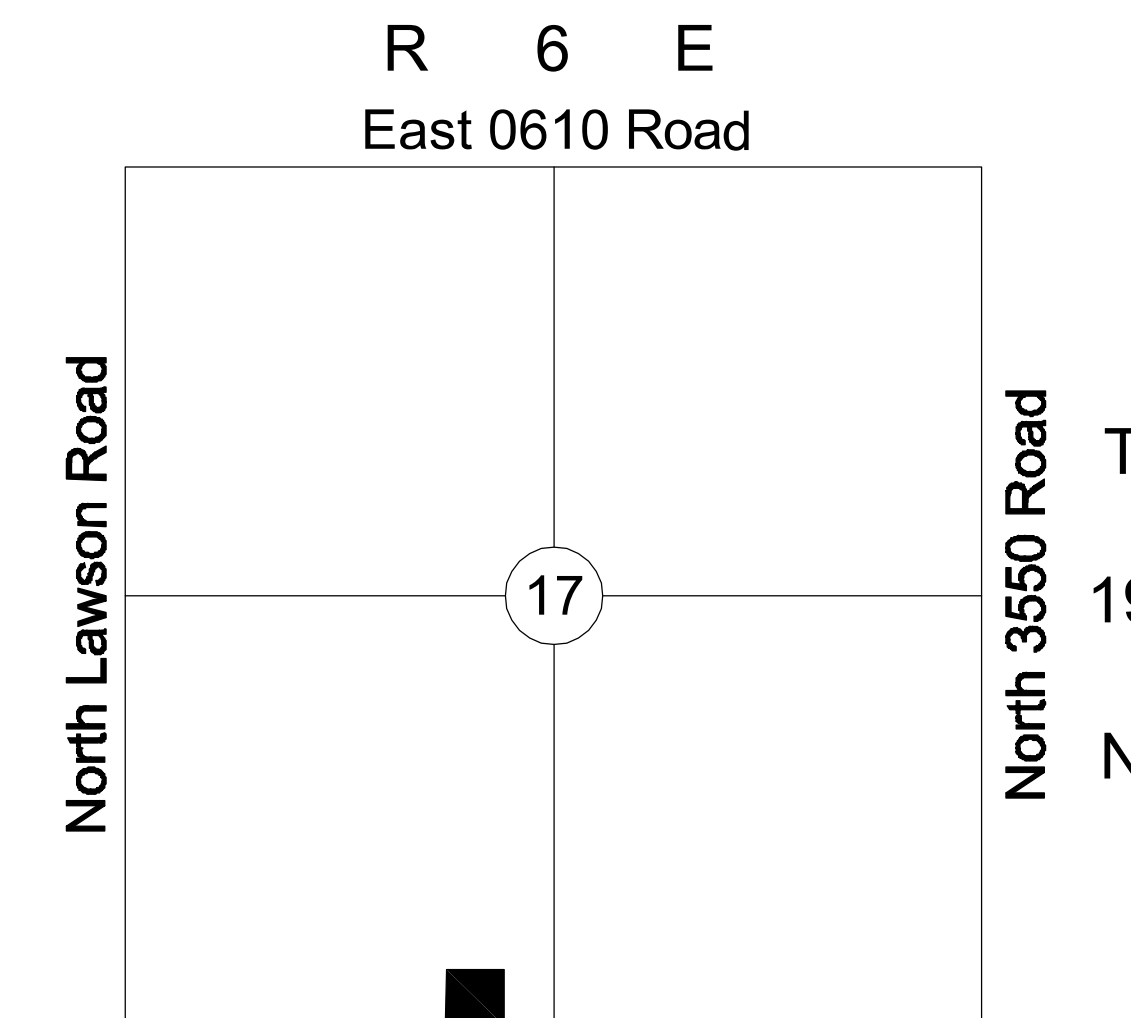
1. THE SITE SHALL COMPLY WITH FEDERAL ACCESSIBILITY REQUIREMENTS AS PUBLISHED IN ANSI 117.1-2003, "ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES."
2. ALL SURFACES ALONG ACCESSIBLE AND USABLE ROUTES AND FOR HANDICAP RAMPS SHALL BE STABLE, FIRM, SLIP RESISTANT, AND SHALL COMPLY WITH UNIFORM FEDERAL ACCESSIBILITY STANDARDS.
3. FOR ACCESSIBLE ROUTES (EXCEPT CURB RAMPS): LONGITUDINAL SLOPES SHALL BE NO STEEPER THAN 1:20 (= 5%) AND CROSS SLOPES SHALL BE NO STEEPER THAN 1:50 (= 2%). AT HANDICAP PARKING SPACES, ACCESS AISLES, AND PASSENGER LOADING ZONES, THE SLOPE IN ALL DIRECTIONS SHALL BE NO STEEPER THAN 1:50 (= 2%). AT CURB RAMPS, THE SLOPE SHALL BE NO STEEPER THAN 1:12 (= 8.33%).
4. WHERE ACCESSIBLE ROUTES ENTER VEHICULAR TRAVEL AREAS, A DETECTABLE WARNING SURFACE, 36" WIDE SHALL BE INSTALLED. THE DETECTABLE WARNING SURFACE SHALL CONSIST OF RAISED TRUNCATED DORIES AND SHALL CONTRAST VISUALLY WITH ADJACENT SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT.

UTILITIES

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE DRAWINGS HAVE BEEN OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. EXCEPT WHERE NOTED, NO UNDERGROUND UTILITIES WERE EXCAVATED AND THEIR EXACT LOCATIONS CONFIRMED DURING THE COURSE OF DESIGN. TO THE BEST OF THE ENGINEER'S KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE DRAWINGS. HOWEVER, THE CONTRACTOR SHALL CONTACT OKIE ONE-CALL UTILITY LOCATING SERVICE (1-800-522-OKIE) AT LEAST 48 HOURS IN ADVANCE OF THE WORK, AND SHALL MAKE EVERY EFFORT TO DISCOVER ALL UNDERGROUND UTILITY LINES, PIPELINES, AND STRUCTURES IN OR NEAR THE WORK AREA PRIOR TO COMMENCING WORK. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF UTILITY LOCATIONS AND THE EXISTENCE OR NON-EXISTENCE OF UTILITY LINES.
2. THE CONTRACTOR SHALL TAKE DUE PRECAUTIONARY MEASURES TO PROTECT UTILITY LINES SHOWN, AND ALL OTHER LINES NOT OF RECORD OR NOT SHOWN BY VERIFICATION OF LINE LOCATION IN THE FIELD PRIOR TO BEGINNING THE WORK. THE CONTRACTOR SHALL VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITY CONNECTION POINTS PRIOR TO STARTING THE WORK AND SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY DISCREPANCIES FROM THE PLAN INFORMATION SO THE DESIGN MAY BE ALTERED AS NECESSARY BEFORE PROCEEDING FURTHER.
3. THE CONTRACTOR SHALL NOTIFY THE CITY OF YALE AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION ON PUBLIC WATER LINES.
4. SEWER LINE DISTANCES SHOWN IN PROFILE ARE MEASURED IN A HORIZONTAL LINE ALONG THE PIPE, BETWEEN CENTERS OF MANHOLES.
5. PUBLIC WATER LINES SHALL BE INSTALLED WITH A MINIMUM OF 3' OF COVER FROM THE TOP OF PIPE TO FINISHED GRADE.
6. SEWER AND WATER MAINS SHALL BE PLACED IN SEPARATE TRENCHES A MINIMUM OF 10' APART HORIZONTALLY. AT ALL CROSSINGS OF WATER AND SEWER LINES, A 24" VERTICAL SEPARATION SHALL BE MAINTAINED. WHERE THIS IS NOT POSSIBLE, THE SEWER PIPE SHALL BE INSTALLED WITH THE 20"-STICK OF PIPE CENTERED ON THE WATERLINE, OR CONSTRUCTED OF PRESSURE PIPE, OR CONCRETE-ENCASED.
7. ONLY WATER SYSTEM PERSONNEL MAY OPERATE PUBLIC WATER SYSTEM VALVES AND FIRE HYDRANTS, UNLESS SPECIFIC PRIOR WRITTEN PERMISSION IS GRANTED BY WATER SYSTEM STAFF FOR THE CONTRACTOR TO OPERATE THE SAME. THIS INCLUDES NEW WATERLINES AND EXTENSIONS TO THE PUBLIC WATER SYSTEM WHICH HAVE NOT BEEN ACCEPTED BUT ARE CONNECTED TO THE EXISTING WATER SYSTEM.
8. THE CONTRACTOR SHALL COORDINATE WATER SHUT-OFFS WITH THE WATER PROVIDER AT LEAST 48 HOURS PRIOR TO THE SHUT-OFF. PUBLIC VALVES SHALL BE OPERATED BY THE WATER PROVIDER ONLY, OR ELSE WITH ITS EXPLICIT CONSENT. THE SHUT-OFF MAY BE DONE AT NIGHT OR ON WEEKENDS TO ACCOMMODATE WATER USERS.
9. PUBLIC WATER MAINS SHALL BE CONSTRUCTED OF 150-PSI AWWA C-900 PVC PIPE OR AWWA C-151 DUCTILE IRON PIPE WITH AWWA C-110 DUCTILE IRON FITTINGS.
10. ALL BENDS, VALVES, TEES, FIRE HYDRANTS, AND CAPS SHALL BE STABILIZED AGAINST WATER HAMMER BY INSTALLING BLOCKING OR RESTRAINING ALL PIPE JOINTS WITHIN A GIVEN DISTANCE OF THE JUNCTURE AS RECOMMENDED BY THE MANUFACTURER (EBAA IRON OR APPROVED EQUIVALENT).

ABBREVIATIONS

ATU	AEROBIC TREATMENT UNIT	MH	MANHOLE
AC	ASPHALT CONCRETE	OC	ON CENTER
BK	BOOK	OE	OVERHEAD ELECTRIC
BLDG	BUILDING	PB	PULL BOX
BM	BENCH MARK	PC	POINT OF CURVATURE
BVC	BEGIN VERTICAL CURVE	PCC	POINT OF COMPOUND CURVATURE,
C	COMMUNICATIONS	PC	PORTLAND CEMENT CONCRETE
CA TV	CABLE TELEVISION	PFPI	PRIVATELY FUNDED PUBLIC
C&G	CURB & GUTTER		INFRASTRUCTURE
CL	CENTER LINE	PI	POINT OF INTERSECTION
CMP	CORRUGATED METAL PIPE	PL	PROPERTY LINE
CO	CLEAN OUT	PP	POWER POLE
CONC	CONCRETE	PRC	POINT OF REVERSE CURVATURE
CY	CUBIC YARD	PT	POINT OF TANGENCY, POINT
CGDI	DOUBLE GRATE DROP INLET	PVC	POINT OF VERTICAL CURVATURE
DIA	DIAMETER	PVI	POINT OF VERTICAL INTERSECTION
DIP	DUCTILE IRON PIPE	R, RAD	RADIUS
DO	DOOR OPENING	RCP	REINFORCED CONCRETE PIPE
DS	DOWN SPOUT	RD	ROOF DRAIN
E	ELECTRIC	RT	RIGHT
EA	EACH	R/W, ROW	RIGHT OF WAY
EL, ELEV	ELEVATION	S	SLOPE
ESMT	EASEMENT	SA	SANITARY SEWER
EP	EDGE OF PAVEMENT	SP	SPRINKLER
EVC	END VERTICAL CURVE	SF	SQUARE FEET
EW	EACH WAY	SGDI	SINGLE GRATE DROP INLET
EX, EXIST	EXISTING	ST, SD	STORM DRAIN, STORM SEWER
FF	FINISHED FLOOR	STA	STATION
FG	FINISHED GROUND (DIRT,GRASS, STD		STANDARD
FH	FIRE HYDRANT OR GRAVEL)	SW	SIDEWALK
FL	FLOW LINE	SY	SQUARE YARDS
FP	FINISHED PAD	T	TANGENT
FUT	FUTURE	TA	TOP OF ASPHALT
G	GAS	TAC	TOP OF ASPHALT CURB
GM	GAS METER	TC	TOP OF CONCRETE, TOP OF CURB
GV	GAS VALVE, GATE VALVE	TEL	TELEPHONE
GT	GREASE TRAP	TG	TOP OF GRATE
HC	HANDICAP	TP	TOP OF PAVEMENT
HORIZ	HORIZONTAL	TR	TOP OF RIM ELEVATION
HB	HOSE BIB	TS	TOP OF SIDEWALK
INT	INTERSECTION	TW	TOP OF WALL
INV	INVERT	TYP	TYPICAL
IP	IRON PIN, IRON PIPE	UE	UNDERGROUND EASEMENT
LF	LINEAR FEET	VC	VERTICAL CURVE
LH	LAMP HOLE	W	WATER
LONG	LONG FOOT	WH	WATER HYDRANT
LP	LONGITUDINAL	WM	WATER METER
LT	LEFT	WS EL	WATER SURFACE ELEVATION
		WV	WATER VALVE



East Chicago Avenue
(Highway 51)

PAYNE COUNTY
LOCATION MAP

LEGEND

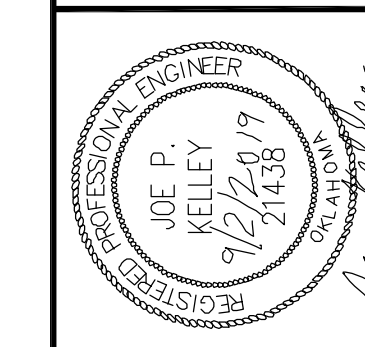
EXISTING	PROPOSED
RIGHT-OF-WAY	RIGHT-OF-WAY
LOT LINE	LOT LINE
BUILDING	BUILDING
CURB AND GUTTER	CURB AND GUTTER
SLOPED AREA	SLOPED AREA
FLOW DIRECTION	FLOW DIRECTION
SANITARY SEWER	SANITARY SEWER
MANHOLE	MANHOLE
SANITARY CLEANOUT	SANITARY CLEANOUT
WATER	WATER
FIRE HYDRANT	FIRE HYDRANT
WATER VALVE	WATER VALVE
WATER METER	WATER METER
STORM SEWER	STORM SEWER
STORM INLET	STORM INLET
TELEPHONE	TELEPHONE
COMMUNICATIONS	COMMUNICATIONS
GAS	GAS
GAS METER	GAS METER
OVERHEAD ELECTRIC	OVERHEAD ELECTRIC
UNDERGROUND ELECTRIC	UNDERGROUND ELECTRIC
TRANSFORMER	TRANSFORMER
LIGHT POLE	LIGHT POLE
INDEX CONTOUR (5')	INDEX CONTOUR (5')
INTERMEDIATE CONTOUR (1')	INTERMEDIATE CONTOUR (1')
SPOT ELEVATION	SPOT ELEVATION
SILT FENCE	SILT FENCE

SHEET INDEX

C100	CIVIL NOTES
C200	TOPOGRAPHIC SURVEY
C300	DEMOLITION AND EROSION CONTROL PLAN
C400	SITE PLAN
C500	GRADING PLAN
C600	UTILITY PLAN
C700	CIVIL DETAILS



JC Engineering, PC
10035 N. 177th E. Ave. • Owasso, OK 74055-7841
(918) 798-5879 • www.j-c-engineering.com
Oklahoma CA No. 5686 Expires June 30, 2019



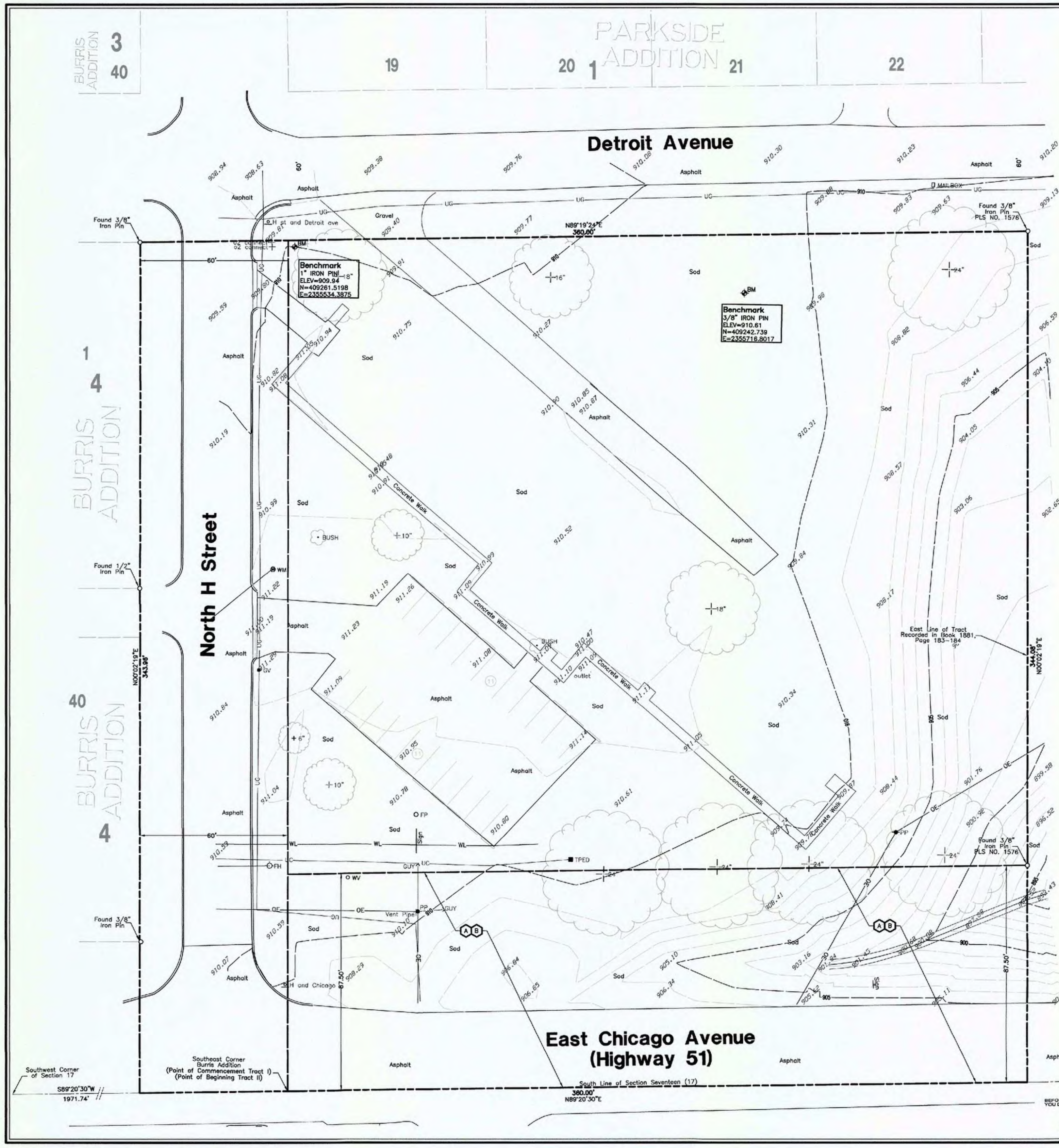
REVISIONS	NO.	DATE	BY	DESCRIPTION

APPROVALS	DEPT.

PROJECT
YALE FIRE DEPT.
801 E. CHICAGO AVE.
CLIENT
YALE FIRE DEPARTMENT

CIVIL NOTES

SHEET NO.
C100



R 6 E
East 0610 Road

T 19
North 3650 Road

North
N

East Chicago Avenue (Highway 51)
Location Map
Scale 1"=2000'

Scale: 1"=20'

Notes

- ALL EASEMENTS AND RIGHTS OF WAY THAT ARE CONTAINED IN THE TITLE OPINION BY LOWELL A. BARTO, ATTORNEY AT LAW, WITH AN EFFECTIVE DATE OF NOVEMBER 29, 2016, ARE SHOWN AND NOTED HEREON.
- THIS FIRM WAS NOT CONTRACTED TO RESEARCH EASEMENTS OR ENCUMBRANCES OF RECORD. NO ATTEMPT TO RESEARCH THE COUNTY RECORDS OR OTHER RECORD OFFICES WAS PERFORMED BY THIS FIRM. THEREFORE EASEMENTS MAY AFFECT THE SUBJECT TRACT THAT ARE NOT REFLECTED BY THIS PLAN.
- ALL UNDERGROUND UTILITIES MAY NOT BE SHOWN. (CALL "OKIE" BEFORE DIGGING).
- THE PROPERTY DESCRIBED HEREON CONTAINS 76,950 SQUARE FEET OR 1.77 ACRES MORE OR LESS.
- THE PROPERTY CONTAINS 22 STRIPED PARKING AREAS.
- THE PROPERTY DESCRIBED HAS BEEN EXAMINED BY A MAP OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY, FLOOD INSURANCE RATE MAP PAYNE COUNTY, OKLAHOMA, MAP NO. 40119C0325F, MAP REVISED: MAY 16, 2007, WHICH SHOWS THE ENTIRE PORTION OF THE PROPERTY DESCRIBED HEREON AS LOCATED IN ZONE (A) NOT SHADDED WHICH IS CLASSIFIED AS AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD PLAIN.
- THE BASIS OF BEARING IS BASED ON THE SOUTH LINE OF SECTION 17 AS BEING N89°20'30"E.
- THERE IS NO OBSERVED EVIDENCE OF THE SITE BEING USED AS A SOLID WASTE DUMP, SLUMP OR SANITARY LANDFILL.
- THE PROPERTY DESCRIBED HEREON CONTAINS NO BUILDINGS.
- THERE IS NO OBSERVED EVIDENCE OF THE SITE BEING IN A WETLAND AREA.
- THERE IS NO OBSERVED EVIDENCE OF EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS WITHIN RECENT MONTHS.
- THE VERTICAL DATUM FOR THIS SURVEY IS BASED ON NAVD83 GPS DATA.
- THE HORIZONTAL DATUM FOR THIS SURVEY IS BASED ON OKLAHOMA STATE PLANE, NAD83.

Legal Description

TRACT I: A TRACT OF LAND IN THE SOUTHWEST QUARTER (SW/4) OF SECTION SEVENTEEN (17), TOWNSHIP NINETEEN (19) NORTH, RANGE SIX (6) EAST OF THE 1st M., PAYNE COUNTY, STATE OF OKLAHOMA, MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING 210 FEET EAST OF THE SE/CORNER OF BURRIS ADDITION TO THE CITY OF YALE, ACCORDING TO THE RECORDED PLAT THEREOF, (SAID POINT BEING 2,243 FEET EAST OF THE SW/CORNER OF SAID SW/4), THENCE NORTH ALONG A LINE PARALLEL TO AND 210 FEET EAST OF SAID BURRIS ADDITION FOR A DISTANCE OF 363 FEET; THENCE EAST PARALLEL TO THE SOUTH LINE OF SAID SECTION 17 FOR A DISTANCE OF 90 FEET; THENCE SOUTH 363 FEET TO A POINT ON THE SOUTH LINE OF SAID SECTION 17; THENCE WEST 90 FEET TO THE POINT OF BEGINNING.

AND

TRACT II: A TRACT OF LAND IN THE SOUTHWEST QUARTER (SW/4) OF SECTION SEVENTEEN (17), TOWNSHIP NINETEEN (19) NORTH, RANGE SIX (6) EAST OF THE 1st M., PAYNE COUNTY, STATE OF OKLAHOMA, MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING AT THE SE/CORNER OF BURRIS ADDITION TO THE CITY OF YALE, ACCORDING TO THE RECORDED PLAT THEREOF (SAID POINT BEING 2,033 FEET EAST OF THE SW/CORNER OF SAID SW/4), THENCE NORTH ALONG THE EAST LINE OF BURRIS ADDITION FOR A DISTANCE OF 363 FEET; THENCE EAST PARALLEL TO THE SOUTH LINE OF SAID SECTION 17 FOR A DISTANCE OF 210 FEET; THENCE SOUTH 363 FEET TO A POINT ON THE SOUTH LINE OF SAID SECTION 17; THENCE WEST 210 FEET TO THE POINT OF BEGINNING.

BOUNDARY DERIVED FROM PLAT OF SURVEY DATED MAY 11, 2014 BY GROUNDS PROFESSIONAL SURVEYING, INC., P.O. BOX 224, PERKINS OKLAHOMA 74059, (405) 547-1233, C.A. NO. 4886, PLS NO. 1576.

Exceptions

A. PAGES 246 AND 247 OF THE ABSTRACT REFLECT A WARRANTY DEED DATED MARY 26, 1965 AND RECORDED JULY 26, 1965 IN BOOK 163 MISCELLANEOUS RECORDS AT PAGE 84, WHICH CONVEYS FEE SIMPLE TITLE TO APPROXIMATELY THE SOUTH 87.50 FEET OF THE SECOND TRACT OF LAND DESCRIBED ABOVE TO THE STATE OF OKLAHOMA, ACTING BY AND THROUGH THE DEPARTMENT OF HIGHWAYS. (AFFECTS SUBJECT PROPERTY AS SHOWN)

B. PAGES 248 AND 249 OF THE ABSTRACT REFLECT A WARRANTY DEED DATED MAY 26, 1965 AND RECORDED JULY 26, 1965 IN BOOK 163 MISCELLANEOUS RECORDS AT PAGE 86, WHICH CONVEYS FEE SIMPLE TITLE TO APPROXIMATELY THE SOUTH 87.50 FEET OF THE FIRST TRACT OF LAND DESCRIBED ABOVE TO THE STATE OF OKLAHOMA, ACTING BY AND THROUGH THE DEPARTMENT OF HIGHWAYS. (AFFECTS SUBJECT PROPERTY AS SHOWN)

C. PAGES 200 AND 201 OF THE ABSTRACT REFLECT A RIGHT OF WAY GRANT TO MID-CENTURY PIPE LINE COMPANY, DATED NOVEMBER 30, 1948 AND RECORDED JANUARY 19, 1949 IN BOOK 92 MISCELLANEOUS RECORDS AT PAGE 252. THE INSTRUMENT PERMITS THE RIGHT TO LOCATE AND MAINTAIN AN OIL, GAS, OR WATER PIPE LINE "ALONG THE EAST LINE" OF THE QUARTER SECTION OF LAND WHICH INCLUDES THE SUBJECT PROPERTY.

D. PAGES 380-382 OF THE ABSTRACT REFLECT AN ASSIGNMENT OF EASEMENT FROM YALE GAS COMPANY, INC. TO YALE WATER AND SEWER TRUST, A PUBLIC TRUST, RECORDED OCTOBER 7, 1991 IN BOOK 963 AT PAGE 537. AMONG THE EASEMENTS INCLUDED IN THE ASSIGNMENT IS A RIGHT-OF-WAY GRANT WHICH DESCRIBES THE S/2 OF SW/4 OF SEC. 17, T19N, R6E. THE MORE SPECIFIC DESCRIPTION PROVIDED INDICATES THAT THIS EASEMENT IS LOCATED NORTH OF THE SUBJECT PROPERTY. THE RECORDED EASEMENT THAT IS ASSIGNED DOES NOT APPEAR ELSEWHERE IN THE ABSTRACT. (DOES NOT AFFECT SUBJECT PROPERTY)

E. PAGES 409 THROUGH 411 OF THE ABSTRACT REFLECT AN ASSIGNMENT OF EASEMENTS AND RIGHTS OF WAY BY YALE RURAL WATER CORPORATION TO THE PAYNE COUNTY RURAL WATER DISTRICT NO. 4, RECORDED AUGUST 9, 2000 IN BOOK 1267 AT PAGE 522. AMONG THE EASEMENTS ASSIGNED IS ONE DESCRIBING THE S/2 SW/4 OF SEC. 17, T19N, R6E. THE RECORDED EASEMENT THAT IS ASSIGNED DOES NOT APPEAR ELSEWHERE IN THE ABSTRACT. (AFFECTS SUBJECT PROPERTY AS A BLANKET)

Benchmark Notes

Benchmark 1" IRON PIN ELEV=909.94 N=409261.5198 E=2355534.3875	Benchmark 3/8" IRON PIN ELEV=910.61 N=409242.739 E=2355716.8017
----------------------------------------------------------------------------	-----------------------------------------------------------------------------

Legend

FH	FIRE HYDRANT
FP	FLAG POLE
GW	ELECTRIC GUY WIRE
GV	GAS VALVE
OE	OVERHEAD ELECTRIC
PP	POWER POLE
TPED	TELEPHONE PEDESTAL
UC	UNDERGROUND CABLE
UG	UNDERGROUND GAS LINE
WL	WATERLINE
WM	WATER METER
WV	WATER VALVE

Section 17, T-19-N, R-6-E
Payne County, Oklahoma

Surveyor's Certification

WE, BENNETT SURVEYING, INC. DO HEREBY CERTIFY TO:
LOWELL A. BARTO, ATTORNEY AT LAW
DARRRELL R. MUEGGENBORG, TRUSTEE OF DARRRELL R. MUEGGENBORG FAMILY TRUST DATED APRIL 12, 2007
JENNIFER D. MUEGGENBORG, TRUSTEE OF THE JENNIFER D. MUEGGENBORG FAMILY TRUST DATED APRIL 12, 2007
YALE FIRE DEPARTMENT

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 3, 4, 5, 7(A), 8, 9, AND 11 OF TABLE A THEREOF. THE FIELDWORK WAS COMPLETED ON JUNE 28, 2017.

WITNESS MY HAND AND SEAL THIS 21ST DAY OF AUGUST, 2017.

REVISIONS

REVISIONS	BY	DATE

BENNETT SURVEYING, INC.
REGISTERED PROFESSIONAL LAND SURVEYOR
OKLAHOMA NO. 1815

FILE: 1906.17 SURVEY BY: GQI SURVEY DATE: 08/22/17
ORDER: 171931 DRAWN BY: ABS SCALE: 1"=20'
ORIG. DOC. DATE: 08/22/17 CHECKED BY: CDB SHEET

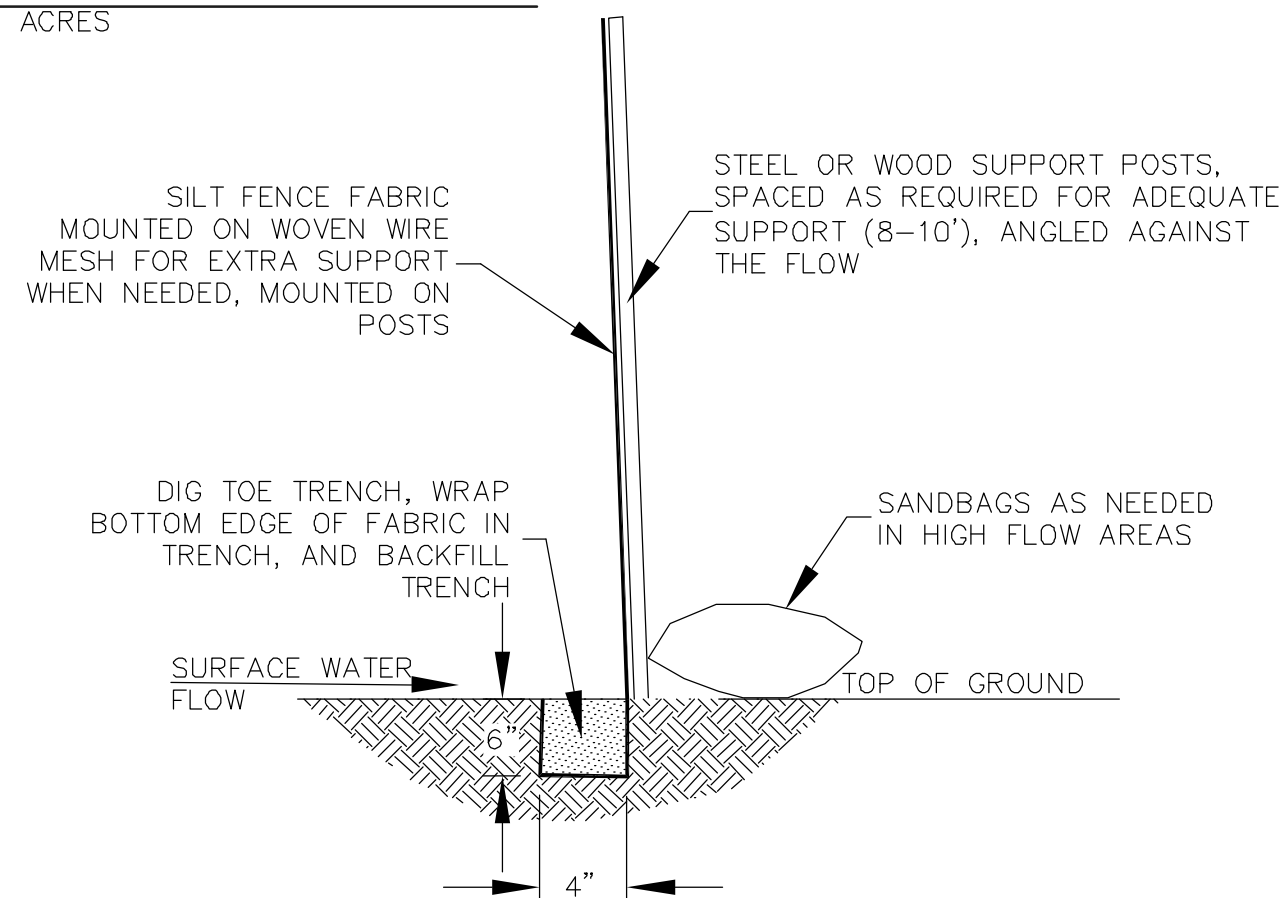
C200

**EROSION CONTROL/ENVIRONMENTAL PROTECTION/
STORMWATER POLLUTION PREVENTION PLAN**

- EROSION CONTROL MEASURES ARE INDICATED ON THE SITE DEMOLITION AND EROSION CONTROL PLAN. THE DEMOLITION PLAN IS A GRAPHIC PLAN INCLUDED IN THE PLAN SHEETS THAT ILLUSTRATES THE EROSION CONTROL MEASURES OUTLINED IN THE STORMWATER POLLUTION PREVENTION PLAN (SWP3).
- ON PROJECTS IN WHICH MORE THAN ONE ACRE OF GROUND WILL BE DISTURBED AT ONE TIME DURING THE COURSE OF CONSTRUCTION, THE SWP3 WILL BE PROVIDED BY THE ENGINEER AND SHALL BE STRICTLY FOLLOWED BY THE CONTRACTOR. THE SWP3 IS A BOUND 8-1/2 X 11 BOOKLET SEPARATE FROM THE BOUND PLAN SET. ON PROJECTS WITH AN SWP3, THE OWNER WILL FILE AN "NOI" SEPARATELY WITH THE OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY (ODEQ). AFTER ALL THE EROSION CONTROL MEASURES IDENTIFIED IN THE SWP3 HAVE BEEN LAWFULLY REMOVED (WHICH USUALLY COINCIDES WITH THE END OF CONSTRUCTION), THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THE "NOI" MAY BE SUBMITTED TO THE ODEQ. LESS THAN 1 ACRE IS BEING DISTURBED ON THIS PROJECT, SO NO SWP3 IS REQUIRED.
- THE CONTRACTOR SHALL CONFORM TO ALL CITY, COUNTY, STATE AND FEDERAL DUST AND EROSION CONTROL REGULATIONS. THE CONTRACTOR SHALL APPLY FOR AND OBTAIN ANY NECESSARY DUST OR EROSION CONTROL PERMITS FROM REGULATORY AGENCIES.
- THE CONTRACTOR SHALL CONTAIN OR REMOVE ANY EXCAVATED MATERIAL TO KEEP IT FROM WASHING OFF THE PROJECT SITE.
- THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE SITE ONTO OTHER PROPERTY BY CONSTRUCTING TEMPORARY EROSION CONTROL BERMS OR INSTALLING SILT FENCES AT THE PROPERTY LINES AS INDICATED ON THE DEMOLITION PLAN. THE CONTRACTOR SHALL PERIODICALLY INSPECT BERMS AND SILT FENCES AND REPAIR THEM AS NEEDED, AND REMOVE ACCUMULATIONS OF SEDIMENT.
- THE CONTRACTOR SHALL MITIGATE EROSION OF TEMPORARY OR PERMANENT DIRT SWALES BY INSTALLING SILT FENCES IN THE SWALES PERPENDICULAR TO THE DIRECTION OF FLOW, AND AT APPROPRIATE INTERVALS.
- THE CONTRACTOR SHALL PERIODICALLY WET EXPOSED SOIL AS NECESSARY TO KEEP IT FROM BLOWING. WATERING, AS REQUIRED FOR CONSTRUCTION AND DUST CONTROL, SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION AND NO SEPARATE PAYMENT SHALL BE MADE THEREFOR. CONSTRUCTION AREAS SHALL BE WATERED FOR DUST CONTROL IN COMPLIANCE WITH GOVERNMENT ORDINANCES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND SUPPLYING WATER AS REQUIRED.
- ANY AREAS DISTURBED BY CONSTRUCTION AND NOT COVERED BY LANDSCAPING OR A PAVED SURFACE SHALL BE RE-VEGETATED WITH SEEDING OR SOLID SLAB SOD APPROPRIATE TO THE LOCATION. THIS SHALL NOT INCLUDE RESIDENTIAL LOTS WHICH ARE TO BE OCCUPIED WITHIN TWELVE MONTHS.
- THE CONTRACTOR SHALL PROPERLY HANDLE AND DISPOSE OF ALL ASPHALT AND CONCRETE REMOVED FROM THE SITE IN ACCORDANCE WITH ODEQ REGULATIONS.
- ALL WASTE PRODUCTS FROM THE CONSTRUCTION SITE, INCLUDING ITEMS DESIGNATED FOR REMOVAL, CONSTRUCTION WASTE, CONSTRUCTION EQUIPMENT WASTE PRODUCTS (OIL, GAS, TIRES, ETC.), GARBAGE, GRUBBING, EXCESS CUT MATERIAL, VEGETATIVE DEBRIS, ETC. SHALL BE APPROPRIATELY DISPOSED OF OFF-SITE AT NO ADDITIONAL COST TO THE OWNER. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN PERMITS REQUIRED FOR HAUL OR DISPOSAL OF WASTE PRODUCTS, AND TO ENSURE THAT THE WASTE DISPOSAL SITE COMPLIES WITH GOVERNMENT REGULATIONS REGARDING THE ENVIRONMENT, ENDANGERED SPECIES, AND ARCHAEOLOGICAL RESOURCES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEANUP AND REPORTING OF SPILLS OF HAZARDOUS MATERIALS ASSOCIATED WITH THE CONSTRUCTION SITE. HAZARDOUS MATERIALS INCLUDE GASOLINE, DIESEL FUEL, MOTOR OIL, SOLVENTS, CHEMICALS, PAINTS, ETC. WHICH MAY BE A THREAT TO THE ENVIRONMENT. THE CONTRACTOR SHALL REPORT THE DISCOVERY OF PAST OR PRESENT SPILLS TO THE ODEQ BY CALLING THE SPILL REPORTING HOTLINE AT 1-800-522-0206.
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS CONCERNING SURFACE AND UNDERGROUND WATER. CONTACT WITH SURFACE WATER BY CONSTRUCTION EQUIPMENT AND PERSONNEL SHALL BE MINIMIZED. EQUIPMENT MAINTENANCE AND REFUELING OPERATIONS SHALL BE PERFORMED IN AN ENVIRONMENTALLY SAFE MANNER IN COMPLIANCE WITH GOVERNMENT REGULATIONS.
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS CONCERNING CONSTRUCTION NOISE, LIGHTING, AND HOURS OF OPERATION.
- WHERE STORM INLETS OR WATERWAYS--EITHER WET OR DRY--ARE SUSCEPTIBLE TO INFLOW OF SILT OR DEBRIS FROM CONSTRUCTION ACTIVITIES, APPROPRIATE MEASURES SHALL BE TAKEN TO PREVENT THE SILT OR DEBRIS INFLOW.
- IF AN SWP3 IS PROVIDED AS PART OF THIS PROJECT, THE CONTRACTOR SHALL MAINTAIN THE WORKING COPY OF THE SWP3 ON-SITE AT ALL TIMES, AND SHALL KEEP IT UP TO DATE IN ACCORDANCE WITH THE DIRECTIONS CONTAINED THEREIN. THE SWP3 SHALL BE MADE AVAILABLE TO GOVERNMENT PERSONNEL WHO MAY VISIT THE SITE FOR INSPECTIONS.

AREA OF DISTURBANCE

0.95 ACRES



NOTES:

- INSPECT FENCES AFTER RAIN EVENTS AND AT LEAST ONCE A WEEK. REPAIR AS NEEDED.
- AN SWP3 MUST BE MAINTAINED FOR THE PROJECT DURATION. RECORD SILT FENCE MAINTENANCE ACTIVITIES IN THE SWP3.
- REMOVE EXCESS SEDIMENT TRAPPED ON THE UPSTREAM SIDE OF THE FENCE AND DISPOSE OF PROPERLY.
- SILT FENCES MAY BE MOUNTED ON EXISTING OR PERMANENT FENCE IF ONE EXISTS.

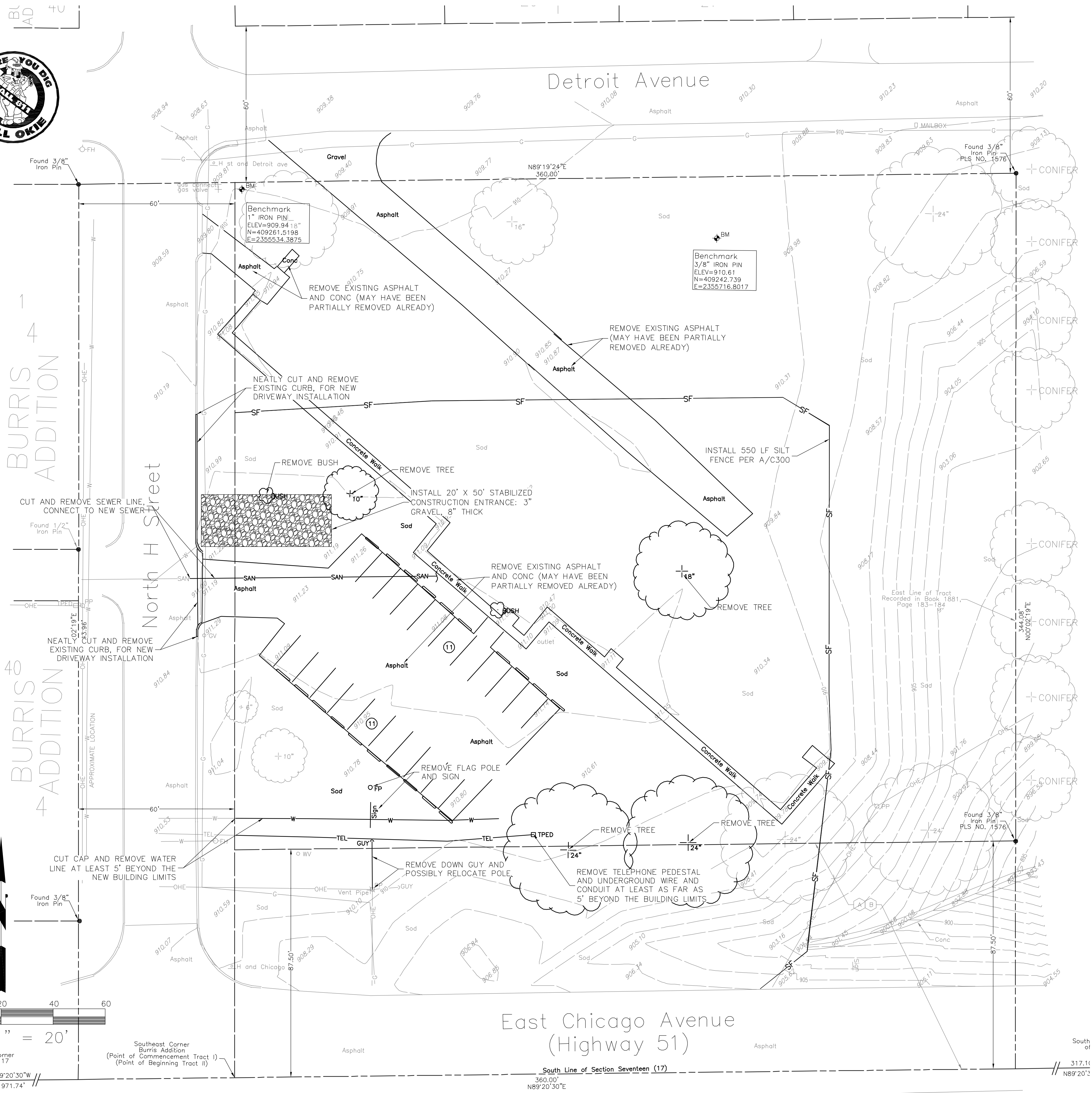
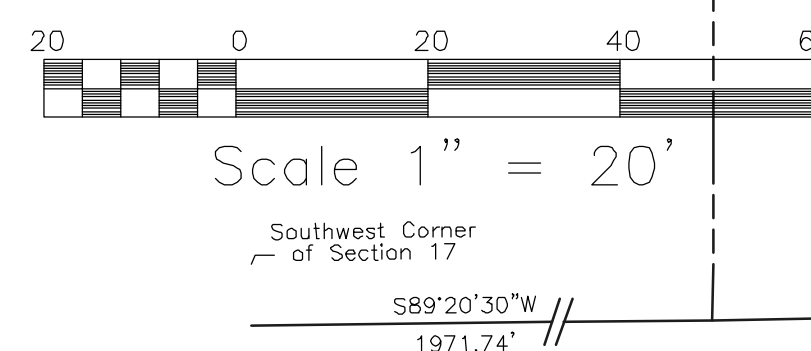
A SILT FENCE

NTS



BURRIS ADDITION

BURRIS ADDITION



JC Engineering, PC
10035 N. 177th E. Ave. • Owasso, OK 74055-7841
(918)798-5879 • www.jc-engineering.com
Oklahoma CA No. 5686 Expires June 30, 2019



REVISIONS	NO.	DATE	BY	DESCRIPTION

PROJECT
YALE FIRE DEPT.
801 E. CHICAGO AVE.

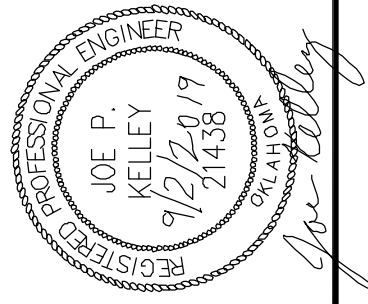
CLIENT
YALE FIRE DEPARTMENT

SHEET TITLE
DEMOLITION & EROSION CONTROL PLAN

SHEET NO.
C300



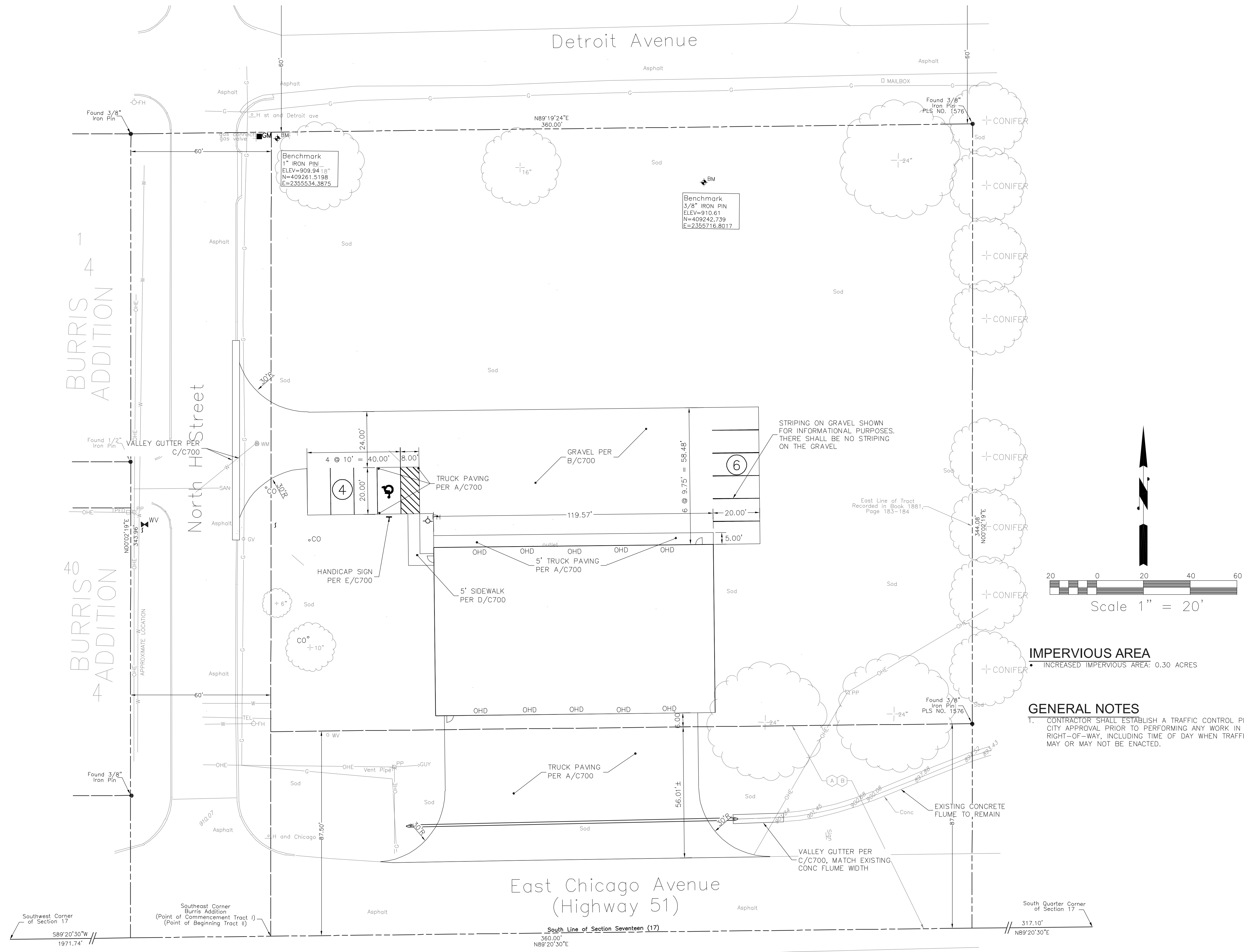
JC Engineering, PC
 10035 N. 177th E. Ave. • Owasso, OK 74055-7841
 (918)798-5879 • www.jc-engineering.com
 Oklahoma CA No. 5686 Expires June 30, 2019



REVISIONS	NO.	DATE	BY	DESCRIPTION

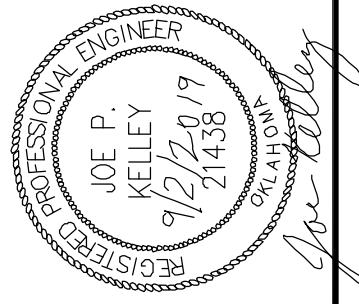
PROJECT: **YALE FIRE DEPT. 801 E. CHICAGO AVE.**
 CLIENT: **YALE FIRE DEPARTMENT**

SHEET TITLE: **SITE PLAN**
 SHEET NO.: **C400**





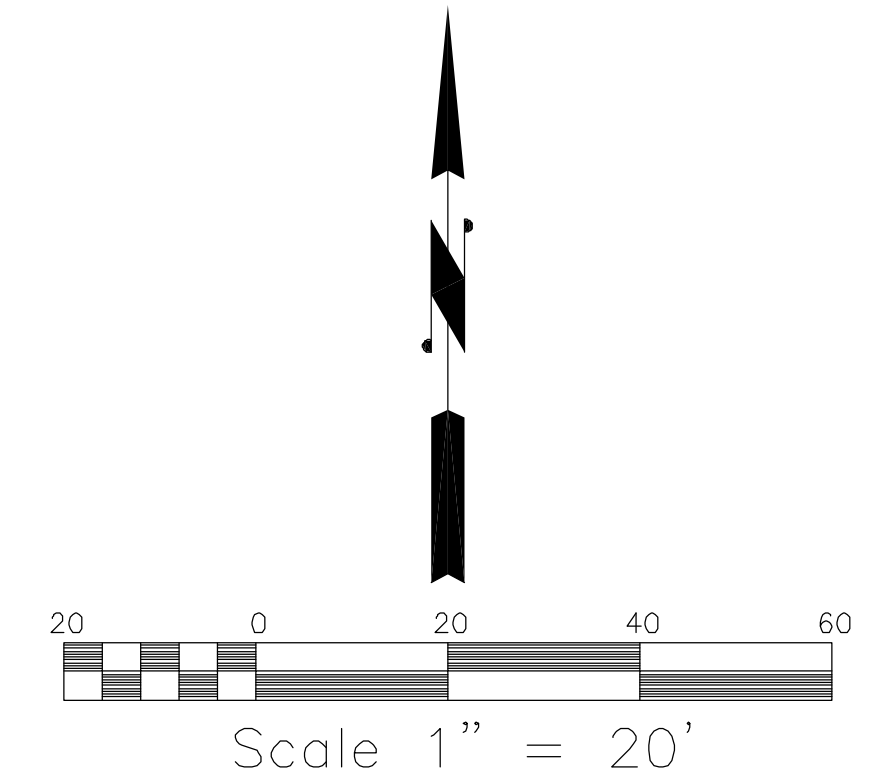
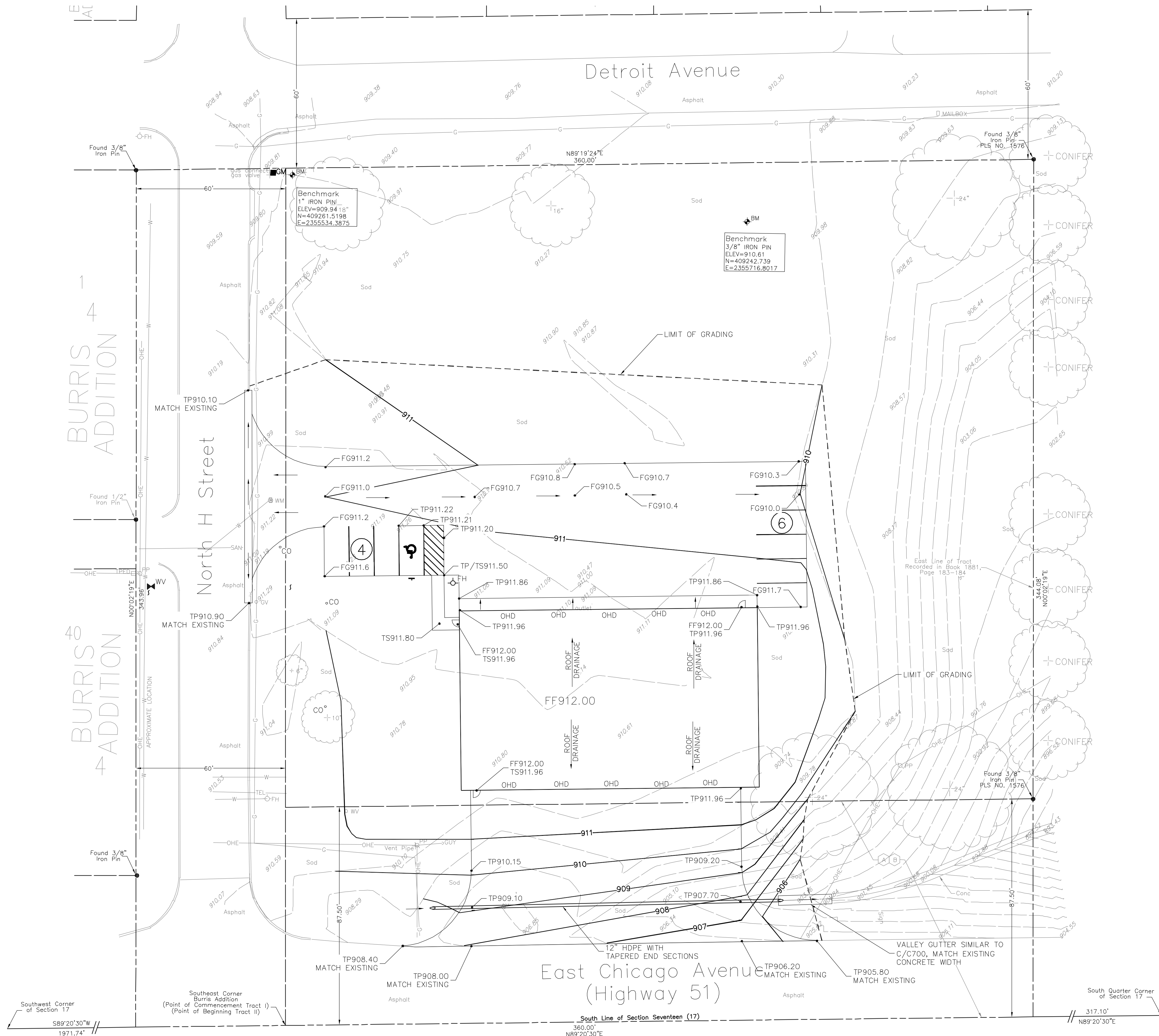
JC Engineering, PC
 10035 N. 177th E. Ave. • Owasso, OK 74055-7841
 (918)798-5879 • www.jc-engineering.com
 Oklahoma CA No. 5686 Expires June 30, 2019



DATE	APPROVALS SIGNATURE	DEPT.	NO.	DATE	BY	DESCRIPTION

PROJECT: **YALE FIRE DEPT. 801 E. CHICAGO AVE.**
 CLIENT: **YALE FIRE DEPARTMENT**

SHEET TITLE: **GRADING PLAN**
 SHEET NO.: **C500**

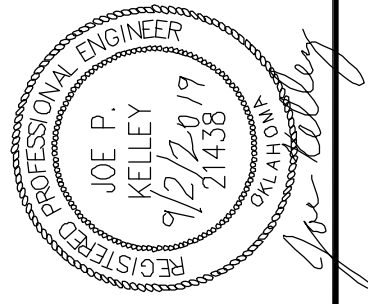


IMPERVIOUS AREA
 • INCREASED IMPERVIOUS AREA: 0.30 ACRES

- GENERAL NOTES**
1. PRIOR TO EARTH DISTURBANCE, CONTRACTOR SHALL IMPLEMENT TEMPORARY EROSION CONTROLS.
 2. ALL DISTURBED UNPAVED SURFACES SHALL BE FINISHED WITH LANDSCAPING OR SOD OR SEED.
 3. ALL EARTHWORK OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING REPORT FOR THIS PROJECT BY GFAC ENGINEERING DATED JUNE 27, 2017.



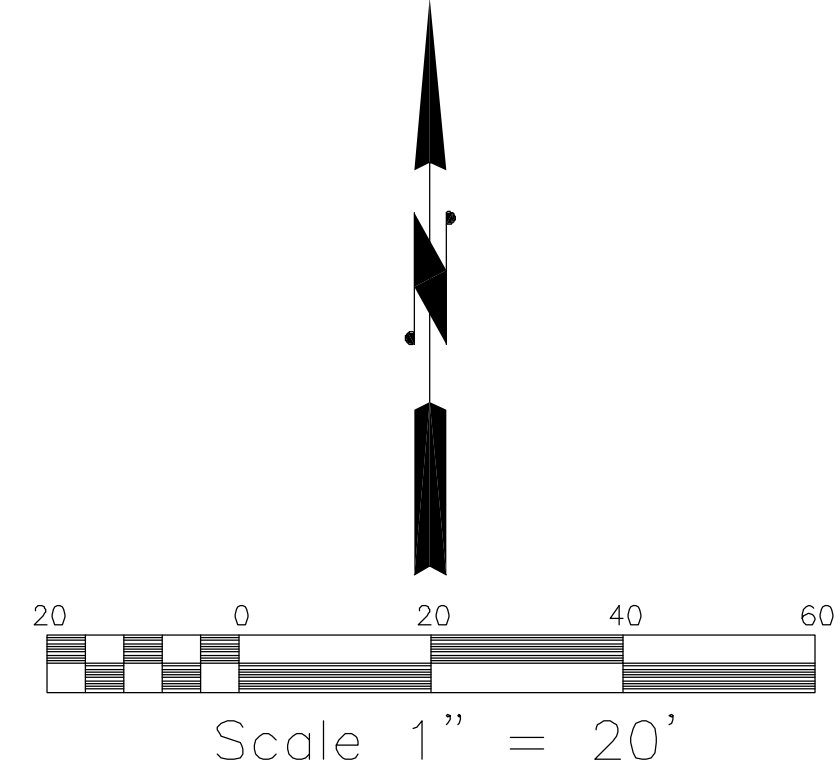
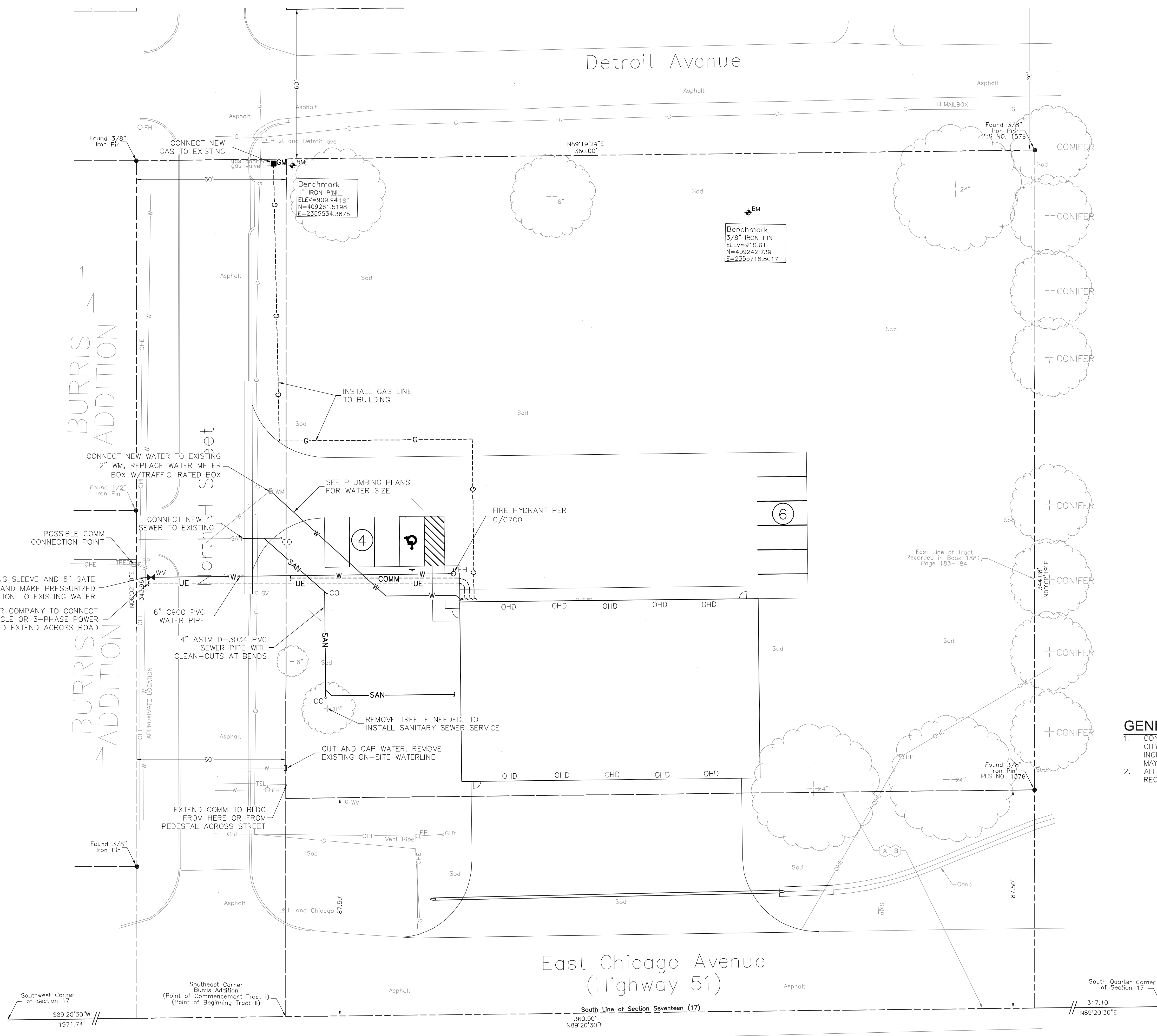
JC Engineering, PC
 10035 N. 177th E. Ave. • Owasso, OK 74055-7841
 (918)798-5979 • www.j-c-engineering.com
 Oklahoma CA No. 5686 Expires June 30, 2019



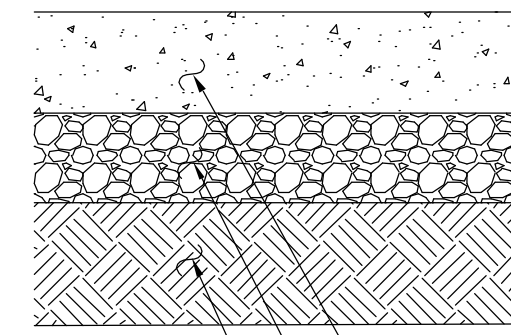
REVISIONS	NO.	DATE	BY	DESCRIPTION

PROJECT: **YALE FIRE DEPT. 801 E. CHICAGO AVE.**
 CLIENT: **YALE FIRE DEPARTMENT**

SHEET TITLE: **UTILITY PLAN**
 SHEET NO.: **C600**



- GENERAL NOTES**
- CONTRACTOR SHALL ESTABLISH A TRAFFIC CONTROL PLAN WITH PRIOR CITY APPROVAL PRIOR TO PERFORMING ANY WORK IN THE RIGHT-OF-WAY, INCLUDING THE TIME OF DAY WHEN THE TRAFFIC CONTROL PLAN MAY OR MAY NOT BE ENACTED.
 - ALL UTILITY CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY PROVIDER.



CLASS A PCC (3000 PSI) PER ODOT SPECS 414 AND 701; 6" FIRE TRUCK
 TYPE A AGGREGATE BASE PER ODOT SPECS 303 AND 703.01 @ 95% DENSITY PER ASTM D-698; 6"
 9" SUBGRADE SCARIFIED AND MOISTURE-CONDITIONED WITHIN 2% OF OPTIMUM AND COMPACTED @ 95% STANDARD PROCTOR DENSITY, ASTM D-698

SEE CONCRETE JOINT NOTE

SEE PAVEMENT SUBGRADE PREPARATION

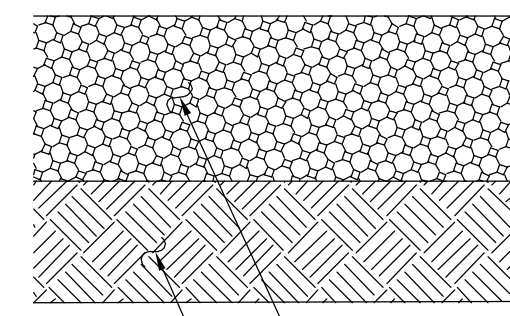
A CONCRETE PAVING NTS

PAVEMENT SUBGRADE PREPARATION

1. EARTHWORK AND SUBGRADE PREPARATION SHALL BE PERFORMED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT FOR THIS PROJECT BY GFAC ENGINEERING DATED JUNE 27, 2017
 2. AT LOCATIONS REQUIRED IN THE GEOTECHNICAL REPORT, PAVEMENT SUBGRADE SHALL BE PROOFROLLED WITH MULTIPLE PASSES OF A FULLY-LOADED, TANDEM-AXLE RUBBER-TIRED DUMP TRUCK OR EQUAL.

CONCRETE PAVEMENT JOINTING

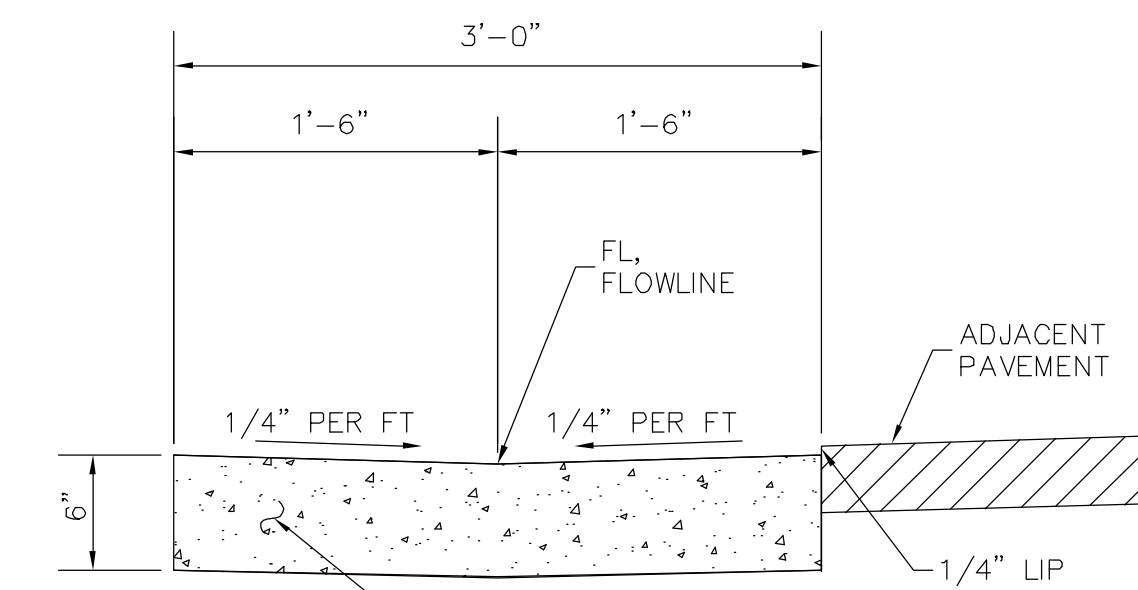
1. CONCRETE PAVEMENT SHALL HAVE JOINTS INSTALLED IN A SQUARISH PATTERN, WITH A MAXIMUM JOINT SPACING OF 12', AND WITH THE DIMENSION OF ANY ONE PAVING "SQUARE" NO MORE THAN 25% DIFFERENT FROM THE TRANSVERSE DIMENSION.
 2. ISOLATION JOINTS CONSISTING OF PREMOLDED JOINT FILLER SHALL BE INSTALLED WHERE THE CONCRETE WILL BE ADJACENT TO A FIXED OBJECT, SUCH AS A BUILDING, OR ADJACENT TO AN EXISTING CURB. CONTRACTION JOINTS, CONSISTING OF SAWED OR TOOLED JOINTS, SHALL BE PLACED AT A REGULAR INTERVAL TRANSVERSE TO THE LONGITUDINAL DIRECTION OF A DAILY POUR.
 3. TIED JOINTS OR KEYED JOINTS SHALL BE LOCATED AT THE LONGITUDINAL JOINT THAT IS CLOSEST TO THE EDGE OF THE CONCRETE PAVEMENT. TIED JOINTS SHALL CONSIST OF 14" NO. 4 REBAR INSERTED AT 30" ON CENTER, EXACTLY PERPENDICULAR TO THE JOINT FACE. KEYED JOINTS SHALL CONSIST OF A METAL KEYWAY FORM DIMENSIONED IN ACCORDANCE WITH ACI STANDARDS. THE METAL KEYWAY FORM SHALL BE REMOVED PRIOR TO PLACEMENT OF THE INTERLOCKING CONCRETE.
 4. PRIOR TO INSTALLATION OF CONCRETE PAVEMENT, CONTRACTOR SHALL SUBMIT TO ENGINEER A JOINTING PLAN INDICATING THE SPACING, LOCATION, AND TYPE OF ALL JOINTS.



8" TYPE A AGGREGATE BASE PER ODOT SPECS 303 AND 703.01 COMPACTED TO 95% ASTM D-698
 9" SUBGRADE SCARIFIED AND MOISTURE-CONDITIONED WITHIN 2% OF OPTIMUM AND COMPACTED @ 95% STANDARD PROCTOR DENSITY, ASTM D-698

SEE SUBGRADE PREP NOTE

B GRAVEL SECTION NTS

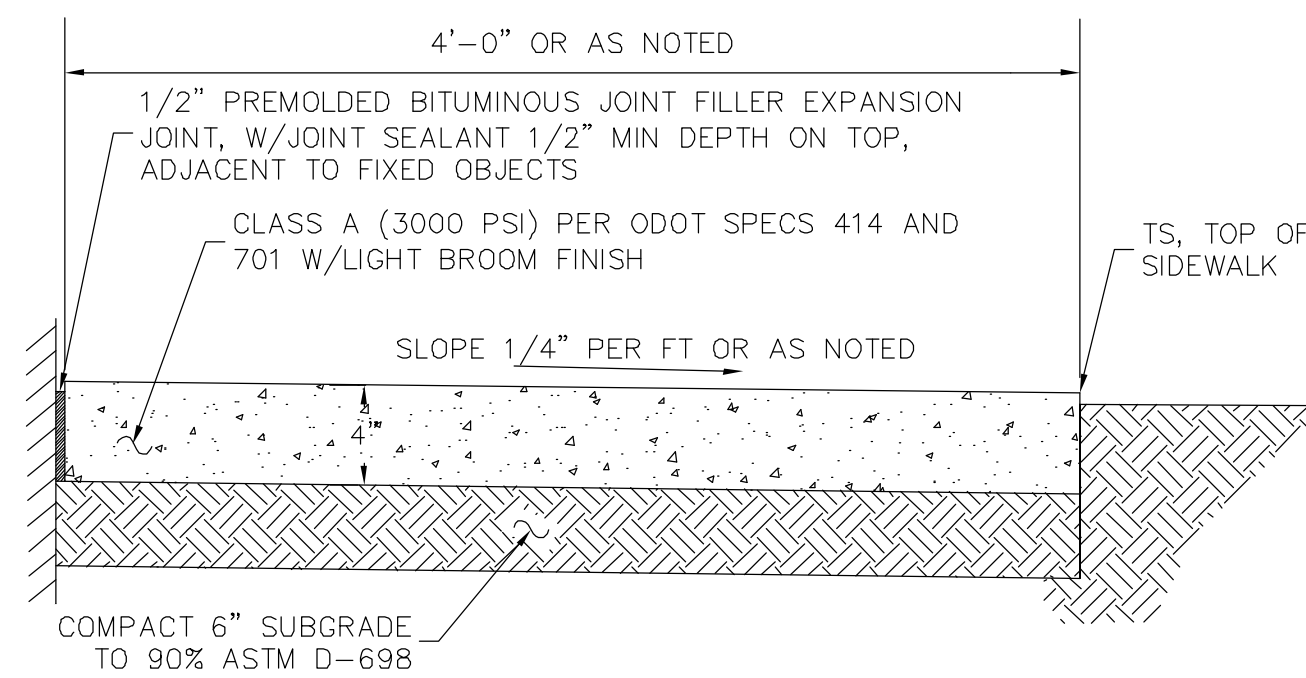


CLASS A CONC (3000 PSI) PER ODOT SPECS 414 AND 701 W/LIGHT BROOM FINISH
 9" SUBGRADE SCARIFIED AND MOISTURE-CONDITIONED WITHIN 2% OF OPTIMUM AND COMPACTED @ 95% STANDARD PROCTOR DENSITY, ASTM D-698

NOTES:

- EXPANSION JOINTS SHALL BE INSTALLED EVERY 50'.
- TOOLED CONTRACTION JOINTS SHALL BE INSTALLED AT MIN. 10' SPACING.

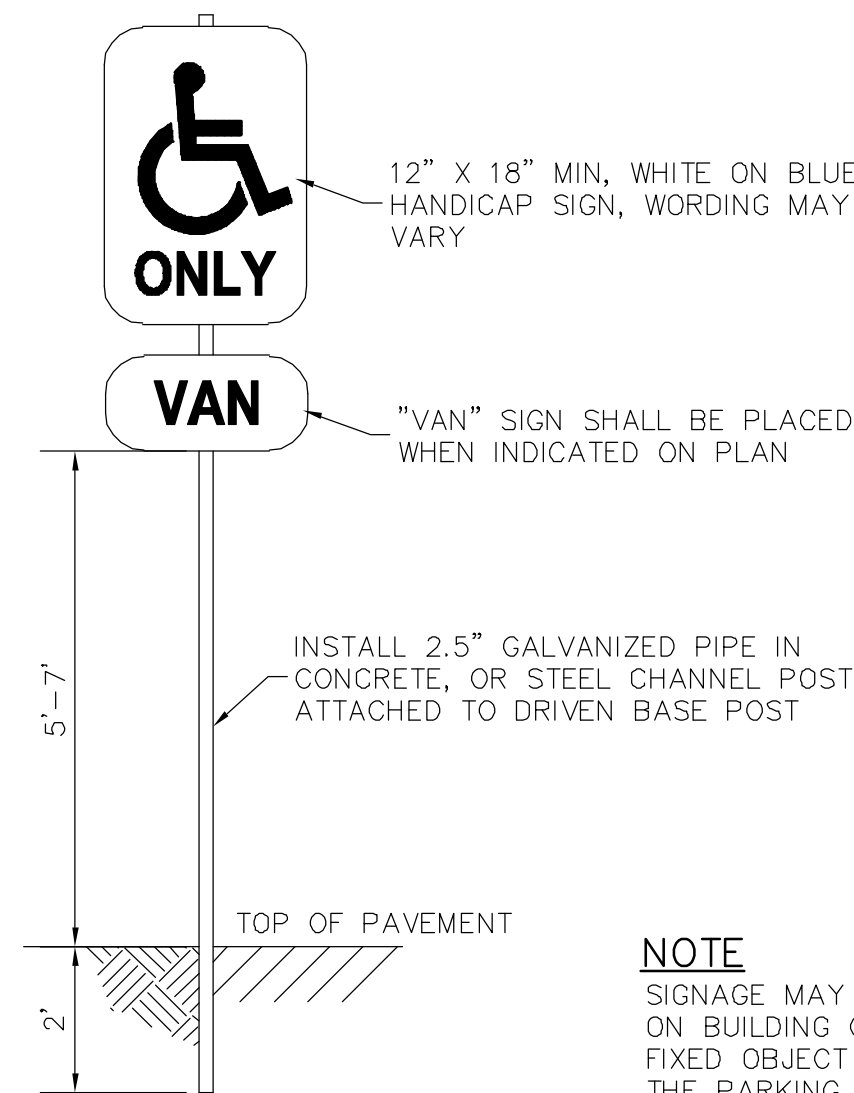
C VALLEY GUTTER NTS



NOTES:

- TOOLED TRANSVERSE CONTRACTION JOINTS SHALL BE INSTALLED AT A SPACING APPROXIMATELY THE SAME AS THE SIDEWALK WIDTH, OR 10' MAX.
- EXPANSION JOINTS SHALL BE INSTALLED EVERY 50' AND ADJACENT TO ALL FIXED OBJECTS.

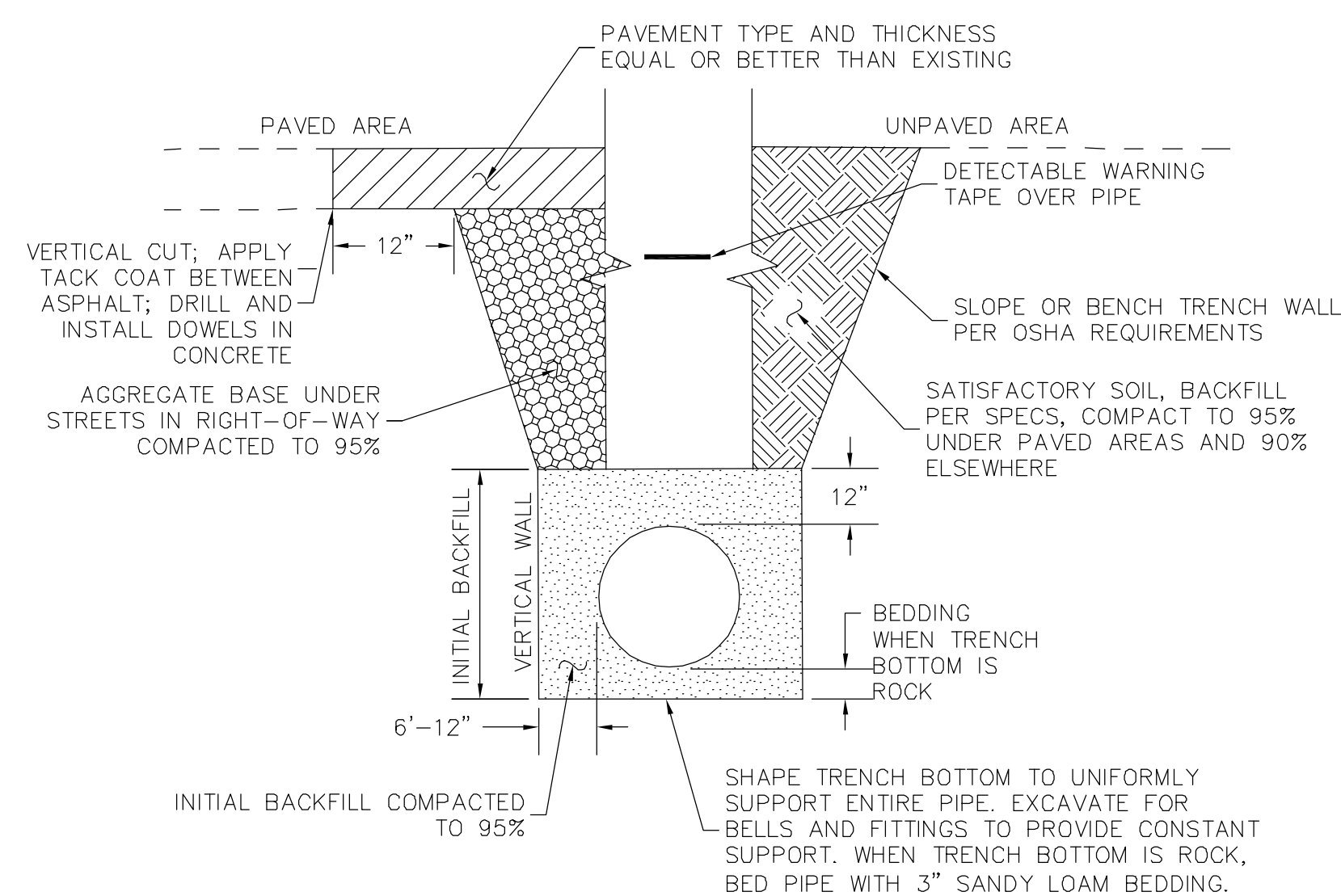
D STANDARD SIDEWALK NTS



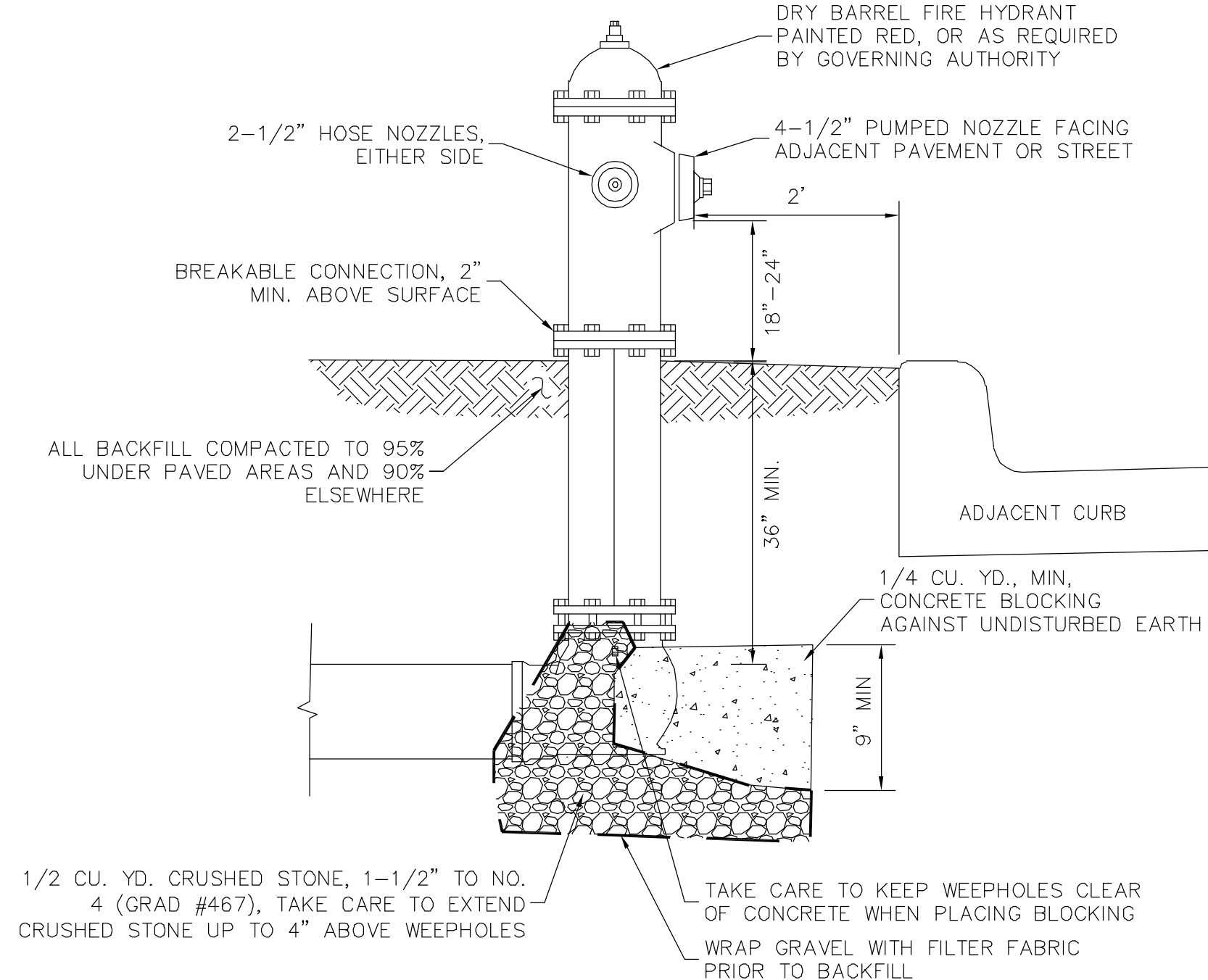
NOTE

SIGNAGE MAY BE MOUNTED ON BUILDING OR OTHER FIXED OBJECT IN FRONT OF THE PARKING SPACE

E HANDICAP SIGNAGE NTS



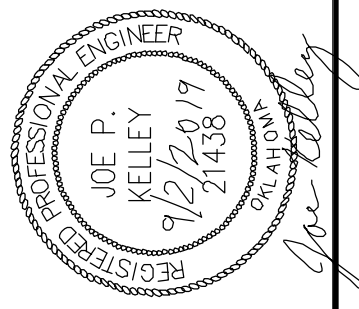
F TRENCH SECTION NTS



NOTES:

- IF HYDRANT IS LOCATED IN A PARKING LOT, BOLLARDS SHALL BE PLACED AROUND HYDRANT TO PROTECT IT FROM CARS.
- WHERE WATER MAIN IS EQUIPPED WITH TRACER WIRE, WIRE SHALL BE EXTENDED TO HYDRANT AND ATTACHED TO THE TRAFFIC FLANGE.
- NOZZLE CAPS SHALL BE EQUIPPED WITH CHAINS.
- IF CURB IS ADJACENT, FIRE HYDRANT SHALL BE LOCATED 2' BEHIND THE CURB.
- FIRE HYDRANT SHALL CONFORM TO ANSI/AWWA C502 SPECIFICATIONS FOR DRY BARREL FIRE HYDRANTS, AND SHALL BE APPROVED BY THE YALE FIRE DEPT. PRIOR TO INSTALLATION.

G FIRE HYDRANT NTS



REVISIONS	NO.	DATE	BY	DESCRIPTION

PROJECT: YALE FIRE DEPT.
 801 E. CHICAGO AVE.
 CLIENT: YALE FIRE DEPARTMENT

SHEET TITLE: CIVIL DETAILS
 SHEET NO.: C700



Glenna Craig

Payne County Clerk

315 W. 6th, Suite 202 Stillwater, Oklahoma 74074

Phone: 405-747-8310* Fax: 405-747-8304

countyclerk.paynecounty.org



BID # 2020-22

YALE FIRE STATION

YALE FIRE DEPARTMENT, YALE, PAYNE COUNTY, OKLAHOMA

Vendor and or company representative,

Included in this correspondence you will find information regarding bid specifications, packet information, and instructions per the Payne County Commissioners who are requesting your company submit a bid for the enclosed project or materials.

The enclosed packet has been developed and approved by the Payne County Commissioners, the content of the packet is per their instruction. The Payne County Clerk's office is the facilitator of the bid process and is required to receive and hold all sealed bids per Oklahoma State Statutes to present to the Board of Commissioners in an open session.

If you have any questions, in regards, to the pack content, specifications, and instructions please contact the following:

JOSH ROBINSON, FIRE CHIEF- 405-612-2453

JOHN HENKAL, FIREMAN- 918-306-1243

We appreciate your bid and time, in regards, to the process. We look forward to hearing from you.

Kind Regards,


Glenna Craig, Payne County Clerk

State of Oklahoma

All bids can be mailed or emailed to vendors upon request, or can be downloaded for completion from our website: www.countyclerk.paynecounty.org

CONTACT KYLA MCCOMBS-PAYNE COUNTY PURCHASING AGENT FOR EMAIL OR MAILED BIDS AT: kmccombs@paynecountyclerk.org

ALL BIDS MUST BE SUBMITTED BACK TO THE PAYNE COUNTY CLERKS OFFICE BY MAIL, OR IN PERSON SEALED BEFORE 9:30 THE DATE OF BID OPENING.

THERE WILL BE A PRE-BID MEETING HELD OCTOBER 31, 2019 AT 9 AM AT THE PAYNE COUNTY ADMINISTRATION BUILDING, 315 W. 6TH, STE 200, STILLWATER, OKLAHOMA.



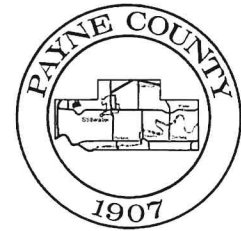
Glenna Craig

Payne County Clerk

315 W. 6th, Suite 202 Stillwater, Oklahoma 74074

Phone: 405-747-8310* Fax: 405-747-8304

countyclerk.paynecounty.org



INVITATION TO BID

The Board of County Commissioners, Payne County, Oklahoma is seeking sealed bids for:

BID # 2020-22

YALE FIRE STATION

BID # 2020-22

Date Published: OCTOBER 11, 2019

Bidding Period Closing Date and Hour: NOVEMBER 18, 2019 @ 9:30 A.M.

Sealed Bid Opening Date and Hour: NOVEMBER 18, 2019 @ 9:30 A.M.

Location: "The Gloria Hesser Commissioners Meeting Room" Room 200, Payne County Administration Building.

Address: 315 W. 6th, Ste. 202, Stillwater, OK. 74074

Requesting Authority: PAYNE COUNTY COMMISSIONERS and YALE FIRE DEPARTMENT

YALE FIRE CHIEF, JOSH ROBINSON, 405-612-2453

FIREMAN, JOHN HENKAL, 918-306-1243

Bid submissions are to be addressed to:

ATTN: Payne County Purchasing Agent

Payne County Clerk's Office

315 W. 6th, Suite 202

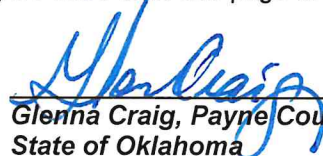
Stillwater, OK 74074

Please review the attached Terms and Conditions pertaining to the submission of this bid.

Please pay particular attention to item (1) of the Terms and Conditions. This item specifies how the bid envelopes are to be identified to prevent inadvertent or premature opening of sealed bids. Your compliance will ensure consideration of your bid by the awarding body. Late bids will not be considered. The Non-Collusions Affidavit bearing original signature must be notarized and returned with the bid submission.

This packet contains:

1. Invitation to Bid
2. Terms and Conditions for Bidding
3. Affidavit for Filing with Competitive Bid
4. Specifications/Bid forms for desired item(s) (may be more than one page of information).



Glenna Craig, Payne County Clerk
State of Oklahoma
315 W. 6th, Suite 202
Stillwater, OK 74074



Glenna Craig

Payne County Clerk

315 W. 6th, Suite 202 Stillwater, Oklahoma 74074

Phone: 405-747-8310* Fax: 405-747-8304

countyclerk.paynecounty.org



TERMS AND CONDITIONS

THESE ITEMS APPLY TO AND BECOME A PART OF THE BID

NO EXCEPTIONS TO THESE TERMS AND CONDITIONS WILL BE CONSIDERED

1. Bids must be submitted on the included form only. Each bid shall be placed in a separate envelope. Be sure the envelope is completely and properly identified and sealed, showing the bid name and number in the lower left-hand corner.
2. All bids shall be entered on the Bid Form enclosed or a copy thereof. Bids are to be typewritten or in ink. No bidder may withdraw his proposal for a period of thirty (30) days after the date and hour set for the opening of bids.
3. The bidder shall attach the manufacturer's name of the equipment or material to be furnished, type model numbers descriptive bulletins and specifications. All guarantees and warranties should be clearly stated. This data shall be sufficient detail to describe accurately the equipment or material to be furnished. Manufacturer's specifications, in respect to the successful bidder, shall be considered as part of the contract with Payne County.
4. Any exceptions or deviations from written specifications shall be identified in writing and attached to the bid form.
5. The enclosed affidavit for Filing with Competitive Bid MUST be returned with the bid.
6. Payne County reserves the right to reject any and all bids and to waive any technicalities in the bidding.
7. Direct purchase of certain items of equipment or material by Payne County is exempt from Federal Excise Tax and Oklahoma Sales Tax. In such cases, the bidder shall quote prices which do not include Federal Excise Tax and Oklahoma Sales Tax.
8. Bid must show number of days required for delivery under normal conditions. Contractor must keep the County advised at all times of the status of the order. For any exception to the delivery date as specified on this order, vendor shall give prior notification and obtain written approval from the Purchasing Agent. Default in promised delivery date or failure to meet specifications, authorizes the County to purchase supplies elsewhere and charge the full increase of cost and handling to defaulting contractor.
9. Bidder agrees to defend and save Payne County from and against all demands, claims costs expense, damage and judgments based upon infringement of any patent to goods specified in this order or the ordinary use or operation of such goods by the County or use or operation of such goods in accordance with the bidder's direction.
10. If the bid requires a written contract, the successful bidders shall execute a written contract with the county within (10) days after submission of the contracts to said bidder.
11. This bid is submitted as a legal offer, and any bid when accepted by the County constitutes a firm contract.
12. **If the bid is \$50,000.00 or greater, Bidder must furnish a bid bond or cashier's check in the amount of 5% of the bid with bid submission.**
13. **If the bid is \$50,000.00 or greater, successful Bidder must be able to bond. (Performance, Maintenance and Payment Bonds)**
14. Successful bidder will be required to furnish their own Workmen's Comp and General Liability Insurance as required by Oklahoma State Law and by Payne County.



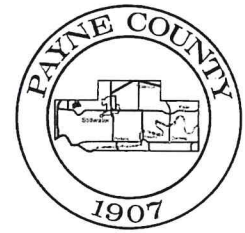
Glenna Craig

Payne County Clerk

315 W. 6th, Suite 202 Stillwater, Oklahoma 74074

Phone: 405-747-8310* Fax: 405-747-8304

countyclerk.paynecounty.org



S.A.&I. 425/1-4040 (2000)

AFFIDAVIT FOR FILING WITH COMPETITIVE BID

STATE OF OKLAHOMA)

)SS

COUNTY OF _____)

_____, of lawful age, being first duly sworn, on oath says, that (s)he is the agent authorized by the bidder to submit the attached bid. Affiant further states that the bidder has not been a party to any collusion among bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding; or with any county official or employee as to quantity, quality or price in the prospective contract, or any other terms of said prospective contract, or in any discussions between bidders and any county official concerning exchange of money or other thing of value for special consideration in the letting of a contract.

Firm: _____

Signed by: _____ (manual signature of undersigned)

Title: _____

Address: _____

City: _____ State: _____

Zip: _____ Tax ID: _____

Telephone (____) _____ Fax (____) _____

Subscribed and sworn to before me this _____ day of _____, 20_____.

_____ Notary Public (or Clerk or Judge)

My commission expires: _____

Note:

Each competitive bid submitted to a county, school district or municipality must be accompanied with the above Affidavit as required by 61 Okl.St. Ann. § 138

**PROJECT MANUAL
FOR THE**

YALE FIRE DEPARTMENT

Fire Station No. 1

Project Number 1533201

801 North Chicago Avenue
Yale, Oklahoma 74085



SGA DESIGN GROUP, P.C.
1437 South Boulder, Suite 550
Tulsa, Oklahoma 74119-3609
Phone 918-587-8600
Fax 918-587-8601

SGA Design Group 

CD Issue No. 2
Revision No. 0
Addendum No. 0
10-1-2019

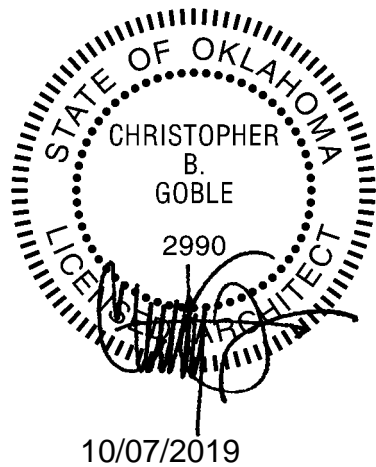
SECTION 00001

SEALS PAGE

1.1 DESIGN PROFESSIONALS OF RECORD

A. Architect:

1. Name: Christopher B. Goble, AIA
2. License #: a2990
3. Responsible for Divisions 01-13 Sections except where indicated as prepared by other design professionals of record.



Architect of Record

Date

DOCUMENT 00003

TABLE OF CONTENTS

INTRODUCTORY INFORMATION

Section 00001	Seals Page
Section 00003	Table of Contents

BIDDING REQUIREMENTS AND CONTRACTING REQUIREMENTS

Bidding Requirements and Contract Forms are issued by the Owner under separate cover and are not included in the Project Manual.

Section 00700	General Conditions
	AIA Document A201-2017
	AIA Document A101-2017
Section 00800	Supplementary Conditions

SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

Section 01010	Summary of Work
Section 01020	Contract Considerations
Section 01200	Coordination and Meetings
Section 01230	Alternates
Section 01250	Execution Requirements
Section 01300	Submittals
Section 01400	Quality Control
Section 01450	Safety
Section 01500	Temporary Facilities
Section 01600	Products, Material and Equipment
Section 01650	Starting of Systems
Section 01700	Project Closeout

DIVISION 2 – SITE CONSTRUCTION

Section 02520	Portland Cement Concrete Paving
---------------	---------------------------------

DIVISION 3 - CONCRETE

Section 03252	Control and Construction Joint Filler
Section 03300	Cast-In-Place Concrete

DIVISION 4 – MASONRY - Not Used

DIVISION 5 - METALS

Section 05500	Metal Fabrications
---------------	--------------------

DIVISION 6 - WOOD AND PLASTICS

Section 06100	Rough Carpentry
---------------	-----------------

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07900	Joint Sealers
---------------	---------------

DIVISION 8 - DOORS AND WINDOWS

00001 - 1
CD Issue No. 2

Section 08110 Steel Doors and Frames
Section 08360 Sectional Overhead Doors
Section 08710 Door Hardware
Section 08734 Overhead Sectional Door Operator
Section 08800 Glazing

DIVISION 9 - FINISHES

Section 09260 Gypsum Board Systems
Section 09511 Acoustical Panel Ceilings
Section 09678 Resilient Base
Section 09900 Painting

DIVISION 10 - SPECIALTIES

Section 10350 Flag Poles
Section 10810 Toilet Accessories

DIVISION 11 – EQUIPMENT - Not Used

DIVISION 12 – FURNISHINGS - Not Used

DIVISION 13 - SPECIAL CONSTRUCTION

Section 13419 Metal Building Systems

DIVISION 14 - CONVEYING SYSTEMS - Not Used

DIVISION 15 – MECHANICAL

Section 15100 Plumbing Narrative
Section 15700 HVAC Narrative

DIVISION 16 - ELECTRICAL

Section 16000 Electrical Narrative

END OF TABLE OF CONTENTS

DOCUMENT 00700
GENERAL CONDITIONS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Reference to standard documents.

PART 2 PRODUCTS

2.01 GENERAL CONDITIONS

- A. General Conditions.

The General Conditions of the contract for construction of the buildings, Articles 1 thru 13, a standard document of the American Institute of Architects, Document No. A201 "General Conditions of the Contract for Construction", 2007 Edition, is hereby made a part of these specifications and except as modified and supplemented by the paragraphs herein, are the General Conditions on which all contracts for this work will be based.
- B. Related Documents.

Contract documents utilized by Payne County may include the following documents.

 - 1. AIA Document A201-2007: General Conditions of the Contract for Construction,
 - 2. AIA Document A101-2007: Standard Form of Agreement Between Owner and Contractor.

END OF DOCUMENT

SECTION 00800

SUPPLEMENTARY CONDITIONS

All **work** in strict compliance with Plans and Specifications entitled **Yale Fire Department**. Furthermore, the work shall be governed by applicable local codes, General Requirements and AIA Document A201-2017 "General Conditions of the Contract for Construction".

General: The requirements of Supplementary Conditions shall govern when in conflict with the General Conditions.

Statutory, Performance and Payment Bonds: The successful bidder shall furnish within ten (10) days after notice of acceptance of his bid, a performance and payment bond complying with all requirements of Title 61, Oklahoma Statutes, Section 113(B) the Public Competitive Bidding Act of 1974 in the amount of the contract sum and shall be executed by a bonding company authorized to do business in the Oklahoma. An original and four copies of this bond shall be submitted and shall have issuing agents power of attorney attached to each. The Owner will not make any payments until the Contractor furnishes the Owner the receipt from the County Clerk that the bond has been filed.

Insurance: The Contractor shall furnish the insurance required herein at his own expense and shall file with the Owner the policies or certificates as required, concurrent with the signing of the contract.

All insurance policies and certificates shall be submitted with the original and three (3) copies.

All policies delivered to the Owner shall be returned to the Contractor upon termination of the work for cancellation and refund of premium, if any.

A) The Contractor shall furnish a Certificate of Insurance addressed to the Owner and showing that he carries the following insurance:

Workmen's Compensation:

State	Statutory Amount
Employers Liability:	\$100,000.00

Comprehensive General Liability: (Including Premises-Operations: Independent Contractors' Protective; Products and Completed Operations; Broad Form Property Damage):

Bodily Injury:	\$1,000,000.00 Each Occurrence \$1,000,000.00 Aggregate, Products and Completed Operations
Property Damage:	\$1,000,000.00 for Each Occurrence

Property Damage Liability for explosion and collapse.

Contractual Liability (Hold Harmless Coverage):

Bodily Injury:	\$1,000,000.00 Each Occurrence
Property Damage:	\$1,000,000.00 Each Occurrence \$1,000,000.00 Aggregate

Comprehensive Automobile Liability (owned, non-owned, hired):

Bodily Injury: \$1,000,000.00 Each Person
\$1,000,000.00 Each Accident

Property Damage: \$1,000,000.00 Each Occurrence

Insurance in those amounts shall be maintained throughout the life of the contract. The certificate shall state that coverage afforded by the policies shall not be cancelled without fifteen (15) days notice (written) to the Owner.

- B. Builder Risk Insurance: The Contractor shall purchase in the names of the Contractor and the Owner a completed value form builder's risk insurance policy with fire and extended coverage in the amount of the contract price, which policy shall contain a vandalism and malicious mischief endorsement and be subject to the approval of the Owner as to form and substance and shall provide for Owner's Protective Liability Policy in the amount of \$1,000,000.00 for each occurrence and aggregate for bodily injury, property damage and personal injury. The policy shall provide that any loss is to be adjusted with and paid to the Owner as trustee for all funds. Any adjustment made in good faith by the Owner shall be binding upon the Contractor. The Owner shall have the right to have said policy issued with a mortgage clause in favor of any mortgagee holding a mortgage on the premises where the insured improvements are to be constructed. The original of the policy shall be delivered to the Owner. A blanket form builder's risk policy covering this and other projects of the Contractor will not be acceptable. In the event of partial or full occupancy by the Owner prior to substantial completion of the building, the Contractor shall notify the insurance carrier and obtain a "Use and Occupancy Waiver" to prevent invalidation for such insurance by occupancy. The waiver shall be delivered promptly to the Owner by the Contractor.

Permits and Ordinances: Permits and ordinances shall be complied with and paid by the Contractor.

Sales Taxes: Sales tax shall be paid by the Contractor.

Unemployment Compensation Taxes: All taxes under this heading shall be paid by the Contractor.

Social Security Taxes: All taxes under this heading shall be paid by the Contractor.

Payments to the Contractor: Partial payment will be made as the work progresses on not later than the thirtieth (30th) day of each calendar month for work done during the preceding calendar month. In preparing estimates, the material delivered on the site and preparatory work may be taken into consideration. Estimated for monthly payments must be submitted at least fifteen (15) days in advance of the date set for payment.

In making such partial payments for the work, there shall be retained ten percent (10%) of the estimated amount until fifty percent completion and acceptance of all work covered by the contract. The balance of the partial payments for the work shall have no retainage.

All material and work covered by the partial payments shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the Owner to require the fulfillment of all terms of the contract.

Upon completion and acceptance of all work required hereunder, the amount due the Contractor under this contract shall be paid upon certification by the Architect and approval of the Owner.

The Owner may, before making any payment, require the Contractor to furnish releases or receipts from all persons performing work and supplying material to the Contractor, if the Owner deems the same

necessary in order to protect his interest. The Owner, however, may make payment in part or in full to the Contractor without requiring the furnishing of such releases or receipts. Any payment so made shall in no way impair the obligations of any sureties on any bond or bonds furnished under the contract.

The Owner may withhold from any payment otherwise due to the Contractor as much as may be necessary to protect the Owner against any claims that may be urged against the Owner, and if he so elects, may also withhold any amounts due from the Contractor to any sub-contractor or materialmen for labor or material furnished by them. The foregoing provisions shall be construed solely for the benefit of the Owner and shall not require the Owner to determine or adjust any claims or disputes between the Contractor or his sub-contractors or materialmen, or to withhold any monies for their protection unless the Owner elects to do so. The failure or refusal of the Owner to withhold any monies from the Contractor shall in no way impair the obligations of any surety or sureties under any bond or bonds furnished under this contract.

1. Cleanliness of Premises During Construction: During construction, the Contractor and each subcontractor shall keep all materials in an orderly manner and shall remove all scraps, debris, empty cans, etc., from the job site on the daily basis. Any debris that falls or blows off the site must be picked up immediately.
2. Subcontractor's work shall be executed with a level of quality and workmanship which is acceptable to the Contractor's representative, and Owner. Any work which is not acceptable is to be removed and replaced at Subcontractor's expense.
3. Subcontractor shall cooperate with contractor to provide information on hazardous materials furnished by subcontractor to comply with OSHA regulation 29 C.F.R. 1926.50 (Hazard Communication Standard). Material Safety Data Sheets (MSDS's) shall be provided for all chemical products furnished by the Subcontractor prior to material being delivered to the job site.
4. Submit a Schedule of Values for the major categories of this work prior to first billing. Schedule of values will be used for accounting purposes only.
5. Escalation costs applicable to all labor and materials necessary for the completion of the work are included on the contract amount.
6. Subcontractor shall provide a complete list of second-tier subcontractors and materials suppliers to the Contractor prior to commencement of work.
7. Subcontractor shall be represented at each weekly job meeting, while work is proceeding, by an on-site Superintendent familiar with the contract documents and authorized to make manpower and overtime commitments. If required by the contractor, an office representative responsible for administering this Subcontract shall also attend each weekly job meeting.
8. Subcontractor shall comply with the Contractor's standard project work week as designated by the Contractor's Superintendent.
9. The Subcontractor shall provide maintenance and warranty manuals, Owner orientation and operation instructions, and as-built drawings as outlined in the specifications.
10. The Subcontractor shall review the surfaces provided by others to which his work is to be applied, and shall notify the Contractor of any defect detrimental to proper procedures, prior to the commencement of his work; otherwise, it shall be deemed that the Subcontractor has accepted the conditions of such surfaces and shall be liable for all consequences resulting therefrom.
11. Safety requirements, including netting, barricades, guardrails, etc., required by governing agencies for the protection of the subcontractor's employees, shall be provided by the Subcontractor. Subcontractor shall also abide by all safety practices of General contractor while on job site, including

but not limited to, wearing hard hats and other appropriate personal job site for Subcontractor's compliance and review. ***The Subcontractor will be required to wear appropriate clothing, i.e., long pants, long sleeved or short sleeved shirts. We do not allow tank tops, cut offs, bare rib shirts, shorts, ragged clothing, hiking boots, soft shoes, dress shoes, tennis shoes, or holes in clothing.***

12. The Subcontractor shall advise the Contractor well in advance of progress of any access obstacles into the structure that would hinder the installation of components to be furnished hereunder.
13. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the work. The Contract Documents are complementary and what is required by one shall be binding as if required by all. Work not covered in the Contract Documents will not be required unless consistent therewith and is reasonably inferable therefrom as being necessary to produce the intended results.
14. Time is of the essence in completion of the Subcontract; therefore, sufficient manpower and materials must be provided at all times. To assure required completion, it is the Subcontractor's responsibility to submit shop drawings in a timely manner allowing for the required approvals, so that material is delivered in such a sequence and period that the Construction Schedule is not exceeded. Subcontractor shall perform all work in accordance with the Construction Schedule.
15. Unit Prices for Rock Excavation: The Contractor, in arriving at his bid, shall assume that it will be possible to accomplish all excavation without the use of air hammers or blasting for removal. In the event that rock is encountered in the footing excavation, the Contractor shall be allowed extra compensation in the form of a unit price for a yard of rock excavated.
16. Trenching and Excavation: The Contractor shall comply with all regulations of CFR 29 1926, Sub-Section P "Trenching and Excavations" which is hereby attached and made a part of this specification. Contractor shall submit a unit price for these requirements as shown on the Bid Form.
17. Substitution of Materials or Equipment: Throughout the specifications, definite materials are specified. It is the intention of the Architect to set and maintain a definite standard and not to discriminate against another manufactured product. Should the Contractor desire to make a substitution, he shall submit to the Architect a written request 10 days prior to the bidding of the contract. No approvals for substitutions shall be made unless authorized in writing by the Architect.
18. Superintendent: The Contractor shall keep on his work throughout its progress, a competent superintendent and any necessary assistants. All directions given to the Superintendent shall be binding as if given to the Contractor in his absence. Important directions shall be so confirmed on written request in each case. If Superintendent is changed by Contractor during construction, this change must be submitted in writing to the Architect and Owner. Change must be approved by Architect and Owner.
19. Shop Drawings: The General Contractor shall submit to the Architect for approval within sixty (60) days after the awarding of the contract, shop drawings and/or brochures which shall include all essential information relating to the materials or specialty specified. Shop drawings and all submittals shall conform to format indicated in Section 01300 - "Submittals".
20. Bracing: The Contractor shall properly brace, temporarily or permanently, any or all parts of the work as necessary or directed during construction of these buildings.
21. Temporary Enclosures: When necessary for the protection of any of the materials or work, or employees, to erect covered enclosures, walls, fences, etc., or temporarily enclose the openings of the building, or to insure protected and lighted egress from the facility, then this shall be done by the Contractor to the satisfaction of the Architect. See related paragraphs in this section of the specifications.

22. Protection from Weather: The Contractor shall protect all incomplete walls with suitable coverings during low temperatures, rain or snow. He shall make temporary provisions to take the water away from building before leaders are erected and shall in every way protect the building and contents from damage or unnecessary wettings.
23. Surplus Materials: All materials delivered on the premises to form a part of the work described in the specifications shall be considered the property of the Owner and shall not be removed prior to final acceptance of the contract work, the Contractor shall then remove all surplus materials (not designated for attic stock) from the premises.
24. Workmanship shall be considered of prime importance in all parts of the work.

Work classified within the skilled trades shall be performed by men who possess the skill, talent, and experience with which to produce a finished job of the best workmanship.

Corrective measures for defective workmanship are limited and very often do not completely correct the defect. Thus, it shall be the duty of Contractor to order the discharge of any person whose skill and ability are not of the best, or whose employment, in the opinion of the Architect, is not for the best interest of the work.

25. Building Guarantee: The construction under this contract, including all materials and equipment shall be guaranteed for a period of one year from the date of substantial completion against all defects in material or workmanship. The guarantee shall be in accordance with AIA Document A201-2017 "General Conditions of the Contract for Construction". Any costs for work or materials required during this period due to failure due to failure of original material or workmanship shall be borne by the General Contractor.

END OF SECTION 00800

Section 01010

SUMMARY OF WORK

Part 1 General

1.01 SECTION INCLUDES

- A. Definitions
- B. Work by Owner
- C. Owner Furnished Materials/Equipment
- D. Contractor use of site and premises

1.02 SUMMARY OF THE PROJECT

The facility is a proposed one (1) story, 5 apparatus bay, 8,609 gross square foot fire station. The project is located at 310 North "H" Street, Yale, OK 74085

1.03 APPLICABLE BUILDING CODES

2015 International Building Code
2015 International Plumbing Code
2015 International Mechanical
2015 International Fire Code
2015 International Fuel and Gas Code
2014 National Electric Code

1.04 GOVERNING AGENCIES

City of Yale
209 N. Main Street,
Yale, OK 74085
918-387-2405

Yale Fire Department
209 N. Main Street
Yale, OK 74085
918-387-2403

Payne County Health
1321 West 7th Avenue
Stillwater, OK 74074
405-372-8200

1.05 DEFINITIONS

1. Owner - Wherever the term "Owner" is used, it shall mean Payne County Board of Commissioners, 315 W. 6th Street, Suite 202, Stillwater, OK 74074. The Architect shall act in behalf of the Owner and shall receive all papers/documents required to be delivered to the Owner, except where specifically directed otherwise in writing.
2. Architect - Wherever the term "Architect" is used, it shall mean SGA Design Group, P.C., 1437 South Boulder, Suite 550, Tulsa, Oklahoma 74119-3609, who is authorized to prepare drawings, specifications, and details for this project and periodically observe the construction after award of construction contract.

1.06 WORK BY OWNER

1. Items noted "NIC" (not in contract) will be furnished and installed by Owner.
2. Items furnished by Owner and installed by Contractor will be as noted on the drawings or specified herein.

1.07 OWNER FURNISHED MATERIALS/EQUIPMENT

1. All supplies, materials and equipment purchased by the Owner or furnished by the Owner for installation by the Subcontractor shall, upon delivery to the jobsite, be unloaded, transferred, stored and fully protected from the weather by the Subcontractor until installed. Any demurrage or similar charge incurred due to failure of the Subcontractor to promptly unload the materials and equipment shall be the responsibility of the Subcontractor.
2. The Owner shall provide equipment and materials to the job as required for the Contractor to receive and install; and the respective subcontractor shall make final hookup to provide complete installation. The Mechanical and Electrical Contractor shall be responsible for coordination of equipment hook-up. The Equipment Manuals are available for review at the Construction Manager's offices.
 - A. Owner's Responsibilities:
 - a. Arrange for and deliver shop drawings, product data, and samples, to Contractor.
 - b. Arrange and pay for Product delivery to site.
 - c. After delivery, inspect products jointly with Contractor.
 - d. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - e. Arrange for manufacturer's warranties, inspections and service.
 - B. Contractor's Responsibilities:
 - a. Review Owner furnished shop drawings, product data, and samples to determine if information is adequate as needed for installation.
 - b. Receive and unload Products at site; inspect for completeness or damage.
 - c. Handle, store, install, and finish products.
 - d. Repair or replace items damaged at jobsite.

1.08 CONTRACTOR USE OF SITE AND PREMISES

1. General: During the entire construction period the Contractor shall have the use of the premises for construction operations, including full use of the site in areas required for construction and materials storage.
2. Use of the Site: Confine operations at the site to the areas permitted. Portions of the site beyond areas on which is indicated are not to be disturbed and trees and grass areas are to be protected.
3. Keep existing drive ways and entrances serving the premises clear and available at all times. Do not use for parking or storage of materials.
4. Do not encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to a central area.
5. Lock automotive type vehicles and other mechanized, or motorized construction equipment, when parked and unattended. Do not leave vehicles or equipment unattended with the motor running or ignition key in place.

01010 - 2
CD Issue No. 2

6. The Contractor shall be responsible for coordinating all disruptions of existing services and work required in existing facilities with approval of the Architect and the Owner forty-eight (48) hours prior to such disruptions.

END OF SECTION

01010 - 3
CD Issue No. 2

SECTION 01020

CONTRACT CONSIDERATIONS

Part 1 General

1.01 SECTION INCLUDES

- A. Cash Allowances
- B. Schedule of Values
- C. Application for Progress Payments
- D. Substantiating Data for Progress Payments
- E. Application for Final Payment
- F. Change Orders
- G. Unit Prices

1.02 CASH ALLOWANCES

1. If cash allowances are to be initiated during the term of the contract, they shall be administered under the following requirements:
2. Costs Included in Allowances: Cost of Product to Contractor or Subcontractor, less applicable trade discounts, delivery to site and applicable taxes.
3. Costs Not Included in the Allowance: Fees for overhead and profit, product handling at the site, including unloading, uncrating, and storage; protection of Products from elements and from damage and labor for installation and finishing.
4. Contractor Responsibilities:
 - a) Assist Architect/Engineer in selection of Products, suppliers, and installers.
 - b) Obtain proposals from suppliers (and installers) and other recommendations.
 - c) On notification of selection by Architect, execute purchase agreement with designated supplier and installer.
 - d) Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
 - e) Promptly inspect Products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.
 - f) Product handling at the site including unloading, uncrating, and storage, protection of products from elements and from damage and labor for installation and finishing.
 - g) The Contractor shall include in his Bid all fees for all cash allowances.
5. Funds will be drawn from Cash Allowances only by Change Order.
6. Differences in costs will be adjusted by Change Order.

1.03 SCHEDULE OF VALUES

1. The Subcontractor will submit to the General Contractor a Schedule of Values that includes all major categories of work. Dollar amounts are to include all labor, material, overhead, and profit applicable to each item in the breakdown. The subcontractor must submit an estimated total value for the projected cost of supplies, materials, and equipment required. Submit typed schedule on AIA Form G703-1992 Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.
2. Submit Schedule of Values in triplicate within seven (7) calendar days after date established in Notice to Proceed. Schedule shall list the installed value of the component parts of the work, broken down in sufficient detail to serve as a basis for computing values for progress payments during construction. No payments will be processed prior to receipt of an approved Schedule of Values.

3. Add to the Schedule of Values approved Change Orders with each Application for Payment. List Change Orders in numerical sequence.
4. No progress payments will be made until the Schedule of Values has been received, reviewed, and approved by the Owner and the Architect. The costs assigned to the breakdown are to total the contract sum. The approved Schedule of Values is to be used by the Contractor on the Application for Payment.

1.04 APPLICATION FOR PROGRESS PAYMENTS

1. At a time consistent with the requirements of this section, the General Conditions, and the Owner-Contractor Agreement, and for each calendar month during the progress of the work, submit one (1) copy of a properly notarized, itemized Application for Payment prepared in a manner consistent with the Schedule of Values.
2. The amount shown on the Application for Payment shall be established by the value of work completed through the last day of the application period. This value shall be based upon the Subcontractor's estimate of labor and materials incorporated in the Work and of materials suitably stored in accordance with the Contract through the last day of the previous application, less the aggregate of previous payments, and less the retainage as specified in this section.
3. The form of application for payment shall be the form provided at the end of this section.
4. Application for payment to be received by the General Contractor prior to the 23rd day of each month. Applications received after this day will be held until the next Application for Payment.

1.05 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

1. Substantiating data is required to verify a payment request. Subcontractors are to include a cover letter identifying:
 - a) Project.
 - b) Application number and date.
 - c) Detailed list of enclosures.
 - d) For stored products: Item number and identification as shown on application and description of specific material. Include Non-Negotiable Bailment Receipt, Bill of Sale, and applicable insurance certificate.
2. Provide the following Data for Progress Payments
 - a) Fill in required information, including that for change orders executed prior to the date of submittal application.
 - b) Fill in summary of dollar values to agree with the respective totals indicated on the continuation sheet.
 - c) Execute certificate with the signature of a responsible officer of the Contractor's firm.
 - d) Submit one copy of the data cover letter for each of the applications.
3. Provide the following itemized data on Continuation Sheet:
 - a) Format, schedules, line items, and values shall be from the Schedule of Values accepted by Architect.
 - b) Include names, trades, and amount for each subcontractor.
 - c) List each change order executed prior to the date of submission at the end of the continuation sheets. List by change order number, description, and breakdown of costs as for an original component item of work.

4. When the General Contractor & Owner finds the application properly completed and correct, payment will be processed.
5. Payment Application Documents (Copies Attached):
 - a) Signed Contract
 - b) Signed Change Orders
 - c) Certificate of Insurance
 - d) Original notarized Cost Breakdown
 - e) Original notarized Application for Payment
 - f) Material Safety Data Sheets
6. When processing of the payment is complete, the General Contractor will fax a Partial Lien Waiver to the subcontractor. The lien waiver must be signed by an official of the subcontractor's company and notarized. Upon receipt of the original lien waiver by the Owner, payment will be released.

1.06 APPLICATION FOR FINAL PAYMENT

1. Submit final Application for Payment following the procedures specified above for progress payments.
2. Before submitting final Application for Payment, forward to the General Contractor for submittal to the Owner and Architect the written warranties and guarantees, Record and Information Manuals, and other documents required by the Contract Documents. Place properly in approved storage at the site the extra stock and spare parts specified. The subcontractor will obtain the signature of the General Contractor verifying receipt of the extra stock and spare parts. Final payment will not be disbursed until the Certificate of Substantial Completion has been executed.
3. Properly executed "Final Lien Waiver and Release" and Contractor's "Affidavit" shall be submitted to the Owner prior to final payment.
4. Application for Final Payment shall be accompanied by a properly executed "Consent of Surety Company to Final Payment": AIA Document G707, 1994 edition, if required.
5. In addition to the responsibilities specified for the Architect in the General Conditions, the Architect will also recommend to the Owner that the Owner record the Notice of Completion within ten (10) calendar days of the date the Architect finds the Contract fully performed.

1.07 CHANGE ORDERS

1. Regardless of methods used to determine the value of changes, the estimated or actual cost shall be submitted in detailed breakdown form. The quantity and unit cost of each trace of each item, labor cost with hourly rates, allowable overhead and profit, and number of calendar days (if any) required to complete the additional work shall be provided. If proposal includes the work of sub-contractors, sub-proposals similarly itemized shall be included.
When both additions and credits are involved in any one change, unit prices shall be applied to net increase or decrease only.
2. Where unit prices are not required by the bid documents and value of changes or extra work is determined by the estimate and acceptance in a lump sum, by cost and percentages, or by cost and a fixed fee, the percentages for overhead and profit, or commission to be allowed for net increases shall in no case exceed the following:

	<u>Profit & Overhead</u>
a) To Contractor for work performed by his own forces.	10%
b) To Contractor for work performed by other than his own forces.	5%
c) To Sub-contractor for work performed by his own forces.	10%
d) To Sub contractor for work performed by other than his own forces.	5%

Percentages for overhead and profit will not be allowed on bond premiums.

3. Percentage change shall include all indirect costs, overhead and profit, and shall be applied to the direct cost of work.
4. Work on proposed changes shall not be started until the estimate of proposed changes has been approved in writing by the Owner & General Contractor.

1.08 UNIT PRICES

1. A unit price is the amount stated in the proposal form or subsequently agreed upon by the Owner and the Contractor as a price per unit of measurement for addition or deduction of materials or services as described in the Contract Documents.
2. Unit prices shall include costs of labor, materials, services, overhead and profit, bonds, insurance, and other costs to cover the completed work.

END OF SECTION

Section 01200

COORDINATION AND MEETINGS

Part 1 General

1.01 SECTION INCLUDES

- A. Coordination
- B. Pre-construction Conference
- C. Progress Meetings
- D. Pre-Installation Meetings

1.02 COORDINATION

1. Coordinate scheduling submittals, and Work of the various Sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements.
2. Verify that utility requirements characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
3. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations for maintenance, and for repairs.
4. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
5. The contractor is to coordinate his work with the work of the Owner's separate contractors.
6. Coordinate completion and clean up of work of separate sections in preparation for Substantial Completion.
7. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.03 PRE-CONSTRUCTION CONFERENCE

A pre-construction conference will be held prior to commencing work, at a time and place announced after award of the Contract. At a minimum, the following individuals shall be in Attendance:

1. Owner's representative.
2. Each Subcontractor's representative.
3. The Architect and Consultant.
4. The General Contractor's Project Manager and Superintendent.
5. Other parties requested by the General Contractor.

The meetings will be chaired by the General Contractor. Items for discussion will include the following:

1. Contracts, Bonds, and Insurance
2. Distribution of Contract Documents
3. Payment Procedures

4. Shop Drawing Procedures
5. Project Schedule
6. Procedures and Processing of RFI's, Clarifications, and Change Orders
7. Safety
8. Temporary Utilities
9. Survey and Layout
10. Testing Agencies and Procedures
11. Quality Control
12. Record Documents
13. Staging and Mobilization
14. Progress Meeting

1.04 PROGRESS MEETING

1. Progress meetings, chaired by the Construction Manager, will be held regularly on a bimonthly or weekly basis as required to support the schedule. Attendance by the Subcontractor's on-site superintendent will be mandatory; however, an authorized representative of the Subcontractor must be present who can make decisions in the Subcontractor's behalf. At the direction of the Construction Manager, subcontractors and supervisors will be required to participate in the coordination and discussions and give summary reports of their activities.
2. The progress meeting gives the Subcontractor the opportunity to discuss with the Construction Manager any problems or potential problems. Each Subcontractor shall attend progress meetings as requested by the Construction Manager and shall come to the meeting prepared to discuss their work status and how it relates to the Project Schedule.
3. The Project Schedule will be updated by the Construction Manager as indicated in the Project Manual and presented at the progress meetings. Each Subcontractor will be expected to discuss, at minimum, the status of shop drawings, material and equipment delivery, job progress, and quality control.

1.05 PRE-INSTALLATION MEETINGS

Pre-installation meetings will be held prior to commencement of selected Scopes of Work or as specified in individual sections to discuss conditions of installation, preparation, and installation procedures and coordination with other work. These meetings will be chaired by the Construction Manager.

END OF SECTION

SECTION 01230

ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 01: Overhead Door Glazing

1. Base Bid: Glass Type BC as indicated on Sheet G-01.
2. Alternate: Glass Type G2 as indicated on Sheet G-01.

B. Alternate No. 02: Electric Cord Reels

1. Base Bid: None
2. Alternate: Provide spring driven, cord reels with 50' electrical cord/outlet at the five roof structure mounted receptacles above door numbers 8, 9, 10, 11 & 12, as indicated on Sheet A1.3 and as specified in Section 16000 paragraph 3.i

C. Alternate No. 03: Domestic Water Heater

1. Base Bid: Electric, Tank-Type as specified in Section 15100, paragraph 10.2
2. Alternate: Gas-Fired, Condensing, Tankless as specified in Section 15100, paragraph 10.2.2.2

END OF SECTION

Section 01250

EXECUTION REQUIREMENTS

1.01 SECTION INCLUDES

- A. Layout of Work
- B. Alteration Project Procedures
- C. Cutting and Patching
- D. Protection of Installed Work
- E. Progress Cleaning
- F. Construction Operation

1.02 LAYOUT OF WORK

1. One benchmark will be established and maintained for the project by the General Contactor.
2. Building footings, grade beams, and columns will be laid out by the subcontractor and verified by the General Contactor.
3. Interior wall lines will be laid out and marked by the subcontractor and verified by the General Contactor.
4. All other layout work, including building lines, partitions, lines, and levels, etc., will be the responsibility of the Subcontractor performing that scope of work.

Any additional surveying services required beyond this definition will be the responsibility of each subcontractor.

The subcontractors shall preserve all stakes, chalk lines, and other marks established by the General Contactor and others. If such marks are destroyed by the subcontractor, the subcontractor shall obtain the services of a licensed surveyor, satisfactory to the General Contactor, who shall reestablish these points without delay to the work and at no cost to the General Contactor or others.

1.03 ALTERATION PROJECT PROCEDURES

1. Materials: As specified in Product Sections: match existing products and work for patching and extending work.
2. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
3. Remove, cut, and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition.
4. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
5. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work shall match existing adjacent work in texture and appearance.
6. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
7. Where a change of plans of 1/4 inch or more occurs, submit recommendation for providing a smooth transition for Architect review.
8. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
9. Finish surfaces as specified in individual Product Sections.

1.04 CUTTING AND PATCHING

1. Each Contractor and Subcontractor shall be responsible for, perform, arrange, and pay for all cutting and patching of existing and new construction as required for installing his work and to make parts of the work come together properly, receive or be received by work of other Contractors.
2. Employ skilled and experienced workmen to perform cutting and patching.
3. Submit written request in advance of cutting or altering elements which affects:
 - a) Structural integrity of elements.
 - b) Integrity of weather exposed or moisture-resistant elements.
 - c) Efficiency, maintenance, or safety of element.
 - d) Visual qualities of sight-exposed elements.
 - e) Work of Owner or separate contractor.
4. Request submitted to Architect shall include means and methods to perform alteration.
5. Execute cutting, fitting, and patching (including excavation and fill,) to complete work, and to:
 - a) Remove and replace defective and non-conforming work.
 - b) Remove samples of installed work for testing.
 - c) Provide openings in elements of work for penetrations of mechanical and electrical work.
6. All cutting shall be carefully done to minimize repair. Core drill concrete for holes 6" diameter and smaller. For larger openings, saw cut outlines and break-out, taking care to prevent excessive spalling on reverse side. Cutting or coring of structural components shall not be permitted without written permission from Architect.
7. All patching shall be done in a neat, workmanlike manner by mechanics of the trade involved, using materials and methods to match adjacent construction and finish.
8. Use of star drill or jackhammer for making holes shall not be permitted.
9. Execute work by methods which will avoid damage to other work, and provide proper surfaces to receive patching and finishing
10. Restore work with new products in accordance with requirements of Contract Documents.
11. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
12. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

END OF SECTION

Section 01300
SUBMITTALS

Part 1 General

1.01 SECTION INCLUDES

- A. Submittal Procedures
- B. Shop Drawings
- C. Product Data
- D. Samples
- E. Mock-ups
- F. Manufacture's Instructions
- G. Manufacture's Certificates
- H. Product Substitution Procedure
- I. Record Drawings

1.02 SUBMITTAL PROCEDURES

1. All shop drawings and samples shall be submitted to the General Contractor who will, in turn, submit to the Architect for review. The Architect's review and approval of shop drawings in no way relieves the contractor from responsibility for errors or omissions which may exist on the drawings. This refers to dimensional or quantitative errors or omissions, or variations from performance standards implied by the Contract Documents. Where such errors or omissions are discovered later, they must be made good by the contractor without cost to the Owner, regardless of any approval stamp which might appear on the shop drawing.
2. The Subcontractor shall incorporate with his shop drawing transmittal letter a statement indicating all deviations from the drawings and/or specifications for the Architect's use in his review.
3. Each shop drawing submitted shall bear the stamp of the Subcontractor indicating he has reviewed and approved the submittal prior to transmitting to the General Contractor.
4. Subcontractor shall prepare for General Contractor's concurrence a schedule for submission of all Shop Drawings and Samples specified necessary for the equipment and materials proposed for incorporation of the Work or Shop Drawings needed for proper installation, operation, or maintenance.
5. Coordinate submittal preparation with performance of construction activity and with purchasing or fabrication, delivery, other submittals, and related activities. Transmit in advance of performance of related activities to avoid delay.
6. Subcontractor, in establishing his schedule for Submittals, shall allow 14 calendar days in Architect's office for reviewing original submittals.
7. All submittals shall be made in accordance with the General Conditions and the Supplementary Conditions/Modifications and Additions to the General Conditions; and as follows:

1.03 SHOP DRAWINGS

1. Subcontractor shall submit eight (8) copies of all Shop drawings required.
2. Submit new information, drawn to accurate scale. Indicate deviations from Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Include the following information:

Dimensions.

Identification of products and materials included.

Notation of coordination requirements.

01300 - 1
CD Issue No. 2

Notation of dimensions established by field measurement.

3. Sheet Size:
Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 30" x 42".

1.04 PRODUCT DATA

1. Submit eight copies for approval.
2. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this project.
3. After review, distribute in accordance with Article on Procedures above and provide copies for Record Documents described in Section 01700 - Project Close-out.

1.05 SAMPLES

1. Submit full-size Samples cured and finished as specified and identical to the product proposed. Mount, display, or package Samples to facilitate review. Include the following:
 - Genetic description.
 - Source.
 - Product name or name of manufacturer.
 - Compliance with recognized standards.
 - Availability and delivery time.
2. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Architect's selection.
3. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics, and a comparison of these characteristics between the final submittal and the component as delivered and installed. Where variations are inherent in the product, submit multiple units that show limits of the variations.
4. Refer to other Sections for Samples that illustrate details of assembly, fabrication, techniques, workmanship, connections, operation, and similar characteristics.
5. Refer to other Sections for Samples to be returned for incorporation in the Work. Such Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.

1.06 MOCK-UPS

1. Assemble and erect specified items, with specified attachments and anchorage devices, flashings, seals, and finishes.
2. Where mock-up is specified to be removed, clear the area when directed by the Architect.
3. Accepted mock-ups shall be a standard for comparison on the remaining work.

1.07 MANUFACTURER'S INSTRUCTIONS

1. When specified in individual specification sections, submit manufacturer's printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.
2. Identify conflicts between manufacturer's instructions and contract documents
3. All manufacturer articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer unless specified otherwise.

1.08 MANUFACTURER'S CERTIFICATES

1. When specified in individual specification sections, submit manufacturer's certificate to Architect for review, in quantities specified for Product Data.
2. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
3. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

1.09 PRODUCT SUBSTITUTION PROCEDURE

See Section 01600 - Products, Materials, and Equipment

1.10 RECORD DRAWINGS

See Section 01700 – Contract Closeout Documents

END OF SECTION

SECTION 01400

QUALITY CONTROL

Part I General

1.01 SECTION INCLUDES

- A. Safety
- B. Contractors Responsibility
- C. Quality Assurance/Control of Installation
- D. References
- E. Field Samples
- F. Mock-up
- G. Inspection and Testing Laboratory Services
- H. Owner Purchased Supplies, Material, and Equipment

1.02 SAFETY

1. Contractors who perform any work under this Contract will fully comply with the provisions of the Federal Occupational Safety and Health Act of 1970 and/or the Construction Safety Act 8 of 1969 (which ever is applicable) to the rules and regulations promulgated to this Act.
2. Hazardous Material. In the event the contractor encounters on the site, material reasonably believed to be asbestos or polychlorinated biphenyl (PCB) which has not been rendered harmless, the contractor shall immediately stop work and notify Construction Manager. Such notification shall be documented in writing.
3. Provide any and all measures of protection required by the local authorities, for the protection of the public and employees during excavation operations and at the completion of work. Measures taken include but not limited to; sidewalks, barricades, warning lights, and signs; and shall comply with American Standard Safety Code and all local laws and ordinances. Maintain in good condition during operations.

1.03 CONTRACTORS RESPONSIBILITY

1. All subcontractors are responsible for the quality of the work performed by his work force and subcontractors as well as the quality of the material, equipment, and supplies furnished by the subcontractor to be incorporated into the work. The subcontractor will designate a quality control representative who will be on site at all times when work is in progress.
2. Each subcontractor shall arrange and pay for all inspections and tests specified as the subcontractor's responsibility in the various sections of the Specifications; inspections and tests required by codes, ordinances or the plan approval authority; and inspections and tests performed for the subcontractor's convenience. These tests shall be made by an independent testing agency approved by the Owner. The subcontractor shall advise and schedule the testing agency with the Construction Manager.
3. Each subcontractor shall advise the Construction Manager's on site field superintendent of all scheduled tests. The subcontractor's quality control representative will review his drawings, procurement documents, and contracts to ensure that the technical information provided and all work performed is in accordance with the latest revision of the Contract Documents. The subcontractor shall maintain a complete set of original contract documents, including contract drawings and specifications, on site for the work performed under his contract. These documents shall be updated to reflect all changes made through Addenda, Change Orders, and Requests for Information.

01400 - 1
CD Issue No. 2

4. Each subcontractor's quality control representative will perform an inspection upon receipt at the site of all materials, equipment, and supplies including those furnished him by the Owner. Items which are damaged or not in conformance with the respective submittals, quality standards, contract documents, contract drawings, and specifications will be identified and segregated from accepted items. Items thus identified will not be incorporated into the work until corrective action, acceptable to the Construction Manager and Architect, is completed.

1.04 QUALITY ASSURANCE/CONTROL OF INSTALLATION

1. Maintain quality control over suppliers, manufactures, products, services, site conditions, and workmanship, to produce work of specified quality.
2. Comply fully with manufacturer's instructions, including each step in sequence.
3. Should manufacturer's instructions conflict with contract documents, request clarifications from Architect before proceeding.
4. Complete with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship are required.
5. Perform work by persons qualified to produce workmanship of specified quality. Work which properly should be done by skilled labor shall not be attempted with common laborers. The contractor shall have on the job, at all times, ample equipment to carry on the work properly, including such tools as may be necessary to meet emergency requirements.
6. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.05 REFERENCES

1. Conform to references standard by date of issue current on date of Contract Documents.
2. Obtain copies of standards when required by Contract Documents.
3. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
4. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.06 FIELD SAMPLES

1. Install field samples at the site as required by individual specification sections for review.
2. Acceptable samples represent a quality level for the work.
3. Where field sample is specified to be removed, clear the area when directed by Architect.

1.07 MOCK-UP

1. Exceptional work quality will be expected on this project. Subcontractors are responsible for coordinating with the Construction Manager all mock-ups required for this project. The Architect's approval must be given in writing before the Contractor can continue the work.
2. Accepted mock-ups shall be a comparison standard for the work.

1.08 INSPECTION AND TESTING LABORATORY SERVICES

1. Owner will appoint, employ, and pay for services of an independent firm to perform inspections and testing, except when a specification section specifically states that

testing of that work be provided for by the Contractor. Testing will include but not limited to special inspection required by IBC Section 1704, earthwork, and structural testing will be by Owner-furnished independent laboratory. Mechanical and electrical testing will be furnished by the contractor.

2. The independent firm will perform inspections, tests and other services specified in individual specification sections and as required by the Architect.
3. Reports will be submitted by the independent firm to the Architect, indicating observations and results of tests and indicating compliance or noncompliance with contract documents. Provide copies to the Architect (1), Structural Engineer (1), and the Construction Manager (1). The Concrete Sub-contractor and Consulting Geotechnical Engineer shall each receive (1) when applicable.
4. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, and assistance as requested.
 - a) Notify Architect, Construction Manager and independent firm 48 hours prior to expected time for operations requiring services.
 - b) Make arrangements with independent firm and pay for additional samples and tests required for contractor's use.
5. Re-testing required because of nonconformance to specified requirements shall be performed by the same independent firm on instructions by the Architect. Payment for re-testing will be charged to the Contractor by deducting inspection or testing charges from the contract sum.

1.09 OWNER PURCHASED SUPPLIES, MATERIALS, AND EQUIPMENT

1. The subcontractor's representative will be responsible for verification of supplies, materials, and/or equipment purchased direct by the Owner.
2. Proof of delivery shall be required for all Owner purchased supplies, materials, and/or equipment.
3. The Construction Manager will require the following for all Owner purchased supplies, materials, and/or equipment stored off site.
 - a) Proof of delivery to site stored.
 - b) Segregated storage areas and identified materials.
 - c) Insured facilities (i.e. bonded warehouse).
 - d) Signed bailment receipt.
4. The subcontractor will be responsible to coordinate all Owner furnished items assigned to his contract.

END OF SECTION

SECTION 01450

SAFETY

1.01 SECTION INCLUDES

- A. General Guidelines
- B. First Aid/Fire Protection
- C. Special Conditions

1.02 GENERAL GUIDELINES

Safety on the project site is a primary concern to the Owner and the General Contractor. Each subcontractor is responsible for the safety and security of their employees. OSHA and general safety regulations must be observed and maintained as a minimum standard in all cases. Failure to comply with safety requirements will be considered as noncompliance with the contract and will result in remedial action, including but not limited to, withholding of progress payments. Owner reserves the right to have unsafe conditions corrected by others, if Subcontractor fails to do so when requested, and back-charge sub-contractor for costs.

1. Personal Protective Equipment - This project is a hard hat job. OSHA approved hard hats shall be worn by all personnel and visitors on the jobsite at all times. Proper clothing shall be worn, suitable for construction work. Shirts and long pants shall be worn at all times. Durable work shoes are required; canvas or leather type athletic shoes and shoes without heels or toes are not permitted. All other personal protective equipment shall be furnished by the subcontractor to its employees as required.
2. Housekeeping - Good housekeeping shall be maintained at all times. All stripped lumber shall be safely stacked after nails have been removed or bent down. All stairways, scaffolds, ramps, walkways, and work areas shall be kept clear and clean of trash and material. All rubbish shall be cleaned from the building daily. Work areas shall be maintained free from accumulation of combustible trash.
3. Tool Box Talks - Subcontractors are required to conduct weekly tool box safety meetings to encourage employee interest in safety. Give specific safety instructions relating to existing or expected hazards encountered during different phases of construction. A report of each safety meeting shall be submitted to the General Contractor weekly. This report shall include the topic discussed, the date, the speaker, and signatures of those in attendance.
4. Safety Representative - Each subcontractor will assign an individual to act as a safety representative. This individual must be on site and have the authority to immediately correct hazardous conditions. The name of the on site representative shall be submitted to the General Contractor prior to the subcontractor beginning work.
5. Responsibility - The General Contractor does not assume the responsibility of subcontractors. Each employer has a general duty to furnish each of his employees a place of employment which shall be free from recognized hazards causing, or likely to cause death or serious physical harm.

1.03 FIRST AID/FIRE PROTECTION

1. The General Contractor will maintain a first aid center at the project trailer. The General Contractor will have phone numbers of the local clinics and hospitals posted at all times.
2. Fire extinguishers will be provided and maintained as required by the General Contractor. The General Contractor insists that each subcontractor plan for the event of fire protection and evacuation.
3. Contractors are required to provide fire extinguishers when performing welding, cutting or other possible fire causing tasks.

01450 - 1
CD Issue No. 2

1.04 SPECIAL CONDITIONS

1. Asbestos and Hazardous Materials

In the event that the Subcontractor encounters material that has any possibility of containing asbestos (or other hazardous material) it must not be disturbed. The Subcontractor must notify the General Contractor immediately upon discovering any hazardous or suspected hazardous material so that the proper testing and removal can take place. Prior to a Subcontractor disturbing any existing material(s), he/she must contact the General Contractor for verification that the material(s) will not result in a hazardous situation once disturbed.

2. Hazardous Waste Disposal

"Hazardous waste, if any that is generated from the work shall be properly disposed of at the end of the work by the Subcontractor pursuant to applicable hazardous waste laws and regulation. The term hazardous waste' means hazardous waste as defined pursuant to the federal Resource Conservation and Recovery Act, as amended.

The Subcontractor must furnish receipts (shipping manifests) from recognized official disposal sites for the disposal of hazardous waste - including, but not limited to asbestos, PCB ballasts, etc.

3. Drug Free Workplace

The Subcontractor agrees that in the performance of this Contract, neither the Subcontractor nor any employee of the Subcontractor shall engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity covered by this Contract.

4. Use of Tobacco Products

The use of tobacco products on the Project is prohibited.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES

Part I General

1.01 SECTION INCLUDES

- A. Temporary Electricity
- B. Temporary Lighting
- C. Temporary Heat & Ventilating
- D. Telephone Service
- E. Drinking Water
- F. Temporary Water Service
- G. Temporary Sanitary Facilities
- H. Temporary Fire Protection
- I. Existing Utilities
- J. Access Roads
- K. Field Offices and Site Storage
- L. Removal of Temporary Utilities and Controls
- M. Hoisting
- N. Security
- O. Disposal and Trash Removal
- P. Clean-Up
- Q. Temporary Partitions

1.02 TEMPORARY ELECTRICITY

1. The electrical subcontractor will furnish, install, relocate, maintain and remove all necessary, temporary wiring, lighting fixtures, protective devices, distribution panels and transformers, etc., required for construction purposes conforming to rules and regulations of OSHA as well as other agencies having local jurisdiction.
2. All subcontractors will be responsible for power extension cords from the temporary panels to their work stations. Cords shall include ground capabilities and meet approval of governing bodies.
3. The Owner shall pay for power usage.

1.03 TEMPORARY LIGHTING

1. The Electrical Contractor shall provide and maintain lighting for construction operations to achieve not less than 2 watts per square foot of illumination.
2. Maintain not less than 1 watt per square foot of illumination at exterior staging and storage areas for security purposes.
3. Maintain not less than 0.25 watts per square foot of illumination at interior work areas for security purposes.
4. Permanent building lighting may be utilized during construction.

1.04 TEMPORARY HEAT & VENTILATING

1. Provide and pay for heat devices and heat required to maintain specified conditions for construction operations.
2. Fuel, equipment, materials, and methods used shall be adequate for the purpose intended.
3. Maintain ambient temperature not less than 45 degrees F in areas where construction is in progress, unless indicated otherwise in individual Sections of Project Manual.

4. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, and gases.
5. Prior to operating permanent equipment for temporary heating or ventilating purposes, verify that installation is approved for operation, equipment is lubricated, and filters are in place.
 - a. Block return air grills to prevent circulation of air through return air system.
 - b. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.05 TELEPHONE SERVICE

Telephones will be provided at the site trailer of the Construction Manager for any emergencies. Telephones will not be provided for tradesmen for their business or personal use. Telephones must be provided by the individual subcontractor for their use, if required.

1.06 DRINKING WATER

Subcontractors are to provide an adequate supply of potable drinking water, satisfactorily cooled, free of contamination, and conforming to State and local requirements for his own forces engaged in work on the project.

1.07 TEMPORARY WATER SERVICE

The Mechanical Contractor shall furnish, install and maintain temporary portable water for use at the jobsite as directed by the Construction Manager. The Owner will pay cost of water used.

1.08 TEMPORARY SANITARY FACILITIES

The Construction Manager will provide temporary toilets for use by all Subcontractors.

1.09 TEMPORARY FIRE PROTECTION

Provide and maintain fire fighting equipment for the duration of construction in accordance with the requirements of local authorities and subject to approval of Owner's insurance carrier.

1.10 EXISTING UTILITIES

1. Provide protection to prevent damage or interference to existing utilities. In the event of accidental interruption of a service or utility, inform Owner, Construction Manager and related utility company without delay, and take prompt remedial action.
2. Schedule work requiring disconnections, reconnections, and interruptions of services and utilities with Owner, Construction Manager, and utility companies.
3. Maintain electrical and mechanical services and utilities unless interruptions are scheduled.
4. Provide and remove temporary connection devices when no longer required.
5. The subcontractor shall determine the locations and availability of water and electrical power within the work area. The subcontractor shall make all the necessary connections to make water and electric power available for construction purposes. The subcontractor shall be responsible for any damage done to water or electrical connection devices.
6. The cost of the water and electric power shall be paid by the Owner.

1.11 ACCESS ROADS

1. Contractors shall maintain the streets and existing drives adjacent to the site clean and unobstructed from traffic, and shall comply in all respects with the applicable City, State, and County laws.
2. Provide and maintain access to fire hydrants, free of obstructions.
3. Designated existing on-site roads may be used for construction traffic. Maintain in existing conditions.
4. Upon completion, all temporary roads, parking lots, unless converted to permanent roads and parking areas, shall be removed completely by the Construction Manager, top soil provided and installed, and disturbed areas re-seeded and mulched.

1.12 FIELD OFFICES AND SITE STORAGE

1. The subcontractor shall provide field offices and other temporary structures they may require. To maintain personnel traffic and control, the personnel will enter such construction gate as indicated by the Construction Manager. The construction entrance(s) will be maintained for the duration of the project, but the location may change as the construction progresses. Each subcontractor must review with the Construction Manager all field office and temporary storage requirements.
2. Limited storage and staging areas will be available during construction. However, if it becomes necessary at any time during construction to move materials which are to enter into construction, or equipment and barricades which have been temporarily placed, the subcontractor furnishing these materials, equipment, or barricades shall, when directed by the Construction Manager, move them or cause them to be moved without additional charge to the Owner and Construction Manager.
3. All supplies, materials, and equipment purchased by the Owner or furnished by the Owner for installation by the subcontractor shall, upon delivery to the jobsite, be unloaded, transferred, stored, and fully protected from the weather by the subcontractor until installed. Any demurrage or similar charge incurred, due to failure of the subcontractor to promptly unload the materials and equipment shall be the responsibility of the subcontractor.
4. The subcontractor shall carefully examine all materials and equipment purchased by the Owner. The subcontractor shall be responsible for subsequent damage or loss until installation is completed and accepted by the Owner and Architect. Should the subcontractor fail to report any visible signs of damage, then it will be understood the damage occurred while the materials and equipment were in care, custody, and control of the subcontractor.

1.13 REMOVAL OF TEMPORARY UTILITIES AND CONTROLS

1. Remove temporary above grade or buried utilities, equipment, facilities, materials, prior to Substantial Completion.
2. Clean and repair damage caused by installation or use of temporary work.
3. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1.14 HOISTING

All hoisting requirements to be the responsibility of each subcontractor and shall be in accordance with OSHA standards.

1.15 SECURITY

The Construction Manager will supply a temporary site fence. However, tool and material security is the responsibility of the subcontractor.

1.16 DISPOSAL AND TRASH REMOVAL

1. Subcontractor will clean up and remove to designated points at the site, daily and as directed and shall clean up his work to the satisfaction of the Construction Manager.
2. All subcontractors shall ensure that all boxes, cartons, etc., are crushed to the minimum volume prior to placing in the trash containers or trash collection areas. No paint cloths will be allowed in trash containers. Construction Manager will provide dumpsters for use by the subcontractors.
3. The disposal of any material, waste, effluents, trash, garbage, or oil, grease, chemicals, etc., resulting from either demolition or new work resulting from either demolition new work, shall be disposed of in accordance with all applicable laws and shall be subject to the approval of the Construction Manager. Any materials disposed of in an unauthorized place or manner shall be removed and the area restored to its original undisturbed condition at the expense of the subcontractor.

1.17 CLEAN-UP

The subcontractors are responsible to clean up and remove debris to designated points at the site daily. All rubbish and debris resulting from the subcontractor's work shall be cleaned up to the satisfaction of the Construction Manager. In the event the subcontractor fails to clean up in accordance with these directions, the Construction Manager, after 24 hours written notice to the subcontractor, reserves the right to arrange otherwise for the clean up to be done and charge the subcontractor the cost.

1.18 TEMPORARY PARTITION

1. Temporary partitions as outlined in the contract documents will be provided by the Construction Manager. Additional protection or access beyond that provided by the Construction Manager will be the responsibility of each separate subcontractor.
2. Temporary partitions shall be provided for the protection of the employees, as well as the protection of existing work, supplies, and important documents.

END OF SECTION

SECTION 01600

PRODUCTS, MATERIAL, AND EQUIPMENT

Part I General

1.01 SECTION INCLUDES

- A. General Product Requirements
- B. Basic Product Requirements
- C. Product Options
- D. Transporting and Hauling
- E. Installation Requirements
- F. Identifying Markings
- G. Storage and Protection
- H. Installation of Products
- I. Substitution Procedures

1.02 GENERAL PRODUCT REQUIREMENTS

1. General: Provide products, materials, and equipment which comply with requirements, and which are undamaged and unused at time of installation, and which are complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation for intended use and effect. Any product, material or piece of equipment that contains asbestos or other hazardous materials is not acceptable.
2. Standard Products: Where available, provide standard products of types which have been produced and used previously and successfully on other projects and in similar applications.
3. Continued Availability: Where additional amounts of a product, by nature of its application, are likely to be needed by Owner at a later date for maintenance and repair or replacement work, provide a standard, domestically produced product which is likely to be available to Owner at such later date.

1.03 BASIC PRODUCT REQUIREMENTS

1. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
2. Conform to reference standard by date of issue current on date of Contract Documents.
3. Obtain copies of standards when required by Contract Documents.
4. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
5. The contractual relationship, duties, and responsibilities of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 PRODUCT OPTIONS

1. Products Specified by Reference Standards or by Description Only: Provide any product meeting specified reference standard or description.
 - a. All products listed by reference to specific manufacturers are for Reference Only as the standard of quality. Products supplied shall be of quality equal or better than those referenced.
2. Substitution of products of quality different from those specified are subject to the procedures noted herein.

1.05 TRANSPORTING AND HAULING

1. Materials, products, and equipment shall be properly containerized, packaged, boxed and protected to prevent damage during transportation and handling.
2. More detailed requirements for transportation and handling are specified under the technical sections.

1.06 INSTALLATION REQUIREMENTS

1. Furnish, apply, install, connect, erect, clean and condition manufactured articles, materials, and equipment per manufacturer's printed directions, unless otherwise indicated or specified.
2. Manufacturer's printed directions must be on job prior to and during installation of materials and equipment.
3. Provide all attachment devices and materials necessary to secure materials together or to other materials and to secure work of other trades.
4. Make field check of actual building dimensions before fabricating products.
5. Where proper fit of work depends upon close tolerances of manufactured products, furnish manufacturer with necessary templates to insure proper fit of all components.
6. Handle materials in manner to prevent scratching, abrading, distortion, chipping, breaking to other disfigurement.
7. Conduct work in a manner to avoid injury to previously placed work.

1.07 IDENTIFYING MARKINGS

1. Name Plates: Except as otherwise indicated for required labels, and operating data, do not permanently attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view either in occupied spaces or on exterior of the work.
2. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface which, in occupied spaces, is not conspicuous.
3. Equipment Name Plates: Provide permanent nameplate on each item of service-connected or power operated equipment. Indicate manufacturer, product name, model number, serial number, capacity, speed, ratings and similar essential operating data. Locate name plates on an easily accessed surface which, in occupied spaces, is not conspicuous.

1.08 STORAGE AND PROTECTION

1. Store and protect products in accordance with manufacturers' instructions.
2. Store with seals and labels intact and legible
3. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
4. For exterior storage of fabricated products, place on sloped supports above ground.
5. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
6. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
7. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
8. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
9. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.09 INSTALLATION OF PRODUCTS

General: Except as otherwise indicated, particularly in individual work sections of these specifications, comply with manufacturer's instructions and recommendations for installation of products in applications indicated. Anchor each product securely in place, accurately located and aligned with other work. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of acceptance.

1.10 SUBSTITUTION PROCEDURES

1. Substitutions after Award of Contract: Substitution of products will be considered after award of contract only under one of the following conditions:

- a. When the specified product is not available, a proposed substitution will be considered unless proof is submitted that firm orders were placed within ten (10) days after review by the Architect of the item listed in the specification, or the unavailability is due to a strike, lockout, bankruptcy, discontinuance of the manufacturer of a product, or natural disasters.
- b. When a guarantee of performance is required and, in the judgment of the Contractor, the specified product or process will not produce the desired results, or the substituted product will produce the same or better desired results than the specified product.
- c. Request for such substitution shall be made in writing to the Architect within ten (10) days of the date that the contractor ascertains he cannot obtain the material or equipment specified, or that the performance cannot be guaranteed.
- d. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

2. Substitution Procedure:

- a. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
- b. Along with the proposed product substitution, submit shop drawings, product data, and certified test results of the specified product specifically noting where Product deviates from the specified material.
- c. The Architect will notify Contractor in writing of decision to accept or reject request.

END OF SECTION

SECTION 01650

STARTING OF SYSTEMS

Part 1 General

1.01 SECTION INCLUDES

- A. Starting Systems
- B. Demonstration and Instructions
- C. Testing, adjusting, and balancing

1.02 STARTING SYSTEMS

1. Coordinate schedule for start-up of various equipment and systems.
2. Notify Architect and Owner's Representative seven days prior to start-up of each item.
3. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
4. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
5. Verify that wiring and support components for equipment are complete and tested
6. Execute start-up under supervision of responsible manufacturer's representative and Contractor's personnel in accordance with manufacturer's instructions.
7. When specified in individual specification sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
8. Submit a written report in accordance with Section 01400 that equipment or system has been properly installed and is functioning correctly.

1.03 DEMONSTRATION AND INSTRUCTIONS

1. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Substantial Completion.
2. Demonstrate Project Equipment by a qualified Manufacturer's Representative knowledgeable about the project.
3. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
4. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
5. Demonstrate start-up, operation, control, adjustment, trouble shooting, serving, maintenance, and shutdown of each item of equipment at schedule agreed-on times and at designated location.
6. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
7. The amount of time required for instruction on each item of equipment and system is as needed or that specified in individual sections.

1.04 TESTING, ADJUSTING, AND BALANCING

1. Subcontractors will appoint, employ, and pay for services of an independent firm to perform testing,
2. The independent firm will perform services specified in Division 15.

3. Reports will be submitted by the independent firm to the Architect indicating compliance or noncompliance with specified requirements and with the requirements of the contract documents.

END OF SECTION

01650 - 2
CD Issue No. 2

SECTION 01700

PROJECT CLOSEOUT

Part 1 General

1.01 SECTION INCLUDES

- A. Substantial Completion
- B. Final Completion and Final Payment
- C. Final Cleaning
- D. Project Record Drawings
- E. Operation and Maintenance Data
- F. Warranties
- G. Final Lien Waiver
- H. Spare Parts and Maintenance Material
- I. Start-Up of Systems
- J. Owner Training
- K. Documents Required for Closeout

1.02 SUBSTANTIAL COMPLETION

1. The Date of Substantial Completion of the Work is the date certified by the Architect when construction is sufficiently complete, in accordance with the Contract Documents, that the Owner may utilize the project. Before requesting Certification of Substantial Completion, the subcontractor will be required to:
 - a. Show 100% completion on progress payment request of work claimed to be substantially complete.
 - b. Submit statement showing accounting of changes to the contract sum.
 - c. Submit evidence of continuing insurance coverage.
 - d. Submit extended warranties.
 - e. Submit releases enabling Owner's full use of the work.
 - f. Deliver maintenance stock to Owner
 - g. Submit Consent of Surety, if required.
2. When the Architect finds the work acceptable and the contract fully performed, the Architect will prepare a Certificate of Substantial Completion. Issuance of the Certificate of Substantial completion is contingent upon receipt of Certificate of Occupancy from the Governing Agencies.

1.03 FINAL COMPLETION AND FINAL PAYMENT

1. Provide submittals to Architect that are required by governing or other authorities. Confirm that all submittals required by the construction documents have been transmitted.
2. The Architect will not issue a final Certificate for Payment until all written Warranties and Certificates, Maintenance Manuals, etc. as required by the Contract Documents have been furnished to the Owner.
3. Upon written notice by the contractor that the re-inspection punch list items are completed, the Architect shall verify this by inspection and shall issue to the Owner a final Certificate of Payment stating that, to the best of his knowledge, information and belief, the work has been completed in accordance with the entire balance found to be due the contractor, and noted in said final certificate of payment, is due and payable. The Owner shall endeavor to make final payment within (30) days.

1.04 FINAL CLEANING

1. Execute final cleaning prior to final inspection
2. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
3. Clean equipment and fixtures to a sanitary condition. Clean all lighting fixtures in areas affected by construction.
4. Replace filters of operating equipment.
5. Clean debris from roofs, gutters, downspouts, and drainage systems.
6. Clean site; sweep paved areas, rake clean landscaped surfaces.
7. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.05 PROJECT RECORD DRAWINGS

- A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Architect's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
 2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
 3. Note related change-order numbers where applicable.
 4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.
 5. In preparation of shop drawings, contractor may, at his option, obtain electronic floor plan drawing files in AutoCAD from the Architect for a fee of \$500.00. Contractor shall contact the Architect to obtain the necessary Release Agreement Form (shown at the end of this specification section) to specify shipping method and drawing format. Payment must be received before electronic drawing files will be sent.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.
 1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
 2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
 3. Note related record drawing information and Product Data.
 4. Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.
- D. Record Product Data: Maintain one copy of each Product Data submittal. Note related Change Orders and markup of record drawings and Specifications.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.
 2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
 3. Upon completion of markup, submit complete set of record Product Data to the Architect for the Owner's records.
- E. Record Sample Submitted: Immediately prior to Substantial Completion, the Contractor shall meet with the Architect and the Owner's personnel at the Project Site to determine which Samples are to be transmitted to the Owner for record purposes. Comply with the Owner's instructions regarding delivery to the Owner's Sample storage area.
- F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Architect for the Owner's records.
- G. Maintenance Manuals: Submit (1) copy of each for approval. Four (4) copies of each Operating and Maintenance Manual will be required after approval. Organize operation and maintenance data into suitable set of manageable size. Bind properly indexed data in individual, heavy-duty, 2-inch, 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
1. Emergency instructions.
 2. Spare parts list.
 3. Copies of warranties.
 4. Wiring diagrams.
 5. Recommended "turn-around" cycles.
 6. Inspection procedures.
 7. Shop Drawings and Product Data.
 8. Fixture lamping schedule.

1.06 WARRANTIES

All written warranties and guarantees must be submitted to the Construction Manager prior to final acceptance. All warranties shall commence from the Date of Substantial Completion unless Owner is receiving beneficial use of warranted equipment prior to this date as defined above and agreed to by the Owner. Subcontractors shall arrange for installer of any work requiring continuing maintenance to meet with Owner's representatives to provide basic instruction needed for proper operation and maintenance of work.

1.07 FINAL LIEN WAIVER

An executed Final Lien Waiver from the contractor and his subcontractors shall be submitted with the contractor's final application for payment.

1.08 SPARE PARTS AND MAINTENANCE MATERIAL

1. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.
2. Deliver to project site and place in location as directed; obtain receipt prior to possession and final payment.

1.9 START-UP OF SYSTEMS

01700 - 3
CD Issue No. 2

Prior to Date of Substantial Completion, mechanical and electrical Contractors shall start-up and test all systems and repair or replace any work found to be defective.

1.10 OWNER TRAINING

Each subcontractor shall provide adequate training sessions for all equipment and systems. Training shall be determined adequate when accepted by the Owner.

1.11 DOCUMENTS REQUIRED FOR CLOSEOUT

Contractor must provide the following prior to the Architect and Construction Manager approving the release of final payment:

1. Verification that final Punch List is complete.
2. Final Affidavit.
3. Consent of Surety.
4. Final Lien Waiver.
5. As-Built drawings applicable to this contract.
6. Operation and Maintenance Manuals applicable to this contract.
7. Current Insurance Certificate.
8. Warranties applicable to this Contract.
9. Stock material turned over to the Owner.

AGREEMENT FOR TRANSFER OF INFORMATION
MACHINE-READABLE FORMAT

By and Between SGA Design Group P.C., Tulsa, Oklahoma (hereinafter referred to as ARCHITECT) and *Contractor Company* (hereinafter referred to as RECIPIENT).

The enclosed electronic media are provided pursuant to your request for the purpose of production of shop drawings. In using it, modifying it, or accessing information from it, you are responsible for confirmation, accuracy, and checking of the data from the media. ARCHITECT hereby disclaims any and all responsibility from any results obtained in use of this electronic media and does not guarantee any accuracy of the information.

RECIPIENT agrees that it shall not use the information provided by ARCHITECT for any purpose other than that describes above without the express written consent of ARCHITECT. RECIPIENT also hereby acknowledges that the data delivered by ARCHITECT is for use by RECIPIENT only, and is not to be released to any other party without the written consent of the ARCHITECT.

RECIPIENT understands that the automated conversion of information and data from the system and format used by ARCHITECT to alternate system of format cannot be accomplished without the possibility of introduction if inexactitudes, anomalies, and errors. In the event project documentation provided to RECIPIENT in machine readable form is so converted, RECIPIENT agrees to assume all risk associated therewith, and to the fullest extent permitted by law, to hold harmless and indemnify ARCHITECT from and against all claims, liabilities, losses, damages, and costs, including but not limited to attorney's fees, arising therefrom or in connection therewith.

RECIPIENT recognizes that changes of modifications to OWNER'S instruments of professional service introduced by anyone other than ARCHITECT may result in adverse consequences that ARCHITECT can neither predict nor control. Therefore, and in consideration of ARCHITECT'S agreement to deliver its instance of professional service in machine readable format, RECIPIENT agrees, to the fullest extent permitted by law to hold harmless and indemnify ARCHITECT from and against all claim, liabilities, losses, damages, and costs, including misuse or reuse by others of the machine readable information and data provided by ARCHITECT under this Agreement. The foregoing indemnification applies, without limitation, to any use of the project documentation on another project, for additions to this project, or for completion of this project by others; ARCHITECT may authorize excepting only such use in writing.

Send a check in the amount of **\$500.00** payable to SGA Design Group, P.C. along with completed and signed agreement to receive electronic media.

Signature
SGA Design Group, P.C.

Signature
Contractor Company

Date _____

Date _____

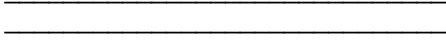
Shipping Method Format
 FedX (No P.O. Boxes) ACAD R14
 E-mail ACAD R13
 First Class Mail ACAD R12
 DXF

Qty Media Transmitted Items
____ CD-ROM (Add \$25 ea.)

Ship To: _____

Phone: _____
Fax: _____

01700 - 5
CD Issue No. 2



END OF SECTION

01700 - 6
CD Issue No. 2

SECTION 02520

PORTLAND CEMENT CONCRETE PAVING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 1 of the Specifications, apply to this Section.

1.2 SUMMARY

- A. This section includes the following:
 - 1. Concrete sidewalks and curbs.
 - 2. Joint Sealers.

1.3 REFERENCES

- A. ACI 301 - Specifications for Structural Concrete for Buildings.
- B. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
- C. ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.
- D. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
- E. ASTM C33 - Concrete Aggregates.
- F. ASTM C94 - Ready Mix Concrete.
- G. ASTM C150 - Portland Cement
- H. ASTM C260 - Air-Entraining Admixtures for Concrete.
- I. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- J. ASTM C494 - Chemical Admixtures for Concrete.
- K. FS TT-C-800 - Curing Compound, Concrete, for New and Existing Surfaces.

1.4 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on joint filler, admixtures and curing compounds.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Form Materials: Conform to ACI 301.
- B. Joint Filler: ASTM D 1751; 1/2 inch thick, asphalt impregnated fiberboard or felt, tongue and groove profile.

2.2 REINFORCEMENT

- A. Dowels: ASTM A615; 40 ksi yield grade, plain steel, unfinished.

2.3 CONCRETE MATERIALS

- A. Concrete Materials: As specified in Section 03300.

2.4 BASE

- A. 4-inch compacted washed clean river sand or 4-inch Class A rock.

2.5 ACCESSORIES

- A. Curing Compound: ASTM C309, Type 1, Class A or B.
- B. Joint Sealers: One-part, self-leveling, silicone joint sealant, Federal Specification TT-S-001543A, Class A.

2.6 SOURCE QUALITY CONTROL

- A. Submit proposed mix design of each class of concrete for review prior to commencement of work.
- B. Tests on cement and aggregates will be performed to ensure conformance with specified requirements.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify compacted subgrade, granular base or stabilized soil is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.2 BASE

- A. Install base course and compact to 95% Standard Proctor Density.

3.3 PREPARATION

- A. Moisten base to minimize absorption of water from fresh concrete.
- B. Notify Owner's Representative minimum 24 hours prior to commencement of concreting operations.

3.4 FORMING

- A. Place and secure forms to correct location, dimension, and profile.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.5 REINFORCEMENT

- A. Place reinforcement as indicated.
- B. Interrupt reinforcement at expansion joints.
- C. Place dowels and reinforcement to achieve pavement and curb alignment as detailed.
- D. Provide doweled joints as indicated.

3.6 PLACING CONCRETE

- A. Place concrete as specified in Section 03300.
- B. Ensure reinforcement, inserts, embedded parts, and formed joints are not disturbed during concrete placement.

- C. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.
- D. Place expansion and contraction joints as shown on drawings. Align curb, gutter, and sidewalk joints.
- E. Place joint filler between paving components and building or other appurtenances.
- F. Saw cut contraction joints as indicated within 12 hours after finishing.
- G. Joint sealant must be executed per Manufacturer's documented recommendations.

3.7 FINISHING

- A. Paving: Light broom.
- B. Curbs and Gutters: Light broom.
- C. Direction of Texturing: Transverse to pavement direction.
- D. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions. Do not use curing compound where colored concrete will be placed.

3.8 TOLERANCES

- A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
- B. Maximum Variation From True Position: 1/4 inch.

3.9 FIELD QUALITY CONTROL

- A. Testing firm will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.
- B. One additional test cylinder will be taken during cold weather and cured on site under same conditions as concrete it represents.
- C. One slump test will be taken for each set of test cylinders taken.
- D. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.10 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit vehicular traffic over pavement until 75 percent design strength of concrete has been achieved.

END OF SECTION

SECTION 03252

CONTROL AND CONSTRUCTION JOINT FILLER

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Preparing joint filler substrate surfaces.
 - 2. Joint filler for interior exposed concrete slab control/construction joints. Isolation joints between concrete slab and vertical surfaces are excluded from this Section.
- B. Related Sections:
 - 1. Section 03300 - Cast-in-Place Concrete: Concrete slab materials and accessories.

1.02 QUALITY ASSURANCE

- A. Provide joint filler that is approved by the United States Department of Agriculture for use in food service areas, as required by local authorities having jurisdiction.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Store joint filler material in manufacturer's labeled, unopened containers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sika Corporation, Lyndhurst, NJ; (800) 933-7452.
- B. Substitutions: Equivalent product manufacturers

2.02 MATERIALS

- A. Epoxy Joint Filler: Two-part liquid, 100 percent solids epoxy resin. Subject to compliance with requirements, provide epoxy joint filler equal to or better than the following:
 - 1. Sikadur 51 SL, by Sika Corporation, Lyndhurst, NJ; (800) 933-7452.

PART 3 EXECUTION

3.01 PREPARATION

- A. Loosen embedded debris and saw laitance in joint using narrow tool or dustless saw/grinder. Remove curing and sealing compounds using dustless saw/grinder.
- B. Clear loosed matter from joint by blowing out or vacuuming. If debris is damp, allow joint to dry for 24 hours.
- C. Choke off shrinkage crack at bottom of control/construction joints.
 - 1. Saw Cut Control Joints: Use one of the following methods:
 - a. Place 1/8 inch to 1/4 inch (maximum) layer of dry-bagged silica sand.
 - b. Insert joint rod, per manufacturer's instructions, to bottom of cut. Rod shall be oversized to fit snugly in joint. Do not use compressible backer.
 - 2. Construction Joints Through Slab: Use one of the following methods:
 - a. Fill joint with dry-bagged silica sand to depth of 2 inches of slab surface. oint rod, per manufacturer's instructions, to depth of 2 inches below slab surface. Do not use compressible backer rod.

3.02 INSTALLATION

- A. Do not proceed with installation until Contractor has verified that joints have been cleaned and prepared as specified.
- B. Mix joint filler in accordance with manufacturer's published instructions.
- C. Fill joint using two pass method. On first pass fill to within 1/2 inch of slab surface. Allow filler to cure for 30 to 60 minutes, while filler is still liquid and tacky make second pass.
- D. Filler shall cure flush with surface. If slightly crowned, shave excess flush with surface within 12 to 24 hours.

3.03 FIELD QUALITY CONTROL

- A. Joint filler installed to a depth less than specified in this Section shall be removed and replace at no cost to the Owner. During installation, the Contractor shall drill random holes through filler and measure depth. Take one random measurement per 500 linear feet of filler.
- B. Joint filler installed over compressible backer rod shall be removed and replaced at no cost to the Owner.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes. Cast-in-place concrete includes the following:
 - 1. Foundations and footings.
 - 2. Slabs-on-grade.
 - 3. Foundation walls.
- b. Section Includes: Densification of concrete floor slabs.

1.2 SUBMITTALS

- A. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others if requested by Architect.
- B. Shop drawings for reinforcement detailing fabricating, bending, and placing concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, bent bar diagrams, and arrangement of concrete reinforcement. Include special reinforcing required for openings through concrete structures.
- C. Laboratory test reports for concrete materials and mix design test.
 - 1. Mix designs: Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed and approved by Architect.
 - 2. Quality control testing during construction: Sampling and testing for quality control during concrete placement may include the following, as directed by Architect.
 - a. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
 - 1) Slump: ASTM C 143; one test at point of discharge for each compressive strength test for each type of concrete; additional tests when concrete consistency seems to have changed.
 - 2) Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
 - 3) Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below, when 80 deg F and above, and one test for each set of compressive-strength specimens.
 - 4) Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
 - 5) Compressive-Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yd plus additional sets for each 50 cu. yd more than the first 25 cu. yd of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

- b. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
 - c. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
 - d. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.
3. Test results: Report in writing to Architect, Structural Engineer, and ready-mix producer within 24 hours after tests. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.
 4. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
 5. Additional Tests: The testing agency shall make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.
- D. Material certificates in lieu of material laboratory test reports when permitted by Architect. Material certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

1.3 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:
1. American Concrete Institute (ACI) 301, "Specifications for Structural Concrete for Buildings."
 2. ACI 318, "Building Code Requirements for Reinforced Concrete."
 3. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."
- B. Concrete Testing Service: Employ an independent testing agency to perform tests and to submit test reports. Engage a testing agency acceptable to Architect to perform material evaluation tests and to design concrete mixes.
- C. Materials and installed work may require testing and retesting at any time during progress of Work. Tests, including retesting of rejected materials for installed Work, shall be done at Contractor's expense.

1.4 CONTRACTOR DESIGN AND BUILD ENGINEERED SYSTEMS

1. The Contractor is responsible for providing engineered designs for all products and systems of this section requiring a licensed engineer. All engineered systems shall be designed by engineers licensed in the state of Oklahoma. Required submittal drawings shall bear the signed seal of the responsible engineer of record.
2. The signed and sealed documents provided by the Architect do not constitute engineered systems.
3. The Metal Building Systems (PEB) shall be a subcontractor to the Contractor. The selection of this subcontractor shall be the choice of successful low bidder. The Metal Building Systems signed and sealed submittals and individual product submittals shall be subject to the approval of the Owner and the Architect.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of metal building system component. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - 1. Building foundations
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Anchor-Bolt Plans: Submit anchor-bolt plans and templates before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach metal building to foundation. Indicate column reactions at each location.
 - 2. Reinforcing Steel Drawings: Show complete layout, size and grade.
- C. Delegated-Design Submittal: For building foundation systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Product certificates.
- C. Field quality-control reports.
- D. Surveys: Show final elevations and locations of major members. Indicate discrepancies between actual installation and the Contract Documents. Have surveyor who performed surveys certify their accuracy.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. Testing Agency Qualifications: An independent agency, **acceptable to authorities having jurisdiction**, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."
- D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301, "Specifications for Structural Concrete," **Sections 1 through 5.**
 - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- E. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- F. Preinstallation Conference: Conduct conference at **Project site**.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.
 - 1. Use overlaid plywood complying with U.S. Product Standard PS-1 "A-C or B-B High Density Overlaid Concrete Form," Class I.
- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or another acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Form Release Agent: Provide commercial formulation form release agent with a maximum of 350 g/L volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties designed to prevent form deflection and to prevent spalling of concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to the plane of the exposed concrete surface.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615 Grade 60, deformed.
- B. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- C. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.
- D. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar-type supports complying with CRSI specifications.
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For exposed-to-view concrete surfaces where legs of supports are in contact with forms, provide supports with legs that are protected by plastic (CRSI, Class 1) or stainless steel (CRSI, Class 2).

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
 - 1. Use one brand of cement throughout Project unless otherwise acceptable to Architect.
- B. Fly Ash: ASTM C 618, Type C or F with a carbon content not greater than 3 percent by volume.
- C. Normal-Weight Aggregates: ASTM C 33 and as specified. Provide aggregates from a single source for exposed concrete.
 - 1. For exposed exterior surfaces, do not use fine or coarse aggregates that contain substances that cause spalling.
 - 2. Local aggregates not complying with ASTM C 33 that have been shown to produce concrete of adequate strength and durability by special tests or actual service may be used when acceptable to Architect.
- D. Lightweight Aggregates: ASTM C 330.
- E. Water: Potable.
- F. Admixtures, General: Provide concrete admixtures that contain not more than 0.1 percent chloride ions.
- G. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
- H. Water-Reducing Admixture: ASTM C 494, Type A.
- I. High-Range Water-Reducing Admixture: ASTM C 494, Type F or Type G.
- J. Water-Reducing, Accelerating Admixture: ASTM C 494, Type E.

K. Water-Reducing, Retarding Admixture: ASTM C 494, Type D.

2.4 DENSIFIER PRODUCTS

- A. Pre-Densifier Floor Cleaner: As recommended by densifier manufacturer.
- B. Reactive Silicate Densifier shall be equal to or better than the following products:
 - 1. 3D Densifier by AmeriPolish
 - 2. Ashford Formula by Curecrete Chemical.
 - 3. Sure Hard (J17) by Dayton Superior.
 - 4. Duro-Nox by Nox-Crete.
 - 5. Euco Diamond Hard by Euclid.
 - 6. L&M Seal Hard by Laticrete Concrete Chemicals.
 - 7. SpecHard by SpecChem
 - 8. Starseal PS by Vexcon.
 - 9. Equivalent product manufacturer (Substitutions).

2.5 RELATED MATERIALS

- A. Reglets: Where sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 0.0217- inch thick galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.
- B. Dovetail Anchor Slots: Hot-dip galvanized sheet steel, not less than 0.0336 inch thick with bent tab anchors. Fill slot with temporary filler or cover face opening to prevent intrusion of concrete or debris.
- C. Waterstops: Provide flat, dumbbell-type or centerbulb-type waterstops at construction joints and other joints as indicated. Size to suit joints.
- D. Sand Cushion: Clean, manufactured or natural sand.
- E. Vapor Retarder: Provide vapor retarder that is resistant to deterioration when tested according to ASTM E 154, as follows:
 - 1. Polyethylene sheet not less than 8 mils thick.
- F. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd., complying with AASHTO M 182, Class 2.
- G. Moisture-Retaining Cover: Waterproof paper, complying with ASTM C 171.
- H. Water-Based Acrylic Membrane Curing Compound: ASTM C 309, Type I, Class B.
- I. Bonding Agent: Acrylic base.
- J. Epoxy Adhesive: ASTM C 881, two-component material suitable for use on dry or damp surfaces. Provide material type, grade, and class to suit Project requirements.

2.6 PROPORTIONING AND DESIGNING MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use an independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
 - 1. Limit use of fly ash to not exceed 20 percent of cement content by weight.
- B. Design mixes to provide normal weight concrete with the following properties as indicated on drawings and schedules:
 - 1. 3000 psi, 28-day compressive strength; water-cement ratio, 0.58 maximum (non-air-entrained), 0.46 maximum (air-entrained).
- C. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:
 - 1. Subjected to freezing and thawing: W/C 0.45.
 - 2. Subjected to deicers/watertight: W/C 0.40.
- D. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
 - 1. Ramps, slabs, and sloping surfaces: Not more than 4 inches.
 - 2. Reinforced foundation systems: Not less than 1 inch and not more than 4 inches.

3. Concrete containing high-range water-reducing admixture (superplasticizer): Not more than 8 inches after adding admixture to site-verified 2 - 3 inch slump concrete.
 4. Other concrete: Not more than 4 inches.
- E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in Work.

2.7 ADMIXTURES

- A. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
- B. Use accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg F.
- C. Use high-range water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight, and concrete with water-cement ratios below 0.50.
- D. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within the following limits:
 1. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or hydraulic pressure:
 - a. 4.5 percent (moderate exposure); 5.5 percent (severe exposure) for 1-1/2 inch maximum aggregate.
 - b. 4.5 percent (moderate exposure); 6.0 percent (severe exposure) for 1 inch maximum aggregate.
 - c. 5.0 percent (moderate exposure); 6.0 percent (severe exposure) for 3/4 inch maximum aggregate.
 - d. 5.5 percent (moderate exposure); 7.0 percent (severe exposure) for 1/2 inch maximum aggregate.
- E. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer's directions.

2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with requirements of ASTM C 94, and as specified.
 1. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 GENERAL

- A. Coordinate the installation of joint materials, vapor retarder/barrier, and other related materials with placement of forms and reinforcing steel.

3.2 FORMS

- A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits:
 1. Provide Class A tolerances for concrete surfaces exposed to view.

2. Provide Class C tolerances for other concrete surfaces.
- B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in the Work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent cement paste from leaking.
 - C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like for easy removal.
 - D. Provide temporary openings for clean-outs and inspections where interior area of formwork is inaccessible before and during concrete placement. Securely brace temporary openings and set tightly to forms to prevent losing concrete mortar. Locate temporary openings in forms at inconspicuous locations.
 - E. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
 - F. Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
 - G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

3.3 VAPOR RETARDER/BARRIER INSTALLATION

- A. General: Place vapor retarder/barrier sheeting in position with longest dimension parallel with direction of pour.
- B. Lap joints 6 inches and seal with manufacturer's recommended mastic or pressure-sensitive tape.

3.4 PLACING REINFORCEMENT

- A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as specified.
 1. Avoiding cutting or puncturing vapor retarder/barrier during reinforcement placement and concreting operations. Repair damages before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Architect.
- D. Place reinforcement to maintain minimum coverages as indicated for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

- A. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure, as acceptable to Architect.

- B. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise. Do not continue reinforcement through sides of strip placements.
- C. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- D. Waterstops: Provide waterstops in construction joints as indicated. Install waterstops to form continuous diaphragm in each joint. Support and protect exposed waterstops during progress of Work. Field-fabricate joints in waterstops according to manufacturer's printed instructions.
- E. Isolation Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Joint fillers and sealants are specified in Division 7 Section "Joint Sealants."
- F. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as shown. Use saw cuts **1/8 inch** wide by one-third of slab depth, unless otherwise indicated.
 - 1. Contraction joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.
 - 2. If joint pattern is not shown, provide joints not exceeding **15 ft.** in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).
 - 3. Joint fillers and sealants are specified in Division 7 Section "Joint Sealants."

3.6 INSTALLING EMBEDDED ITEMS

- A. General: Set and build into formwork anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached.
- B. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

3.7 PREPARING FORM SURFACES

- A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before placing reinforcement.
- B. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply according to manufacturer's instructions.
 - 1. Coat steel forms with a nonstaining, rust-preventative material. Rust-stained steel formwork is not acceptable.

3.8 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," and as specified.
- C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation at its final location.
- D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than **24 inches** and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309.
 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least **6 inches** into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix to segregate.
- E. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until completing placement of a panel or section.
1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.
 2. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 3. Maintain reinforcing in proper position on chairs during concrete placement.
- F. Cold-Weather Placement: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
- G. When air temperature has fallen to or is expected to fall below **40 deg F**, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than **50 deg F** and not more than **80 deg F** at point of placement.
1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- H. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as specified.
1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below **90 deg F**. Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
 3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
 4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to Architect.

3.9 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished Work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding **1/4 inch** in height rubbed down or chipped off.
- B. Smooth-Formed Finish: Provide a smooth-formed finish on formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or another similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.

- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 MONOLITHIC SLAB FINISHES

- A. Trowel Finish: Apply a trowel finish to monolithic slab surfaces exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or another thin film-finish coating system.
 - 1. After floating, begin first trowel-finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances of F(F) 20 (floor flatness) and F(L) 17 (floor levelness) measured according to [ASTM E 1155](#). Grind smooth any surface defects that would telegraph through applied floor covering system.
- B. Nonslip Broom Finish: Apply a nonslip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.11 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as specified to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete Work.

3.12 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before power floating and troweling.
- B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
- C. Curing Methods: Cure concrete by curing compound, by moist curing, by moisture-retaining cover curing, or by combining these methods, as specified.
- D. Provide moisture curing by the following methods:
 - 1. Keep concrete surface continuously wet by covering with water.
 - 2. Use continuous water-fog spray.
 - 3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with a [4 inch](#) lap over adjacent absorptive covers.
- E. Provide moisture-retaining cover curing as follows:
 - 1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least [3 inches](#) and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape
- F. Apply curing compound on exposed interior slabs and on exterior slabs, walks, and curbs as follows:
 - 1. Apply curing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply

- uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.
- G. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- H. Curing Unformed Surfaces: Cure unformed surfaces, including slabs, floor topping, and other flat surfaces, by applying the appropriate curing method.
1. Final cure concrete surfaces to receive finish flooring with a moisture-retaining cover, unless otherwise directed.

3.13 REMOVING FORMS

- A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.
- B. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days or until concrete has attained at least 75 percent of design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.
- C. Form-facing material may be removed 4 days after placement only if shores and other vertical supports have been arranged to permit removal of form-facing material without loosening or disturbing shores and supports.

3.14 REUSING FORMS

- A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use patched forms for exposed concrete surfaces except as acceptable to Architect.

3.15 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to Architect.
- B. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.

3.16 DENSIFIER APPLICATION

- A. Area to be Treated: Apply densifier to all interior concrete floors, except floors to receive resilient flooring, unless otherwise shown or scheduled on the drawings.
- B. Examination and Preparation:
1. Examine surfaces receiving densifier. Verify that surfaces conform to product manufacturer's requirements for substrate conditions.
 2. Vacuum and clean saw cut joints and surrounding area using a HEPA-rated filter vacuum so that no dust remains to react with concrete finish material.

3. Remove remnant of temporary film forming curing compound prior to application of densifier. Remove compound by cleaning and scrubbing in accordance with manufacturer's instructions.
 4. Scrub floor with pre-densifier floor cleaner to remove latent salts.
 5. Verify floor is free of curing membrane, bond-breaker, and construction laitance.
 6. Do not proceed until unsatisfactory conditions have been corrected.
- C. Application:
1. Application shall be performed by certified applicator in accordance with manufacturers published instructions.
 2. Schedule to begin 7 to 14 days after floor slab placement.
 3. Employ methods to ensure concrete surface is not damaged during application, including discoloration.
 4. Apply densifier finish at the rate of 300 square feet maximum per gallon.
 5. Apply with low pressure sprayer with enough coverage to keep concrete surface wet for minimum 20 minute period.
 6. When treated surface gels and becomes slippery under foot, lightly sprinkle surface with water and agitate with broom to redistribute special concrete finish material evenly across surface.
 7. After surface again becomes slippery, using garden hose with garden-type spray nozzle, flush entire surface with water removing excess material, alkali, or impurities. Squeegee or wet-vac surface dry to remove excess material to avoid whitening of concrete during curing. Whitening of concrete by over-application of hardener/densifier may be cause for rejection.
 8. Apply second coat of densifier 2 weeks prior to Owner Possession, apply over surfaces to which densifier has been applied.
 9. Apply densifier finish at the rate of 1000 square feet per gallon.
 10. Apply with low pressure sprayer with enough coverage to keep concrete surface wet for minimum 20 minute period.

3.17 DENSIFIER DISPOSAL

- A. Upon completion of each densifier treatment, dispose of excess densifier material as required by local agency having jurisdiction.
- B. Certified applicator shall remove all densifier product containers from job site immediately upon completion of work.
- C. Dispose of other construction and universal waste in accordance with the requirements of Section 01351 Regulatory Compliance Supplement.

END OF SECTION

SECTION 05500
METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Shop fabricated ferrous metal items, galvanized and prime painted.
 - 2. Owner furnished fabricated metal items.
 - 3. See Schedule at end of this Section.
 - a. Provide as scheduled and as indicated on Drawings.
 - b. Include anchorages and attachments necessary for installation.
 - c. Schedule lists basic items and systems. Include related items and systems necessary to complete the Work.
- B. Products Installed But Not Furnished Under This Section: Under provisions of Section 01010, Owner's metal fabrication supplier will furnish some fabricated metal items for installation by Contractor.
- C. Related Sections:
 - 1. Section 01010 - Summary of Work: General procedures related to Owner furnished products.
 - 2. Section 01400 - Quality Control: Testing and inspection.
 - 3. Section 03300 - Cast-In-Place Concrete: Furnish handrail sleeves for embedding into concrete.
 - 4. Section 09900 - Painting: Painted finishes.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A 36 - Specification for Carbon Structural Steel.
 - 2. ASTM A 53 - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - 3. ASTM A 307 - Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - 4. ASTM A 325 - Specification for Structural Bolts, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - 5. ASTM A 366 - Specification for Steel Sheet, Carbon, Cold-Rolled, Commercial Quality.
 - 6. ASTM A 500 - Specification for Cold-formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - 7. ASTM A 570 - Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.
 - 8. ASTM A 591 - Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications.
 - 9. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. American Welding Society (AWS):
 - 1. AWS D1.1 - Structural Welding Code.
 - 2. AWS D1.3 - Structural Welding Code - Sheet Steel.
- C. Steel Structures Painting Council (SSPC):
 - 1. SSPC-Paint 20 Type II - Zinc Rich Primers - Organic.
 - 2. SSPC-Paint 25 - Red Iron Oxide, Zinc Oxide, Raw Linseed Oil, and Alkyd Primer.

1.03 SUBMITTALS

- A. Section 01300 - Submittals: Procedures for submittals.

1.04 QUALITY ASSURANCE

- A. Qualifications for Welding Work: Qualify welding operators in accordance with AWS Standard Qualification Procedures. Provide certification that welders employed in work have satisfactorily passed AWS qualification tests within previous 12 months. If recertification of welders is required, provide without additional cost to Owner.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Section 01600 – Products, Material and Equipment: Transport, handle, store, and protect products.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Steel Plates and Shapes: ASTM A 36.
- B. Bolts, Nuts, and Washers: ASTM A 325 and ASTM A 307.
- C. Cold Rolled Steel: ASTM A 366, Class I, matte finish.
- D. Cold Rolled Sheet: ASTM A 570.
- E. Galvanized Steel Sheets:
 - 1. Structural: ASTM A 653 Structural Quality, G90.
 - 2. Galvanized Sheet Steel: ASTM A 591, Class C.
- F. Steel Tubing: ASTM A 500, Grade B.
- G. Steel Piping: ASTM A 53.
- H. Welding Materials: AWS D1.1 and AWS D1.3 type required for materials being welded.
- I. Primers:
 - 1. Shop application and field touch-up: SSPC 25.
 - 2. Touch-up Primer for Galvanized Surfaces: SSPC 20.
 - 3. Color: To match primer used on steel roof deck and joists.
- J. Concrete Inserts: Cast steel or malleable bolts, washers, and shims; galvanized.

2.02 FABRICATION

- A. Verify dimensions on site prior to shop fabrication.
- B. Fabricate items with joints tightly fitted and secured.
- C. Fit and shop assemble in largest practical sections, for delivery to site.
- D. Grind exposed welds flush and smooth with adjacent finished surface. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of structure, except where specifically noted otherwise.
- F. Make exposed joints butt tight, flush, and hairline.
- G. Supply components required for anchorage of metal fabrications. Fabricate anchorage and related components of same material and finish as metal fabrication, except where specifically noted otherwise.
- H. Finishing:
 - 1. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
 - 2. Do not prime surfaces in direct contact bond with concrete or where field welding is required.
 - 3. Prime paint items scheduled with one coat; touch up with same primer.
 - 4. Galvanize to minimum 2.0 oz/sq ft zinc coating, exterior items, and those items indicated on Drawings and specified herein, to be galvanized.

PART 3 EXECUTION

3.01 PREPARATION

- A. Obtain Owner Construction Manager approval prior to site cutting or making adjustments not scheduled.
- B. Clean and strip site primed steel items to bare metal where site welding is scheduled.
- C. Make provision for erection loads with temporary bracing. Keep work in alignment.
- D. Use grout specified in Section 03300 for setting metal fabrications.

3.02 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Perform field welding in accordance with AWS D1.1 or D1.3, as applicable. After installation, grind sight-exposed field welds smooth, touch-up welds, scratched, or damaged surfaces with primer.

3.03 FIELD QUALITY CONTROL

- A. Testing and Inspection: See Section 01410.

3.04 SCHEDULE

- A. Loose Bearing Plates and Lintels: Fabricate to sizes and configuration indicated on Drawings; prime paint finish except for items requiring field welding.
- B. Miscellaneous Framing and Supports: Furnish steel framing and supports not specified under Section 13419. Fabricate welded construction in as large units as possible. Drill and tap for hardware and other items. Include anchors required for building into work of other Sections.
 - 1. Interior: Prime paint finish, gray.
 - 2. Exterior: Galvanized.
- C. Rough Hardware: Custom fabricated bolts, plates, anchors, hanger, dowels, and other miscellaneous steel and iron shapes required for framing, supporting, and anchoring other construction. Galvanized unless otherwise indicated on Drawings.
- E. Miscellaneous Steel Trim: Profiles and sizes as indicated on Drawings; continuous welded joints and smooth exposed edges. Use concealed field splices where possible. Provide cutouts, fittings, and anchorages; coordinate assembly and installation into work of other Sections.
 - 1. Interior: Prime paint finish.
 - 2. Exterior: Galvanized.
- F. Steel Pipe Bollards: ASTM A 53, Type E (electric-resistance welded) or Type S (seamless), Grade B, Schedule 40, size and configuration as detailed.
 - 1. Fill bollard as indicated on Drawings.
 - 2. Finish:
 - a. Interior: Prime paint finish, as indicated in Section 09900.
 - b. Exterior: Galvanized.
 - 3. Exterior Bollards: Where indicated, provide "red" thermoplastic polyethylene bollard sleeve, #001220 x 52" high to fit 6" diameter pipe bollards.
- G. Steel Pipe Railings: ASTM A53, Type E (electric-resistance welded) or Type S (seamless), Grade B, Schedule 40. Fabricate to dimensions indicated on Drawings. Cope horizontal railings intersecting vertical members. Provide radius bends at changes in direction. Finish: Prime painted at interior applications and galvanized at exterior applications.
 - 1. Set -in sleeves and secure railings to other construction, as indicated on Drawings.
 - 2. Handrails and Top Rails: Design point load 200 lbs, downward or horizontal, and uniform load of 50 lb/lin ft applied simultaneously in both vertical and horizontal directions. Concentrated and uniform loads need not be assumed to act concurrently.

3. Intermediate Rails: Uniform load of 25 lbs/sq ft of gross area of railing system, including open area.
- H. Steel Supports for Overhead Doors, Operators, and Grilles: Channels and tubes as indicated on Drawings for overhead coiling doors and overhead coiling grilles. Coordinate fabrication with respective section of work.

END OF SECTION

SECTION 06100
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Wood furring for wall finishes.
 - 2. Blocking and nailers for roofing system and related metal flashings.
 - 3. Preservative and fire resistive treatment.
 - 4. Concealed blocking behind wall mounted items.
 - 5. Structural panel products.
 - 6. Non-structural panel products including the following:
 - a. Backing for electrical and telephone equipment.
 - b. Panels concealed within gypsum board and metal stud partitions.
 - c. Panels used as finish material; walls, ceilings, wainscots, and bases.
 - 7. Panel product and framing for wood and wire mesh doors.
- B. Related Sections:
 - 1. Section 07240 - Exterior Insulation and Finish System: Finish over plywood sheathing at exterior signage.
 - 2. Section 07620 - Sheet Metal Flashing and Trim; Optional Coping Detail.

1.02 REFERENCES

- A. American Lumber Standards Committee (ALSC): Softwood Lumber Standards.
- B. American Plywood Association (APA): Grades and Standards.
- C. American Society for Testing and Materials (ASTM):
 - 1. ASTM A123 - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 2. ASTM A307 - Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - 3. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
- D. American Wood Preservers Association(AWPA):
 - 1. AWPA - C1 - All Timber Products - Preservative Treatment by Pressure Processes.
 - 2. AWPA - C15 - Wood for Commercial-Residential Construction Preservative Treatment by Pressure Processes.
 - 3. AWPA - C20 - Structural Lumber - Fire-Retardant Treatment by Pressure Processes.
 - 4. AWPA - C27 - Plywood - Fire-Retardant Treatment by Pressure Processes.
 - 5. AWPA - M4 - Care of Preservative Treated Wood Products.
 - 6. AWPA - P5 - Water Borne Preservatives.
- E. National Forest Products Association (NFoPA): National Design Specification for Wood Construction (and Supplement).
- F. Product Standard (PS):
 - 1. PS 1 - Construction and Industrial Plywood with typical APA Trademarks.
 - 2. PS 20 - American Softwood Lumber Standard.
- G. Southern Pine Inspection Bureau (SPIB): Grading Rules.
- H. Western Wood Products Association (WWPA): Western Lumber Grading Rules.
- I. Underwriters' Laboratories (UL):
 - 1. UL FR-S Classification - Fire Retardant Treated Wood with Flame Spread Ratings of 25 or less in accordance with ASTM E84.
 - 2. UL 723 - Test for Surface Burning Characteristics of Building Materials.

1.03 QUALITY ASSURANCE

- A. Lumber Grading Agency: Lumber to be grade stamped by an agency certified by the Board of Review of the American Lumber Standards Committee (ALSC).
- B. Plywood Grading Agency: Certified by APA.
- C. Regulatory Requirements: Conform to applicable codes for fire retardant treatment of wood surfaces for flame/smoke ratings.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Provide proper facilities for handling and storage of materials to prevent damage to edges, ends and surfaces.
- B. Keep materials dry. Stack materials off ground a minimum of 12 inches or if on concrete slab-on-grade a minimum of 1-1/2 inches, fully protected from weather.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Lumber: PS 20; S4S. Maximum of 19 percent moisture content, surfaced dry, No. 2 any species graded under WWPA grading rules or No. 3 Grade Southern Pine graded under SPIB grading rules.
- B. Non-Structural Panel Product: APA graded plywood for application indicated.
 - 1. Backing for Electrical and Telephone Equipment (If Applicable): C-D Plugged, Exposure 1; fire retardant treated, 3/4 inch thickness.
 - 2. Other Locations: C-D Plugged, Exposure 1, 1/2 inch thickness.
- C. Structural Panel Product:
 - 1. APA Performance Rated Panels: For concealed applications, provide plywood meeting performance requirements (PS 1) indicated on Drawings.
 - 2. Where exposure rating or span rating is not given, provide Exposure 1 plywood with rating required to suit support spacing indicated on Drawings.
 - 3. Exterior Sheathing: Provide a product equal to or better than the following; thickness as indicated on Drawings.
 - a. Exterior grade, formaldehyde free, medium density fiberboard, Medex, by Medite Corporation, Medford, OR
 - b. Fiber-reinforced cement board, Plycem, by U.S. Plycem Corporation, South Plainfield, NJ,
- D. High Density Wood Fiber to be equal to or better than the following:
 - 1. Huebert Fiberboard Roof Insulation, by Huebert Fiberboard, Inc,

2.02 ACCESSORIES

- A. Fasteners: Provide manufacturers recommended power tools for each type of fastener.
 - 1. Nails, Spikes and Staples: ASTM A123, Galvanized for exterior locations, high humidity areas, and treated wood; plain finish for other interior locations; size and type to suit application, unless otherwise noted.
 - 2. Bolts, Nuts, Washers, Lag Screws, and Wood Screws: ASTM A307, Medium carbon steel; size and type to suit application; galvanized for exterior locations, high humidity areas, and treated wood; plain finish for other interior locations, of size and type to suit application, unless otherwise noted.
 - 3. Toggle Bolt Fasteners: For anchorage of non-structural items to hollow masonry.
 - 4. Expansion Shield Fasteners: For anchorage of non-structural items to solid masonry and concrete.
 - 5. Powder or Pneumatically Activated Fasteners: For anchorage of non-structural items to steel.
 - 6. Fasteners for Wood and Plywood to Light Gage Metal Framing and Metal Deck (up to 11 gage (0.1196 inch)): Self-drilling flat head wood-to-metal screws.

- a. Manufacturers:
 - 1) Hilti, Tulsa, OK (800) 879-8000.
 - 2) Equivalent product manufacturer (Substitutions).
- b. Wood and Plywood Up to 3/4 Inch Thick:
 - 1) Hilti: 8-18 PFH #3 Point.
 - 2) Equivalent product manufacturer (Substitutions).
- c. Wood 7/8 Inch Thick and Thicker to 18 Gage (0.0478 inch) and 20 Gage (0.0359 inch) Metal:
 - 1) Hilti: 8-18 PFH #3 Point.
 - 2) Equivalent product manufacturer (Substitutions).
- d. Wood 7/8 Inch Thick and Thicker to 16 Gage (0.598 inch) and Heavier Metal:
 - 1) Hilti: 12-24 PFH #4 Point with Wings.
 - 2) Equivalent product manufacturer (Substitutions).
- 7. Fasteners for Structural Wood Members to Solid Grouted Masonry: Adhesive anchors, size and length as indicated on Drawings.
 - a. Manufacturers:
 - 1) Hilti, Tulsa, OK (800) 879-8000.
 - 2) Equivalent product manufacturer (Substitutions).
 - b. Hilti: HIT HY-100.
 - c. Substitution: Equivalent product acceptable
- 8. Fasteners for Non-Structural Wood Members to Masonry: 1/4 inch diameter x 3-1/4 inch with phillips or torx flat head.
 - a. Manufacturers:
 - 1) Hilti, Tulsa, OK (800) 879-8000.
 - 2) Equivalent product manufacturer (Substitutions).
 - b. Hilti: Kwik-Con II fastener.
 - c. Substitutions: Equivalent product acceptable

2.03 WOOD TREATMENT

- A. Preservative Pressure Treated Lumber:
 - 1. Manufacturers:
 - a. "Wolmanized Pressure-Treated Wood", Wolman CCA Type C, by Hickson Corporation; Atlanta, GA; (404) 801-6600.
 - b. Equivalent product manufacturer (Substitutions).
 - 2. Impregnate lumber with preservative treatment conforming to AWPAs Standard C1 and P5. Apply the preservative in a closed cylinder by pressure process in accordance with AWPAs Standard C15.
 - 3. Retention of dry salts:
 - a. Moderate service conditions (weather exposure): 0.25 pounds per cubic foot (oxide basis).
 - b. Severe conditions (constant contact with ground or water): 0.40 pounds per cubic foot (oxide basis).
 - 4. Remove excess moisture where shrinkage is a serious fault or where treated lumber will be in contact with plaster, or stucco, and where water-borne treated lumber is to be painted or stained.
 - 5. Lumber shall be dried to 15-19 percent moisture content after treatment, and material to be painted or stained shall have knots and pitch streaks sealed as with untreated wood.
 - 6. Liberally brush freshly cut surfaces, bolt holes and machined areas with the same preservative in accordance with AWPAs Standard M4.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive rough carpentry work and verify following:

06100 - 3
CD Issue No. 2

1. That installation of building components to receive rough carpentry work is complete.
2. That surfaces are satisfactory to receive work.
3. That spacing, direction and details of supports are correct to accommodate installation of blocking, backing, stripping, furring and nailing strips.

3.02 SITE TREATMENT OF WOOD MATERIALS

- A. Retreat site sawn ends with brush application according to manufacturer's instructions. Allow preservative to cure prior to placing members.

3.03 INSTALLATION

- A. Install miscellaneous blocking, nailing strips, framing, and sheathing as detailed on Drawings. Coordinate to allow proper attachment of work of other Sections.
 1. Secure wood blocking, cants, nailers, in place using fasteners specified. Use only recommended power tools for placement of fasteners.
 2. Recess heads of fasteners below surface of wood members.
- B. Install members true to line, plumb, and level.
- C. Secure in place with appropriate fasteners. Use fasteners of correct size that will not penetrate members where opposite side will be exposed to view or require finishing. Do not split wood with fasteners; set panel products to allow expansion at joints.
- D. Do not splice structural members between supports.
- E. Firestop concealed spaces with wood blocking (horizontally and vertically per drawings) not less than 2 inches thick where space is not blocked by other framing members.
- F. Construct members of continuous pieces of longest possible lengths.

END OF SECTION

SECTION 07900

JOINT SEALERS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Preparing sealant substrate surfaces.
 - 2. Sealant and backing
 - 3. Control joint filler.
- B. Related Sections:
 - 1. Section 03252 - Control and Construction Joint Filler: Joint filler for control/construction joints in interior exposed concrete floor slabs.
 - 2. Section 04200 - Concrete Unit Masonry: Installation of expansion joint filler in masonry walls.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM C920 - Specification for Elastomeric Joint Sealants.

1.03 QUALITY ASSURANCE

- A. Interior sealants in food preparation areas shall be USDA approved, as required by local authorities having jurisdiction.

1.04 ENVIRONMENTAL REQUIREMENTS

- A. Do not install solvent curing sealants in enclosed building spaces.
- B. Maintain temperature and humidity recommended by sealant manufacturer during and after installation.

PART 2 PRODUCTS

2.01 ELASTOMERIC SEALANTS

- A. Polyurethane Sealants:
 - 1. Polyurethane Sealant #1: ASTM C 920, Type S, Grade NS, Class 25, single component.
 - a. Product shall be equal to or better than Vulkem 116, Dymonic, or Dymonic FC by Tremco.
 - b. Equivalent product manufacturer (Substitutions).
 - 2. Polyurethane Sealant #2: ASTM C 920, Type M, Grade NS, Class 50, multi-component.
 - a. Product shall be equal to or better than Dymeric 240FC, by Tremco.
 - b. Equivalent product manufacturer (Substitutions).
- B. Silicone Sealants:
 - 1. Silicone Sealant #1: ASTM C920, Type S, Grade NS, Class 25.
 - a. Product shall be equal to or better than 791, by Dow Corning Corporation.
 - b. Equivalent product manufacturer (Substitutions).
 - 2. Silicone Sealant #2: ASTM C920, Type S, Grade NS, Class 25, mildew resistant.
 - a. Product shall be equal to or better than 786, by Dow Corning Corporation.
 - b. Equivalent product manufacturer (Substitutions).

2.02 EXPANDING FOAM SEALANTS

- A. Polyurethane Expanding Foam Sealants:
 - 1. Polyurethane Expanding Foam Sealant #1: Closed-cell foam and non-flammable propellant; urea formaldehyde-free, CFC-free; UL Class 1 Foam with flamespread of 20 and smoke developed of 25 as tested in accordance with ASTM E84.
 - a. Product shall be equal to or better than Touch'n Seal Quick Cure, by Convenience Products, (314) 349-5333.
 - b. Equivalent product manufacturer (Substitutions).

2.03 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Filler: Polyethylene foam rod, oversized 30 percent to 50 percent.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and joint openings are ready to receive work and field measurements are as indicated on Drawings.
- B. Beginning of installation means installer accepts existing substrates.

3.02 PREPARATION

- A. Clean and prime joints in accordance with manufacturer's instructions.
- B. Remove loose materials and foreign matter which might impair adhesion of sealant.
- C. Verify that joint backing and release tapes are compatible with sealant.
- D. Protect elements surrounding work of this Section from damage or disfiguration.

3.03 INSTALLATION

- A. Install sealant in accordance with manufacturer's instructions.
- B. Measure joint dimensions and size materials to achieve required width/depth ratios.
- C. Install joint backing to achieve neck dimension no greater than 1/3 the joint width.
- D. Install bond breaker where joint backing is not used.
- E. Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature ranges.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Tool joints concave.

3.04 SCHEDULE

- A. Exterior Joints:
 - 1. Non-Metal to Metal Joints in vertical surfaces directly exposed to weather, including perimeter of openings where frames and other penetrations meet building facade, control and expansion joints in building facade:
 - a. Polyurethane Sealant #1, or
 - b. Polyurethane Sealant #2.
 - c. Color: To match adjacent material.

2. Metal to Metal Joints in vertical surfaces directly exposed to weather, including perimeter of openings where frames and other penetrations meet building facade, control and expansion joints in building facade:
 - a. Silicone Sealant #1.
 - b. Color: To match adjacent material.
 3. Joints in horizontal surfaces subject to traffic:
 - a. Polyurethane Sealant #1.
 - b. Color: To match adjacent material.
 4. Joints in vertical and horizontal surfaces concealed, including lapped sheet metal joints, joints at skylights or smoke vents (if specified) and curbs:
 - a. Silicone Sealant #1.
- B. Interior Joints:
1. Joints in vertical surfaces, including perimeter of openings where frames and other openings meet partitions, control and expansion joints in gypsum board partitions:
 - a. Polyurethane Sealant #1, or
 - b. Polyurethane Sealant #2
 - c. Color: To match adjacent material.
 2. Joints in horizontal surfaces exposed to foot traffic, including expansion joints in ceramic tile flooring:
 - a. Polyurethane Sealant #1, or
 - b. Polyurethane Sealant #2
 - c. Color: To match adjacent material.
 3. Joints in horizontal surfaces concealed by floor finish material, including control/construction joints in slabs-on-grade:
 - a. Epoxy Subfloor Filler: MasterSeal CR 190, two-part 100% solids flexible epoxy joint filler, by [BASF Building Systems](#) (800) 433-9517.
 4. Joints where plumbing fixtures meet adjacent floor and wall finishes:
 - a. Silicone Sealant #2.
 - b. Color: To match plumbing fixture.
 5. Joints in vertical surfaces, irregular in shape, and greater than 1/2 inch in width:
 - a. Polyurethane Expanding Foam Sealant #1.

END OF SECTION

SECTION 08110

STEEL DOORS AND FRAMES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Non-rated and fire rated steel doors, panels, and frames.
 - 2. Glazed light frames in non-rated and fire rated doors.
 - 3. Louvers.
- B. Related Sections:
 - 1. Section 04100 - Mortar and Grout: Masonry mortar fill of metal frames. Placement of anchors into wall construction.
 - 2. Section 08710 - Door Hardware: Door hardware coordination.
 - 3. Section 08800 - Glazing: Glass in non-fire rated steel doors and frames.
 - 4. Section 09260 - Gypsum Board Systems: Door frame attachment to metal wall framing. Coordination of frame throat size and variations is wall thickness.
 - 5. Section 09900 - Painting: Field painting of doors and frames.

1.02 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM E 152 - Methods of Fire Tests of Door Assemblies.
- C. Door Hardware Institute (DHI):
 - 1. DHI - The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
- D. National Fire Protection Association (NFPA):
 - 1. NFPA 80 - Fire Doors and Windows.
 - 2. NFPA 252 - Fire Tests for Door Assemblies.
- E. Steel Door Institute (SDI), 1991 Edition:
 - 1. SDI-100 - Standard Steel Doors and Frames.
 - 2. SDI-105 - Recommended Erection Instructions for Steel Frames.
- F. Underwriters Laboratories (UL):
 - 1. UL 10B - Fire Tests of Door Assemblies.

1.03 QUALITY ASSURANCE

- A. Conform to requirements of SDI-100 and ANSI A117.1.
- B. Regulatory Requirements:
 - 1. Installed Fire Rated Door Assemblies: Conform to NFPA 80, NFPA 252, and UL 10B for fire rated class, as indicated on Drawings.

1.04 DELIVERY, STORAGE AND PROTECTION

- A. Protect doors and frames with resilient packaging. Break seal on-site to permit ventilation.

1.05 PROJECT CONDITIONS

- A. Field Measurements: Verify that field measurements are as indicated on shop drawings.

- B. Coordination: Coordinate the work with door opening construction, door frame and door hardware installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements, provide doors, panels and frames:
 - a. Equal to or better than Ceco Door Division.
 - b. Equivalent product manufacturer (Substitutions).

2.02 DOORS

- A. Interior Doors: SDI-100, Grade I - Standard-Duty 1-3/4 inches thick, Model 2 Seamless Design - Hollow Steel Construction (seamless edges and faces), 20 gage cold-rolled steel.
- B. Exterior Doors: SDI-100; Grade III, Extra Heavy Duty 1-3/4 inches thick, Model 2 Seamless Design - Hollow Steel Construction (seamless edges and faces), 16 gage galvanized (ASTM A 653) cold-rolled steel.
 - 1. Fabricate head with inverted, unperforated channel flush with top edge to exclude water.
- C. Core Construction: Provide one of the following core constructions; Contractor's option:
 - 1. Vertical steel stiffeners, 22 gage, spaced 6 inches apart and spot welded to face sheets at 6 inches on center.
 - a. Insulate spaces between stiffeners with loose fill insulation full height of door.
 - 2. Polyurethane core foamed in place or laminated, 20 psi strength, 1.8 pcf density, R=12; 1/2 inch maximum voids in any direction. Strength of bond between core and steel face sheet shall exceed strength of core so delamination will not occur during operating conditions.
 - 3. Rigid core or polystyrene foam board, 1500 psf compressive strength, 18 psi shear strength, R=7. Strength of bond between core and steel face sheet shall exceed strength of core so that delamination will not occur under operating conditions.
 - 4. If laminated insulation is used, apply adhesive full coverage to door face. Do not use spot adhesive method.

2.03 FRAMES

- A. Interior Drywall Frames: 16 gage, cold-rolled steel, mitered knockdown units.
 - 1. Jamb depth: Sized to fit wall thickness.
- C. Exterior Frames: 16 gage, galvanized (ASTM A 653) steel, mitered and welded units.
 - 1. Jamb depth: 5-3/4", unless otherwise indicated on Drawings.

2.04 ACCESSORIES

- A. Rubber Silencers: Resilient rubber. Specified in Section 08710.
- B. Glazing Stops: Rolled steel channel shape, butted corners; prepared for countersink style screws.
- C. Plaster Guards: Provide 26 gage steel plaster guards or mortar boxes, welded to frame, at back of hardware cutouts in masonry openings.
- D. Board Insulation Blocking: ASTM C578, Type IV (density 1.6 pcf minimum), 1 inch thick. Provide one of the following:
 - 1. Product shall be equal to or better than Foamular 250, by UC Industries, Inc.
- E. Astragals: Doors swinging in pairs and having a fire protection rating of more than 1-1/2 hours, provide an overlapping astragal to meet UL rating requirements. Doors swinging in pairs and having a fire protection rating of not more than 1-1/2 hours, when located within

a means of egress, shall not be equipped with astragals that inhibit the free use of either leaf.

1. Provide steel astragals, integral with door construction.
2. If U-shaped astragal is used that does not require a coordinator, coordinate with Section 08710 to omit double door coordinator from applicable hardware sets.

2.05 PROTECTIVE COATINGS

- A. Bituminous Coating: Fibered asphalt emulsion, field applied.
- B. Primer: Exposed surfaces shall be cleaned, treated with Bonderite chemical and given one baked-on shop coat of grey synthetic primer.

2.06 FABRICATION

- A. Fabricate doors and frames rigid, neat, and free from warp or buckle. Weld exposed joints continuously; grind, dress, and make smooth, flush and invisible.
 1. Fabricate exterior frames and interior masonry frames as welded units.
- B. Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.
- C. Fabricate doors with hardware reinforcement welded in place.
- D. Fabricate frames with hardware reinforcement plates welded in place. Provide mortar guard boxes.
- E. Fabricate frames to suit masonry wall coursing with 4 inch head member.
- F. Silencers: Prepare frames for silencers.
 1. Single Doors: Provide 3 single rubber silencers on strike side.
- G. Fire Rated Doors: Attach fire rated label to each door unit. Do not paint over labels.
- H. Close top edge of exterior door flush with inverted unperforated steel channel closure set flush with top edge to exclude water. Seal joints watertight.
- I. Undercut non-fire rated doors as indicated on drawings.
- J. Where multiple openings are indicated, fabricate double wide frames of material gauge as scheduled. Joint frames at swing jamb using minimum 16 gauge insert spline connection full length. After assembly, fill joint with epoxy filler, allow to harden, and finish smooth and flush.
 1. Fabricate impost base anchor, providing for minimum of two (2) anchors per impost. Base shall fit impost inside profile with "force fit."

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify substrate conditions, opening sizes and tolerances are acceptable for proper installation.

3.02 INSTALLATION

- A. Install frames in accordance with SDI-105 and DHI.
- B. Install doors in accordance with SDI-100 and DHI.
- C. Coordinate with adjacent wall construction for anchor placement.
- D. Coordinate installation of glass and glazing.
- E. Install door louvers, plumb and level.
- F. Coordinate installation of doors with installation of hardware specified in Section 08710.
 1. Provide board insulation blocking at exterior hollow metal frames. Glue blocking in frame jambs (strike side and hinge side) at height indicated on Drawings.

3.03 ADJUSTING AND CLEANING

- A. Test for smooth operation through full range of swing; make necessary adjustments.

- B. Coordinate adjustment of doors with installation of hardware. Adjust doors and hardware for smooth and balanced door movement.

END OF SECTION

SECTION 08360

SECTIONAL OVERHEAD DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes electrically operated sectional doors.
- B. Related Requirements:
 - 1. Section 05500 Metal Fabrications for miscellaneous steel supports.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type and size of sectional door and accessory.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
- C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

- A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 QUALITY ASSURANCE

- A. Wood Sectional Door Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Sectional doors shall comply with performance requirements specified without failure due to defective manufacture, fabrication, installation, or other defects in construction and without requiring temporary installation of reinforcing components.
- B. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.
 - 1. Design Wind Load: Uniform pressure (velocity pressure) of 20 lbf/sq. ft. (960 Pa), acting inward and outward
 - 2. Testing: According to ASTM E 330

2.2 DOOR ASSEMBLY

- A. Insulated Steel Sectional Door: Sectional door formed with hinged sections.
 - 1. Manufacturers:
 - a. Shall be equal to or better than Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: sales@overheaddoor.com.
 - b. Equivalent product manufacturer (Substitutions).
 - 2. Door Type D-1 Basis of Design: Product shall be equal to or better than Thermacore 592 with bronze polycarbonate glazed aluminum sash by Overhead Door Company
 - 3. Door Type D-2 Basis of Design: Product shall be equal to or better than Thermacore 592 by Overhead Door Company
- B. Door Finish:
 - 1. Finish: White
 - 2. Finish of Interior Facing Material: White
- C. Reinforce bottom section with a continuous channel or angle conforming to bottom-section profile and allowing installation of astragal.
- D. Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard CFC-free insulation, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84. Enclose insulation completely within steel sections and the interior facing material, with no exposed insulation.

2.3 TRACKS, SUPPORTS, AND ACCESSORIES

- A. Tracks: Manufacturer's standard, galvanized-steel track system of configuration indicated, sized for door size and weight, designed for lift type indicated and clearances indicated on Drawings, Provide complete system including brackets, bracing, and reinforcement to ensure rigid support of ball-bearing roller guides for required door type, size, weight, and loading.
 - 1. Track Reinforcement and Supports: Galvanized-steel members to support track without sag, sway, and vibration during opening and closing of doors. Slot vertical sections of track spaced 2 inches (51 mm) apart for door-drop safety device.

083613 - 2
CD Issue No. 2

- B. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom and top of sectional door unless otherwise indicated.
- C. Windows: Manufacturer's standard window units of type, size, and in arrangement indicated. Provide removable stops of same material as door-section frames.

2.4 HARDWARE

- A. General: Heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless-steel, or other corrosion-resistant fasteners, to suit door type.
- B. Hinges: Heavy-duty, galvanized-steel hinges at each end stile and at each intermediate stile, according to manufacturer's written recommendations for door size. Attach hinges to door sections through stiles and rails.
- C. Rollers: Heavy-duty rollers with steel ball-bearings in case-hardened steel races, mounted with varying projections to suit slope of track. Provide 3-inch- (76-mm-) diameter roller tires for 3-inch- (76-mm-) wide track and 2-inch- (51-mm-) diameter roller tires for 2-inch- (51-mm-) wide track.
- D. Push/Pull Handles: Equip each push-up operated or emergency-operated door with galvanized-steel lifting handles on each side of door, finished to match door.

2.5 COUNTERBALANCE MECHANISM

- A. Torsion Spring: Counterbalance mechanism consisting of adjustable-tension torsion springs fabricated from steel-spring wire complying with ASTM A 229/A 229M, mounted on torsion shaft made of steel tube or solid steel. Provide springs designed for number of operation cycles indicated.
- B. Cable Drums and Shaft for Doors: Cast-aluminum or gray-iron casting cable drums mounted on torsion shaft and grooved to receive door-lifting cables as door is raised. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft.
- C. Cables: Galvanized-steel, multistrand, lifting cables.
- D. Cable Safety Device: Include a spring-loaded steel or spring-loaded bronze cam mounted to bottom door roller assembly on each side and designed to automatically stop door if either lifting cable breaks.
- E. Bracket: Provide anchor support bracket as required to connect stationary end of spring to the wall and to level the shaft and prevent sag.
- F. Bumper: Provide spring bumper at each horizontal track to cushion door at end of opening operation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install sectional doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Tracks: Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.
- C. Accessibility: Install sectional doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.
- D. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- E. Touch-up Painting: Immediately after welding galvanized materials, clean welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A 780/A 780M.

3.2 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain sectional doors.

END OF SECTION

SECTION 08710

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 08110 - Steel Doors and Frames: for silencers integral with hollow metal frames.
 - 2. Section 08211 - Flush Wood Doors: for factory pre-fitting and factory pre-machining of doors for door hardware.
 - 3. Section 08410 - Aluminum Entrances and Storefronts: for aluminum entrance door hardware, except cylinders.

1.2 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.
- B. Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
 - a. Type, style, function, size, and finish of each hardware item.
 - b. Name and manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of each hardware set cross referenced to indications on Drawings both on floor plans and in door and frame schedule.
 - e. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for hardware.
 - g. Door and frame sizes and materials.
 - h. Product Cut Sheet of each device
 - 2. Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.
- D. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service

performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.

1. Require supplier to meet with Owner to finalize keying requirements and to obtain final instructions in writing.

1.4 PRODUCT HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- D. Deliver individually packaged door hardware items promptly to place of installation.
- E. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

1.5 MAINTENANCE

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work Product shall be equal to or better than the following:
 1. Schlage
 2. PBB, Inc.
 3. Von Duprin
 4. L.C.N.
 5. Rockwood Manufacturing Co.
 6. Pemko Manufacturing Co.
 7. Ives
 8. Equivalent product manufacturer (Substitutions).

2.2 SCHEDULED HARDWARE

- A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of finish hardware are indicated in the "Hardware Schedule" at the end of this Section. Provide appropriate hardware where none is listed. Products are identified by using hardware designation numbers of the following:
 1. Manufacturer's Product Designations: The product designation and name of one manufacturer are listed for each hardware type required for the purpose of establishing minimum requirements. Provide either the product designated or, where more than one manufacturer is specified under the Article "Manufacturers" in Part 2 for each hardware type, the comparable product of one of the other manufacturers that complies with requirements.

2. ANSI/BHMA designations used elsewhere in this Section or in schedules to describe hardware items or to define quality or function are derived from the following standards. Provide products complying with these standards and requirements specified elsewhere in this Section.
 - a. Butts and Hinges: ANSI/BHMA A156.1.
 - b. Bored and Preassembled Locks and Latches: ANSI/BHMA A156.2.
 - c. Exit Devices: ANSI/BHMA A156.3.
 - d. Auxiliary Locks and Associated Products: ANSI/BHMA A156.5.
 - e. Template Hinge Dimensions: ANSI/BHMA A156.7.
 - f. Door Controls - Overhead Holders: ANSI/BHMA A156.8.
 - g. Mortise Locks and Latches: ANSI/BHMA A156.13.
 - h. Auxiliary Hardware: ANSI/BHMA A156.16.
 - i. Self-Closing Hinges and Pivots: ANSI/BHMA A156.17.
 - j. Materials and Finishes: ANSI/BHMA A156.18.

2.3 MATERIALS AND FABRICATION

- A. Manufacturer's Name Plate: Do not use manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise acceptable to Architect.
 1. Manufacturer's identification will be permitted on rim of lock cylinders only.
- B. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI/BHMA A156 series standards for each type of hardware item and with ANSI/BHMA A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
- C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
- D. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
- E. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of reinforcing the work adequately to fasten the hardware securely. Where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use sex screw fasteners.
- F. Provide chrome accent pieces as indicated on door and glazing elevations; adhered with silicone adhesive.

2.4 HINGES, BUTTS, AND PIVOTS

- A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- B. Screws: Provide Phillips flat-head screws complying with the following requirements:
 1. For metal doors and frames install machine screws into drilled and tapped holes.
 2. For wood doors and frames install wood screws.
 3. Finish screw heads to match surface of hinges or pivots.
- C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 1. Out-Swing Exterior Doors: Nonremovable pins.
 2. Out-Swing Corridor Doors with Locks: Nonremovable pins.
 3. Interior Doors: Nonrising pins.
 4. Tips: Flat button and matching plug, finished to match leaves.

- D. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges per door leaf for doors 90 inches or less in height and one additional hinge for each 30 inches of additional height.

2.5 LOCK CYLINDERS

- A. Equip locks with manufacturer's standard 6-pin tumbler cylinders.
- B. Equip locks with manufacturer's special 6-pin tumbler cylinder with construction masterkey feature that permits voiding of construction keys without cylinder removal.
- C. Equip locks with cylinders for interchangeable-core pin tumbler inserts. Furnish only temporary inserts for the construction period, and remove these when directed.
- D. Equip locks with high-security cylinders that comply with performance requirements for Grade 1 cylinders as listed in ANSI/BHMA A156.5 and that have been tested for pick and drill resistance requirements of UL 437 and are UL listed.
- E. Metals: Construct lock cylinder parts from brass or bronze, stainless steel, or nickel silver.
- F. Comply with Owner's instructions for master keying and, except as otherwise indicated, provide individual change key for each lock that is not designated to be keyed alike with a group of related locks.
 - 1. Permanently inscribe each key with number of lock that identifies cylinder manufacturer's key symbol, and notation, "DO NOT DUPLICATE."

2.6 LOCKS, LATCHES, AND BOLTS

- A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set, unless otherwise indicated.
 - 1. Provide flat lip strikes for locks with 3-piece, anti-friction latch bolts as recommended by manufacturer.
 - 2. Provide extra long strike lips for locks used on frames with applied wood casing trim.
- B. Lock Throw: Provide 5/8-inch minimum throw of latch on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.
 - 1. Provide 1/2-inch minimum throw of latch for other bored and preassembled types of locks and 3/4-inch minimum throw of latch for mortise locks. Provide 1-inch minimum throw for all dead bolts.
- C. Flush Bolt Heads: Minimum of 1/2-inch-diameter rods of brass, bronze, or stainless steel with minimum 12-inch-long rod for doors up to 7'-0" in height. Provide longer rods as necessary for doors exceeding 7'-0" in height.
- D. Exit Device Dogging: Except on fire-rated doors where closers are provided on doors equipped with exit devices, equip the units with keyed dogging device to keep the latch bolt retracted, when engaged.
- E. Rabbeted Doors: Where rabbeted door stiles are indicated, provide special rabbeted front on lock and latch units and bolts.

2.7 PUSH/PULL UNITS

- A. Exposed Fasteners: Provide manufacturer's standard exposed fasteners for installation, thru-bolted for matched pairs but not for single units.

2.8 CLOSERS AND DOOR CONTROL DEVICES

- A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit depending on size of door, exposure to weather, and anticipated frequency of use.
 - 1. Where parallel arms are indicated for closers, provide closer unit one size larger than recommended for use with standard arms.

2. Provide parallel arms for all overhead closers, except as otherwise indicated.
- B. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ANSI A117.1 provisions for door opening force and delayed action closing.
- C. Combination Door Closers and Holders: Provide units designed to hold door in open position under normal usage and to release and close door automatically under fire conditions. Incorporate an integral electromagnetic holder mechanism designed for use with UL listed fire detectors, provided with normally closed switching contacts.
 1. Provide integral smoke detector device in combination door closers and holders complying with UL 228.
- D. Provide grey resilient parts for exposed bumpers.

2.09 DOOR TRIM UNITS

- A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units consisting of either machine screws or self-tapping screws.
- B. Fabricate edge trim of stainless steel to fit door thickness in standard lengths or to match height of protection plates.
- C. Fabricate protection plates not more than 1-1/2 inches less than door width on hinge side and not more than 1/2 inch less than door width on pull side by height indicated.
 1. Plastic Plates: Plastic laminate or high-impact polyethylene, 1/8 inch thick, in color selected.

2.10 WEATHERSTRIPPING AND SEALS

- A. General: Provide continuous weatherstripping on exterior doors and smoke, light, or sound seals on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
- B. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from stocks maintained by manufacturer.
- C. Weatherstripping at Jambs and Heads: Provide bumper-type resilient insert and metal retainer strips, surface applied unless shown as mortised or semimortised.
- D. Weatherstripping at Door Bottoms: Provide threshold consisting of contact-type resilient insert and metal housing of design and size shown.

2.11 THRESHOLDS

- A. General: Except as otherwise indicated, provide standard metal threshold unit of type, size, and profile as shown or scheduled.
- B. Exterior Hinged or Pivoted Doors: Provide units not less than 4 inches wide, formed to accommodate change in floor elevation where indicated, fabricated to accommodate door hardware and to fit door frames.

2.12 HARDWARE FINISHES

- A. Match items to the manufacturer's standard color and texture finish for the latch and lock sets (or push-pull units if no latch or lock sets).
- B. Provide finishes that match US26D – Satin Chrome.
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- D. The designations used in schedules and elsewhere to indicate hardware finishes are the industry-recognized standard commercial finishes, except as otherwise noted.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mount hardware units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
 - 1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
 - 2. NWWDA Industry Standard I.S.1.7, "Hardware Locations for Wood Flush Doors."
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- C. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements specified in Division 7 Section "Joint Sealers."
- F. Weatherstripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

3.2 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
 - 1. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.

3.3 HARDWARE SCHEDULE

MANUFACTURERS LIST

Manufacturers shall be equal to or better than the following:

SC SCHLAGE

PB P.B.B. HINGE

VD VON DUPRIN

08710 - 6
CD Issue No. 2

LC L.C.N.
RO ROCKWOOD
PE PEMKO
IV IVES

HARDWARE SET #1

EACH DOOR SHALL HAVE:

COMPLETE WITH ALL HARDWARE BY DOOR SUPPLIER.

HARDWARE SET #2

EACH DOOR SHALL HAVE:

- 3 EA. HINGES BB81-4.5 X 4.5-US26D
PB
- 1 EA. PRIVACY L9040-03B-US26D
SC
- 1 EA. CLOSER 1461-RW/PA-ALUMINUM
LC
- 2 EA. KICKPLATE K1050-10" X 2"-LDW-US32D
RO
- 1 EA. STOP 409/442-US26D
RO
- 3 EA. SILENCER 608
RO

HARDWARE SET #3

EACH DOOR SHALL HAVE:

- 1 EA. CONTINUOUS HINGE CFM83-HD1
PE
- 1 EA. EXIT DEVICE 99L-996L-03-US28/26D
VD
- 1 EA. CYLINDER 20-022-US26D
SC
- 1 EA. CLOSER 4040XP-S CUSH-ALUMINUM
LC
- 1 EA. LOCKSET
- 2 EA. KICKPLATE K1050-10" X 2"-LDW-US32D
RO

- 1 EA. THRESHOLD 171A X DW
PE
- 1 EA. SWEEP 315CN X DW
PE
- 1 SET WEATHERSTRIP 306AV-H&J
PE

HARDWARE SET #4

EACH DOOR SHALL HAVE:

- 3 EA. HINGES BB81-4.5 X 4.5-US26D
PB
- 1 EA. PASSAGE L9010-03B-US26D
SC
- 2 EA. KICKPLATE K1050-10" X 2"-LDW-US32D
RO
- 1 EA. STOP 409/442-US32D
RO
- 1 SET SOUND SEAL 312CR-H&J
PE

END OF SECTION

SECTION 08734

OVERHEAD SECTIONAL DOOR OPERATOR

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Overhead Sectional Door Openers.

1.2 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Support framing and framed opening.
- B. Section 08360 - Sectional Overhead Doors.
- C. Section 08710 - Door Hardware: Product Requirements for cylinder core and keys.
- D. Raceway and Boxes: Conduit from electric circuit to door operator and from door operator to control station. Refer to Design/Build Narrative Summary.
- E. Wiring Connections: Power to disconnect. Refer to Design/Build Narrative Summary.

1.3 REFERENCES

- A. [NEMA 250](#) - Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. [NEMA ICS 6](#) - Enclosures for Industrial Controls and Systems.
- C. [NEMA MG 1](#) - Motors and Generators.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.
- B. Electric Motors shall be alternating-current squirrel-cage motors conforming with NEMA MG 1.
- C. Wiring Connections: Requirements for electrical characteristics.
 - 1. 115 volts, 60 Hz single phase.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- 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. Details of construction and fabrication.
 - 4. Installation methods.
- C. Shop Drawings: Include detailed plans, elevations, details of framing members, required clearances and accessories. Include relationship with adjacent construction.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- E. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified with minimum of five years documented experience.

- B. Installer Qualifications: Authorized representative of the manufacturer with minimum five years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
- C. Store materials in a dry, warm, ventilated weathertight location.

1.8 PROJECT CONDITIONS

- A. 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.

1.9 WARRANTY

- A. Provide operators with a 2 year or 20,000 cycle limited warranty on motor and parts.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer shall be equal to or better than: Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com.
- B. Equivalent product manufacturer (Substitutions).

2.2 OVERHEAD SECTIONAL DOOR OPERATORS

- A. Commercial Sectional Door Operator:
 - 1. Application:
 - a. Full Vertical Sectional Door.
 - 2. Electric Motor: UL listed.
 - a. Rating:
 - 1) 1/2 horsepower single phase or three.
 - b. Motor frame comply with:
 - 1) NEMA 48 for 1/2 hp single phase.
 - c. Construction:
 - 1) Open drip-proof construction.
 - d. Reduction: Primary reduction is SuperBelt, an auto tension poly-V flex belt that does not require adjustment. Secondary reduction is by chain and sprocket.
 - e. Duty cycle: Accommodate standard usage, up to 60 cycles per hour during peak usage periods.
 - 1) Brake: DC Disc type with selectable Progressive Braking for smooth stopping.
 - 2) Clutch: Adjustable friction disc type.
 - 3) Limit System: LimitLock limit system, magnetic type providing absolute positioning with push to set and remote setting capabilities. Limit System shall remain synchronized with the door during manual operation and supply power interruptions.

3. Control System: Microprocessor based with relay motor controls on a single board. System incorporates a 16 character Liquid Crystal Display (LCD) to display the system status. System shall include the following:
 - a. Capable of monitoring and reporting on a variety of operating conditions, including: Current operating status, Current command status, Motor movement status, Current error status (if applicable), Hoist Interlock status (if applicable), External Interlock status, and 24VDC status.
 - b. A delay-on-reverse operating protocol.
 - c. Maximum run timers in both directions of travel that limit motor run time in the event a clutch slips or some other problem occurs.
 - d. Provisions for the connection of a 2-wire monitored photo-eye or a 2-wire monitored edge sensor, as well as non-monitored 2-wire sensing edges, photo-eyes or other entrapment protection devices.
 - e. Control action will be constant contact close until a monitored entrapment device is installed, allowing for selection of momentary contact.
 - f. Provisions for connection of single and/or 3-button control stations.
 - g. Provisions for connection of an external 3-wire radio controls and related control devices.
 - h. On board open, close and stop control keys for local operation.
 - i. Trolley operators with an inherent secondary reversal system.
 - j. CodeDodger radio receiver that is dual frequency cycling at 315 Mhz and 390 Mhz capable of storing 250 single button and/or 250 Open-Close-Stop transmitters with the ability to add and/or delete transmitters individually, identify and store activating transmitter IDs.
4. Mounting:
 - a. Sectional Steel Doors:
 - 1) Jackshaft/Hoist that is side mounted with:
 - (a) Direct shaft-to-shaft coupling to door.
5. Release:
 - a. Release shall be a pull and hold type mechanism with single cable operation and an integrated interlock switch on hoist units.
6. Hoist: Chain hoist consists of chain pocket wheel, chain guard and smooth hand chain on hoist units.
7. Entrapment Protection:
 - a. Control system shall have provisions to connect monitored entrapment protection devices such as monitored electric sensing edge, or monitored photo-eye and to provide constant contact close control operation in lieu of such devices.
8. Control accessories:
 - a. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Controls for interior location.
 - 3) Controls surface mounted.
 - b. Special Operation:
 - 1) Radio control operation.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify door sizes, configuration, tolerances and conditions are acceptable.

- B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly without distortion or stress.
- C. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- D. Coordinate installation of electrical service with Section 16150. Complete wiring from disconnect to unit components.

3.4 ADJUSTING

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- A. Clean components using non-abrasive materials and methods recommended by manufacturer.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08800

GLAZING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Glass and glazing for hollow metal doors.
 - 2. Glazing sealants.
- B. Related Sections:
 - 1. Section 08110 - Steel Doors and Frames

1.02 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM C920 - Specification for Elastomeric Joint Sealants.
 - 2. ASTM C1036 - Flat Glass.
 - 3. ASTM C1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
 - 4. ASTM D2000 - Classification System for Rubber Products in Automotive Applications.
- C. Flat Glass Marketing Association (FGMA):
 - 1. FGMA - Glazing Manual and Glazing Sealing Systems Manual.
- D. Consumer Product Safety Standards for Architectural Glazing. CPSC 16 CFR, Part 1201.

1.03 QUALITY ASSURANCE

- A. Conform to FGMA Glazing Manual for glazing installation methods.
- B. Provide permanent labeling for safety glass indicating conformance with specified standards.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. PPG IdeaScapes. 1-888-774-4332

2.02 GLASS MATERIALS

- A. Clear Tempered Glass: Solarban 60(2) Clear. Tempered.
 - 1. Glass Thickness: 6.0 mm (1/4 inch), unless indicated otherwise.
 - 2. Identification: Each unit of tempered glass shall be permanently identified by the manufacturer. The identification shall be etched or ceramic fired on the glass and be visible when the unit is glazed. Tempered spandrel glass is exempted from permanent labeling but shall be identified by the manufacturer with a removable paper label.

2.03 GLAZING COMPOUNDS

08800 - 1
CD Issue No. 2

- A. Polysulphide Sealant: Two component, chemical curing, non-sagging type; cured Shore A hardness of 15-25.
- B. Silicone Sealant: Single component, chemical curing; capable of water immersion without loss of properties; non-bleeding, non-staining; cured Shore A hardness of 15-25.
 - 1. Color: Clear.
- C. Acrylic terpolymer compounded especially for glazing; non-hardening, non-staining, and non-bleeding.

2.04 GLAZING ACCESSORIES

- A. Setting Blocks: Resilient blocks of 70 to 90 Shore A durometer hardness; compatible with glazing sealant.
- B. Spacers: Resilient blocks of 40 to 50 Shore A durometer hardness; self adhesive on one side; compatible with glazing sealant.
- C. Filler Rods: Closed cell or jacketed foam rods of polyethylene, butyl, neoprene, polyurethane, or vinyl; compatible with glazing sealant.
- D. Joint Cleaners, Primers, and Sealers: As recommended by glazing sealant manufacturer.
- E. Gaskets: ASTM D2000, SBC 415 to 3BC 620; extruded or molded neoprene or EPDM, black.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify surfaces of glazing channels or recesses are clean, free of obstructions, and ready for work of this Section.
- B. Beginning of installation means acceptance of substrate.

3.02 PREPARATION

- A. Clean contact surfaces; prime or seal where recommended by sealant manufacturer for intended application.
- B. Inspect glass edges immediately prior to setting; discard those with edge damage that will contribute to glazing failure.

3.03 GLAZING

- A. Locate setting blocks at quarter points of sill; set in sealant if heel or toe bead is required.
- B. Install spacers inside and out except where preshimmed tape or glazing gaskets are to be used.
- C. Set each piece in a series to other pieces in pattern draw, bow, or other visually perceptible characteristics.
- D. Provide glazing sealants and gaskets as required for particular glazing application. Coordinate with other Sections for material compatibility.
- E. Gaskets:
 - 1. Provide adequate anchorage, particularly for driven-in wedge gaskets.
 - 2. Miter and weld ends of channel gaskets at corners to provide continuous gaskets.
 - 3. Seal face gaskets at corners with sealant to close opening and prevent withdrawal of gaskets from corners.
- F. Do not leave voids in glazing channels except as specifically indicated or recommended by glass manufacturer. Force sealant into channel to eliminate voids. Tool exposed surfaces to slight wash away from joint. Trim and clean promptly.
- G. Do not allow sealant to close weeps of aluminum framing.
- H. Provide filler rod where sealants are used in the following locations:
 - 1. Head and jamb channels.
 - 2. Colored glass over 75 united inches in size.

3. Clear glass over 125 united inches in size.

3.04 ADJUSTING AND CLEANING

A. Immediately prior to Owner acceptance of Project, replace broken or otherwise damaged glass. Wash and polish glass inside and out.

END OF SECTION

SECTION 09260

GYPSUM BOARD SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Interior nonload-bearing steel stud partition framing 20 gage and lighter (designed for 5 pounds per square foot uniform load perpendicular to partition).
 - 2. Gypsum board.
 - 3. Acoustic treatment.
 - 4. Taped and sanded joint treatment.
- B. Related Sections:
 - 2. Section 06100 - Rough Carpentry: Wood furring strips, plywood, and blocking.
 - 3. Section 07210 - Building Insulation: Thermal insulation.
 - 4. Section 09900 - Painting: Paint finish applied to gypsum board.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A 525 - Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
 - 2. ASTM C 36 - Specification for Gypsum Wallboard.
 - 4. ASTM C 630 - Specification Water Resistant Gypsum Backing Board.
 - 5. ASTM C 645 - Specification for Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.
 - 6. ASTM C 754 - Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing board, or Water-Resistant Backing Board.
 - 8. ASTM C 1002 - Specification Steel Drill Screws for the Application of Gypsum Board.
- B. Gypsum Association (GA):
 - 1. GA-201 - Gypsum Board for Walls and Ceilings.
 - 2. GA-214 - Recommended Specification for Levels of Gypsum Board Finish.
 - 3. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.

1.03 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in the installation of light gage metal framing components and gypsum wallboard with minimum 5 years documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Material and Equipment: Transport, handle, store, and protect products.
- B. Protect metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- C. Store and protect metal framing with weatherproof covering, and ventilate to avoid condensation.
- D. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- E. Stack gypsum board flat to prevent sagging.

1.05 PROJECT CONDITIONS OR SITE CONDITIONS

- A. Environmental Requirements:
 - 1. Establish and maintain environmental conditions for applying and finishing gypsum board in conformance with GA-216.
 - 2. Maintain minimum 50 degrees F for 48 hours before application and finishing of gypsum board. Maintain temperature continuously until dry. Do not exceed 95 degrees F when using temporary heat sources.
 - 3. Ventilate building spaces as required to dry joint treatment materials. Prevent drafts during hot, dry weather to avoid finishing materials from drying too rapidly.

PART 2 PRODUCTS

2.01 GYPSUM BOARD MATERIALS

- A. Standard Gypsum Board: Sheetrock, ASTM C 36; 1/2 inch and 5/8 inch thick, maximum permissible length; ends square cut, tapered edges.
- B. Water Resistant Gypsum Board: Sheetrock WR, ASTM C 630, 1/2 inch thick, maximum permissible lengths; ends square cut, tapered edges.
- C. Gypsum Board Fasteners:
 - 1. Metal Framing: ASTM C 954 and C 1002, Type S-12 bugle head, corrosion-resistant self-drilling self-tapping steel screws.
 - a. One Layer 1/2 Inch: 1 inch.
 - b. One Layer 5/8 Inch: 1-1/8 inch.
 - c. Two Layers: 5/8 Inch: 1-7/8 inch.
 - 2. Wood Furring: ASTM C 1002, 1-1/4 inch, Type W bugle head, corrosion-resistant self-drilling steel screws.
- D. Gypsum Board Accessories:
 - 1. Corner Beads: Galvanized steel corner bead.
 - 2. Edge Trim: Galvanized steel casing.
 - a. No. 200-B, L shape for tight abutment at edges.
 - b. No. 200-A, J shape at other locations.
 - 3. Control Joint: No. 093 roll-formed zinc.
 - 4. Joint Materials:
 - a. Reinforcing Tape: Joint Tape.
 - b. Joint Compound: Ready-Mixed All-Purpose Joint Compound.
 - c. Adhesive: Commercial Adhesive complying with ASTM C 557.
 - 5. Acoustical Insulation: Unfaced fiberglass batts specified in Section 07210.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine existing conditions and adjacent areas where products will be installed and verify that conditions conform to product manufacturer's requirements. Verify that building framing components are ready to receive Work. Verify that rough-in utilities are in-place and located where required. Do not proceed until unsatisfactory conditions have been corrected.
- B. Beginning of erection and installation indicates acceptance of existing conditions.

3.02 ACOUSTICAL ACCESSORIES INSTALLATION

- A. Place acoustical insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions as specified in Section 07210.
- B. Provide acoustic insulation at all interior partitions bounding the following rooms:
 - a. 102, 103, 104, 105, 107, 108, and 112.

3.03 INSTALLATION - GYPSUM BOARD

- A. Install gypsum board in accordance with manufacturer's published instructions and GA-201, GA 216, and GA-600.
 - 1. Use water resistant gypsum board at each Men's and Women's Toilet Room ceiling, each Toilet Room wall and ceiling, and each Janitor Room wall and ceiling.
 - 2. Use standard gypsum board at locations not indicated to be fire resistant or water resistant type.
- B. Where applicable, install ceiling panels before the installation of wall panels.
- C. Erect single layer gypsum board in most economical direction, with attachment to firm bearing surfaces over framing members. Do not align panel joints with edges of openings.
- D. Treat cut edges, holes, fastener heads, and joints, including those at angle intersections, in water resistant gypsum board and exterior gypsum soffit board with specified joint compound. Treat prior to installation.
- E. Place gypsum panels over supporting framing members with panel ends aligning and parallel with framing members.
- F. Install fasteners from center of field of panel toward ends and edges. Install fasteners 3/8 inch from ends and edges of panels, and as follows:
 - 1. Ceiling: 12 inches on center, perimeter and field.
 - 2. Walls:
 - a. Standard: 16 inches on center, perimeter and field.
 - b. Water-Resistant: 12 inches on center, perimeter and field.

3.07 JOINT TREATMENT

- A. Reinforce interior and exterior corners at ceiling and wall surfaces. Apply 3 inch wide initial coating of joint compound, pressing tape firmly into joint compound. Wipe off excess joint compound. Apply second coat of joint compound with tools of sufficient width to extend beyond joint center, approximately 4 inches. Draw joint compound down to a smooth even plane.
- B. After drying or setting, sand or sponge joints, edges, and corners, eliminating high spots and excessive joint compound to produce smooth finish surface. Prepare surfaces to receive subsequent finishes to height of 6 inches above finish ceiling. Feather coats onto adjoining surfaces resulting in maximum camber of 1/32-inch in 12.
- C. Sand after second and third applications of joint compound. Do not to raise nap of paper when sanding.
- D. Install control joints full height of partition, consistent with lines of building spaces, with 1/2 inch between boards. Apply sealant at base of joint and control joint accessory piece at face.
 - 1. At pairs of doors, install vertical control joint at each jamb. At single doors, install control joint at latch side of jamb. In long expanses of partitions, install control joints spaced at maximum of 30 feet on center.
- E. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.

3.08 FINISH

- A. Apply gypsum board finish in accordance with manufacturer's published instructions and GA-214 Finish Levels.
- B. Provide gypsum board finish levels at locations as follows:
 - 1. Level 1: Joints and interior angles have tape embedment in joint compound. Surface free of excess joint compound. Tool Marks and ridges are acceptable.
 - a. Areas above ceilings.
 - b. Concealed areas.
 - c. Non-occupied spaces.
 - d. Areas not indicated to receive Level 3 Finish.
 - 2. Level 3: Joints and interior angles have tape embedded in joint compound and two separate coats of joint compound applied over joints, angles, fastener heads, and accessories. Surface smooth and free of tool marks and ridges.
 - a. Toilet rooms.
 - b. Public and occupied spaces.

3.09 CONSTRUCTION

- A. Interface with Other Work:
 - 1. Coordinate erection of studs with hollow metal door and window frames, sliding window, and overhead coiling door frames.
 - 2. Coordinate installation of anchors, supports, and blocking for mechanical, electrical, and building accessory items installed within framing.

3.10 FIELD QUALITY CONTROL

- A. Inspect metal framing erection, placement, spacing, fasteners, and connections to building.
- B. Inspect gypsum board installation, fastener type, spacing, and finish level.
- C. Correct deficiencies in Work which inspection indicates are not in compliance with Contract Documents.

END OF SECTION

SECTION 09511

ACOUSTICAL PANEL CEILINGS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Suspended metal grid ceiling system.
 - 2. Acoustical panels.
 - 3. Perimeter trim.
- B. Related Sections:
 - 1. Fire Protection: Sprinkler heads in ceiling system. Refer to Design/Build Narrative Summary.
 - 2. Air Distribution: Air diffusion devices in ceiling system. Refer to Design/Build Narrative Summary.
 - 3. Lighting: Light fixtures attached to ceiling system. Refer to Design/Build Narrative Summary.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM C 635 - Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
 - 2. ASTM C 636 - Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
 - 3. ASTM E 84 Test Method for Surface Burning Characteristics of Building Materials.

1.03 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Rigidly secure acoustical ceiling system including integral mechanical and electrical components with maximum deflection of 1/360.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Surface Burning Characteristics in Accordance with ASTM E 84 for Class III or C finish:
 - a. Flame Spread: Less than 200.
 - b. Smoke Density: Less than 450.
 - 2. Food Serving and Preparation Areas where Scheduled:
 - a. United States Department of Agriculture (USDA): Approved for incidental food contact.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Section 01600 - Material and Equipment: Transport, handle, store, and protect products.
- B. Deliver acoustical units in manufacturer's original unopened containers with brand name and type clearly marked.
- C. Store under cover in dry, watertight conditions.
- D. Prior to installation, store acoustical units for 24 hours minimum at same temperature and relative humidity as space where Work will be installed.

1.06 PROJECT CONDITIONS

09511 - 1
CD Issue No. 2

- A. Environmental Requirements: Maintain uniform temperature range of 60-85 degrees F, and humidity of no more than 70 percent relative humidity prior to, during, and after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Suspension System: Subject to compliance with project requirements, provide ceiling suspension system from a manufacturer equal to or better than the following:
 - 1. Armstrong World Industries Incorporated, Lancaster, PA (800) 448-1405.
- B. Acoustical Panels: Subject to compliance with project requirements, provide acoustical panels from the following manufacturers:
 - 1. Armstrong World Industries Incorporated, Lancaster, PA (800) 448-1405.
 - 2. Equivalent product manufacturer (Substitutions).

2.02 ACOUSTICAL CEILING SYSTEM - TYPE 1

- A. Suspension System:
 - 1. Manufacturers: Subject to compliance with project requirements, provide non fire-rated suspension system from one of the following:
 - a. Product shall be equal to or better than Prelude 15/16 inch, XL #7300 Exposed Tee System, by Armstrong.
 - 2. Materials:
 - a. Grid: ASTM C635, intermediate duty, steel exposed T; nominal 1 inch width; stab-in connections.
 - b. Accessories: Stabilizer bars, clips, and splices.
 - c. Grid Finish: White.
 - d. Support System: Hot or cold rolled steel channels; galvanized hanger wire, minimum 12 gage.
 - e. Edge Moldings: Metal channel with exposed flange to match suspension system.
 - f. Hold-Down Clips: Manufacturer's standard retention clips to suit conditions specified.
- B. Acoustical Lay-in Panels:
 - 1. Specification is based on the following:
 - a. Standard Fiberglass Ceiling Panels, ACT-1: Product shall be equal to or better than #1761 Fine Fissured Second Look II by Armstrong.
 - 1) Size: 24 x 48 x 3/4 inches. (Nominal 24" x 24" scored pattern)
 - 2) Edge: 15/16" Angled Tegular
 - b. Food Prep Areas, ACT-2: vinyl faced USDA approved for incidental food contact.
 - 1) Size 24 x 48 x 3/4 inches (Nominal 24" x 24" scored pattern)
 - 2) Edge: 15/16" Angled Tegular

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine surfaces and adjacent areas where products will be installed and verify that surfaces conform to product manufacturer's requirements for substrate conditions. Do not proceed until unsatisfactory conditions have been corrected.
- B. Verify that layout of hangers will not interfere with other Work.
- C. Beginning of installation indicates acceptance of existing conditions.

3.02 INSTALLATION - SUSPENSION SYSTEM

09511 - 2
CD Issue No. 2

- A. Install system in accordance with ASTM C636 and manufacturer's published instructions.
- B. If metal deck is not supplied with hanger tabs, coordinate installation of hanger clips during steel deck erection. Provide additional hangers and inserts as required.
- C. Hang system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest affected hangers and related carrying channels to span extra distance.
- D. Locate system on room axis according to Reflected Ceiling Plan, where indicated on Drawings, or locate system to a balanced grid design with edge units no less than 50 percent of acoustical panel size where Reflected Ceiling Plan not shown on Drawings
- E. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Do not eccentrically load system, or produce rotation of runners.
- F. Install edge molding at intersection of ceiling and vertical surfaces using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions. Secure at 16 inches on center.
 - 1. Rivet cross tee's at 4 feet on center to edge mold.

3.03 INSTALLATION - ACOUSTICAL PANELS

- A. Fit acoustic units in place free from damaged edges or other defects. Install acoustic units level, in uniform plane, and free from twist, warp, and dents.

3.04 CONSTRUCTION

- A. Interface with Other Work:
 - 1. Do not install acoustical ceilings until building is enclosed, heating is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
 - 2. Schedule installation of acoustic units after interior wet work is completed.
 - 3. Install after major above ceiling work is complete.
 - 4. Coordinate location of hangers with other Work.
- B. Site Tolerances:
 - 1. Variation from Flat and Level Surface: 1/8 inch in 12 feet.

3.05 FIELD QUALITY CONTROL

- A. Inspect acoustical panel placement, ceiling grid suspension system installation and connection to structure.
- B. Correct deficiencies in Work which inspection indicates are not in compliance with contract requirements.

3.06 CLEANING

- A. Clean exposed surfaces of acoustical ceilings including trim, edge moldings, and suspension system members.

3.07 MAINTENANCE STOCK

- A. Provide 2% additional stock of each ceiling type for facility maintenance. (maximum 12 panels each)

END OF SECTION

SECTION 09678
RESILIENT BASE

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Resilient base.

1.02 QUALITY ASSURANCE

- A. Regulatory Requirements: Conform to applicable code for flame/fuel/smoke rating requirements in accordance with ASTM E84.

1.03 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperature required by resilient base adhesive manufacturer three days prior to, during, and 24 hours after installation of materials.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Resilient Base - RE: Architectural Drawings and Finish Schedules; vinyl or rubber; 4 inch high cove base, 1/8 inch thickness; with matching end stops and preformed corner units.
Products:
1. Product shall be equal to or better than Roppe Rubber.
2. Equivalent product manufacturer (Substitutions).
- B. Color: "140 Fawn"
- C. Adhesive: As recommended by resilient base manufacturer for application intended.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints
- B. Corners:
1. Resilient Base: Premolded corner units.
2. Plastic Base: Miter and adhesively bond joint together.
- C. Install base on solid backing. Bond tight to wall and floor surfaces.
- D. Scribe to fit door frames and other interruptions.
- E. Pre-drill plastic base for attachment screws. Attach plastic base at 32 inches on center into metal stud wall framing.

3.02 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.

END OF SECTION

SECTION 09900

PAINTING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Surface preparation and field application of paints and finishes for interior and exterior surfaces.
 - 2. Schedule of Items to be painted.
 - 3. Exterior painting and finishing schedule.
 - 4. Interior painting and finishing schedule.
 - 5. Paint color schedule.
- B. Related Sections:
 - 1. Section 05120 - Structural Steel: Shop priming.
 - 2. Section 05210 - Steel Joists: Shop priming.
 - 3. Section 05300 - Metal Decking: Shop priming.
 - 4. Section 05500 - Metal fabrications: Shop priming.
 - 5. Section 08110 - Steel Doors and Frames: Shop priming.
 - 6. Section 08360 - Sectional Overhead Doors: Shop Priming

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

1.03 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Surface Burning Characteristics in Accordance with ASTM E-84 for Class I or A finish:
 - a. Flame Spread (Non-Combustible Surfaces): Less than 25.
 - b. Smoke Density (Non-Combustible Surfaces): Less than 450.
 - 2. Provide paint and coating materials that conform to Federal, State, and Local restrictions for Volatile Organic Compounds (VOC) content.
- B. Field Sample: Provide sample 2 foot square sample panel of each color and sheen at location indicated by Owner Construction Manager for color verification.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Section 01600 - Material and Equipment: Transport, handle, store, and protect products.
- B. Deliver paint materials in sealed original labeled containers, bearing manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and/or reducing.
- C. Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.
- D. Prevent fire hazards and spontaneous combustion.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. Apply paint finishes only when moisture content of surfaces is within manufacturer's acceptable ranges for type of finish being applied.

- B. Surface temperatures or surrounding air temperature to be above 40 degrees F before applying alkyd finishes; above 45 degrees F for interior latex, and 50 degrees F for exterior latex work. Minimum for varnish and transparent finishes is 65 degrees F.
- C. Provide continuous ventilation and heating facilities to maintain temperatures above 45 degrees F for 24 hours prior to, during and 48 hours after application of finishes.
- D. Do not apply paint in areas where dust is being generated.
- E. Provide lighting level in areas being painted of 80 foot candles measured mid-height at substrate surface.

1.06 EXTRA MATERIALS

- A. Furnish the following to Owner as part of contract closeout under provisions of Section 00800.
 - 1. Provide 2 gallons of each color, type and surface texture for Residential & Apparatus Bay Area each.
- B. Label each container with color, type, texture, room locations, in addition to the manufacturer's label.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with project requirements, provide products that are equal to or better than following manufacturers:
 - 1. Sherwin-Williams Company, Cleveland, OH (800) 321-8194.
 - 2. Equivalent product manufacturer (Substitutions).

2.02 MATERIALS

- A. Paints:
 - 1. Ready-mixed; pigments fully ground maintaining a soft paste consistency, capable of readily and uniformly dispersing to a complete homogeneous mixture.
 - 2. Providing good flowing and brushing properties and be capable of drying or curing free of streaks or sags.
- B. Primers and Undercoaters: Manufactured by same manufacturer as finish coat materials.
- C. Paint Accessory Materials: Linseed oil, shellac, turpentine and other materials not specifically indicated herein but required to achieve the finishes specified of high quality and approved manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine surfaces and adjacent areas where products will be applied and verify that surfaces conform to product manufacturer's requirements for substrate conditions. Do not proceed until unsatisfactory conditions have been corrected.
- B. Beginning of application indicates acceptance of substrate conditions.

3.02 PREPARATION

- A. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, and conditions otherwise detrimental to formation of a durable paint film.
- B. Perform preparation and cleaning procedures in accordance with paint manufacturer's published instructions for each particular substrate condition.
 - 1. Provide barrier coats over incompatible primers or remove and reprime as required.
 - 2. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be painted or provide surface

- applied protection prior to surface preparation and painting operations. Reinstall all removed items after completion of paint work.
 - 3. Clean surfaces to be painted before applying paint or surface treatment. Remove oil and grease prior to mechanical cleaning.
- C. Ferrous Metals: Clean ferrous surfaces, that are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.
 - 1. Touch-up shop-applied prime coats, where damaged or bare. Clean and touch-up with same type shop primer.
- D. Galvanized Surfaces: Clean free of oil and surface contaminants with non-petroleum based solvent. Apply coat of etching primer if required by paint manufacturer.
- E. Cementitious Materials: Prepare cementitious surfaces to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze.
 - 1. Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests.
 - a. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct condition before application of paint.
 - 2. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed instructions.
 - 3. Clean floor surfaces scheduled to be painted with a commercial solution of muriatic acid, or other etching cleaner. Flush floor with clean water to neutralize acid, and allow to dry before painting.
- F. Wood: Clean wood surfaces to be painted of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view, and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of priming coat. After priming, fill holes, and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.
 - 1. Prime, stain, or seal wood required to be job-painted immediately upon delivery to job. Prime edges, ends faces, undersides, and backsides of such wood, including cabinets and counters.
 - 2. Seal tops, bottoms, and cut-outs with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.
- G. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

3.03 APPLICATION

- A. Apply paint products in accordance with manufacturer's published instructions using application procedures approved for the particular application and substrate to the specified Minimum Dry Film Thickness (MDF). Apply each coat to uniform finish.
- B. Apply each coat slightly darker than preceding coat unless otherwise approved by Owner Construction Manager. Sand lightly between coats to achieve specified finish.
- C. Do not apply finishes on surfaces that are not dry.
- D. Number of coats and film thickness required is same regardless of application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer.
- E. Apply additional coats when undercoats, stains, or other conditions show through final coat until paint film is of uniform finish, color, and appearance. Surfaces, including edges, corners, crevices, welds, and exposed fasteners to receive minimum dry film thickness equivalent to that of flat surfaces.
- F. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate. Provide minimum dry film thickness (MDF) of the entire coating system as indicated in Painting and Finishing Schedule at end of this Section.
- G. Block Fillers: Apply block fillers to concrete masonry units at rate to provide complete coverage with pores filled.
- H. Prime Coats: Before application of finish coats, apply a prime coat of material as recommended by manufacturer to material scheduled to be painted or finished that has

not been shop primed. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.

- I. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, laps, brush marks, runs, sags, or other surface imperfections will not be acceptable.
- J. Hollow Metal Doors: Paint each door edge.
- K. Completed Work: Match Owner Construction Manager approved field samples for color and sheen.

3.04 MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Replace identification markings on mechanical or electrical equipment when painted over or spattered.
- B. Paint exposed conduit and electrical equipment occurring in finished areas where it will be exposed to the public. Color and texture to match adjacent surfaces.
- C. Paint exposed piping occurring in finished areas where it will be exposed to the public. Color and texture to match adjacent surfaces.
- D. Paint both sides and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.
- E. Prepaint Gas piping prior to installation. (Touch-up paint after installation.)
 - 1. Color:
 - a. Roof (Yellow): P5, OSHA Standard "Safety Yellow."
 - b. Other Areas: Match adjacent surfaces.

3.05 FIELD QUALITY CONTROL

- A. Inspect painting and coating application for scheduled material, color, sheen, specified thickness (MDF), and coverage.
- B. Correct deficiencies in Work which inspection indicates are not in compliance with Contract requirements.

3.06 CLEANING

- A. As work proceeds and upon completion, promptly remove paint where spilled, splashed, or spattered.
- B. During progress of work keep premises free from any unnecessary accumulation of tools, equipment, surplus materials, and debris.
- C. Collect waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.
- D. Upon completion of work leave premises neat and clean.

3.07 PROTECTION

- A. Protect other surfaces from paint and damage. Repair damage as a result of inadequate or unsuitable protection.

3.08 SCHEDULE OF ITEMS TO BE PAINTED

- A. Painted finishes shall be provided for, but not limited to, the following items. Refer to Drawings and Paint Color Schedule at end of this Section for designated finishes and colors of areas.
 - 1. Exterior: All exterior surfaces including, but not limited to:
 - a. Hollow metal doors and frames.
 - b. Pipe Bollards.
 - c. Metal railings.
 - d. Paving graphics and markings.
 - e. Exposed piping and conduit, hangers and supports.

2. Interior: All interior surfaces as scheduled on Drawings including, but not limited to:
 - a. Hollow metal doors and frames.
 - b. Hollow metal window frames.
 - c. Gypsum wallboard.
 - d. Pipe Bollards.
- B. Do not paint the following Items:
1. Aluminum, brass, bronze, stainless steel, and chrome plated steel.
 2. Pre-finished items, such as toilet compartments, acoustical ceiling materials, mechanical, and electrical equipment.
 3. UL, FM, and other code-required labels.
 4. Equipment identification, performance rating, and name plates.
 5. Finish hardware.
 6. Factory finished metal wall panels, metal wall panel trim, and metal gravelstops.

3.09 EXTERIOR PAINTING AND FINISHING SCHEDULE

- A. Ferrous Metal: Gloss, Water Base, Water Alkyd.
1. 1st Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: DTM Acrylic Primer/Finish, B66W1, White; MDF 3.0 mils.
 2. 2nd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: Pro Industrial DTM Acrylic Gloss Coating, B66W01051; MDF 3.0 mils.
 3. 3rd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: Pro Industrial DTM Acrylic Gloss Coating, B66W01051; MDF 3.0 mils.
- B. Galvanized Metal: Gloss, Water Base, Acrylic or Water Alkyd.
1. 1st Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: DTM Acrylic Primer/Finish, B66W1, White; MDF 3.0 mils.
 2. 2nd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: Pro Industrial DTM Acrylic Gloss Coating, B66W01051; MDF 3.0 mils.
 3. 3rd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: Pro Industrial DTM Acrylic Gloss Coating, B66W01051; MDF 3.0 mils.
- C. Concrete Paving Markings and Graphics: Eggshell/Satin, Modified Acrylic Latex.
1. 1st Coat: Reduce in accordance with manufacturer's published instructions.
 - a. Product shall be equal to or better than Sherwin-Williams: Porch and Floor Enamel Satin, A32W251; MDF 1.2 mils.
 2. 2nd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: Porch and Floor Enamel Satin, A32W251; MDF 1.2 mils.
 3. 3rd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: Porch and Floor Enamel Satin, A32W251; MDF 1.2 mils.
- D. Wood: Semi-Gloss, Water Base, Vinyl Acrylic Enamel.
1. 1st Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: ProMar 400 Zero VOC Interior Latex Primer, B28W4600; MDF 1.2 mils.
 2. 2nd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: ProMar 400 Interior Alkyd Semi-Gloss Enamel, B34W04451; MDF 1.0 mils.

3.10 INTERIOR PAINTING AND FINISHING SCHEDULE

- A. Ferrous Metal: Gloss, Water Base, Water Alkyd.
 - 1. 1st Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: DTM Acrylic Primer/Finish, B66W1, White; MDF 3.0 mils.
 - 2. 2nd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: Pro Industrial DTM Acrylic Gloss Coating, B66W01051; MDF 3.0 mils.
 - 3. 3rd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: Pro Industrial DTM Acrylic Gloss Coating, B66W01051; MDF 3.0 mils.
- B. Ferrous Metals: Semi-Gloss, Water Base, Vinyl Acrylic Latex and Acrylic.
 - 1. 1st Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: DTM Acrylic Primer/Finish, B66W1, White: MDF 3.0 mils.
 - 2. 2nd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: ProMar 400 Interior Alkyd Semi-Gloss Enamel, B34w04451 Series; MDF 1.2g mils.
 - 3. 3rd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: ProMar 400 Interior Alkyd Semi-Gloss Enamel, B34w04451 Series; MDF 1.2 mils.
- C. Gypsum Board: Eggshell, Water Base, Acrylic Vinyl Acrylic Enamel.
 - 1. 1st Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: ProMar 400 Zero VOC Interior Latex Primer, B28W4600; MDF 1.2 mils.
 - 2. 2nd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: ProMar 400 Zero VOC Latex Eggshell Enamel, B20W04651; MDF 1.0 mils.
- D. Gypsum Board: Semi-Gloss, Water Base, Vinyl Acrylic Enamel.
 - 1. 1st Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: ProMar 400 Zero VOC Interior Latex Primer, B28W4600; MDF 1.2 mils.
 - 2. 2nd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: ProMar 400 Zero VOC Interior Latex Semi-Gloss Enamel, B31W4651; MDF 1.0 mils.
- E. Concrete Unit Masonry: Semi-Gloss, Water Base, Vinyl Acrylic Latex/Polyvinyl Acetate.
 - 1. 1st Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: PrepRite Interior/Exterior Block Filler, B25W25.
 - 2. 2nd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: ProMar 400 Low VOC Interior Latex Semi-Gloss Enamel, B31 W4651; MDF 1.2 mils.
 - 3. 3rd Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: ProMar 400 Low VOC Interior Latex Semi-Gloss Enamel, B31 W4651; MDF 1.2 mils.
- F. Exposed Overhead Structure - Ferrous Metals: Flat, Alkyd Resin.
 - 1. 1st Coat:
 - a. Product shall be equal to or better than Sherwin-Williams: Dryfall Flat Brilliant White, B48W60; MDF 3.0 mils.
 - 2. 2nd Coat:

- a. Product shall be equal to or better than Sherwin-Williams: Dryfall Flat Brilliant White, B48W60; MDF 3.0 mils.

END OF SECTION

SECTION 10350

FLAG POLES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Aluminum flagpoles.
- B. Related Sections include the following:
 - 1. Section 03300 - Cast-in-Place Concrete: for concrete footings for flagpoles, if any, and if not specified in this Section.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide flagpoles capable of withstanding the effects of wind loads as determined according to the building code in effect for this Project or NAAMM FP 1001, "Guide Specifications for Design Loads for Metal Flagpoles," whichever is more stringent.
 - 1. Base flagpole design on maximum standard-size flag suitable for use with pole or flag size indicated, whichever is more stringent.
 - 2. Basic Wind Speed: For Project location, 70 mph.

1.3 SUBMITTALS

- A. Product Data: For each type of flagpole required. Include installation instructions.
- B. Shop Drawings: Show general layout, anchoring and supporting systems.
- C. Structural Calculations: For flagpoles indicated to comply with certain design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Finish Samples for Verification: For each finished metal used for flagpoles and accessories.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each flagpole as a complete unit from a single manufacturer, including fittings, accessories, bases, and anchorage devices.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General: Spiral wrap flagpoles with heavy kraft paper or other weathertight wrapping and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work shall be equal to or better than the following:
 - 1. American Flagpole, 1.800.368.7176 www.americanflagpole.com
 - 2. Equivalent product manufacturer (Substitutions).

2.2 FLAGPOLE

- A. Furnish and install equal or better than American Flagpole Architectural Series 93380-001 (8'-0" long, 30 degree angle) where shown on plans, complete with standard features, a double revolving truck for external halyard operation, with exposed height, total length, butt diameter, top diameter and butt wall thickness measurements as listed. Provide standard flagpole fittings and equipment equal to or better than manufactured by American Flagpole, Abingdon, VA.
1. Material: Alloy 6063-T6 aluminum tubing with uniform conical taper.
 2. Finish: Directional sanded satin ground.
 3. Finial: Clear anodized aluminum ball with flush seam.
 4. Truck: Double metal sheave cast aluminum revolving with stainless steel bearing.
 5. Halyard: #10 (5/16" dia.) braided polypropylene rope with two (2) chrome-plated bronze swivel snaphooks.
 6. Cleats: Two (2) 9" cast aluminum, each attached with two (2) 5/16" stainless steel screws.
 7. Collar: Spun aluminum flash collar finished to match pole.

PART 3 - EXECUTION

3.1 FLAGPOLE INSTALLATION

- A. General: Install flagpoles where shown and according to Shop Drawings and manufacturer's written instructions.

END OF SECTION 10350

SECTION 10810
TOILET ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Toilet accessories and attachment hardware.
- B. Related Sections:
 - 1. Section 01010 - Summary of Work: General procedures related to Owner furnished products.
 - 2. Section 06100 - Rough Carpentry: Blocking for attachment of accessories.

1.02 REFERENCES

- A. American National Standards Institute (ANSI): ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with project requirements, provide toilet accessory products equal to or better than those manufactured by one of the following:
 - 1. American Specialties Co., Inc.; Deer Park, NY
 - 2. Equivalent product manufacturer (Substitutions).

2.02 MATERIALS

- A. Stainless Steel: AISI Type 302/304.
- B. Mounting Devices: Hot-dip galvanized after fabrication or of same material as accessory unit.
- C. Adhesive: Epoxy type contact cement.
- D. Finishes:
 - 1. Chrome/Nickel Plating: Polished finish.
 - 2. Stainless Steel: No. 4 satin finish, unless specified otherwise.
 - 3. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.

2.03 FABRICATION

- A. Weld and grind smooth joints of fabricated components.
- B. Form exposed surfaces from one sheet of stock, free of joints. Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- C. Provide steel anchor plates and anchor components for installation on building finishes. Hot-dip galvanize ferrous metal anchors and fastening devices.
- D. Back paint components where contact is made with building finishes to prevent electrolysis.
- E. Shop assemble components and package complete with anchors and fittings.

PART 3 EXECUTION

3.01 PREPARATION

- A. Deliver inserts and rough-in frames to jobsite at appropriate time for building-in. Use templates and rough-in measurements as required.

- B. Ensure that blocking is appropriately installed and ready to receive accessories.

3.02 INSTALLATION

- A. Install fixtures, accessories, and items in accordance with manufacturer's instructions and as shown on Drawings. Use tamper-proof fasteners.
- B. Install true, plumb, and level, securely and rigidly anchored to wall framing.

3.03 SCHEDULE OF ACCESSORIES

- A. Refer to Drawing for Accessory Schedules.

END OF SECTION

Section 13419

METAL BUILDING SYSTEMS

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. Structural-steel framing.
 - 2. Metal roof panels.
 - 3. Metal wall panels.
 - 4. Interior liner panels.
 - 5. Thermal insulation & vapor barrier liner system
 - 6. Gutters, downspouts and trim.
 - 7. Accessories.
- B. Related Sections:
 - 1. Section 03252 Control and Construction Joint Filler
 - 2. Section 03300 Cast-In-Place Concrete
 - 3. Section 08110 Steel Doors and Frames
 - 4. Section 08710 Door Hardware
 - 5. Section 08734 Overhead Sectional Door Operator
 - 6. Section 08800 Glazing

1.3 DEFINITIONS

- A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in referenced standards.
- B. PEB (Pre-Engineered Builder): shall refer elsewhere in the documents to the subcontractor for the work of this section.

1.08 CONTRACTOR DESIGN AND BUILD ENGINEERED SYSTEMS

- 1. The Contractor is responsible for providing engineered designs for all products and systems of this section requiring a licensed engineer. All engineered systems shall be designed by engineers licensed in the state of Oklahoma. Required submittal drawings shall bear the signed seal of the responsible engineer of record.
- 2. The signed and sealed documents provided by the Architect do not constitute engineered systems.
- 3. The Metal Building Systems (PEB) shall be a subcontractor to the Contractor. The selection of this subcontractor shall be the choice of successful low bidder. The Metal Building Systems

signed and sealed submittals and individual product submittals shall be subject to the approval of the Owner and the Architect.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of metal building system component. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - 1. Structural-steel-framing system.
 - 2. Metal roof panels.
 - 3. Metal wall panels.
 - 4. Metal ceiling and liner panels.
 - 5. Thermal insulation & vapor barrier liner system.
 - 6. Flashing and trim.
 - 7. Accessories.
- B. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Anchor-Bolt Plans: Submit anchor-bolt plans and templates before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach metal building to foundation. Indicate column reactions at each location.
 - 2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
 - a. Show provisions for attaching suspended systems and equipment.
 - 3. Interior and Exterior Metal Roof and Wall Panel Layout Drawings: Show layouts of metal panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of sizes indicated below:
 - 1. Metal Panels..
 - 2. Flashing and Trim.
 - 3. Vapor-Vapor Barrier Liner.
- D. Door Schedule: For doors and frames. Use same designations indicated on Drawings. Include details of reinforcement.
- E. Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Manufacturer Accreditation: Statement that metal building system and components were designed and produced by a manufacturer accredited according to the International Accreditation Service's AC472.
- B. Welding certificates.
- C. Metal Building System Certificates: For each type of metal building system, from manufacturer.

1. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
 - a. Name and location of Project.
 - b. Order number.
 - c. Name of manufacturer.
 - d. Name of Contractor.
 - e. Building dimensions including width, length, height, and roof slope.
 - f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
 - g. Governing building code and year of edition.
 - h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
 - i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
 - j. Building-Use Category: Indicate the effect of Structural Importance Category 1 on load importance factors.

D. Erector Certificates: For each product, from manufacturer.

E. Manufacturer Certificates: For each product, from manufacturer.

F. Material Test Reports: For each of the following products:

1. Structural steel including chemical and physical properties.
2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
3. Tension-control, high-strength, bolt-nut-washer assemblies.
4. Non-shrink grout.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for insulation and vapor-retarder facings. Include reports for thermal resistance, fire-test-response characteristics, water-vapor transmission, and water absorption.

H. Surveys: Show final elevations and locations of major members. Indicate discrepancies between actual installation and the Contract Documents. Have surveyor who performed surveys certify their accuracy.

I. Warranties: Sample of special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panel finishes to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer and member of MBMA.

1. Accreditation: According to the International Accreditation Service's AC472.
2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in the State of Oklahoma.

- B. Land Surveyor Qualifications: A professional land surveyor who practices in jurisdiction where Project is located and who is experienced in providing surveying services of the kind indicated.
- C. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- D. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.
- E. Welding Qualifications: Qualify procedures and personnel according to the following:
 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.3, "Structural Welding Code - Sheet Steel."
- F. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.
- G. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

1.9 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements:
 1. Established Dimensions for Foundations: Comply with established dimensions on approved anchor-bolt plans, establishing foundation dimensions and proceeding with fabricating structural framing without field measurements. Coordinate anchor-bolt installation to ensure that actual anchorage dimensions correspond to established dimensions.
 2. Established Dimensions for Metal Panels: Where field measurements cannot be made without delaying the Work, either establish framing and opening dimensions and proceed with fabricating metal panels without field measurements or allow for field trimming metal panels. Coordinate construction to ensure that actual building dimensions, locations of structural members, and openings correspond to established dimensions.

1.10 COORDINATION

- A. Coordinate sizes and locations of concrete foundations and casting of anchor-bolt inserts into foundation walls and footings. Concrete, reinforcement, and formwork requirements are specified in Section 03000 "Cast-in-Place Concrete."
- B. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leak-proof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. Special Warranty on Metal Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.
- B. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.0 METAL BUILDING SYSTEM

- A. Description: Provide a complete, integrated set of metal building system manufacturer's standard mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.
 - 1. Provide metal building system of size and roof slopes, and spans indicated.
 - 2. Bay Spacing shall be varied to accommodate the locations walls, doors, windows and clear spaces indicated.
- B. Primary-Frame Type:
 - 1. Rigid Clear Span: Solid-member, structural-framing system without interior columns.
- C. End-Wall Framing:
 - 1. East end wall: manufacturer's standard, for buildings not required to be expandable, consisting of load-bearing end-wall and corner columns and rafters.
 - 2. West end wall shall be designed to accommodate future one-story office addition. Secondary framing to provide rough openings for future doors indicated. Provide framing as required to install exterior and interior wall panels over rough openings.
- D. Secondary-Frame Type: Manufacturer's standard purlins and joists and flush-framed girts.
- E. Eave Height: as indicated on Drawings.

- F. Roof Slope: as indicated on the Drawings.
- G. Roof System: as indicated on the Drawings.
- H. Exterior Wall Finishes: as indicated on the Drawings.

2.1 METAL BUILDING SYSTEM PERFORMANCE

- A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."
 - 1. Design Loads: As required by ASCE/SEI 7 and 2015 International Building Code.
- C. Wind Load & Seismic Performance: Design metal building system assemblies to withstand design loads with deflections in accordance with 2015 International Building Code, Risk Category IV.
- D. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 at test-pressure difference of 2.86 lbf/sq. ft. (137 Pa).
- E. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at a wind-load design pressure of not less than 2.86 lbf/sq. ft. (137 Pa).

2.2 STRUCTURAL-STEEL FRAMING

- A. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafter, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
 - 1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.
 - 2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
 - 3. Truss-Frame, Clear-Span Frames: Rafter frames fabricated from joist girders, and I-shaped column sections fabricated from shop-welded, built-up steel plates or structural-steel shapes.
- B. Bracing: Provide adjustable wind and lateral bracing that:
 - 1. Does not bypass windows.
 - 2. Is not exposed to interior view at spaces with wall or ceiling finishes.

2.3 METAL PANELS

- A. Wall Panels: 26 gauge MBCI PBR or equal. Color as indicated.
- B. Roof Panels: 26 gauge MBCI PBR or equal. Color as indicated.

- C. Liner Panels: 26 gauge MBCI 7.2 or equal. Color: white.

2.4 THERMAL INSULATION & LINER SYSTEM

A. Products:

1. Product shall be equal to or better than Simple Saver System, manufactured by Thermal Design, Inc., P.O. Box 468, 601 N. Main Street, Madison, NE 68748. Tel: (800) 255-0776 or (402) 454-6591. Fax: (402) 454-2708. www.thermaldesign.com.

B. Insulation: ASTM C 991, Type I and ASTM E 84 with a thermal resistance and thickness as follows:

1. Roof: R-28.6: 6 inches R-19 + 3.5 inches R-11.
2. Walls: R-25, 8 inches

C. Vapor Barrier Liner Fabric: high density polyethelene coated woven fabric. Color: white

D. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

E. Vapor Barrier Lap Sealant: Solvent-based, Simple Saver polyethylene fabric adhesive.

F. Vapor Barrier Tape: Double-sided sealant tape 3/4 inch (19 mm) wide by 1/32 inch (.79 mm) thick.

G. Vapor Barrier Patch Tape: Single-sided, adhesive backed sealant tape 3 inches (76 mm) wide made from same material as liner fabric.

1. Thermal Breaks: 1/8 inch (3 mm) thick by 3 inch (76 mm) wide white, closed-cell polyethylene foam with pre-applied adhesive film and peel-off backing.
2. Polystyrene snap-on thermal blocks.

H. Straps:

1. 100 KSI minimum yield tempered, high-tensile-strength steel.
2. Size: Not less than 0.020 inch (0.50 mm) thick by 1 inch (25 mm) by continuous length.
3. Galvanized, primed, and painted to match specified finish color on the exposed side.
4. Color:
 - a. White.

I. Fasteners:

1. For light gage steel: #12 by 3/4 (19 mm) inch plated Tek 2 type screws with sealing washer, painted to match specified color.
2. For heavy gage steel: #12 by 1-1/2 inch (38 mm) plated Tek 4 type screws with sealing washer, painted to match specified color.

J. Wall Insulation Hangers: Fast-R preformed rigid hangers, 32 inch (813 mm) long galvanized steel strips with barbed arrows every 8 inches (203 mm) along its length.

2.5 DOORS AND FRAMES

- A. Swinging Personnel Doors and Frames: As specified in other sections.

2.6 ACCESSORIES

- A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
- B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
1. Closures: Provide closures at eaves and ridges, fabricated of same material as metal roof panels.
 2. Clips: Manufacturer's standard, formed from [steel] [stainless-steel] sheet, designed to withstand negative-load requirements.
 3. Cleats: Manufacturer's standard.
 4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.
1. Closures: Provide closures at eaves and rakes, fabricated of same material as metal wall panels.
- D. Flashing and Trim: Formed from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match adjacent metal panels.
1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
 2. Opening Trim: Formed from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating. Trim head and jamb of door openings, and head, jamb, and sill of other openings.
- E. Gutters: Formed from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- (2438-mm-) long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
1. Gutter Supports: Fabricated from same material and finish as gutters.
 2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.
- F. Downspouts: Formed from 0.022-inch (0.56-mm) nominal-thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- (3-m-) long sections, complete with formed elbows and offsets.

1. Mounting Straps: Fabricated from same material and finish as gutters.
- G. Continuous or Sectional-Ridge Type: Factory-engineered and -fabricated, continuous unit; fabricated from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal roof panels. Fabricated in minimum 10-foot- (3-m-) long sections. Provide throat size and total length indicated, complete with side baffles, ventilator assembly, end caps, splice plates, and reinforcing diaphragms.
1. Bird Screening: Galvanized steel, 1/2-inch- (13-mm-) square mesh, 0.041-inch (1.04-mm) wire; or aluminum, 1/2-inch- (13-mm-) square mesh, 0.063-inch (1.6-mm) wire.
- H. Materials:
1. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.
 - a. Fasteners for Metal Roof Panels: Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with a stainless-steel cap or zinc-aluminum-alloy head and EPDM sealing washer.
 - b. Fasteners for Metal Wall Panels: Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with EPDM sealing washers bearing on weather side of metal panels.
 2. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
 3. Metal Panel Sealants:
 - a. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape of manufacturer's standard size.
 - b. Joint Sealant: ASTM C 920; one-part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

2.7 FABRICATION

- A. General: Design components and field connections required for erection to permit easy assembly.
1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
 2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.
- B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.
- C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
1. Make shop connections by welding or by using high-strength bolts.
 2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.

3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
 4. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.
- D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
1. Make shop connections by welding or by using non-high-strength bolts.
 2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.
- E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.
- F. Louvers: Provide fully screened louvers in configuration indicated and sized to accommodate motorized fan specified under Sections 15000 and 16000. Louvers at both building ends to match in size and shape. Match adjacent wall panel and trim colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.
 1. Engage land surveyor to perform surveying.
- C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.
- B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

- A. Erect metal building system according to manufacturer's written erection instructions and erection drawings.
- B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.
- C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.
- D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
- F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.
- G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
 - 1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
 - 2. Locate and space wall girts to suit openings such as doors and windows.
 - 3. Locate canopy framing as indicated.
 - 4. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.
- H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
 - 1. Tighten rod and cable bracing to avoid sag.
 - 2. Locate interior end-bay bracing only where indicated.
- I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.
- J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 METAL PANEL INSTALLATION, GENERAL

- A. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.

1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.
- B. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
 - a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
 2. Install metal panels perpendicular to structural supports unless otherwise indicated.
 3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 5. Locate metal panel splices over, but not attached to, structural supports with end laps in alignment.
 6. Lap metal flashing over metal panels to allow moisture to run over and off the material.
- C. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.
1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
- D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
- E. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.
1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.

3.5 METAL ROOF PANEL INSTALLATION

- A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
1. Install ridge and hip caps as metal roof panel work proceeds.
 2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.
- B. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

3.6 METAL WALL PANEL INSTALLATION

- A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
 2. Shim or otherwise plumb substrates receiving metal wall panels.
 3. When two rows of metal panels are required, lap panels 4 inches (102 mm) minimum.
 4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
 5. Rigidly fasten base end of metal wall panels and allow eave end free movement due to thermal expansion and contraction. Predrill panels.
 6. Flash and seal metal wall panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
 7. Install screw fasteners in predrilled holes.
 8. Install flashing and trim as metal wall panel work proceeds.
 9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated; or, if not indicated, as necessary for waterproofing.
 10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
 11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.
- B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.
- C. Insulated Metal Wall Panels: Install insulated metal wall panels on exterior side of girts. Attach panels to supports at each panel joint using concealed clip and fasteners at maximum 42 inches (1067 mm) o.c., spaced not more than manufacturer's recommendation. Fully engage tongue and groove of adjacent insulated metal wall panels.
1. Install clips to supports with self-tapping fasteners.
 2. Apply continuous ribbon of sealant to panel joint on concealed side of insulated metal wall panels as vapor seal; apply sealant to panel joint on exposed side of panels as weather seal.

3.7 THERMAL INSULATION INSTALLATION

- A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to insulation and vapor barrier liner system manufacturer's written instructions.

3.8 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
 2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
 1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).
 - C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches (914 mm) o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
 - D. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1524 mm) o.c. in between.
 1. Provide elbows at base of downspouts to direct water away from building.
 - E. Continuous Roof Ventilators: Set ventilators complete with necessary hardware, anchors, dampers, weather guards, rain caps, and equipment supports. Join sections with splice plates and end-cap skirt assemblies where required to achieve indicated length. Install preformed filler strips at base to seal ventilator to metal roof panels.
 - F. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.9 CLEANING AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- C. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.
 1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

- D. Touchup Painting: Cleaning and touchup painting are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
- E. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
 - 1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 13419

SECTION 15100
Plumbing Narrative

PART 1 GENERAL

1.01 SUMMARY

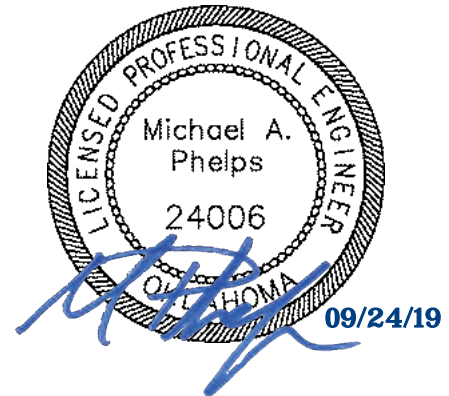
- A. Section Includes: Plumbing Narrative as follows.



Yale Fire Department Owner's Project Requirements

Plumbing

Date: 9/24/2019



Introduction

This document contains the *Owner's Project Requirements (OPR)* concerning the Plumbing components for the Yale Fire Department (YFD) Fire Station project. The OPR forms the basis from which all design, construction, acceptance, and operation decisions are made. The OPR can be modified as the owner's objectives and criteria are refined.

Plumbing Systems

1. Plumbing General

- 1.1. Contractor to refer to the Architectural, Structural and Civil drawings, the MEP design narratives, and to design, size, and install all required plumbing systems per the latest adopted International Plumbing Code, International Fuel Gas Code, all local amendments, Yale Fire Department (YFD) requirements, and all other adopted codes.
- 1.2. For continuation of utilities 5'-0" beyond building refer to Civil Engineering drawings unless noted otherwise.
- 1.3. Connect all plumbing fixtures to water and sanitary lines.
- 1.4. All underground plumbing piping subject to freeze shall be installed below local area frost line minimum. Contractor to verify site frost depth before installation.
- 1.5. Plumbing contractor shall provide a leak-proof system able to perform the intended service without failure or degradation.
- 1.6. Plumbing contractor shall coordinate with Owners project manager for all work required outside building and underground.
- 1.7. All piping shall be rigidly secured.
- 1.8. Contractor shall coordinate locations of all below grade piping with structural footings and grade beams prior to installation.
- 1.9. Provide access doors for all inaccessible valves and cleanouts.
- 1.10. Piping installed in stud walls shall be protected with minimum 1/16 inch shield plates extending beyond the pipe in all directions.
- 1.11. Cap all pipe openings during construction.
- 1.12. Sleeve piping through exterior walls, fire and smoke rated walls and assemblies, on grade slab floors, and multi-story floors. Annular space between pipe and sleeve shall be caulked and sealed. Fire rated penetrations shall be fire stopped to meet rating of construction penetrated. Extend sleeves a minimum of 1 inch above floor penetrations in potentially wet areas such as a mechanical and equipment rooms.
- 1.13. Route all piping within partitions or chases. Do not require furring other than those shown on the drawings.
- 1.14. All valves, fittings and piping shall be suitable for intended service and system temperatures and pressures.
- 1.15. Do not route piping subject to freeze in unheated areas.
- 1.16. Install above ground PVC piping according to ASTM D 2665. Install below ground PVC piping according to ASTM D 2321.

- 1.17. Provide wall boxes with shut-off valves and water hammer arrestors for all clothes washers and ice machines.
- 1.18. Provide gas to all gas-fired appliances including, but not limited to, water heaters, clothes dryers, furnaces, and radiant heaters.
2. Owner Provided Equipment and Systems:
 - 2.1. AIRVAC 911 vehicle exhaust removal systems in the Apparatus Bay.
 - 2.2. Compressed air and breathing air equipment, piping, hose reels, and accessories in Apparatus Bay.
 - 2.3. Domestic water hose reels in Apparatus Bay. Coordinate quantity and locations with Owner.
3. Sanitary and Vent
 - 3.1. Provide a complete system of waste and vent lines from all fixtures. All waste lines shall be installed on a continuous waste and vent system as required by codes and/or regulations.
 - 3.2. Slope sanitary sewer piping as follows:
 - 3.2.1. 2-1/2" and smaller at 1/4" per foot.
 - 3.2.2. 3" and larger at 1/8" per foot
 - 3.3. Provide cleanouts at the end of each run, at any change of direction greater than 45 degrees, at a maximum of 50'-0" on center inside the building and at a maximum spacing of 100'-0" on center outside the building, or as shown on drawings. Provide additional cleanouts as noted and/or required to fully clean and service piping systems. Locate cleanouts a minimum of 18 inches clear from walls and obstructions to allow servicing. Cleanouts shall be of nominal sizes for pipes up to 4 inches and not less than 4 inches for larger pipes.
 - 3.4. All stacks shall be supported at their base and at every floor level to the roof line.
 - 3.5. Vent piping shall not be less than 1-1/2 inch in diameter and shall not have a diameter less than half that of the trap being vented.
 - 3.6. All changes of direction shall be made by the use of 45° wyes, double wyes, long sweep quarter bends or 1/8 bends.
 - 3.7. Provide trap primers or at all floor drains and floor sinks. Connect trap primer to a nearby clean water source. Trap seals are also acceptable.
 - 3.8. Coordinate location of vent piping termination with other trades and architectural features and conditions. Install VTR's a minimum of 24" from the edge of roof and/or parapet walls. Provide offset below roof as required. Locate all VTR's a minimum of 10'-0" from outdoor intakes. Maintain required clearances to outside air intakes, windows, etc. as required by all applicable codes.
 - 3.9. Standpipes shall be individually trapped and shall extend a minimum of 18 inches and a maximum of 42 inches above the trap weir. Provide access to all standpipes and drains for rodding.
 - 3.10. Provide and install indirect waste pipe from backflow preventer(s) drain connection to floor drain. Turn down and terminate above floor drain with air gap. Indirect waste piping to be Type "L" hard copper pipe for and with wrought 95-5 solder joints and di-electric unions at all iron-copper connections.
 - 3.11. Run all drain lines from equipment, overflow receivers, etc. to nearest floor drains. Drain lines shall be installed with minimum 1/8 inch per foot slope secured by guides and supports for pipe size shown. No drain line to be smaller than 3/4 inch.
 - 3.12. Provide funnel receptor for floor drains where required to prevent spillage from indirect waste lines.
 - 3.13. Floor drains and cleanouts shall be furnished with top and trim compatible with floor covering material. Refer to architectural drawings for floor finish alternates affecting floor drain and cleanout trim requirements.
 - 3.14. Do not install fixture traps inside exterior walls.
 - 3.15. All vent and branch vent pipes shall be sloped to gravity drain back to the drainage pipe.
 - 3.16. Provide floor drain for ice machine and domestic hot water heater. Coordinate with Owner for any other required floor drains. Floor or trench drains in Apparatus Bay are not desired to avoid installing an oil separator.
4. Domestic Water
 - 4.1. The domestic water main coming into the building shall be sized for future addition. Estimated size is 1.5-IN. Provide a 1.5-IN tap with shut-off valve and end cap for future addition.

- 4.2. All domestic water piping shall be lead free. Piping will be considered lead free if the solder and flux contain less than 0.2% lead and the piping and fittings contain less than 8% lead.
- 4.3. All water piping shall be pitched in direction of flow to allow for system draining.
- 4.4. Provide a complete and operating cold water, hot water and hot water return distribution system. Hot water recirculation system required if most remote fixture exceeds 50-FT in pipe length from water heater.
- 4.5. Connect each and every fixture and appliance requiring domestic water service. Each connection shall be valved as directed. Install shut-off valves in hot and cold water lines ahead of connections to all plumbing fixtures and equipment. Fixtures and appliances that are furnished with valves or shut-offs need not to be additionally valved. Each fixture shall be valved in an accessible location.
- 4.6. All end of copper tubing shall be square cut and burrs removed before assembling. Joints shall be thoroughly cleaned with sandpaper or Emory cloth before applying flux and solder.
- 4.7. PEX-a piping shall be installed per manufacturer's instructions and recommendations to maintain warranty. PEX must be rigidly terminated.
- 4.8. The domestic water system shall be protected against water hammer shock or surge pressure by adequate air chambers.
- 4.9. If applicable, contractor to verify water pressure at entry to building. If pressure is found to be less than adequate (< 40 psi upstream of water meter), a booster pump may be required and shall be furnished and installed by the contractor. If pressure is found to exceed 80 psi, contractor shall install a pressure reducing valve to bring incoming water into building at a pressure of less than 80 psi.
- 4.10. A neat, vapor tight installation is required with all joints tight and neat. All insulation shall be applied as per manufacturer's specifications and installation requirements.
- 4.11. All vertical risers shall be supported at every floor and at roof.
- 4.12. The contractor shall furnish and install on all equipment and fixtures and at all points requiring same, backflow preventers or vacuum breakers of a type approved by the Department of Health and Human Resources, Division of Health. Water connections to fixtures and equipment shall be made in such a way as to prevent back siphonage when the water supply is out or if there is a drop in pressure.
- 4.13. Fixtures requiring both cold and hot water shall be roughed-in with cold water on the right, hot water on the left, while facing the fixture.
- 4.14. Domestic water piping shall be installed to slope to drain points. Where conditions dictate trapped section of piping, a drain valve or capped tee shall be installed to facilitate draining of the trapped section of piping.
- 4.15. Do not install domestic water piping in exterior walls. Where building design forces installation of piping in exterior walls, install piping on room side of exterior wall insulation and increase pipe insulation thickness required to next standard thickness with a minimum thickness of 1-1/2 inches.
- 4.16. Do not install domestic water piping over electrical equipment and electrical clearances.
5. Gas Piping
 - 5.1. Gas meter and service regulator to be provided and installed by utility company.
 - 5.2. Contractor shall coordinate all details of the gas piping system with the local gas company. This shall include gas meter, gas service regulator and gas pressure requirements.
 - 5.3. Contractor shall verify correct gas pressure downstream of service regulator after gas utility completes installation.
 - 5.4. The contractor shall furnish and install all low pressure gas piping required for project.
 - 5.5. Natural gas piping system shall be sized and installed per latest adopted International Fuel Gas Code.
 - 5.6. Provide a suitable gas cock, unions and dirt leg at each connection to each piece of gas fired equipment.
 - 5.7. Provide suitable gas pressure regulators with vents to the atmosphere as required in order to maintain 14 INWC at each piece of gas consuming equipment gas regulators downstream of meter shall be provide and installed by contractor.
 - 5.8. Route separate and dedicated gas line from meter to natural gas emergency generator.
6. Piping Schedule

- 6.1. Above Ground Domestic Water
 - 6.1.1. ASTM B 88, Type L hard copper tube / wrought-copper solder-joint fittings; and soldered joints. Use drainage pattern fittings for condensate drain piping.
 - 6.1.2. PEX-a or Engel method, ASTM F876 and ASTM F877, ASTM F1960 cold expansion fittings. Contractor shall be trained and certified to install PEX-a from the manufacturer and shall provide documentation proving successful completion of PEX-a plumbing installation training. PEX-b or PEX-c is not acceptable. Crimped fittings are not allowed.
 - 6.1.3. For 1-IN stub-ups to Owner provided water hose reels in the Apparatus Bay, transition to Copper above the slab and rigidly mount the piping to the wall and provide a stainless steel, full-port ball valve for isolation.
- 6.2. Below Ground Domestic Water
 - 6.2.1. PEX-a or Engel method, ASTM F876 and ASTM F877, ASTM F1960 cold expansion fittings. Contractor shall be trained and certified to install PEX-a from the manufacturer and shall provide documentation proving successful completion of PEX-a plumbing installation training. PEX-b or PEX-c is not acceptable. Crimped fittings are not allowed.
- 6.3. Below Ground Sanitary Sewer and Vent Piping
 - 6.3.1. Solid-wall PVC pipe: ASTM D 2665, drain, waste and vent. PVC socket fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe. Adhesive primer: ASTM F 656. Adhesive primer shall have a VOC content of 550 g/l or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24). Solvent cement: ASTM D 2564. PVC solvent cement shall have a VOC content of 510 g/l or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- 6.4. Above Ground Sanitary Sewer and Vent Piping
 - 6.4.1. Solid-wall PVC pipe: ASTM D 2665, drain, waste and vent. PVC socket fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe. Adhesive primer: ASTM F 656. Adhesive primer shall have a VOC content of 550 g/l or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24). Solvent cement: ASTM D 2564. PVC solvent cement shall have a VOC content of 510 g/l or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- 6.5. Condensate/Equipment Drains
 - 6.5.1. ASTM B 88, Type L hard copper tube / wrought-copper solder-joint fittings; and soldered joints. Use drainage pattern fittings for condensate drain piping.
 - 6.5.2. Solid-wall PVC pipe: ASTM D 2665, drain, waste and vent. PVC socket fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe. Adhesive primer: ASTM F 656. Adhesive primer shall have a VOC content of 550 g/l or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24). Solvent cement: ASTM D 2564. PVC solvent cement shall have a VOC content of 510 g/l or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- 6.6. Above Ground Natural Gas Piping
 - 6.6.1. Steel pipe: ASTM A 53/A 53M, black steel, Schedule 40, Grade B. Malleable-iron threaded fittings: ASME B16.3, Class 150, standard pattern. Wrought-steel welding fittings: ASTM A 234/A 234M for butt welding and socket welding. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends. Provide threaded fittings for piping up to 2" and welded connections for piping 2-1/2" and greater.
- 6.7. Outdoor Below Ground Natural Gas Piping
 - 6.7.1. Refer to Civil.
- 7. Piping Insulation
 - 7.1. General:
 - 7.1.1. Fittings and valves shall be insulated same as pipe.
 - 7.1.2. Continuously insulate all piping specified to be insulated.

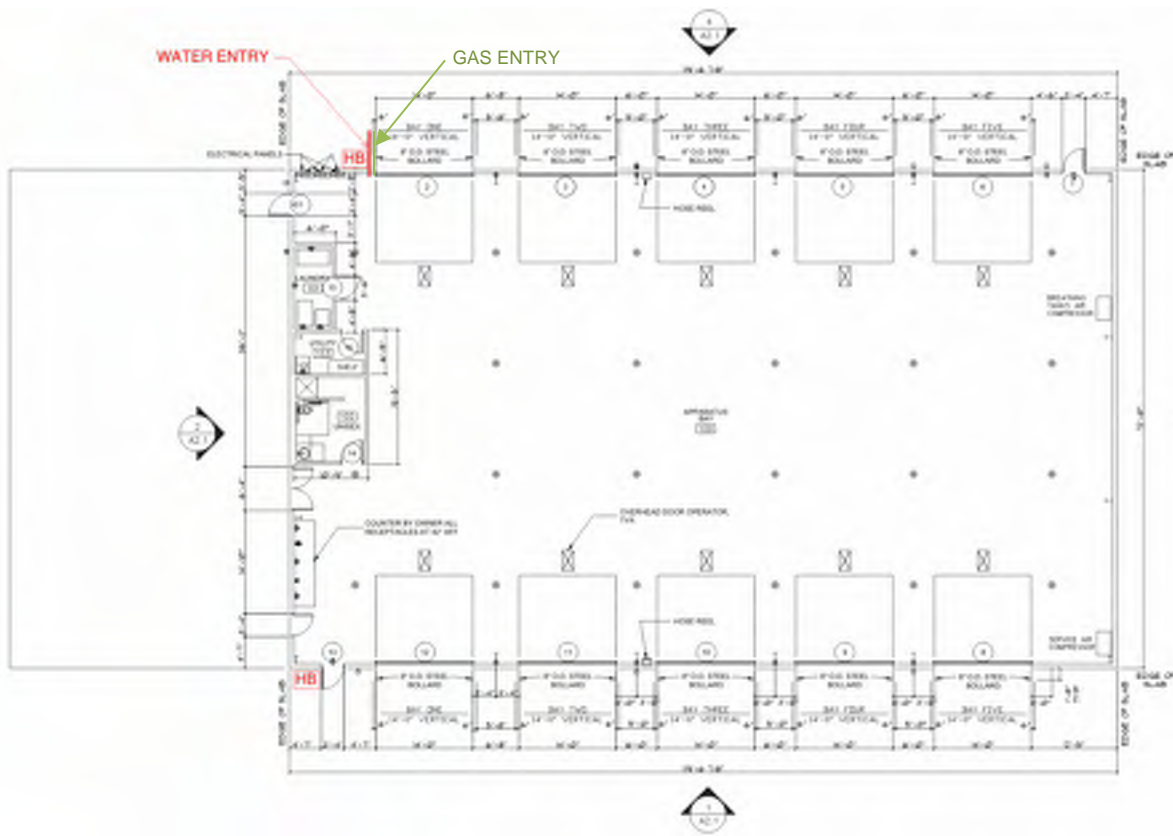
- 7.1.3. Install all hangers over outside surface of insulation. Provide sheet metal insulation shield between hanger and insulation to prevent insulation from compressing excessively (provide insulation inserts where required).
- 7.1.4. Provide PVC jacket over insulation in areas where piping is installed exposed in occupied areas. Provide high-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; 20 mils thick; roll stock ready for shop or field cutting and forming. Color: White.
- 7.2. Domestic cold water:
 - 7.2.1. All pipe sizes, 1/2 inch thick preformed fiberglass, ASJ-VB.
 - 7.2.2. All pipe sizes, 1/2 inch thick flexible, closed-cell elastomeric insulation or approved equal.
- 7.3. Domestic hot water (and return):
 - 7.3.1. All pipe sizes, 1 inch thick preformed fiberglass, ASJ.
 - 7.3.2. All pipe sizes, 3/4 inch thick flexible, closed-cell elastomeric insulation or approved equal.
- 7.4. Condensate drain
 - 7.4.1. All pipe sizes, 1/2 inch thick preformed fiberglass, ASJ-VB.
 - 7.4.2. All pipe sizes, 1/2 inch thick flexible, closed-cell elastomeric insulation or approved equal.
- 8. Hangers
 - 8.1. Coordinate location and method of attachment of hangers and supports for piping system to building structure with the structural engineer. Establish proposed locations and methods of system pipe anchors and obtain approval from the architect and structural engineer.
 - 8.2. PEX-a piping shall be supported per manufacturer's installation instructions.
 - 8.3. All other piping without hubs shall be rigidly supported by solid or split ring adjustable hangers spaced in accordance with the following table and supported by solid steel rods from necessary inserts, lag screws or expansion shields.
- 9. Distance between pipe supports:
 - 9.1. NPS 3/4" and smaller: 60 inches with 3/8-inch rod.
 - 9.2. NPS 1" and NPS 1-1/4": 72 inches with 3/8-inch rod.
 - 9.3. NPS 1-1/2" and NPS 2": 96 inches with 3/8-inch rod.
 - 9.4. NPS 2-1/2": 108 inches with 1/2-inch rod.
 - 9.5. NPS 3" to NPS 5": 10 feet with 1/2-inch rod.
 - 9.6. NPS 6": 10 feet with 5/8-inch rod.
- 10. Equipment
 - 10.1. General
 - 10.1.1. All equipment shall be installed in accordance with manufacturer's installation instructions and code requirements.
 - 10.1.2. Maintain all required service clearances.
 - 10.1.3. Coordinate electrical requirements with electrical contractor.
 - 10.1.4. Review connection requirements of furnished fixtures prior to rough-in. Adjust rough-in to meet installation requirements.
 - 10.2. Water Heaters
 - 10.2.1. Water heater shall be located in mechanical closet or above ceiling and connected such that it will be readily accessible for observation, maintaining, service and replacement. Coordinate location with Owner.
 - 10.2.2. Type:
 - 10.2.2.1. Base Bid: Electric, Tank-Type, 20-Gallon, 5.0-kW
 - 10.2.2.2. Alternate: Gas-Fired, Condensing, Tankless, 5.2-GPM, 157-MBH
 - 10.2.3. Quantity: Refer to manufacturer's sizing guidelines.
 - 10.2.4. Flue: Concentric flue kit. Coordinate routing and termination with building conditions.
 - 10.2.5. Tank-Type, Equal to or better than: State, Rheem/RUUD, Bradford White.
 - 10.2.6. Tankless, Equal to or better than: Noritz, Rheem, Bosch.
 - 10.2.7. Equivalent product manufacturer (Substitutions).
- 11. Fixtures
 - 11.1. General

- 11.1.1. The contractor shall furnish, install and connect all plumbing fixtures indicated on architectural drawings.
- 11.1.2. Each plumbing fixture shall be fitted with all necessary and proper fittings, stops, trim and operating devices and shall be left in proper operating condition. The finish of all traps, wall escutcheons, exposed metal work in connection with fixtures, trimmings and operating devices shall be chrome plated.
- 11.1.3. Refer to the architectural drawings for the location and number of fixtures required. Refer to architectural drawings for elevations and dimensioned locations of plumbing fixtures. Fixtures designated for handicap use shall be installed to meet most current applicable ADA and/or ANSI requirements for installation clearance and access.
- 11.1.4. Review connection requirements of furnished fixtures prior to rough-in. Adjust rough-in to meet installation requirements.
- 11.1.5. Provide chrome plated, heavy duty, commercial grade, angle supply (hot and cold, as required) with wheel handle stop(s), stainless steel flexible riser hose(s), and chrome plated wall escutcheon(s).
- 11.1.6. Provide undersink protective pipe covering, for waste, hot, and cold piping for all sinks requiring ADA access. Color: White. Covers shall be secured with snap-clip flush reusable fasteners. Provide all required accessories for a complete installation meeting current ADA standards where required.
 - 11.1.6.1. Better than or equal to: Truebro, Inc. Handi Lav-Guard Model 103.
 - 11.1.6.2. Equivalent product manufacturer (Substitutions).
- 11.2. Water Closets
 - 11.2.1. Type: Elongated, 2-Piece, Tank Type, Gravity Flush
 - 11.2.2. Flush Rate: 1.28 GPF
 - 11.2.3. Color: White
 - 11.2.4. Seat Type: Elongated, open-front with quiet close seat
 - 11.2.5. Rough-In: 12 Inch
 - 11.2.6. Equal to or better than:
 - 11.2.6.1. American Standard
 - 11.2.6.2. Kohler
 - 11.2.6.3. Crane
 - 11.2.6.4. Toto
 - 11.2.7. Equivalent product manufacturer (Substitutions).
- 11.3. Lavatory
 - 11.3.1. Type: Wall mount (Check architectural drawings before ordering)
 - 11.3.2. Color: White
 - 11.3.3. Size: Refer to Architectural programming documents
 - 11.3.4. Better to or equal to:
 - 11.3.4.1. American Standard
 - 11.3.4.2. Kohler
 - 11.3.4.3. Toto
 - 11.3.5. Equivalent product manufacturer (Substitutions).
- 11.4. Lavatory Faucets
 - 11.4.1. Type: Single handled, 2-hole drilling on 4-Inch centers
 - 11.4.2. Drain: Grid strainer.
 - 11.4.3. Flow Rate: 2.5 GPM for private, 0.5 GPM for public
 - 11.4.4. Finish: Chrome
 - 11.4.5. Tempering: For public hand washing lavatories, provide a ASSE 1070 thermostatic mixing valve and set discharge to 110°F maximum.
 - 11.4.6. Better than or equal to:
 - 11.4.6.1. Delta
 - 11.4.6.2. Kohler
 - 11.4.6.3. American Standard
 - 11.4.6.4. Toto
 - 11.4.7. Equivalent product manufacturer (Substitutions).
- 11.5. Sink

- 11.5.1. Type: Undermount
- 11.5.2. Compartment: Double (Check architectural drawings before ordering)
- 11.5.3. Color: 18 Gauge, Stainless Steel
- 11.5.4. Size: Refer to Architectural programming documents
- 11.5.5. Better than or equal to:
 - 11.5.5.1. Elkay
 - 11.5.5.2. Just
 - 11.5.5.3. Kohler
- 11.5.6. Equivalent product manufacturer (Substitutions).
- 11.6. Sink Faucets
 - 11.6.1. Type: Single handle with sprayer
 - 11.6.2. Flow Rate: 2.5 GPM
 - 11.6.3. Finish: Chrome
 - 11.6.4. Better than or equal to:
 - 11.6.4.1. Elkay
 - 11.6.4.2. Just
 - 11.6.4.3. Kohler
 - 11.6.5. Equivalent product manufacturer (Substitutions).
- 11.7. Shower Valves
 - 11.7.1. Type: Single handle, pressure balancing
 - 11.7.2. Flow Rate: 1.75 GPM (low flow)
 - 11.7.3. Color: Chrome
 - 11.7.4. Drain: Chrome, grid
 - 11.7.5. Better than or equal to:
 - 11.7.5.1. Delta
 - 11.7.5.2. Kohler
 - 11.7.5.3. American Standard
 - 11.7.5.4. Symmons
 - 11.7.5.5. Toto
 - 11.7.6. Equivalent product manufacturer (Substitutions).
- 11.8. Emergency Fixture
 - 11.8.1. Type: Floor mounted, indoor, combination shower and eye/face
 - 11.8.2. Bowl: Stainless steel
 - 11.8.3. Flow control: Integral
 - 11.8.4. Accessories: Test tag, sign, freeze valve, emergency thermostatic mixing valve with 18 guage, recessed, stainless steel cabinet.
 - 11.8.5. Better than or equal to:
 - 11.8.5.1. Haws
 - 11.8.5.2. Bradley
 - 11.8.6. Equivalent product manufacturer (Substitutions).
- 11.9. Exterior Hose Bibbs
 - 11.9.1. Type: Freezeless wall hydrant, automatic draining with anti-siphon vacuum breaker, with concealed box
 - 11.9.2. Inlet and Outlet: ASSE Standard 1019-B
 - 11.9.3. Finish: Chrome
 - 11.9.4. Key: loose tee
 - 11.9.5. Location: Place one hose bibb on the south wall of the administrative area and one on the north side of the administrative area.
 - 11.9.6. Better than or equal to:
 - 11.9.6.1. Woodford
 - 11.9.6.2. Zurn
 - 11.9.7. Equivalent product manufacturer (Substitutions).
- 12. Valving
 - 12.1. The contractor shall furnish and install all valves required under these specifications. All valves shall be installed so as to be easily accessible for cleaning, inspection and maintenance.

- 12.2. Valves 2" inches and smaller shall be all brass, screw end and 2-1/2" and larger iron body brass mounted flanged ends.
- 12.3. Valve all individual branch lines. Every piece of equipment and every plumbing fixture shall be separately valved, on all services, including cold water, etc. Stops below fixtures shall meet individual valve requirements. Valves shall be located in the most accessible locations.
- 12.4. Provide valves with a minimum rating of 200 PSI (WOG). Provide higher rating where required.
- 12.5. Provide shut-off valves and unions at all piping connections to equipment.
- 12.6. All valving installed in the potable water system shall be lead free.
- 12.7. Provide 1-IN stainless steel, full-port, ball valve for owner provided hose reels.**
13. Testing and instructions
 - 13.1. Piping shall be tested to pressure specified. Where pressures are not mentioned, piping shall be tested to 1-1/2 times service conditions, before insulation is applied.
 - 13.2. All drainage piping, vent and waste risers shall be plugged and tested by filling with water from top to bottom of system prior to being connected to fixture.
 - 13.3. All cold & hot water supply piping shall be tested hydrostatic ally to 125 PSI before application of insulation.
 - 13.4. All tests shall be made in the presence of the owner or his representative. Where pipes or connections in new piping are found to leak, they shall be made tight and tests repeated. Tests shall be held for minimum of twenty-four (24) hours before inspection.
 - 13.5. Make all necessary adjustments to controls, dampers, valves, etc., to obtain best operation first with empty building and later under actual conditions.
 - 13.6. Thoroughly check the operation of each item of equipment and controls while testing, without waiting first for the owner or engineer to complain about their operation. Verify that same are wired correctly and completely, notifying the proper parties for necessary corrections. Thoroughly instruct the owner's representative in the operation and care of controls, individual equipment, and entire system.
14. Equipment and piping labels
 - 14.1. Label all equipment with phenolic nameplates. Provide black background with minimum 1/2 inch high white engraved letters.
 - 14.2. Identify piping with 1 inch high stencils and directional arrow at 20 feet on center, at equipment and at each side of wall penetrations.
15. Asbuilts/maintenance manuals
 - 15.1. Contractor to provide asbuilts in a .dwg format.
 - 15.2. Provide complete asbuilts immediately upon completion of project.
 - 15.3. Maintain accurate continuous records of any and all changes from the contract documents.
 - 15.4. Provide an electronic set of operation and maintenance manuals for all equipment in .pdf format. Information shall include, but is not limited to, start-up, shut-down, service and lubrication procedures.
 - 15.5. Identify each piece of equipment on asbuilts and in operation and maintenance manuals.
16. Start-up and instruction procedures
 - 16.1. Operation and maintenance manuals shall be submitted a minimum of two weeks prior to system starting and commissioning.
 - 16.2. Instruct owner and owner representatives in operating, adjustment and maintenance of equipment and systems at agreed to times.
 - 16.3. For equipment requiring seasonal operation, perform instructions for other seasons within six months.
 - 16.4. Prepare and insert additional data in operating and maintenance manual when need for such data becomes apparent during instruction.
 - 16.5. Instruction shall include, but not limited to, the following equipment and systems:
 - 16.5.1. Water heater(s).
 - 16.5.2. Hot water recirculation pump (if required).

Domestic Water Entry and Hose Bibb Locations



END OF SECTION 15100

15100 - 2
CD Issue No. 2

SECTION 15700

HVAC Narrative

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: HVAC Narrative as follows.



Yale Fire Department Owner's Project Requirements

HVAC

Date: 9/24/2019



Introduction

This document contains the *Owner's Project Requirements (OPR)* concerning the HVAC components for the Yale Fire Department (YFD) Fire Station project. The OPR forms the basis from which all design, construction, acceptance, and operation decisions are made. The OPR can be modified as the owner's objectives and criteria are refined.

HVAC Systems

1. HVAC General
 - 1.1. Contractor to refer to the Architectural, Structural and Civil drawings, the MEP design narratives, and to design, size, and install all required HVAC systems per the latest adopted International Mechanical Code, all local amendments, NFPA, ASHRAE 90.1-2013, Yale Fire Department (YFD) requirements, and all other applicable adopted codes.
 - 1.2. Maintain a minimum of 10 feet horizontally between flue, vent, or air exhaust from outside air intakes. Where horizontal distance cannot be provided, extend flue, vent, or exhaust 2 feet above intake.
 - 1.3. All roof penetrations shall be per architectural and building manufacturer's requirements. Coordinate location with roof framing members.
 - 1.4. All thermostats, sensors, etc. shall be mounted on wall 48 inches above finished floor, unless noted otherwise. Mount on wall near light switch. Mount level and 4 inches to the side of the light switch. Thermostat, sensor, control device, etc. wiring is the responsibility of HVAC contractor.
 - 1.5. The final location of ceiling air distribution devices shall be coordinated and adjusted by the Contractor as necessary to coordinate with structural systems, architectural reflected ceiling plan, installed ceiling grid system, fire protection piping, lighting, electrical, plumbing, etc.
 - 1.6. Steel air devices in restrooms and shower rooms are not allowed.
 - 1.7. All valves, fittings and piping shall be suitable for intended service and system temperatures and pressures.
 - 1.8. Provide transfer ducts from rooms with exhaust fans (e.g., restrooms) to adjacent spaces to allow air to transfer from adjacent spaces into the room with exhaust. Size transfer air opening (free area) at 0.03-INWC / 100-FT.
 - 1.9. Refer to architectural plans for locations of mechanical equipment.
2. Owner Provided Equipment and Systems:
 - 2.1. AIRVAC 911 vehicle exhaust removal systems in the Apparatus Bay.
 - 2.2. Compressed air and breathing air equipment, piping, hose reels, and accessories in Apparatus Bay.
 - 2.3. Domestic water hose reels in Apparatus Bay.
3. Clothes Dryer Exhaust Ductwork
 - 3.1. The Contractor shall be responsible for running all ductwork for the clothes dryer exhaust system.
 - 3.2. The Contractor shall be responsible to review cutsheet and installation requirements for Owner provide clothes dryer and to meet the manufacturer's requirements for dryer exhaust.

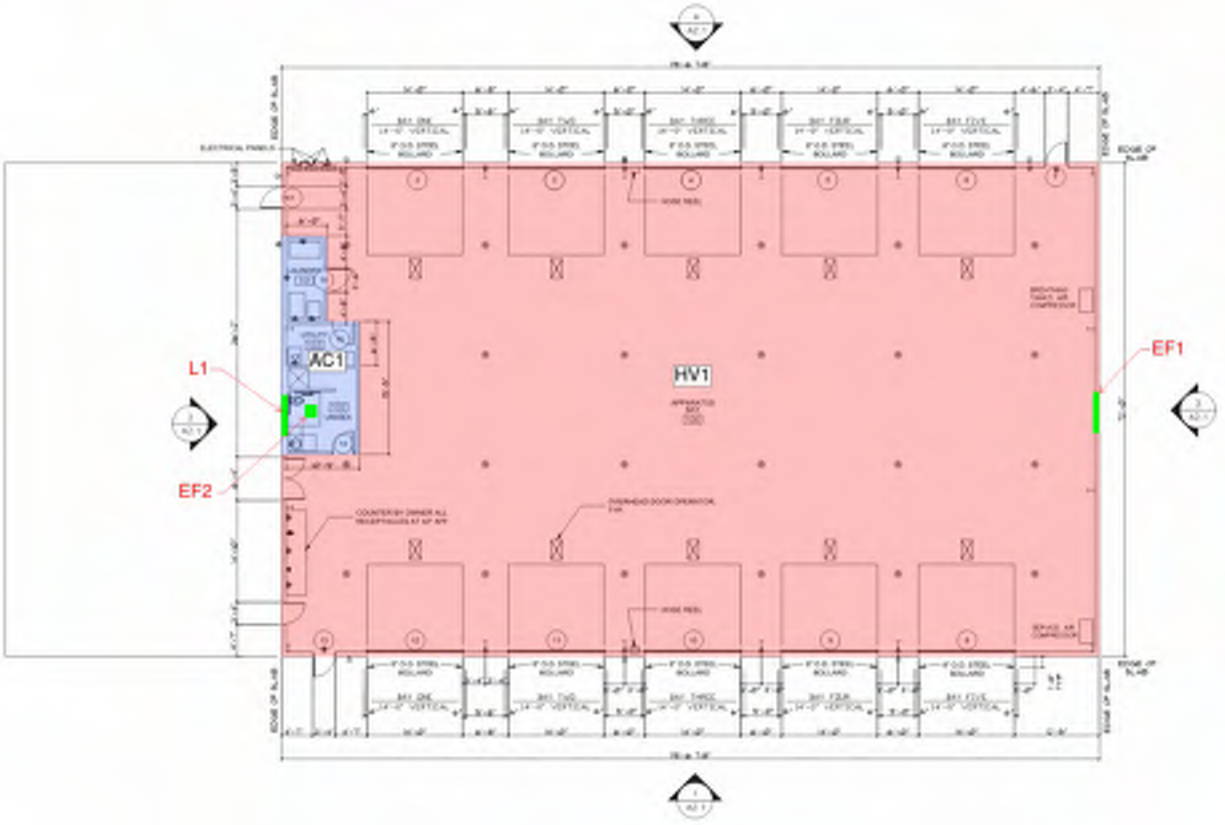
- 3.3. Install a recessed dryer vent box in the wall behind the clothes dryer. Coordinate the vent box type with the wall type and construction and with exhaust duct connection location on dryer.
 - 3.3.1. Better than or equal to: Dryerbox.
 - 3.3.2. Equivalent project manufacturer (substitutions).
- 3.4. All concealed dryer ducting must be rigid metal (galvanized or aluminum), a minimum of 4 inches in diameter, smooth 30 gauge, clean, unobstructed, frictionless ducts (no flexible duct allowed in concealed areas). Size of ductwork to be by clothes dryer manufacturer's installation instructions.
- 3.5. Seal all joints with foil backed pressure sensitive duct tape meeting the requirements of UL 181. Duct joints shall be installed so that the male end of the duct points in the direction of the airflow. Do not use rivets or screws in the joints or anywhere else in the duct as these will encourage lint collection.
- 3.6. Terminate dryer duct with roof jack on roof or wall hood. Roof jack and wall hoods shall have a gravity backdraft damper. Roof jacks and wall hoods with screens are not allowed.
4. Piping Specifications
 - 4.1. Condensate drain/Equipment drain piping:
 - 4.1.1. ASTM B 88, Type L hard copper tube / wrought-copper solder-joint fittings; and soldered joints. Use drainage pattern fittings for condensate drain piping.
 - 4.1.2. Solid-wall PVC pipe: ASTM D 2665, drain, waste and vent. PVC socket fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe. Adhesive primer: ASTM F 656. Adhesive primer shall have a VOC content of 550 g/l or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24). Solvent cement: ASTM D 2564. PVC solvent cement shall have a VOC content of 510 g/l or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 4.2. Refrigerant piping:
 - 4.2.1. Copper, ASTM B 280 ACR, drawn-temper tubing and wrought-copper fittings with brazed joints.
 - 4.3. Note: Do not route piping exposed in occupied areas below ceilings or below 8-FT above finished floor in finished areas.
5. Piping Insulation
 - 5.1. General:
 - 5.1.1. Provide PVC jacket over insulation in areas where piping is installed exposed in occupied areas. Provide high-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; 20 mils thick; roll stock ready for shop or field cutting and forming. Color: White.
 - 5.1.2. Insulation shall be installed per manufacturer's installation instructions and recommendations.
 - 5.1.3. All fittings shall be insulated with the same thickness as adjacent piping.
 - 5.1.4. Insulated pipe supports must be used at all pipe hangers to support the piping system with high-density inserts with sufficient compressive strength to prevent the insulation from compressing.
 - 5.2. Condensate drain piping:
 - 5.2.1. 1/2 inch mineral or glass fibers, preformed pipe insulation bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with a factory-applied ASJ jacket.
 - 5.2.2. 1/2 inch thick flexible, closed-cell elastomeric insulation.
 - 5.3. Refrigerant piping:
 - 5.3.1. 3/4 inch thick flexible, closed-cell elastomeric insulation.
6. Equipment
 - 6.1. General
 - 6.1.1. The contractor shall furnish, install and connect all HVAC equipment required for the project.
 - 6.1.2. Coordinate electrical requirements with electrical contractor. Coordinate voltage and phase with the electrical contractor.

- 6.1.3. All equipment shall be installed in accordance with manufacturer's installation instructions and code requirements.
- 6.1.4. Provide clearance around equipment as recommended by equipment manufacturer. If recommended clearances are unable to be maintained, provide provisions to allow for proper maintenance/repair/replacement of equipment.
- 6.1.5. Equipment shall be installed to allow coils and tubes full clearance space to be removed without cutting or removal of existing adjacent equipment.
- 6.1.6. Install all motor driven equipment with vibration isolators and or pads to reduce noise transfer. Type and method of isolation shall be per equipment manufacturer's recommendations.
- 6.1.7. The contractor shall coordinate the installation of equipment with actual and final building conditions of structure size and location, light locations, architectural features, and work of other trades.
- 6.2. Zoning and Preliminary Sizing of Air-Conditioning and Heating Equipment.
 - 6.2.1. Refer to the attached Preliminary Zoning and Sizing Table for recommended zoning and estimated sizing.
 - 6.2.2. The Contractor is responsible and required to calculate a heating and cooling load on the building to determine the correct equipment sizes and CFM amounts for each space.
- 6.3. Air-Conditioning
 - 6.3.1. Provide ceiling-mounted, 2-FT by 2-FT, ductless mini-split heat pump with a cooling capacity of 12,000 BTU/H. Locate unit in 103 Utility and provide supply ducts to 101 Laundry and 102 Unisex. Provide return jumper duct to allow return air to return from 101 Laundry back to 103 Utility. Return air is not allowed in a restroom. Provide a jumper duct from the Apparatus Bay into 102 Unisex for make-up air for the exhaust fan.
 - 6.3.2. Locate condensing unit on west side of the building. Provide a 3.5-IN concrete pad for condensing unit. Note: This condensing unit will need to be relocated when the office addition is constructed.
 - 6.3.3. Provide a unit with a minimum efficiency rating of 20 SEER.
 - 6.3.4. Provide with manufacturer's wall mounted thermostat. Coordinate location of thermostat with the YFD.
 - 6.3.5. Provide unit with a water detection device to shut off unit upon detection of condensate overflow. Provide a Rector Seal Safe-T-Switch (or approved equal) or provide with water detection device integrated into the unit by the Manufacturer.
 - 6.3.6. Route condensate to nearest floor drain or mop service sink or route outdoors and terminate with a splash block. Routing condensate piping where it has to be stepped over is not acceptable. Owner to approve routing prior to installation.
 - 6.3.7. Air Filtration: Provide unit with filtration integrated into the unit by the Manufacturer.
 - 6.3.8. All manufacturers that meet the requirements of the project are allowed to bid.
 - 6.3.8.1. Better than or equal to: LG.
 - 6.3.8.2. Equivalent product manufacturer (substitutions).
- 6.4. Heating and Ventilation
 - 6.4.1. The Apparatus Bay will be heated only with gas-fired radiant heaters. Sizing, layout, and quantities of radiant heaters to be by the manufacturer. Coordinate the location of the radiant heaters with all other trades before installing.
 - 6.4.1.1. Better than or equal to: Roberts Gordon CoRayVac.
 - 6.4.1.2. Equivalent project manufacturer (substitutions).
 - 6.4.2. Provide sidewall exhaust fan (EF1) on the west gable with the following:
 - 6.4.2.1. CFM: 12,000.
 - 6.4.2.2. Fan Type: Direct drive.
 - 6.4.2.3. Gravity operated damper.
 - 6.4.2.4. OSHA approved fan guard.
 - 6.4.2.5. Vertical mount gravity exhaust damper (WD-320).
 - 6.4.2.6. Provide field supplied sleeves and wall collars.
 - 6.4.2.7. Electrical: 2-HP, 115/1/60.

- 6.4.2.8. Coordinate additional required accessories with construction type and equipment sales representative.
- 6.4.2.9. Manufacturer:
 - 6.4.2.9.1. Equal to or better than: Greenheck model AER-E30C-310-A20.
 - 6.4.2.9.2. Equivalent product manufacturer (substitutions).
- 6.4.3. Provide intake louver (L1) on the east gable with the following:
 - 6.4.3.1. CFM: 12,000.
 - 6.4.3.2. Height and Width: 42-IN x 42-IN.
 - 6.4.3.3. Vertical mount gravity intake damper (WD-400).
 - 6.4.3.4. Provide field supplied sleeves and wall collars.
 - 6.4.3.5. Manufacturer:
 - 6.4.3.5.1. Equal to or better than: Greenheck model ESD-435.
 - 6.4.3.5.2. Equivalent product manufacturer (substitutions).
- 6.5. Restroom Exhaust
 - 6.5.1. For 102 Unisex provide a ceiling mounted exhaust fan (EF2). Provide a wall switch for independent fan operation on the wall next to the restroom light switch. Coordinate with electrical.
 - 6.5.1.1. Equal to or better than: Greenheck SP-A.
 - 6.5.1.2. Equivalent product manufacturer (substitutions).
 - 6.5.2. Provide code required exhaust for all restrooms. Refer to the attached Preliminary Zoning and Sizing Table for recommended zoning and estimated exhaust rates.
 - 6.5.3. Terminate exhaust ductwork outdoors with a roof jack or wall hood.
 - 6.5.4. Provide a backdraft damper for all exhaust fans to avoid infiltration of untreated air when the fan is not in operation.
- 7. Required Submittals
 - 7.1. Scheduled equipment with accessories.
 - 7.2. Ductwork and hangers.
 - 7.3. Piping and hangers.
 - 7.4. Ductwork and piping insulation.
 - 7.5. Test and balance certifications and instrumentation calibration certificates.
- 8. Testing, Adjusting and Balancing (TAB)
 - 8.1. The tab contractor shall be NEBB or AABC certified.
 - 8.2. All HVAC systems shall be tested, balanced, and reported per NEBB or AABC procedural standards for testing, adjusting and balancing of environmental systems.
 - 8.3. Provide typewritten tab reports to owner and engineer. Tab report shall be per NEBB or AABC standards.
 - 8.4. Filters shall be new and clean, ductwork shall be clean, and equipment controls and devices shall be fully functional at the time of performing tab.
 - 8.5. Balance HVAC equipment to air flow quantities ($\pm 10\%$) of design.
 - 8.6. After test and balance and before acceptance replace all air filters with new. Provide the specified type.
- 9. Asbuilts/Maintenance Manuals
 - 9.1. Contractor to provide Asbuilts in a .PDF format.
 - 9.2. Provide complete Asbuilts immediately upon completion of project.
 - 9.3. Maintain accurate continuous records of any and all changes from the contract documents.
 - 9.4. Provide an electronic set of operation and maintenance manuals for all equipment in .PDF format. Information shall include, but is not limited to, start-up, shut-down, service and lubrication procedures.
 - 9.5. Identify each piece of equipment on Asbuilts and in operation and maintenance manuals.
- 10. Equipment and piping labels
 - 10.1. All equipment and piping shall be permanently labeled.
 - 10.2. All equipment and pipe label nomenclature shall be approved by owner.
 - 10.3. Label all mechanical equipment with phenolic nameplates. Provide black background with minimum 1/2 inch high white engraved letters. Label thermostats and switches with the equipment tag of the HVAC unit they control.

- 10.4. Identify piping with 1 inch high stencils and directional arrow at 20 feet on center, at equipment and at each side of wall penetrations.
11. Start-up and instruction procedures
 - 11.1. Operation and maintenance manuals shall be submitted a minimum of two weeks prior to system starting and commissioning.
 - 11.2. Instruct owner and owner representatives in operating, adjustment and maintenance of equipment and systems at agreed to times.
 - 11.3. For equipment requiring seasonal operation, perform instructions for other seasons within six months.
 - 11.4. Prepare and insert additional data in operating and maintenance manual when need for such data becomes apparent during instruction.
 - 11.5. Instruction shall include, but not limited to, the following equipment and systems:
 - 11.5.1. Air conditioning units.
 - 11.5.2. Radiant heaters.
 - 11.5.3. Exhaust fans.
 - 11.5.4. Ventilation fans and louvers.

HVAC Zone Maps



HVAC Estimated Sizing

The equipment sizes and CFMs listed below are preliminary. The Contractor is responsible to run heating and cooling loads, size equipment, size ductwork, determine outside air rates, etc. Refer to Sections 1.2 and 9.2.2. of the OPR.

Preliminary Zoning and Sizing - Table 1							
Zone	Room Information			Estimated Airflow			Estimated Tonnage Range
	Room Number	Room Name	Area (SF)	SA Rate (CFM/SF)	SA (CFM)	EA (CFM)	
AC-1	101	Laundry	85	1.25	106	0	
	103	Utility	74	1.25	93	0	
	102	Unisex	146	1.25	183	100	
Total			305		381	100	0.95

Preliminary Zoning and Sizing - Table 2						
Zone	Room Information			Est Heating Capacity		EA
	Room Number	Room Name	SF	Btu/hr / SF	Btu/hr	
HV-1	100	Apparatus Bay	8,305	40.00	332,200	12,000
Total			8,305		332,200	12,000

END OF SECTION 15700

15700 - 2
CD Issue No. 2

SECTION 16000

Electrical Narrative

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Electrical Narrative as follows.



Date: August 2, 2018
To: Chris Goble, AIA
From: Christopher Harwell, PE
Project: Yale Fire Department

Owner's Project Requirements

Introduction

This document contains the *Owner's Project Requirements (OPR)* concerning the Electrical components for the above referenced project. The OPR forms the basis from which all design decisions are made. The OPR can be modified as the owner's objectives and criteria are refined.

ELECTRICAL

1. GENERAL

- a. Installation shall be in accordance with the most current editions (unless otherwise noted) of the National Electric Code, City of Yale Amendments, IBC 2015, IMC, IFC, NFPA, ADA, ASHRAE 90.1, Yale Fire Department (YFD) requirements, and all other applicable adopted codes. Refer to Sheet G-01 for additional information.
- b. Oklahoma Statutes Regulating the Practice of Engineering and Land Surveying requires that drawings and specifications be engineered by a professional engineer (PE). The design build (or design bid build) contractor is responsible for obtaining the services of a licensed electrical professional engineer registered in the State of Oklahoma to create electrical Contract Documents specifically for this project.
- c. Refer to the architectural, civil, structural, and mechanical Contract Documents for additional information.
- d. Contractor shall coordinate with all other trades/consultants, including but not limited to: mechanical, architectural, civil, and structural.
- e. All equipment, shall be UL listed or have other City approved listing.
- f. Equipment/devices/lighting shall be commercial, specification, or industrial grade. Residential grade equipment/devices/lighting are not acceptable.
- g. All branch circuits larger than 20A shall be installed in dedicated conduits.
- h. All 120 volt branch circuits longer than 100' shall be #10 AWG, minimum.
- i. The connected load on lighting or power 120 volt 20 ampere circuits shall not exceed 1800 volt-amperes (15A).
- j. A separate green insulated equipment grounding conductor shall be installed with the circuit conductors.
- k. All wire shall be copper in conduit with the following possible exception:
 - If acceptable to the YFD, metal clad cable (Type MC) may be used for all 120V branch circuits in walls and 6' maximum length for connection to recessed light fixtures.
- l. All wiring device's faceplates and all equipment connections (e.g. disconnects) shall be labeled with panelboard and circuit number. Labeling shall utilize a clear back ground and 1/8" high black letters. Provide UV stabilized labels for exterior connections.
- m. Fire seal all fire rated wall/ceiling penetrations.
- n. Voltage drop for branch circuits shall not exceed 3%.
- o. Furnish and install all YFD required low-voltage systems (phone, data, cable TV, security, etc.). Coordinate exact requirements with YFD-Terry Bradley (918-285-1634) prior to bid.
- p. Provide (3) 2 inch conduits for phone, data, security, etc. for equipment counter.
- q. Provide one spare 1" conduit from the east wall of the Apparatus Bay to below an accessible area under or adjacent to the main distribution panel. Conduit shall be underground and stubbed up 3" above finished floor at each end and installed as close as possible to the wall. Cap each end of conduit, provide pull rope and label each conduit as "SPARE CONDUIT".

- r. Provide three spare 1" conduits from below the main panelboard to 5'-0" outside of the building, below grade. One conduit shall be routed to the east, one to the south, and one to the north side of the building. Conduits shall be underground, stubbed up 3" above finished floor and installed as close as possible to the wall. Cap each end of conduit, provide pull rope and label each conduit as "SPARE CONDUIT TO THE EXTERIOR".

2. ELECTRICAL SERVICE AND DISTRIBUTION

- a. Refer to civil engineering documents for additional information.
- b. Coordinate electrical utility requirements (120/240V single phase) with YFD and the electric utility company (City of Yale: Tim Campbell) prior to bid.
- c. Distribution equipment shall have an A.I.C. rating equal to or greater than what is available at each piece of distribution equipment. Coordinate available A.I.C. at the secondary bushings of the utility transformer with the electric utility company.
- d. Provide a spare 3.5" conduit and two 0.75" conduits from below the main distribution panel to 5'-0" beyond the building's footing to allow for connection to a future permanent ATS/generator. Conduits shall be underground, stubbed up 3" above finished floor and installed as close as possible to the wall. Cap each end of conduit, provide pull rope and label each conduit as "FUTURE GENERATOR".
- e. Provide service entrance rated service disconnect or service entrance rated main distribution panel.
- f. Main distribution panel and branch circuit panelboard(s) shall be installed inside the building at locations approved by the YFD.
- g. Provide a 100A, 24 circuit, single phase panelboard labeled as "PANEL GP" adjacent to the main distribution panel. Connect the fire alarm system, all motorized doors, and all lighting to this panelboard.
- h. Provide three spare 0.75" conduits from below Panel GP to 5'-0" beyond the building's north footing to allow for connection to future helipad equipment. Conduits shall be underground and stubbed up 3" above finished floor as close as possible to the wall. Cap each end of conduit, provide pull rope and label each conduit as "FUTURE HELIPAD".
- i. Provide grounding/bonding in accordance with NEC 250.
- j. Size the main distribution panel for the loads, including future loads, shown in the attached Load Calculation.
- k. Provide branch circuit panelboard(s) for electrical distribution as required.
- l. Voltage drop for service entrance and feeders shall not exceed 2%.
- m. The service shall have a surge protective device (SPD) installed in accordance with the manufacturer's recommendations.
 - The SPD shall provide a minimum surge current capacity of 200kA per phase (L-N plus L-G) and 100 kA per mode (L-N, L-G, L-L and N-G).
- n. Distribution and branch circuit panelboards shall be provided with bolt-on molded case circuit breakers.
- o. Distribution and branch circuit panelboards in the apparatus bay shall be NEMA 3R.
- p. All branch circuit panelboards shall be provided with a minimum of 20% spare load and pole capacity for future loads.
- q. Panel directories shall be typed. All labeling shall use actual room numbers for identification, not just the room numbers indicated on the drawings.

3. POWER

- a. Refer to architectural plans for outlet/device/lighting layout and additional information.
- b. Provide electrical service to mechanical/plumbing equipment. Refer to mechanical/plumbing documents and coordinate with mechanical/plumbing contractors for sizes and system descriptions requiring electrical connection.
- c. Provide power and control to overhead motorized doors.
- d. Provide electrical service to the breathing air system.
- e. Provide electrical service to the relocated air compressor (confirm voltage compatibility prior to installation).
- f. Provide power to the extractor (i.e. commercial washer for YFD's bunker gear).

- g. Provide power to the bunker gear dryer system.
 - h. Provide ten electrical receptacles, for cord reels, mounted to the beams/purlins/joist in the apparatus bay on the driver's side of the vehicles toward the overhead doors at the entry and exit doors.
 - i. Alternate cost shall be provided for the following (refer to Specification Section 01230 for additional information): Provide a spring driven, cord reel with 50' electrical cord/outlet at the five beam/purlin/joist mounted receptacles adjacent to the south exit doors. Install/support cord reels in accordance with manufacturer's recommendations. Cord reel shall be Reelcraft or equal. Cord reels for the north entry doors will be provided in the future.
 - j. Provide ground-fault protection in areas required by the 2017 National Electrical Code.
 - k. Minimum mounting heights for receptacles shall be 15" above finished floor (AFF), minimum mounting height for dimmers/switches shall be 46" AFF.
 - l. Do not locate electrical devices within 6'-0" of any shower (including emergency showers).
 - m. Provide electrical service to all electrical devices/equipment/lighting/etc. if identified above or not.
 - n. Circuit breakers serving receptacles in the apparatus bay (including those for the cord reels) shall be GFCI. Provide a dedicated neutral for each phase conductor.
4. RECEPTACLES/SWITCHES/DEVICE PLATES
- a. Receptacles shall be 20-amp, 120-volt. (NEMA 5-20R)
 - b. Receptacles shall be specification grade.
 - c. Switches shall be specification grade.
 - d. Dimmers shall be rated for and compatible with the loads served.
 - e. All cover plates shall be commercial grade nylon plastic, color to match wiring devices, or stainless steel as directed by the Architect.
 - f. Receptacles and lighting control devices in apparatus bay shall be provided with weather-proof in-use covers.
 - g. Provide exterior electrical GFCI receptacles with aluminum weather-proof in-use covers.
5. LIGHTING
- a. Illumination levels and uniformity shall meet or exceed IES recommendations.
 - Photometrics shall be calculated with the appropriate values. As a maximum, use 0.92 for the light loss factor and 80-50-20 for the ceiling-wall-floor reflectances. Coordinate reflectances with Architect.
 - b. Light source for all fixtures shall be LED with dimmable drivers.
 - c. Correlated Color Temperature (CCT) of the fixtures shall be 4000° Kelvin.
 - d. LED correlated color temperature shall be less than or equal to three McAdams Ellipse.
 - e. Light color rendering index (CRI) shall be ≥ 85 .
 - f. All LED fixtures (including LEDs and drivers) shall have a minimum 50,000hr life at a lumen maintenance of 70% for the installed application and temperature for this project.
 - g. Warranty for all fixtures and all of their components shall be a minimum of five years.
 - h. All fixtures shall be UL (or approved equivalent) listed, and energy efficient.
 - i. Exit signage shall be provided throughout the facility.
 - j. Egress lighting shall be provided throughout the facility, including select exterior fixtures at the exit discharge doors.
 - k. Egress lighting levels shall meet the requirements of the International Building Code.
 - l. Refer to architectural reflected ceiling plans for lighting layout and additional information.
 - m. Present light fixtures and control types/locations to YFD and the Architect prior to ordering equipment.
 - n. Exterior fixtures shall be controlled by a single photo cell installed on the north side of the building.
 - o. Lighting controls shall meet IECC requirements.
 - p. All interior light fixtures shall be controlled with dimmers.
 - q. All dimmers shall be compatible with the controlled fixtures.
 - r. Restrooms shall utilize ceiling mounted ultrasonic/IR dual technology sensors and wall mounted dimmers.
 - s. All exterior building mounted fixtures shall be Dark Sky rated.

6. FIRE ALARM/DETECTION

- a. Furnish and install a fire alarm system in full conformance to applicable codes including but not limited to NFPA and manufacturer's recommendations.
- b. Locate fire alarm control panel and if applicable the remote annunciator panel as directed by YFD. Connections to 120VAC fire alarm equipment power service shall be on a dedicated branch circuit(s). The circuit(s) and connections shall be mechanically protected. Circuit breaker(s) shall be lockable, shall have a red marking, shall be accessible only to authorized personnel, and circuit identification shall include "fire alarm". Electrical panel location and circuit/breaker number shall be permanently identified at the fire alarm equipment requiring 120VAC circuit(s).
- c. Coordinate with wall types and ratings if fire alarm control panel and remote annunciator panel are to be recessed.
- d. Coordinate digital alarm communicator monitoring system/service with YFD.
- e. As requested by YFD, if required by code or not, the fire alarm system shall be provided in all areas of the facility.
- f. Fire alarm system shall have the capability and capacity to add a minimum of two times the amount of devices for future additions.

Christopher A. Harwell



8-3-18

LOAD CALCULATION

Project: Yale Fire Department
Date: 8/2/18
Prepared by: CAH

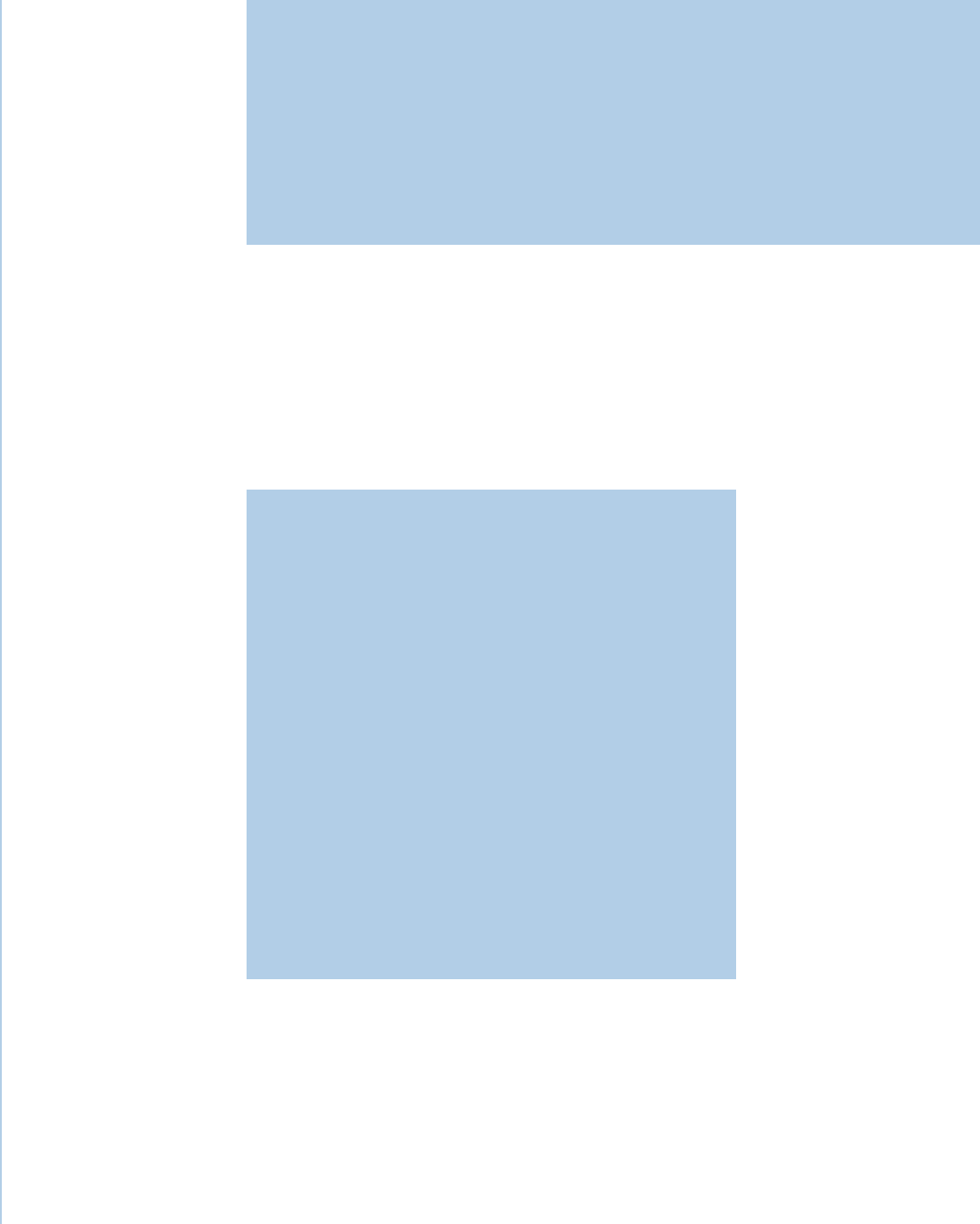
Item	Future Quantity	VA per SF	OR	1ph or 3ph	Volt	Amps	KVA Each	KVA Total	Dem. Factor	Dem. KVA	Remarks
First Floor											
Lighting (office, training, etc.)	X	2,900	3.5				0.004	10.2	1.00	10.2	NEC Table 220.12
Lighting (App Bay)		8,400	1.0				0.001	8.4	1.00	8.4	NEC Table 220.12
Power (office, training, etc.)	X	2,900	1.0				0.001	2.9	1.00	2.9	Estimate
Power (App Bay)		8,400	1.0				0.001	8.4	1.00	8.4	Estimate
Air Compressor	1	6500					6.500	6.5	1.00	6.5	5 HP Estimate
Ice Maker	1						2.000	2.0	1.00	2.0	Estimate
Restroom EF	1						0.060	0.1	1.00	0.1	Estimate
Sidewall Fan	1						2.400	2.4	1.00	2.4	Estimate
Ductless Mini-Split	1			1	240	7.8	1.872	1.9	1.00	1.9	
HVAC (tons)	X	4					2.000	8.0	1.00	8.0	2kW/Ton Estimate
Vehicle Exhaust	10			1	120	13.0	1.560	15.6	1.00	15.6	Estimate
Extractor	1	5000					5.000	5.0	1.00	5.0	Estimate
Breathing Air	1			1	240	30.0	7.200	7.2	1.00	7.2	Based on equipment model #
Miscellaneous Items (App Bay)	8,400	0.25					0.000	2.1	1.00	2.1	
Miscellaneous Items	X	5,800	0.25				0.000	1.5	1.00	1.5	
Second Floor											
Lighting (mezzanine)	X	2,900	0.5				0.001	1.5	1.00	1.5	NEC Table 220.12
Power (receptacles)	X	2	180.0				0.180	0.4	1.00	0.4	Estimate
Exterior Lighting											
Lighting (exterior)	1	2500					2.500	2.5	1.25	3.1	Estimate
							Subtotal:	86		87	
							Total:	86		87	
SF Total (excludes mezzanine):		11,300									
Demand VA/SF:		7.7									

Demand KVA = 87
 Amperes at 240V, 1P = 362
 Amperes at 208V, 3P = 242

Notes: Contractor shall confirm loads with final equipment selections.

END OF SECTION 16000

16000 - 2
CD Issue No. 2



This is a PDF package created by Bluebeam Revu and may contain both PDF and non-PDF files. In order to fully utilize the PDF package interface for accessing files, download and install Bluebeam Revu.

[Download now](#)