SECTION 00 11 13 - INVITATION TO BID

236-D CCPS RHS BB Hitting

Sealed Bids for the construction of the Ringgold High School Baseball Hitting Facility, Ringgold, Georgia, will be received in the Board Room, Central Office, Catoosa County, Georgia, 307 Cleveland Street, Ringgold, Georgia 30736, until 2:00 pm on November 7, 2023 at which time they will be opened publicly and read aloud.
There will not be a pre-bid conference.

Plans and Specifications are available for inspection in the in the Central Office of the Board of Education at 307 Cleveland Street, Ringgold, Georgia 30736. The hours are Monday through Friday, 7:30 am until 4:30 pm.

Contract documents in electronic pdf form will be issued to General Contractors by the office of the Architect, Derthick, Henley & Wilkerson, Architects, 1001 Carter Street, Chattanooga, Tennessee. All questions regarding this project should be directed to Ray Boaz at (423) 266-4816.

Bids shall be submitted on the proposal form furnished by the Architect, and must be submitted in a sealed envelope, clearly marked as to the job and the submitting General Contractor. Each bid must be accompanied by a bid bond executed by the bidder and a surety company in an amount equal to 5 of the amount of the bid.

No bid may be withdrawn for a period of Sixty (60) days from the above listed date, except as otherwise provided by law.

The successful bidder will be required to execute a contract on AIA Standard Form of Agreement Between the Owner and Contractor, and to execute performance and payment bonds each in the amount of 100 of the contract amount.

The owner reserves the right to accept or reject any and all proposals and to waive any informalities therewith.

END OF SECTION

ADDENDUM NO. 1

8236-D CCPS RHS BB Hitting **Date: 10-24-23**
Derthick Henley & Wilkerson Architects **File: 8236-D**

The following amendments to the specifications and/or revisions to the drawings shall be a part of the contract documents. Bidders, therefore, shall consider them when preparing cost estimates, and the contractors shall be bound by them.

FRONT END

1. Last day for RFI prior to bid is October 31, 2023

SPECIFICATIONS FOR ADDENDUM NO. 1, OCTOBER 24, 2023 viewable on pages 227 - 232 of this packet.

DRAWINGS

Sheet G000
Revised sheets indicated.

.
Sheet A102
Revised overhead coiling door height.

Sheet A600
Revised overhead coiling door height.
Revised overhead door head detail.

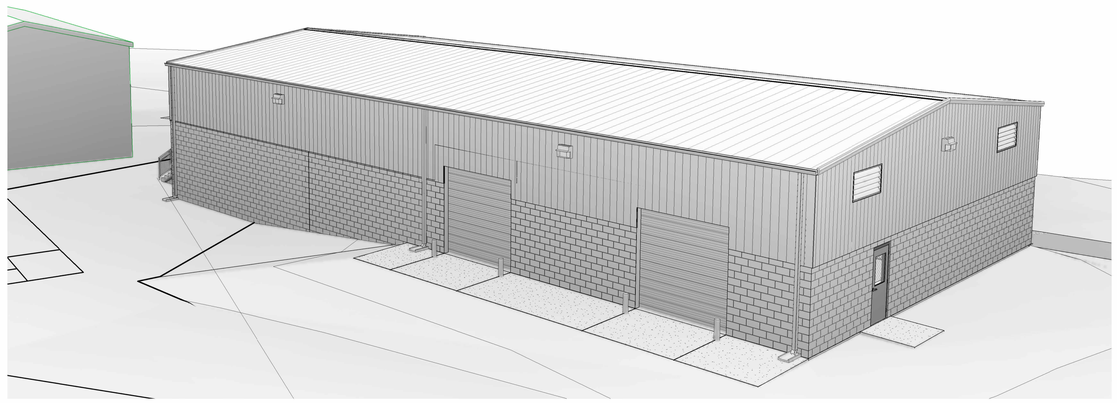
Sheet M001
Revised electrical information in schedule.

Sheet E001
Revised conduit size and panel schedule.

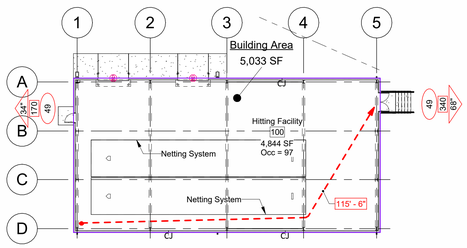
Sheet E201
Revised key note 4.

Ringgold High School Baseball Hitting Facility
29 Tiger Trail
Ringgold, GA 30736

Derthick, Henley & Wilkerson Architects 1001 Carter Street Chattanooga, Tennessee 37402 423-266-4816 FAX 423-267-8830



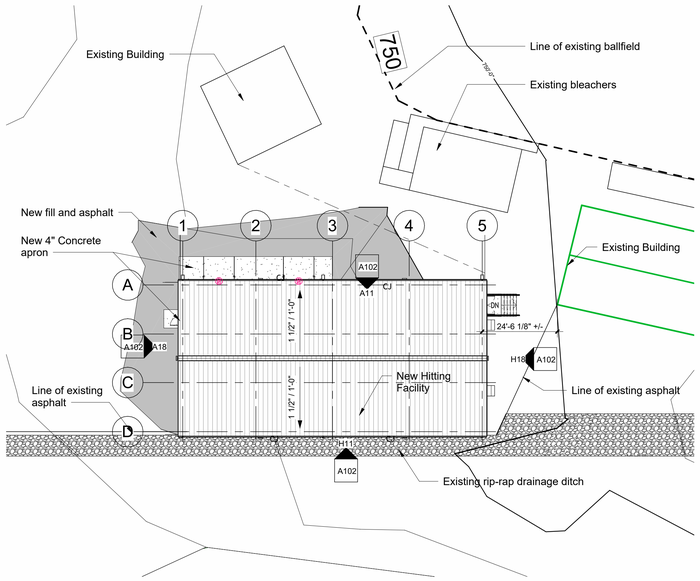
G12 G000 **Cover View**



Life Safety Plan Legend
(view in color for clarity)

34" Egress Component Width
100 Egress Component Capacity
100 Occupant Load
Egress_distance

A6 G000 A100 1" = 20'-0" **Life Safety Plan**



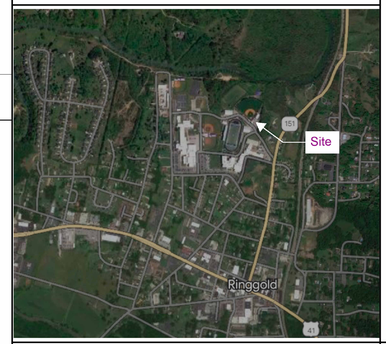
PLAN NORTH

A12 G000 A100 1" = 20'-0" **Site Plan Project North**

SHEET LIST

Sheet Number	Sheet Name	Current Revision Description	Current Revision Date
General			
G000	Cover Sheet		
Civil			
C100	Site Staking		
C200	Existing Conditions and Demolition		
C301	Site Grading		
C302	Site Drainage		
C500	Sediment and Erosion Control Notes		
C501	Sediment and Erosion Control Phase I		
C502	Sediment and Erosion Control Phase II		
C700	Site Details		
Structural			
S001	Structural General Notes and Details		
S002	Structural Details		
S003	Special Inspections		
S100	Structural Plans		
Architecture			
A100	Floor Plan		
A101	Sections		
A102	Elevations		
A103	Ceiling Plan		
A600	Openings		
Mechanical			
M001	Mechanical Schedules & Plan		
Electrical			
ES1.0	Electrical Site Plan		
Electrical			
E001 -	Electrical Project Schedules & Notes		
E101	Electrical Lighting Plan		
E201	Electrical Power Plan		

VICINITY



CONTACTS

ARCHITECT

DERTHICK, HENLEY AND WILKERSON, ARCHITECTS
1001 Carter Street
Chattanooga, Tennessee 37402
Telephone: (423) 266-4816
Fax: (423) 267-8830
Contact: Ray Boaz
rboaz@dhw-architects.com

CONSULTANT

March Adams & Associates
310 Dodds Avenue
Chattanooga, TN 37404
423-698-6675

Jeff Westbrook PE, Mechanical Engineering email: jeff.westbrook@marchadams.com
Brian Horne PE, Structural Engineering email: horne@marchadams.com
Joseph Parks PE, Civil Engineering email: joe.parks@marchadams.com

GENERAL NOTES

Contractor shall field verify all dimensions, elevations, and locations of existing conditions affecting this project, prior to fabrication or installation of new work. Notify architect of any discrepancies from dimensions shown, noted, or required. Adjust dimensions of new construction at direction of architect to allow for actual field conditions.

Where a detail is shown or note is described for one condition, it shall apply for all like or similar conditions even though not specifically noted on the drawings.

Penetrations through floor slabs and walls shall be carefully cut with saws or drills and patched with same materials and thicknesses as existing.

All penetrations of fire rated walls, floor/ceiling assemblies, and roof/ceiling assemblies by electrical cables, cable trays, electrical conduit, mechanical piping, or plumbing piping shall be protected by through penetration firestop systems as tested by recognized testing laboratories in accordance with (ASTM e 814) UL 1479 "fire tests of through-penetration firestops". Copies of the test of each type penetration to be used shall be submitted for approval by the architect/engineer and building official prior to any installation. Copies of the approved submittal shall be maintained at the jobsite for inspection at all times.

Refer to mechanical, electrical & plumbing drawings for locations of Equipment.

Provide continuous separation between dissimilar materials as required to prevent galvanic corrosion.

Coordinate opening sizes and locations with mechanical, plumbing and electrical drawings.

SUMMARY

Code Analysis (edit for project)

Applicable Codes:
International Building Code, 2018 Edition, with Georgia Amendments (2020), (2022)
International Fire Code, 2018 Edition (Contact State Fire Marshal Below)
International Plumbing Code, 2018 Edition, with Georgia Amendments (2020), (2022), (2023)
International Mechanical Code, 2018 Edition, with Georgia Amendments (2020)
International Fuel Gas Code, 2018 Edition, with Georgia Amendments (2020), (2022)
National Electrical Code, 2020 Edition, with Georgia Amendments (2021)
International Energy Conservation Code, 2015 Edition, with Georgia Supplements and Amendments (2020), (2022), (2023)

Climate Zone 4A

Occupancy Type:
Occupancy Group A-3

Construction Type:
Per Table 601 Building is Type 2B

Fire Resistance Ratings per Table 601:
Structural Columns:0
Exterior Building Walls: 0
Structural Floor Beams:0
Structural Floor Slabs:0
Roofs: 0

Area Summary:

5,033 SF	Building Area

Fire Suppression System: None

Rating Requirements:
713.4, 1009.3.1.2 and 402.4
Elevator Shaft & Room: N/A
Stairs: N/A
Separation between Occupancies: N/A

Building Occupancy:
Per Table 1004.1.2
Hitting Facility: 4827 sf / 50 = 97 occupants

Exits and Exit Capacity:
Per 1005.3

2 exits provided. 102" exit capacity provided.
97 occupants x .2" = 19.4" exit capacity required.

Exit Access Travel Distance:
Per Table 1016.2
Occupancy A-3: 200 feet without sprinkler system

Plumbing Fixtures:
Provided in existing adjacent buildings

5,033 SF	Building Area

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423 | 266 | 4816 www.dhw-architects.com

Catoosa County Public Schools

Ringgold High School Baseball Hitting Facility

29 Tiger Trail
Ringgold, GA 30736

9-29-23
Drawn: Author
File: 8236-D

Revisions
:

Key Plan

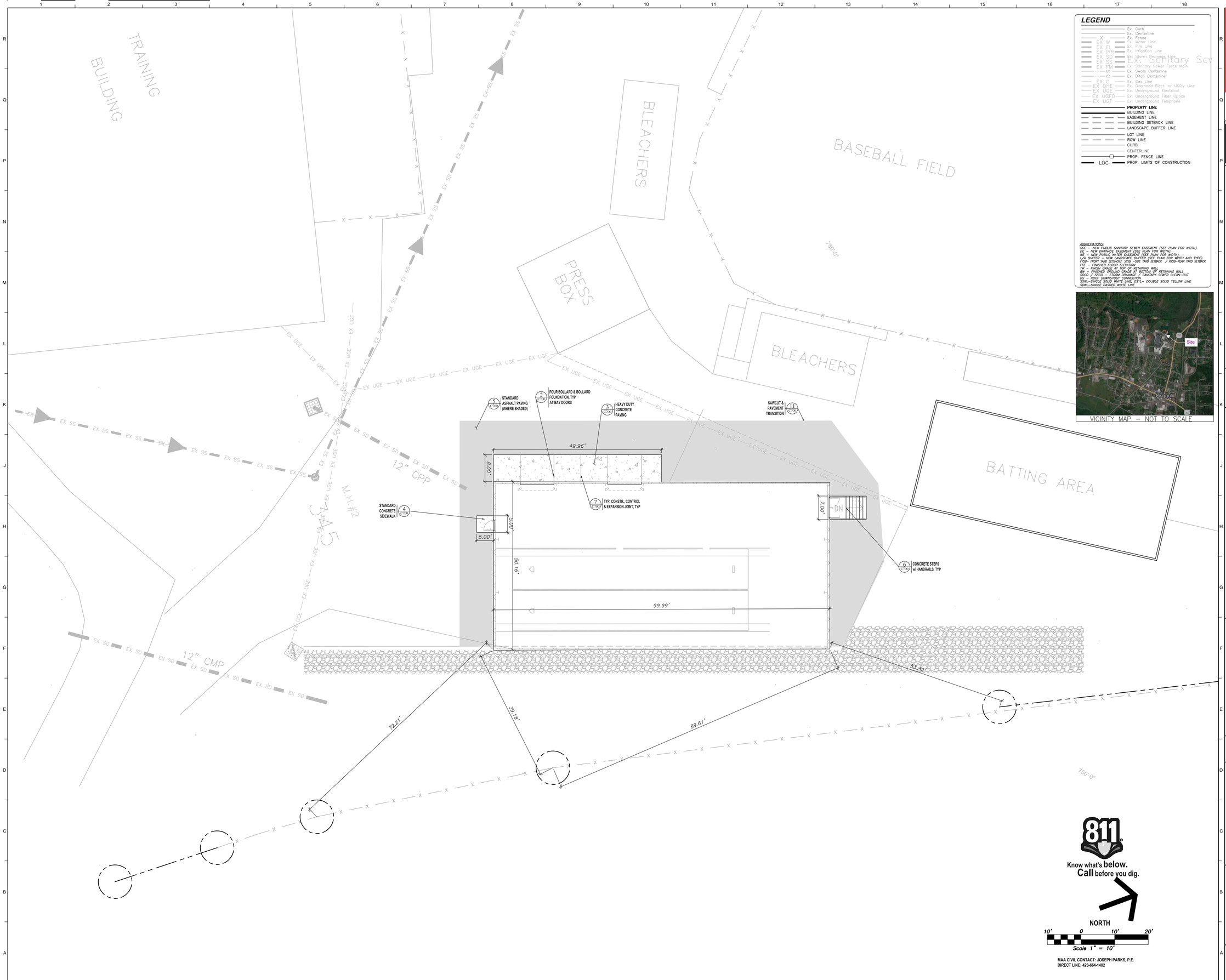
STATE OF GEORGIA
RAYMOND M. BOAZ, JR.
CERTIFICATE NO. 041417
REGISTERED ARCHITECT

NOTE THAT THESE DRAWINGS ARE PRODUCED IN COLOR AND ARE TO BE USED IN COLOR.

Title:
Cover Sheet

Scale:

Sheet No.
G000



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310 Dodds Ave.
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Chattanooga, Tennessee 37404
PH: (423)698-6875 PROJ# 23217

RHS BB Hitting Facility

29 Tiger Trail
Ringgold, GA 30736

9-29-23
Drawn: CH, JP
File: 8236-D

Revisions:

Key Plan

GEORGIA REGISTERED PROFESSIONAL ENGINEER JOSEPH L. PARKS
9/29/2023

Level II Design Professional Certification #35390

Title:
Site Staking

Scale:

Sheet No.
C100

SPECIAL NOTE: ***EXISTING UNDERGROUND UTILITIES AS SHOWN ARE APPROXIMATE. EXISTING UNDERGROUND UTILITIES (NOT SHOWN ON THESE DRAWINGS) MAY BE PRESENT IN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION DURING EXCAVATION. SHOULD THE CONTRACTOR UNCOVER UNKNOWN UTILITIES, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE SOURCE AND DISCHARGE OF THE UNKNOWN UTILITIES AND CONTACT THE OWNER AND ENGINEER PRIOR TO CONTINUING CONSTRUCTION.***

NORTH

10' 0 10' 20'

Scale 1" = 10'

MAA CIVIL CONTACT: JOSEPH PARKS, P.E.
DIRECT LINE: 423-664-1482

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9-29-23
Drawn: CH, JP
File: 8236-D

Revisions:

Key Plan

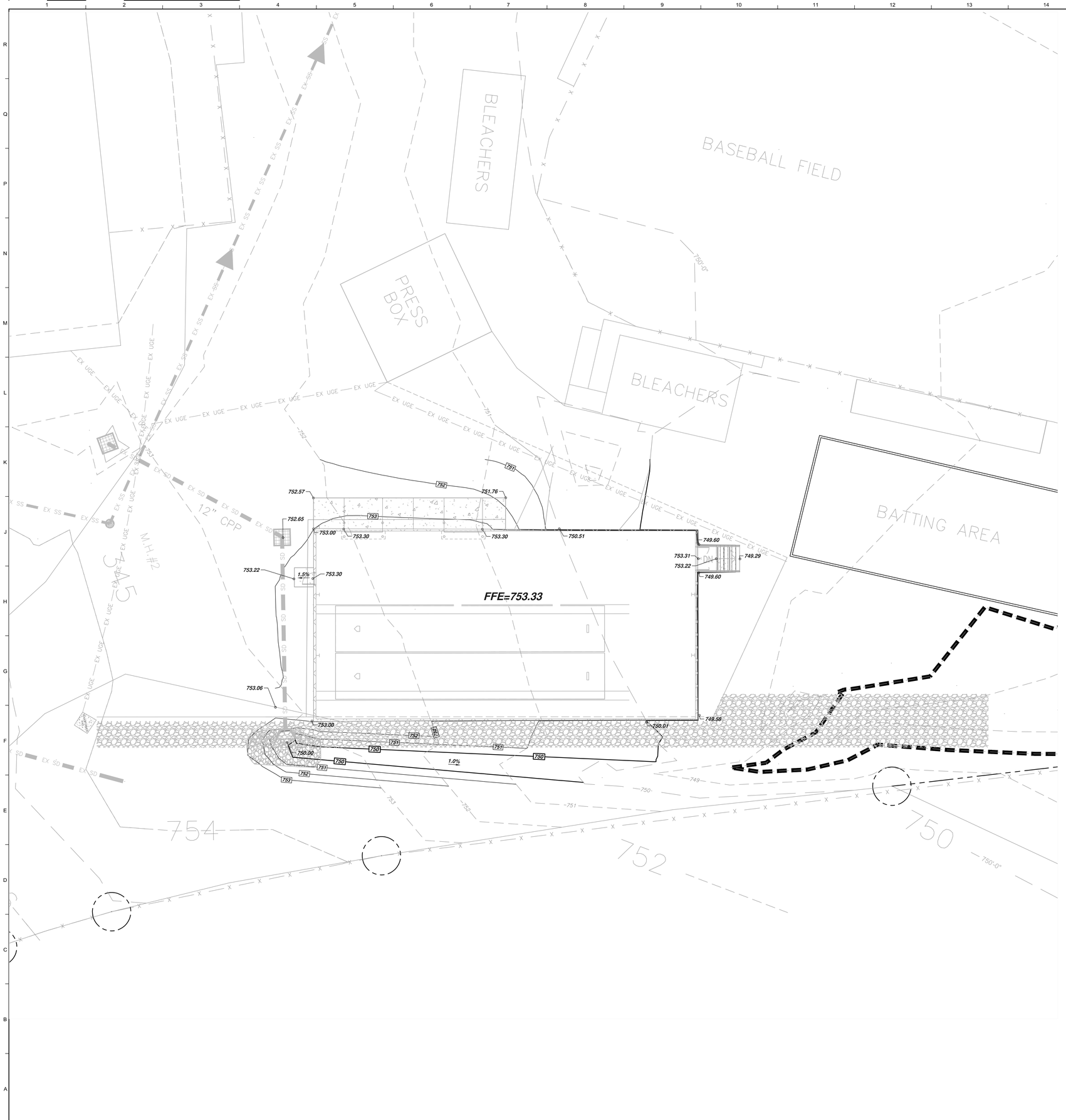
GEORGIA REGISTERED PROFESSIONAL ENGINEER JOSEPH L. PARKS
3/29/2023

Level II Design Professional
Certification #35390

Title:
Existing Conditions and Demolition

Scale:

Sheet No.
C200



LEGEND

- Ex. Curb
- Ex. Centerline
- EX X Ex. Fence
- EX W Ex. Water Line
- EX FL Ex. Fire Line
- EX IRR Ex. Irrigation Line
- EX SD Ex. Storm Drainage Line
- EX SS Ex. Sanitary Sewer Line
- EX FM Ex. Sanitary Sewer Force Main
- Ex. Swale Centerline
- Ex. Ditch Centerline
- EX G Ex. Gas Line
- EX OHE Ex. Overhead Elect. or Utility Line
- EX UGE Ex. Underground Electrical
- EX UGFO Ex. Underground Fiber Optics
- EX UGT Ex. Underground Telephone
- **PROPERTY LINE**
- BUILDING LINE
- LANDSCAPE BUFFER LINE
- LOT LINE
- CURB
- CENTERLINE
- PROP. FENCE LINE
- PROPOSED SWALE CENTERLINE
- PROPOSED DITCH CENTERLINE
- W PROP. WATER LINE
- FL PROP. FIRE LINE
- IRR PROP. IRRIGATION LINE
- SD PROP. STORM DRAINAGE LINE
- SS PROP. SANITARY SEWER LINE
- FM PROP. SANITARY SEWER FORCE MAIN
- OHE **PROP. OVERHEAD ELECT. OR UTILITY LINE**
- UGT PROP. UNDERGROUND TELEPHONE

ABBREVIATIONS:
SSE – NEW PUBLIC SANITARY SEWER EASEMENT (SEE PLAN FOR WIDTH).
DE – NEW DRAINAGE EASEMENT (SEE PLAN FOR WIDTH).
WE – NEW PUBLIC WATER EASEMENT (SEE PLAN FOR WIDTH).
L/A BUFFER – NEW LANDSCAPE BUFFER (SEE PLAN FOR WIDTH AND TYPE).
FYSB– FRONT YARD SETBACK/ SYSB –SIDE YARD SETBACK / RYSB–REAR YARD SETBACK
FFE – FINISHED FLOOR ELEVATION
TW – FINISH GRADE AT TOP OF RETAINING WALL
BW – FINISHED GROUND GRADE AT BOTTOM OF RETAINING WALL
SSCO – SANITARY SEWER CLEAN-OUT/ SSMH – SANITARY SEWER CLEAN-OUT
DS – ROOF DOWNSPOUT DISCHARGE
SSWL–SINGLE SOLID WHITE LINE, DSYL– DOUBLE SOLID YELLOW LINE
SDWL–SINGLE DASHED WHITE LINE

NORTH

10' 0 10' 20'

Scale 1" = 10'

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Revisions:

Key Plan

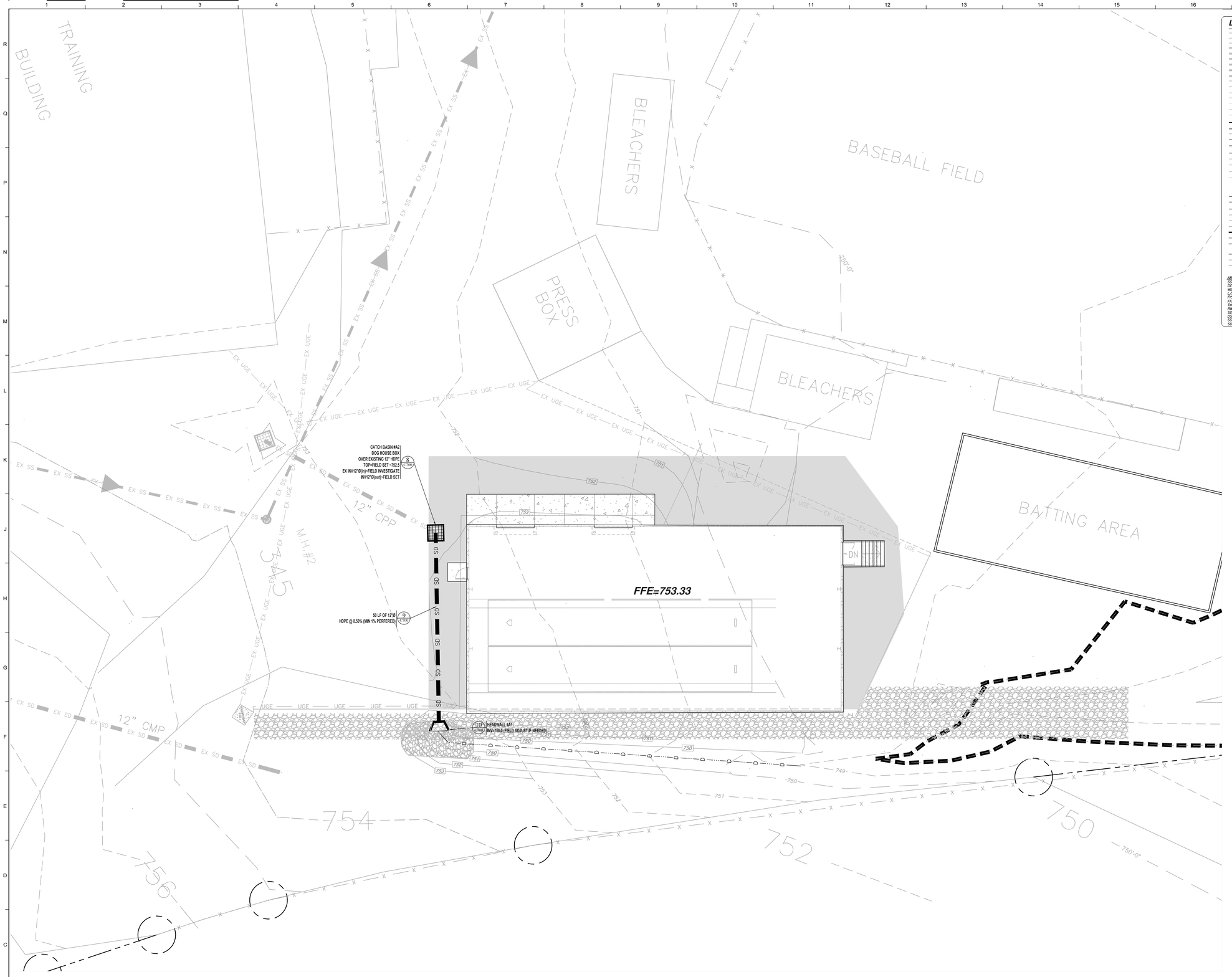
GEORGIA REGISTERED PROFESSIONAL ENGINEER JOSEPH L. PARKS
9/29/2023

Level II Design Professional
Certification #35390

Title:
Site Grading

Scale:

Sheet No.
C301



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- EASEMENT LINE
- BUILDING SETBACK LINE
- LANDSCAPE BUFFER LINE
- LOT LINE
- ROW LINE
- CURB
- CENTERLINE
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10' 0 10' 20'

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RHS BB Hitting Facility

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9-29-23
Drawn: CH, JP
File: 8236-D

Revisions:

Key Plan

GEORGIA REGISTERED PROFESSIONAL ENGINEER JOSEPH L. PARKS
9/29/2023
Level II Design Professional Certification #35390

Title:
Site Drainage

Scale:

Sheet No.
C302

TYPE OF SPECIES	YEAR	ANALYSIS OR EQUIVALENT N-P-K	RATE	N TOP DRESSING RATE
1. COOL SEASON GRASSES	FIRST SECOND MAINTENANCE	6-12-12 6-12-12 10-10-10	1500LBS./AC. 1000LBS./AC. 400LBS./AC.	50-100 LBS./AC. 1/ 2/ - 30
2. COOL SEASON GRASSES AND LEGUMES	FIRST SECOND MAINTENANCE	6-12-12 0-10-10 0-10-10	1500LBS./AC. 1000LBS./AC. 400LBS./AC.	0-50 LBS./AC. 1/ - -
3. GROUND COVERS	FIRST SECOND MAINTENANCE	10-10-10 10-10-10 10-10-10	1300LBS./AC. 3/ 1300LBS./AC. 3/ 1100LBS./AC.	- - -
4. SHRUB LESPEDEZA	FIRST MAINTENANCE	0-10-10 0-10-10	700LBS./AC. 700LBS./AC. 4/	-
5. TEMPORARY COVER CROPS SEEDED ALONE	FIRST MAINTENANCE	10-10-10	500LBS./AC.	30 LBS./AC. 5/
6. WARM SEASON GRASSES	FIRST SECOND MAINTENANCE	6-12-12 6-12-12 10-10-10	1500LBS./AC. 800LBS./AC. 400LBS./AC.	50-100 LBS./AC. 2/ 6/ 50-100 LBS./AC. 2/ 30 LBS./AC.
7. WARM SEASON GRASSES AND LEGUMES	FIRST SECOND MAINTENANCE	6-12-12 0-10-10 0-10-10	1500LBS./AC. 1000LBS./AC. 400LBS./AC.	50 LBS./AC. 6/

1. APPLY IN SPRING FOLLOWING SEEDING.
2. APPLY IN SPLIT APPLICATIONS WHEN HIGH RATES ARE USED.
3. APPLY IN 3 SPLIT APPLICATIONS.
4. APPLY WHEN PLANTS ARE PRUNED.
5. APPLY TO GRASS SPECIES ONLY.
6. APPLY WHEN PLANTS GROW TO A HEIGHT OF 2 TO 4 INCHES.

MULCHING RATES:
1. DRY STRAW: 2 TONS PER ACRE.
2. DRY HAY: 2-1/2 TONS PER ACRE.
3. FOR HYDRAULIC SEEDING USE WOOD CELLULOSE MULCH OR WOOD PULP FIBER AT THE RATE OF 500 POUNDS / ACRE

FERTILIZER & MULCHING REQUIREMENTS

MULCHING APPLICATION REQUIREMENTS		
MATERIAL	RATE	DEPTH
STRAW OR HAY	2-1/2 TON/ACRE	6" TO 10"
WOOD WASTE, CHIPS, SAWDUST, BARK	6 TO 9 TON/ACRE	2" TO 3"
CUTBACK ASPHALT	1200 GAL./ACRE OR 1/4 GAL./SY	----
POLYETHYLENE FILM	SECURE WITH SOIL, ANCHORS, WEIGHTS	----
CUTBACK ASPHALT	SEE MANUFACTURER'S RECOMMENDATIONS RATE	----
GEOTEXTILES, JUTE MATTING, NETTING, ETC.		----

DS1 DISTURBED AREA STABILIZATION (WITH MULCHING ONLY)

SPECIES	BROADCAST PER ACRE	BROADCAST PER 1000 S.F.	RESOURCE AREA	PLANTING DATES (J F M A M J J A S O N D)	REMARKS
BARLEY (HORDEUM VULGARE) ALONE / IN MIXTURES	144 LBS. 24 LBS.	3.3 LBS. 0.6 LBS.	M-L 4/ P C		14,000 SEED PER POUND WINTERHARDY. USE ON PRODUCTIVE SOILS.
LESPEDEZA, ANNUAL (LESPEDEZA STRIATA) ALONE / IN MIXTURES	40 LBS. 10 LBS.	0.9 LBS. 0.2 LBS.	M-L P C		200,000 SEED PER POUND MAY VOLUNTEER FOR SEVERAL YEARS USE INOCULANT EL.
LOVE GRASS, WEEPING (ERAGROTIS CURVULA) ALONE / IN MIXTURES	4 LBS. 2 LBS.	0.1 LBS. 0.05 LBS.	M-L P C		1,500,000 SEED PER POUND MAY LAST FOR SEVERAL YEARS. MIX WITH SERICEA LESPEDEZA
MILLET, BROWNTOP (PANICUM FASCICULATUM) ALONE / IN MIXTURES	40 LBS. 10 LBS.	0.9 LBS. 0.2 LBS.	M-L P C		137,000 SEED PER POUND. QUICK DENSE COVER. WILL PROVIDE TOO MUCH COMPETITION IN MIXTURES IF SEEDED AT HIGH RATES.
RYE (SECALE CEREALE) ALONE / IN MIXTURES	3 BU 1/2 BU	3.9 LBS. 0.6 LBS.	M-L P C		18,000 SEED PER POUND. QUICK COVER. DROUGHT TOLERANT AND WINTERHARDY.
RYEGRASS, ANNUAL (LOLIUM TEMULENTUM) ALONE	40 LBS.	0.9 LBS.	M-L P C		227,000 SEED PER POUND. DENSE COVER. VERY COMPETITIVE & IS NOT TO BE USED IN MIXTURES.

DS2 DISTURBED AREA STABILIZATION (TEMP)

SPECIES	BROADCAST PER ACRE	BROADCAST PER 1000 S.F.	RESOURCE AREA	PLANTING DATES (J F M A M J J A S O N D)	REMARKS
BERMUDA, COMMON HULLED SEED ALONE WITH OTHER PERENNIALS	10 LBS. 6 LBS.	0.2 LBS. 0.1 LBS.	P C		1,787,000 SEED PER POUND. QUICK COVER. LOW GROWING AND SOD FORMING. FULL SUN. GOOD FOR ATHLETIC FIELDS
BERMUDA, COMMON UNHULLED SEED W/ TEMP COVER WITH OTHER PERENNIALS	10 LBS. 6 LBS.	0.2 LBS. 0.1 LBS.	P C		PLANT WITH WINTER ANNUALS PLANT WITH TALL FESCUE
CENTIPEDE (EREMOCHLOA OPHIUROIDES)	BLOCK SOD ONLY		P C		DROUGHT TOLERANT. FULL SUN OR PARTIAL SHADE. EFFECTIVE ADJACENT TO CONC. & IN CONCENTRATED FLOW AREAS. IRRIGATION IS NEEDED UNTIL FULLY ESTABLISHED. DO NOT PLANT NEAR PASTURES.
CROWNVETECH (CORONILLA VARIA) WITH WINTER ANNUALS OR COOL SEASON GRASSES	15 LBS.	0.3 LBS.	M-L P		100,000 SEED PER POUND. DENSE GROWTH. DROUGHT TOLERANT & FIRE RESISTANT. USE FROM NORTH ATLANTA AND NORTHWARD.
FESCUE, TALL (FESTUCA ARUNDINACEA) ALONE W/ OTHER PERENNIALS	50 LBS 30 LBS	1.1 LBS. 0.7 LBS.	M-L P		227,000 SEED PER POUND. USE ALONE ONLY ON BETTER SITES. NOT FOR DROUGHTY SOILS. NOT FOR HEAVY USE
LESPEDEZA (AMBRO VIRGATA) SCARIFIED / UNSCARIFIED	60 LBS. 75 LBS.	1.4 LBS. 1.7 LBS.	M-L P C		300,000 SEED PER POUND. HEIGHT OF GROWTH IS 18 TO 24 INCHES. ADVANTAGES IN URBAN AREAS. MIX W/ WEEPING LOVE GRASS, COMMON BERMUDA BAHIA, TALL FESCUE, OR WINTER ANNUALS. INOCULATE SEED W/ INOCULANT.

DS3 DISTURBED AREA STABILIZATION (PERM)

SEDIMENT & EROSION CONTROL NOTES:

1 CONTRACTOR IS TO ADHERE TO THE GEORGIA EROSION & SEDIMENT CONTROL HANDBOOK

2 CONTRACTOR SHALL BE RESPONSIBLE DURING CONSTRUCTION FOR THE CONTINUOUS MAINTENANCE OF SEDIMENT & EROSION CONTROL MEASURES AS CALLED FOR ON THE DRAWINGS

3 SEDIMENT & EROSION CONTROL FACILITIES, & STORM DRAINAGE FACILITIES SHALL BE CONSTRUCTED PRIOR TO ANY OTHER CONSTRUCITON.

4 SEDIMENT & EROSION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL ALL CONSTRUCTION IS COMPLETE & UNTIL A PERMANENT GROUND COVER HAS BEEN ESTABLISHED.

5 ALL GRADED AREAS SHALL BE STABILIZED WITH A TEMPORARY FAST GROWING COVER AND/OR MULCH, NO LATER THAN 2 WEEKS AFTER EARTH DISTURBING ACTIVITY ENDS IN THOSE AREAS WHERE GRADING ACTIVITY HAS CEASED & FINE GRADING WILL NOT TAKE PLACE FOR AT LEAST 15 DAYS.

6 EXISTING DRAINAGE STRUCTURES TO BE INSPECTED, REPAIRED AS NEEDED & CLEANED OUT TO REMOVE ALL SILT & DEBRIS.

7 SEEDING & FERTILIZING RATES FOR TEMPORARY AND PERMANENT STANDS OF GRASS SHALL BE PER CHARTS ON DETAIL SHEET.

8 ADDITIONAL EROSION CONTROL DEVICES SHALL BE USED AS REQUIRED.

9 SILT FENCE AND/OR SILT LOGS SHALL BE CLEANED OR REPLACED WHEN SILT BUILDS UP TO 50% CAPACITY OF SILT FENCE AND/OR SILT LOGS.

10 IF ANY FINES OR PENALTIES ARE LEVIED AGAINST THE PROPERTY OR PROPERTY OWNER BECAUSE OF LACK OF EROSION AND/OR SEDIMENT CONTROL, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF SUCH FINES OR PENALTIES OR THE COST OF ANY FINES OR PENALTIES SHALL BE DEDUCTED FROM THE CONTRACT AMOUNT.

11 EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION & SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.

12 CONSTRUCTION EXIT SHALL BE MAINTAINED ON A CONTINUOUS BASIS.

13 THE CONTRACTOR SHALL USE WHATEVER MEASURES ARE REQUIRED TO PREVENT SILT & CONSTRUCTION DEBRIS FROM FLOWING ONTO ADJACENT PROPERTIES. THIS CAN BE ACCOMPLISHED BY SMALL TEMPORARY SEDIMENT POINTS, SILT FENCES OF STEEL WIRE & BURLAP OR BARRIERS OF CEDAR TREES AND/OR BALES OF STRAW. CONTRACTOR SHALL COMPLY WITH ALL LOCAL EROSION, CONSERVATION, & SILTATION ORDINANCES. CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL STRUCTURES UPON COMPLETION OF PERMANENT DRAINAGE FACILITIES & THE ESTABLISHMENT OF A STAND OF GRASS SUFFICIENT TO PREVENT EROSION.

14 CONTRACTOR SHALL TAKE ALL AVAILABLE PRECAUTIONS TO CONTROL DUST. CONTRACTOR SHALL CONTROL DUST BY SPRINKLING, BY APPLYING CALCIUM CHLORIDE, OR BY OTHER METHODS AS DIRECTED BY ENGINEER AND/OR OWNER'S REPRESENTATIVE, AT NO ADDITIONAL COST TO OWNER.

15 CONTRACTOR TO COMPLY WITH ALL STATE & LOCAL SEDIMENT CONTROL & AIR POLLUTION ORDINANCES OR RULES.

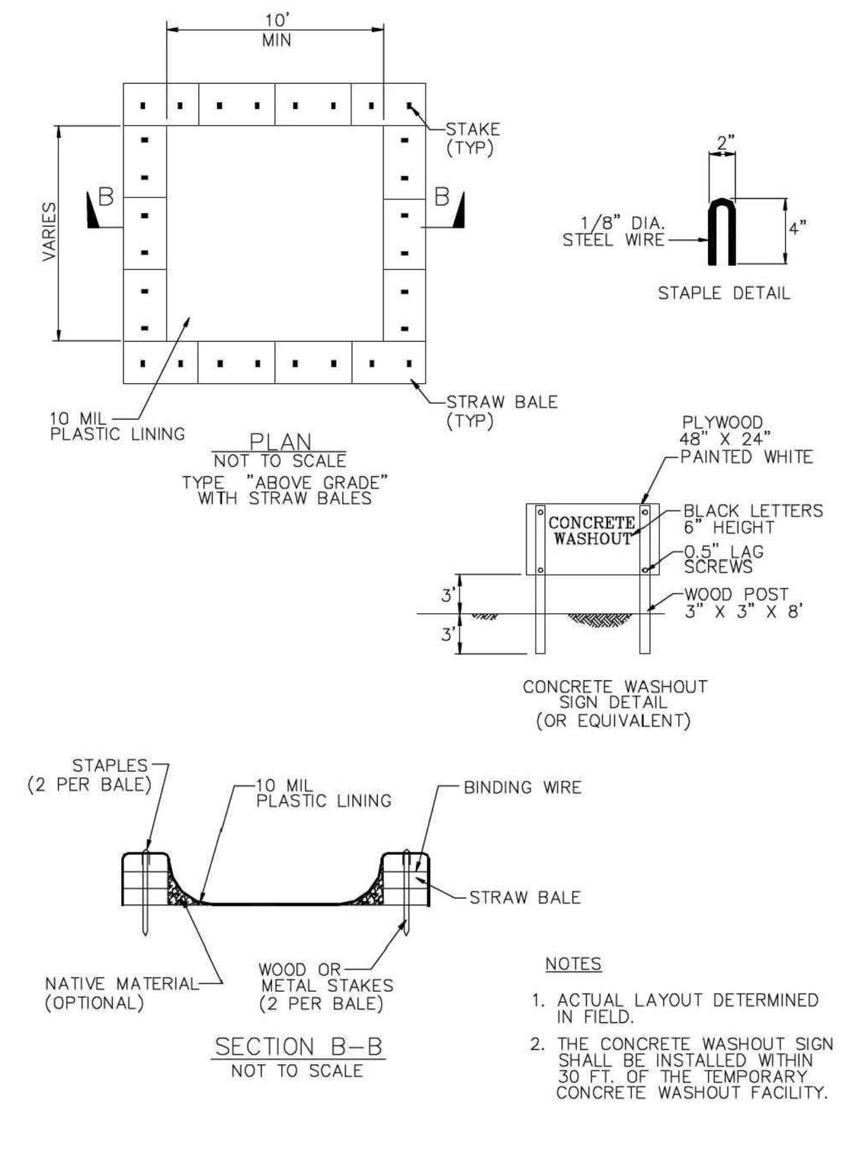
16 ALL DISTURBED AREA TO BE GRASSED.

17 TEMPORARY EROSION CONTROL DEVICES TO BE INSTALLED PRIOR TO BEGINNING OF GRADING. CONTRACTOR SHALL MAINTAIN ALL TEMPORARY EROSION CONTROL DEVICES & SHALL REMOVE SILT FROM BERM DITCHES, SILT DAMS, & SILT FENCES AS NEEDED.

18 ALL SIDE DITCHES TO BE CLEANED AND/OR REGRADED TO PROVIDE PROPER DRAINAGE.

19 ALL AREAS NOT OTHERWISE SURFACED ARE TO BE COVERED WITH 4" TOP SOIL SEEDED, LANDSCAPED, MULCHED, WATERED & MAINTAINED UNTIL AN ADEQUATE STAND OF GRASS IS OBTAINED.

20 SEEDING & FERTILIZING RATES FOR TEMPORARY & PERMANENT STANDS OF GRASS SHALL BE PER THE GEORGIA BEST MANAGEMENT PRACTICES MANUAL



NOTES
1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

CW DETAIL: CONCRETE WASHOUT (NTS)

LAND DISTURBING ACTIVITY NOTES:

VEGETATION: TOP SOIL WILL BE SALVAGED, STOCK PILED & SPREAD ON AREAS TO BE VEGETATED. TREES OUTSIDE OF THE CLEARING LINE WILL BE PROTECTED FROM DAMAGE BY APPROPRIATE MARKINGS. SUPPLEMENTAL VEGETATION WILL BE ESTABLISHED.

EROSION CONTROL PROGRAM: CLEARING WILL BE KEPT TO A MINIMUM. VEGETATION & MULCH WILL BE APPLIED TO APPLICABLE AREAS IMMEDIATELY AFTER GRADING IS COMPLETED. LAND DISTURBING WILL BE EMPLOYED TO PREVENT EROSION IN AREAS OF CONCENTRATED WATER FLOWS. EROSION AT THE EXITS OF ALL STORM WATER STRUCTURES WILL BE PREVENTED BY THE INSTALLATION OF STORM DRAIN OUTLET PROTECTION DEVICES.

SEDIMENT CONTROL PROGRAM: SEDIMENT CONTROL WILL BE ACCOMPLISHED BY THE INSTALLATION OF SEDIMENT BASINS, SEDIMENT FENCES & ADDITIONAL MEASURES AS REQUIRED. DIVERSIONS & DIKES WILL BE INSTALLED TO DIVERT SEDIMENT LADEN RUNOFF INTO THE SEDIMENT BASINS & TO PROTECT CUT AND FILL SLOPES FROM EROSIVE WATER FLOWS. A TEMPORARY CONSTRUCTION EXIT WILL BE EMPLOYED TO PREVENT THE TRANSPORT OF SEDIMENT FROM SITE BY VEHICULAR TRAFFIC.

STANDARDS & SPECIFICATIONS: ALL DESIGNS WILL CONFORM TO AND ALL WORK WILL BE PERFORMED IN ACCORDANCE WITH THE STANDARDS & SPECIFICS OF THE PUBLICATION ENTITLED "THE TENNESSEE EROSION & SEDIMENT CONTROL HANDBOOK; & THE BEST MANAGEMENT PRACTICES MANUAL OF THE STORM WATER MANAGEMENT DEPARTMENT OF PUBLIC WORKS FOR THE CITY OF CHATTANOOGA.

MAINTENANCE PROGRAM: SEDIMENT & EROSION CONTROL MEASURES WILL BE INSPECTED DAILY. ANY DAMAGES OBSERVED WILL BE REPAIRED BY THE END OF THAT DAY. CLEAN OUT OF SEDIMENT CONTROL STRUCTURES WILL BE ACCOMPLISHED IN ACCORDANCE WITH THE SPECIFICATIONS & SEDIMENT DISPOSAL ACCOMPLISHED BY SPREADING ON THE SITE. SEDIMENT BASINS & BARRIERS WILL REMAIN IN PLACE UNTIL SEDIMENT CONTRIBUTING AREAS ARE STABILIZED. SEDIMENT BASINS, THE SEDIMENT FENCES, & THE BARRIERS WILL THEN BE REMOVED & THE AREAS OCCUPIED BY THESE STRUCTURES VEGETATED. GUIDELINES FOR THE MAINTENANCE OF ESTABLISHED VEGETATION WILL BE PROVIDED TO THE OWNER WHEN ALL DISTURBED AREAS ARE STABILIZED.

CONCRETE TRUCKS: THE CONTRACTOR SHALL PROVIDE A BERMED AREA FOR CONCRETE TRUCKS TO "WASH-DOWN". CONTRACTOR TO PERIODICALLY REMOVE CONCRETE WASTE & BYPRODUCTS AND DISPOSE OF PROPERLY.

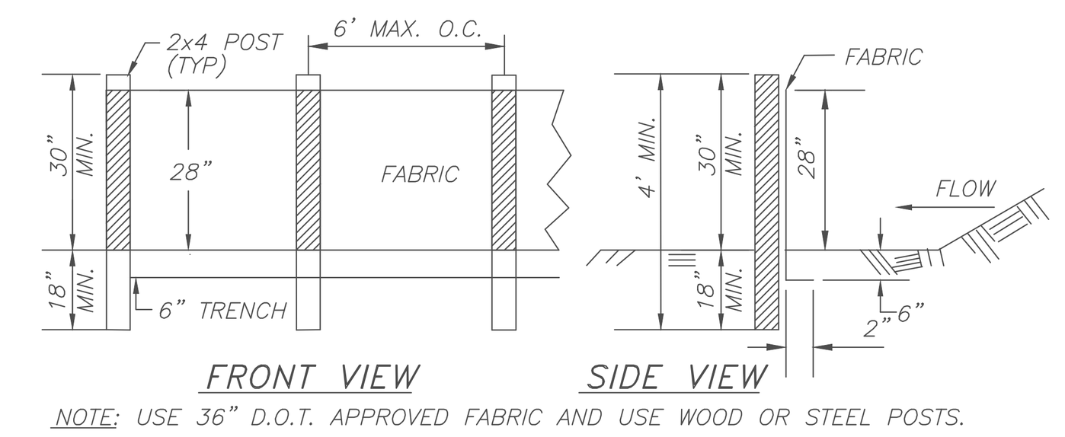
THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION CONTROL MEASURES AND PRACTICES PRIOR TO, OR CONCURRENT WITH LAND DISTURBANCE ACTIVITIES.

TOPSOIL STOCKPILE AREA SHALL BE COVERED WITH BLACK PLASTIC.

WIDTH OF FABRIC	SILT FENCE TYPE USES
TYPE NS (36")	1 ON DEVELOPMENTS WHERE THE LIFE OF THE PROJECT IS GREATER THAN OR EQUAL TO 6 MONTHS 2 WHERE THE SLOPE GRADIENT IS STEEPER THAN 3:1.
TYPE NS (22")	1 ON PROJECTS, SUCH AS RESIDENTIAL HOME SITES OR SMALL COMMERCIAL DEVELOPMENTS, WHERE THE LIFE OF THE PROJECT IS LESS THAN 6 MONTHS. 2 WHERE THE SLOPE GRADIENT IS LESS THAN OR EQUAL TO 3:1.
TYPE S (36") w/ WOVEN WIRE REINFORCEMENT	1 WHERE FILL SLOPES EXCEED A VERTICAL HEIGHT OF 20 FEET AND THE SLOPE GRADIENT IS STEEPER THAN 3:1.

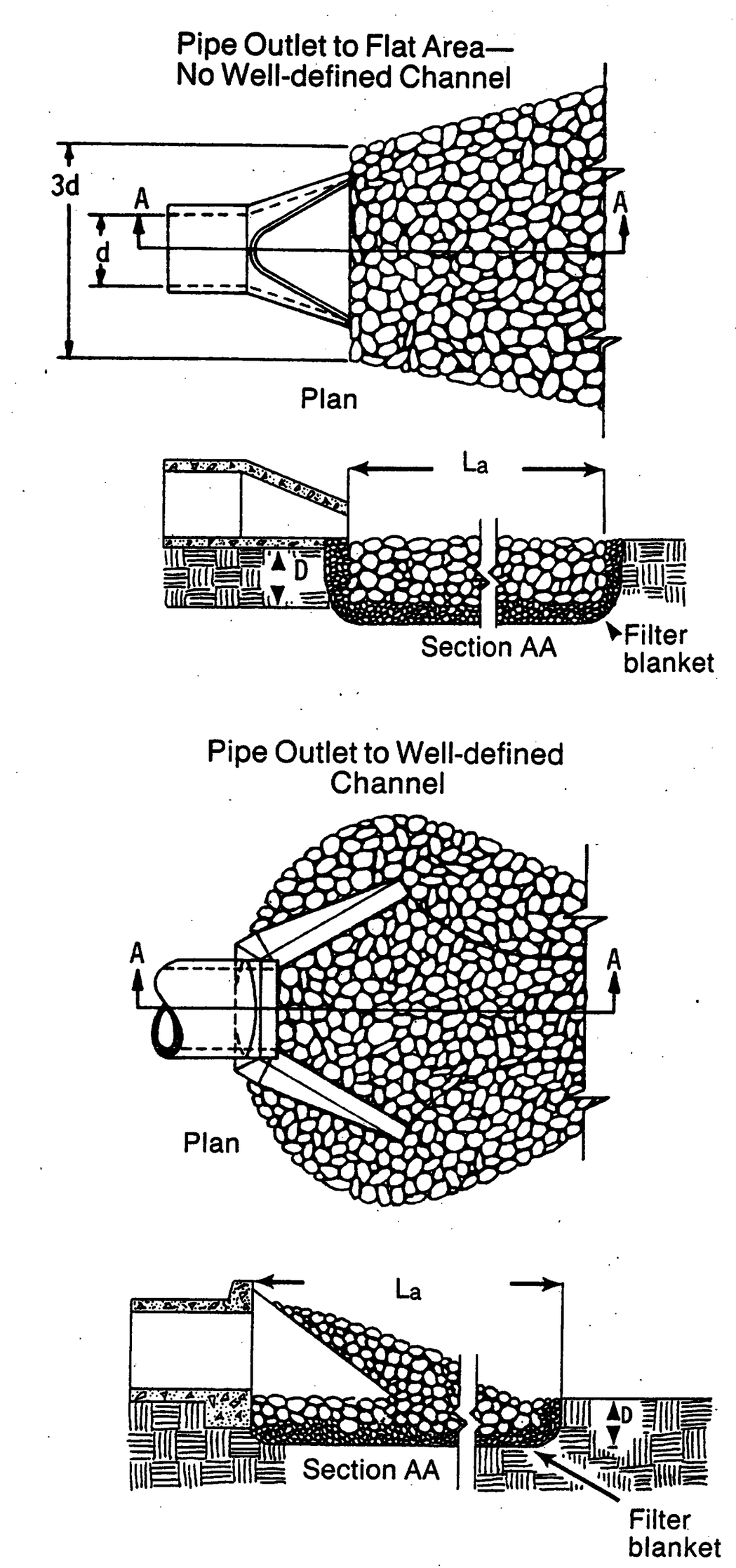
POST SIZE			
	MINIMUM LENGTH	TYPE OF POST	SIZE OF POST
TYPE NS	4'	SOFT WOOD OAK STEEL	3" DIA. OR 2X4 1.5" X 1.5" 1.3lb./FT. MIN.
TYPE S	4'	STEEL	1.3lb./FT. MIN.

FASTENERS FOR WOOD POSTS				
	GAUGE	CROWN	LEGS	STAPLES/POST
WIRE STAPLES	17 MIN	3/4 " WIDE	1/2 " LONG	5 MIN.
	GAUGE	LENGTH	BUTTON HEADS	NAIL/POST
NAILS	14 MIN	1"	3/4 "	4 MIN.
NOTE: FILTER FABRIC MAY ALSO BE ATTACHED TO THE POST BY WIRE, CORD, AND POCKETS.				



NOTE: USE 36" D.O.T. APPROVED FABRIC AND USE WOOD OR STEEL POSTS.

SD1 DETAIL: SILT FENCE - TYPE NS (NTS)



Notes

1. L_a is the length of the riprap apron.
2. D = 1.5 times the maximum stone diameter but not less than 6".
3. In a well-defined channel extend the apron up the channel banks to an elevation of 6" above the maximum tailwater depth or to the top of the bank, whichever is less.
4. A filter blanket or filter fabric should be installed between the riprap and soil foundation.

St / C500 DETAIL: RIP RAP OUTLET PROTECTION (NTS)

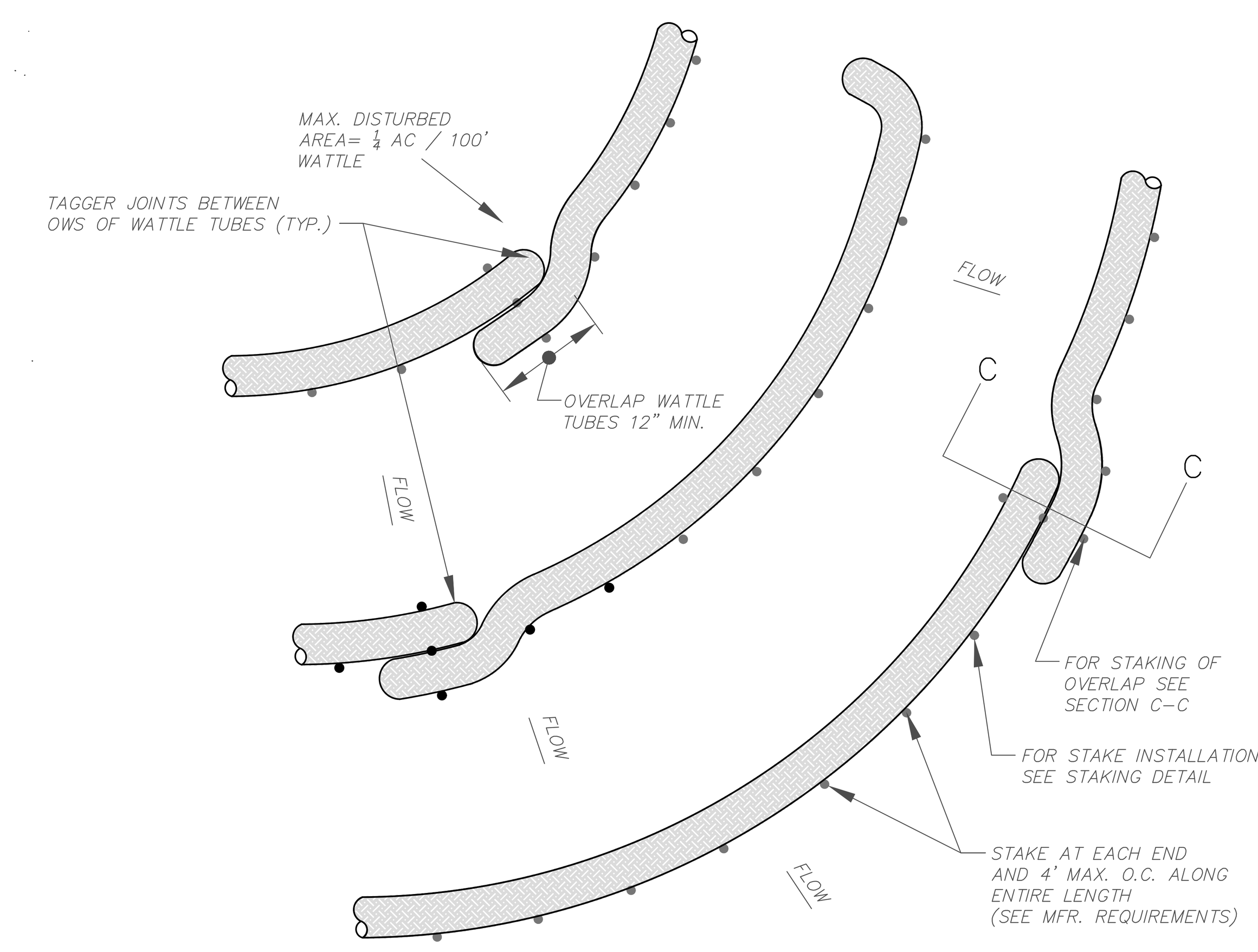
RIP RAP OUTLET PROTECTION								
PIPE ø	FLOW RATE	VELOCITY	TAIL WATER COND.	La (LENGTH APRON)	W1 (WIDTH @HDWL)	W2 (DOWNST. WIDTH)	d50 (AVG STONEø)	D (STONE DEPTH)
INCHES	CFS	FPS		FEET	FEET	FEET	INCHES	INCHES
12	--	2	MIN.	10 FT	3 FT	12 FT	9"	20"

STRUCTURAL PRACTICES

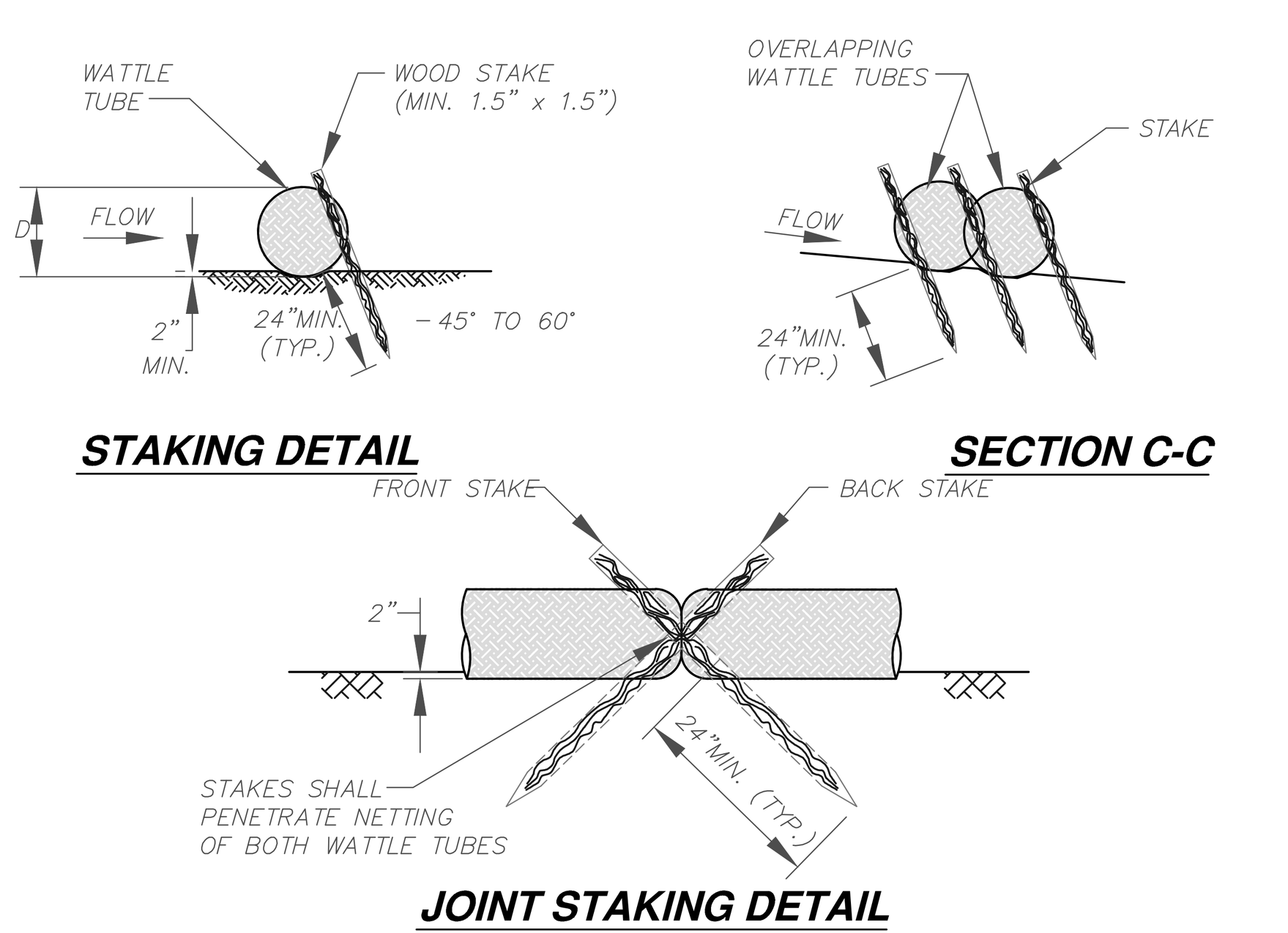
CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Sd2	INLET SEDIMENT TRAP			An impounding area created by excavating around a storm drain inlet. The excavated area will be filled and stabilized on completion of construction activities.
Sd3	TEMPORARY SEDIMENT BASIN			A basin created by excavation or a dam across a waterway. The surface water runoff is temporarily stored allowing the bulk of the sediment to drop out. The basin is usually temporary but may be designed as a permanent pond or stormwater retention device.
Sr	TEMPORARY STREAM CROSSING		Sr	A temporary bridge or culvert-type structure protecting a stream or watercourse from damage by crossing construction equipment.
St	STORM DRAIN OUTLET PROTECTION		St	A paved or short section of riprap channel at the outlet of a storm drain system preventing erosion from the cconcentrated runoff.
Su	SURFACE ROUGHENING		Su	A rough soil surface with horizontal depressions on a contour or slopes left in a roughened condition after grading.
Tp	TOPSOILING		Tp (Show Striping & Storage Areas)	The practice of stripping off the more fertile top soil,storing it,then spreading it over the disturbed area after the completion of construction activities.
Wt	VEGETATED WATERWAY OR STORMWATER CONVEYANCE CHANNEL			Paved or vegetative water outlets for diversions,terraces,berms,dikes or similar structures.

VEGETATIVE MEASURES

CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Bf	BUFFER ZONE		Bf (LABEL)	An undisturbed natural"green belt" separating the land-disturbed site from surrounding property and bordering streams. It serves to reduce water velocity and remove some sediment. It is also at times a noise or"vision pollution"barrier.
Cs	COASTAL DUNE STABILIZATION (WITH VEGETATION)		Cs	Planting vegetation on dunes that are denuded,artificially constructed,or re-nourished.
Ds1	DISTURBED AREA STABILIZATION (WITH MULCHING ONLY)		Ds1	Establishing temporary protection for disturbed areas where seeding may not have a suitable growing season to produce an erosion retarding cover.
Ds2	DISTURBED AREA STABILIZATION (WITH TEMPORARY SEEDING)		Ds2	Establishing temporary vegetative cover with fast growing seedings on disturbed areas.
Ds3	DISTURBED AREA STABILIZATION (WITH PERMANENT VEGETATION)		Ds3	Establishing permanent vegetative cover such as trees,shrubs,vines, grasses,sod,or legumes on disturbed areas.
Du	DUST CONTROL ON DISTURBED AREAS		Du	Controlling surface and air movement of dust on construction sites,roadways and similar sites.

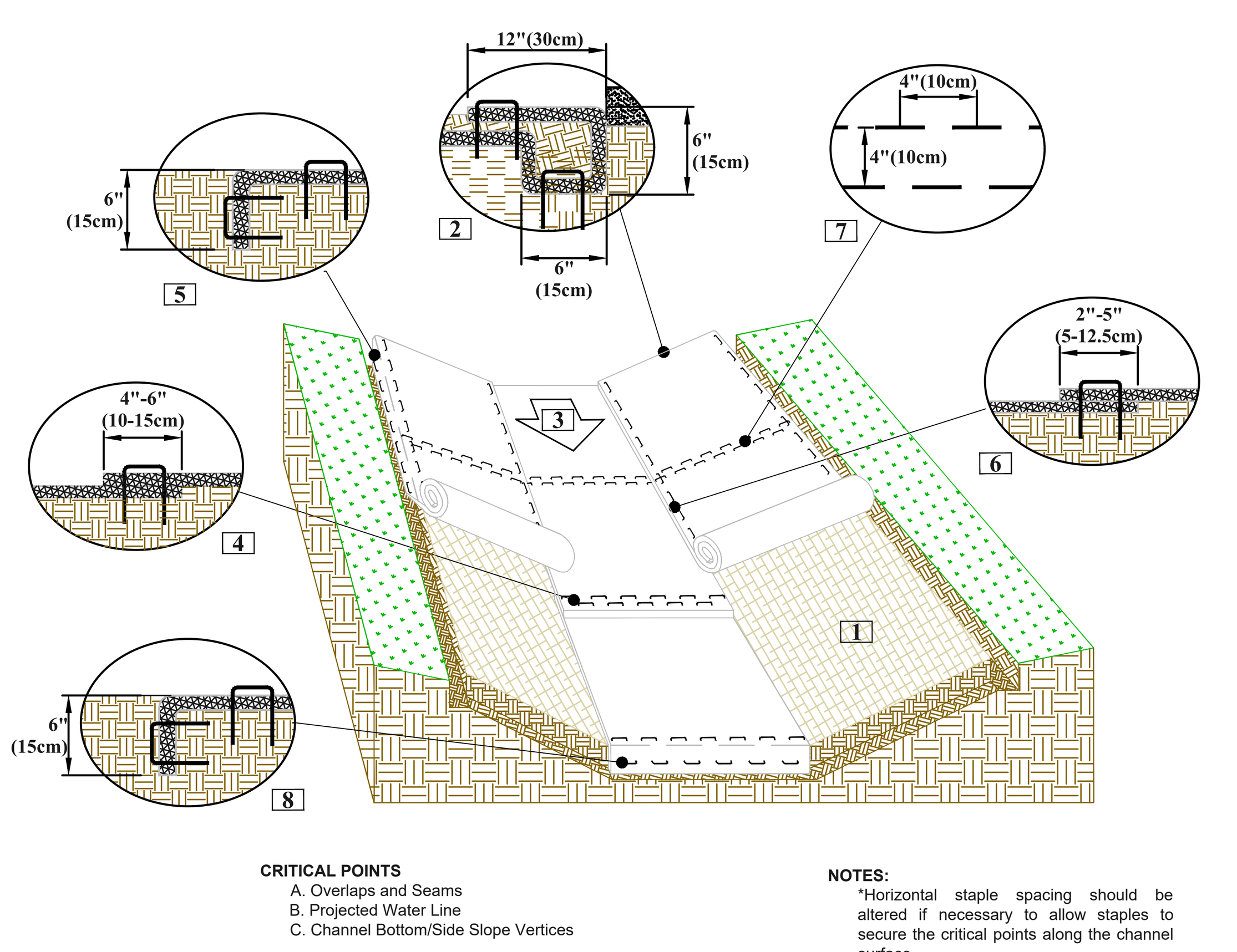


PLAN VIEW FOR SLOPE APPLICATION



JOINT STAKING DETAIL

Sd1-W DETAIL: SILT WATTLE (NTS)



CRITICAL POINTS
A. Overlaps and Seams
B. Projected Water Line
C. Channel Bottom/Side Slope Vertices

Drawing Not To Scale

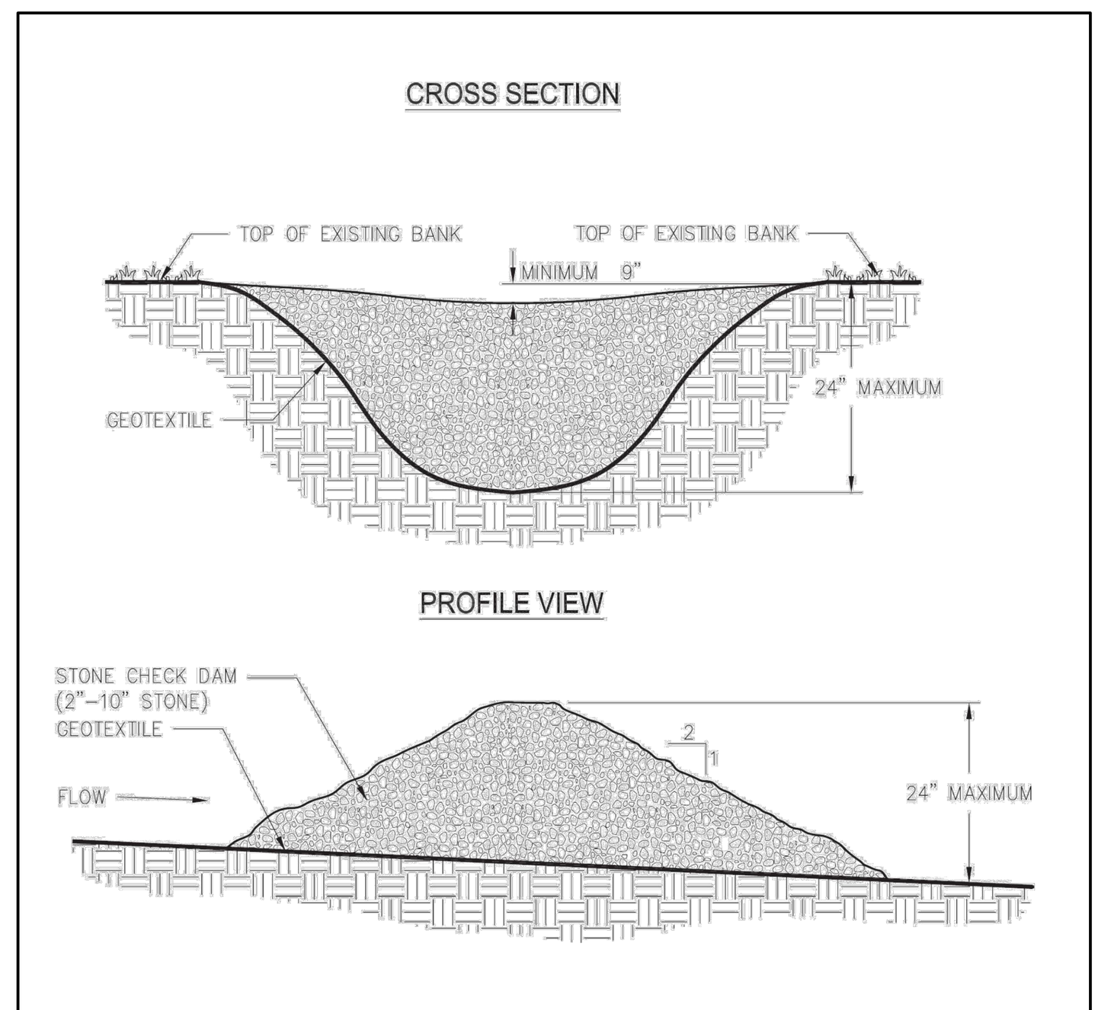
NOTES:
*Horizontal staple spacing should be altered if necessary to allow staples to secure the critical points along the channel surface.

**In loose soil conditions, the use of staple or stake lengths greater than 6"(15cm) may be necessary to properly secure the RECP's.

CHANNEL INSTALLATION DETAIL

1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed.
2. Begin at the top of the channel by anchoring the RECPs in a 6"(15cm) deep X 6"(15cm) wide trench with approximately 12"(30cm) of RECPs extended beyond the up-slope portion of the trench. Use ShoreMax mat at the channel/culvert outlet as supplemental scour protection as needed. Anchor the RECPs with a row of staples/stakes approximately 12"(30cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12"(30cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12" apart across the width of the RECPs.
3. Roll center RECPs in direction of water flow in bottom of channel. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. Place consecutive RECPs end-over-end (Shingle style) with a 4"-6" overlap. Use a double row of staples staggered 4" apart and 4" on center to secure RECPs.
5. Full length edge of RECPs at top of side slopes must be anchored with a row of staples/stakes approximately 12"(30cm) apart in a 6"(15cm) deep X 6"(15cm) wide trench. Backfill and compact the trench after stapling.
6. Adjacent RECPs must be overlapped approximately 2"-5" (5-12.5cm) (Depending on RECPs type) and stapled.
7. In high flow channel applications a staple check slot is recommended at 30 to 40 foot (9 -12m) intervals. Use a double row of staples staggered 4"(10cm) apart and 4"(10cm) on center over entire width of the channel.
8. The terminal end of the RECPs must be anchored with a row of staples/stakes approximately 12" (30cm) apart in a 6"(15cm) deep X 6"(15cm) wide trench. Backfill and compact the trench after stapling.

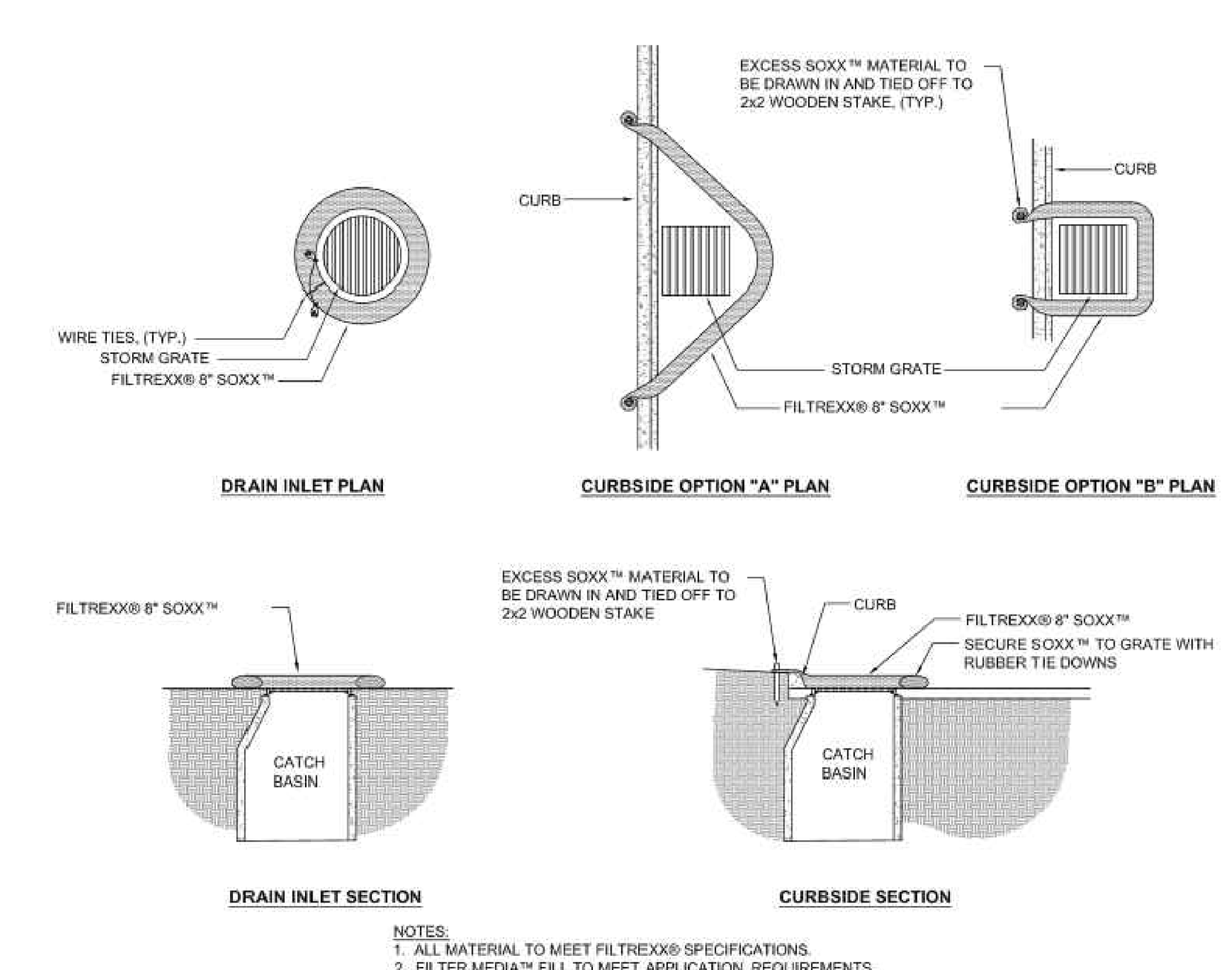
Wt / C500 DETAIL: MATTING AND BLANKETS IN CHANNELS (NTS)



NOTES:
1. CHECK DAMS ARE TO BE USED ONLY IN SMALL OPEN CHANNELS (THEY ARE NOT TO BE USED IN LIVE STREAMS).
2. THE DRAINAGE AREA FOR STONE CHECK DAMS SHALL NOT EXCEED TWO ACRES.
3. THE CENTER OF THE CHECK DAM MUST BE AT LEAST 9 INCHES LOWER THAN THE OUTER EDGES.
4. THE DAM HEIGHT SHOULD BE A MAXIMUM OF 2 FEET FROM CENTER TO RIM EDGE.
5. THE SIDE SLOPES OF THE CHECK DAM SHALL NOT EXCEED A 2:1 SLOPE.
6. GEOTEXTILE SHALL BE USED TO PREVENT THE MITIGATION OF SUBGRADE SOIL PARTICLES INTO THE STONES (REFER TO AASHTO M288-06, SECTION 7.3, TABLE 3).

Figure 6-12.2

Cd-S DETAIL: STONE CHECK DAM (NTS)



NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. FILTER MEDIA™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPOSED ON SITE, AS DETERMINED BY ENGINEER.

Sd2-P DETAIL: WATTLE INLET PROTECTION (NTS)

DH&W
ARCHITECTURE INTERIORS PLANNING
1001 Carter Street · Chattanooga · 37402
423 | 266 | 4816 www.dhw-architects.com

March Adams & Associates
Consulting Engineers
310 Dodds Ave.
P.O. BOX 3689
Chattanooga, Tennessee 37404
PH: (423)698-6675 PROJ.# 23217

RHS BB Hitting Facility

29 Tiger Trail
Ringgold, GA 30736

9-29-23
Drawn: CH, JP
File: 8236-D

Revisions:

Key Plan

Level II Design Professional Certification #35390

Title:
Sediment and Erosion Control Notes & Details

Scale:

Sheet No.
C500

I. GENERAL NOTES

A. THESE NOTES SHALL APPLY EXCEPT WHERE OTHERWISE INDICATED BY THE DRAWINGS OR SPECIFICATIONS.

B. WHERE A DETAIL IS SHOWN FOR ONE CONDITION, IT SHALL APPLY FOR ALL LIKE OR SIMILAR CONDITIONS EVEN THOUGH NOT SPECIFICALLY MARKED ON THE DRAWINGS.

C. IF APPLICABLE, CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS OF EXISTING BUILDINGS AFFECTING NEW CONSTRUCTION, AND DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY TO THE ARCHITECT/ENGINEER IN WRITING.

D. GENERAL CONTRACTOR SHALL ENSURE THAT ALL MATERIALS ARE IN COMPLIANCE WITH THE PLANS AND SPECIFICATIONS.

E. ALL MASONRY WALLS BELOW GRADE SHALL BE BACKFILLED ON BOTH SIDES OF WALL SIMULTANEOUSLY. PROVIDE TEMPORARY BRACING AS REQUIRED TO ADEQUATELY SUPPORT STRUCTURE DURING CONSTRUCTION AND BACKFILLING. BRACING SHALL REMAIN IN PLACE UNTIL ALL FLOOR AND ROOF CONNECTIONS ARE COMPLETE.

F. CENTER LINE OF COLUMN = CENTER LINE OF FOOTING = CENTER LINE OF ANCHOR BOLT TEMPLATE UNLESS NOTED OTHERWISE. NO PIPING SHALL PASS THROUGH OR UNDER ANY FOOTING WITHOUT PRIOR APPROVAL OF THE ENGINEER.

G. DIMENSIONS AT FRAMED OPENINGS TO BE VERIFIED WITH APPLICABLE SUB-CONTRACTOR BEFORE FABRICATION OF STEEL. IF ANY DISCREPANCIES ARE FOUND, THE ARCHITECT/ENGINEER IS TO BE IMMEDIATELY NOTIFIED IN WRITING.

H. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO ORDERING MATERIAL. DISCREPANCIES BETWEEN FIELD MEASURMENTS OF THE EXISTING CONDITIONS AND THE DIMENSIONS INDICATED ON THE CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER.

I. SUBMIT SHOP DRAWINGS OF ALL FABRICATED MATERIALS FOR REVIEW. CONTRACT DOCUMENTS REPRODUCED FOR USE AS SHOP DRAWINGS WILL BE RETURNED UNREVIEWED AND UNSTAMPED. SHOP DRAWINGS WILL NOT BE REVIEWED UNLESS THEY ARE STAMPED "APPROVED" OR "APPROVED AS NOTED" BY THE GENERAL CONTRACTOR.

J. COORDINATE FOUNDATION TO ACCOMODATE DESIGN OF METAL BY OTHERS.

II. DESIGN CRITERIA:

A. BUILDING CODE : 2018 INTERNATIONAL BUILDING CODE

B. DESIGN LOADS:

1. ADDITIONAL DESIGN LOADS INDICATED ON STRUCTURAL DRAWINGS SHALL BE IDENTIFIED AS FOLLOWS:

   LL = LIVE LOAD
   WL = WIND LOAD
   EL = SEISMIC LOAD
   SN = SNOW LOAD
   SD = SNOW DRIFT

2. WIND:
   a. V_{ULT} = 105 mph
   b. RISK CATEGORY = II IMPORTANCE FACTOR = 1.00
   c. MEAN ROOF HT = 18'-0"
   d. EXPOSURE B
   e. END ZONE = 5'-0"
   f. ENCLOSED BUILDING, GC_{pi} =+/-0.18
   g. WIND PRESSURES FOR COMPONENTS AND CLADDING BY TRIBUTARY AREA. VALUES BASED ON WINDSPEED=115 MPH AND EXPOSURE=B. VALUES ARE UNFACTORED AND MAY BE USED IN EITHER STRENGTH DESIGN OR ALLOWABLE STRESS DESIGN LOAD COMBINATIONS OF ASCE 7-16.

ZONE	TRIBUTARY AREA			
	10 ft^2	20 ft^2	50 ft^2	100 ft^2
1, 2e	+13.8/-50.2	+11.3/-50.2	+10.1/-22.4	+7.5/-12.5
2n, 2r, 3e	+13.8/-75.3	+11.3/-65.2	+10.1/-40.8	+7.5/-40.1
3r	+13.8/-90.3	+11.3/-75.3	+10.1/-49.0	+7.5/-45.1
4	+25.1/-27.6	+23.9/-25.1	+21.3/-20.4	+20.1/-22.6
5	+25.1/-35.2	+23.9/-32.6	+21.3/-24.5	+20.1/-25.1
LOADS TO BE APPLIED PER FIGURES 30.3-1 AND 30.3-5A OF ASCE 7-16				

3. SEISMIC:
   a. RISK CATEGORY = II IMPORTANCE FACTOR = 1.00
   b. SITE CLASS = D
   c. S_S = 0.530 S_{DS} = 0.370
      S_1 = 0.130 S_{D1} = 0.18
   d. SEISMIC DESIGN CATEGORY = C
   e. EQUIVALENT LATERAL FORCE PROCEDURE
   f. BUILDING SYSTEM - BY METAL BUILDING MANUFACTURER (MBM) R = BY MBM
   g. C_S = BY MBM
   h. DESIGN BASE SHEAR = BY MBM

4. SNOW:
   a. RISK CATEGORY = II IMPORTANCE FACTOR = 1.00
   b. Pg = 10.0 psf Pf = 10.0 psf RAIN-ON-SNOW = 0.0 psf
   c. Ce = 1.0 Ct= 1.0

C. FOUNDATIONS:

1. FOUNDATION DESIGN IS BASED ON SUBSURFACE EXPLORATION REPORT PREPARED BY: n/a

2. IF, AFTER EXCAVATION, THE CONDITION OF THE SOIL INDICATES A SAFE BEARING CAPACITY OF LESS THAN 2000 p.s.f. THE ENGINEER SHALL BE NOTIFIED AND THE FOOTINGS REVISED IF NECESSARY.

3. ALL GRADING AND FILLING SHALL BE DONE AS RECOMMENDED BY A GEOTECHNICAL ENGINEER. GENERAL CONTRACTOR SHALL ESTABLISH AND MAINTAIN SITE DRAINAGE TO DIRECT WATER AWAY FROM FOOTING EXCAVATIONS AND FILL PLACEMENT.

4. ALL FOOTINGS SHALL BE POURED ON FIRM, UNDISTURBED EARTH OR ENGINEERED CONTROLLED BACKFILL. BOTTOM OF EXTERIOR FOOTINGS SHALL BE A MINIMUM OF 18 INCHES BELOW FINISH GRADE UNLESS OTHERWISE NOTED, AND TOP OF FOOTING MUST COURSE WITH FINISH FLOOR. FROST LINE FOR THIS PROJECT IS 12 BELOW FINISH GRADE.

SCHEDULE NOTES:

1. ALL COLUMNS TO BE CONTINUOUS U.N.O.

COLUMN SCHEDULE

MARK	C1
COLUMN	METAL BLDG. COLUMN
BASE PLATE	BY METAL BLDG. MFR.
ANCHOR BOLT	BY METAL BLDG. MFR.
NOTES	

III. CONCRETE:

A. CONCRETE SHALL BE PROPORTIONED, MIXED AND PLACED IN ACCORDANCE WITH ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS."

B. CEMENT TO BE PORTLAND TYPE 1 OR APPROVED EQUAL.

C. MIX DESIGN SHALL BE DOCUMENTED IN ACCORD WITH SECTION 03300 OF THE PROJECT SPECS AND ACI 301, CHAPTER 3 "PROPORTIONING". MIX DESIGNS WHICH ARE SUBMITTED WITHOUT THE REQUIRED DOCUMENTATION WILL BE REJECTED. FIELD SLUMPS RECORDED AT JOB SITE SHALL NOT EXCEED THE SLUMP ESTABLISHED FOR THE MIX DESIGN.

D. CONCRETE SHALL HAVE AN ALLOWABLE COMPRESSIVE STRENGTH AS NOTED BELOW:
   * INTERIOR SLABS ON GRADE, F'c = 3,000 PSI
   FOUNDATIONS F'c = 3,000 PSI
   STRUCTURAL SLABS ON MTL DECK F'c = 3,000 PSI

E. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCEMENT:
   FOOTINGS 3"
   SLAB-ON-GRADE 3"
   ELEVATED SLABS 1"

F. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4 INCH UNLESS NOTED.

G. CONCRETE SHALL NOT BE POURED IN WATER OR ON FROZEN GROUND AND SHALL BE PROTECTED FROM FROST DURING CONSTRUCTION.

H. CONTRACTOR SHALL COORDINATE ALL CONTRACT DRAWINGS FOR THE LOCATION OF ANCHOR BOLTS, FLOOR DRAINS, INSERTS, ETC., BEFORE POURING CONCRETE.

I. SLABS:

1. SLAB THICKNESS INDICATED ON DRAWINGS IS MINIMUM AND SHALL BE MEASURED FROM LOW POINT ON FLOOR. CONTRACTOR SHALL COORDINATE ALL DRAWINGS TO ASSURE THAT ALL FLOORS HAVE PROPER SLOPE TO DRAIN IN TOILETS, SHOWERS, ETC.

2. "C.J.", AS INDICATED ON SLAB, INDICATES 3/4" DEEP SAW CUT CONTROL JOINT OR KEYED CONSTRUCTION JOINT IN SLAB-ON-GRADE. MAKE CUTS WITHIN 12 HOURS AFTER CONCRETE PLACEMENT.

J. REINFORCEMENT:

1. ALL DETAILING, FABRICATION AND PLACEMENT OF REINFORCING STEEL, MIXING, HANDLING, PLACING, FINISHING AND CURING OF CONCRETE SHALL BE IN ACCORDANCE WITH ACI-315 AND ACI-318.

2. WIRE MESH REINFORCEMENT SHALL BE CENTERED IN SLAB, BY USE OF HIGH CHAIR WELDING WASHERS OR CONTINUOUS BEAM BOLSTERS.

3. WELDED WIRE FABRIC AND WIRE SHALL BE LAPPED THE SPACING OF THE CROSS WIRES PLUS 2".

K. CONCRETE MASONRY UNITS (CMU):

1. DOWEL ALL VERTICAL REINFORCEMENT FROM FOUNDATIONS. HOLD VERTICAL BARS PLUMB. PROVIDE A MINIMUM OF 1/2" GROUT BETWEEN MAIN REINFORCEMENT AND CMU.

2. HOLLOW CONCRETE BLOCK (MASONRY) UNITS SHALL CONFORM TO A.S.T.M. C90, LIGHTWEIGHT, TYPE N1 WITH A MINIMUM COMPRESSIVE STRENGTH OF 1900 PSI ON THE NET AREA . SAMPLE AND TEST IN ACCORDANCE WITH ASTM C140 (f'm=1500 PSI)

3. ALL MORTAR FOR MASONRY SHALL CONFORM TO A.S.T.M. C270, TYPE M OR S. USE TYPE N MORTAR FOR BRICK AND INTERIOR NON-LOAD BEARING PARTITIONS. ALL GROUT FOR USE IN MASONRY SHALL CONFORM TO A.S.T.M. C476, 3000 PSI @ 28 DAYS. DETERMINE COMPRESSIVE STRENGTH OF GROUT IN ACCORDANCE WITH ASTM C1019.

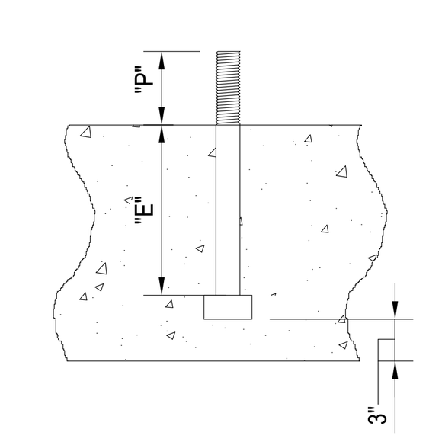
4. HORIZONTAL JOINT REINFORCEMENT (HJR) IN MASONRY WALLS SHALL BE CONTINUOUS TRUSS TYPE WITH No. 9 SIDE RODS AND CROSS-TIES OF GALVANIZED COLD DRAWN MILD STEEL WIRE CONFORMING TO A.S.T.M. A82.

5. MASONRY IS TO BE LAID IN RUNNING BOND UNLESS OTHERWISE NOTED. ALL CORNERS AND INTERSECTING WALLS SHOULD INTERLOCK.

6. FOR HOT WEATHER CONSTRUCTION, IMPLEMENT THE FOLLOWING PROCEDURES WHEN THE AMBIENT TEMP. EXCEEDS CONDITIONS BELOW:
   (a)100°F OR
   (b)90°F w/WIND VELOCITY GREATER THAN 8 mph
   a. DO NOT SPREAD MORTAR BEDS MORE THAN 4'-0" AHEAD OF MASONRY.
   b. SET MASONRY UNITS WITHIN ONE MIN. OF SPREADING MORTAR.

ANCHOR BOLT EMBEDMENTS SCHEDULE

DIAMETER	GRADE	"P"	"E"
1/2"	F1554 (36KSI)	6"	10"
5/8"	F1554 (36KSI)	6"	10"
3/4"	F1554 (36KSI)	6"	10"
7/8"	F1554 (36KSI)	6"	11"
1"	F1554 (36KSI)	6"	12"
1 1/8"	F1554 (36KSI)	6"	14"
1 1/4"	F1554 (36KSI)	6"	15"



FOOTING SCHEDULE

MARK	F3.0	F6.0	F6.0
FOOTING	3'-0"x3'-0"x16"	6'-0"x6'-0"x16"	4'-0"x4'-0"x16"
REINFORCEMENT	(4) #5 BARS EACH WAY	(7) #5 BARS EACH WAY	(5) #5 BARS EACH WAY
NOTES			

V. STRUCTURAL STEEL:

A.. DESIGN, FABRICATION, & ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE MANUAL OF STEEL CONSTRUCTION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION NINTH EDITION UNLESS OTHERWISE MODIFIED ON THE DRAWINGS OR IN SPECIFICATIONS.

B. MATERIAL SHALL MEET THE REQUIREMENTS OF THE FOLLOWING SPECIFICATION UNLESS NOTED:

STRUCTURAL STEEL	- ASTM A992 (Fy=50 ksi)
ROUND PIPE STEEL	- ASTM A53 GRADE B (Fy=35ksi)
TUBE STEEL	- ASTM A500 GRADE B (Fy=46ksi)
HIGH STRENGTH BOLTS	- ASTM A325-86A, 3/4" ∅
WELD STEEL	- AWS CLASS E70

C. ALL SHOP CONNECTIONS SHALL BE WELDED OR MADE WITH HIGH STRENGTH BOLTS UNLESS NOTED SPECIFICALLY.

D. FIELD CONNECTIONS SHALL BE MADE WITH 3/4" HIGH STRENGTH BOLTS. FIELD WELDING WILL BE ALLOWED ONLY WHERE NOTED ON THE DRAWINGS AND DETAILS.

E. ALL HIGH STRENGTH BOLTED CONNECTIONS SHALL BE BEARING TYPE WITH THREADS INCLUDED IN THE SHEAR PLANE UNLESS NOTED.

F. ALL HIGH STRENGTH FIELD BOLTED CONNECTIONS SHALL BE TIGHTENED BY THE "TURN-OF-THE-NUT" METHOD AS SPECIFIED IN "THE ALLOWABLE STRESS DESIGN SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS."

G. FRAMED BEAM CONNECTIONS SHALL DEVELOP THE REACTION SHOWN ON ENDS OF BEAMS ON STRUCTURAL PLANS. WHERE REACTIONS ARE NOT SHOWN THE CONNECTION SHALL DEVELOP ONE-HALF THE ALLOWABLE UNIFORM LOAD FOR LATERALLY SUPPORTED BEAMS AS SHOWN IN TABLES IN PART 2 OF THE AISC MANUAL. CONNECTION DESIGN TO BE SUBMITTED BY ENGINEER LICENSED IN THE PROJECT STATE.

H. ALL STRUCTURAL STEEL BELOW GRADE SHALL BE ENCASED WITH A MINIMUM OF 4" CONCRETE COVER OR PAINTED WITH A COAL TAR

I. JOIST AND JOIST GIRDERS SHALL CONFORM TO THE STEEL JOIST INSTITUTE STANDARDS.

J. WELD JOISTS TO STEEL SUPPORTS WITH 1/8" x 2" LONG FILLET WELDS EACH SIDE OF JOIST BEARING PLATE, OR BOLT WITH (2) 1/2" ∅ A325N BOLTS.

K. WHERE OPEN-WEB JOISTS FRAME PARALLEL TO BEAMS AND WALLS, EXTEND ALL JOISTS BRIDGING AND CONNECT TO BEAMS AND WALLS. EXTEND BOTTOM CHORD OF JOISTS AT COLUMN LINE AND CONNECT FULL STRENGTH TO COLUMNS. EXTEND BOTTOM CHORD OF OTHER JOISTS AS SHOWN ON DRAWINGS OR AS REQUIRED BY JOIST GIRDER SUPPLIER.

L. SUSPENSION OF ANY MISC. ITEMS FROM JOISTS OR TRUSSES SHALL BE ONLY AT TOP CHORD PANEL POINTS, OR AS DETAILED WITH WEB REINFORCEMENT. ABSOLUTELY NOTHING SHALL BE SUSPENDED FROM BAR JOIST OR JOIST GIRDER BRIDGING.

M. LOCATE BEAMS AND BAR JOIST TO CLEAR STACKED HVAC UNITS, TOILET, WASTE LINES, AND DRAINS

N. PROVIDE DOUBLE JOIST UNDER ALL ROOF MOUNTED MECHANICAL UNITS CONTRACTOR SHALL VERIFY ACTUAL SIZE, WEIGHT AND LOCATION OF ROOF TOP UNITS AND SUBMIT TO PROJECT ENGINEER FOR APPROVAL PRIOR TO FABRICATION OF BAR JOIST OR STRUCTURAL STEEL.

VI. FASTENERS:

EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE ON DRAWINGS:

A. ALL POWDER ACTUATED FASTENERS (P.A.F.) TO BE .145" SHANK DIAMETER x 1 1/4" LONG HILTI X-DNI 32 P8 OR .177" SHANK DIAMETER x 1 1/4" LONG HILTI DS 37 P10, TYP. U.N.O.

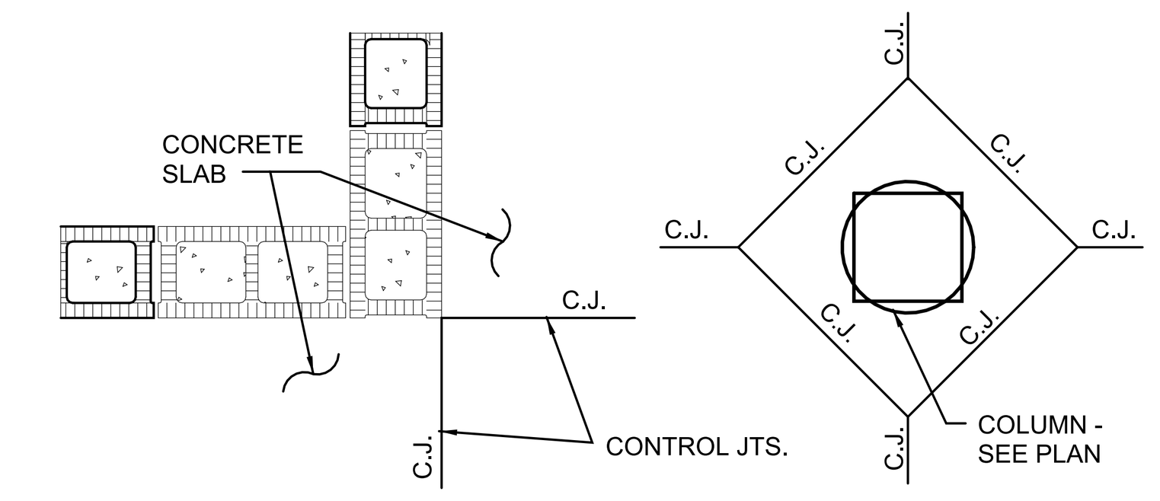
B. ALL EXPANSION ANCHORS TO BE HILTI KWIK BOLT II
   5/8"∅ - MIN. EMBED = 4"
   3/4"∅ - MIN. EMBED = 4 3/4"
   1"∅ - MIN. EMBED = 6"

C. ALL SLEEVE ANCHORS TO BE HILTI CARBON STEEL SLEEVE ANCHORS.
   1/2"∅ - MIN. EMBED = 1 1/2"

D. ALL EPOXY ANCHORS TO BE HILTI HIT HY200 ADHESIVE ANCHORS.
   5/8"∅ - MIN. EMBED = 5"
   3/4"∅ - MIN. EMBED = 6 5/8"
   7/8"∅ - MIN. EMBED = 7 1/2"
   1"∅ - MIN. EMBED = 8 1/4"

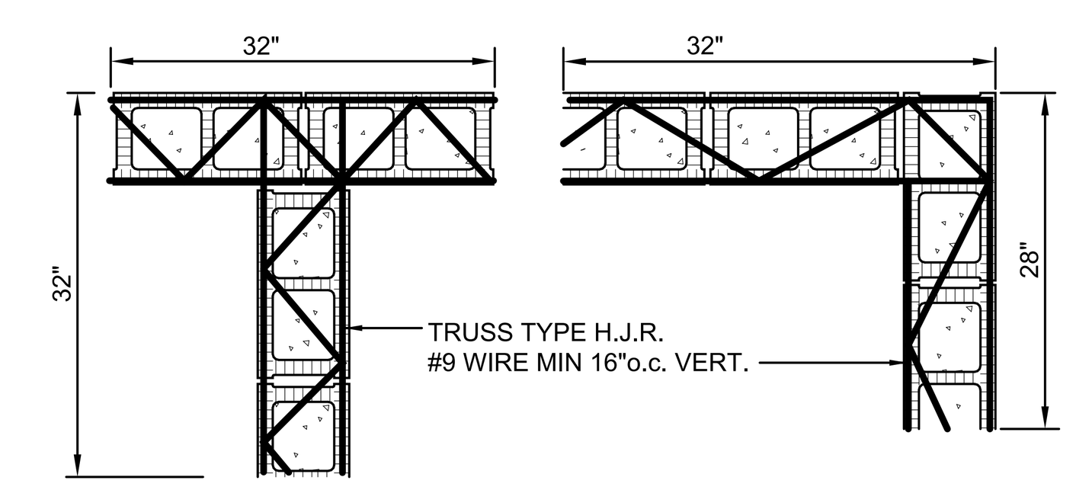
E. ALL CONCRETE/MASONRY SCREWS TO BE HILTI KWIK-CON II+.
   3/16"∅ - MIN. EMBED = 1"
   1/4"∅ - MIN. EMBED = 1 3/4"

F. ALL FASTENERS ARE SIZED PER HILTI SPECIFICATIONS. ALL FASTENERS MAY BE SUBSTITUTED BY AN EQUIVALENT THAT MUST BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

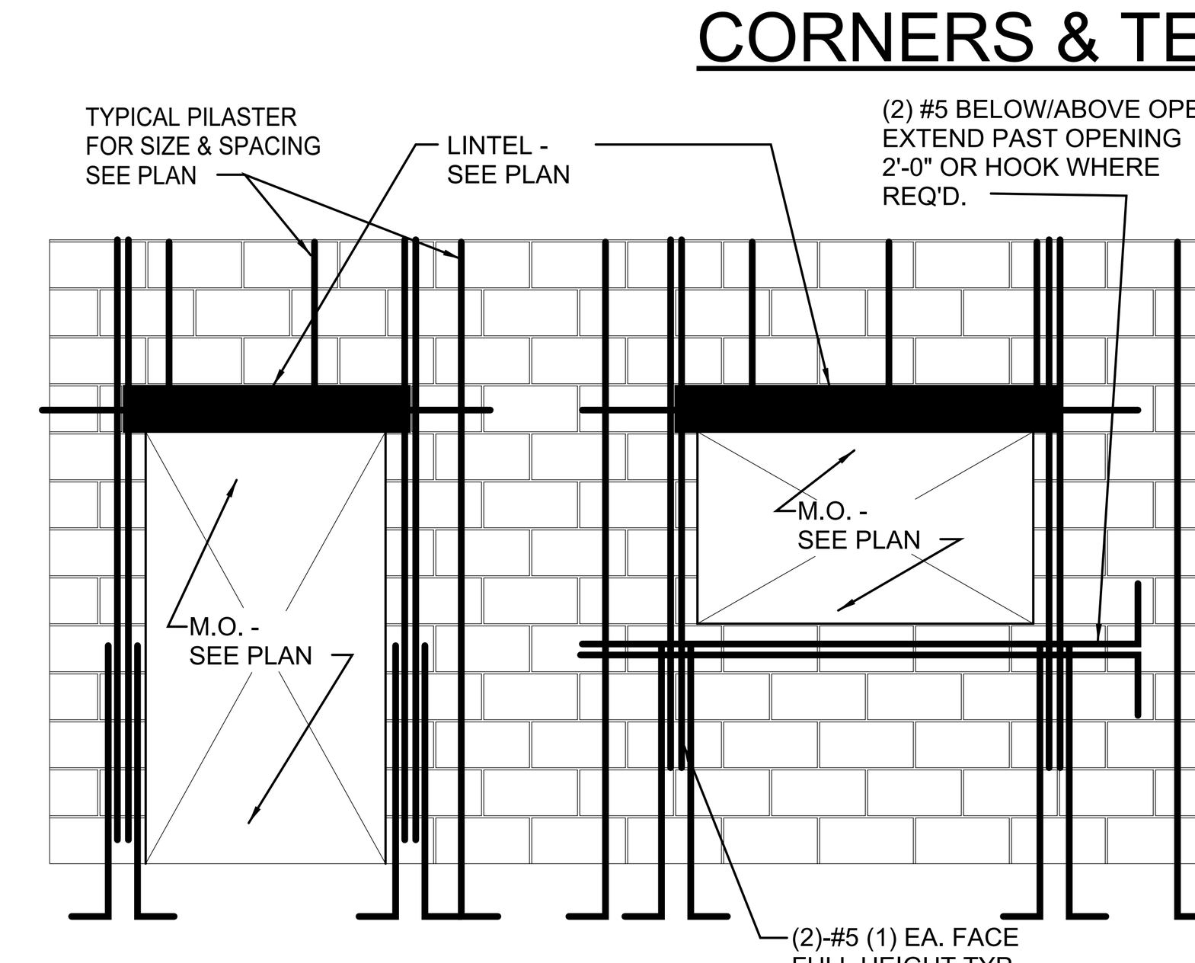


CONTROL JTS SHALL BE PLACED AT ALL CORNERS WHERE SLAB EDGES CHANGE DIRECTION AND ON 4 SIDES OF COLUMN LOCATIONS AS SHOWN ABOVE. INTERMEDIATE JOINTS SHALL BE PLACED SO THAT AREA DOES NOT EXCEED 400 SQ. FT. & RATIO OF SIDES SHALL NOT EXCEED 1.5:1. SEE SECTION 4 OR 5/S2.1.

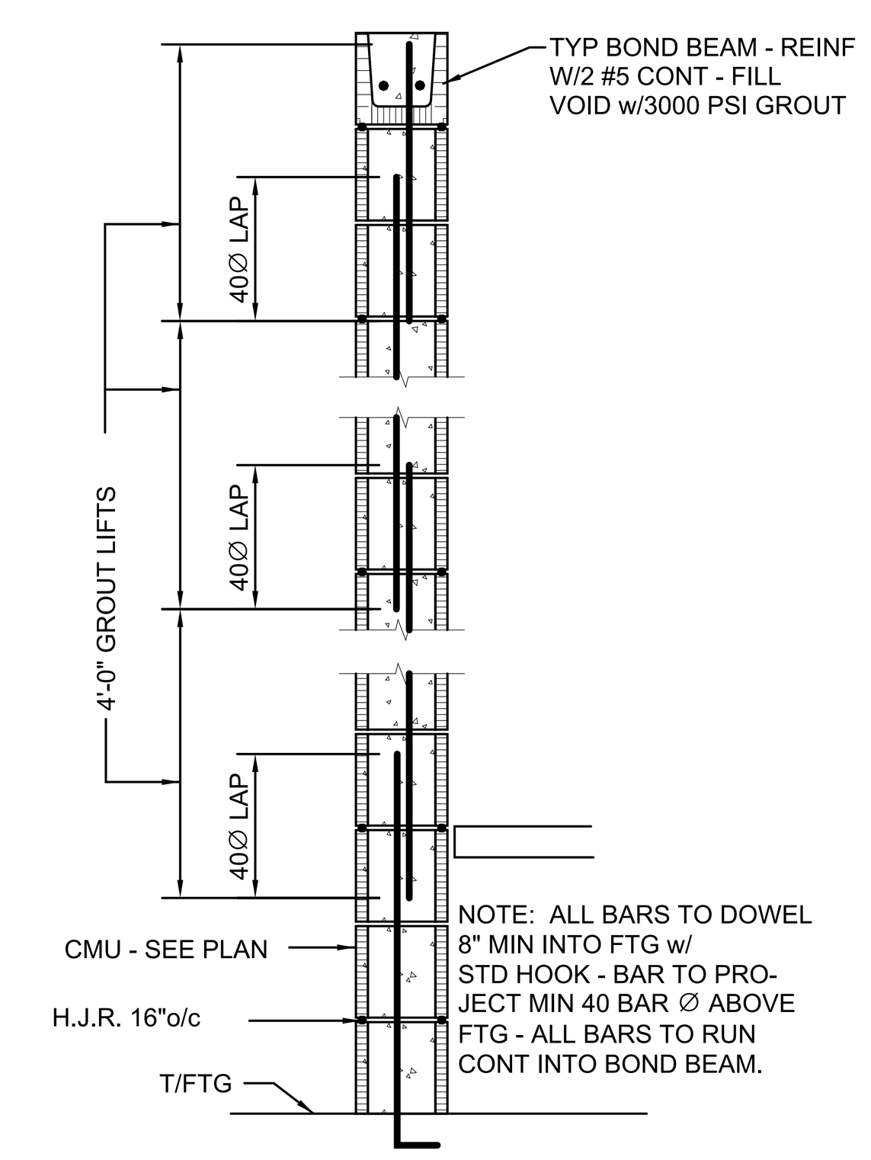
CONTROL/CONSTRUCTION JOINT PLACEMENT DETAIL



PREFABRICATED CORNERS & TEES

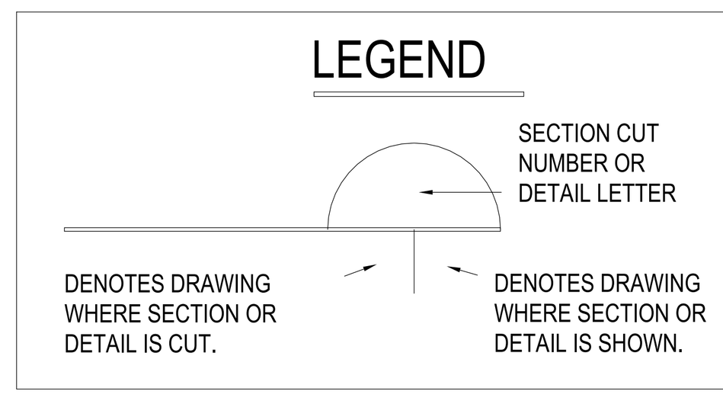


MASONRY OPENING (M.O.) REINFORCEMENT DETAIL



MASONRY WALL REINFORCEMENT DETAIL

LEGEND



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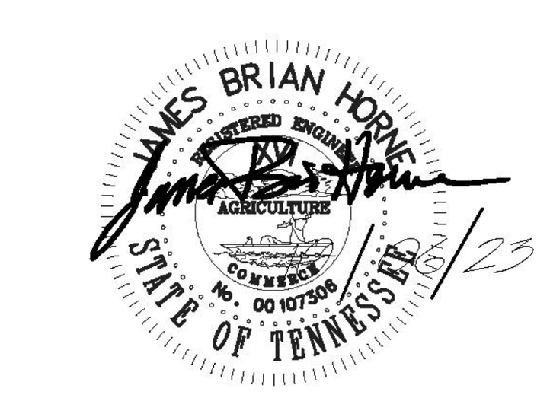
Key Plan



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Structural General Notes and Details

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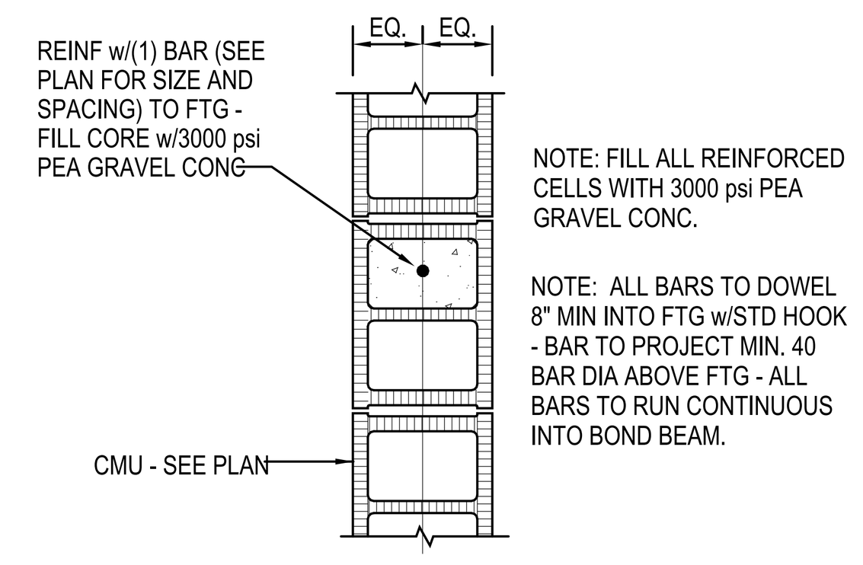
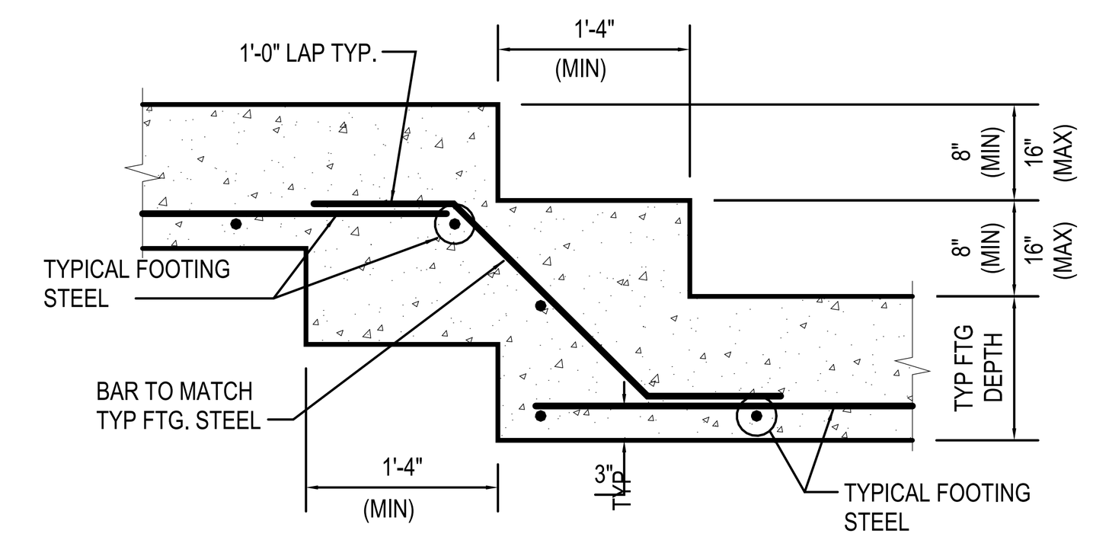
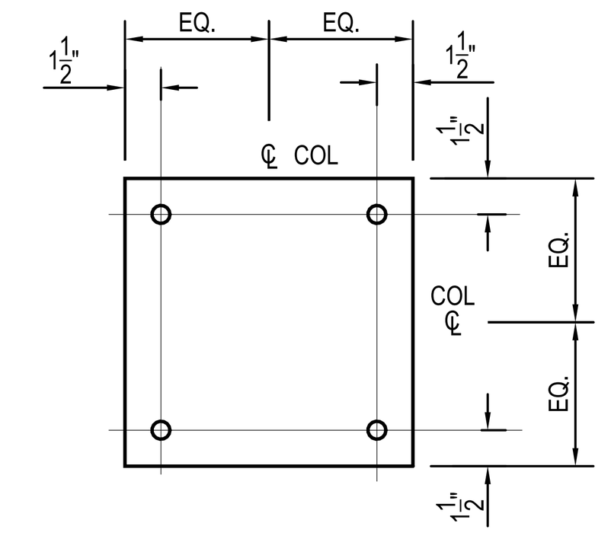
S001



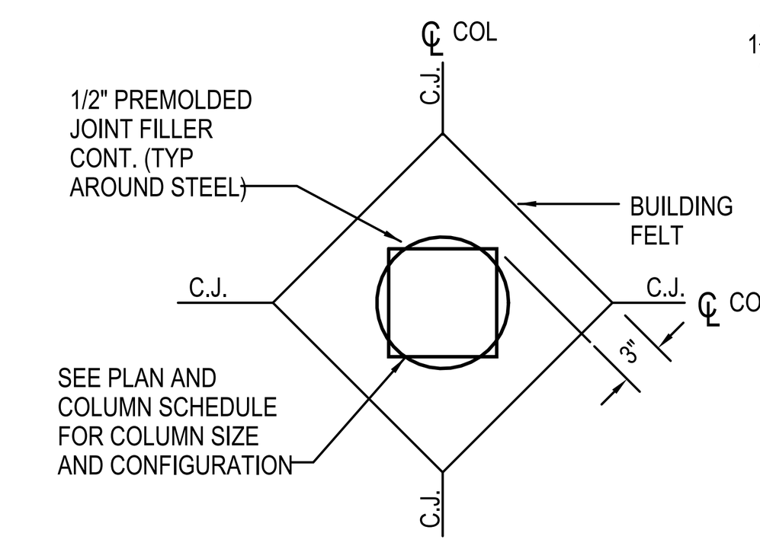
E		E CMU Reinforcing
S002	3/4" = 1'-0"	



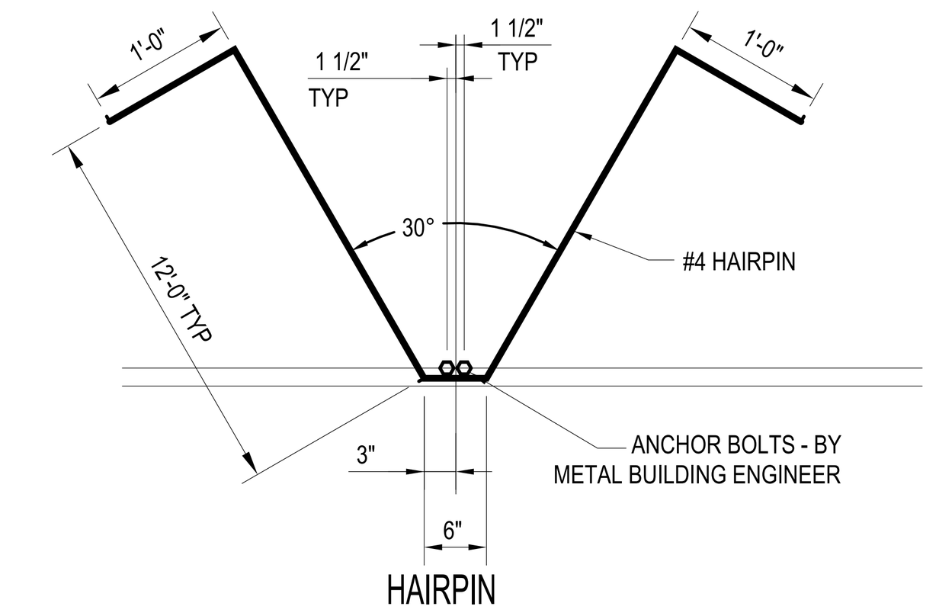
D		D Stepped Footing
S002	3/4" = 1'-0"	



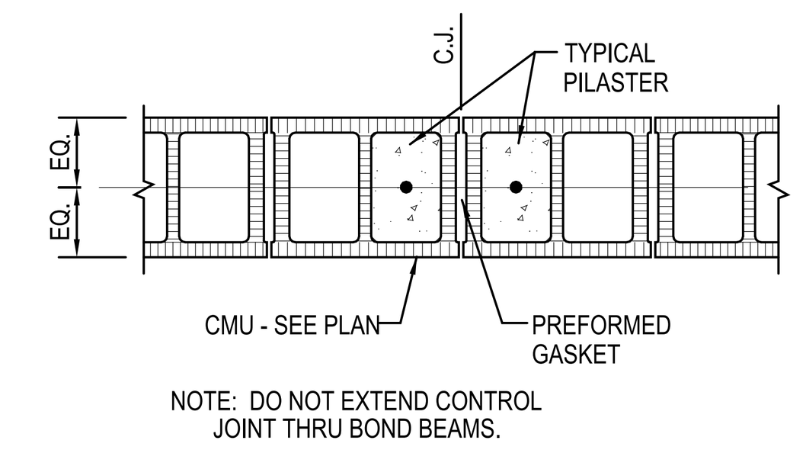
C		C Anchor Bolt Locations
S002	3/4" = 1'-0"	



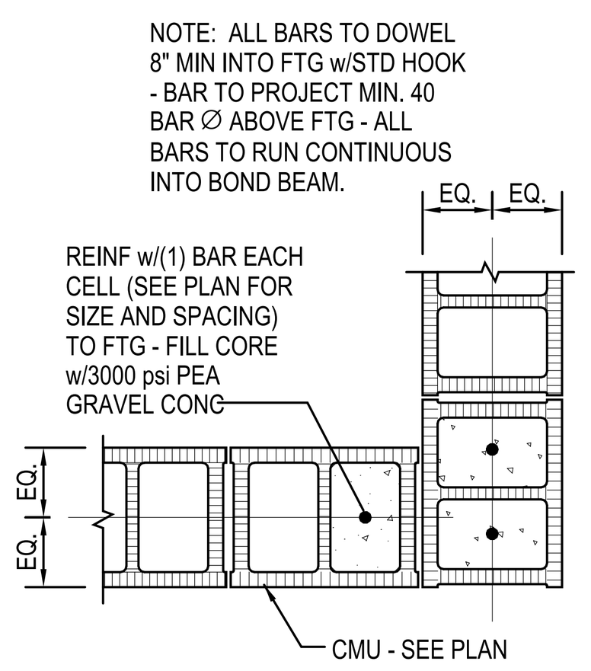
B		B Joints at Column
S002	3/4" = 1'-0"	



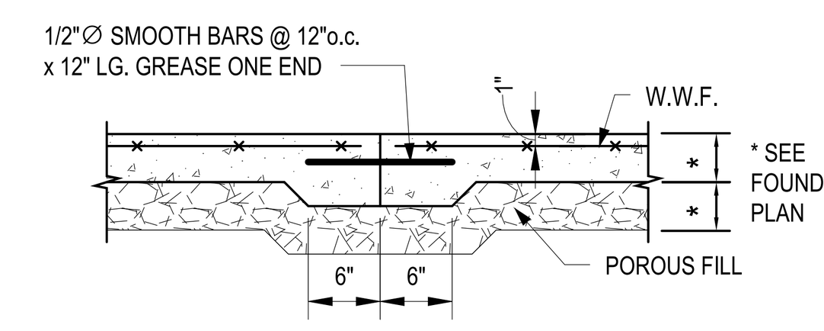
A		A Reinforcing at Column
S002	3/4" = 1'-0"	



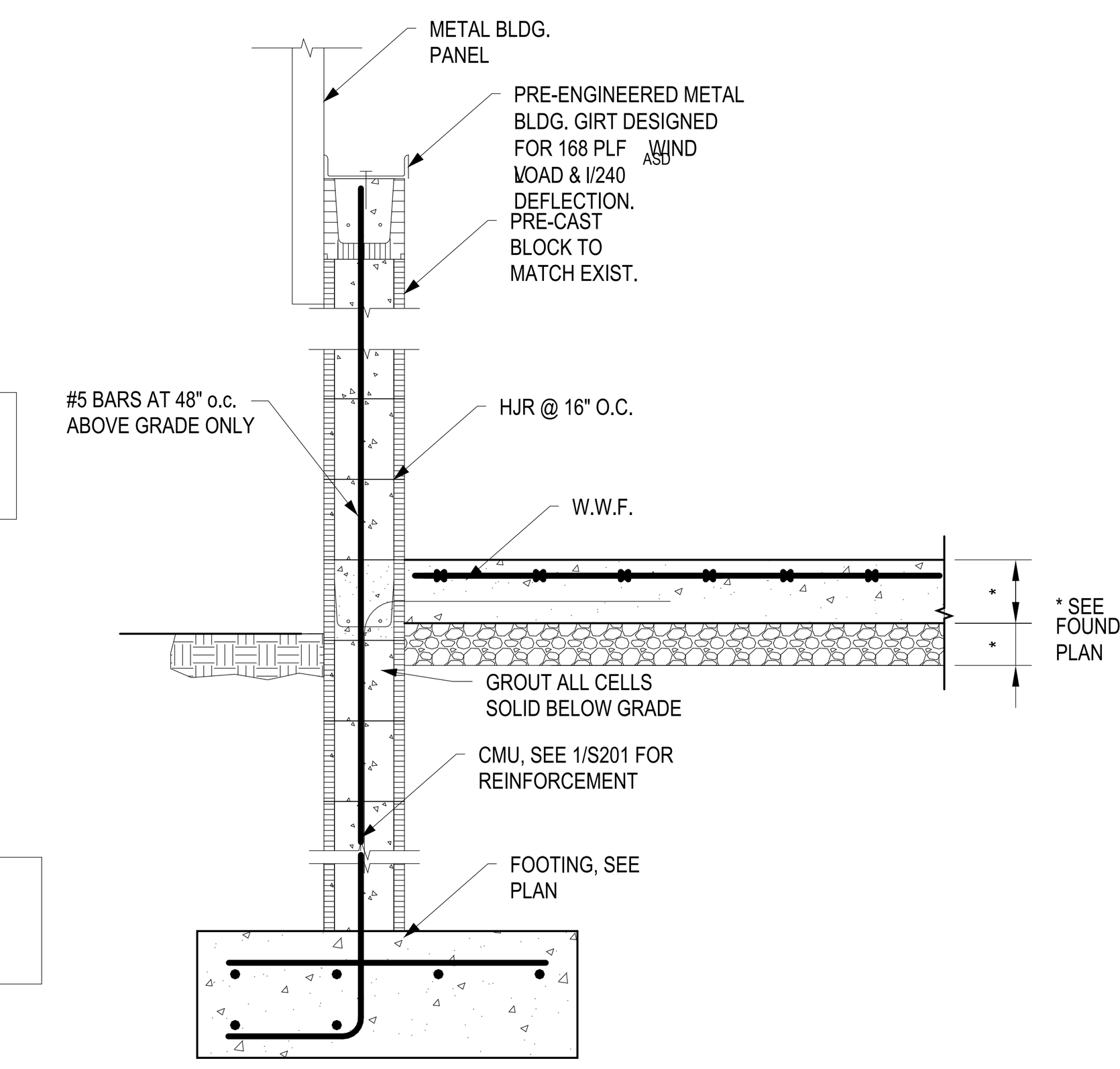
11	S100	G CMU Control Joint
S002	3/4" = 1'-0"	



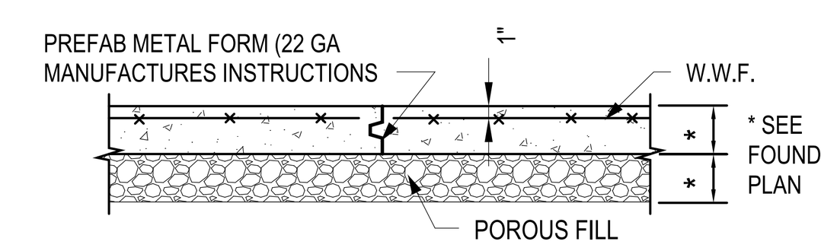
F		F Corner CMU Reinforcing
S002	3/4" = 1'-0"	



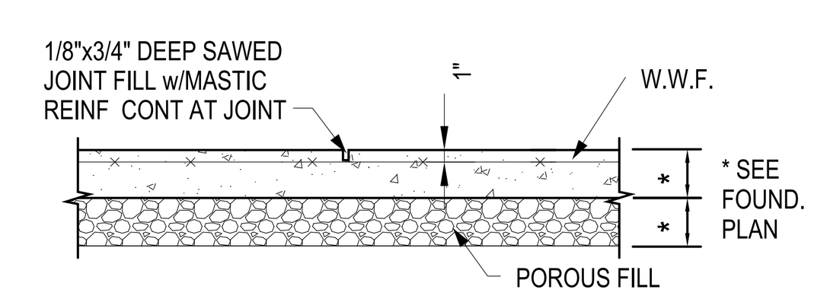
8		8 Reinforced Construction Joint
S002	3/4" = 1'-0"	



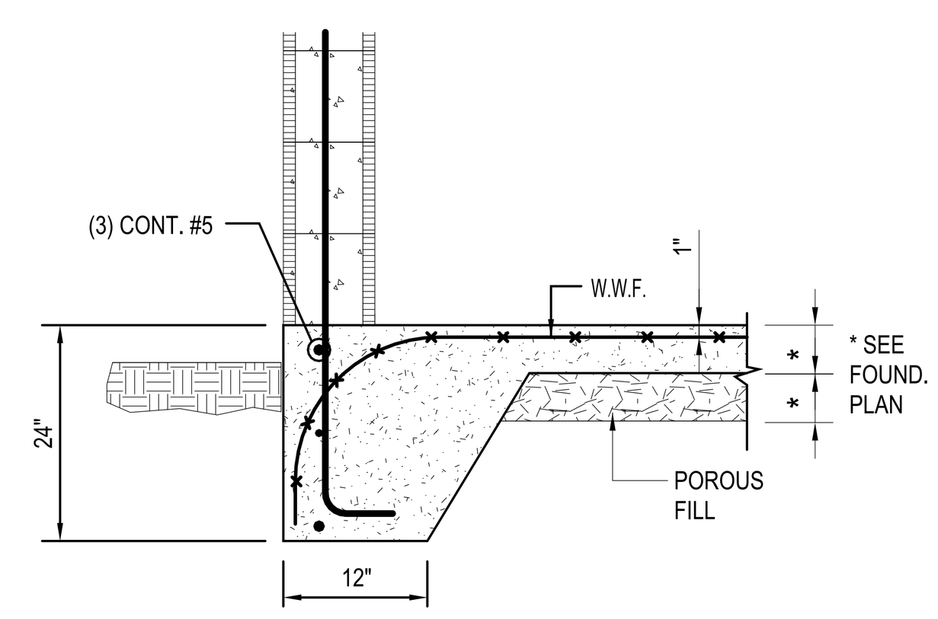
5	S100	5 Wall Section
S002	3/4" = 1'-0"	



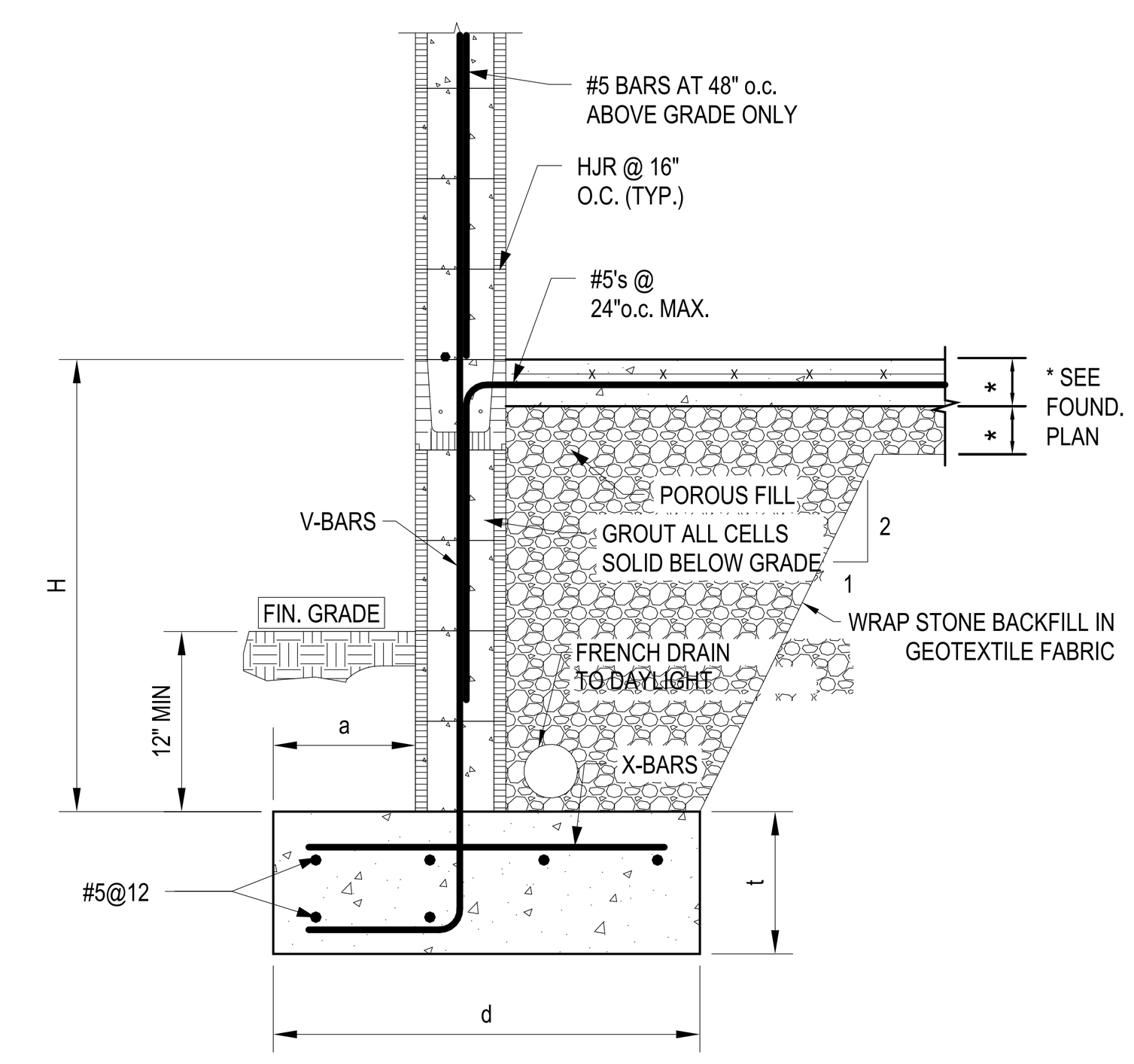
7		7 Construction Joint
S002	3/4" = 1'-0"	



6		6 Control Joint
S002	3/4" = 1'-0"	

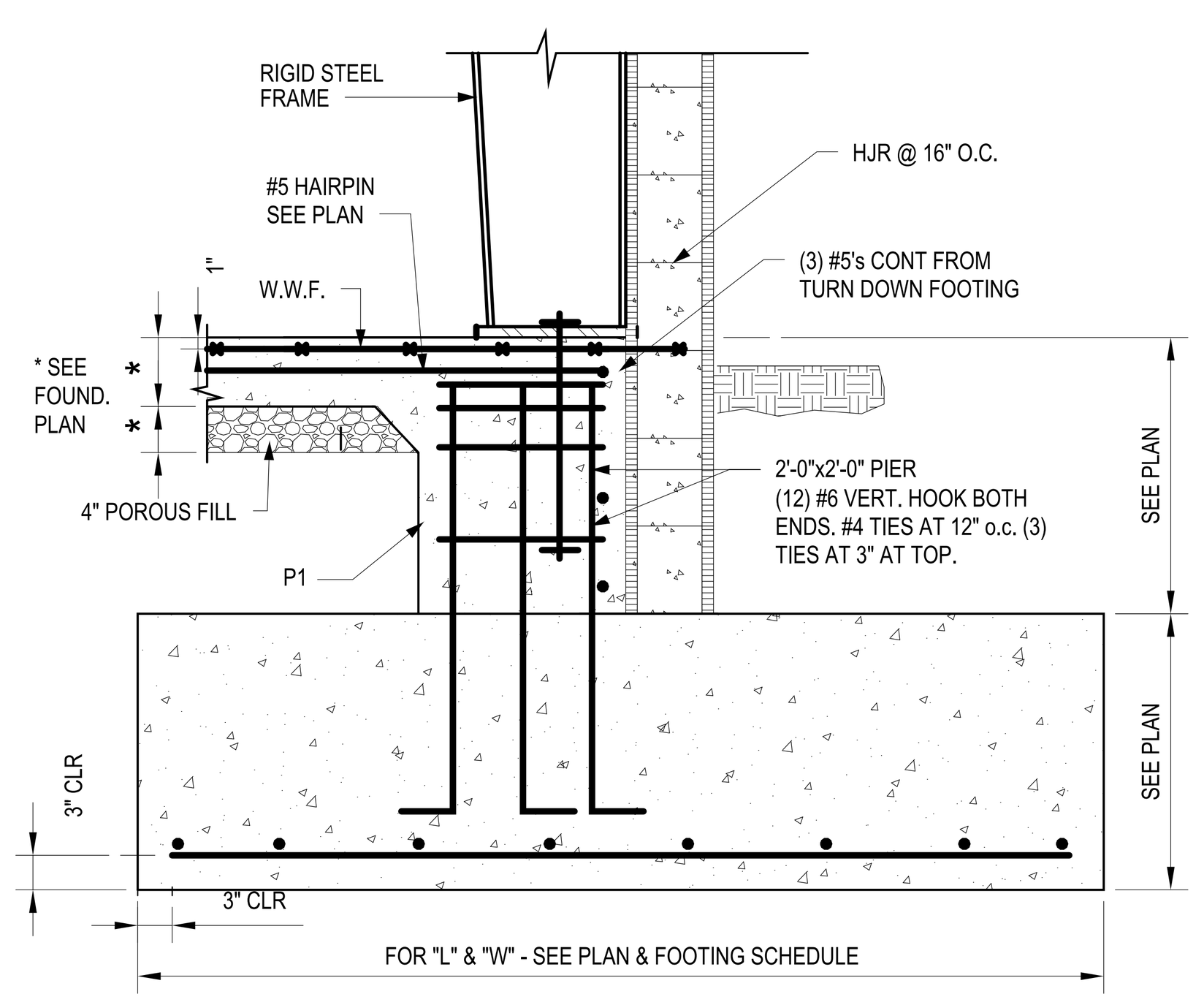


9	S100	9 Thickened edge footing
S002	3/4" = 1'-0"	

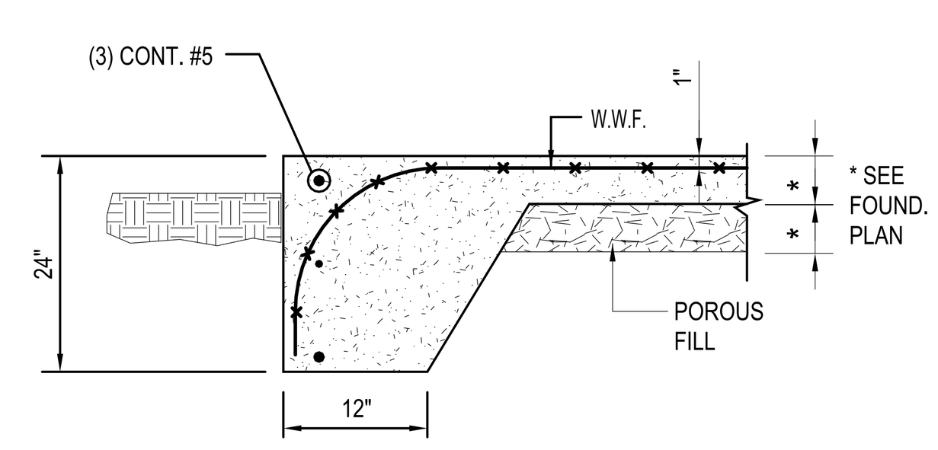


RETAINING WALL SCHEDULE					
"H" ft.-in.	"a" in	"d" ft.-in.	"t" in	V-BARS	X-BARS
8" INCH REINFORCED CONCRETE MASONRY WALLS					
1'-4"	8"	2'-0"	16"	#5 @ 24"o/c	#5 @ 8"o/c
2'-8"	8"	2'-6"	16"	#5 @ 24"o/c	#5 @ 8"o/c
4'-0"	12"	3'-0"	16"	#5 @ 16"o/c	#5 @ 8"o/c
5'-4"	12"	4'-0"	16"	#5 @ 16"o/c	#5 @ 8"o/c

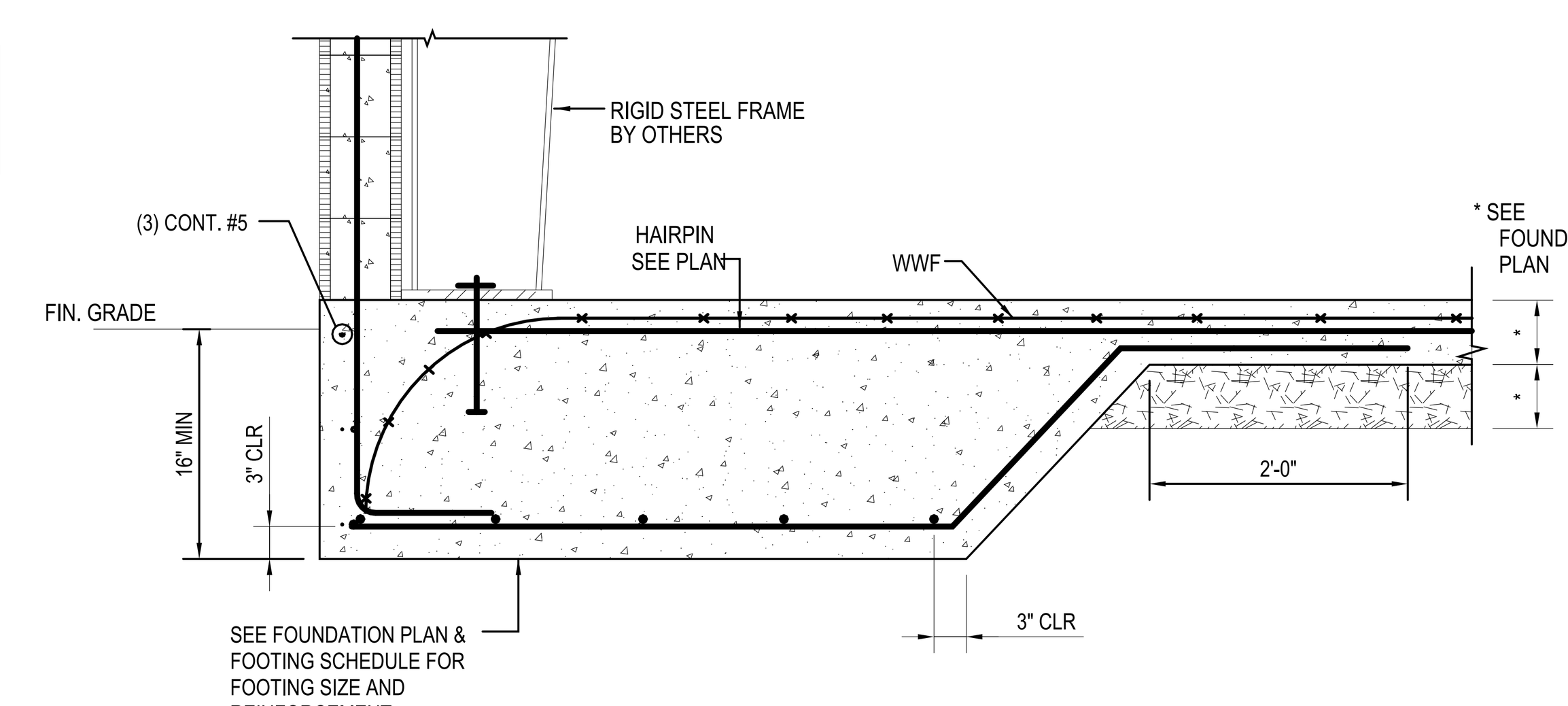
1	S100	1 Retaining Wall
S002	3/4" = 1'-0"	



4	S100	4 Dropped Footing at Rigid Frame
S002	3/4" = 1'-0"	



3	S100	3 Thickened Slab Edge
S002	3/4" = 1'-0"	



2		2 Slab at Rigid Frame
S002	3/4" = 1'-0"	

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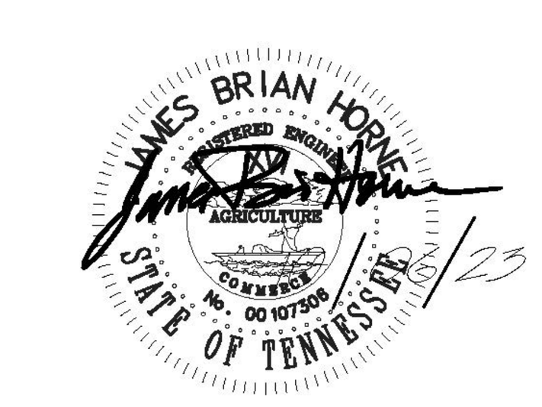

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IBC 2018 SECTION 1705.2
REQUIRED SPECIAL INSPECTIONS AND TESTS OF STEEL CONSTRUCTION

1. SPECIAL INSPECTION FOR STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE QUALITY CONTROL AND QUALITY ASSURANCE REQUIREMENTS OF THE LATEST EDITIONS OF AISC 360 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS AND THE COMMENTARY OF AISC 360 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

2. SPECIAL INSPECTIONS AND QUALIFICATION OF WELDING SPECIAL INSPECTORS FOR COLD-FORMED STEEL FLOOR AND ROOF DECK SHALL BE IN ACCORDANCE WITH THE QUALITY ASSURANCE INSPECTION REQUIREMENTS OF SDI QA/QC.

IBC 2018 TABLE 1705.3
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD	IBC REFERENCE
1. INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESING TENDONS, AND PLACEMENT.	-		ACI 318 Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
2. REINFORCING BAR WELDING: a. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A-706 b. INSPECT SINGLE PASS FILLET WELDS, MAXIMUM 5/16" c. INSPECT ALL OTHER WELDS	- - X	X X -	AWS D1.4 ACI 318: 26.6.4	-
3. INSPECT ANCHORS CAST IN CONCRETE.	-	X	ACI 318: 17.8.2	-
4. INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS. a. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS. b. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.A.	X -	- X	ACI 318: 17.8.2.4 ACI 318: 17.8.2	-
5. VERIFY USE OF REQUIRED DESIGN MIX.	-	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	-	ASTM C 172 ASTM C 31 ACI 318: 26.5, 26.12	1908.10
7. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES	X	-	ACI 318: 26.5	1908.6, 1908.7 1908.8
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES	-	X	ACI 318: 26.5.3-26.5.5	1908.9
9. INSPECT PRESTRESSED CONCRETE FOR: a. APPLICATION OF PRESTRESSING FORCES; AND b. GROUTING OF BONDED PRESTRESSING TENDONS.	X X	- -	ACI 318: 26.10	
10. INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.	-	X	ACI 318: Ch. 26.9	
11. VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	-	X	ACI 318: 26.11.2	
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	-	X	ACI 318: 26.11.1.2(b)	

IBC 2018 TABLE 1705.6
REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

VERIFICATION AND INSPECTION	CONTINUOUSLY DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	-	X
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	-	X
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	-	X
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	-
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	-	X

MINIMUM VERIFICATION AND SPECIAL INSPECTION REQUIREMENTS FOR MASONRY STRUCTURES TMS 602-16 TABLES 3 AND 4
PROJECT REQUIREMENT LEVEL 2

	REQUIRED FOR QUALITY ASSURANCE			REFERENCE FOR CRITERIA	
MINIMUM VERIFICATION	LEVEL 1	LEVEL 2	LEVEL 3	TMS 602	
PRIOR TO CONSTRUCTION VERIFY COMPLIANCE WITH THE APPROVED SUBMITTALS.	R	R	R	ART. 1.5	
PRIOR TO CONSTRUCTION VERIFICATION OF f'm AND f'aac EXCEPT WHERE SPECIFICALLY EXEMPTED BY THE CODE.	NR	R	R	ART. 1.4 B	
DURING CONSTRUCTION, VERIFICATION OF SLUMP FLOW AND VISUAL STABILITY INDEX (VSI) WHEN SELF-CONSOLDATING GROUT IS DELIVERED TO THE PROJECT SITE.	NR	R	R	ART 1.5 & 1.6.3	
DURING CONSTRUCTION, VERIFICATION OF f'm AND f'aac FOR EVERY 5,000 SF	NR	NR	R	ART 1.4 B	
DURING CONSTRUCTION, VERIFICATION OF PROPORTIONS OF MATERIALS AS DELIVERED TO THE PROJECT SITE FOR PREMIXED OR PREBLENDED MORTAR, PRESTRESSING GROUT, AND GROUT OTHER THAN SELF CONSOLIDATING GROUT.	NR	NR	R	ART 1.4 B	
	FREQUENCY OF TASK[a]			REFERENCE FOR CRITERIA	
INSPECTION TASK	LEVEL 1	LEVEL 2	LEVEL 3	TMS 402	TMS 602
1. AS MASONRY CONSTRUCTION BEGINS VERIFY THE FOLLOWING ARE IN COMPLIANCE:					
A. PROPORTIONS OF SITE-PREPARED MORTAR	NR	P	P		ART 2.1, 2.6 A, &2.6 C
B. GRADE AND SIZE OF PRESTRESSING TENDONS AND ANCHORAGES	NR	P	P		ART 2.4 B& 2.4 H
C. GRADE, TYPE AND SIZE OF REINFORCEMENT, CONNECTORS, ANCHOR BOLTS AND PRESTRESSING TENDONS AND ANCHORAGES.	NR	P	P		ART 3.4 & 3.6A
D. PRESTRESSING TECHNIQUE	NR	P	P		ART 3.6 B
E. PROPERTIES OF THIN-BED MORTAR FOR AAC MASONRY	NR	C (b), P (c)	C		ART 2.1 C.1
F. SAMPLE PANEL CONSTRUCTION	NR	P	C		ART 1.6 D
2. PRIOR TO GROUTING, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:					
A. GROUT SPACE	NR	P	C		ART 3.2 D & 3.2 F
B. PLACEMENT OF PRESTRESSING TENDONS AND ANCHORAGES	NR	P	P		ART 2.4 & 3.6
C. PLACEMENT OF REINFORCEMENT, CONNECTORS, AND ANCHOR BOLTS.	NR	P	C		ART 3.2 E & 3.4
D. PROPORTIONS OF SITE-PREPARED GROUT AND PRESTRESSING GROUT FOR BONDED TENDONS	NR	P	P		ART 2.6 B & 2.4 G.1.b
3. VERIFY COMPLIANCE OF THE FOLLOWING DURING CONSTRUCTION:					
A. MATERIALS AND PROCEDURES WITH THE APPROVED SUBMITTALS	NR	P	P		ART 1.5
B. PLACEMENT OF MASONRY UNITS AND MORTAR JOINT CONSTRUCTION.	NR	P	P		ART 3.3 B
C. SIZE AND LOCATION OF STRUCTURAL MEMBERS	NR	P	P		ART 3.3 F
D. TYPE, SIZE, AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES OR OTHER CONSTRUCTION	NR	P	C	SEC 1.2.1 (c) 6.2.1, & 6.3.1	
E. WELDING OF REINFORCEMENT	NR	C	C	SEC. 6.1.6.1.2	
F. PREPARATION, CONSTRUCTION, AND PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40 DEG F) OR HOT WEATHER (TEMPERATURE ABOVE 90 DEG F)	NR	P	P		ART 1.8 C & 1.8 D
G. APPLICATION AND MEASUREMENT OF PRESTRESSING FORCE	NR	C	C		ART 3.6 B
H. PLACEMENT OF GROUT AND PRESTRESSING GROUT FOR BONDED TENDONS IS IN COMPLIANCE	NR	C	C		ART 3.5 & 3.6 C
I. PLACEMENT OF AAC MASONRY UNITS AND CONSTRUCTION OF THIN-BED MORTAR JOINTS	NR	C (b), P (c)	C		ART 3.3 B.9 & 3.3 F.1.b
4. OBSERVE PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS	NR	P	C		ART 1.4 B.2.a.3, 1.4 B.2.b.3 1.4 B.2.c.3, 1.4 B.3, & 1.4 B.4

(a) REFERS R = REQUIRED, NR = NOT REQUIRED, P = PERIODIC, C = CONTINUOUS
(b) REQUIRED FOR THE FIRST 5000 SQUARE FEET (456 SQUARE METERS) OF AAC MASONRY
(c) REQUIRED AFTER THE FIRST 5000 SQUARE FEET (456 SQUARE METERS) OF AAC MASONRY

VII. SPECIAL INSPECTIONS:

THE FOLLOWING SPECIAL INSPECTIONS SHALL BE PERFORMED PER CHAPTER 17 OF THE 2018 INTERNATIONAL BUILDING CODE:

GENERAL NOTES:

1. INSPECTION OF FABRICATORS: SPECIAL INSPECTOR IS TO VERIFY THAT FABRICATORS MAINTAIN DETAILED FABRICATION AND QUALITY CONTROL PROCEDURES THAT PROVIDE A BASIS FOR INSPECTION CONTROL OF THE WORKMANSHIP AND THE FABRICATOR'S ABILITY TO CONFORM TO THE APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS. SEE 1704.2.5.1.

2. REFERENCE CURRENT STATE BUILDING CODE FOR APPLICABLE REFERENCED STANDARD SPECIFIC EDITION INFORMATION.

3. CONTRACTOR RESPONSIBILITY:
   a. EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A MAIN WIND- OR SEISMIC-FORCE-RESISTING SYSTEM, DESIGNATED SEISMIC SYSTEM OR A WIND- OR SEISMIC-RESISTING COMPONENT LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT. THE CONTRACTOR'S STATEMENT OF RESPONSIBILITY SHALL CONTAIN ACKNOWLEDGMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE STATEMENT OF SPECIAL INSPECTIONS.

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Catoosa County Public Schools

Ringgold High School Baseball Hitting Facility

29 Tiger Trail
Ringgold, GA 30736

9-29-23
Drawn: Author
File: 8236-D

Revisions
:

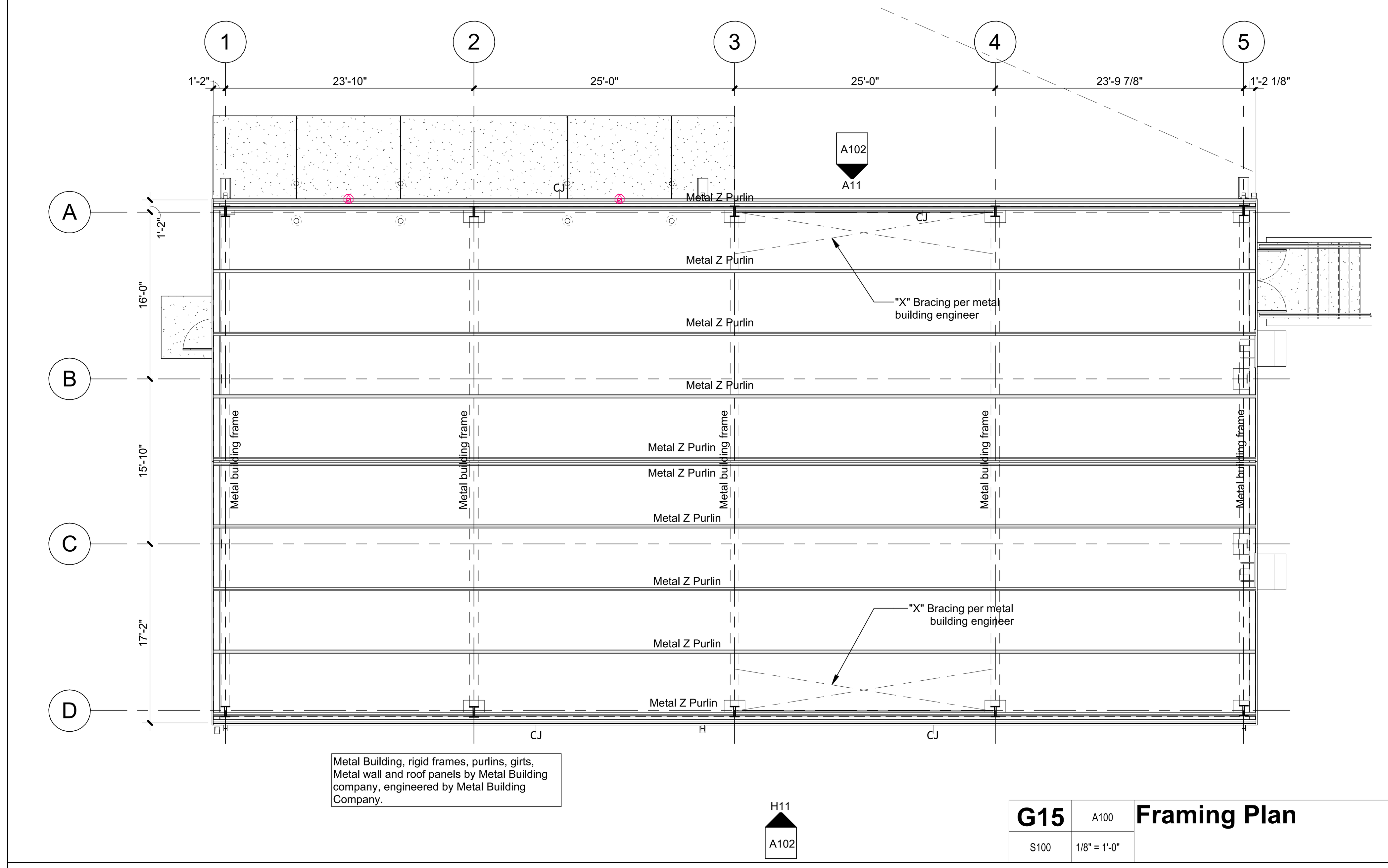
Key Plan

JAMES BRIAN HOWE — REGISTERED PROFESSIONAL ENGINEER — STATE OF TENNESSEE — 125

Title:
Special Inspections

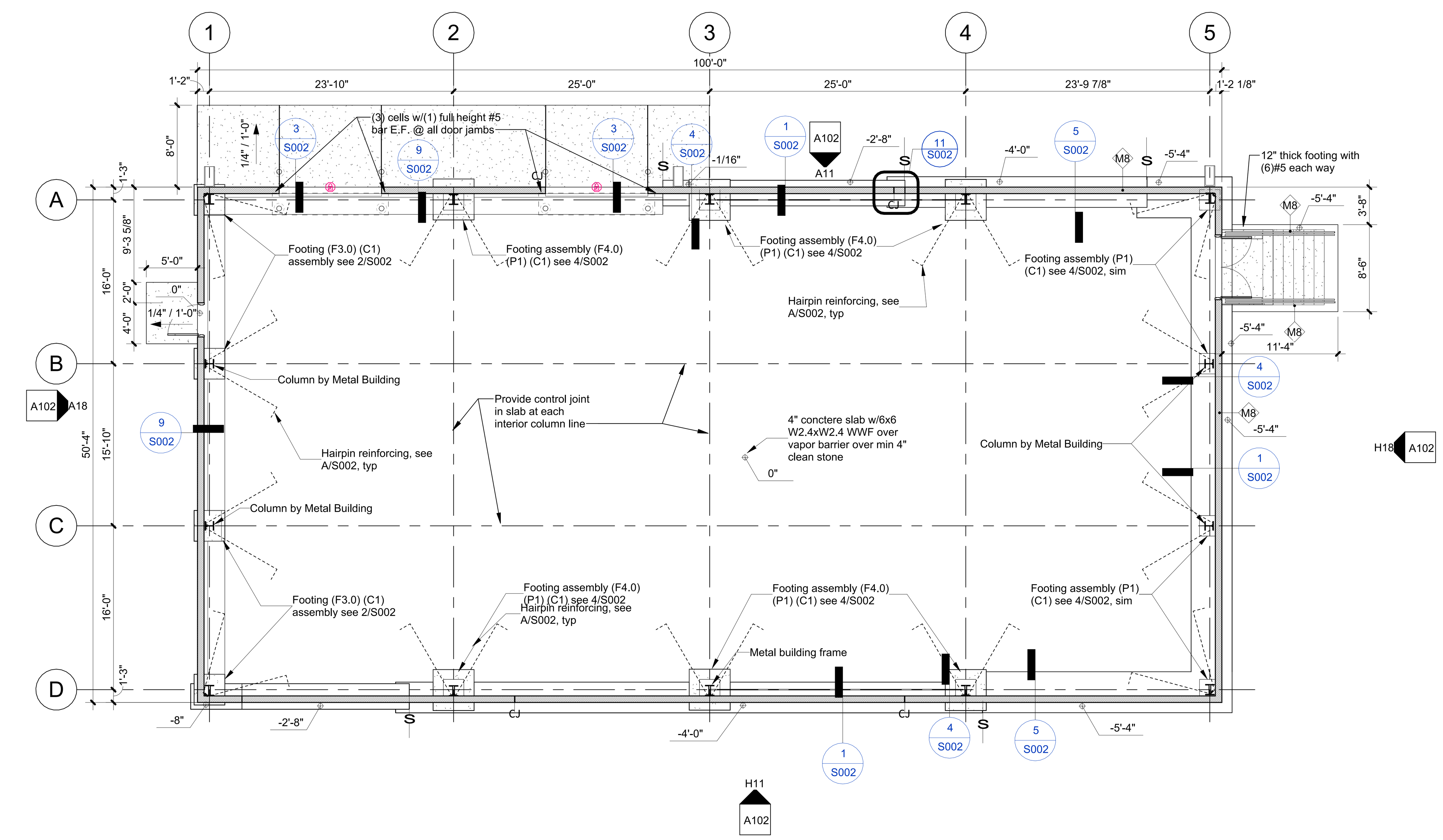
Scale:

Sheet No.
S003



G15 A100 Framing Plan

S100 1/8" = 1'-0"



A15 A100 Foundation Plan

S100 1/8" = 1'-0"

STRUCTURAL NOTES:

1. (-)X'-X" INDICATES TOP OF FOOTING ELEVATION BELOW FINISH FLOOR ELEVATION
2. ALL FOOTINGS SHALL BE CENTERED UNDER COLUMNS AND BEAM BEARING WALL REINFORCEMENTS U.N.O.
3. SEE SHEET S201 FOR ADDITIONAL SECTIONS AND DETAILS
4. ALL SECTIONS TYP U.N.O.
5. FOR TYPICAL PILASTER SEE E/S201 WALL SIZE, BAR SIZE AND SPACING ARE INDICATED AS SHOWN BELOW:

X - X - XX

WALL SIZE — BAR SIZE — BAR SPACING

STRUCTURAL LEGEND:

(?)	COLUMN/FOOTING DESIGNATION - SEE COLUMN/FOOTING SCHEDULE ON S001
	RETAINING WALL - SEE 1/S002
C.J.	TYPICAL SLAB CONTROL OR CONSTRUCTION JOINT. SEE SECTION 6, 7, 8/S002
C.J.	TYPICAL MASONRY CONTROL JOINT SEE DETAIL F/S002 C.J.'s ARE 32'-0"o.c. MAX.
	TYPICAL MASONRY CORNER PILASTER SEE DETAIL E/S001
	(2)#5 x 2'-0" LG. CENTERED IN SLAB TYP ALL MSRY DOOR OPENINGS.
S	INDICATES STEPPED FOOTING - STEP PER D/S002
(C?)	INDICATES COLUMN - SEE SCHEDULE
(P?)	INDICATES PIER - SEE 4/S002

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9-29-23
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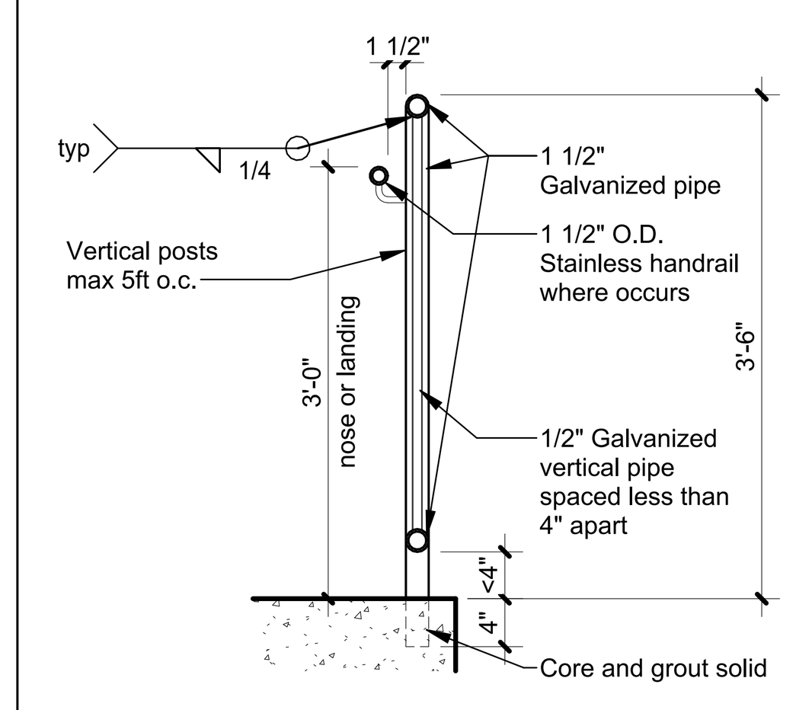
Revisions
:

Key Plan

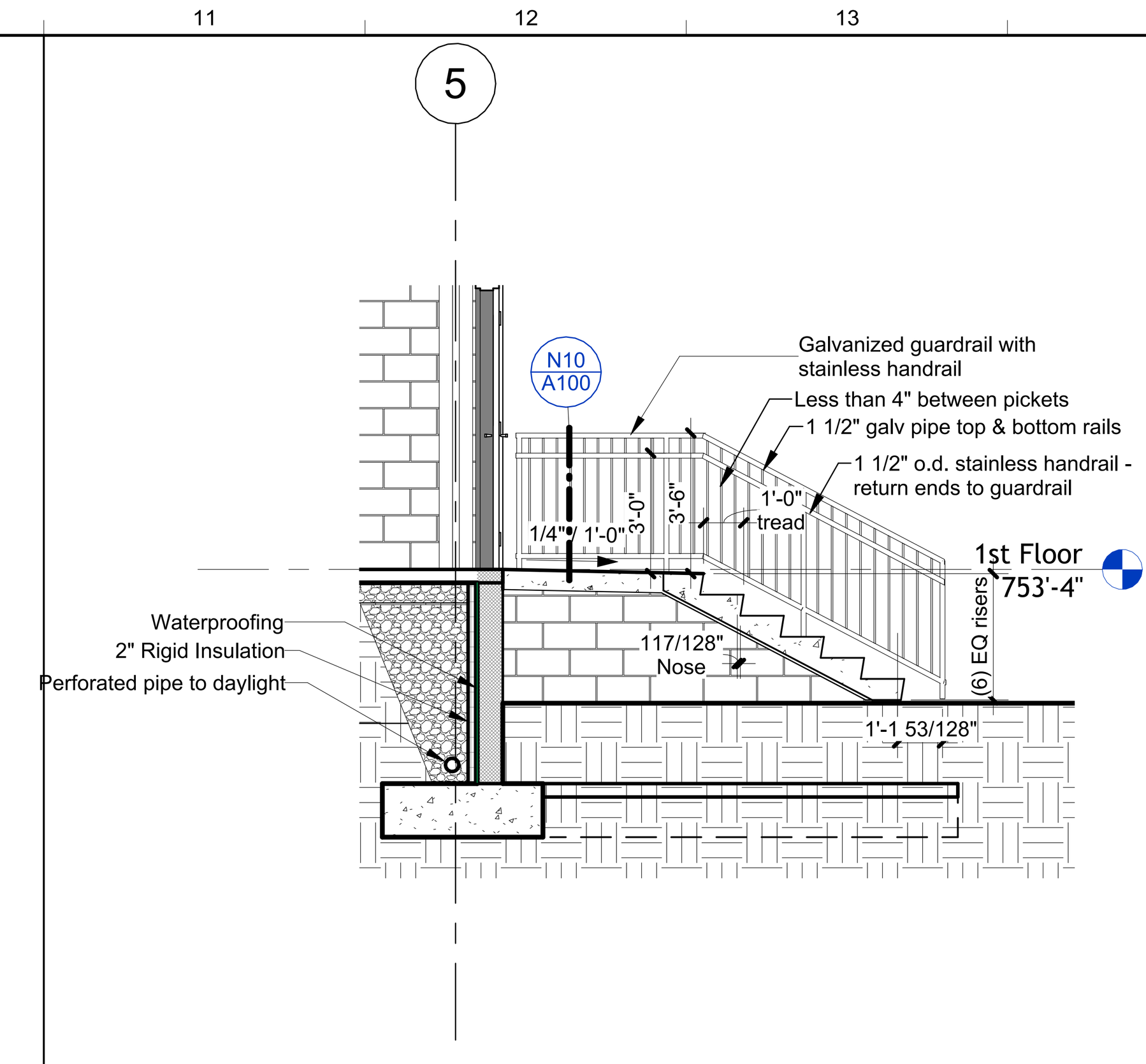
Title:
Structural Plans

Scale:

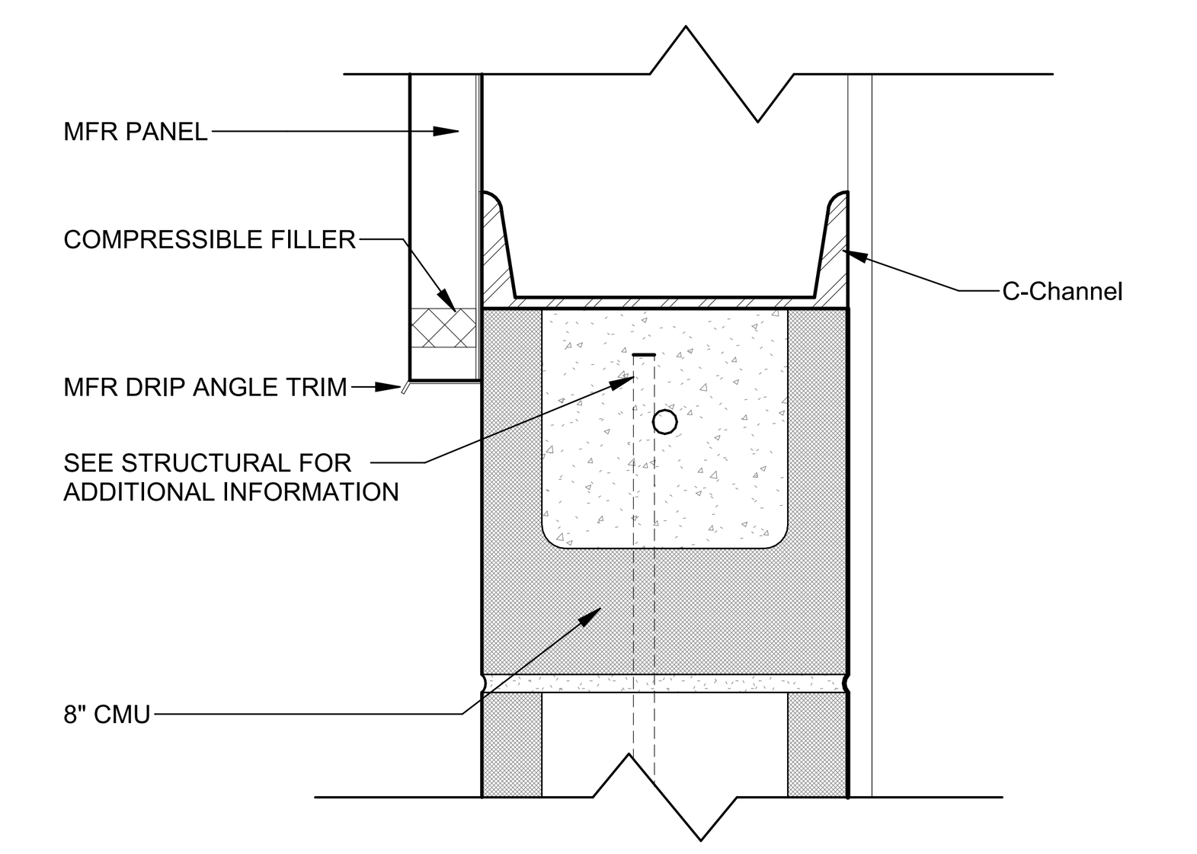
Sheet No.
S100



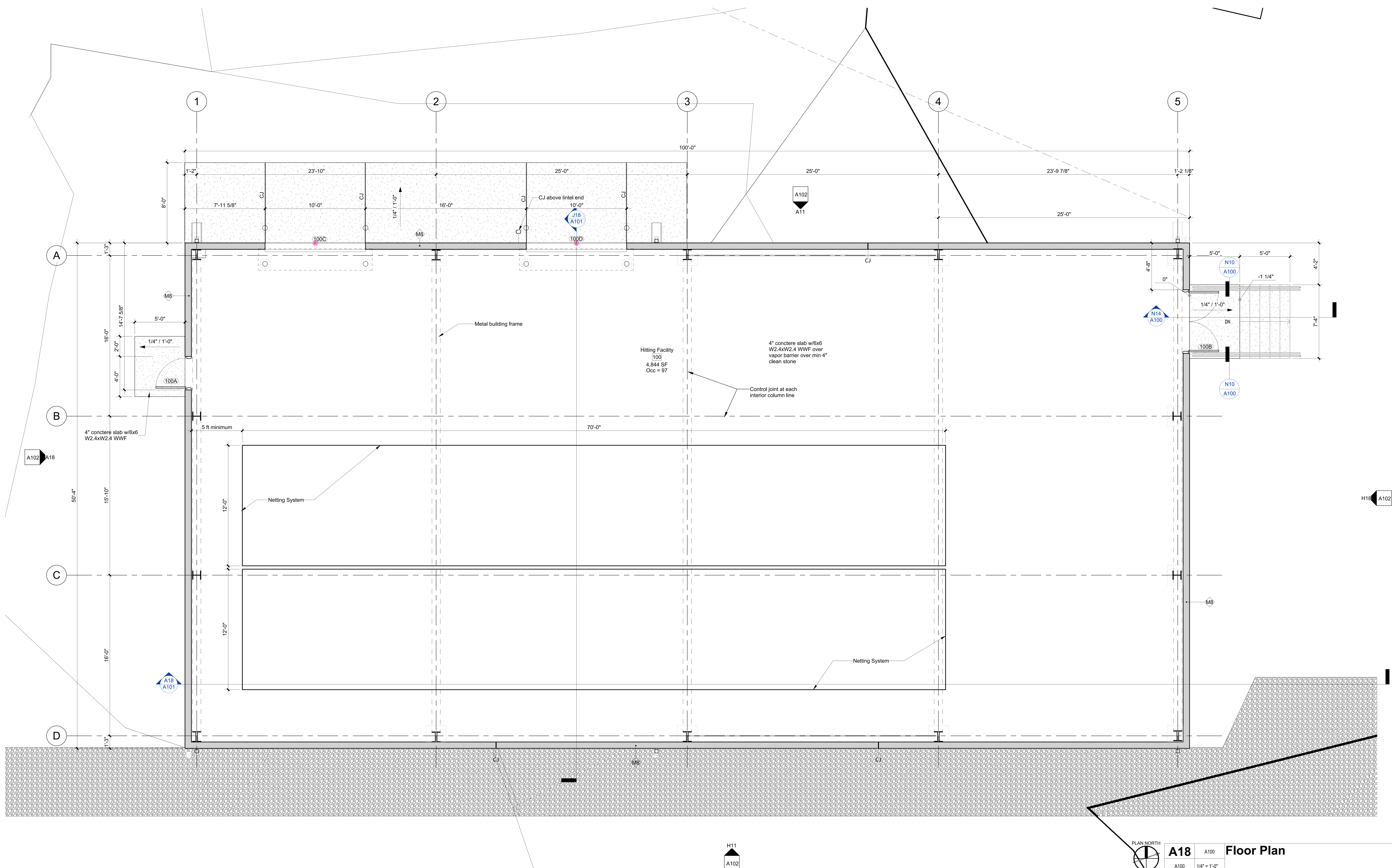
N10 A100 **Typical Railing Section**
A100 3/4" = 1'-0"



N14 A100 **Section at stair**
A100 1/4" = 1'-0"



N18 A101 **METAL PANEL TERMINATION**
A100 3" = 1'-0"



A18 A100 **Floor Plan**
A100 1/4" = 1'-0"

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Revisions

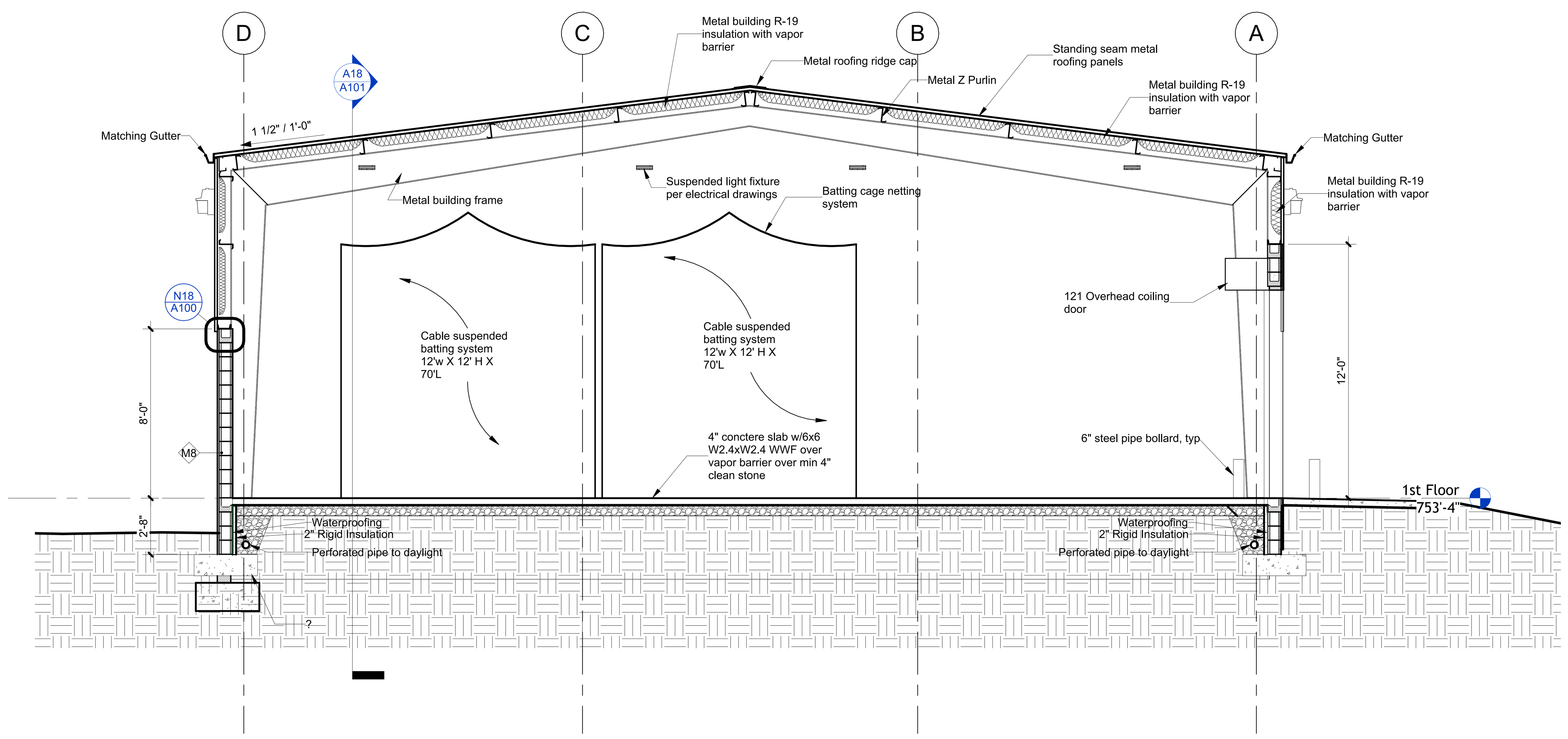
Key Plan

STATE OF GEORGIA RAYMOND M. BOAZ, JR. REGISTERED ARCHITECT

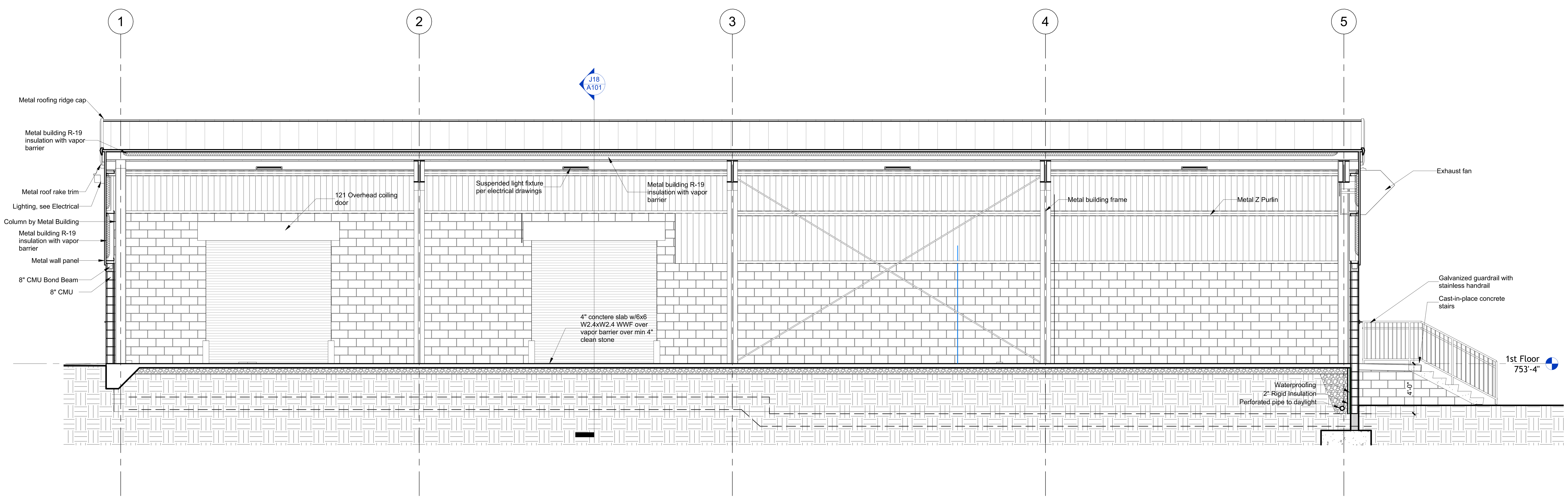
Title:
Floor Plan

Scale:

Sheet No.
A100



J18 A100 **South Section**
A101 1/4" = 1'-0"



A18 A100 **West Section**
A101 1/4" = 1'-0"

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Catoosa County Public Schools

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9-29-23
Drawn: Nicholas D.
File: 8236-D

Revisions

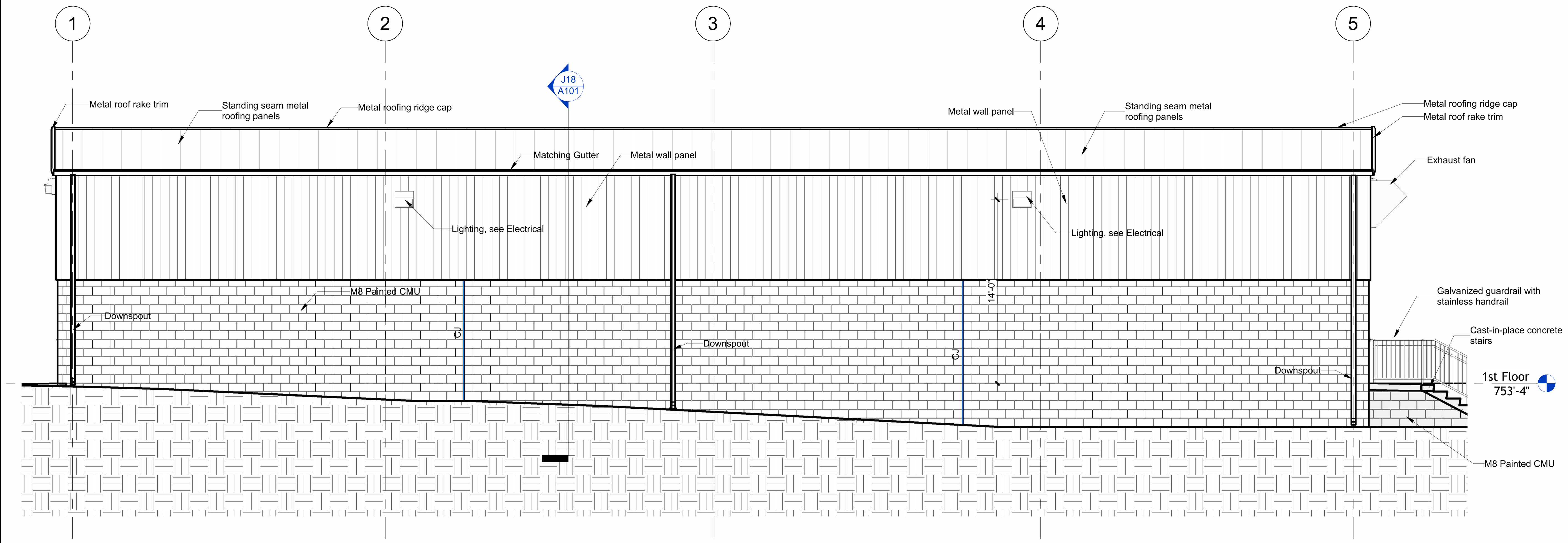
Key Plan

STATE OF GEORGIA
RAYMOND M. BOAZ, JR.
REGISTERED ARCHITECT

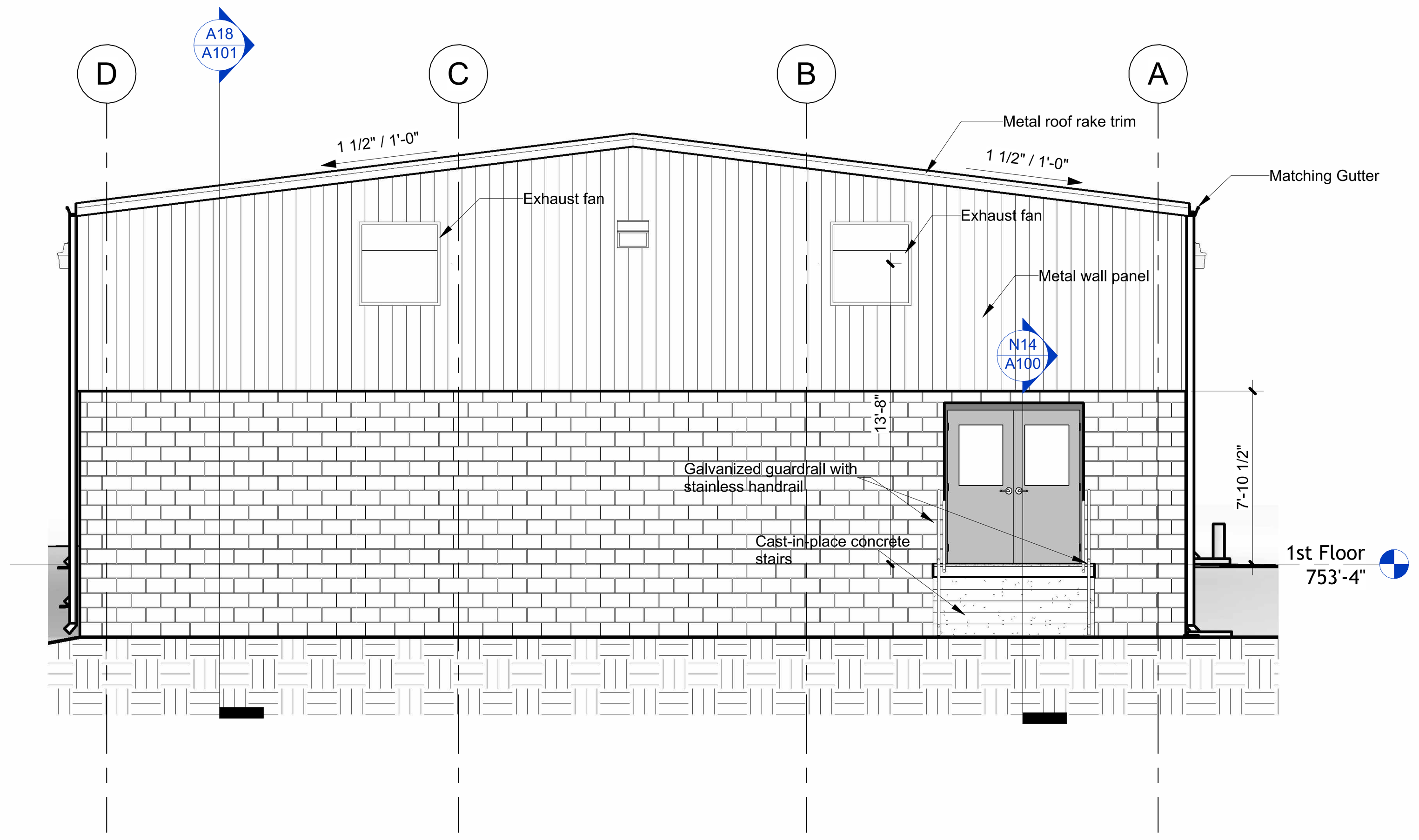
Title:
Sections

Scale:

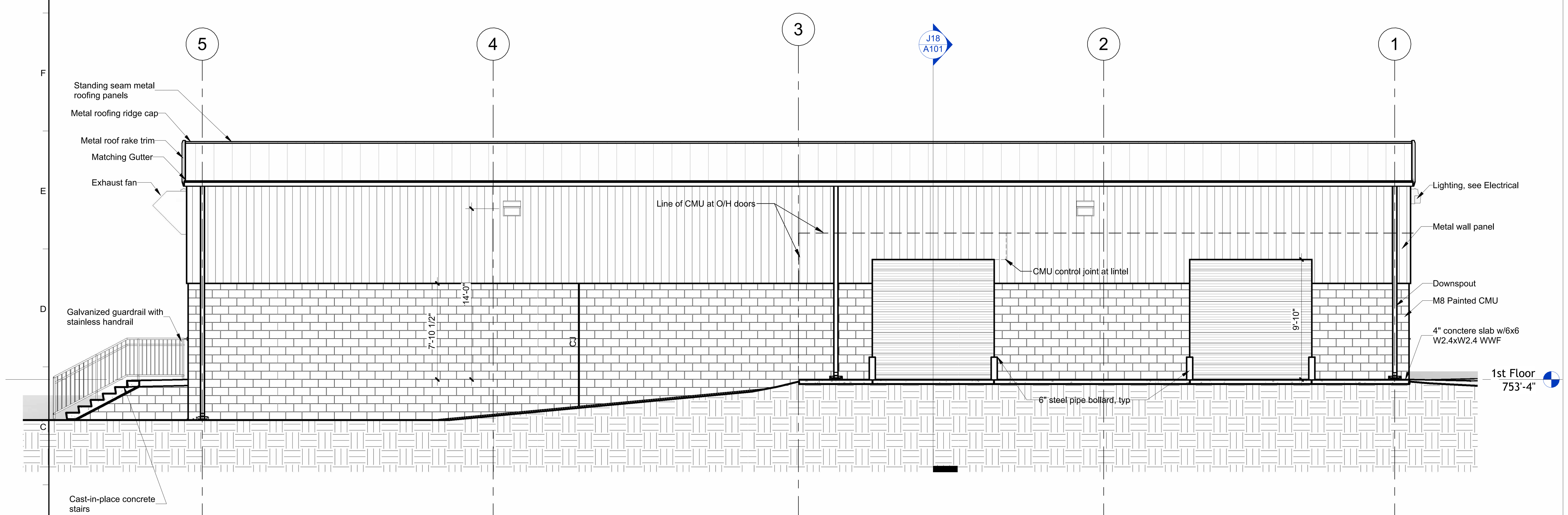
Sheet No.
A101



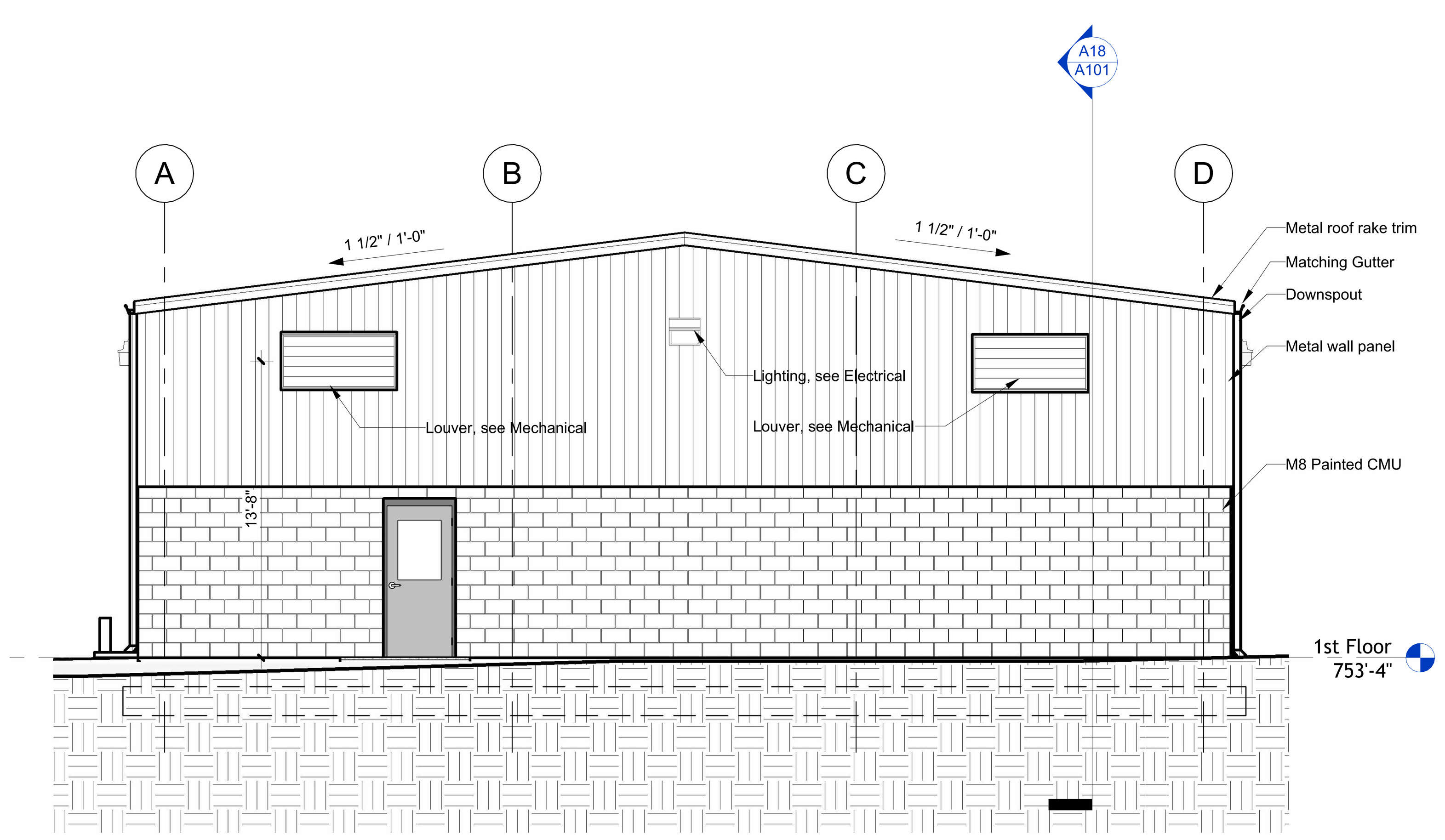
H11 A100 **Elevation -South**
A102 3/16" = 1'-0"



H18 A100 **Elevation - East**
A102 3/16" = 1'-0"



A11 A100 **Elevation - North**
A102 3/16" = 1'-0"



A18 A100 **Elevation - West**
A102 3/16" = 1'-0"

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Drawn: Nicholas D.
File: 8236-D

Revisions

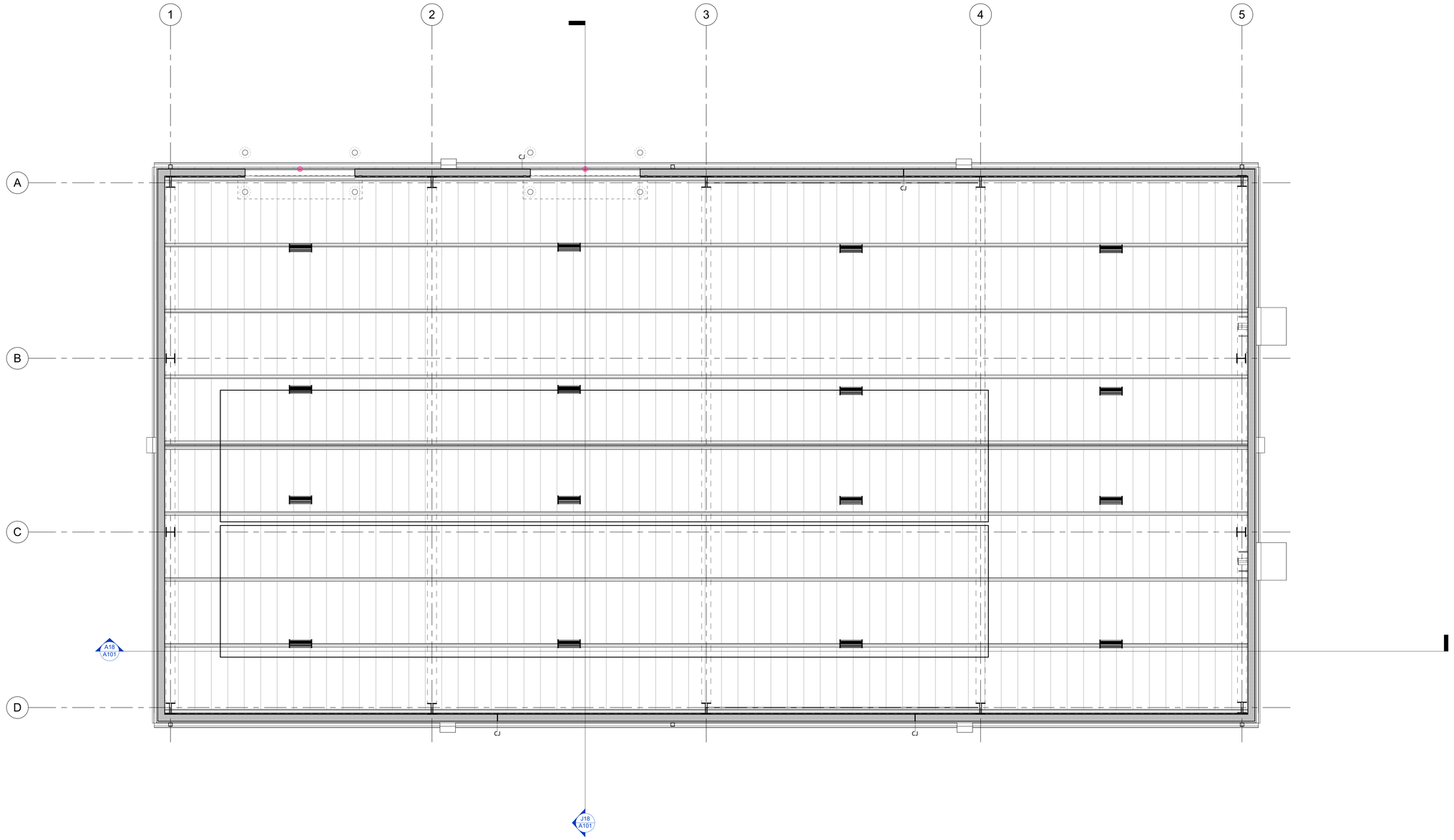
Key Plan

STATE OF GEORGIA
RAYMOND M. BOAZ, JR.
REGISTERED ARCHITECT

Title:
Elevations

Scale:

Sheet No.
A102



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Revisions
:

Key Plan

STATE OF GEORGIA
RAYMOND M. BOAZ, JR.
CERTIFICATE NO. RA0451
REGISTERED ARCHITECT

NOTE THAT THESE DRAWINGS ARE PRODUCED IN COLOR AND ARE TO BE USED IN COLOR.

Title:
Ceiling Plan

Scale:

Sheet No.
A103

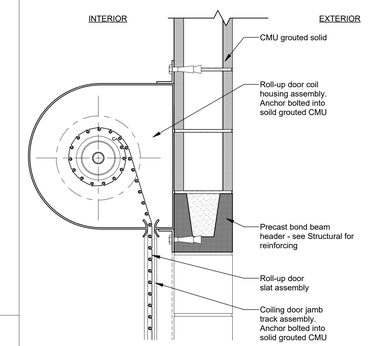
1	A100	1st Floor Reflected Ceiling Plan
A103	1/4" = 1'-0"	

Door Schedule

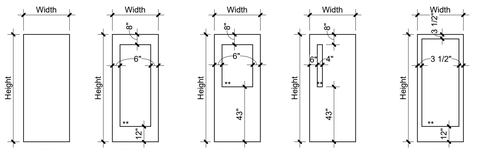
Mark	Door Type	Panel Material	Door Size Width	Door Size Panel 1 Width	Door Size Panel 2 Width	Door Size Height	Door Size Thickness	Frame Type	Frame Material	Frame Detail Head	Frame Detail Jamb	Fire Rating	Access Ctl.	Hardware Set	Hardware Set Use	Comments
1st Floor																
100A	HG	HM	3'-0"	3'-0"		7'-0"	1 3/4"	S	HM	4"	A18	D18		1	(none)	
100B	DHG	HM	6'-0"	3'-0"	3'-0"	7'-0"	1 3/4"	D	HM	4"	A18	D18		2	(none)	
100C			10'-0"			12'-0"					A18	D18		■	(none)	Keyed motor control for overhead coiling door
100D			10'-0"			12'-0"					A18	D18		■	(none)	Keyed motor control for overhead coiling door

Hardware Set 1
Closer
Hinges
Rim Panic Bar
Weatherstripping
Threshold

Hardware Set 2
(2) Closers
Hinges
(2) rod Panic
Bars
Weatherstripping
Threshold



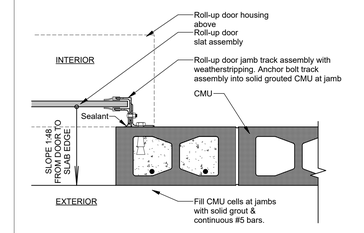
K18 A600 1 1/2" = 1'-0" **Door Detail - Overhead - 8" CMU - Head**



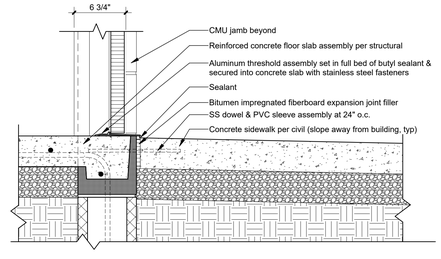
Door Types

** indicates1/4" tempered glass at doors without fire rating
indicates fire rated glass at doors with fire rating

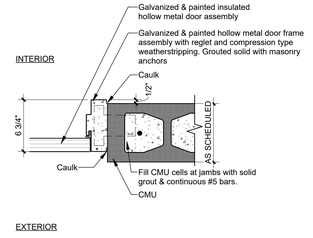
Frame Types



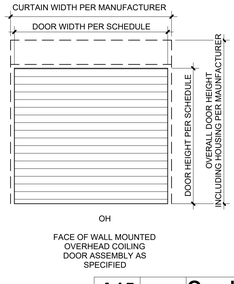
G18 A600 1 1/2" = 1'-0" **Door Detail - Overhead - 8"CMU - Jamb**



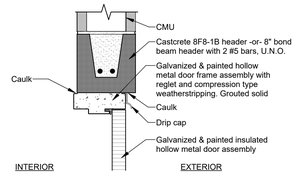
D15 A600 1 1/2" = 1'-0" **Door Detail - HM - Sill**



D18 A600 1 1/2" = 1'-0" **Door Detail - Exterior CMU - Jamb**



A15 A600 1/4" = 1'-0" **Overhead Door**



A18 A600 1 1/2" = 1'-0" **Door Detail - HM - Head**

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Catoosa County Public Schools

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9-29-23
Drawn: Author
File: 8236-D

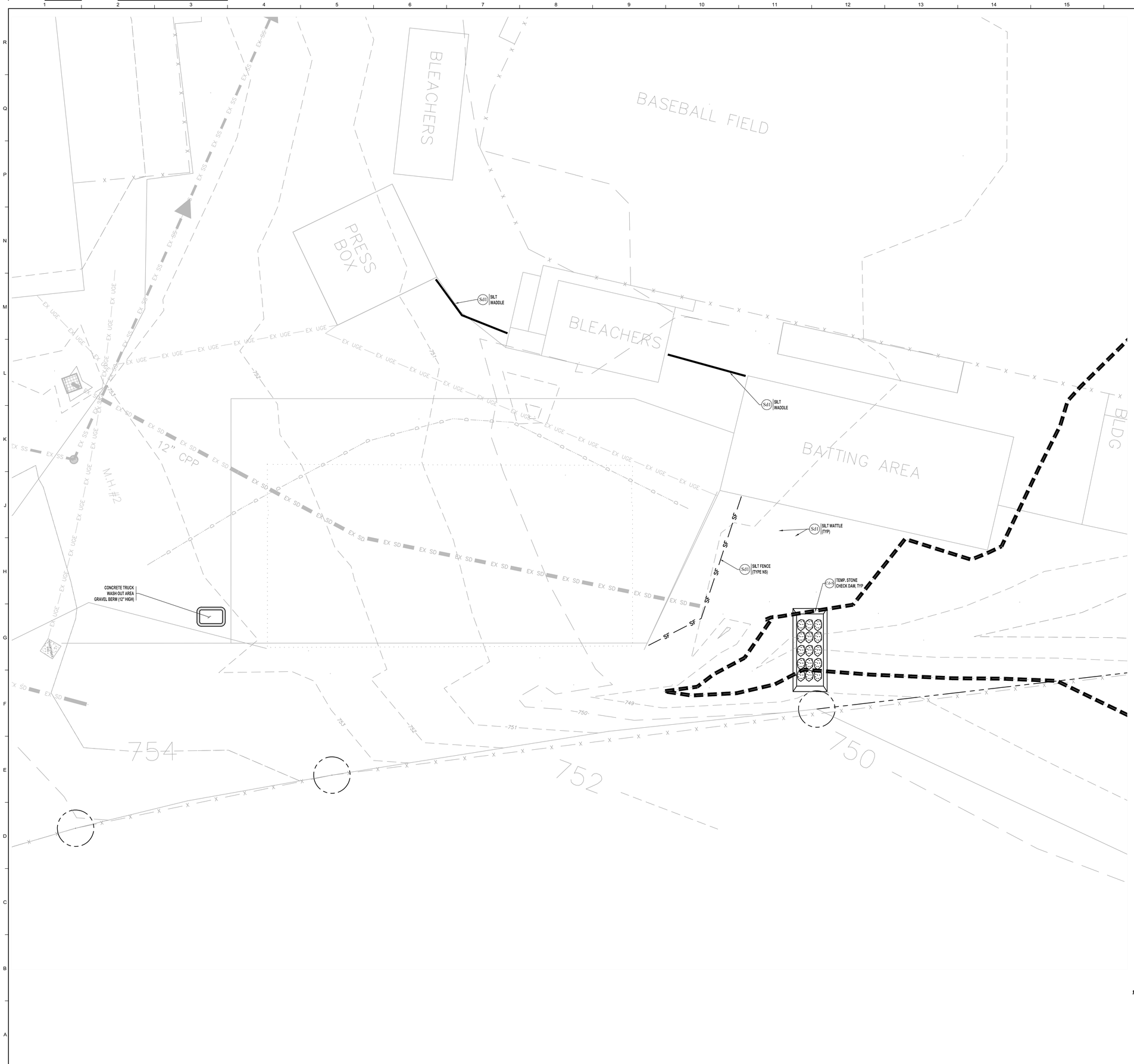
Revisions
:

Key Plan

Title:
Openings

Scale:

Sheet No.
A600



LEGEND

- Ex. Curb
- Ex. Centerline
- EX. FE — Ex. Fence
- EX. W — Ex. Water Line
- EX. FL — Ex. Fire Line
- EX. IRR — Ex. Irrigation Line
- EX. SD — Ex. Storm Drainage Line
- EX. SS — Ex. Sanitary Sewer Line
- EX. FM — Ex. Sanitary Sewer Force Main
- Ex. Swale Centerline
- Ex. Ditch Centerline
- EX. G — Ex. Gas Line
- EX. OHE — Ex. Overhead Elect. or Utility Line
- EX. UGE — Ex. Underground Electrical
- EX. UGFO — Ex. Underground Fiber Optics
- EX. UGT — Ex. Underground Telephone
- **PROPERTY LINE**
- BUILDING LINE
- LANDSCAPE BUFFER LINE
- LOT LINE
- TF — PROPOSED TREE PROTECTION
- SF — **PROP. SILT FENCE OR SILT WADDLE**

ABBREVIATIONS:
SSE – NEW PUBLIC SANITARY SEWER EASEMENT (SEE PLAN FOR WIDTH).
DE – NEW DRAINAGE EASEMENT (SEE PLAN FOR WIDTH).
WE – NEW PUBLIC WATER EASEMENT (SEE PLAN FOR WIDTH).
L/A BUFFER – NEW LANDSCAPE BUFFER (SEE PLAN FOR WIDTH AND TYPE).
FYSB– FRONT YARD SETBACK/ SYSB –SIDE YARD SETBACK / RYSB–REAR YARD SETBACK
FFE – FINISHED FLOOR ELEVATION
TW – FINISH GRADE AT TOP OF RETAINING WALL
BW – FINISHED GROUND GRADE AT BOTTOM OF RETAINING WALL
SSCO – SANITARY SEWER CLEAN-OUT/ SSMH – SANITARY SEWER CLEAN-OUT
DS – ROOF DOWNSPOUT DIRECTION
SSWL–SINGLE SOLID WHITE LINE, DSYL– DOUBLE SOLID YELLOW LINE
SDWL–SINGLE DASHED WHITE LINE

MAA CIVIL CONTACT: JOSEPH PARKS, P.E.
DIRECT LINE: 423-664-1482

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March Adams & Associates
Consulting Engineers
310 Dodds Ave.
P.O. BOX 3689
Chattanooga, Tennessee 37404
PH: (423)698-6875 PROJ# 23217

RHS BB Hitting Facility

29 Tiger Trail
Ringgold, GA 30736

9-29-23
Drawn: CH, JP
File: 8236-D

Revisions:

Key Plan

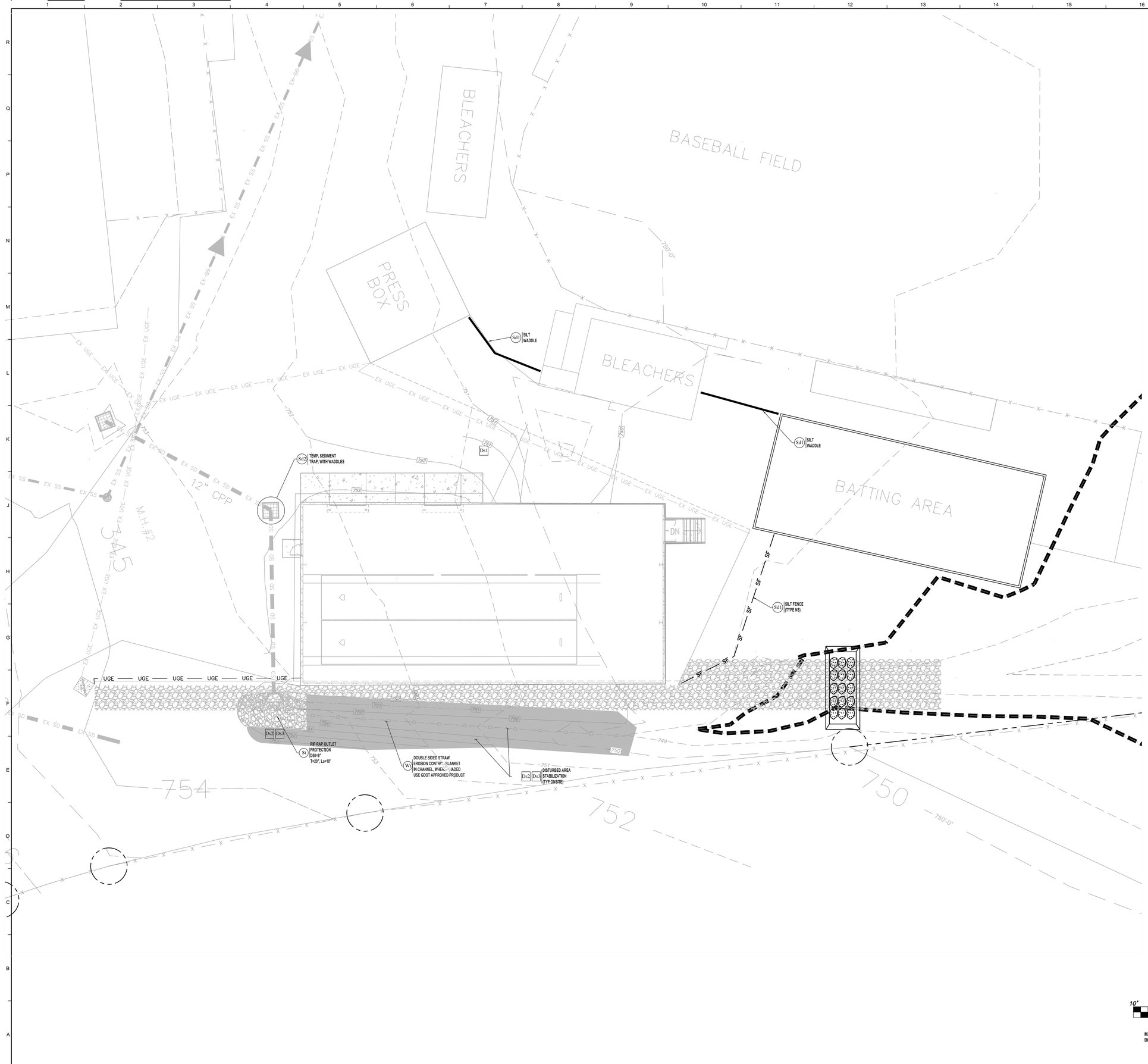
GEORGIA REGISTERED PROFESSIONAL ENGINEER JOSEPH L. PARKS
9/29/2023

Level II Design Professional Certification #35390

Title:
Sediment and Erosion Control Phase I

Scale:

Sheet No.
C501



LEGEND

- Ex. Curb
- Ex. Centerline
- X — Ex. Fence
- EX W — Ex. Water Line
- EX FL — Ex. Fire Line
- EX IRR — Ex. Irrigation Line
- EX SD — Ex. Storm Drainage Line
- EX SS — Ex. Sanitary Sewer Line
- EX FM — Ex. Sanitary Sewer Force Main
- Ex. Swale Centerline
- Ex. Ditch Centerline
- EX G — Ex. Gas Line
- EX OHE — Ex. Overhead Elect. or Utility Line
- EX UGE — Ex. Underground Electrical
- EX UGFO — Ex. Underground Fiber Optics
- EX UGT — Ex. Underground Telephone
- **PROPERTY LINE**
- BUILDING LINE
- BUILDING SETBACK LINE
- LOT LINE
- CURB
- LOC — PROP. LIMITS OF CONSTRUCTION
- TF — PROPOSED TREE PROTECTION
- PROPOSED SWALE CENTERLINE
- PROPOSED DITCH CENTERLINE
- W — PROP. WATER LINE
- FL — PROP. FIRE LINE
- IRR — PROP. IRRIGATION LINE
- G — PROP. GAS LINE
- SD — PROP. STORM DRAINAGE LINE
- SS — PROP. SANITARY SEWER LINE
- FM — PROP. SANITARY SEWER FORCE MAIN
- OHE — **PROP. OVERHEAD ELECT. OR UTILITY LINE**
- UGE — **PROP. UNDERGROUND ELECTRICAL**
- UGFO — PROP. UNDERGROUND FIBER OPTICS
- SF — **PROP. SILT FENCE OR SILT WADDLE**

ABBREVIATIONS:
SSE – NEW PUBLIC SANITARY SEWER EASEMENT (SEE PLAN FOR WIDTH).
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DS – ROOF DOWNSPOUT DOWNSPOUT
SSWL–SINGLE SOLID WHITE LINE, DSYL– DOUBLE SOLID YELLOW LINE
SDWL–SINGLE DASHED WHITE LINE

NORTH

10' 0 10' 20'

Scale 1" = 10'

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DIRECT LINE: 423-664-1482

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RHS BB Hitting Facility

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9-29-23
Drawn: CH, JP
File: 8236-D

Revisions:

Key Plan

GEORGIA REGISTERED PROFESSIONAL ENGINEER JOSEPH L. PARKS 9/29/2023

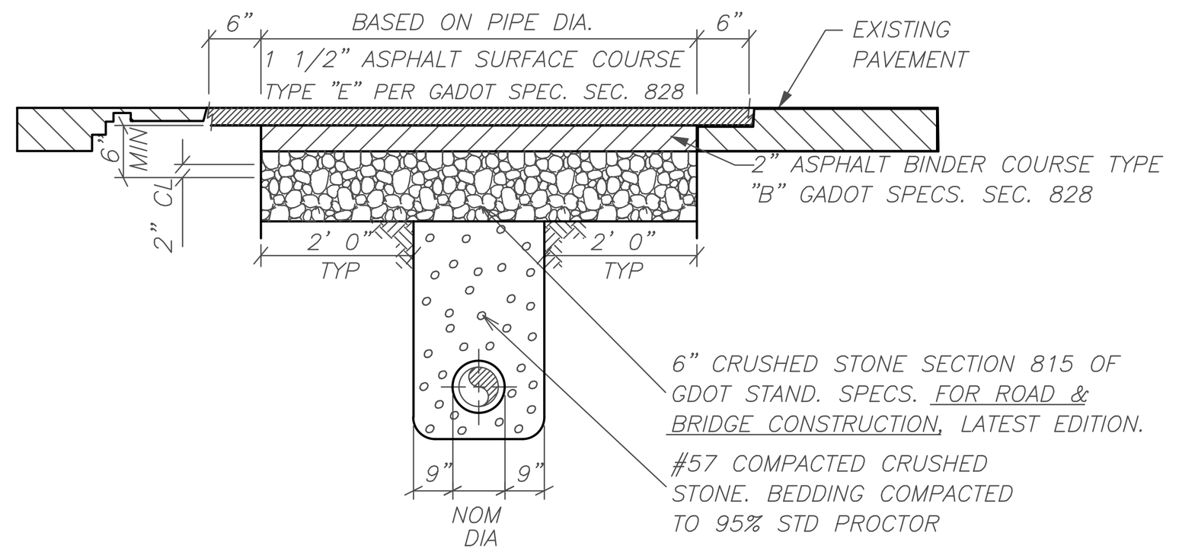
Level II Design Professional
Certification #35390

Title:
Sediment and Erosion Control Phase II

Scale:

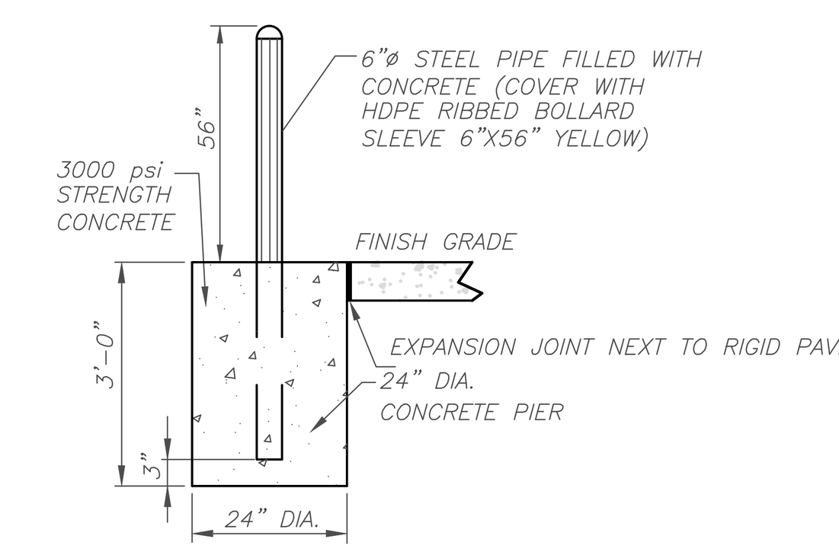
Sheet No.
C502

NOTE: ALL LATERAL STREET CUTS MUST BE COVERED WITH STEEL PLATES OF SUFFICIENT THICKNESS TO SPAN THE CUT WITHOUT NOTICEABLE DEFLECTION. PLATES TO REMAIN IN PLACE UNTIL THE CONCRETE BASE HAS GAINED SUFFICIENT STRENGTH TO WITHST& TRAFFIC LOADS (24 HR. MINIMUM).



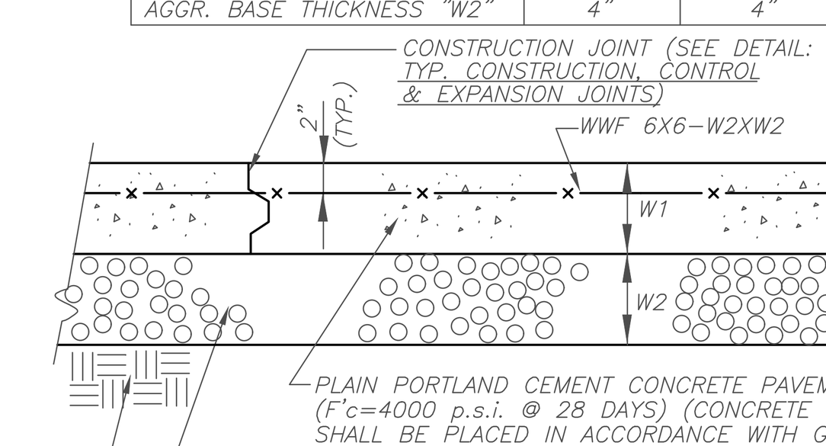
NOTE: THE CONTRACTOR SHALL REPLACE ALL OTHER DAMAGED PAVEMENT OUTSIDE OF LIMITS SHOWN AT HIS OWN EXPENSE

1/C700 DETAIL: ROADWAY PAVEMENT CUT & REPLACEMENT
(NTS)

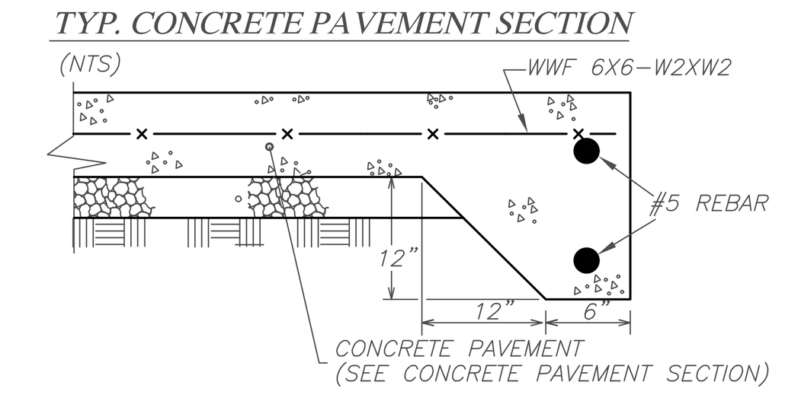


2/C700 DETAIL: BOLLARD FOUNDATION
(NTS)

	LIGHT DUTY THICKNESS	HEAVY DUTY THICKNESS
CONC. PVMT. THICKNESS "W1"	4"	5"
AGGR. BASE THICKNESS "W2"	4"	4"

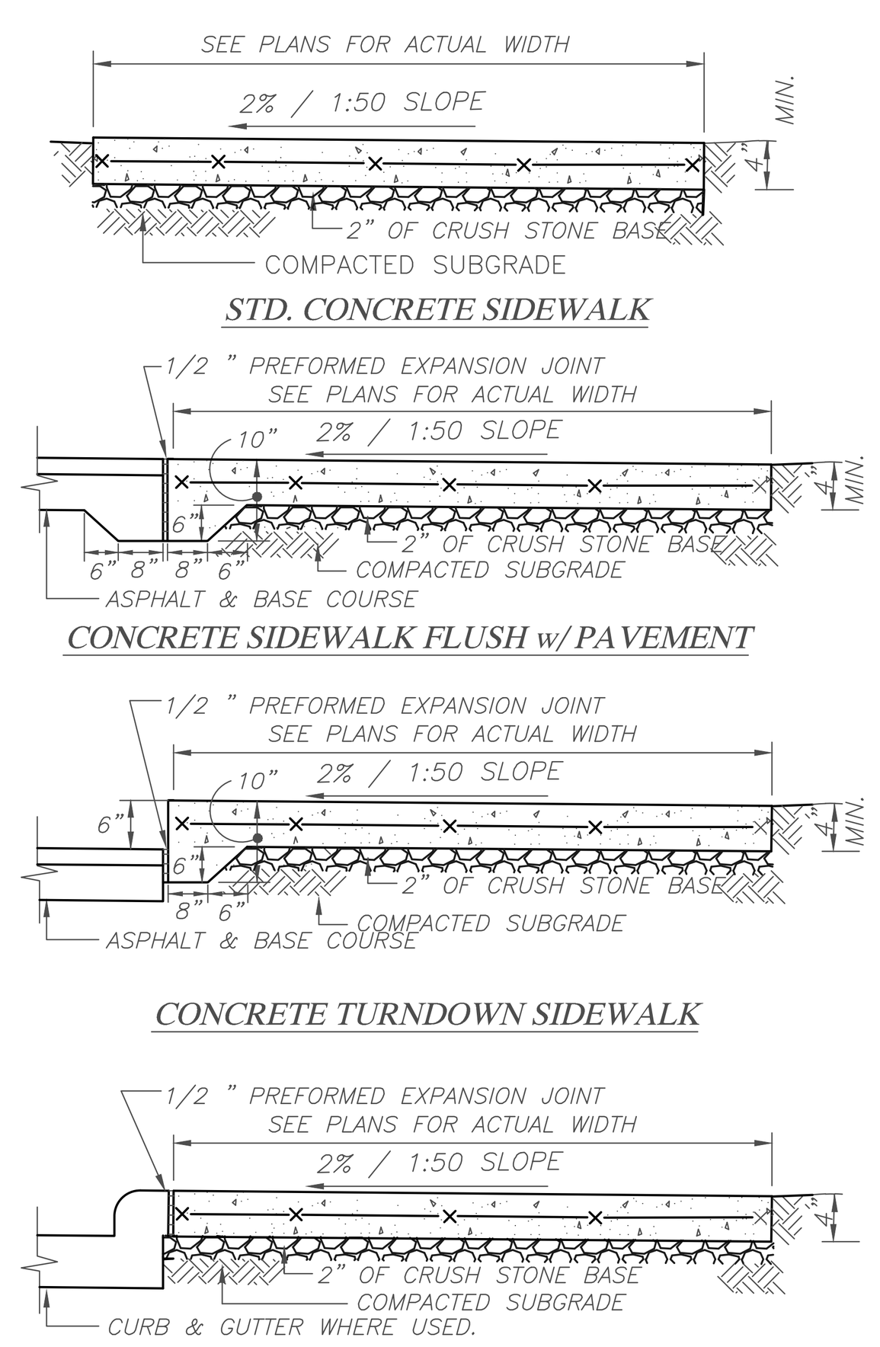


TYP. CONCRETE PAVEMENT SECTION
(NTS)



TYP. CONCRETE TURNDOWN (TYP WHEN EXPOSED TO TRAFFIC)
(NTS)

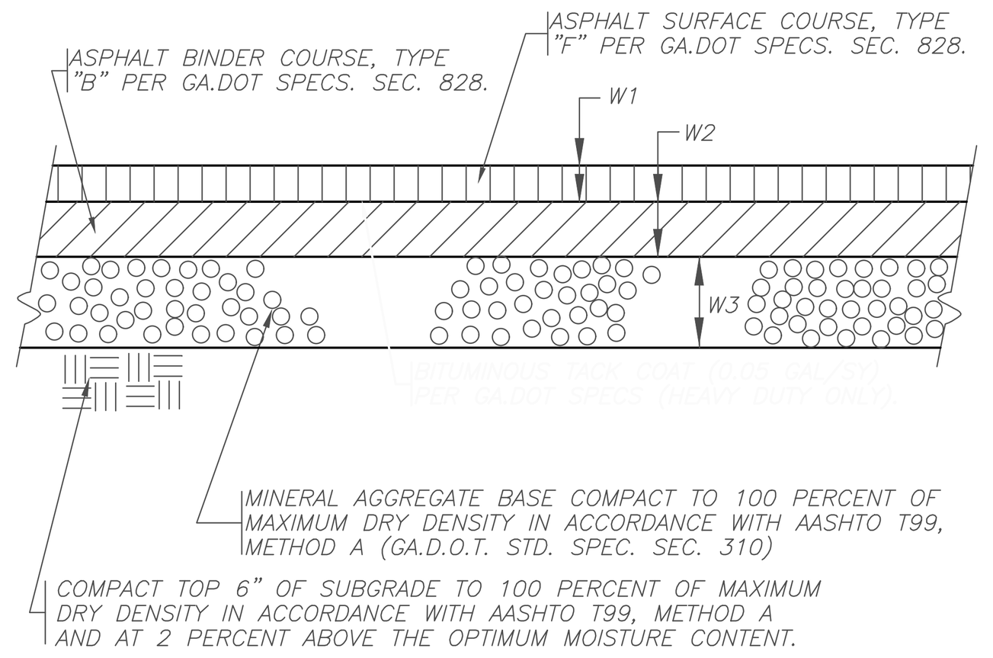
3/C700 DETAIL: TYP. CONCRETE PAVEMENT w/ TURNDOWN
(NTS)



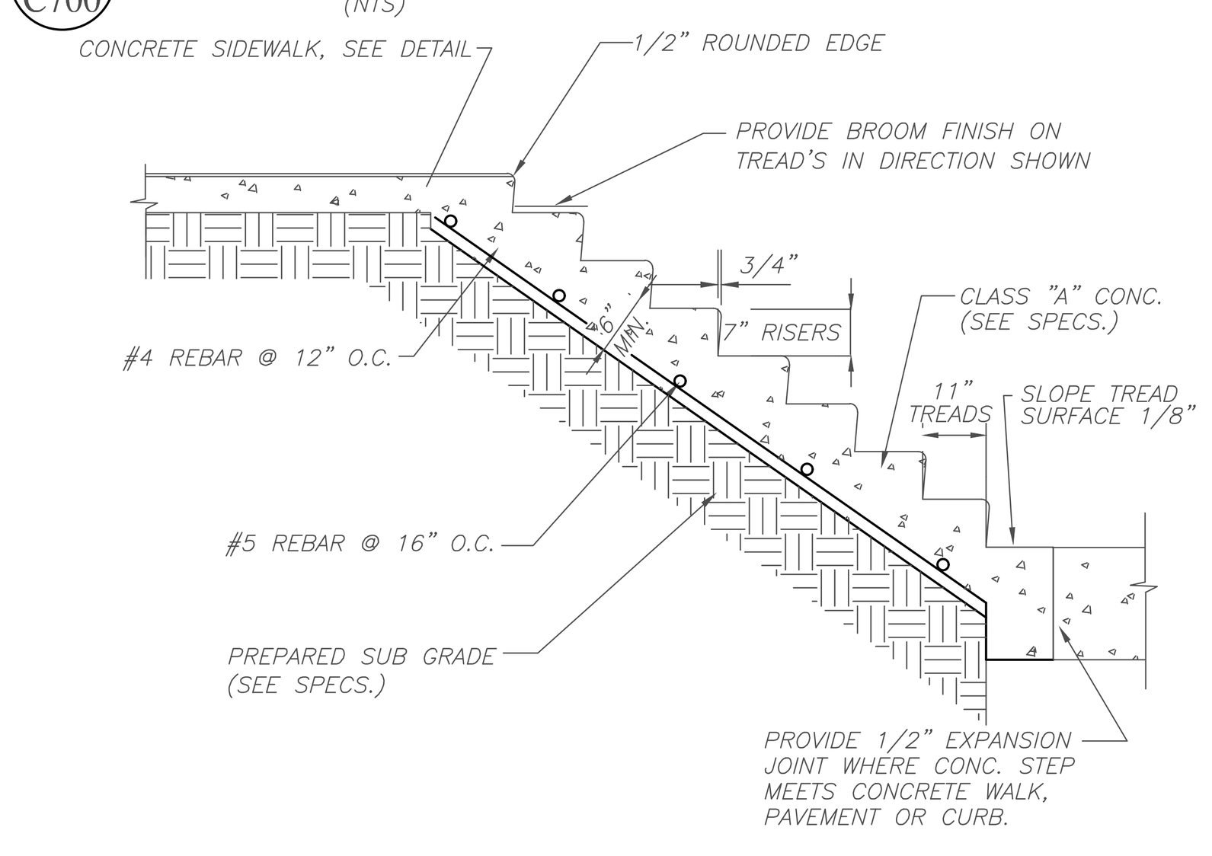
NOTES:
1. 4,000 PSI CONCRETE @ 28 DAYS WITH REINFORCEMENT – 6X6–W1.4 X W1.4 W.W.M.
2. SEE ALSO DETAIL: TYP. CONSTRUCTION, CONTROL & EXPANSION JOINTS
3. PROVIDE 1" DEEP TRANSVERSE GROOVES AT 5'–0" INTERVALS, OR AS SHOWN ON PLAN.
4. PROVIDE 1/2 " WIDE EXPANSION JOINT AT 20' INTERVALS AND AT ALL CURBS, RIGID STRUCTURES AND RIGID PAVEMENT.
5. TOOL ALL EXPOSED EDGES AND JOINTS TO 1/4 " RADIUS.
6. BROOM FINISH ACROSS DIRECTION OF TRAVEL.
7. MAXIMUM SLOPE = 5%.
8. FIBERMESH ALTERNATIVE: MIX AND RATE OF APPLICATION OF "FIBERMESH" SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

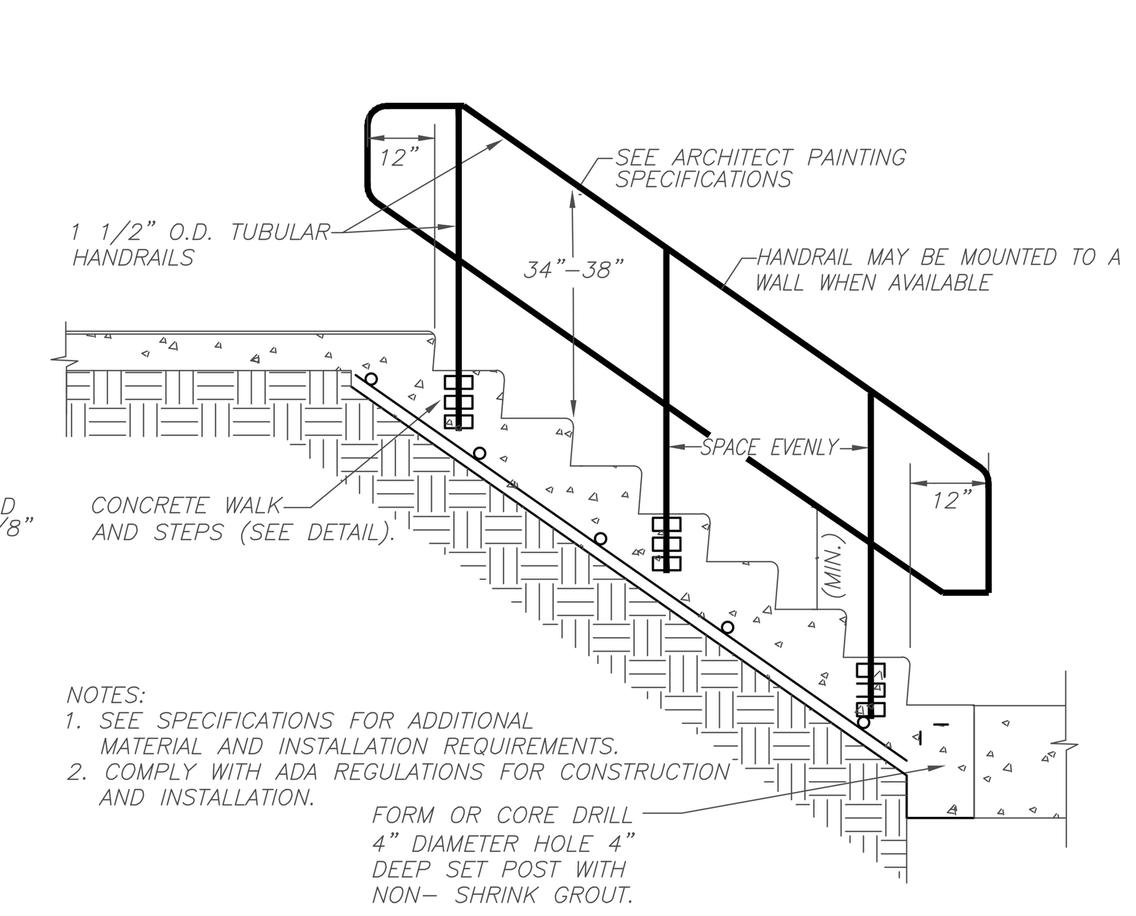
4/C700 DETAIL: CONCRETE SIDEWALK
(NTS)

	STANDARD DUTY THICKNESS
ASPH. SURFACE COURSE THICKNESS "W1"	1.5"
ASPH. BINDER COURSE THICKNESS "W2"	2"
AGGREGATE BASE THICKNESS "W3"	6"



5/C700 DETAIL: ASPHALT PAVEMENT SECTIONS
(NTS)

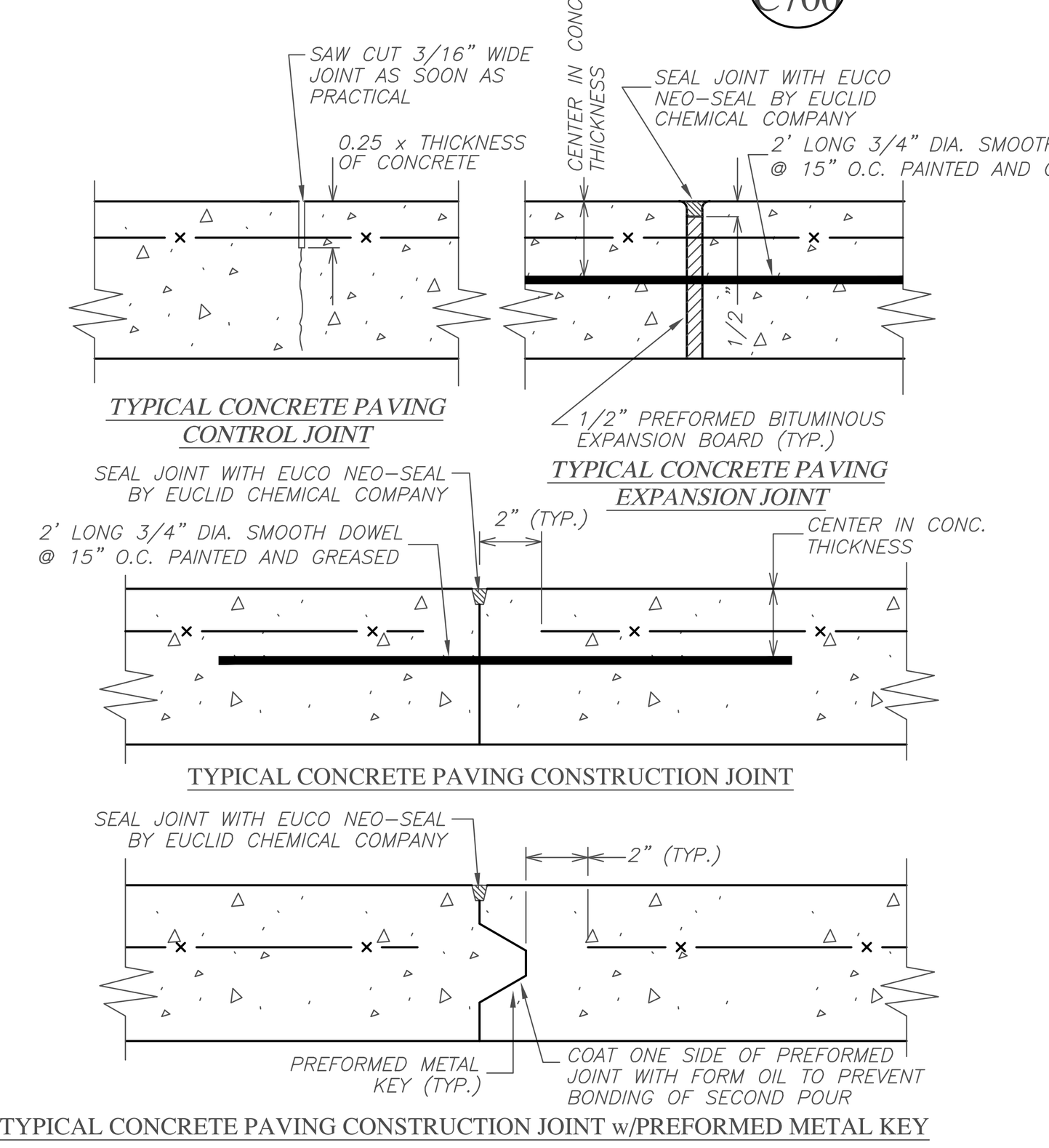




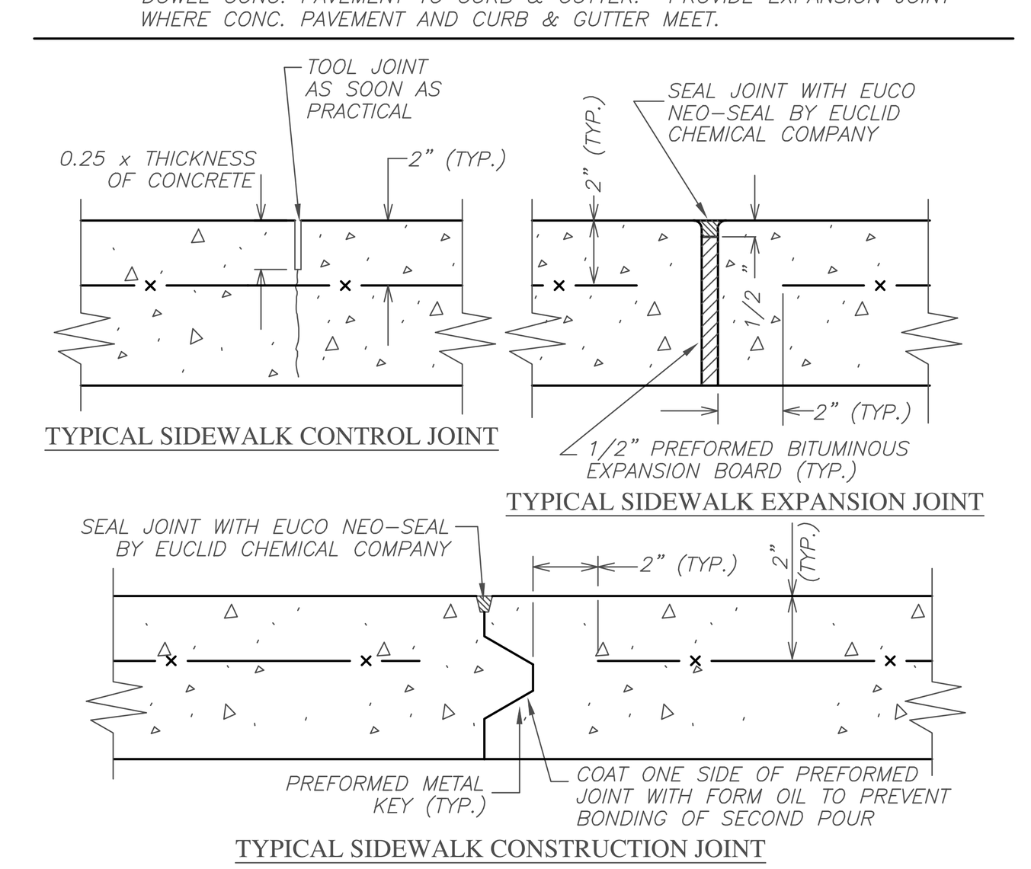
NOTES:
1. SEE SPECIFICATIONS FOR ADDITIONAL MATERIAL AND INSTALLATION REQUIREMENTS.
2. COMPLY WITH ADA REGULATIONS FOR CONSTRUCTION AND INSTALLATION.

HANDRAIL FOR STEPS w/ FOUR OR MORE RISERS

6/C700 DETAIL: CONCRETE STEPS
(NTS)



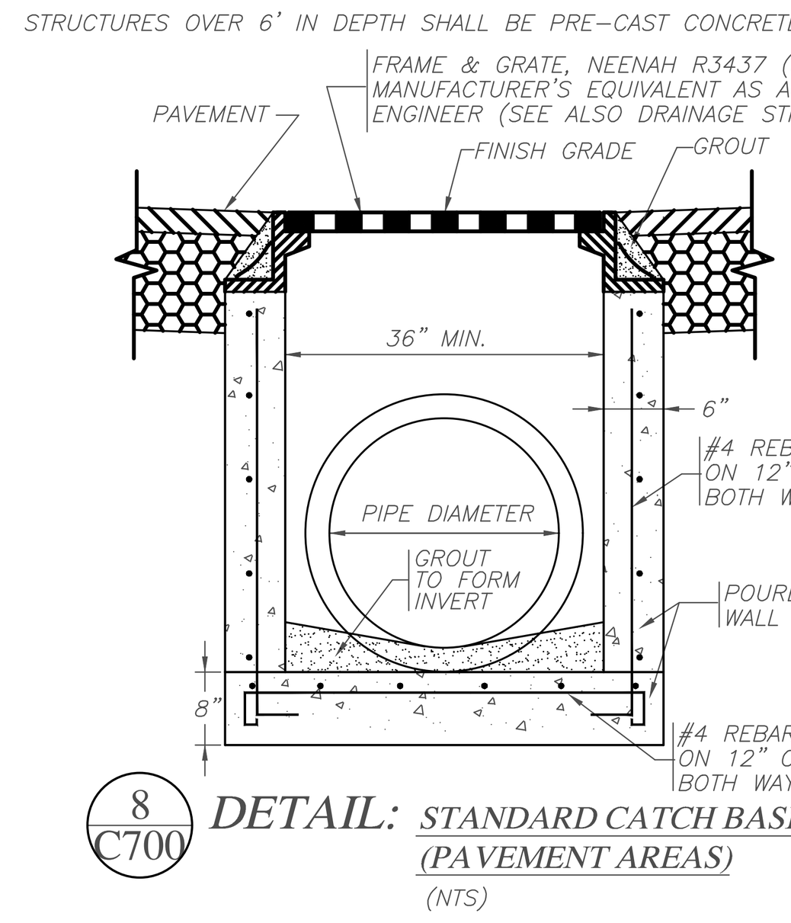
NOTES:
1. JOINTS NOT TO EXCEED 30 TIMES THE CONCRETE THICKNESS AS PER AMERICAN CONCRETE INSTITUTES RECOMMENDATIONS.
2. DOWEL BARS SHALL BE HELD IN PLACE BY BAR SUPPORT ASSEMBLY. DOWEL CONC. PAVEMENT TO CURB & GUTTER. PROVIDE EXPANSION JOINT WHERE CONC. PAVEMENT AND CURB & GUTTER MEET.



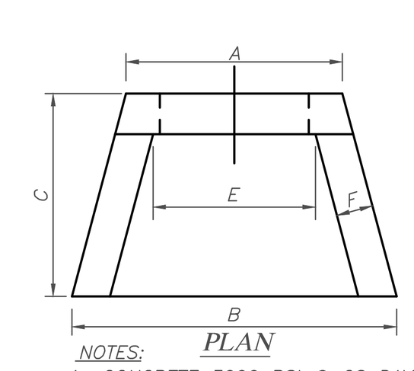
JOINTS NOT TO EXCEED 30 TIMES THE CONCRETE THICKNESS AS PER AMERICAN CONCRETE INSTITUTES RECOMMENDATIONS.

7/C700 DETAIL: TYP. CONSTRUCTION, CONTROL & EXPANSION JOINTS
(NTS)

NOTES:
1. 8" CONCRETE BRICK MAY BE USED FOR WALL CONSTRUCTION.
2. BOXES OVER 4' IN DEPTH SHALL HAVE 12" WIDE POLYPROPYLENE PLASTIC STEPS PROTRUDE 4" MIN. FROM INSIDE OF STRUCTURE.
3. PRE-CAST CONCRETE BOXES OR DOG HOUSE MAY BE USED AS APPROVED BY THE ENGINEER.
4. STRUCTURES OVER 6' IN DEPTH SHALL BE PRE-CAST CONCRETE MANHOLES.

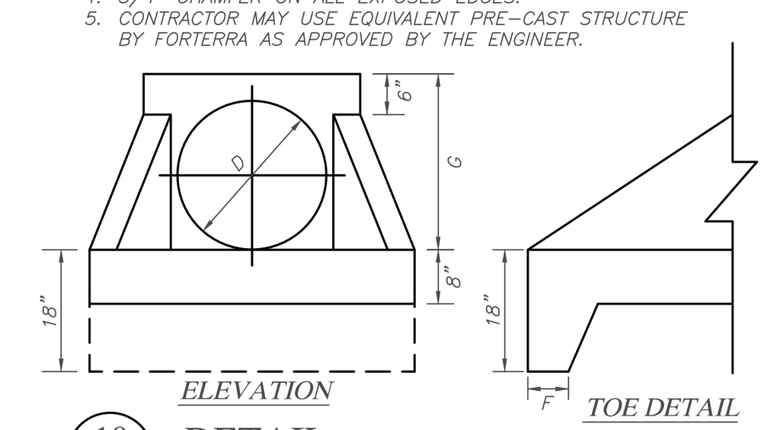


8/C700 DETAIL: STANDARD CATCH BASIN (PAVEMENT AREAS)
(NTS)

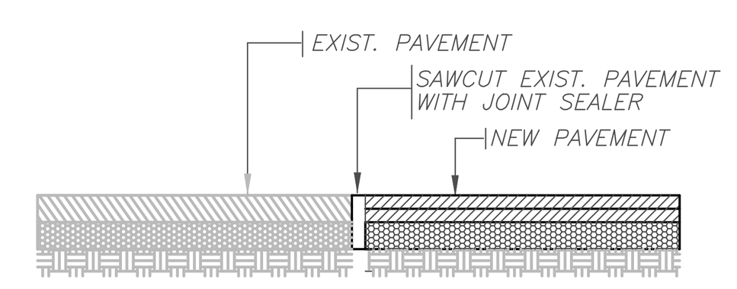


PIPE	15"-18"	24"	30"-42"	48"-60"
A	32"	48"	80"	99"
B	48"	72"	102"	120"
C	30"	44"	54"	56"
D	22"	32"	55"	60"
E	24"	36"	64"	83"
F	6"	8"	8"	8"
G	26"	36"	60"	66"

NOTES:
1. CONCRETE 3000 PSI @ 28 DAYS.
2. REINFORCING: #4 BAR @ 12" EACH WAY – GR. 60
3. MINIMUM REBAR COVERAGE – 2"
4. 3/4" CHAMFER ON ALL EXPOSED EDGES.
5. CONTRACTOR MAY USE EQUIVALENT PRE-CAST STRUCTURE BY FORTERRA AS APPROVED BY THE ENGINEER.

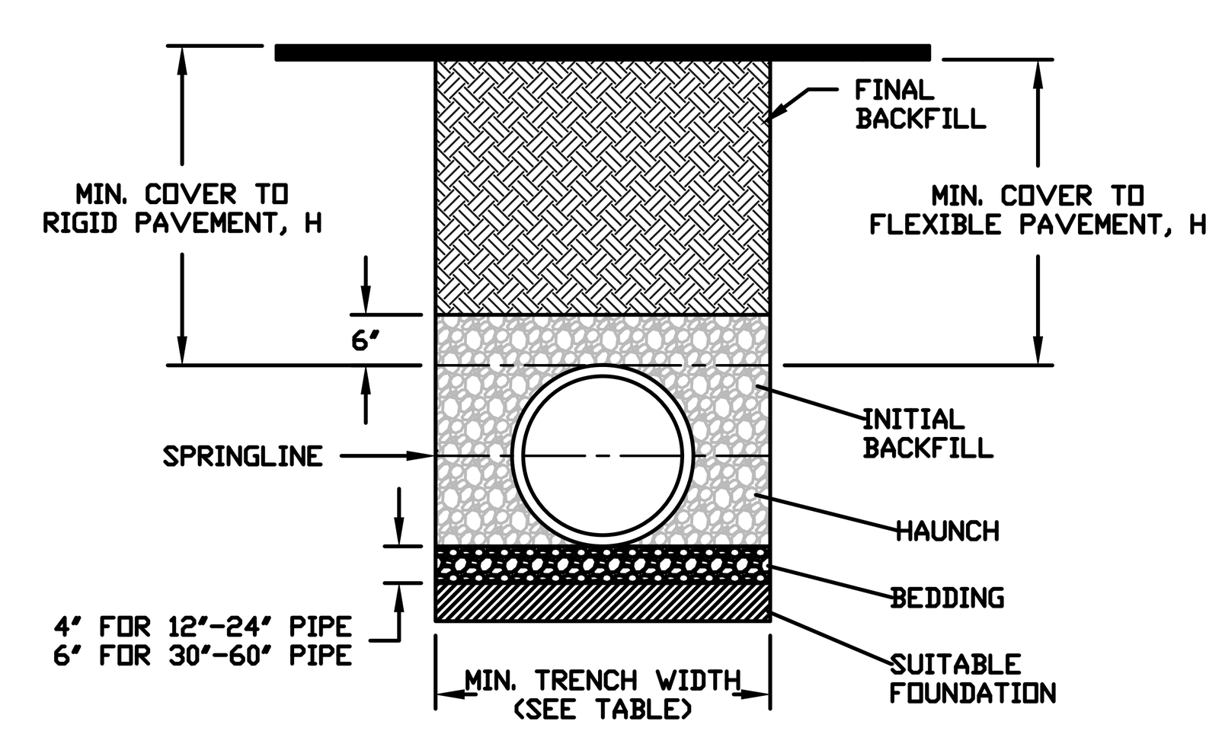


10/C700 DETAIL: CONCRETE HEADWALL
(NTS)



NOTE: NEW PAVEMENT TO MATCH ELEVATION OF EXISTING PAVEMENT. SAW CUT EXISTING PAVEMENT AS NECESSARY TO OBTAIN A FULL DEPTH SEAL BETWEEN THE PROPOSED PAVEMENT AND THE EXISTING PAVEMENT.

11/C700 DETAIL: SAWCUT & PAVEMENT TRANSITION
(NTS)



NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION

2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.

3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.

4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (750mm-900mm).

5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

9/C700 DETAIL: HDPE PIPE TRENCH
(NTS)

RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
4"	21"
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
54"	88"
60"	96"

MINIMUM RECOMMENDED COVER BASED ON VECHICLE LOADING CONDITIONS

PIPE DIAM.	SURFACE LIVE LOADING CONDITION: H-25	HEAVY CONSTRUCTION (75T AXLE LOAD) *
12" - 48"	12"	48"
54" - 60"	24"	60"

* VEHICLES IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER

MINIMUM RECOMMENDED COVER BASED ON RAILWAY LOADING CONDITIONS

PIPE DIAM.	COOPER E-80**
UP TO 24"	24"
30"-36"	36"
42"-60"	48"

** COVER IS MEASURED FROM TOP OF PIPE TO BOTTOM OF RAILWAY TIE.
*** E-80 COVER REQUIREMENTS, ARE ONLY APPLICABLE TO ASTM F 2306 PIPE.

GENERAL NOTES:

1. THESE DRAWINGS DO NOT PURPORT TO LOCATE ALL UTILITIES.
2. ALL UTILITY LOCATIONS TO BE FIELD VERIFIED BY PROPER AGENCIES BEFORE BEGINNING CONSTRUCTION. UNDERGROUND UTILITIES ARE NOT FIELD LOCATED NOR ARE ALL PURPORTED TO BE SHOWN. INFORMATION SHOWN SHOULD BE CONSIDERED APPROXIMATE. CONTRACTOR TO CONTACT ALL UTILITY COMPANIES TO HAVE UTILITIES FIELD LOCATED BEFORE EXCAVATION OR DEMOLITION WORK BEGINS.
3. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES WITHIN THE WORKING AREA BEFORE COMMENCING WORK & AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE & PRESERVE ANY & ALL UNDERGROUND UTILITIES.
4. THE CONTRACTOR SHALL COORDINATE LOCATION & INSTALLATION OF ALL UNDERGROUND UTILITIES & APPURTENANCES TO MINIMIZE DISTURBING CURB & GUTTER, PAVING, EXISTING UTILITIES & COMPACTED SUBGRADE.
5. CONTRACTOR SHALL VERIFY EXISTING UTILITY LINE OR EXISTING INFRASTRUCTURE PRIOR TO BEGINNING WORK. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES ON THE DRAWING OR IN THE FIELD BEFORE BEGINNING WORK OR DURING CONSTRUCTION.
6. CONTRACTOR TO COORDINATE ALL WORK WITH OTHER UTILITY INSTALLATIONS NOT COVERED IN THESE PLANS (ELECTRIC, TELEPHONE, GAS, CABLE, ETC.) & ALLOW FOR THEIR OPERATIONS & CONSTRUCTION TO BE PREPARED.
7. THE CONTRACTOR SHALL IMMEDIATELY INFORM THE OWNERS REPRESENTATIVE OR ENGINEER OF ANY DISCREPANCIES OR ERRORS HE DISCOVERS IN THE PLAN.
8. DEVIATION FROM THESE PLANS & NOTES WITHOUT THE PRIOR CONSENT OF THE OWNERS REPRESENTATIVE MAY BE CAUSE FOR THE WORK TO BE UNACCEPTABLE.
9. ALL WORK SHALL COMPLY WITH APPLICABLE STATE, FEDERAL, AND LOCAL CODES, & ALL NECESSARY LICENSES & PERMITS SHALL BE OBTAINED BY THE CONTRACTOR AT HIS EXPENSE UNLESS PREVIOUSLY OBTAINED BY THE OWNER/DEVELOPER.
10. FOR ANY WORK IN THE STATE OR CITY RIGHT-OF-WAY, THE CONTRACTOR SHALL:
A. NOT STORE MATERIAL, EXCESS DIRT OR EQUIPMENT ON THE SHOULDERS OF PAVEMENT; IN THE CASE OF MULTI-LANE HIGHWAYS, IN THE MEDIAN STRIPS. THE PAVEMENT SHALL BE KEPT FREE FROM ANY MUD OR EXCAVATION WASTE FROM TRUCKS OR OTHER EQUIPMENT. ON COMPLETION OF THE WORK, ALL EXCESS MATERIAL SHALL BE REMOVED FROM THE RIGHT-OF-WAY.
B. PROVIDE ALL NECESSARY & ADEQUATE SAFETY PRECAUTIONS SUCH AS SIGNS, FLAGS, LIGHTS, BARRICADES & FLAG MEN AS REQUIRED BY THE LOCAL AUTHORITIES & IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR & HOLD HARMLESS THE STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION, THE CITY OF RINGGOLD & THE OWNER FROM ANY CLAIMS FOR DAMAGE DONE TO EXISTING PRIVATE PROPERTY, PUBLIC UTILITIES, OR TO THE TRAVELING PUBLIC.
C. COMPLETE THE WORK TO THE SATISFACTION OF THE CITY OF RINGGOLD OR DOT AND OBTAIN A LETTER FROM THE DEPARTMENT STATING THAT THE WORK IS ACCEPTABLE.
D. POST NECESSARY BONDS AS REQUIRED BY THE CITY AND/OR STATE.
11. ALL WORK & MATERIALS SHALL COMPLY WITH CITY OF RINGGOLD REGULATIONS & CODES OF O.S.H.A. STANDARDS.
12. A MINIMUM CLEARANCE OF TWO FEET SHALL BE MAINTAINED BETWEEN THE FACE OF CURB & ANY PART OF A TRAFFIC SIGNAL OR LIGHT POLE.
13. NECESSARY & SUFFICIENT BARRICADES, LIGHTS, SIGNS & OTHER TRAFFIC CONTROL MEASURES AS MAY BE NECESSARY FOR THE PROTECTION AND SAFETY OF THE PUBLIC SHALL BE PROVIDED & MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
14. CONTRACTORS SHOULD NOT BE DOING ANY OPEN BURNING OF CONSTRUCTION MATERIALS OR DEBRIS WITHOUT A PERMIT FROM THE DEPARTMENT OF AIR POLLUTION CONTROL OR LOCAL AUTHORITY. IF A CONTRACTOR DESIRES TO PERFORM OPEN BURNING, HE MUST BE RESPONSIBLE FOR OBTAINING ANY PERMITS AND IS RESPONSIBLE FOR ANY VIOLATION OF THE AIR POLLUTION LAWS.
15. CONTRACTOR SHALL BE RESPONSIBLE DURING CONSTRUCTION FOR THE CONTINUOUS MAINTENANCE OF SEDIMENT & EROSION CONTROL MEASURES AS CALLED FOR ON THE DRAWINGS.
16. EROSION CONTROL MEASURES ARE TO BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION (SEE GRADING & DRAINAGE PLAN AND/OR SEDIMENT & EROSION CONTROL PLAN).
17. EXISTING DRAINAGE STRUCTURES TO BE INSPECTED, REPAIRED AS NEEDED & CLEANED OUT TO REMOVE ALL SILT & DEBRIS.
18. THE CONTRACTOR SHALL REPAIR OR REPLACE IN-KIND ANY DAMAGE THAT OCCURS TO PROPERTY AS RESULT OF HIS WORK.
19. ALL SIDE DITCHES TO BE CLEANED AND/OR REGRADED TO PROVIDE PROPER DRAINAGE.
20. ALL AREAS NOT OTHERWISE SURFACED ARE TO BE SEEDED, LANDSCAPED, MULCHED, WATERED, & MAINTAINED UNTIL ADEQUATE STAND OF GRASS IS OBTAINED.
21. UNLESS OTHERWISE SPECIFIED, ALL SLOPES TO BE COVERED WITH MINIMUM OF 4" OF TOPSOIL.
22. ALL PIPE LENGTHS & DISTANCES BETWEEN STRUCTURES ARE MEASURED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE ALONG A HORIZONTAL PLANE.
23. THE CONTRACTOR SHALL PROVIDE ALL THE MATERIALS & APPURTENANCES NECESSARY FOR THE COMPLETE INSTALLATION OF THE STORM DRAINAGE, SEWER, WATER & UTILITY SYSTEMS. ALL PIPE & FITTINGS SHALL BE INSPECTED BY THE UTILITY DEPARTMENT INSPECTOR PRIOR TO BEING COVERED. THE INSPECTOR MUST ALSO BE PRESENT DURING PRESSURE TESTING & DISINFECTION OF LATERALS & HIS SIGNATURE OF APPROVAL IS REQUIRED.
24. THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE LOCAL UTILITY AUTHORITIES FOR CONNECTION TO THE EXISTING MAINS & PAY ALL APPLICABLE FEES.
25. UTILITY COORDINATION & COSTS SHALL BE INCLUDED IN THE PROJECT SCHEDULE & IT IS THE EXPLICIT RESPONSIBILITY OF THE CONTRACTOR TO ASSURE THAT THE PROJECT SCHEDULE INCLUDES THE NECESSARY RELOCATION. THE CONTRACTOR WILL NOT BE PAID ADDITIONALLY FOR THIS COORDINATION. THE CONTRACTOR SHOULD SEEK ASSISTANCE FROM ALL UTILITY COMPANIES TO LOCATE & PROTECT THEIR FACILITIES.
26. CONTRACTOR SHALL OBTAIN ALL PERMITS BEFORE CONSTRUCTION BEGINS.
27. DIMENSIONS ON BUILDINGS ARE FOR GRADING PURPOSES ONLY & ARE NOT TO BE USED TO LAYOUT FOOTINGS. REFER TO THE STRUCTURAL DRAWINGS FOR FOUNDATION INFORMATION.
28. ALL DIMENSIONS SHOWN ARE TO FACE OF CURB OR EDGE OF S/W UNLESS NOTED OTHERWISE.
29. CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO BEGINNING CONSTRUCTION.
30. JOINTS OR SCORE MARKS ARE TO BE SHARP & CLEAN WITHOUT SHOWING EDGES OF JOINT TOOL.
31. THE CONTRACTOR SHALL PROVIDE FOR ANY NECESSARY BONDS AS REQUIRED BY GOVERNING AGENCIES.
32. AN AUTO CAD BASE PLAN MAY BE PROVIDED TO THE CONTRACTOR FOR CONSTRUCTION PURPOSES.
33. TEMPORARY BENCHMARK: IS NOT SHOWN ON SURVEY.
34. TOPOGRAPHIC & BOUNDARY SURVEY BY CAMPBELL SURVYEING NAD MAPPING DATED 2011 & PROVIDED BY THE OWNER. SOME ADJUSTMENTS HAVE BEEN ESTIMATED BASED ON RECORD ELECTRICAL DRAWINGS, AND SITE VISIT OBSERVATIONS ONLY. EXISTING CONDITIONS TO BE VERIFIED BY CONTRACTOR.

SITE NOTES:

1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE BEGINNING CONSTRUCTION.
2. FOR EXACT BUILDING DIMENSIONS SEE ARCHITECTURAL PLANS.
3. DIMENSIONS ON BUILDINGS ARE FOR GRADING PURPOSES ONLY & ARE NOT TO BE USED TO LAYOUT FOOTINGS. REFER TO THE STRUCTURAL DRAWINGS FOR FOUNDATION INFORMATION.
4. ALL DIMENSIONS SHOWN ARE TO FACE OF CURB, FACE OF SIDEWALK, OR FACE OF BUILDING UNLESS NOTED OTHERWISE.
5. A 1' CURB TAPER SHALL BE FORMED AT ALL PLACES WHERE CURB & GUTTER MEETS AN ADJACENT CONCRETE SIDEWALK OR PARKING AREA WHICH IS 0.5' LOWER THAN THE TOP OF CURB ELEVATION.
6. REFER ALSO TO GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.

DEMOLITION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING DEMOLITION PERMITS AS WELL AS OTHER ASSOCIATED PERMITS PRIOR TO CONSTRUCTION.
2. DIMENSIONS ON BUILDINGS ARE FOR GRADING PURPOSES ONLY & ARE NOT TO BE USED TO LAYOUT FOOTINGS. REFER TO THE STRUCTURALDRAWINGS FOR FOUNDATION INFORMATION.
3. ALL DEMOLITION DIMENSIONS SHOWN ARE APPROXIMATE & SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
4. THE CONTRACTOR SHALL SAW-CUT TIE-INS AT EXISTING PAVEMENT OR CONC. AREAS AS NECESSARY TO ENSURE SMOOTH TRANSITIONS. THE CONTRACTOR SHALL SAW-CUT AND TRANSITION TO MEET EXISTING PAVEMENT AS NECESSARY & AS DIRECTED BY THE INSPECTOR TO ENSURE POSITIVE DRAINAGE (TYPICAL AT ALL INTERSECTIONS). INSTALL EXPANSION JOINTS AT ALL CONC. SAW-CUT TIE-INS.
5. ALL EXISTING TREES, VEGETATION & ORGANIC TOPSOIL SHALL BE STRIPPED & REMOVED FROM THE CONSTRUCTION AREA, AS REQUIRED.
6. EXISTING STRUCTURES WITHIN CONSTRUCTION LIMITS ARE TO BE ABANDONED, REMOVED, OR RELOCATED AS REQUIRED. COORDINATE WITH PROPER AUTHORITIES AND/OR UTILITY COMPANIES.
7. REFER ALSO TO GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.

DRAINAGE & GRADING NOTES:

1. CONTRACTOR SHALL OBTAIN ALL PERMITS BEFORE CONSTRUCTION BEGINS.
2. NEW FINISHED CONTOURS SHOWN ARE TOP OF NEW PAVING IN AREAS TO RECEIVE PAVEMENT & TOP OF TOPSOIL IN AREAS TO BE SEEDED.
3. PROPOSED CONTOUR INTERVALS ARE AS LABELED. ALL PROPOSED CONTOURS ARE FINISHED GRADE.
4. CONTRACTOR SHALL NOTIFY & COOPERATE WITH ALL UTILITY COMPANIES OR FIRMS HAVING FACILITIES ON OR ADJACENT TO THE SITE BEFORE DISTURBING, ALTERING, REMOVING, RELOCATING, ADJUSTING OR CONNECTING TO SAID FACILITIES. CONTRACTOR SHALL PAY ALL COSTS IN CONNECTION WITH THE ALTERNATION OF OR RELOCATION OF THE FACILITIES. CONTRACTOR SHALL RAISE OR LOWER TOPS OF EXISTING MANHOLES AS REQUIRED TO MATCH FINISHED GRADES.
5. A QUALIFIED SOILS LABORATORY SHALL DETERMINE THE SUITABILITY OF THE EXISTING SUB-GRADE & EXISTING ON SITE MATERIAL PRIOR TO BEGINNING ANY FILLING OPERATION.
6. UNUSABLE EXCAVATED MATERIALS (SOIL) SHALL BE RESPREAD ON SITE AT LOCATIONS APPROVED BY THE ARCHITECT. ALL WASTE RESULTING FROM DEMOLITION, CLEARING & GRUBBING SHALL BE DISPOSED OF OFF SITE BY THE CONTRACTOR AT AN APPROVED LOCATION.
7. BEFORE ANY MACHINE WORK IS DONE, CONTRACTOR SHALL STAKE OUT & MARK THE ITEMS ESTABLISHED BY THE SITE PLAN. CONTROL POINTS SHALL BE PRESERVED AT ALL TIMES DURING THE COURSE OF THE PROJECT. LACK OF PROPER WORKING POINTS AND GRADE STAKES MAY REQUIRE CESSATION OF OPERATIONS UNTIL SUCH POINTS & GRADES HAVE BEEN PLACED TO THE OWNER'S SATISFACTION.
8. COMPACTION OF THE BACK FILL OF ALL TRENCHES SHALL BE COMPACTED TO THE DENSITY OF 95% OF THEORETICAL MAXIMUM DRY DENSITY (ASTM D698). BACK FILL MATERIAL SHALL BE FREE FROM ROOTS, STUMPS, OR OTHER FOREIGN DEBRIS & SHALL BE PLACED AT OR NEAR OPTIMUM MOISTURE. CORRECTION OF ANY TRENCH SETTLEMENT WITHIN A YEAR FROM THE DATE OF APPROVAL WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
9. THE CONTRACTOR WILL INSURE THAT POSITIVE & ADEQUATE DRAINAGE IS MAINTAINED AT ALL TIMES WITHIN THE PROJECT LIMITS. THIS MAY INCLUDE, BUT NOT BE LIMITED TO, REPLACEMENT OR RECONSTRUCTION OF EXISTING DRAINAGE STRUCTURES THAT HAVE BEEN DAMAGED OR REMOVED OR RECONSTRUCTED AS REQUIRED BY THE ENGINEER, EXCEPT FOR THOSE DRAINAGE ITEMS SHOWN AT SPECIFIC LOCATIONS IN & HAVING SPECIFIC PAY ITEMS IN THE DETAILED ESTIMATE. NO SEPARATE PAYMENT WILL BE MADE AT ANY COSTS INCURRED TO COMPLY WITH THIS REQUIREMENT.
10. THE CONTRACTOR SHALL PROVIDE ANY EXCAVATION & MATERIAL SAMPLES NECESSARY TO CONDUCT REQUIRED SOIL TESTS. ALL ARRANGEMENTS & SCHEDULING FOR THE TESTING SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
11. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL VERIFY EXISTING GRADES ESPECIALLY WITHIN & ALONG DRAINAGE WAYS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF WORK.
12. UNLESS OTHERWISE SPECIFIED, ALL SLOPES TO BE COVERED WITH MINIMUM OF 4" TOPSOIL.
13. MAXIMUM EMBANKMENT SLOPES TO BE AS FOLLOWS: CUT AREA - 3:1; FILL AREAS 3:1 (UNLESS NOTED OTHERWISE).
14. STOCKPILED TOPSOIL IS TO BE SPREAD OVER LAWN AREAS AT COMPLETION OF PROJECT (PROVIDE 4" MINIMUM SPREAD). IT IS THE INTENT OF THIS PROJECT FOR THE CONTRACTOR TO VERIFY & MATCH EXISTING CONDITIONS UNLESS OTHERWISE NOTED.
15. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY ITEMS THAT DO NOT EXIST AS SHOWN.
16. STORM DRAIN PIPE TO BE CLASS III REINFORCED CONCRETE CONFORMING TO ASTM C-76, OR CMP, FULLY COATED (16 GAGE MIN.) PER ASTM A44, OR ADS N-12 WITH WATERTIGHT GASKET AS SHOWN ON DRAWINGS.
17. PRE CAST STRUCTURES MAY BE USED AT THE CONTRACTORS OPTION. ALL CONCRETE TO HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 P.S.I.
18. CONTRACTOR SHALL BLEND ALL SLOPES WITH THE SURROUNDING ENVIRONMENT.
19. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER FOR ANY FIELD GRADE ADJUSTMENTS NEEDED DUE TO ACTUAL TOPOGRAPHY VARYING FROM THE TOPOGRAPHIC SURVEY
20. REFER ALSO TO GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.

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RHS BB Hitting Facility

29 Tiger Trail
Ringgold, GA 30736

9-29-23
Drawn: CH, JP
File: 8236-D

Revisions:

Key Plan

GEORGIA REGISTERED No. PE034052 PROFESSIONAL ENGINEER JOSEPH L. PARK
9/29/2023
Level II Design Professional Certification #35390

Title:
Site Notes & Details

Scale:

Sheet No.
C700

Louver Schedule

Mark	Manufacturer	Model	Description	Material	Size	Notes	Count
L-1	Greenheck Fan Corp.	EAD-635	Motorized Intake Louver	Aluminum	64"x32"	1-4	2

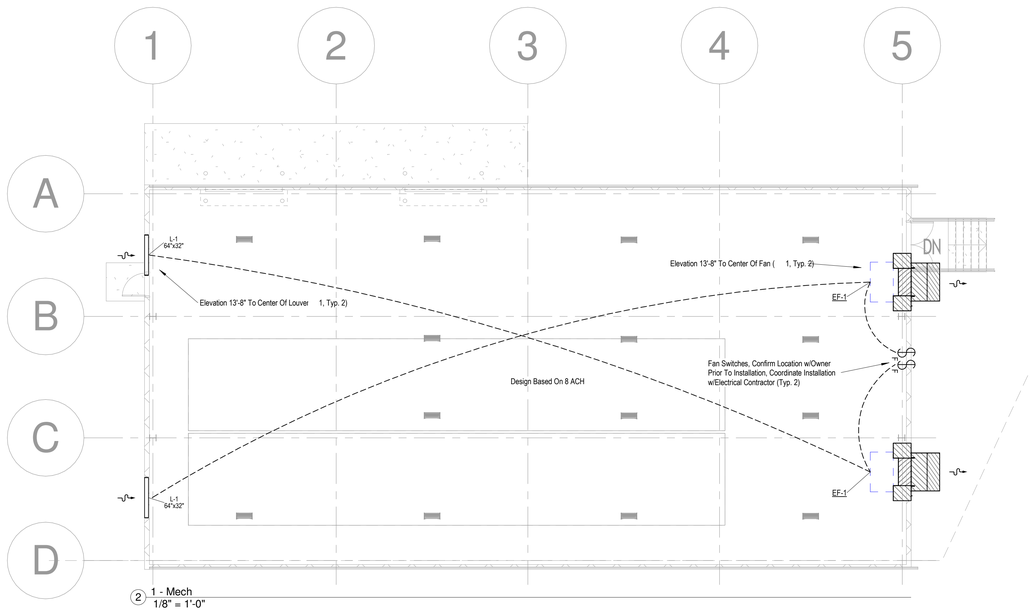
Notes:
1. Louver finishes shall be per Architect.
2. Flanded Frame
3. Insect Screen
4. Provide w/120V Actuator, 2-Position, Fail Close, Interlock w/F-1 Operation

Approved Alternate Manufacturers: Greenheck, Ruskin

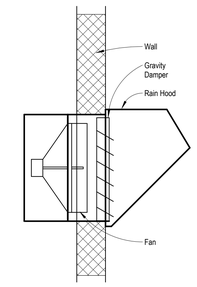
Fan Schedule

Mark	Manufacturer	Model	Description	Air Flow	E.S.P.	Fan Drive Type	Electrical					Control	Sones	Weight	Notes	Count
							Power	Volt	Phase	MCA	MOP					
EF-1	Greenheck	SBE-1H30	Sidewall Belt Drive Exhaust Fan	6500 CFM	0.25 in-wg	Direct	450 W	208 V	1	4.4 A	15 A	Wall Switch	17.2	86 lb	1-4	2

Notes:
1. Electrical Contractor To Install And Wire Disconnect Switch
2. NEMA Premium Efficient Motor
3. 1-Year Standard Warranty
4. Wall Housing (Include Mounted Gravity-Operated Damper)



2 1 - Mech
1/8" = 1'-0"



3 Sidewall Exhaust Fan
NTS

Mechanical Symbols

Sections
- 1 / M301 — Indicates Similar to Noted View When Present; SIM — View Number on Sheet; Sheet on Which Detail Appears

Air Terminals
- CD1 — Mark (See Air Terminal Schedule)
- 6"ø — Duct Connection Size
- 125 — Air Flow (cfm)

Sizing Nomenclature
- 18" x 16" — 18" Width x 16" Height on Floor Plans (Top View), Typical for Ductwork and Louvers

- Supply Air Duct Up | Supply Air Duct Down
- Return / Outdoor Air Duct Up | Return / Outdoor Air Duct Down
- Exhaust Air Duct Up | Exhaust Air Duct Down
- Duct Centerline (Round Duct)
- Damper in Ductwork, if Damper is Unlabeled, Assume Balancing Damper, Manual (B)

Damper Types:
- **B** = Balancing Damper, Manual
- **2-P** = 2-Position Damper, Motorized Actuator
- **M_v** = Full Motorized Variable Damper
- **M₂** = 2-Position Motorized Damper (Open/Close)
- **F** = Fire Damper
- **FS** = Combination Fire / Smoke Damper
- **S** = Duct-Mounted Smoke Detector. Provided, installed, and wired to the FACP by the Electrical Contractor.

- Ceiling Diffuser with Flexible Duct Connection and 4-Way Throw Direction Arrows, if Throw Indication Arrows Are Not Present, Assume 4-Way Throw
- Direction of Air Flow
- Door Undercut (3/4" Unless Otherwise Indincated)
- Mitered Rectangular Duct Elbow with Turning Vanes (Provide Turning Vanes in All Rectangular Supply Ductwork Even if Vanes Are Not Indicated. Turning Vanes Not Required in Return Air, Outdoor Air, And Exhaust Air Ducts Unless Indicated)
- 18"x12" | 18"ø — Rectangular Duct with Dimensions | Round Duct with Dimensions
- T +48" A.F.F. <RTU-*> — Thermostat - Wall Mounted with Unit Designation and Mounting Height to Bottom of Thermostat (Mounting Height 48" A.F.F. Unless Noted Otherwise on Plans). Confirm Location(s) with Owner(s) Prior to Installation. Coordinate Installation with Electrical Contractor.
- T — Thermostat in Lockbox
- H +48" A.F.F. RTU-1 — Humidistat - Wall Mounted with Unit Designation and Mounting Height to Bottom of Thermostat (Mounting Height 48" A.F.F. Unless Noted Otherwise on Plans). Confirm Location(s) with Owner(s) Prior to Installation. Coordinate Installation with Electrical Contractor.
- S — Remote Temperature Sensor
- R — Thermostat Remote Display
- CO2 — Carbon Dioxide Sensor
- CD — Condensate Drain Piping (CD)
- R — Relocate Existing
- CL — Center Line
- Connection - New/Existing
- F — Fan Switch

Sequences of Operation

Louvers:
L-1 Will Open When EF-1 Is On And Close When EF-1 Is Off.

Mechanical Project Notes

1. All mechanical work shall be done in accordance with all state and local laws and ordinances and in a manner satisfactory to the authority having jurisdiction. It shall be the responsibility of the Mechanical contractor to obtain all required permits, inspections and pay all applicable fees.
2. The mechanical contractor shall coordinate the routing of ductwork with other trades and ensure there is available space for all involved occupations before fabrication of ductwork begins. Ductwork sizes noted on mechanical plans are net clear inside dimensions.
3. The mechanical contractor shall not pass ductwork, piping, or place mechanical equipment directly over any electrical panels or electrical equipment. Coordinate with the electrical contractor to maintain clearances as required by codes.
4. Fire dampers are required where ductwork penetrates a one or more hour fire resistance rated assembly. [International Mechanical Code section 607 and International Building code 716.5]. Fire dampers may be omitted in 1-hour rated fire partitions where the duct penetrating the wall is not larger than 100 in², the duct does not terminate at a wall register, steel duct material is at least 0.0217 in. Thick, and the duct is located above a ceiling [International Building Code 716.5.4 and International Mechanical Code 607.5.3]. Fire dampers are also required where ducts pass through fire rated floor assemblies. Coordinate placement of all fire dampers with rated assemblies indicated on the architectural plans.
5. The mechanical contractor shall furnish all labor, materials, equipment, services and incidentals required for a complete and operating facility.
6. All mechanical equipment shall be provided complete with electrical starter, protective devices, and interlocks required for complete operable system.
7. Mechanical equipment placement shall allow for full service/maintenance as recommended by the equipment manufacturer.
8. Color and finish of air terminals, louvers, and wall caps shall be coordinated with the architect.
9. The mechanical contractor is responsible for the testing, adjusting and balancing of all air systems.
10. Outdoor air intakes shall not be located within 10'-0" of exhaust/relief louvers, wall caps, plumbing vents, or roof caps.
11. Units with air flows above 2,000 cfm must have a duct mounted smoke detector mounted in the supply duct downstream of all filters [2002 NFPA 90a 6.4.2.1]. Smoke detectors are also required in the return air stream prior to any exhausting from the building or mixing with outdoor air unless all portions of the building served by the air distribution system are protected by area smoke detectors connected to a fire alarm system in accordance with the international fire code [International Mechanical Code 606.2.1 and exception]. These smoke detectors must be wired to a fire alarm system when one is provided in a constantly attended location for supervisory signals [International Mechanical Code 606.4.1 and 2002 NFPA 90a 6.4.4]. Local ordinances may have more stringent requirements. Coordinate with electrical contractor. See electrical drawings for locations.
12. Insulating materials shall have a flame spread index not more than 25 and a smoke-developed index not exceeding 450 in accordance with ASTM E 84.
13. The mechanical contractor shall size refrigerant line sets in accordance with the equipment manufacturer's guidelines.
14. Furnish mechanical as-built drawings as well as Operations & Maintenance manuals for all mechanical systems to the owner within 90 days of system acceptance by the authority having jurisdiction.

HVAC Submittals
Submittals are required for all equipment specified on schedule sheet. The mechanical contractor shall provide the HVAC equipment submittals with an electrical summary sheet for use by the electrical engineer. The sheet shall indicate voltage, phase, MCA, and MOCP for all HVAC equipment submitted. Electrical values that conflict with information provided in the HVAC equipment submittals is sole responsibility of the mechanical contractor.

Design Conditions

Outdoor	
Design Data Location	Chattanooga, TN
Heating db (99.6%)	19.6
Cooling db (0.4%)	95.0
Mean Coincident wb (0.4%)	74.5
Weather Station	Chattanooga AP, TN, USA (WMO:723240)
Current Energy Code	2012 IECC
Climate Zone	4A
Indoor	
Heating db	70
Cooling db	74
Cooling Relative Humidity	55% (Maximum)

db: Dry Bulb °F
wb: Wet Bulb °F
Note: Outdoor conditions based upon ASHRAE Climatic Design Conditions 2017.

DH&W
ARCHITECTURE INTERIORS PLANNING
1001 Carter Street - Chattanooga - 37402
423 | 266 | 4816 www.dhw-architects.com

Ringgold High School Baseball Hitting Facility

29 Tiger Trail
Ringgold, GA 30736

9-29-23
Drawn: SCK
File: 8236-D

Revisions

Key Plan

C. JEFFREY WEST BROOKS — REGISTERED ARCHITECT — 110509 — STATE OF TENNESSEE — 9-29-23

Title:
MECHANICAL SCHEDULES & PLAN

Scale:

Sheet No.
M001

1 ELECTRICAL SITE PLAN
ES101 SCALE: 1" = 10'-0"

UTILITY SUPPLY NOTES

1. ALL UTILITY SERVICES SHOWN ARE FOR SCHEMATIC REPRESENTATION ONLY. NO EXPRESSED OR IMPLIED GUARANTEE IS GIVEN AS TO THE EXACT LOCATION, GRADE OR ELEVATION OF THE ABOVE MENTIONED ITEMS. ACTUAL LOCATIONS ARE TO BE BASED ON UTILITY COMPANY AND OWNER INSTRUCTIONS.
2. THE CONTRACTOR IS RESPONSIBLE FOR ALL COST ASSOCIATED WITH THE SECONDARY SERVICE AND PRIMARY DUCTBANK WORK. ANY POWER UTILITY AID TO CONSTRUCTION CHARGES TO BE PAID BY OWNER.
3. BECAUSE OF ALL OF THE ABOVE REASONS, ALL ELECTRICAL CONTRACTORS DESIRING TO BID ON THIS PROJECT ARE REQUIRED TO VISIT THE JOB SITE PRIOR TO BIDDING SO THAT THEY MAY BECOME FAMILIAR WITH ALL CIRCUMSTANCES WHICH WILL AFFECT THE ELECTRICAL WORK.
4. CONTRACTOR SHALL INCLUDE OVERTIME AND AFTER HOURS PREMIUM LABOR CHANGES IN HIS BID AS REQUIRED TO COMPLETE THE INSTALLATION OF THIS PROJECT IN ACCORDANCE PROJECT IN ACCORDANCE WITH THE ARCHITECTS SCHEDULE.
5. ALL ELECTRICAL CONTRACTORS ARE REQUIRED TO VISIT THE JOB SITE PRIOR TO BID AND TO INCLUDE ALL REQUIRED COST TO PROVIDE A COMPLETE, FUNCTIONAL AND CODE COMPLIANT ELECTRICAL INSTALLATION.
6. COORDINATE SERVICE PROVISIONS FOR TELEPHONE, CATV AND POWER FOR UNDERGROUND SERVICE TO BUILDING.
7. ALL REQUIRED 90° ELBOWS OF UTILITY CONDUITS TO BE OF SWEEPING TYPE AND SCHEDULE 80.
8. THE CONTRACTOR IS RESPONSIBLE FOR ALL COST ASSOCIATED WITH TEMPORARY POWER, BE IT 1Ø OR 3Ø, AS REQUIRED FOR THIS PROJECT.

CONTACT LIST

1. POWER COMPANY POINT OF CONTACT IS:
   CHRISTOPHER EGAN
   GEORGIA POWER
   P: 404-272-6131

GENERAL SITE NOTES

1. ALL CONDUCTOR SIZES SHOWN ARE BASED ON THE NEC AMPACITIES OF COPPER CONDUCTORS, TYPE THW UNLESS OTHERWISE NOTED.
2. ALL UNDERGROUND WIRING IS TO BE INSTALLED IN SCHEDULE 40 PVC CONDUIT PER THE WRITTEN SPECIFICATIONS. RIGID STEEL ELBOWS ARE TO BE USED ON THE CONDUIT WHEREVER IT TURNS UP AND EXITS THE GROUND.
3. THE CONTRACTOR SHALL SUPPLY A SEPARATE GREEN INSULATED GROUND WIRE IN ALL RUNS OF PVC CONDUIT, WHETHER SHOWN ON THE DRAWINGS OR NOT.
4. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR SUPPLYING ALL CONCRETE AND RELATED WORK FOR ALL POLE BASES, TRANSFORMER PADS, ETC., WHICH ARE IN HIS SCOPE OF WORK.
5. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVISION OF ELECTRICAL WIRING AND ASSOCIATED EQUIPMENT REQUIRED TO PROVIDE SERVICE TO ALL PYLON SIGNS.
6. ALL WORK IS TO COMPLY WITH THE LATEST VERSION OF THE NEC AND ALL APPLICABLE STATE, LOCAL, AND MUNICIPAL CODES.
7. THE ELECTRICAL CONTRACTOR IS TO COORDINATE ALL OF HIS WORK WITH ALL OF THE OTHER DISCIPLINES AND TRADES. WATER, SEWER, STORM DRAINAGE, ETC., ROUTING TAKE PRECEDENCE OVER THE ELECTRICAL WIRE AND CONDUIT ROUTING. THE ELECTRICAL CONTRACTOR IS TO RELOCATE OR REROUTE AS REQUIRED TO CLEAR SUCH.
8. COORDINATE ALL SITE WORK WITH CIVIL DRAWINGS.

ELECTRICAL KEYED NOTES

1. EXISTING UTILITY TRANSFORMER. COORDINATE WITH GEORGIA POWER. BRING NEW CONDUCTORS OUT OF PAD. SEE RISER. ALL WORK BY CONTRACTOR. COORDINATE ANY POWER OUTAGE WITH OWNER FOR AFTER HOURS SHUTDOWN IF NEEDED.
2. UNDERGROUND SECONDARY LINES BY ELECTRICAL CONTRACTOR FROM TRANSFORMER TO NEW SERVICE DISCONNECT. SEE RISER DIAGRAM. ALL WIRE AND CONDUIT BY CONTRACTOR, SEE RISER FOR SIZES.
3. PROPOSED LOCATION FOR BUILDING DISCONNECT. SEE RISER DIAGRAM.
4. PROPOSED LOCATION WITH FOR NEW 480V TO 120/208V, 3Ø PAD MOUNT STEP-DOWN TRANSFORMER.
5. STEP-DOWN TRANSFORMER SECONDARY. SEE RISER FOR DETAILS.
6. PROPOSED PANEL LOCATION. SEE RISER FOR DETAILS.

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Chattanooga, Tennessee 37404
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Revisions:

Key Plan

GEORGIA REGISTERED PROFESSIONAL ENGINEER
No. 39815
STEVEN B SAAD
09/29/23

Title:
ELECTRICAL SITE PLAN

Scale:

Sheet No.
ES101

GENERAL ELECTRICAL PROJECT NOTES

GENERAL:

1. VERIFY ALL DOOR SWINGS WITH THE ARCHITECTURAL DRAWINGS BEFORE ROUGHING IN LIGHT SWITCHES TO INSURE PROPER LOCATION. VERIFY ALL CASEWORK HEIGHTS TO INSURE THAT ALL OUTLETS ABOVE CASEWORK ARE AT THE PROPER HEIGHT.

2. VERIFY THE EXACT LOCATION OF ALL MOTORS AND EQUIPMENT OF ELECTRICAL AND OTHER TRADES BEFORE ROUGHING IN ELECTRICAL WORK. ALSO ADVISE OTHER TRADES OF THE LOCATIONS OF ELECTRICAL WORK WHICH WILL AFFECT THEIR WORK, PRIOR TO THE INSTALLATION OF THE ELECTRICAL WORK. COORDINATE LIGHT FIXTURE LOCATION WITH OTHER TRADES AND ARCHITECTURAL.

3. ALL DIMENSIONS AFFECTING ELECTRICAL WORK ARE TO BE CAREFULLY CHECKED AND VERIFIED WITH THE GENERAL CONTRACTOR BEFORE ANY WORK IS DONE.

4. UNLESS OTHERWISE NOTED IN THE WRITTEN SPECIFICATIONS OR ON THE DRAWINGS, ALL ELECTRICAL WORK AND ELECTRICAL EQUIPMENT ARE TO BE PROVIDED BY THE ELECTRICAL CONTRACTOR.

5. FIRE WALL MEMBRANE PENETRATIONS SHALL CONFORM WITH IBC.

WIRE/CONDUIT:

1. ELECTRICAL CONTRACTOR IS TO PROVIDE CONDUITS AND BOXES FOR THERMOSTAT AND SENSOR LOCATIONS. COORDINATE WITH MECHANICAL FOR LOCATIONS, MOUNTING HEIGHTS, BOXES, & CONDUIT SIZE. PROVIDE MEASURED PULL STRINGS. STUB OUT IN 1/2"C.

2. PROVIDE MEASURED PULL STRINGS IN ALL CONDUIT TO BE LEFT EMPTY.

3. ALL 120V, 20A HOMERUNS OVER 100' SHALL BE #10 AWG.

4. PROVIDE SEPARATE GROUND WIRES FOR ALL CIRCUITS. NO RACEWAY GROUNDS.

5. CONTRACTOR IS REQUIRED TO PROVIDE CONDUIT SLEEVE PENETRATIONS THRU RATED WALLS FOR USE BY HIMSELF AND OTHER TRADES. COORDINATE SIZE AND LOCATION OF CONDUITS REQUIRED BY OTHER TRADES. THE INTERIOR OF ALL CONDUIT SLEEVES PENETRATING RATED WALLS ARE TO BE SEALED AROUND WIRING AND TO THE INTERIOR OF THE CONDUIT AT EACH END WITH FIRE STOP MATERIAL TO PRESERVE THE RATING INTEGRITY OF THE WALL; SEALING IS TO BE DONE ONLY AFTER ALL WIRING IS COMPLETE BOTH BY THE ELECTRICAL CONTRACTOR AND OWNER.

6. CONDUIT ROUTING IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. ROUTING SHOWN ON THESE DRAWINGS ARE FOR SCHEMATIC PURPOSES ONLY. THE ONLY EXCEPTION TO THIS IS THAT NO SURFACE MOUNTED CONDUIT WILL BE PROVIDED EXCEPT AS INDICATED ON THESE DRAWINGS UNLESS APPROVAL IS GIVEN BY OWNERS REP OR ENGINEER. CONDUIT SIZES INDICATED ON THESE DRAWINGS ARE MINIMUM SIZES FOR INDIVIDUAL HOMERUNS. CONTRACTOR IS FREE TO COMBINE DIFFERENT HOMERUNS IN SAME CONDUIT AND RESIZE ACCORDING TO NEC REQUIREMENTS. CONTRACTOR IS TO PROVIDE MULTIPLE RUNS OF CONDUIT AT HIS EXPENSE TO REPLACE LARGER INDIVIDUAL RUNS OF CONDUIT INDICATED ON THESE DRAWINGS WHERE FIELD CONDITIONS WILL NOT ALLOW THEM TO BE INSTALLED IN THE SIZES SHOWN. ELECTRICAL CONTRACTOR FREE TO USE LEAST EXPENSIVE WIRING METHOD AS ALLOWED BY CODE. COORDINATE WITH OTHER TRADES FOR INSTALLATION SO THAT NO TRADES INSTALLED PIPING, DUCTWORK, OR RECESSED LIGHTING FIXTURES INTERFERES WITH THE ARCHITECTS REQUIRED MINIMUM CEILING HEIGHT.CONTRACTOR IS TO PUNCH THRU WALLS WITH CONDUIT RUNS AS REQUIRED BY FIELD CONDITIONS. LOCATE WALL PENETRATIONS ABOVE CEILING AREAS UNLESS OTHERWISE INDICATED. FIRE STOP AS REQUIRED.

7. CONTRACTOR TO RUN ALL POLYPHASE CIRCUITRY IN CONDUIT OR IN MC FEEDERS. ALL OTHER WIRING ALLOWED TO BE LEAST EXPENSIVE INSTALLATION AS ALLOWED BY CODE AND AHJ. THIS NOTE SHALL OVERRIDE WIRE AND CABLE SPECIFICATIONS. ENT IS ACCEPTABLE FOR LOW VOLTAGE WIRING.

8. CONTRACTOR IS FREE TO USE 1/2"C. WHERE ALLOWED BY NUMBER AND SIZE OF CONDUCTORS, FOLLOW NEC. CONTRACTOR IS ALSO FREE TO ROUTE CONDUITS IN THE SLAB IN PVC AS HE DEEMS APPROPRIATE. SEE WIRE/CONDUIT NOTE 6 ABOVE AND ELBOW REQUIREMENTS IN SPECIFICATIONS.

POWER/SYSTEMS:

1. ALL BOXES FOR POWER AND/OR COMMUNICATION DEVICES SHALL BE LOCATED 18" A.F.F. TO CENTER OF BOX UNLESS OTHERWISE NOTED. CONTRACTOR IS TO COORDINATE ALL DEVICE LOCATIONS WITH MILLWORK.

2. PROVIDE SERVICE ENTRANCE GROUNDING IN ACCORDANCE WITH NEC.

3. ALL COMMUNICATIONS SYSTEMS ARE TO BE PROVIDED BY OWNER. THE ELECTRICAL CONTRACTOR IS TO PROVIDE ALL CONDUIT AND STANDARD BACKBOXES IDENTIFIED IN ELECTRICAL DOCUMENTS.

4. CONTRACTOR TO MARK CIRCUIT NUMBERS ON ALL J BOXES. MARK ON EXTERIOR IF NOT PAINTED, INTERIOR IF PAINTED.

5. PROVIDE TAMPERPROOF OUTLETS AS REQUIRED BY CODE.

LIGHTING:

1. CONTRACTOR IS TO VERIFY LIGHT FIXTURE COLOR/FINISHES WITH ARCHITECT PRIOR TO ORDER.

2. ALL LIGHT FIXTURES ARE TO BE CHECKED BEFORE ROUGHING IN TO INSURE THAT THEY CAN BE MOUNTED AS DIRECTED BY THE DRAWINGS AND THAT THERE IS ENOUGH SPACE TO ALLOW SUCH.

3. RECESSED LIGHT FIXTURES IN INSULATED CEILINGS MUST BE I.C. RATED.

4. CONTRACTOR IS RESPONSIBLE FOR COORDINATING LOCATION OF HIS LIGHT FIXTURES WITH OTHER TRADES AND ARCHITECTURAL DRAWINGS PRIOR TO ANY INSTALLATION.

5. PROVIDE PHOTOCELL ON ROOF FOR SWITCHING OF EXTERIOR LIGHTING. SWITCH THRU TIMECLOCK ALSO PROVIDED BY CONTRACTOR.

ELECTRICAL SYMBOLS LEGEND

LED WALL SCONCE. SEE LIGHTING FIXTURE SCHEDULE FOR DETAILS.

LED HIGH BAY LIGHT. SEE LIGHTING FIXTURE SCHEDULE FOR DETAILS.

EXIT SIGN/EXIT COMBO, SEE LIGHTIING SCHEDULE FOR INCLUSION OF EMERGENCY BATTERY PACKS. SHADING INDICATES NUMBER AND ORIENTATION OF FACES UNIVERSAL MOUNTING KIT. ARROW INDICATES PROVIDE KNOCKOUT FOR DIRECTIONAL ARROW IN THE DIRECTION SHOWN. SEE LIGHTING FIXTURE SCHEDULE FOR DETAILS.

$ — WALL MOUNTED SWITCH, MOUNT 48" A.F.F. UNLESS OTHERWISE NOTED. NUMBER INDICATES TYPE (3-WAY, ETC.), PROVIDE NYLON FACEPLATES.
"D" INDICATES SLIDE DIMMER. COORDINATE SIZE WITH FIXTURES CONTROLLED TO AVOID FLICKERING.

PANELBOARDS; RECESSED OR SURFACE MOUNTED AS NOTED IN PANEL SCHEDULE. UNLESS OTHERWISE NECESSARY BY HEIGHT OF CABINET, MOUNT SO THAT TOP IS AT 6'-0" A.F.F.. 3'-0" HORIZONTAL CLEARANCE MUST BE MAINTAINED FROM FLOOR TO CEILING IN FRONT OF ELECTRICAL PANELS.

A-12 — HOMERUN TO PANELBOARD IN CONDUIT. LETTER INDICATES PANEL, NUMBER INDICATES CIRCUIT NUMBER. CROSS HATCHES INDICATE NUMBER OF CONDUCTORS TO BE #12 AWG UNLESSOTHERWISE NOTED. ALSO PROVIDE PHASE WIRES. LONG LINE INDICATES NEUTRAL. SEPARATE GROUND WIRES FOR ALL CIRCUITS, SIZE PER NEC.

CONDUIT IN FLOOR SLAB OR UNDERGROUND, 3/4" UNLESS OTHERWISE NOTED.

SURFACE MOUNTED EXPOSED CONDUIT, 3/4" UNLESS OTHERWISE NOTED.

J — JUNCTION BOX, SIZE AND USE AS REQUIRED.

DISCONNECT SWITCH. ALL TO BE HEAVY DUTY. FUSE SIZE SHOWN ON DRAWINGS.

DUPLEX RECEPTACLE OUTLET.
"C" INDICATES MOUNTING AT COUNTER TOP HEIGHT, 6" ABOVE BACKSPLASH, VERIFY COUNTER HEIGHTS WITH ARCHITECT PRIOR TO DOING ANY WORK.
"WP" INDICATES A WEATHERPROOF DEVICE MOUNTED HORIZONTALLY.
"G" INDICATES GROUND FAULT PROTECTED DEVICE OR BREAKER (SEE PANEL SCH.).
"U" INDICATES DUPLEX RECEPTACLE WITH TWO EACH USB PORTS.
GROUNDS TO LOCATED UP ON ALL RECEPTACLES.

TELEPHONE OUTLET, MOUNT AT 18" A.F.F. TO CENTER OF BOX, PROVIDE MEASURED PULL STRING, UNLESS OTHERWISE SHOWN. CABLE & FACE PLATES BY OWNER.

SPECIAL PURPOSE RECEPTACLE. CONTRACTOR TO PROVIDE RECEPTACLE TO MATCH NEMA CONFIGURATION OF CORD & PLUG OF DEVICE TO BE PLUGGED INTO RECEPTACLE. "C" INDICATES MOUNTING AT COUNTER TOP HEIGHT, 6" ABOVE BACKSPLASH.

$ — MOTOR RATED SWITCH.

LEGEND NOTES:
1. ALL WIRING DEVICES AND COVERPLATES ARE TO BE PER ARCHITECT.

LIGHTING FIXTURE SCHEDULE

Type	MFG	Model	Description
EM	OWNER PROVIDED	PEH-T20	WALL MOUNTED EMERGENCY LIGHT. LED. TWO HEADS. 120V. NICAD BATTERY.
H	WILLIAMS	GH-2-L240-840-FP-DIM-UNV	LED HIGH BAY. 2' LENGHT, 24000lm, 80 CRI, 4000K CCT, UNIVERSAL VOLTAGE
WP	OWNER PROVIDED	LPW32-90-NW-G3-3-120	EXTERIOR LED WALL SCONCE. 90W, 120V
XC	BEGHELLI	BRZ-LR-U-W	EXIT SIGN/COMBO. RED LETTERS ON WHITE THERMOPLASTIC HOUSING. UNIVERSAL VOLTAGE. NICAD BATTERY. PROVIDE REMOTE BATTERY PACK FOR REMOTE HEAD WHERE NEEDED.
XR	BEGHELLI	BRH-WP-2	REMOTE HEAD. PROVIDE REMOTE BATTERY PACK WITH USE OF EXIT/COMBO.

SCHEDULE NOTES

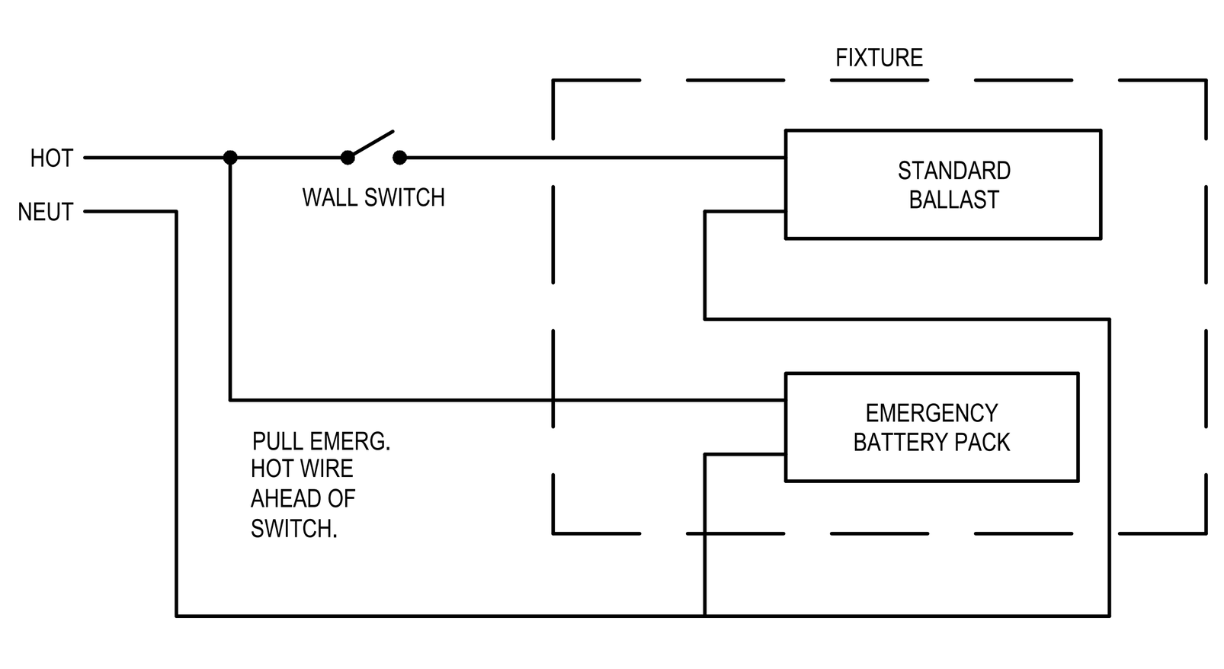
1. CONTACT ADAM FLOWERS WITH SESCOLIGHTING AT (423) 495-0495 FOR HELP WITH THE ABOVE LISTED FIXTURES.
2. ALL FINISH AND TRIM PER ARCHITECT. CONFIRM WITH ARCHITECT PRIOR TO ORDERING ANY FIXTURE.
3. CONTRACTOR TO PROVIDE CAGES FOR ALL: "EM" AND "XC" TYPE FIXTURES.
4. CONTRACTOR TO PROVIDE ALL MOUNTING AND ACCESSORIES FOR MOUNTING OF FIXTURES.

PANEL SCHEDULE

NAME: **A**
FRAME: **125A**
MAIN: **80A MCB**
TRIM: **SURFACE, NEMA 1**
AIC RATING: **SERIES RATED**

VOLTAGE: **208/120, 3PH., 4W.**
FEEDS FROM: **TRANSFORMER**
PROVIDE NEUTRAL BAR
PROVIDE GROUND BAR

CODE	CKT.	LOAD	TRIP	PLS	A	B	C	PLS	TRIP	LOAD	CKT	CODE
L	1	LTS - Exterior Wall Packs	20	1	540 / 1,080			1	20	LTS - Interior	2	
	3	LTS - Interior	20	1		1,080 / 540		1	20	Rcps. - Interior	4	
	5	Rcps. - Interior	20	1			540 / 360	1	20	Rcps. - Interior	6	
	7	Rcps. - Interior	20	1	540 / 540			1	20	Rcps. - Interior	8	
	9	EF-1	20	3		528 / 528					10	
	11						528 / 528				12	
	13				528 / 528			3	20	EF-1	14	
	15	Garage Door #1	20	2		510 / 510					16	
	17						510 / 510	2	20	Garage Door #2	18	
	19	Rcps. - Pitching Machine	20	1	1,000 / 1,000			1	20	Rcps. - Pitching Machine	20	
	21	SPACE ONLY	20	1				1	20	SPACE ONLY	22	
	23	SPACE ONLY	20	1				1	20	SPACE ONLY	24	
	25	SPACE ONLY	20	1				1	20	SPACE ONLY	26	
	27	SPACE ONLY	20	1				1	20	SPACE ONLY	28	
	29	SPACE ONLY	20	1				1	20	SPACE ONLY	30	
	31	SPACE ONLY	20	1				1	20	SPACE ONLY	32	
	33	SPACE ONLY	20	1				1	20	SPACE ONLY	34	
	35	SPACE ONLY	20	1				1	20	SPACE ONLY	36	
	37	SPACE ONLY	20	1				1	20	SPACE ONLY	38	
	39	SPACE ONLY	20	1				1	20	SPACE ONLY	40	
	41	SPACE ONLY	20	1				1	20	SPACE ONLY	42	
					PHASE LOAD TOTAL			PROVIDE TYPEWRITTEN SCHEDULES WITH PLASTIC COVER. CIRCUIT NAMES TO BE EXACTLY AS LISTED HERE. PROVIDE ENGRAVED NAMEPLATE ON FACE OF PANEL.				
					A	B	C					
					5,756	3,696	2,976					
		TOTAL CONNECTED LOAD:	12.4	KVA	OR				34.5	AMPS		



DETAIL NOTES:

1. THIS DETAIL ALSO APPLIES TO FIXTURES WHICH ARE WIRED DIRECTLY FROM A BREAKER WITHOUT A WALL SWITCH. IN THIS CASE, WIRE THE "HOT" LEAD FROM THE EMERGENCY BATTERY PACK TO ANOTHER BREAKER IN THE PANEL.
2. EMERGENCY EXIT SIGNS AND WALL BUG-EYES TO BE WIRED HOT LEG AHEAD OF ANY SWITCHING.

NO SCALE

01 EMERGENCY FIXTURE WIRING DETAIL

RISER WIRING TABLE

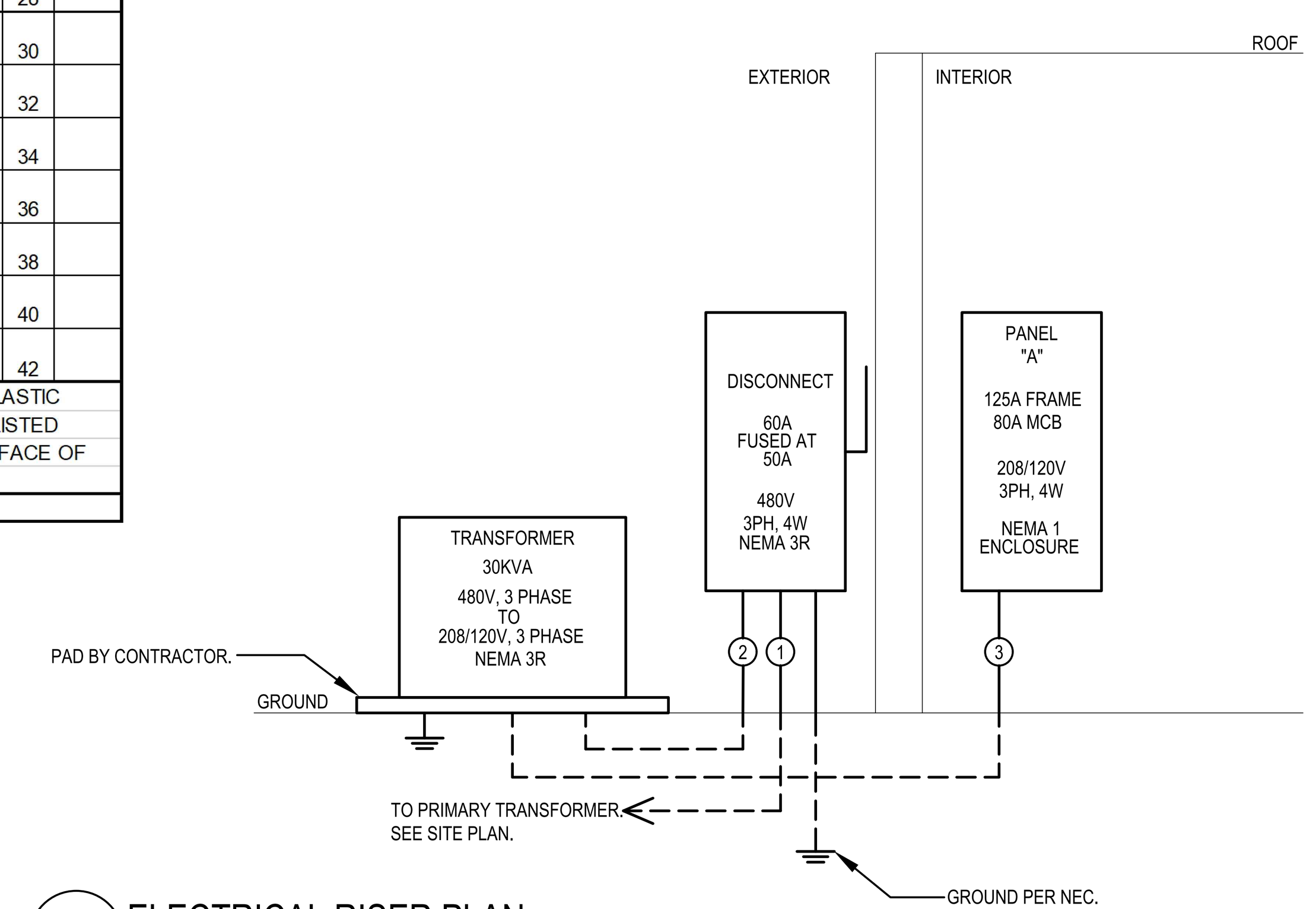
MARK	FED FROM	WIRE SIZE	WIRE TYPE	CONDUIT	GROUND PER RACEWAY
1	UTILITY-TRANSFORMER	6	AL.	3"	8
2	DISCONNECT	6	AL.	1-1/4"	8
3	STEP-TRANSFORMER	2	AL.	1-1/2"	6

TABLE NOTES:

1. ALL CONDUITS ABOVE GRADE TO BE EMT OR SCH80. CONDUITS IN CMU BLOCK TO BE EMT.
2. ALL BELOW GRADE ELBOWS TO BE RIGID OR SCH80 EXCEPT WHERE CONVERTING FROM PVC TO EMT INSIDE WALLS, EMT ALLOWED THEN.
3. ALL ABOVE SLAB CONDUIT RUNS ARE TO BE RAN PARALLEL & PERPENDICULAR TO BUILDING STRUCTURE.

TRANSFORMER NOTES

1. TRANSFORMER TO BE 480V DELTA PRIMARY TO 208Y/120V WYE SECONDARY, SIZE AS INDICATED. TRANSFORMER TO BE 150° RISE.



1 / E001 ELECTRICAL RISER PLAN
SCALE: N.T.S.

SHEET LIST - ELECTRICAL

NUMBER	NAME
E001	ELECTRICAL PROJECT SCHEDULES & NOTES
E101	ELECTRICAL LIGHTING PLAN
E201	ELECTRICAL POWER PLAN
ES101	ELECTRICAL SITE PLAN

March Adams & Associates
Consulting Engineers
310 Dodds Ave.
P.O. Box 3689
Chattanooga, Tennessee 37404
PH: (423)698-6675
MAA #23217

DH&W
ARCHITECTURE INTERIORS PLANNING
1001 Carter Street - Chattanooga - 37402
423 | 266 | 4816 www.dhw-architects.com

RHS BB Hitting Facility

29 Tiger Trail
Ringold, GA 30736

9-13-23
Drawn: DSA
File: 8236-D

Revisions:

Key Plan

GEORGIA PROFESSIONAL ENGINEER STEVEN B. SABACK 09/29/23

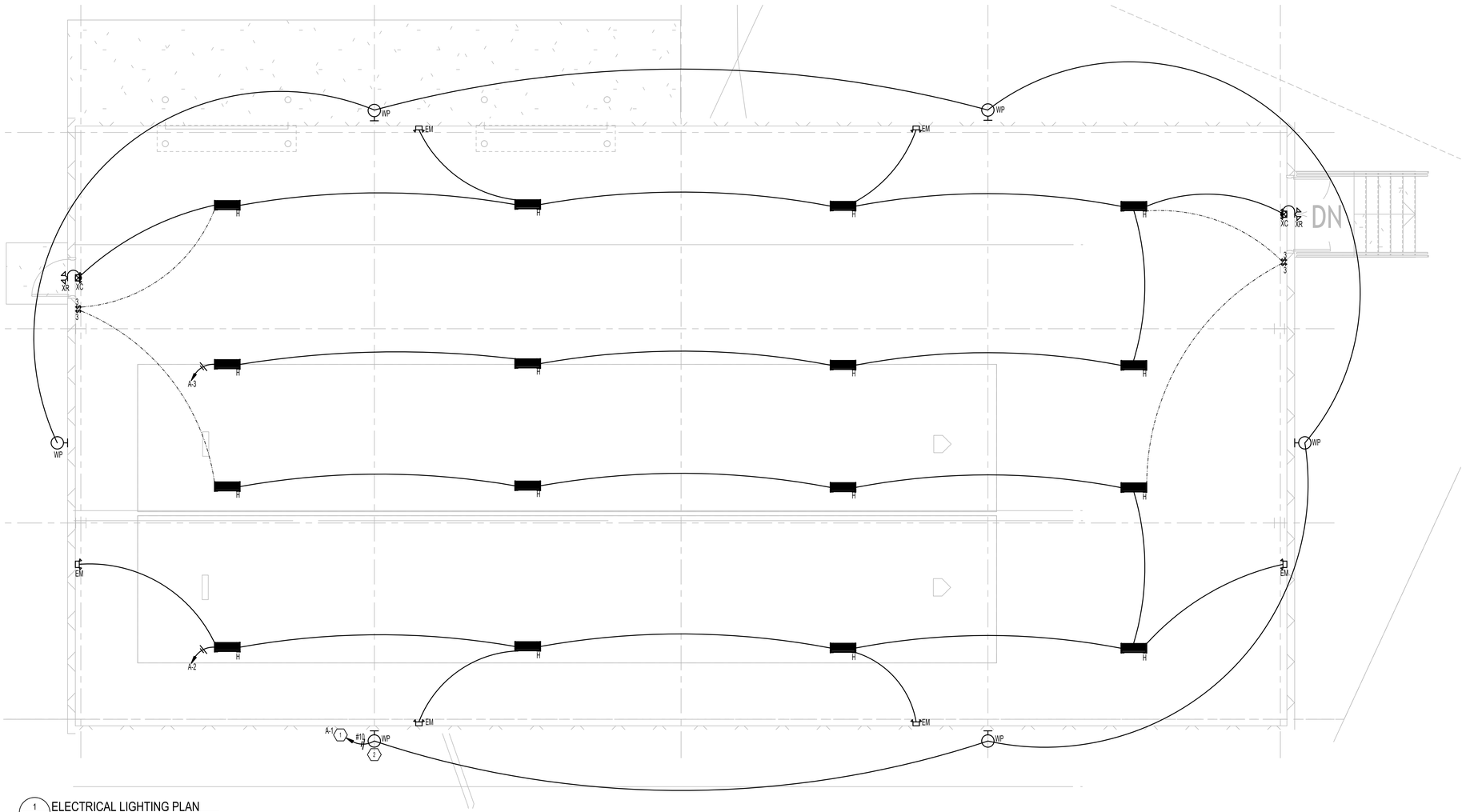
Title:
ELECTRICAL SCHEDULES & NOTES

Scale:

Sheet No.
E001

ELECTRICAL KEYED NOTES

1. RUN CIRCUIT THRU LIGHTING CONTACTOR. CONTACTOR TO BE CONTOLLED BY TIMECLOCK & PHOTOCELL ASSEMBLY.
2. COORDINATE MOUNTING HEIGHT OF FIXTURE TYPE "WP" WITH ARCHITECT. TYPICAL



1 / E1.0 ELECTRICAL LIGHTING PLAN
SCALE: 1/4"=1'-0"

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P.O. Box 3689
Chattanooga, Tennessee 37404
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Revisions:

Key Plan

GEORGIA REGISTERED PROFESSIONAL ENGINEER No. 39875 STEVEN B. SABACKY 09/29/23

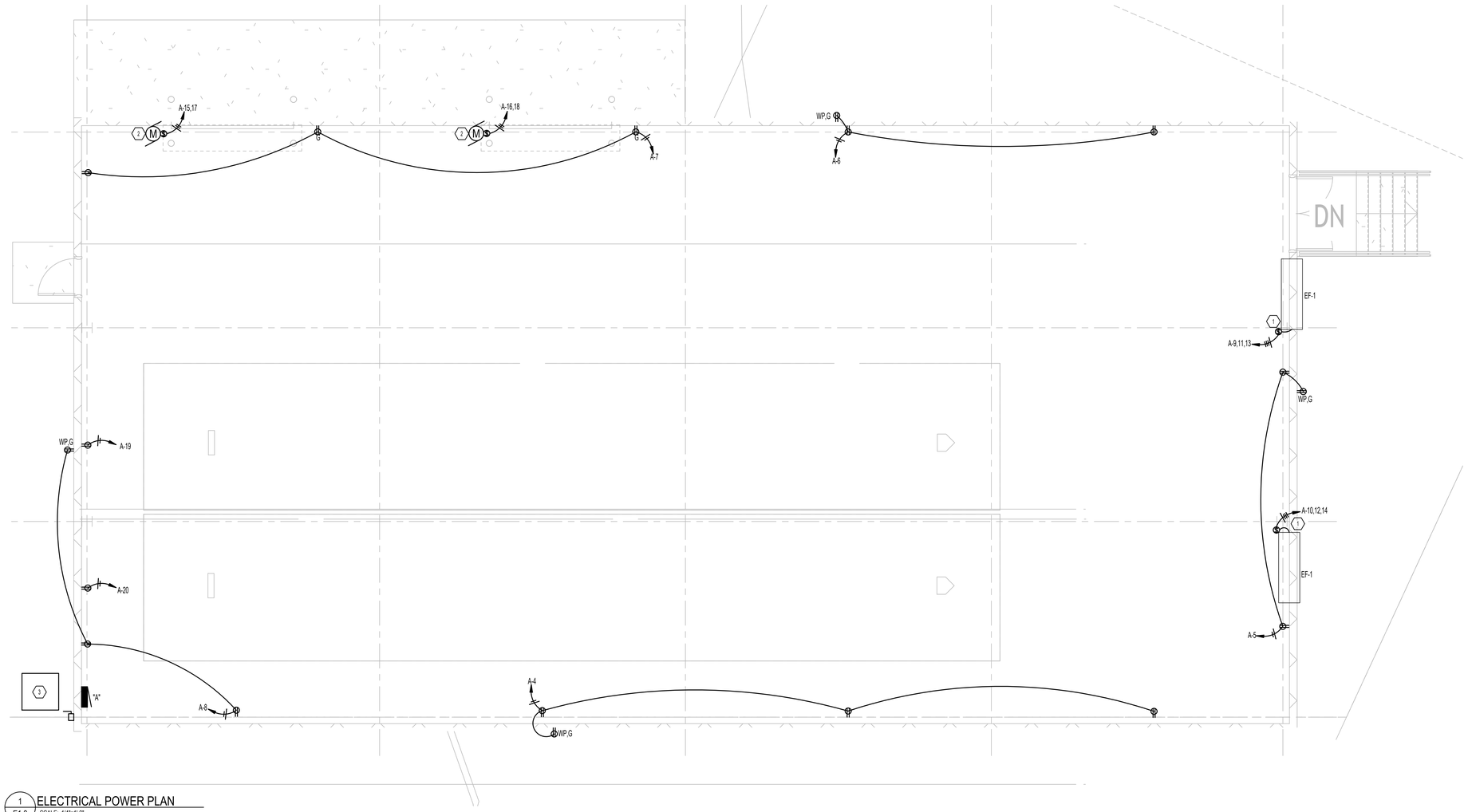
Title:
ELECTRICAL LIGHTING PLAN

Scale:

Sheet No.
E101

ELECTRICAL KEYED NOTES

1. PROVIDE A 15A MOTOR RATED SWITCH FOR EF-1. WIRE WITH #12 CU + #12 G IN A 3/4" C.
2. PROVIDE A 15A MOTOR RATED SWITCH FOR GARAGE DOOR MOTOR. WIRE WITH #12 CU + #12 G IN A 3/4" C.
3. APPROXIMATE LOCATION OF STEP-DOWN TRANSFORMER. SEE SITE PLAN AND RISER FOR MORE DETAILS.



1 E1.0 ELECTRICAL POWER PLAN
SCALE: 1/4"=1'-0"

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Chattanooga, Tennessee 37404
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MAA #23217

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423 | 266 | 4816 www.dhw-architects.com

Revisions:

Key Plan

GEORGIA REGISTERED No. 39815 PROFESSIONAL ENGINEER STEVEN B. MARCH 06/29/23

Title:
ELECTRICAL POWER PLAN

Scale:

Sheet No.
E201

PROJECT MANUAL

FOR

CATOOSA COUNTY SCHOOLS
RINGGOLD HIGH SCHOOL
BASEBALL HITTING FACILITY

Ringgold, Georgia
September 29, 2023
DHW File No. 8236-D

ARCHITECTS
Derthick, Henley & Wilkerson, Architects
1001 Carter Street
Chattanooga, Tennessee 37402
Phone (423) 266-4816

INDEX

CATOOSA COUNTY SCHOOLS
RINGGOLD HIGH SCHOOL
HITTING FACILITY

SECTION 00 11 13 - INVITATION TO BID

8236-D CCPS RHS BB Hitting

Sealed Bids for the construction of the Heritage Outdoor Pavilion, Ringgold, Georgia, will be received in the Board Room, Central Office, Catoosa County, Georgia, 307 Cleveland Street, Ringgold, Georgia 30736, until 2:00 pm on November 7, 2023 at which time they will be opened publicly and read aloud.
There will not be a pre-bid conference.

Plans and Specifications are available for inspection in the Central Office of the Board of Education at 307 Cleveland Street, Ringgold, Georgia 30736. The hours are Monday through Friday, 7:30 am until 4:30 pm.

Contract documents will be issued to General Contractors by the office of the Architect, Derthick, Henley & Wilkerson, Architects, 1001 Carter Street, Chattanooga, Tennessee for a deposit of $75.00. All questions regarding this project should be directed to Ray Boaz at (423) 266-4816. General Contractors submitting a bona-fide bid will be refunded the deposit, provided the plans and specifications are returned in good condition within ten (10) days from the bid date, EXCEPT for the successful bidder. Others may purchase plans and specifications from the Architect at the rate of $3.00 per sheet for plans and .25 per sheet for specifications.

Bids shall be submitted on the proposal form furnished by the Architect, and must be submitted in a sealed envelope, clearly marked as to the job and the submitting General Contractor. Each bid must be accompanied by a bid bond executed by the bidder and a surety company in an amount equal to 5% of the amount of the bid.

No bid may be withdrawn for a period of Sixty (60) days from the above listed date, except as otherwise provided by law.

The successful bidder will be required to execute a contract on AIA Standard Form of Agreement Between the Owner and Contractor, and to execute performance and payment bonds each in the amount of 100% of the contract amount.

The owner reserves the right to accept or reject any and all proposals and to waive any informalities therewith.

END OF SECTION

SECTION 00 21 13 – PROPOSAL FORM

Catoosa County Schools
Ringgold, Georgia
Derthick, Henley & Wilkerson, Architects

Date:

RE: Catoosa County Public Schools
Ringgold High School
Baseball Batting Facility

1. Having carefully examined the specifications entitled “Heritage Outdoor Pavilion” and the Drawings entitled and numbered as shown on the Index, all dated October 29, 2023 and Addendum No.(s) _____, as well as the premises and conditions affecting the work, the undersigned proposes to furnish all services, labor and material called for by them for the entire work, in accordance with said documents for the sum of

   _____ Dollars

   ($_____) which sum is hereinafter called the “Base Bid”.

2. For and in consideration of the amount of $1.00, the receipt of which is hereby acknowledged, the undersigned agrees that this proposal may not be revoked or withdrawn after the time set for the opening of bids, but the Base Bid shall remain open for acceptance for a period of Sixty (60) days following such time.

3. In case he be notified in writing, by mail, telegraph, or delivery of the acceptance of the proposal within 60 days after the time set for opening bids, the undersigned agrees to execute within ten (10) days a contract (AIA Standard Form of Agreement Between Owner and Contractor Where a Stipulated Sum Forms the Basis of Payment, Document A101, 2017 Edition) for the work for the above stated compensation.

4. The undersigned agrees to furnish and deliver, at the time the contract is executed, a Performance Bond and Labor and Material Payment Bond both in the amount equal to 100% of the contract sum. The undersigned Bidder proposes:

5. The undersigned agrees to execute a contract on or about November 29, 2023 and to commence actual physical work on the site, with an adequate force and equipment immediately and to complete fully all work as indicated in drawings and specifications. Final completion date is March 1, 2024.

Company Name _____

By _____

Title _____

SECTION 00 72 00
GENERAL CONDITIONS

FORM OF GENERAL CONDITIONS

1.01 THE AIA GENERAL CONDITION OF THE CONTRACT FOR CONSTRUCTION, AIA DOCUMENT A201, 2017 EDITION IS MADE A PART OF THESE SPECIFICATIONS AND THE CONTRACT DOCUMENTS.

RELATED REQUIREMENTS

2.01 SECTION 00 73 00 - SUPPLEMENTARY CONDITIONS.

END OF SECTION

AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

\
Ringgold High School
Baseball Hitting Facility
29 Tiger Trail
Ringgold, Georgia 30736

THE OWNER:
(Name, legal status and address)

Catoosa County Schools
307 Cleveland Street
Ringgold, Georgia 30736

THE ARCHITECT:
(Name, legal status and address)

Derthick, Henley & Wilkerson, Architects PLLC
1001 Carter Street
Chattanooga, Tennessee 37402

TABLE OF ARTICLES

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

INDEX
(Topics and numbers in bold are Section headings.)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will

specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;
.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
.4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

.1 defective Work not remedied;

.2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;

.3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a Separate Contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

.1 employees on the Work and other persons who may be affected thereby;

.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act

or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and

approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;

.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

SECTION 00 73 00
SUPPLEMENTARY CONDITIONS

PART 1 GENERAL

1.01 SUMMARY

1.02 THESE SUPPLEMENTARY CONDITIONS AMEND AND SUPPLEMENT THE GENERAL CONDITIONS DEFINED IN DOCUMENT 00 72 00 - GENERAL CONDITIONS AND OTHER PROVISIONS OF THE CONTRACT DOCUMENTS AS INDICATED BELOW. PROVISIONS THAT ARE NOT SO AMENDED OR SUPPLEMENTED REMAIN IN FULL FORCE AND EFFECT.

1.03 THE TERMS USED IN THESE SUPPLEMENTARY CONDITIONS THAT ARE DEFINED IN THE GENERAL CONDITIONS HAVE THE MEANINGS ASSIGNED TO THEM IN THE GENERAL CONDITIONS.

1.04 MODIFICATIONS TO GENERAL CONDITIONS

A. The following supplements modify the General Conditions of the Contract for Construction, AIA Document A201-1997. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

B. These specifications are the abbreviated or “streamlined” type and include incomplete sentences. Omissions of words and phrases such as “the Contractor shall” “in conformity therewith”, “shall be”, “as noted on the drawings”, “a”, “an”, “the”, and “all” are intentional. Omitted words and phrases shall be supplied by inference in the same manner as they are when a “note” occurs on the Drawings.

C. Drawings and specifications are not intended to be gender specific. Where any gender specific word is used (he, she, him, her etc) these words are intended to imply the gender being addressed.

1.05 ARTICLE 1 - GENERAL PROVISIONS - 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS ADD SUBPARAGRAPH 1.2.5 AS FOLLOWS

A. 1.2.5 References to known standard specifications shall mean and intend latest editions of such specifications adopted and published at date of invitation to submit proposals.

1.06 ARTICLE 3 - CONTRACTOR 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES - ADD SUBPARAGRAPH 3.3.4 AS FOLLOWS

A. 3.3.4 The Contractor shall locate, lay out work as per drawings, with respect to location on property and elevation in relation to grade. Field establish, maintain grades, lines, levels, locations required for work; be responsible for accuracy of same. Verify grades, lines, levels, locations dimensions as indicated. Report any errors or inconsistences in above, before commencing work. The Contractor shall perform the work in accordance with any special sequences, schedules, and procedures shown on the drawings.

1.07 ARTICLE 3 3.4 LABOR AND MATERIALS - ADD SUBPARAGRAPH 3.4.4 AS FOLLOWS

A. 3.4.4 Labor shall be performed in best, most workmanlike manner, by mechanics skilled in their respective trades. Standards of work required throughout; such grade as will bring results of first class only.

1.0 ARTICLE 3 3.5 WARRANTY ADD SUBPARAGRAPH 3.5.1 AS FOLLOWS

A. 3.5.1 General Contractor shall guarantee all work for a period of one (1) year from date of acceptance. It is specifically understood that this guarantee, and fulfillment of all obligations thereunder, is fully protected by the Performance Bond furnished by the General Contractor, Sub-Contractor, or manufacturer for required guarantees and warranties called for in the Specifications. Nothing in this guarantee shall apply to work which has been abused or neglected by the Owner.

1.09 ARTICLE 3 3.7 PERMITS FEES AND NOTICES ADD SUB SUBPARAGRAPH 3.7.1.1 AS FOLLOWS

A. 3.7.1.1 All permit and plans review fees shall be the obligation of the Contractor.

1.10 ARTICLE 7 - CHANGES IN THE WOR 7.1 CHANGES ADD SUBPARAGRAPH 7.1.1.1 AS FOLLOWS

A. 7.1.1.1 Execute work precisely as shown on Contract Documents. Make no changes therefrom without having first received written permission. Where detail is lacking, refer matter to Architect for instructions before proceeding.

1.11 ARTICLE 7 7.2 CHANGE ORDERS ADD SUBPARAGRAPH 7.2.2 AS FOLLOWS

A. 7.2.2 In order to facilitate the Architect's checking of the Contractor's quotations for extras or credits, all change order proposals from the Contractor, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs prepared by the Contractor including labor, materials and subcontracts. Labor and materials shall be itemized in the manner prescribed in this Article 7. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over 500.00 be approved without such itemization.

B. Add Subparagraph 7.2.3.1 as follows:

1. 7.2.2.1 The itemization referred to in Article 7.2.2 shall include at least the following: (1) Quantities of Material (2) Unit cost of Materials (3)Total hours for each classification of labor (4) Hourly rates applicable for all labor classifications (5) Social Security, Old Age and Unemployment Insurance, (6) Contractor's allowance for overhead and profit (7) Total cost to Owner (8)Number of additional calendar days (if any) required to complete the change order

1.12 ARTICLE 7 7.3 CONSTRUCTION CHANGE DIRECTIVES DELETE SUBPARAGRAPH 7.3.3 IN ITS ENTIRETY AND SUBSTITUTE THE FOLLOWING AS NEW SUBPARAGRAPH 7.3.3

A. 7.3.3 For extra work performed, the allowance for overhead and profit combined, included in the total cost to Owner, shall not exceed the following schedule:

1. To the Contractor for the work which he performs with his own forces, not to exceed ten-percent (10) of his net additional cost for material and fifteen-percent (15) of his net additional cost for labor and equipment.
2. To a Sub-Contractor for work which he performs with his own forces, not to exceed ten-percent (10) of his net additional cost for material and fifteen-percent (15) of his net additional cost for labor and equipment.
3. To the Contractor for work performed by his Sub-Contractors, not to exceed seven-one-half percent (7) of the amount due the Sub-Contractor.
4. If the net cost of a change results in a credit from the Contractor or Sub-Contractor, the credit given shall be the net cost without overhead or profit.
5. The "net cost" used herein shall mean the difference between all proper cost additions and deductions related to each item of work. The cost as used herein shall include all items of labor and material. Among items to be considered as overhead are time keepers, clerks, watchmen, small tools, incidental job burdens, and general office expenses.

B. The cost or credit to the Owner resulting from a change in the work shall be determined by mutual acceptance of a lump sum or unit prices completely itemized indicating separately:

1. Quantities of materials
2. Unit cost of materials
3. Total hours for each classification of labor
4. Hourly rates applicable for all labor classifications
5. Social Security, Old Age and Unemployment Insurance
6. Contractor's overhead and profit
7. Number of calendar days (if any) required to complete the additional work.

C. Revise Subparagraph 7.3.6 as follows:

1. In lines (6) and (7) at the end of the first sentence, delete the words "a reasonable allowance for overhead and profit" and substitute "an allowance for combined overhead and profit in accordance with subparagraph 7.3.3.

1.13 ARTICLE 9 - PAYMENTS AND COMPLETION 9.2 SCHEDULE OF VALUES DELETE AND SUBSTITUTE THE FOLLOWING

A. 9.2. Prior to the start of construction the Contractor shall submit a Schedule of Values listing all building components at a level of detail satisfactory to the Architect. All sub-contractors shall have separate listings for their sub-contractors and separate listings for each component at a level of detail satisfactory to the Architect. All listed components shall have separate categories for labor, material and equipment. Where a project is phased the Schedule of Values shall be detailed by phase. Where a project has separate distinct building areas the Architect may require that the Schedule of values be detailed by area. This proposed Schedule of Values shall be accompanied by a letter signed by an officer of the Contractor and certifying under penalty of fraud that the distribution of costs are true and accurate to the best of his or her knowledge and belief. A similar certification shall be submitted by each subcontractor covering his portion of the Schedule of Values. The Architect shall approve this Schedule of Values before any Application for Payment is processed.

1.14 ARTICLE 9 9.6 PROGRESS PAYMENTS ADD SUBPARAGRAPHS AS FOLLOWS

A. 9.6.1.1 Until Substantial Completion, the Owner shall pay ninety-five (95) percent of the amount certified by the Architect, holding the remaining five (5) percent as retainage. At Substantial Completion and with the full knowledge and consent of the Contractor's Surety, retainage shall be reduced to an amount sufficient, in the Architect's opinion, to complete the Work should the Contractor default.

B. 9.6.1.2 Provided an Application for Payment is received by the Architect not later than the last day of the month, the Owner shall make payment to the Contractor not later than the last day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment shall be made by the Owner not later than thirty consecutive calendar days after the Architect receives the Application for Payment.

C. 9.6.1.3 Tennessee law makes provisions for the Owner to pay interest on the retainage withheld during construction. If requested by the Contractor at the start of construction the Owner will establish a separate interest bearing account at a financial institution agreeable to both parties and not co-mingled with any other funds. Each month the Owner will deposit the retainage amount as a lump sum in said account on the same day that payment is made to the Contractor. For information purposes, the Contractor shall be responsible for providing the Owner with a detailed cumulative monthly accounting as a separate attachment to each monthly pay request certifying the amounts of interest that will be distributed to him and each of his sub-contractors and material suppliers based on the prior month’s retainage withheld. The interest payment along with retainage withheld will be made upon Substantial Completion. Should the Contractor fail to give notice or provide the Owner with this detailed monthly accounting then all interest expenses shall be the responsibility of the Contractor with no obligation on the part of the Owner.

1.15 ARTICLE 9 9. MODIFY SUBPARAGRAPH 9. .1 AS FOLLOWS

A. Add at end: To be considered substantially complete the only allowed deficiencies shall be minor in nature and shall not be such as to inconvenience the normal use and operation of the project.

1.16 ARTICLE 11 - INSURANCE AND BONDS 11.1 CONTRACTOR S LIABILITY INSURANCE ADD SUBPARAGRAPH 11.1.3.1 AS FOLLOWS

A. 11.1.3.1 All insurance shall be purchased from companies authorized to do business in Tennessee and policies shall be acceptable to the Owner, Architect and Contractor. Before starting work, certificates of insurance shall be filed with Architect as well as Owner.

1.17 ARTICLE 11 11.1 ADD SUBPARAGRAPH 11.1.4 AS FOLLOWS

A. 11.1.4 The Contractor shall provide insurance written for no less than the following coverages and limits:
   1. Worker’s Compensation & Employer’s Liability shall be in accordance with the regulations of the State in which the contract is performed, but no less than the following:
      a. Coverages “A” and “B”

2. Commercial General Liability
    a. Each Occurrence Bodily Injury
    b. and Property Damage Liability 1,000,000
    c. Aggregate 1,000,000
    d. Include the following:
        1) Completed Operations
            (a) Broad Form Comprehensive General Liability Endorsement - Personal Injury, Broad Form Property Damage and Contractual Liability
            (b) Coverages for Underground Hazard, Collapse and Explosion
3. Vehicular Insurance - include any auto, non-owned autos and hired autos
    a. Auto Liability Combined Single Limit
    b. Bodily Injury and Property Damage 1,000,000
    c. Hired an Non-Owned Autos 1,000,000
4. Excess Liability - Umbrella
    a. Each Occurrence 5,000,000
    b. Aggregate 5,000,000
5. Hospitalization: All full time salaried employees of the Contractor or subcontractor who have worked full time for at least six months and are working on this project either in the office or in the field shall have hospitalization insurance. The contractor shall submit evidence of coverage prior to starting work on the project.

1.1 ARTICLE 11 11.2 OWNER S LIABILITY INSURANCE DELETE TEXT OF PARAGRAPH 11.2.1 AS WRITTEN AND SUBSTITUTE THE FOLLOWING AS NEW PARAGRAPH 11.2.1

A. 11.2.1 The Contractor (not the Owner) shall purchase and maintain until Substantial Completion Owners and Contractors Protective Liability (O.C.P). Insurance on behalf of the Owner and Contractor A.T.I.M.A., in the amount of 1,500,000.

1.19 ARTICLE 11 11.3 PROPERTY INSURANCE DELETE PARAGRAPH 11.3 AND SUBSTITUTE THE FOLLOWING

A. 11.3 Property Insurance: The Owner (not the Contractor) shall purchase and maintain until substantial Completion, Builder's Risk Insurance (not All Risk Insurance) in the amount of the initial Contract Sum plus any amounts added by Change Order. The insurance shall list and include as named insured the Owner, the Contractor, and all subcontractors. The Builder's Risk Insurance shall also provide coverage for portions of the Work in transit and for temporary storage of portions of the Work to the value approved by the Engineer in the Certificate for Payment. Coverage is to be written on a special perils form including theft of building materials.

1.20 ARTICLE 13 - MISCELLAENOUS PROVISIONS ADD PARAGRAPHS 13. THROUGH 13.16 AS FOLLOWS

A. 13.8 COOPERATION Contractor and Sub-Contractors shall coordinate their work with adjacent work and cooperate with other trades so as to facilitate general progress of work. Each trade shall afford other trades every reasonable opportunity for installation of their work and for storage of their materials.

B. 13.9 MANUFACTURER’S DIRECTIONS Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, conditioned in accordance with manufacturer’s printed directions, unless specified to contrary.

C. 13.10 TEMPORAR EASEMENTS Obtain consent of adjoining property Owners as needed for temporary easements or any other manner of physical encroachment.

D. 13.11 PROTECTION OF WORK
    1. Provide constant protection against rain, wind, storm, freezing or heat so as to maintain work, materials, apparatus, fixtures free from injury or damage.
    2. Protect excavation, trenches, building, from damage from rain water, spring water, ground water, backing up drains or sewers, other water. Provide pumps, equipment, enclosures to provide this protection.
    3. Remove work damaged by failure to provide protection; replace with new work without extra cost to Owner.

E. 13.12 UTILITIES
   1. When encountered in work or as indicated, protect existing active sewer, water, gas, electric, other utility services and structures. Where required for proper execution of work, relocate them as directed. If existing active services are not indicated but are encountered, require protection or relocation, request Architect in writing for determination, decisions. Do not proceed until written instructions are obtained.
   2. When encountered in work, whether or not indicated to be removed, cap or plug or otherwise discontinue existing inactive sewer, water, gas, electric, other utility services, structures, which interfere with work execution.
   3. Notify agencies or service utility companies having jurisdiction over specified utilities. Protect, relocate, remove, or discontinue services as per their requirements.

F. 13.13 LABOR REQUIREMENTS Contractor and all Sub-Contractors employed on the work shall be required to conform to applicable labor laws of the state and various acts amendatory and supplementary thereto; and shall comply with all other laws and ordinances and legal requirements applicable thereto.

G. 13.14 OMNIBUS RECONCILIATION ACT The Contractor shall execute an amendment agreement to the contract relating to the access of certain records of the contracting party as required by Omnibus Reconciliation Act of 1980.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.

B. Electronic document submittal service.

C. Progress meetings.

D. Submittals for review, information, and project closeout.

E. Number of copies of submittals.

F. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.

1.03 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

B. Make the following types of submittals to Architect:
   1. Requests for Interpretation (RFI).
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Design data.
   6. Manufacturer's instructions and field reports.
   7. Applications for payment and change order requests.
   8. Progress schedules.
   9. Coordination drawings.
   10. Correction Punch List and Final Correction Punch List for Substantial Completion.
   11. Closeout submittals.

1.04 PROJECT COORDINATION

A. Project Coordinator: Construction Manager.

B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for site access, traffic, and parking facilities.

C. During construction, coordinate use of site and facilities through the Project Coordinator.

D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.

F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

G. Make the following types of submittals to Architect through the Project Coordinator:
   1. Requests for interpretation.
   2. Shop drawings, product data, and samples.
   3. Test and inspection reports.
   4. Design data.
   5. Manufacturer's instructions and field reports.
   6. Applications for payment and change order requests.
   7. Progress schedules.
   8. Coordination drawings.

9. Correction Punch List and Final Correction Punch List for Substantial Completion.
10. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
   1. Besides submittals for review, information, and closeout, this procedure applies to requests for information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
   2. Contractor and Architect are required to use this service.
   3. It is Contractor's responsibility to submit documents in PDF format.
   4. Subcontractors, suppliers, and Architect's consultants will be permitted to use the service at no extra charge.
   5. Users of the service need an email address, Internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
   6. Paper document transmittals will not be reviewed; emailed PDF documents will not be reviewed.
   7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Submittal Service: The selected service is:
   1. SharePoint as maintained by DH&W Architects.

3.02 PROGRESS MEETINGS

A. Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Contractor's Superintendent.
   5. Major Subcontractors.

C. Agenda:
   1. Review minutes of previous meetings.
   2. Review of Work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Maintenance of progress schedule.
   7. Corrective measures to regain projected schedules.
   8. Planned progress during succeeding work period.
   9. Maintenance of quality and work standards.
   10. Effect of proposed changes on progress schedule and coordination.
   11. Other business relating to Work.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed only for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.04 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

3.05 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.06 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

C. Color Samples: Two (2) copies of all color samples or chartgs are to be provided in hard copy and digital.

3.07 SUBMITTAL PROCEDURES

A. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
   2. Generic, non-project specific information submitted as shop drawings do not meet the requirements for shop drawings.

B. Transmit each submittal with a copy of approved submittal form.

C. Transmit each submittal with approved form.

D. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

E. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

F. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

G. Schedule submittals to expedite the Project, and coordinate submission of related items.

H. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

I. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

J. Provide space for Contractor and Architect review stamps.

K. When revised for resubmission, identify all changes made since previous submission.

L. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

M. Submittals not requested will not be recognized or processed.

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Controls: Barriers, enclosures, and fencing.

B. Security requirements.

C. Waste removal facilities and services.

1.02 RELATED REQUIREMENTS

A. Section 01 35 53 - Security Procedures.

1.03 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.04 FENCING

A. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.05 SECURITY - SEE SECTION 01 35 53

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.06 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.07 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Transportation, handling, storage and protection.

B. Product option requirements.

C. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

1.03 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. Where all other criteria are met, Contractor shall give preference to products that:
   1. If used on interior, have lower emissions, as defined in Section 01 61 16.
   2. If wet-applied, have lower VOC content, as defined in Section 01 61 16.
   3. Have a published GreenScreen Chemical Hazard Analysis.

2.02 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.03 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

B. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Agrees to provide the same warranty for the substitution as for the specified product.

3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.

3.02 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

H. Comply with manufacturer's warranty conditions, if any.

I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

J. Prevent contact with material that may cause corrosion, discoloration, or staining.

K. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

L. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 07 84 00 - Firestopping.

1.02 QUALIFICATIONS

A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

1.03 PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 LAYING OUT THE WOR

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

F. Utilize recognized engineering survey practices.

G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations; and _____.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations, and _____.

H. Periodically verify layouts by same means.

I. Maintain a complete and accurate log of control and survey work as it progresses.

3.04 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.

I. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire

unit.

2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WOR

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.0 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.09 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

E. Clean filters of operating equipment.

F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and _____.

G. Clean site; sweep paved areas, rake clean landscaped surfaces.

H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.10 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of

Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

END OF SECTION

SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition .

B. Selective demolition of built site elements.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

C. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

D. Section 31 23 23 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction Current Edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2022, with Errata (2021).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Site Plan: Showing:
   1. Areas for temporary construction and field offices.

C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
   2. Identify demolition firm and submit qualifications.
   3. Include a summary of safety procedures.

D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.05 QUALITY ASSURANCE

PART 2 PRODUCTS

2.01 MATERIALS

A. Fill Material: As specified in Section 31 23 23 - Fill.

PART 3 EXECUTION

3.01 SCOPE

A. Remove the entire building designated _____.

B. Remove paving and curbs as required to accomplish new work.

C. Within area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.

D. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 22 00.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.

2. Use of explosives is not permitted.
3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
4. Provide, erect, and maintain temporary barriers and security devices.
5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
6. Do not close or obstruct roadways or sidewalks without permit.
7. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
8. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Protect existing structures and other elements that are not to be removed.
1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

D. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

E. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.04 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 05 16
UNDERSLAB VAPOR BARRIER - STEGO

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs 2018a.

B. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs 2017 (Reapproved 2023).

PART 2 PRODUCTS

2.01 MATERIALS

A. Underslab Vapor Barrier:
   1. Water Vapor Permeance: Not more than 0.010 perms, maximum.
   2. Thickness: 15 mils.
   3. Basis of Design:
      a. Stego Industries LLC; Stego Wrap Vapor Barrier (15-mil): www.stegoindustries.com/#sle.

B. Accessory Products: Vapor barrier manufacturer's recommended tape, adhesive, mastic, etc., for sealing seams and penetrations in vapor barrier.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install vapor barrier in accordance with manufacturer's instructions and ASTM E1643.

B. Install vapor barrier under interior slabs on grade; lap sheet over footings and seal to foundation walls.

C. Lap joints minimum 6 inches.

D. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.

E. No penetration of vapor barrier is allowed except for reinforcing steel and permanent utilities.

F. Repair damaged vapor retarder before covering with other materials.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.

B. Floors and slabs on grade.

C. Concrete reinforcement.

D. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Products and installation for sealants for saw cut joints and isolation joints in slabs.

1.03 REFERENCE STANDARDS

A. ACI 211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide 2022.

B. ACI 301 - Specifications for Concrete Construction 2020.

C. ACI 302.1R - Guide to Concrete Floor and Slab Construction 2015.

D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete 2000 (Reapproved 2009).

E. ACI 308R - Guide to External Curing of Concrete 2016.

F. ACI 318 - Building Code Requirements for Structural Concrete 2019 (Reapproved 2022).

G. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2022.

H. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete 2022.

I. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens 2021.

J. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2023.

K. ASTM C150/C150M - Standard Specification for Portland Cement 2022.

L. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete 2020.

M. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method 2016.

N. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete 2010a (Reapproved 2016).

O. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types) 2018.

P. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs 2018a.

Q. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs 2017 (Reapproved 2023).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Mix Design: Submit proposed concrete mix design.
   1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

PART 2 PRODUCTS

2.01 FORMWOR

A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
   2. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.02 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
   1. Type: Deformed billet-steel bars.
   2. Finish: Unfinished, unless otherwise indicated.

B. Steel Welded Wire Reinforcement (WWR): Galvanized, plain type, ASTM A1064/A1064M.
   1. WWR Style: As indicated on drawings.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type. Provide _____ manufactured by _____ .

B. Fine and Coarse Aggregates: ASTM C 33.

C. Water: Clean and not detrimental to concrete.

2.04 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.

2.05 ACCESSORY MATERIALS

A. Underslab Vapor Retarder: Multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
   1. Installation: Comply with ASTM E1643.
   2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations in vapor retarder.
   3. Manufacturers:
      a. Stego Industries, LLC; ____: www.stegoindustries.com/#sle.

2.06 BONDING AND JOINTING PRODUCTS

A. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
   1. Material: ASTM D1751, cellulose fiber.

2.07 CURING MATERIALS

A. Curing and Sealing Compound, Low Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.

B. Moisture-Retaining Sheet: ASTM C171.
   1. Polyethylene film, clear, minimum nominal thickness of 0.0040 inch.

2.0 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

B. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

C. Normal Weight Concrete:

1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch.
2. Water-Cement Ratio: Maximum 40 percent by weight.
3. Total Air Content: 4 percent, determined in accordance with ASTM C173/C173M.
4. Maximum Slump: 3 inches.
5. Maximum Aggregate Size: 5/8 inch.

2.09 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

C. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

D. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Notify Architect not less than 24 hours prior to commencement of placement operations.

D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

E. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.

F. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 SLAB JOINTING

A. Locate joints as indicated on drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
   1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.

D. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Maximum Variation of Surface Flatness:
   1. Exposed Concrete Floors: 1/4 inch in 10 feet.
   2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
   3. Under Carpeting: 1/4 inch in 10 feet.

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

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

3.07 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

C. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
   1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
   2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
   3. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.
   4. Exterior Concrete Walking Surfaces: Medium Broom Finish

3.0 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Surfaces Not in Contact with Forms:
   1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
   2. Final Curing: Begin after initial curing but before surface is dry.

3.09 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

3.10 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.11 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

SECTION 03 30 51

CONCRETE CURING AND FINISHES

PART 1 - GENERAL

1.01 SCOPE

A. Provide all materials, equipment, incidentals and labor for patching, finishing, curing and protecting from flowing water and mechanical injury the concrete specified.

1.02 RELATED WOR

A. Cast-In-Place Concrete - Section 033000

1.03 REFERENCED STANDARDS FOR QUALITY ASSURANCE

A. All work shall be in accordance with the applicable sections and references therein, of the Specifications and Standards of the following:
   1. American Concrete Institute (ACI)
   2. American Society For Testing Materials (ASTM)

B. In conflicts between this specification, industry standards and/or local building codes, the more stringent requirements shall govern.

1.04 SUBMITTALS

A. Product data on curing compounds.

PART 2 - PRODUCTS

2.01 WATER CURING

A. Heavy burlap weighing at least 10 ounces per square yard.

B. Clean river sand, ASTM C-33.

C. Sawdust

2.02 MEMBRANE CURING

A. Waterproof sheet material conforming to ASTM C-171, Standard Specification for Sheet Materials For Curing Concrete.

2.03 LIQUID CURING

A.	"Kure-N-Seal"	Sonneborn
B.	"Clear Bond"	Guardian Chemical
C.	"Clear Seal"	(A.C. Horn) Grace Construction
D.	"Eucocure" or Kurez E-100"	Euclid Chemical Co.
E.	"Clear Seal"	Lambert Corporation
F.	"Chem-Seal"	Hillyard Chemical Co.
G.	"Masterseal"	Master Builders

PART 3 - EXECUTION

3.01 PATCHING OF CONCRETE

A. Immediately after removing forms, all surfaces shall be inspected for defective work. Any concrete which is poorly formed, out of alignment or level, or shows a defective service, shall at the election of the Engineer, be removed from the job by the Contractor at the Contractor's expense. The engineer may grant permission to patch or repair defective work; but such permission shall not be considered a waiver of the Engineer's right to require complete removal of the defective work, if in the Engineer's opinion, the patching or repairs do not satisfactorily

restore the quality and appearance of the items in question.

B. Where permitted by the Engineer, all honeycombs, voids, stone pockets, tie holes and other defective areas shall be patched as soon as practicable. Patching shall be done in accordance with the following procedure.
   1. Defective areas shall be chipped away to a depth of at least 1" with the edges cut perpendicular to the surface.
   2. The area to be patched and space at least 6" wide entirely surrounding it shall be wetted to prevent absorption of water from the patching mortar.
   3. A grout of equal parts of Portland Cement and sand, with sufficient water to produce a brushing consistency, shall be well brushed into the surface followed immediately by the patching mortar.
   4. The patch shall be made of the same materials and of approximately the same proportion as used for the concrete except that the coarse aggregate shall be omitted. The mortar shall not be richer than 1 part cement to 3 parts sand. The proportions of white and gray cements shall be determined by making a trial patch. The amount of mixing water used shall be the minimum consistent with the requirements of handling and placing. The mortar shall be retempered without the addition of water by allowing it to stand for one hour, during which time it shall be mixed with a trowel to prevent setting.

   5. The mortar shall be thoroughly compacted into place and screened off so as to leave the patch slightly higher than the surrounding surface. The patch shall then be left undisturbed for one to two hours to permit initial shrinkage before being finally finished.
   6. The patched areas shall be finished to match the adjoining surface. On exposed surfaces, where unlined forms have been used, the final finish shall be obtained by striking off the surface with a straight edge spanning the patch and held parallel to the form marks.
   7. Curing of the patched areas shall be in accordance with these specifications.
   8. Contractor's Option:
      In lieu of mixing grout for patching, the Contractor may provide a PVC bonding agent recommended by the manufacturer for the use intended. Approved products and manufacturers:
      a. "Dara Weld C" by W.R. Grace
      b. "Weldcrete" by E.A. Larson
      c. "Vinyl Hesive" by Nox-Crete

3.02 CONCRETE FLOORS

(All floors, tilt-up panels and slabs on grade)

A. The surface of all concrete shall be worked with a wood float or by machine in a manner which will compact the concrete and produce a surface free of depressions or inequalities of any kind. Test for grade (or level) and correct as necessary by removing excess or adding and compacting additional concrete. After the concrete has hardened sufficiently to prevent fine material from working to the top (when the sheen or shiny film of water on the surface has disappeared), the surface shall be finished in accordance with the applicable following paragraphs, but excessive working shall be avoided. Final finishing shall not be started until all surface water has disappeared. The drying of the surface moisture must proceed naturally and must not be hastened by sacking or dusting-on of dry sand and/or cement.

B. At the end of the job, or just prior to application of permanent floor coverings, slabs shall be thoroughly cleaned and left in suitable condition for installation of permanent covering.

C. Tolerances
   1. While still plastic, concrete surfaces shall be testing for surface irregularities with a 10' straightedge and the necessary corrections made. Allowable irregularity is 1/8" in 10', non-accumulating.
   2. Floor slab surfaces shall slope uniformly to floor drains as shown on the drawings.

D. Monolithic finish for Slabs

All interior floor slabs shall have a steel trowel finish (except for floor slabs to receive ceramic tile). The steel troweling shall produce a smooth finished surface free of pin holes and other imperfections.

E. Depressed slabs shall have a rough screed finish at levels indicated on the drawings.

F. Broom finish shall be used for all interior stairs unless shown otherwise. Slabs and landings shall be troweled to a smooth, even surface and receive a light broom finish.

3.03 FINISHES ON FORMED CONCRETE SURFACES

A. Common finish shall be confined to concrete surfaces which will be covered by other construction and which will not be visible. This finish shall be produced by filling smoothly all tie holes, honeycomb and other depressions, knocking off and evening-up burrs and form marks.

3.04 CURING AND SEALING COMPOUND APPLICATION

A. Curing and sealing compound shall be applied as soon as the concrete has set sufficiently so as not to be marred by the application. Preparation of surfaces, quantities used, application procedures, and installation precautions shall be followed in strict compliance with the manufacturer's stated recommendations and directions as set forth on the package.

B. Final curing shall continue for 7-days minimum.

END OF SECTION

SECTION 03 31 00

CONCRETE ACCESSORIES

PART 1 - GENERAL

1.01 SUBMITTALS

Submit manufacturer's product data for all specified materials intended for use.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Filler strips for expansion joints: Non-extruded type cane fiber board impregnated with bituminous material, score for the edge, 3/4 of the way through, for easy removal of top of filler strip material, after concrete pour, or foam plastic with extruded high impact polystyrene removable caps.

B. Vapor retarder: 15-mil thickness polyethylene film.

C. Gravel base: #4 graded aggregate.

D. Joint filler: ASTM D1850.

E. Evaporation Retarder:
   1. Acceptable Products:
      a. Eucobar by Euclid Chemical Company
      b. Confilm by Master Builders
   2. Characteristics:
      a. Compatible with curing agents.
      b. Designed for use on liquid concrete, to prevent shrinkage cracking.
      c. Spray application.
      d. Capable of maintaining moisture content of concrete surface as necessary to cure properly without plastic shrinkage.

F. Concrete sealers:
   1. Acceptable products:
      a. Rez-Seal by Euclid Chemical Company
      b. Equal products by Scofield or Pro-Crete will be acceptable.
   2. Characteristics:
      a. Combination Sealer and Curing Compound
      b. Acrylic Copolymer Composition
      c. Clear color with glossy finish, non-yellowing.

PART 3 - EXECUTION

3.01 ACCESSORIES

Install concrete accessories at locations indicated in accord with manufacturer's recommendations, and as specified herein.

3.02 GRAVEL BASE

Install under concrete slabs, unless noted otherwise, and as indicated on the

drawings.

3.03 VAPOR RETARDER

A. Install vapor retarder over compacted, clean subgrade material, free of debris and protrusions.

B. Lay vapor retarder over interior building area to receive concrete slab; lap edges 6. Apply membrane in maximum widths. Lay membrane with seams perpendicular to and lapped in direction of pour. Turn edges of membrane up to within of top of slab at intersection with vertical surfaces.

C. Seal openings in vapor retarder around pipes and other protrusions with mastic. Fold at corners for form envelope.

D. Protect vapor retarder from damage until concrete slab is in place. Repair damaged membrane with vapor retarder patch, 6 inches larger on all sides than the damaged area.

3.04 JOINTS

A. Expansion joints:
   1. Install filler strips from bottom of slab to within □ □ of finished floor. Fill top □ □ full and level with joint filler.
   2. Locate against walls at perimeter of floors and around other protrusions through slabs.

B. Control joints:
   1. Locate control joints in accord with industry standards and as shown on drawings.
   2. Joints shall be formed, sawn, or tooled. Joints subject to traffic (wheel or foot) shall be tooled.
   3. Minimum depth of joint shall be 1/4 the depth of the slab.
   4. Cut control joints as soon as the slab will support the weight of the saw and operator without disturbing the final finish.

3.05 SEALERS

Apply sealer to all concrete floors not receiving an applied finish. Comply with manufacturers recommended application specifications.

END OF SECTION

SECTION 04 20 00
UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete Block.

B. Mortar and Grout.

C. Reinforcement and Anchorage.

D. Flashings.

E. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2022, with Errata.

B. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.

C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire 2019.

D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2023.

E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete 2022.

F. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units 2022.

G. ASTM C270 - Standard Specification for Mortar for Unit Masonry 2019a, with Editorial Revision.

H. ASTM C476 - Standard Specification for Grout for Masonry 2023.

I. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing 2017.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Samples: Submit 2 samples of decorative block units to illustrate color, texture, and extremes of color range.

D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

E. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.

F. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

1.05 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of the contract documents.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depths as indicated on drawings for specific locations.
   2. Special Shapes: Provide non-standard blocks configured for corners.
   3. Load-Bearing Units: ASTM C90, normal weight.
      a. Hollow block, as indicated.
      b. Exposed Faces: Manufacturer's standard color and texture where indicated.
         1) Standard 'Smooth' Face CMU
         2) Split Face CMU

2.02 MORTAR AND GROUT MATERIALS

2.03 REINFORCEMENT AND ANCHORAGE

A. Single Wythe Joint Reinforcement: Truss or ladder type; ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M, Class 3; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.

2.04 FLASHINGS

A. Stainless Steel Flashing: ASTM A666, Type 304, soft temper; 26 gage, 0.0187 inch thick; finish 2B to 2D.

2.05 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
   1. Manufacturers:
      a. Blok-Lok Limited; _____: www.blok-lok.com/#sle.
      b. Hohmann & Barnard, Inc; _____: www.h-b.com/#sle.
      c. WIRE-BOND: www.wirebond.com/#sle.

B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; ____ inch wide by maximum lengths available.
   1. Manufacturers:
      a. Hohmann & Barnard, Inc; _____: www.h-b.com/#sle.
      b. WIRE-BOND: www.wirebond.com/#sle.

C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.06 MORTAR AND GROUT MIXES

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
   1. Masonry below grade and in contact with earth: Type S.
   2. Exterior, loadbearing masonry: Type N.
   3. Exterior, non-loadbearing masonry: Type N.
   4. Interior, loadbearing masonry: Type N.

B. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

C. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.

D. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches.
   3. Mortar Joints: Concave.

3.05 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

D. Remove excess mortar and mortar smears as work progresses.

E. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.

F. Interlock intersections and external corners.

G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

3.06 REINFORCEMENT AND ANCHORAGE - GENERAL

3.07 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY

A. Install horizontal joint reinforcement 8 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches.

3.0 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up at least 8 inches, minimum, to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Extend metal flashings through exterior face of masonry and turn down to form drip. Install joint sealer below drip edge to prevent moisture migration under flashing.

3.09 LINTELS

A. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.

3.10 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

3.11 TOLERANCES

A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

C. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

E. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.

3.12 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

3.13 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 05 52 13
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall mounted handrails.

B. Stair railings and guardrails.

C. Balcony railings and guardrails.

1.02 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

B. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.

C. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings 2021.

D. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings 2000 (Reapproved 2006).

E. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.

B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935

C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935

D. Allow for expansion and contraction of members and building movement without damage to connections or members.

E. Dimensions: See drawings for configurations and heights.
   1. Top Rails and Wall Rails: 1-1/2 inches diameter, round.
   2. Intermediate Rails: 1-1/2 inches diameter, round.
   3. Posts: 1-1/2 inches diameter, round.
   4. Balusters: 1/2 inch round solid bar.

F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
   1. For anchorage to concrete, core drill concrete and set posts in non-shrink epoxy groutnon shrin.

2.02 STEEL RAILING SYSTEM

A. Steel Tube: ASTM A500/A500M Grade B cold-formed structural tubing.

B. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

C. Exposed Fasteners: No exposed bolts or screws.

D. Galvanizing: In accordance with requirements of ASTM A123/A123M.
   1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic.

2.03 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Welded Joints:
   1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
   2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
   3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Anchor railings securely to structure.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 07 14 00
FLUID-APPLIED WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cold-applied rubberized asphalt waterproofing.

B. Water-based asphalt emulsion waterproofing.

1.02 RELATED REQUIREMENTS

A. Section 04 20 00 - Unit Masonry: Masonry joints prepared to receive flashings.

1.03 REFERENCE STANDARDS

A. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2022a, with Editorial Revision (2023).

B. NRCA (WM) - The NRCA Waterproofing Manual 2021.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data for membrane, surface conditioner, flexible flashings, joint cover sheet, and joint and crack sealants.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.

E. Installer's qualification statement.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until cured.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Cold-Applied Rubberized Asphalt Waterproofing:

B. Water-Based Asphalt Emulsion Waterproofing:
   1. Carlisle Coatings & Waterproofing, Inc; Barricoat: www.carlisleccw.com/#sle.
   2. Mar-flex Waterproofing & Building Products; _____: www.mar-flex.com/#sle.
   3. Tremco Commercial Sealants & Waterproofing; TREMproof 260: www.tremcosealants.com/#sle.
   4. W.R. Meadows, Inc; MEL-ROL LM: www.wrmeadows.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FLUID-APPLIED WATERPROOFING APPLICATIONS

A. Cold-Applied Rubberized Asphalt Waterproofing:
   1. Cover with 2" Rigid Insulation.

B. Water-Based Asphalt Emulsion Waterproofing:
   1. Location: below slab as shown.
   2. Cover with 2" rigid insulation.

2.03 FLUID-APPLIED WATERPROOFING MATERIALS

A. Cold-Applied Rubberized Asphalt Waterproofing: Rubberized asphaltic compound, suitable for installation on concrete and concrete masonry.
   1. Cured Thickness: 60 mil, 0.060 inch, minimum.
   2. Water Vapor Permeance: 1 perm, maximum, when tested in accordance with ASTM E96/E96M.

B. Water-Based Asphalt Emulsion Waterproofing:
   1. Cured Thickness: 60 mil, 0.060 inch, minimum.
   2. Suitable for installation over concrete substrates.
   3. Water Vapor Permeability: 0.02 perm, maximum, measured in accordance with ASTM E96/E96M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify substrate surfaces are free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of waterproofing system.

B. Do not proceed with this work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Protect adjacent surfaces from damage not designated to receive waterproofing.

B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions; vacuum substrate clean.

C. Do not apply waterproofing to surfaces unacceptable to waterproofing manufacturer.

3.03 INSTALLATION

A. Install waterproofing to specified minimum thickness in accordance with manufacturers instructions and NRCA (WM) applicable requirements.

B. Seal membrane and flashings to adjoining surfaces.

3.04 INSTALLATION - DRAINAGE PANEL AND PROTECTION BOARD

A. Place protection board directly against drainage panel; butt joints, and scribe and cut boards around projections, penetrations, and interruptions.

END OF SECTION

SECTION 07 90 05
JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sealants and joint backing.

1.02 REFERENCE STANDARDS

A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

B. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016 (Reapproved 2023).

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with other sections referencing this section.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating sealant chemical characteristics.

C. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.06 MOC -UP

A. Provide mock-up of sealant joints in conjunction with window under provisions of Section 01 40 00.

B. Construct mock-up with specified sealant types and with other components noted.

C. Locate where directed.

D. Mock-up may remain as part of the Work.

1.07 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.0 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Silicone Sealants:
   1. Bostik Inc: www.bostik-us.com.
   2. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.
   3. Pecora Corporation; 890NST Ultra Low Modulus Architectural Silicone Sealant - Class 100: www.pecora.com.
   4. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
   5. Tremco Global Sealants; Product ____: www.tremcosealants.com.
   6. Sherwin-Williams Company; Silicone Rubber All Purpose Sealant: www.sherwin-williams.com.

B. Polyurethane Sealants:
   1. Bostik Inc: www.bostik-us.com.

2. Pecora Corporation; DynaTrol I- L General Purpose One Part Polyurethane Sealant: www.pecora.com.
3. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
4. Sherwin-Williams Company; Stampede-1/-T Polyurethane Sealant: www.sherwin-williams.com.

2.02 SEALANTS

A. Sealants and Primers - General: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.

B. Type A - General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25 minimum; Uses M, G, and A; single component.
   1. Color: To be selected by Architect from manufacturer's standard range.
   2. Applications: Use for:
      a. Control, expansion, and soft joints in masonry.
      b. Joints between concrete and other materials.
      c. Joints between metal frames and other materials.
      d. Other exterior joints for which no other sealant is indicated.

C. Type C - Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C920, Class 25, Uses T, I, M and A; single component.
   1. Color: Gray.
   2. Applications: Use for:
      a. Joints in sidewalks and vehicular paving.

2.03 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Backing: Round foam rod compatible with sealant; ASTM D1667 closed cell PVC; oversized 30 to 50 percent larger than joint width.

C. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Install bond breaker where joint backing is not used.

D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

E. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

F. Tool joints concave.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

3.05 PROTECTION

A. Protect sealants until cured.

END OF SECTION

SECTION 0 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Thermally insulated hollow metal doors with frames.

1.02 REFERENCE STANDARDS

A. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors 2022.

B. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2023.

C. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2020.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.

E. ASTM C1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2005.

F. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames 2017.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

E. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes installation requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door, an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
   2. Republic Doors; ____: www.republicdoor.com.
   3. Steelcraft: www.steelcraft.com.

2.02 DESIGN CRITERIA

A. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Type 1Exterior Doors: Thermally insulated.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 1 - Standard-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
   2. Core Material: Manufacturers standard core material/construction and in compliance with requirements.
   3. Door Thickness: 1-3/4 inch, nominal.
   4. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
   5. Insulating Value: U-value of 0.50, when tested in accordance with ASTM C1363.
   6. Weatherstripping: Integral, recessed into door edge or frame.

B. Type F ,Interior Doors, Non-Fire Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 1 - Standard-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
   2. Core Material: Manufacturers standard core material/construction and in compliance with requirements.
   3. Door Thickness: 1-3/4 inch, nominal.
   4. Door Face Sheets: Flush.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. General:
   1. Comply with the requirements of grade specified for corresponding door.
   2. Finish: Same as for door.
   3. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
   4. Frames in Masonry Walls: Size to suit masonry coursing with head member to fill opening without cutting masonry units.

C. Exterior Door Frames: Full profile/continuously welded type.
   1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
   2. Weatherstripping: Integral, recessed into door edge or frame.

D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.

2.05 ACCESSORIES

A. Louvers: Extruded aluminum with overlapping frame; finish same as door components; factory-installed. See Mechanical Drawings for sizes & locations

B. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.

C. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

D. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

2.06 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Coordinate frame anchor placement with wall construction.

C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

D. Coordinate installation of hardware.

3.04 TOLERANCES

A. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 0 33 23
OVERHEAD COILING DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior coiling doors.

B. Electric operators and control stations.

C. Wiring from electric circuit disconnect to operators and control stations.

1.02 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.

D. ASTM E2226 - Standard Practice for Application of Hose Stream 2015b (Reapproved 2019).

E. ITS (DIR) - Directory of Listed Products Current Edition.

F. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.

G. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts 2008 (Reaffirmed 2020).

H. NEMA MG 1 - Motors and Generators 2021.

I. UL (DIR) - Online Certifications Directory Current Edition.

J. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide general construction, electrical equipment, component connections and details, and _____.

C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.

D. Manufacturer's qualification statement.

E. Installer's qualification statement.

F. Specimen warranty.

1.04 QUALITY ASSURANCE

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

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years documented experience.

C. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose specified and indicated.

1.05 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 3 year, 500,000 cycles manufacturer warranty for roller shaft counterbalance assembly. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Overhead Coiling Metal Doors:
   1. Clopay Building Products; Model CERD20: www.clopaydoor.com/#sle.
   2. Cornell Iron Works, Inc; _____: www.cornelliron.com/#sle.
   3. Wayne-Dalton, a Division of Overhead Door Corporation; ____: www.wayne-dalton.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 COILING DOORS

A. Exterior Coiling Doors: Steel slat curtain.
   1. Capable of withstanding positive and negative wind loads of 20 psf without undue deflection or damage to components.
   2. Single Thickness Slats: Manufacturer's standard.
   3. Finish: Factory painted, Powdercoated with 5 year finish warranty color as selected.
   4. Guide, Angles: Galvanized steel.
   5. Hood Enclosure: Manufacturer's standard; primed steel.
   6. Electric operation.

2.03 MATERIALS AND COMPONENTS

A. Metal Curtain Construction: Interlocking slats.
   1. Curtain Bottom for Slat Curtains: Fitted with angles to provide reinforcement and positive contact in closed position.
   2. Weatherstripping for Exterior Doors: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of exterior doors.
   3. Steel Slats: Minimum thickness, 20 gauge, ___ inch; ASTM A653/A653M galvanized steel sheet.
      a. Galvanizing: Minimum G90 coating.

B. Guide Construction: Continuous, of profile to retain door in place with snap-on trim, mounting brackets of same metal.

C. Guides - Angle: ASTM A36/A36M metal angles, size as indicated.
   1. Hot-dip galvanized in compliance with ASTM A123/A123M.

D. Hood Enclosure and Trim: Internally reinforced to maintain rigidity and shape.

2.04 ELECTRIC OPERATION

A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
   1. Provide interlock switches on motor operated units.
   2. Provide tamperproof operation cycle counter.

B. Electric Operators:
   1. Mounting: Side mounted.
   2. Motor Enclosure:
      a. Exterior Coiling Doors: NEMA MG 1, Type 4; open drip proof.
   3. Motor Rating: 1/2 HP; continuous duty.
   4. Motor Voltage: 220/240V volts, single phase, 60 Hz.
   5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
   6. Controller Enclosure: NEMA 250, Type 4.
   7. Opening Speed: 12 inches per second.
   8. Brake: Manufacturer's standard type, activated by motor controller.
   9. Manual override in case of power failure.
   10. See Section 26 05 83 for electrical connections.

C. Control Station: Provide standard key-operated, 'Open-Close-Stop' momentary-contact control device for each operator complying with UL 325.

1. 24 volt circuit.
2. Surface mounted, at interior door jamb.
3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
    a. Primary Device: Provide electric sensing edge, wireless sensing, NEMA 1 photo eye sensors, or NEMA 4 photo eye sensors as required with momentary-contact control device.

D. Safety Edge: Located at bottom of coiling door, full width, electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object, hollow neoprene covered.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that adjacent construction is suitable for door installation.

B. Verify that electrical services have been installed and are accessible.

C. Verify that door opening is plumb, header is level, and dimensions are correct.

D. Notify Architect of any unacceptable conditions or varying dimensions.

E. Commencement of installation indicates acceptance of substrate and door opening conditions.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

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

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

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

E. Coordinate installation of electrical service with Section 26 05 83.

F. Complete wiring from disconnect to unit components.

G. Install enclosure and perimeter trim.

3.03 ADJUSTING

A. Adjust operating assemblies for smooth and noiseless operation.

3.04 CLEANING

A. Clean installed components.

B. Remove labels and visible markings.

END OF SECTION

SECTION 0 71 00
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for hollow metal doors.

B. Thresholds.

C. Weatherstripping, seals and door gaskets.

1.02 RELATED REQUIREMENTS

A. Section 08 11 13 - Hollow Metal Doors and Frames.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.

B. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; 2010; (ADA Standards for Accessible Design).

C. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.

D. BHMA A156.1 - Standard for Butts and Hinges 2021.

E. BHMA A156.2 - Bored and Preassembled Locks and Latches 2022.

F. BHMA A156.3 - Exit Devices 2020.

G. BHMA A156.4 - Door Controls - Closers 2019.

H. BHMA A156.5 - Cylinders and Input Devices for Locks 2020.

I. BHMA A156.6 - Standard for Architectural Door Trim 2021.

J. BHMA A156.21 - Thresholds 2019.

K. BHMA A156.22 - Standard for Gasketing 2021.

L. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames 2016.

M. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames 2004.

N. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware will be installed upon.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.

C. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. Hardware Supplier Qualifications: Company specializing in supplying the type of products specified in this section with at least three years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.0 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five year warranty for door closers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. See Drawings Sheet A600 for Hardware Manufacturers & Hardware Schedule
   1. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOOR HARDWARE - GENERAL

A. Provide hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.

B. Provide items of a single type of the same model by the same manufacturer.

C. Provide products that comply with the following:
   1. Applicable provisions of federal, state, and local codes.
   2. Accessibility: ADA Standards and ICC A117.1.
   3. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.

D. Finishes: Identified in schedule.

2.03 LOC S AND LATCHES

A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
   1. If no hardware set is indicated for a swinging door provide an office lockset.
   2. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
   3. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.

B. Lock Cylinders: Manufacturer’s standard tumbler type, six-pin standard core.
   1. Provide cams and/or tailpieces as required for locking devices required.

C. Keying: Grand master keyed.

D. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

2.04 HINGES

A. Hinges: Provide hinges on every swinging door.
   1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
   2. Provide ball-bearing hinges at all doors having closers.
   3. Provide hinges in the quantities indicated.
   4. Provide non-removable pins on exterior outswinging doors.

2.05 LOC S AND LATCHES

A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
   1. Hardware Sets indicate locking functions required for each door.
   2. If no hardware set is indicated for a swinging door provide an office lockset.
   3. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
   4. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.

B. Lock Cylinders: Manufacturer’s standard tumbler type, six-pin standard core.
   1. Provide cams and/or tailpieces as required for locking devices required.

C. Keying: Grand master keyed.

D. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

2.06 EXIT DEVICES

A. Locking Functions: Functions as defined in BHMA A156.3, and as follows:
   1. Entry/Exit, Always-Latched: Key outside locks and unlocks lever, no latch holdback (dogging).

2.07 STOPS AND HOLDERS

A. Stops: Complying with BHMA A156.8; provide a stop for every swinging door, unless otherwise indicated.
   1. Provide wall stops, unless otherwise indicated.
   2. If wall stops are not practical, due to configuration of room or furnishings, provide overhead stop.
   3. Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop unless specifically so stated.

2.0 GAS ETING AND THRESHOLDS

A. Gaskets: Complying with BHMA A156.22.
   1. On each exterior door, provide weatherstripping gaskets, unless otherwise indicated; top, sides, and meeting stiles of pairs.
      a. Where exterior door is also required to have fire or smoke rating, provide gaskets functioning as both smoke and weather seals.
   2. On each exterior door, provideautomatic door bottom & drip sweep, unless otherwise indicated.

B. Thresholds: Complying with BHMA A156.21.
   1. At each exterior door, provide a threshold unless otherwise indicated.
   2. Field cut threshold to frame for tight fit.

C. Fasteners At Exterior Locations: Non-corroding.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Use templates provided by hardware item manufacturer.

C. Do not install surface mounted items until finishes applied to substrate are complete.

D. Mounting heights for hardware from finished floor to center line of hardware item.
   1. For steel doors and frames: Comply with DHI (LOCS) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames".

E. Set exterior door thresholds with full-width bead of elastomeric sealant on each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.03 ADJUSTING

A. Adjust work under provisions of Section 01 70 00 - Execution and Closeout Requirements.

B. Adjust hardware for smooth operation.

C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.04 CLEANING

A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.05 PROTECTION

A. Protect finished Work under provisions of Section 01 70 00 - Execution and Closeout Requirements.

B. Do not permit adjacent work to damage hardware or finish.

3.06 SCHEDULE - SEE SHEET A600 FOR DOOR HARDWARE SCHEDULE

END OF SECTION

SECTION 09 90 00
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.

D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Floors, unless specifically so indicated.
   5. Glass.
   6. Concealed pipes, ducts, and conduits.

1.02 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.03 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency current edition.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications 2023.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials 2020.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   4. Manufacturer's installation instructions.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.

D. Manufacturer's Instructions: Indicate special surface preparation procedures.

E. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Paint and Coatings: 1 gallon of each color; store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include 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 reducing.

C. Paint Materials: Store 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.

1.07 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

B. Provide all paint and coating products from the same manufacturer to the greatest extent possible.

C. Paints:
1. Duron, Inc: www.duron.com/#sle.
2. General Paint, a Comex Group company: www.generalpaint.com.
3. Glidden Professional: www.gliddenprofessional.com.
4. Benjamin Moore & Co: www.benjaminmoore.com/#sle.
5. Parker Paint Mfg Co Inc., a Comex Group company: www.parkerpaint.com.
6. PPG Paints: www.ppgpaints.com/#sle.
7. Pratt & Lambert Paints: www.prattandlambert.com/#sle.
8. Sherwin-Williams Company: www.sherwin-williams.com/#sle.

D. Primer Sealers: Same manufacturer as top coats.

E. Block Fillers: Same manufacturer as top coats.

F. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
3. Supply each coating material in quantity required to complete entire project's work from a single production run.
4. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer

categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
      b. Architectural coatings VOC limits of State in which the project is located.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Colors: To be selected from manufacturer's full range of available colors.

2.03 PAINT SYSTEMS - EXTERIOR

A. Paint EC-OP - All Exterior Surfaces Indicated to be Painted (Except pre-finished metal panels and trim), Unless Otherwise Indicated: Including concrete, concrete masonry, cement board, and metals.
   1. Preparation as specified by manufacturer.
   2. Two top coats and one coat primer recommended by manufacturer.
   3. Primer On Concrete and Concrete Masonry: One heavy coat latex block filler (100 percent acrylic) squeegeed into pores.

B. Paint CE-OP-3L - Masonry/Concrete, Opaque, Latex, 3 Coat:
   1. One coat of block filler.
   2. Semi-gloss: Two coats of latex enamel; ____.

C. Paint ME-OP-3A - Ferrous Metals, Unprimed, Alkyd, 3 Coat:
   1. One coat of alkyd primer.
   2. Semi-gloss: Two coats of alkyd enamel; ____.

D. Paint MgE-OP-3A - Galvanized Metals, Alkyd, 3 Coat:
   1. One coat galvanize primer.
   2. Semi-gloss: Two coats of alkyd enamel; ____.

E. Paint MaE-OP-3A - Aluminum , Unprimed, Alkyd, 3 Coat:
   1. One coat etching primer.
   2. Semi-gloss: Two coats of alkyd enamel; ____.

2.04 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   2. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
   3. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

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

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

G. Aluminum Surfaces to be Painted: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.

H. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

I. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

J. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

K. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

L. Interior Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

M. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

N. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

B. Apply products in accordance with manufacturer's instructions.

C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

E. Apply each coat to uniform appearance.

F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

G. Sand wood surfaces lightly between coats to achieve required finish.

H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finished coatings until completion of project.

B. Touch-up damaged coatings after Substantial Completion.

END OF SECTION

SECTION 11 65 00
SPORT NETS AND RECREATIONAL EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sport nets and recreational equipment including the following:
   1. Indoor batting cage system.

1.02 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

1.03 DELIVERY, STORAGE, AND HANDLING

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

1.04 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Carron Net Co., Inc. , which is located at: P. O. Box 177 1623 - 17th St.; Two Rivers, WI 54241 ; Toll Free Tel: 800-558-7768 ; Tel: 920-793-2217; Fax: 920-793-2122 ; Email:request info (sales@carronnet.com); Web:www.carronnet.com

2.02 APPLICATIONS/SCOPE

A. Baseball Netting: Nylon, 1-3/4 inches (44 mm) mesh used for baseball barrier. Refer to drawings for size and shape.
   1. Nets shall be dead-hung.
   2. Installation Hardware:
      a. Cable: Cable assembly for suspending and drawing the nets as required per the drawings and as scheduled on the Court/Track Event Layout drawings. Including turnbuckles, 1/4 inch (6 mm) galvanized steel cable, cable clamps, and thimbles. Contractor to provide eye bolts/anchors of whatever type appropriate for wall type where cable assembly is to be installed. Attachment hardware to be determined by application.
      b. Hardware as detailed on drawings.
   3. Constructed of:
      a. #21 nylon, 1-3/4 inches (44 mm) mesh, knotted netting, color: Black (weather treated for outdoors). Cord tensile strength: 210 lbs.
   4. Color for Netting:
      a. Black.
   5. Edge Binding for Netting:
      a. Nets are edge bordered with 5/16 poly rope binding. (standard)

B. Indoor Batting Cage System: System included cable kit for suspension and top-quality cage net.
   1. Installation Hardware: Steel Cable and Hardware: Three 100 feet. (30480 mm) steel cables, 12 cable clamps, 6 thimbles, 3 turnbuckles, and 75 snaps. Wall eye bolts not included.
   2. Batting Cage Net, #21 nylon, 12 feet H by 12 feet W by 70 feet L (3.7 m by 3.7 m by 21 m), Black.

PART 3 EXECUTION

3.01 PREPARATION

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

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions, approved submittals an in proper relationship with adjacent construction. Examine and test for proper operation and performance. Adjust until satisfactory results are obtained.

3.03 PROTECTION

A. Protect installed products until completion of project.

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

END OF SECTION

SECTION 13 34 19
METAL BUILDING SYSTEMS

PART 2 PRODUCTS

1.01 MANUFACTURERS

A. Metal Buildings Systems:
   1. Ceco Building Systems; ____: www.cecobuildings.com/#sle.
   2. Nucor Building Systems; _____: www.nucorbuildingsystems.com/#sle.
   3. BIGBEE Steel Buildings, www.bigbee.com/.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

1.02 ASSEMBLIES

A. Single span rigid frame.

B. Primary Framing: Rigid frame of rafter beams and columns, canopy beams, and wind bracing.

C. Secondary Framing: Purlins, and other items detailed.

D. Wall System: Preformed metal panels of vertical profile, with sub-girt framing/anchorage assembly, and accessory components.

E. Roof System: Preformed metal panels oriented parallel to slope, with sub-girt framing/anchorage assembly, and accessory components.

F. Roof Slope: 1 1/2" inches in 12 inches.

1.03 PERFORMANCE REQUIREMENTS

A. Installed Thermal Resistance of Wall System: R-value of R19.

B. Installed Thermal Resistance of Roof System: R-value of R19.

C. Provide drainage to exterior for water entering or condensation occurring within wall or roof system.

D. Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of ____ degrees F.

1.04 MATERIALS - FRAMING

A. Structural Steel Members: ASTM A36/A36M.

B. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1; galvanized to ASTM A153/A153M.

C. Primer: SSPC-Paint 20 zinc rich.

D. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
   2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.

1.05 MATERIALS - WALLS AND ROOF

A. Steel Sheet: Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792/A792M, structural quality, Grade 50, Coating Class AZ50 (Grade 340, Coating Class AZM150), prepainted by the coil-coating process per ASTM A755/A755M

B. Metal Building Type, Factory Applied, Vapor-Barrier Insulation Facings: Water vapor permeance no greater than 0.10 perm when tested in accordance with ASTM E96/E96M; flame spread index of 25 or less, and smoke developed index of 40 or less when tested in accordance with ASTM E84.

C. Fasteners: Manufacturer's standard type, galvanized to comply with requirements of ASTM A153/A153M, finish to match adjacent surfaces when exterior exposed.

D. Sealant: Manufacturer's standard type.

E. Trim, Closure Pieces, Caps, Flashings, Gutters, Downspouts, Rain Water Diverter, Fascias, and Infills: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

1.06 COMPONENTS

1.07 FABRICATION - GUTTERS AND DOWNSPOUTS

A. Fabricate of same material and finish as roofing metal.

B. Form sections in maximum possible lengths. Hem exposed edges. Allow for expansion at joints.

C. Fabricate support straps of same material and finish as roofing metal, color as selected.

PART 3 EXECUTION

2.01 EXAMINATION

A. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position

2.02 ERECTION - FRAMING

A. Erect framing in accordance with AISC 360.

B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing. Locate braced bays as indicated.

C. Set column base plates with non-shrink grout to achieve full plate bearing.

D. Do not field cut or alter structural members without approval.

E. After erection, prime welds, abrasions, and surfaces not shop primed.

2.03 ERECTION - WALL AND ROOF PANELS

A. Install in accordance with manufacturer's instructions.

B. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.

C. Fasten cladding system to structural supports, aligned level and plumb.

D. Locate end laps over supports. End laps minimum 2 inches. Place side laps over bearing.

E. Provide expansion joints where indicated.

F. Use concealed fasteners.

G. Install sealant and gaskets, providing weather tight installation.

2.04 TOLERANCES

A. Framing Members: 1/4 inch from level; 1/8 inch from plumb.

B. Siding and Roofing: 1/8 inch from true position.

END OF SECTION

SECTION 23 05 00

COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 The contractor agrees that upon the submittal of a bid, he will have read and studied all of the contract documents, and that all of the requirements and coordination resulting from these documents are included in his bid. The intent is to obtain a complete installation of mechanical HVAC work to which end the contractor shall provide all labor, equipment, material, freight, rigging, etc., specified, shown or scheduled on plans. He also agrees that any other accessory items which may not be specified, shown, or scheduled on the plans, but which normally are furnished or can be reasonably implied from the specifications and/or plans to be required shall be provided.

1.2 No exclusion from, or limitations in the drawings, specifications, or other contract documents for the mechanical HVAC work shall be reason for the omitting of the appurtenances or accessories necessary to complete any required system or item of equipment in this project.

1.3 Should the contractor find any discrepancies and/or omissions in the contract documents, or be in doubt as to the intent of said documents, he shall obtain clarification or correction from the architect and the engineer before submitting a bid for work under this division. The contractor will not be granted monetary allowances for discrepancies between his bid and the intent or the work after the contract is let, due to failure to follow this instruction.

1.4 REFERENCES

A. The American Society of Mechanical Engineers (ASME) Publications:
   1. B1.20.1 "Pipe Threads, General Purpose, Inch"
   2. B16.21 "Nonmetallic Flat Gaskets for Pipes Flanges"
   3. B18.2.1 "Square and Hex Bolts and Screws, Inch Series"

B. American Welding Society (AWS) Publications:
   1. "Soldering Manual"
   2. BRH "Brazing Handbook"
   3. A5.8 "Specification for Filler Metals for Brazing and Braze Welding"
   4. D1.1 "Structural Welding Code - Steel"
   5. D10.12 "Guide for Welding Mild Steel Pipe"

1.5 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.6 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 01 Specification Sections:
   1. Product Data: For dielectric fittings, flexible connectors, mechanical sleeve seals, and identification materials and devices.
   2. Coordination Drawings: Detail major elements, components, and systems of mechanical

equipment and materials in relationship with other systems, installations, and building components. Show space requirements for installation and access. Indicate if sequence and coordination of installations are important to efficient flow of the Work. Include the following:

a. Planned piping layout, including valve and specialty locations and valve-stem movement.
b. Clearances for installing and maintaining insulation.
c. Clearances for servicing and maintaining equipment, accessories, and specialties, including space for disassembly required for periodic maintenance.
d. Equipment and accessory service connections and support details.
e. Exterior wall and foundation penetrations.
f. Fire-rated wall and floor penetrations.
g. Sizes and location of required concrete pads and bases.
h. Scheduling, sequencing, movement, and positioning of large equipment into building during construction.
i. Floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.

1.7 QUALITY ASSURANCE

A. Equipment Selection: Equipment of higher electrical characteristics, physical dimensions, capacities, and ratings may be furnished provided such proposed equipment is approved in writing and connecting mechanical and electrical services, circuit breakers, conduit, motors, bases, and equipment spaces are increased. Additional costs shall be approved in advance by appropriate Contract Modification for these increases.
   1. If minimum energy ratings or efficiencies of equipment are specified, equipment must meet design requirements. See drawings for equipment schedules and requirements.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect flanges, fittings, and equipment from moisture and dirt.

1.9 SEQUENCING AND SCHEDULING

A. Coordinate mechanical equipment installation with other building components.

B. Coordinate installation of required supporting, devices, other structural components, as they are constructed.

C. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning before closing in building.

D. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.

E. Coordinate requirements for access panels and doors if mechanical items requiring access are concealed behind finished surfaces.

F. Coordinate installation of identifying devices after completing covering and painting, if devices are applied to surfaces. Install identifying devices before installing acoustical ceilings and similar concealment.

1.10 POSTED OPERATING INSTRUCTIONS

A. Provide and post operating instructions for all mechanical systems.

PART 2 - PRODUCTS - NOT USED

PART 3- EXECUTION

3.1 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to provide maximum possible headroom, if mounting heights is not indicated.

B. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to Owner's Representative.

C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

D. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

E. Clearance from Electrical Equipment: Piping and ductwork are prohibited in electric rooms and closets, elevator machine rooms and installation over transformers, switchboards and motor control centers.

3.2 ERECTION OF METAL SUPPORTS AND ANCHORAGE

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

B. Field Welding: Comply with AWS D1.1, "Structural Welding Code--Steel."

C. Prime and paint all metal supports.

3.3 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for mechanical installations. Perform cutting by skilled mechanics of trades involved.

B. Repair cut surfaces to match adjacent surfaces.

C. Refer to Division 01 Sections for additional requirements.

END OF SECTION

SECTION 23 34 23

HVAC POWER VENTILATORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Centrifugal Roof Ventilators
   2. Ceiling-Mounted Ventilators
   3. In-Line Centrifugal Fans
   4. Motors
   5. Factory Finishes
   6. Quality Control

B. Products Supplied But Not Installed Under This Section:
   1. Roof curbs for roof-mounted exhaust fans.

1.2 REFERENCES

A. Air Movement & Control Association International, Inc. (AMCA) Publications:
   1. 99 "Standards Handbook" (Revised 2003)
   2. 210 "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating"
   3. 300 "Reverberant Room Method for Sound Testing of Fans"
   4. 301 "Methods for Calculating Fan Sound Ratings from Laboratory Test Data"

B. National Electrical Manufacturer's Association (NEMA) Standards Publications:
   1. MG 1 "Motors and Generators"

C. National Fire Protection Association (NFPA) Publications:
   1. 70 "National Electric Code"

D. Underwriter's Laboratories, Inc. (UL) Publications:
   1. 486A "Standard for Wire Connectors and Soldering Lugs for Use with Copper Conductors"
   2. 486B "Standard for Wire Connectors for Use with Aluminum Conductors"
   3. 705 "Standard for Power Ventilators"

1.3 PERFORMANCE REQUIREMENTS

A. Project Altitude: Base air ratings on actual site elevations.

B. Operating Limits: Classify according to AMCA 99.

C. Fan Schedule: The following information is described in an equipment schedule on the Drawings.
   1. Fan performance data including capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.
   2. Fan arrangement including wheel configuration, inlet and discharge configurations, and required accessories.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 01 Specification Sections:
   1. Product Data including rated capacities of each unit, weights (shipping, installed, and operating), furnished specialties, accessories, and the following:
      a. Certified fan performance curves with system operating conditions indicated.
      b. Certified fan sound power ratings.
      c. Motor ratings and electrical characteristics plus motor and electrical accessories.
      d. Material gages and finishes, including color charts.
      e. Dampers, including housings, linkages, and operators.
   2. Shop Drawings from manufacturer detailing equipment assemblies and indicating

dimensions, weights, loadings, required clearances, method of field assembly, components, and location and size of each field connection.

3. Wiring diagrams detailing wiring for power and control systems and differentiating clearly between manufacturer-installed and field-installed wiring.
4. Maintenance data for power ventilators to include in the operation and maintenance manual.

1.5 QUALITY ASSURANCE

A. Electrical Component Standard: Provide components that comply with NFPA 70 and that are listed and labeled by UL where available.

B. Listing and Labeling: Provide electrically operated fixtures specified in this Section that are listed and labeled.
   1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

C. AMCA Compliance: Provide products that meet performance requirements and are licensed to use the AMCA Seal.

D. NEMA Compliance: Provide components required as part of fans that comply with applicable NEMA standards.

E. UL Standard: Provide power ventilators that comply with UL 705.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions by field measurements. Verify clearances.

B. Do not operate fans until ductwork is clean, filters are in place, bearings are lubricated, and fans have been commissioned.

1.7 COORDINATION AND SCHEDULING

A. Coordinate the size and location of structural steel support members.

B. Coordinate the installation of roof curbs, equipment supports, and roof penetrations. Roof specialties are specified in Division 07 Sections.

PART 2 - PRODUCTS

2.1 CENTRIFUGAL ROOF VENTILATORS

A. Description: Belt-driven or direct-drive centrifugal fans, as indicated, consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, curb base, and accessories.

B. Housing: Removable, spun-aluminum, dome top and outlet baffle; square, one-piece, aluminum base with venturi inlet cone.

C. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.

D. Belt-Driven Drive Assembly: Resiliently mounted to the housing, with the following features:
   1. Fan Shaft: Turned, ground, and polished steel drive shaft keyed to wheel hub.
   2. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
   3. Pulleys: Cast-iron, adjustable-pitch motor pulley.
   4. Fan and motor isolated from exhaust air stream.

E. Accessories: The following items are required as indicated:
   1. Variable-Speed Controller: Solid-state control to reduce speed from 100 percent to less than 50 percent. (Direct drive fans only).
   2. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted inside fan housing, factory wired through an internal aluminum conduit.
   3. Bird Screens: Removable 1/2-inch mesh, aluminum or brass wire.
   4. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base;

factory set to close when fan stops.

5. Roof Curbs: Galvanized steel; mitered and welded corners; 2-inch- thick, rigid, fiberglass insulation adhered to inside walls; and 2-inch wood nailer. Size as required to suit roof opening and fan base. Built-in cant and mounting flange.
   a. Overall Height: 12 inches. Minimum.

2.2 CEILING-MOUNTED VENTILATORS

A. Description: Centrifugal fans designed for installing in ceiling or wall, or for concealed in-line applications.

B. Housing: Galvanized steel lined with acoustical insulation.

C. Fan Wheel: Centrifugal wheels directly mounted on motor shaft. Fan shrouds, motor, and fan wheel shall be removable for service.

D. Grille: Aluminum, louvered grille or eggcrate with flange on intake and thumbscrew attachment to fan housing.

E. Electrical Requirements: Junction box for electrical connection on housing and receptacle for motor plug-in.

F. Variable-Speed Controller Mounted on Fan Housing: Solid-state control to reduce speed from 100 percent to less than 50 percent.

G. Sound Level: Maximum of 1.5 Sones in Toilets

H. Accessories: Manufacturer's standard roof jack or wall cap, and transition fittings.

2.3 IN-LINE CENTRIFUGAL FANS

A. Description: In-line, belt-driven, or direct-drive centrifugal fans consisting of housing, wheel, outlet guide vanes, fan shaft, bearings, drive assembly, motor and disconnect switch, mounting brackets, and accessories.

B. Housing: Split, spun-aluminum housing, with aluminum straightening vanes; inlet and outlet flanges; and support bracket adaptable to floor, side wall, or ceiling mounting.

C. Direct-Drive Units: Motor encased in housing out of air stream, factory wired to disconnect located on outside of fan housing.

D. Belt-Driven Units: Motor mounted on adjustable base, with adjustable sheaves, enclosure around belts within fan housing, and lubricating tubes from fan bearings extended to outside of fan housing.

E. Fan Wheels: Aluminum, airfoil blades welded to aluminum hub.

F. Accessories: The following accessories are required as indicated:
   1. Volume-Control Damper: Manually operated with quadrant lock, located in fan outlet.
   2. Companion Flanges: For inlet and outlet duct connections.
   3. Fan Guards: Expanded metal in removable frame. Provide fan guards for units not connected to ductwork.

G. Motor Construction: NEMA MG 1, general purpose, continuous duty, Design B.

H. Enclosure Type: The following features are required as indicated:
   1. Open drip proof motors where satisfactorily housed or remotely located during operation.

2.4 FACTORY FINISHES

A. Sheet Metal Parts: Prime coat before final assembly.

B. Exterior Surfaces: Baked-enamel finish coat after assembly.

C. Aluminum Parts: No finish required.

2.5 SOURCE QUALITY CONTROL

A. Testing Requirements: The following factory tests are required as indicated:
   1. Sound Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA Seal.
   2. Fan Performance Ratings: Establish flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests and ratings according to AMCA 210, "Laboratory Methods of Testing Fans for Rating."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements of installation tolerances and other conditions affecting performance of the power ventilators. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install power ventilators according to manufacturer's written instructions.

B. Support units using the vibration-control devices.
   1. Secure roof-mounted fans to roof curbs with cadmium-plated hardware.
      a. Installation of roof curbs is specified in Division 07 Sections.
   2. Suspend units from structural steel support frame using threaded steel rods and vibration isolation springs.
   3. Ceiling Units: Suspend units from structure using steel wire or metal straps.

C. Install units with clearances for service and maintenance.

D. Label units according to requirements.

3.3 CONNECTIONS

A. Duct installation and connection requirements are specified in other Division 23 Sections. Drawings indicate the general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors.

B. Electrical: Conform to applicable requirements in Division 26 Sections.

C. Grounding: Ground equipment. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Provide services of a factory-authorized service representative to supervise the field assembly of components and installation of fans, including duct and electrical connections, and to report results in writing.

3.5 ADJUSTING

A. Adjust damper linkages for proper damper operation.

B. Adjust belt tension.

C. Lubricate bearings.

3.6 CLEANING

A. After completing installation, inspect exposed finish. Remove burrs, dirt, and construction debris, and repair damaged finishes including chips, scratches, and abrasions.

B. Clean fan interiors to remove foreign material and construction debris. Vacuum clean fan wheel and cabinet.

3.7 COMMISSIONING

A. Final Checks before Startup: Perform the following operations and checks before startup:
   1. Verify that shipping, blocking, and bracing are removed.
   2. Verify that unit is secure on mountings and supporting devices and that connections for piping, ducts, and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnects.
   3. Perform cleaning and adjusting specified in this Section.
   4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
   5. Lubricate bearings, pulleys, belts, and other moving parts with factory-recommended lubricants.
   6. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in the fully open position.
   7. Disable automatic temperature-control operators.

B. Starting procedures for fans are as follows:
   1. Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated RPM.
   2. Measure and record motor voltage and amperage.

C. Shut unit down and reconnect automatic temperature-control operators.

D. Refer to Testing, Adjusting, and Balancing for HVAC for procedures for air-handling-system testing, adjusting, and balancing.

E. Replace fan and motor pulleys as required to achieve design conditions.

3.8 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.
   1. Conduct training as specified in Division 01 Sections.
   2. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive.

END OF SECTION

SECTION 23 37 00

AIR OUTLETS AND INLETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Diffusers
   2. Registers
   3. Grilles
   4. Louvers

1.2 REFERENCES

A. Air Movement & Control Association International, Inc. (AMCA) Publications:
   1. 511 "Certified Ratings Program for Air Control Devices"

B. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Publications:
   1. 70 "Method of Testing for Rating the Performance of Air Outlets and Inlets"

C. National Fire Protection Association (NFPA) Publications:
   1. 90A “Standard for the Installation of Air Conditioning and Ventilating Systems”

1.3 DEFINITIONS

A. Diffuser: Circular, square, or rectangular air distribution outlet, generally located in the ceiling and comprised of deflecting members discharging supply air in various directions and planes and arranged to promote mixing of primary air with secondary room air.

B. Grille: A louvered or perforated covering for an opening in an air passage, which can be located in a sidewall, ceiling, or floor.

C. Register: A combination grille and damper assembly over an air opening.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 01 Specification Sections:
   1. Product Data: For each model indicated, include the following:
      a. Data Sheet: For each type of air outlet and inlet, and accessory furnished; indicate construction, finish, and mounting details.
      b. Performance Data: Include throw and drop, static-pressure drop, and noise ratings for each type of air outlet and inlet.
      c. Schedule of diffusers, registers, and grilles indicating drawing designation, room location, quantity, model number, size, finish, and accessories furnished.
      d. Assembly Drawing: For each type of air outlet and inlet: indicate materials and methods of assembly of components.

1.5 QUALITY ASSURANCE

A. Product Options: Drawings and schedules indicate specific requirements of diffusers, registers, and grilles and are based on the specific requirements of the systems indicated.

B. NFPA Compliance: Install diffusers, registers, and grilles according to NFPA 90A, "Standard for the Installation of air-conditioning and Ventilating Systems."

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Diffusers, registers, and grilles (As scheduled on Drawings):

B. Exterior Louvers:

1. Provide storm proof and drainable exterior wall louvers; size as indicated on Drawings.
2. Louvers shall be AMCA 511 certified for zero water penetration and maximum 1/8-inch pressure drop at a free area velocity of 900 fpm.
3. Louvers shall be minimum 4-inches deep constructed of 0.081-inch thick 6063-TS extruded aluminum complete with ½-inch square mesh aluminum screen in removable frame.
4. Frames shall be box type for masonry construction and flange type for frame construction.
5. Louver shall have a factory baked enamel prime finish ready to accept full paint to match adjacent surfaces.

2.2 SOURCE QUALITY CONTROL

A. Testing: Test performance according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

B. Noise Criteria: Diffusers, registers, and grilles shall not exceed a noise level of NC-30.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install diffusers, registers, and grilles level and plumb, according to manufacturer's written instructions, Coordination Drawings, original design, and referenced standards.

B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practicable. For units installed in lay-in ceiling panels, locate units in the center of the panel. Where architectural features or other item conflict with installation notify Owner’s Representative for a determination of final location.

C. Install diffusers, registers, and grilles with airtight connection to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

3.4 CLEANING

A. After installation of diffusers, registers, and grilles, inspect exposed finish. Clean exposed surfaces to remove burrs, dirt, and smudges. Replace diffusers, registers, and grilles that have damaged finishes.

END OF SECTION

SECTION 26 05 00

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.01 DEFINITIONS

Whenever occurring in Division 26 the following words shall have the meanings given below:

A. "Provide" shall mean to furnish, install and connect complete.

B. "Wiring" shall mean wire or cable, installed in conduit, cable tray, or wireways with all required boxes, fittings, connectors, and accessories completely installed.

C. "Work" shall be understood to mean the materials completely installed including the labor involved.

D. "Plans and Specifications/Contract Documents" shall be understood to mean the complete documents, including all trades, divisions, sections, addenda, etc.

E. "Review of Shop Drawings" - see Division 1.

F. "Conduit" shall mean either rigid steel conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT), or plastic conduit (PVC).

1.02 The Contractor AGREES that upon the submittal of a bid, he will have read and studied ALL of the Contract Documents, and that all of the requirements and coordination resulting from these documents are included in his bid. The intent is to obtain a complete installation of electrical work to which end the Contractor shall provide ALL labor, equipment, material, freight, rigging, etc., specified, shown or scheduled on plans. He also agrees that any other accessory items which may not be specified, shown, or scheduled on the plans, but which normally are furnished or can be reasonably implied from the specifications and/or plans to be required shall be provided.

1.03 No exclusion from, or limitations in the drawings, specifications, or other contract documents for the electrical work shall be reason for the omitting of the appurtenances or accessories necessary to complete any required system or item of equipment in this project.

1.04 Should the Contractor find any discrepancies and/or omissions in the contract documents, or be in doubt as to the intent of said documents, he shall obtain clarification or correction from the Architect and the Engineer BEFORE submitting a bid for work under this division. The Contractor will not be granted monetary allowances for discrepancies between his bid and the intent or the work after the contract is let, due to failure to follow this instruction.

1.05 The contractor shall not use any material or equipment that contains asbestos, PCB's, or any other substance which is known to endanger the public health.

1.06 SCOPE OF WORK

A. The Contractor shall refer to Architectural, Mechanical, and Structural drawings and Division 23 of these specifications for related work.

B. The work of this division shall include the furnishing of all labor, supplies, materials, sales tax, permits, inspection fees, costs of testing, shop drawings, as built drawings, operation and maintenance manuals, and the performing of all operations including installation, cutting and chasing, trenching and backfilling, compaction, coordination with other trades on the job, etc., to the end of obtaining a complete installation of electrical work as shown on the drawings and called for in the written specifications.

C. The work to be performed under the electrical contract shall include, but not be limited to:

1. Service entrance conduit and wire.
2. Service entrance equipment including disconnects, switchboards, panelboards, etc.
3. Feeder conduit and wire.
4. Distribution, lighting, and miscellaneous panelboards.

5. Branch circuit conduit and wire.
6. Lighting Fixtures.
7. Wiring devices including receptacles, light switches, etc.
8. Communications service entrance conduit, and interior conduit and outlets.
9. Fire Alarm System complete, if called for on the drawings
10. Disconnects for mechanical equipment are provided by the mechanical contractor. The electrical contractor shall install and connect them to power supplies. Disconnects for equipment other than mechanical equipment shall be provided with appropriate disconnects by the electrical contractor.
11. Provision of temporary power at 120/240, single phase for construction.
12. Power monitoring meters to tenants and various entities, and the associated software to utilize them
13. Communications wiring as outlined in Specification Section 270520
14. CATV cabling, splitters, and termination jacks

D. Work not included under the electrical contract:
1. Unless provided in motor control center, all motor starters and their associated control devices, heaters, etc. will be furnished with the motors under Division 23 of these specifications.
2. Control and interlock wiring for mechanical contract supplied systems.

E. The owner will not make any consideration to the contractor for any alleged misunderstanding of the amount of work to be performed. Submittal of a bid for work shall convey full agreement by the Contractor to all items and conditions specified, indicated on the drawings, and/or required by the nature of the job site.

F. The Contractor shall be responsible for ensuring that all equipment and materials are installed in a neat and workmanlike manner and are aligned, leveled and adjusted for satisfactory operation. He shall install all equipment so that all parts are easily accessible for inspection, operation, maintenance and repair. He shall insure that all equipment is solidly supported from building structures.

1.08 CODES, LAWS AND ORDINANCES

A. Comply with all laws, codes, ordinances, and etc., having jurisdiction over the work to be performed under the contract for this project, EXCEPT where the requirements of the drawings and/or specifications are in excess of those called for in said laws, codes, ordinances, etc.

B. Perform work in accordance with the locally adopted editions of the standards listed below; EXCEPT where federal, state and/or local codes are more stringent, in which case, follow them instead:

1.	National Fire Protection Association	NFPA
2.	Underwriters Laboratories	UL
3.	American Society of Testing Materials	ASTM
4.	National Electrical Code	NEC
5.	National Electrical Manufacturing Association	NEMA
6.	Occupational Safety & Health Act	OSHA

C. The Contractor shall be responsible for installation of the work called for in the contract documents in accordance with all codes, laws, and ordinances, which govern such work. Should he encounter anything contained within the contract documents during preparation for bid which would prohibit the successful compliance of his responsibility under this item, he shall notify the Architect prior to execution of the contract for work so that adjustments can be made to the contract.

D. The Contractor shall be responsible for obtaining all permits, inspection certificates, etc., required by local, state and/or federal authorities for this project, at his expense. Any and all additional work, expense, etc., incurred as the result of failure to request timely inspections, and or permits, shall be charged against the Contractor.

E. Approval of the Architect, Engineer, and the appropriate inspection authorities must be secured for the complete electrical installation prior to contract closeout. Upon completion of the electrical work, the Contractor will furnish the Architect with two (2) copies of all certificates of inspection, permits, etc. Final payment to the Contractor will not be made until the requirements of this paragraph have been met.

1.09 LOCAL CONDITIONS

A. Existing site utilities, underground services, structures, etc., are shown on the drawings accurately in scope only. No expressed or implied guarantee is given as to exact location of the above items. The Contractor is required to verify exact locations and subsequent effects of such on the job.

B. Contractors desiring to bid on work under this division are required to visit the job site before bid submittal. During said visit the Contractor shall become familiar with all site conditions which will affect his work and the cost of the work. He shall also verify exact location of the equipment of the various utility companies from whom services will be required. The Contractor shall submit a letter with his bid stating that he has complied with this requirement.

1.10 PLANS AND SPECIFICATIONS

A. While drawings are to scale, they are diagrammatic. DO NOT SCALE DRAWINGS HAVING 1/4" OR SMALLER SCALE. Equipment, conduit, outlets, etc., are not exactly positioned; therefore, the Contractor shall refer to architectural drawings for actual building dimensions, ceiling layouts, light fixture locations, work by other trades, etc.

B. Should any conflict exist between the drawings and the written specifications, the specifications shall generally govern. Contact Engineer for clarifications.

C. The drawings and written specifications for all divisions are part of the contract. Any work and material shown in the one and omitted in the other, or which may be reasonably implied by both or either, shall be fully furnished and performed by the Contractor, as required for a complete electrical system installation.

D. No deviation from the drawings and specifications shall be made without the full knowledge and consent of the Architect. Should the Contractor find, at any time during the progress of the work, that, in his judgment, existing conditions make desirable a modification in requirements covering any particular item or items, he shall report such item promptly to the Architect for his decision and instructions.

E. The right is reserved by the Architect to move any equipment, outlet, conduit, etc.; as much as ten (10) feet at no increase in cost, provided the Contractor is notified of the change before work on the detail in question is started.

F. It shall be the responsibility of the Contractor to insure that the equipment he provides will fit into the available space, leaving reasonable space for maintenance and servicing of the equipment. If, after the installation of any equipment, it is determined that the space requirements have not been met, the Contractor shall rearrange the work at no additional cost.

1.11 COORDINATION OF WORK

A. It is the responsibility of the Contractor to plan all work so that it proceeds with a minimum of interference with all other trades. He is to inform all parties concerned of openings in the building construction for equipment or conduit required for the electrical work. He is to coordinate the electrical work with the mechanical and plumbing installation.

B. The contractor shall review and coordinate the locations of all electrical equipment (meters, instrument transformer cabinets, panels, disconnect switches, lighting contactors, etc.) mounted on the outside walls of buildings with the drawings for the mechanical, plumbing, and architectural disciplines to avoid any conflicts in locations with sprinkler risers, plumbing risers, rain downspouts, doors, etc. Generally, meter center risers are shown on the drawings for the purposes of information only; they are not dimensioned. In addition, the locations of the meter

centers on the site plans are diagrammatic only. They are not dimensioned. The contractor must coordinate these installations. If there are any questions as to locations of equipment, notify the engineer for clarification prior to installation of equipment.

C. The Contractor shall provide all required frames, sleeves, inserts, supports, anchor bolts, etc., as required for completion of the work.

D. The Contractor shall lay out and coordinate all work well enough in advance so as to avoid conflicts or interference with other work in progress. If there is any interference, the electrical layout may be altered to suit the conditions, prior to the installation of any work and at no additional cost to the Owner. Consult the Architect for instructions.

E. The contractor shall verify the location of all disconnect switches required by the project, prior to their installation. The installed location of any disconnect shall not impede the access to, or working space around, any piece of equipment. Neither shall the location cause any loss of equipment performance due to impeded air flow, etc. This requirement applies regardless of the location shown for the disconnects on the plans. If there is any question as to disconnect location, the contractor shall ask the engineer for clarification prior to installation. If any disconnect is found to be installed in such a way that it causes any problems as mentioned above, it shall be relocated at the expense of the contractor.

F. Work lines and established heights shall be in strict accordance with architectural drawings and specifications, insofar as these drawings and specifications extend. It is the Contractor's responsibility to verify all elevations and detailed dimensions not indicated.

G. The Contractor shall coordinate all outlets, fixtures, equipment, etc., with floor, wall and ceiling patterns. Any lines which must pitch shall have right-of-way over lines whose elevations can be changed.

1.12 EQUIPMENT DATA

A. Deliver all printed tags, instructions, certified drawings, parts lists, certificates, etc., supplied with equipment items, to the Architect at completion of the project.

B. Assemble all such printed materials into a stiff-back binder identified on its face. Provide quadruple copies.

1.13 SHOP DRAWINGS

A. Shop drawings for switchboards, panelboards, transformers, generators, fire alarm systems, security systems, lighting fixtures, structured communications cabling system, and other items as might be requested, shall be submitted to the Architect's Engineer for his approval, by the Contractor promptly upon receipt of the contract for work.

B. The engineer will review the shop drawings for errors in the contractor’s interpretation of the contract documents only, and to assist the contractor in compliance with the documents. Corrections of comments made on shop drawings during the review do not relieve the contractor from compliance with requirements of the contract documents, plans, and specifications. Review of the shop drawings shall not relieve the contractor from responsibility for confirming and correlating all quantities and dimensions, coordination of his work with the other trades, and performance of his work in a safe and satisfactory manner. Review of shop drawings shall not permit any deviations from plans and specifications by the contractor, nor shall it permit changes to the plans and specifications by the engineer. Changes to, or deviations from, the contract documents may only be made by a Change Order issued by the architect and executed properly.

C. The contractor shall review the information prepared by his suppliers and note any changes required prior to submitting the information to the engineer and shall include the form, Exhibit 2, entitled “Certification of Compliance – Shop Drawings” with each submittal (see end of specifications). Failure to complete and submit this form will result in rejection of the submittal without review.

D. Equipment subject to shop drawing approval shall not be ordered until approved by the Engineer.

Material ordered or installed without such approval, if rejected by the Engineer, shall be removed and replaced with approved items at the Contractor's expense.

E. In order to procure approval for such equipment, the Contractor shall submit a minimum of six (6) sets of shop drawings and/or brochures describing each piece of equipment. Description shall include rated capacities, dimensions, manufacturer's catalog number, performance data with operating characteristics, optional features, modifications, etc.

F. ALL BROCHURES AND DRAWINGS SHALL BE SUBMITTED AT THE SAME TIME. Items not approved shall be resubmitted with the necessary corrections made until final approval is obtained.

G. See individual specification sections for additional shop drawing requirements.

F. If equipment is substituted and approved in the shop drawing process; its use may affect electrical, mechanical, structural, and other systems which were designed based on the original equipment specifications. Any changes, and their cost, in any of the divisions of work affected by the substitution of equipment, shall be the sole responsibility of the contractor making the substitution.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. All materials and equipment shall be new and the best grade. They shall conform to all standards and requirements governing the work. Any and all equipment and materials damaged during installation shall be immediately replaced at NO cost to the Owner.

B. Reference shall be made to drawing schedules and details and/or specifications for manufacturer, model, catalog number, size, capacity, performance, installation, etc., of equipment and material. Such information is used to denote design, workmanship, and quality desired.

C. The Contractor shall offer his bid for work based on the electrical equipment (including light fixtures) which is described in these specifications and described in the respective schedules on the drawings. Pre-bid approvals for substitute equipment will not be given.

D. PRODUCT SELECTION PROCEDURES

Product selection shall be governed by the Contract Documents, and not by previous project experience which the Contractor or his suppliers may possess. Procedures governing product selection include the following:

1. PROPRIETARY SPECIFICATION REQUIREMENTS: Where only a single product or manufacturer is named, provide the product indicated. No substitutions shall be permitted.
2. SEMIPROPRIETARY SPECIFICATION REQUIREMENTS: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions shall be permitted.
3. NON-PROPRIETARY SPECIFICATONS: When the specification lists products or manufacturers that are available for incorporation into the work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product which complies with the contract requirements. Such products are still subject to the shop drawings submittal process.

E. In the submission of substitute equipment and materials, the Contractor shall note the following: (1) capacities are absolute minimum and must be equaled, (2) physical size limitations for space allotted, (3) structural properties, (4) noise levels, (5) interchangeability, (6) compatibility with other materials, (7) similar items shall be same manufacturer and style wherever possible.

F. All materials and equipment, for which a UL or NEMA standard is established, shall be so approved and labeled or stamped.

G. NEMA standards shall be taken as minimum requirements for electrical equipment.

H. Electrical equipment shall operate properly under a 10 percent plus or minus voltage variation.

I. Adhesives are not acceptable as mounting, supporting or assembling media.

PART 3 - EXECUTION

3.01 All materials required for the project shall be ordered by the Contractor in a timely manner which allows the material to be received at the job site for installation in agreement with the job schedule, so that work of the other divisions is not held up in any way.

3.02 All materials and equipment received at the job site by the Contractor shall be stored and protected from damage while they wait to be installed.

3.03 All work shall be carried out in a neat and orderly manner by experienced electricians, under the constant supervision of a competent electrician, trained and licensed in this field, who shall represent the Contractor at all times in connection with the work.

3.04 Materials or work installed, rejected by the Architect's Engineer upon inspection shall be completely removed by the Contractor, and the work redone in a manner acceptable to the Engineer by the Contractor at no charge.

3.05 When rejected work is removed, should other material, equipment, etc., be damaged in the process, the Contractor shall make all necessary repairs, so that the damaged equipment is equal in quality, strength and appearance to its original state.

3.06 SPACE REQUIREMENTS

A. The Contractor is fully responsible for determining in advance of purchase that all equipment and materials proposed for installation will fit into the space indicated while allowing sufficient clearance about the equipment and materials to allow proper maintenance and servicing of all components requiring such, including equipment and materials of other divisions located in the vicinity.

B. Clearances in front of panelboards, switchboards, motor starters, busway taps, and other electrical equipment requiring servicing while energized, shall be provided in accordance with the NEC, table 110-16a, as required by the code text.

C. The contractor shall prepare, and submit for review and approval prior to ordering equipment, dimensioned rough-in drawings at ½" = 1'-0" scale for each equipment room and meter equipment layout. These drawings shall show all equipment to scale based on the actual equipment ordered and shall be fully dimensioned.

3.07 FIRESTOPPING

A. Firestop all penetrations of building fire rated surfaces made by this division.

B. Each penetration shall be protected by a firestop system with a rating equal to or greater than the original assembly in which the penetration occurs.

C. All firestop material shall be installed in accordance with manufacturer's standard details and the UL Building Materials Directory for each type of fire rated assembly penetrated.

D. Telephone sleeves shall be firestopped with materials that will permit re-entry and use of the sleeves.

3.08 WIRING ELECTRICALLY OPERATED EQUIPMENT

A. The Contractor shall provide all conduit, conductors, wiring, etc., required to connect power to all electrically operated equipment installed on the project, whether provided by this division or other divisions, or by the owner.

B. The Contractor shall install, support, and electrically connect motor starters, disconnects, etc., and shall complete all power wiring circuits so that each is left in satisfactory condition.

C. All control equipment associated with any equipment furnished under any other division, or by

the owner, shall be furnished by that provider.

D. This division shall provide all conduit required for control wiring as needed for Division 15000. Refer to that division and its associated drawings for specifics.

E. This division is responsible for the provision of, and fire alarm system wiring of, duct smoke detectors for all HVAC equipment requiring them. If there is a fire alarm system provided for the project, the detectors shall be tied to that system. If there is no fire alarm system, the Contractor shall provide remote visual and audible alarm indicators per the requirements of NFPA 90A, latest edition.

3.09 RECORD AND AS-BUILT DOCUMETS

A. The Contractor shall maintain at the job site a complete set of Contract Documents. These documents shall be kept current with all changes, substitutions, etc., to the original documents as reflected by the actual work being installed.

B. At closeout, the Contractor shall provide the Owner with one complete set of as-built reproducible drawings, and two clean sets of complete specifications. These documents shall show installed locations, sizes, etc., of all work and material as required by the contract documents and actually installed on the project.

C. For each piece of equipment installed or provided, the Contractor shall provide three (3) sets of:
1. Manufacturer's printed catalog pages
2. Manufacturer's operating and maintenance instructions
3. Manufacturer's wiring and connection diagrams, etc.,
4. Motor interlock and control diagrams, showing operating instructions for, and normal positions of, each motor and controller.

All of this information shall be provided in bound 8-1/2" by 11" hardback booklets.

3.10 CLEANING

A. The Contractor shall insure that all interior and exterior surfaces of panelboards, transformers, switchboards, motor starters, cabinets, etc., are cleaned so as to be free of dust, dirt, grease, plaster, debris, etc. Lighting fixtures shall be cleaned according to manufacturer's recommendations.

B. Any electrical equipment having sustained damage to any factory painted surfaces shall have that damage repaired and restored to original factory condition.

C. Any and all ferrous metal surfaces exposed on the electrical system shall be painted.

3.11 TEMPORARY LIGHTING AND POWER

A. As soon as is possible, the Contractor shall install temporary electrical wiring and lighting for the project in accordance with NEC Article 305.

B. Wiring shall consist of non-metallic sheathed cable with ground wire.

3.12 EXCAVATION, SHORING, AND BACKFILL

A. The Contractor shall perform all necessary excavation required for installation of his work. Each utility shall be installed in a separate trench.

B. Excavation shall be below that required for general construction and final grade. It is expected that the Contractor shall process normally difficulties encountered in excavation related to rocks, debris, etc. However, should the Contractor encounter "solid" rock impediments to his excavation, he shall contact the Architect for directions.

C. Any and all trenching shall be performed strictly in accordance with OSHA, and other authorities having jurisdiction, rules and regulations regarding "cave in" safety shoring. All shoring material used shall be completely removed prior to backfilling the trench.

D. The Contractor shall not backfill trenches until the conduit banks have been inspected by the

proper authorities.

E. Backfill shall be done simultaneously on both sides of the equipment, raceways, etc.

F. Backfill shall be clean soil, free of rocks, cinders, wood, debris, etc.

G. Backfill shall be installed in 12-inch layers. It shall be compacted to 85% per ASTM D-1557 in areas under sidewalks and grass; and to 95% under any paved areas.

H. Should concrete encasement of raceways be required, the sides and floor of the trench shall be used as formwork for the concrete. This shall not apply unless the excavation is clean, free of debris, and of the proper size.

3.13 CUTTING AND PATCHING

A. The Contractor shall be responsible for the location and size of all openings required for his work.

B. The Contractor shall not cut into structural members or architectural finish surfaces without expressed written approval of the Architect.

C. Any patching of surfaces required by the Contractor's work shall be made so that they are equal in quality and appearance to the original surface.

3.14 FLASHING

A. Raceways which pass through walls or roof surfaces to the outside shall be flashed in accordance with architectural standards and with the requirements of the roofing manufacturer.

B. Any raceways penetrating the roof shall maintain a clearance of 18 inches minimum from all parapets.

C. Whenever raceways pass through floor structures which contain a waterproofing membrane, the Contractor shall provide a watertight floor sleeve for each raceway. The lowest floor shall be exempt.

3.15 MOISTURE - DAMP PROTECTION

A. Whenever any electrical component, such as panels, raceways, etc., will be in contact with surfaces which may become damp or wet, that component shall be mounted on standoff devices so that it is a minimum of ¼" away from the surface.

3.16 GUARANTEE AND WARRANTY

A. The Contractor and the General Contractor shall, and hereby does, guarantee that all work executed, and all electrical equipment installed, under this division will be free of all defects in materials, manufacture, and workmanship for a period of one (1) year from the date of final acceptance of the building. The above parties agree that they will, at their expense, repair and/or replace all such defective work and equipment, and any and all other work damaged thereby, which becomes defective during the term of this guarantee.

END OF SECTION

SECTION 26 05 02

TESTING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. The entire electrical system shall be tested to insure proper operation and safety for building occupants and operating personnel.

B. Testing shall insure conformity to code requirements and conformity to contract documents.

1.02 REGULATORY REQUIREMENTS

A. Testing shall be in conformance with local codes, utility company requirements, and standard industry practices.

B. Testing shall accomplish the requirements of the NEC, Article 110.

PART 2 - PRODUCTS

2.01 Testing shall be performed with instruments and materials required and approved for the purpose.

PART 3 - EXECUTION

3.01 Perform appropriate tests on the entire electrical system before it is energized. Testing shall be performed to ensure that it is free of unintended grounds, short circuits, and open circuits.

3.02 Provide safeguards to protect all personnel involved in the testing as well as for protection of equipment being tested.

3.03 Testing shall be performed in a timely manner. Reports of results shall be filed with the Architect in written form.

3.04 Testing shall include the following:

A. Prior to connections to equipment, all service entrance conductors and feeder conductors shall be tested for unintended grounds and for insulation integrity with a megohm meter. Any conductor found to be defective in the testing shall be replaced.

B. Ground fault protection systems on service entrance equipment shall be tested according to the NEC, Article 230-95.

C. The grounding system network shall be tested to ensure a resistance value of not more than ten (10) ohms to ground. Should the system test results be higher than 10 ohms, additional ground rods shall be driven, or alterations made to the system, to produce the 10-ohm or less value required.

D. Full load currents of each feeder shall be measured to test for phase load balance. If the phases are not load balanced, circuit rearrangement shall be made to achieve balanced load conditions.

E. The proper operation of all alarm and control systems installed under this division shall be verified by system operational testing.

F. All circuits having parallel conductors shall be tested for proper phasing using hot phasing or other compatible techniques.

3.05 The Contractor shall provide additional testing as deemed necessary by the Architect to ensure that all equipment functions properly and meets the requirements of the specifications and drawings.

END OF SECTION

SECTION 26 05 04

MINOR ELECTRICAL DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Electrical demolition.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual Sections.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify field measurements and circuiting arrangements are as shown on Drawings.

B. Verify that abandoned wiring and equipment serve only abandoned facilities.

C. Demolition Drawings are based on casual field observation and existing record documents. Report discrepancies to Engineer before disturbing existing installation.

D. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

A. Disconnect electrical systems to mechanical and electrical equipment scheduled for removal.

B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

C. Existing Electrical Service: Maintain existing system in service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 72 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Demolish and extend existing electrical work under this Section.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring to source of supply.

D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

E. Disconnect and remove abandoned panelboards and distribution equipment.

F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

G. Repair adjacent construction and finishes damaged during demolition and extension work.

H. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

3.04 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

3.05 INSTALLATION

A. Install relocated materials and equipment under the provisions of the Contract Documents.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes building wires and cables, metal clad cable, connectors, and terminations for systems rated below 600 volts.

1.02 RELATED DOCUMENTS

A. All drawings and Division 01 of the specifications and the general conditions of the Contract apply to this section.

B. Section 260553 – Identification for Electrical Systems

1.03 REGULATORY REQUIRMENTS

A. All products required and furnished under this section shall be listed and labeled per the NEC by UL or other testing agency acceptable to the authority having jurisdiction and marked for intended use.

B. All products furnished under this section, as installed, shall meet all requirements of the NEC.

1.04 WIRE AND CABLE

A. All wire and cable routing shown on the drawings is approximate. Field verify dimensions and routing lengths of all conductors and cables required prior to installation.

B. All wire and cable furnished on this project shall be copper and drawings reflect conductor sizes, conduit sizes, etc. based on copper conductors.

PART 2 - PRODUCTS

2.01 CONDUCTORS

A. Specified gauge sizes refer to American Wire Gauge, copper conductors.

B. All wire and cable shall be of soft drawn, annealed, copper having a conductivity of not less than 98% of that of pure copper; each wire continuous without weld, splice, or joint throughout its length; uniform in cross section and free from flaws, scales and other imperfections.

C. Sizes specified are AWG through No. 4/0 and circular mils above No. 4/0. Conductor No. 10 and smaller shall be solid; No. 8 and larger stranded.

D. Conductors No. 4 and smaller shall be Type "THHN/THWN"; larger conductors shall be type "THWN".

E. All conductors shall be of the same name brand and shall be in the original wrapping.

F. All conductors shall be Anaconda, Diamond, General Electric, General Cable, Paranite, Phelps-Dodge, Simplex, Triangle, or Southwire.

2.02 BRANCH CIRCUIT CONDUCTORS

A. Minimum wire size for lighting and power circuits shall be #12. #10 shall be used where the run to the first outlet exceeds 75' for 120V circuit and 150' for 277V circuit.

B. Branch circuit wiring, which supplies more than one light fixture through the wire-way of other fixtures, shall be rated for use at 150 degrees C.

C. Except for provisions of these specifications in Section 260533, paragraph 3.05, all power circuitry on this project shall be via wire in conduit.

2.03 METAL CLAD CABLE

A. Provide a factory assembly of one or more 90 degrees C. insulation rated conductors enclosed in

an armor of interlocking metal tape or a smooth or corrugated metallic sheath.

B. Approved manufacturers shall be Alflex Corp., Armorlite, and American Flexible Conduit Co., or equal.

C. Provide connectors rated specifically for use on MC cable. Connectors shall have an insulating sleeve or bushing provided between the armor and the conductors. Provide connectors that attach to cabinetry with locknuts. Other types are prohibited.

2.04 SPLICES AND TERMINATIONS

A. Splices for #10 AWG and smaller wire used on branch circuits and fixtures shall be of the "Live Spring" pressure type, Ideal Co. wing nut and/or wire nut type connectors or approved equal. Splices shall be rated 600 volts, or 1000 volts when enclosed in a fixture or sign.

B. Solderless, mechanical type lugs shall be used for terminal connections for copper conductors of #8 AWG or larger.

PART 3 - EXECUTION

3.01 WIRE AND CABLE

A. Conductors shall be continuous from outlet to outlet and from outlet to junction box or pull box. All splices and joints shall be carefully and securely made to be mechanically and electrically solid with "Live Spring" pressure type connectors, by "IDEAL CO." or approved equal. Tape shall be "Scotch" No. 33 for indoor and NO. 88 for outdoor or approved equal. Where connection is made to any material, copper terminal lugs shall be bolted or compression fitted to the conductors. Where multiple connections are made to the same terminal, individual lugs for each conductor shall be used.

B. Wire shall not be drawn into a conduit until all work on the conduit system, which might cause damage to the wiring, is complete. Ideal, Wire-Ease or approved equal may be used as lubricant.

C. Where two or more circuits run to a single outlet box, mark each circuit with appropriate markings (tags) as a guide to the fixture hanger in making fixture connections.

D. All stranded conductors shall be furnished with copper connecting lugs drilled or reamed the full diameter of the bare conductors.

E. Mains and feeders shall be run their entire length in continuous pieces without joints or splices, unless the runs are too long for a single conductor piece as supplied as a standard package by the manufacturer, then joint and/or splices installed per these specifications shall be used.

F. All splices, taps, terminations, etc. in the conductors shall be kept where they are permanently fully accessible for inspection and maintenance.

G. All wiring in cabinets, boxes, gutters, etc., shall be neatly tied and held in place by nylon cable ties and mounting brackets.

H. At each fixture outlet a loop or end of wire not less than 8" long shall be left for connection to fixtures.

I. Branch circuits shall contain the necessary number of conductors to afford the switch control indicated.

J. Splices, etc. in signal and/or communication conductors shall be made with crimp-on or soldered connections, which are properly insulated.

K. The Contractor shall not permit conductor bends to a radius less than 10 diameters or thickness on circuits of 600 volts or less.

L. Conductors, when installed, shall not have dents, cuts, scars, pressure indentations, abraded areas, etc. The Contractor shall replace any such conductors so damaged, at his expense.

M. Lubricants used to ease conductor-pulling operations shall be specifically manufactured for that purpose. TALC only shall be used on isolated branch circuit wiring.

N. An UL approved non-oxidation compound or grease (PENETROX by Burndy) is to be applied at all terminations of panel feeders, secondary service conductors, and primary (high voltage) service conductors prior to connection.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes the electrical grounding of all electrical systems and equipment provided on this project.

1.02 RELATED DOCUMENTS

A. All drawings and Division 01 of the specifications and the general conditions of the Contract apply to this section.

B. Specification section 260519 – Low Voltage Electric Power Conductors and Cables

1.03 REGULATORY REQUIREMENTS

A. All components, equipment, fittings, accessories, etc. required and furnished under this section shall be listed and labeled per the NEC by UL or other testing agency acceptable to the authority having jurisdiction, and marked for intended use.

B. All components, equipment, fittings, accessories, etc. required and furnished under this section shall comply with the NEC, particularly Article 250.

1.04 GROUNDING SYSTEM

A. Components of the grounding system shall include (but not limited to):
   1. Building water supply pipe
   2. Building structural steel
   3. Driven ground rod(s)

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. All grounding equipment shall be manufactured by ERICO International Corporation or equal.

B. Grounding conductor manufacturers shall be per Section 260519 of these specifications.

2.02 CONDUCTORS

A. All grounding conductors shall be copper. Conductors smaller than No. 8 AWG shall be solid; all other conductors shall be stranded. Ground conductors shall be bare or have type THHN insulation, green in color.

B. Aluminum grounding conductors shall not be used.

2.03 GROUND RODS

A. Ground rods shall be copper clad, sectional, solid steel, 10-ft. long, ¾ in. diameter.

B. Rods shall be threaded on both ends.

C. All couplings shall be bronze and made by the rod manufacturer.

2.04 CONNECTIONS

A. Grounding connections made to ground rods, building re-steel, counterpoise systems, etc. shall be made via exothermic welding means.

B. Grounding connections to pipes shall be made with bolted pressure type or compression type clamps manufactured for grounding purposes.

C. Grounding connections to boxes, fixtures, etc. shall be made at the factory provided grounding terminal.

PART 3 - EXECUTION

3.01 SERVICE GROUND

A. Provide driven ground rods in 3 separate locations arranged in a triangle, separated from each other by a minimum of 10 ft. Set rods so that top of final rod driven is 2 inches below grade at each of the 3 locations.

B. Connect ground rods together with grounding conductor via exothermic welding process. Provide connection to main service entrance disconnect ground bus connection point and to system neutral at this location with grounding conductor.

C. Provide grounding conductor from main service entrance disconnect ground bus to main building water service piping. Provide grounding conductor shunts around all valves and water meter in water service piping. Shunts shall be braided type, copper only.

3.02 BUILDING CONNECTIONS

A. Provide grounding conductors from main service entrance disconnect ground bus connection point to building foundation reinforcement steel and to building frame steel.

B. Provide bonding connections to all above ground sections of gas piping upstream from the equipment shutoff valve that the pipe feeds.

3.03 COMMUNICATIONS SYSTEMS

A. Provide a #4 AWG grounding conductor from the grounding electrode system to the communications system (fire alarm, security, telephone, data, cable television, etc.) utility service cabinet.

B. Provide connection to service and/or central equipment locations on a ¼" by 2" by 12" grounding bus.

3.04 EQUIPMENT CONNECTIONS

A. Provide grounds to all equipment requiring them, including, but not limited to:
1. Electric service
2. Secondary of transformers (except the isolating type).
3. Raceways and enclosures.
4. All neutral conductors.
5. Panelboards, switchboards, etc.
6. Ground terminals on receptacles, appliances, equipment, etc.

B. Make all connections with galvanically compatible materials.

C. Clean all connection points so that new bare metal only surfaces are involved in connections.

D. Tighten all bolts, screws, etc. on grounding connections to torque ratings of manufacturer, or per UL 486A if there are no manufacturer's instructions on torque settings.

E. Seal all grounding connections of dissimilar metals with inert product intended for this purpose to exclude moisture infiltration into connection joints.

F. Provide grounding connection for all step-down transformer neutrals to nearest building steel member.

3.05 Route all grounding conductors via shortest physical path possible without obstructing access to other systems or placing the conductors in locations where they will be subjected to any type of damage.

3.06 All bonding conductors (straps, jumpers, etc.) shall be installed so that their connections are isolated from equipment vibrations, etc.

3.07 In all raceway systems provide an equipment grounding conductor in addition to the circuit neutral inside the raceway with the phase conductors. Equipment grounding conductor shall be "Green" in color.

END OF SECTION

SECTION 26 05 29

SUPPORTING DEVICES

PART 1 - GENERAL

Not used.

PART 2 - PRODUCTS

2.01 MATERIAL

A. Support Channel: Galvanized or painted steel.

B. Hardware: Corrosion resistant.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using expansion anchors.

B. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.

C. Do not fasten supports to piping, ductwork, mechanical equipment, or conduit.

D. Do not use powder-actuated anchors.

E. Do not drill structural steel members.

F. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.

G. Install free-standing electrical equipment on 3" concrete pads.

H. Install surface-mounted cabinets and panelboards with minimum of four anchors. Provide steel channel supports to stand cabinet one inch off wall.

I. Bridge studs top and bottom with channels to support flush-mounted cabinets and panelboards in stud walls.

END OF SECTION

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.

1.02 LOCATION OF OUTLETS

A. Unless specifically indicated, all outlets are located diagrammatically on the drawings. Reference shall be made to the architectural and mechanical plans for the exact location of all outlets.

B. Outlets shall be located so that they will be symmetrical with architectural details and power outlets shall be so located as to properly serve the equipment.

1.03 JUNCTION BOXES AND PULL BOXES

A. Furnish and install junction and pull boxes as required to facilitate installation of the various raceway systems and as required by the NEC.

PART 2 - PRODUCTS

2.01 SECONDARY SERVICE CONDUIT

A. Secondary service duct from UTC's utility system pad mounted transformer shall be galvanized schedule 40 PVC encased in concrete. See electrical site plan.

2.02 COMMUNICATIONS SERVICE ENTRANCE CONDUIT

A. Communications service entrance duct from manhole shall be schedule 40 PVC. Where penetrations through slabs occur, use long sweep rigid steel conduit elbows.

2.03 FEEDERS AND BRANCH CIRCUITS

A. Rigid conduit or IMC shall be used for all feeders and sub-feeders and branch circuits, where exposed to possible physical damage. EMT shall be permitted in protected areas.

2.04 RIGID CONDUIT

A. All rigid conduit shall be of the best quality steel of standard dimensions, hot dip galvanized, threads included, clean and smooth inside. Conduit shall be manufactured as Electrical Conduit with the manufacturer's trademark or stamp on each length of conduit.

B. Fittings for all rigid conduits shall be steel or malleable iron as manufactured by Thomas and Betts or equal. DIE CAST FITTINGS OF ANY MATERIAL SHALL NOT BE USED.

2.05 ELECTRIC METALLIC TUBING (EMT)

A. EMT conduit shall be of the best quality steel of standard dimensions, hot dip galvanized, clean and smooth inside. Conduit shall be manufactured as Electrical Conduit with the manufacturer's trademark or stamp on each length of conduit.

B. Fittings for all EMT conduit shall be set screw type, made of steel, with case hardened locknuts, and nylon insulated throats; or steel setscrew fillings with case hardened locknuts, and nylon insulated throats. DIE CAST FITTINGS OF ANY MATERIAL SHALL NOT BE USED. Fittings shall be manufactured by Thomas and Betts or equal.

2.06 RIGID NONMETALLIC CONDUIT (PVC)

A. All PVC conduit shall be produced by the same manufacturer, be schedule 40, and manufactured as Electrical Conduit with the manufacturer's trade mark or stamp on each length of conduit.

B. All PVC conduit fittings and cement shall be secured from the conduit manufacturer.

C. All PVC conduit shall meet the following standards:
   1. Rated for 90 degrees centigrade.
   2. Shall have a tensile strength of 7,000 psi @ 73 degrees F.
   3. Shall have a flexural strength of 11,000 psi.
   4. Shall have a compressive strength of 8,600 psi.

D. PVC not allowed above grade.

2.07 FLEXIBLE CONDUIT

A. Flexible Steel Conduit (No Cover) shall be constructed of reduced wall galvanized steel and shall be manufactured as Electrical Conduit with the manufacturer's trademark or stamp.

B. PVC Extruded Cover Flexible Conduit shall be used in all outdoor applications. It shall be UL listed for outdoor use.

C. Connectors and fittings for flexible conduit shall be steel type with nylon insulated throats. Connectors shall "bite" into the conduit under pressure of the connector bolt. All connectors and fittings shall be manufactured by Thomas and Betts or equal.

2.08 BELOW GRADE CONDUIT AND CABLE SEAL

A. Seals for either conduit or cable below grade shall form a reliable lasting seal between building and the outside and shall be able to withstand pressures to a minimum head of 50 feet of water. The below grade seals shall be as manufactured by O.Z./Gedney, Roxtec or Hauff-Technik, and sized for the particular application.

2.09 THREADED JOINT COMPOUND

A. Threaded joint compound shall be a corrosive inhibiting compound that is electrically conductive under pipe joint pressure. The compound shall be Thomas and Betts "KOPR-HIELD" or approved equal.

2.10 CONDUIT IDENTIFICATION TAPE

A. Conduit identification tape for use in marking underground conduit runs shall be inert polyethylene, resistant to acids, alkalis, etc., which might be in the soil. The tape shall be a minimum of 4 mils thick, 6 inches wide, and yellow in color. It shall have the words "CAUTION – ELECTRIC LINE BURIED BELOW" imprinted along its entire length with a contrasting color permanent ink. The tape shall be "Terra Tape" as manufactured by Reef Industries, Inc., Houston, Texas; or equal.

2.11 PULL BOXES

A. All pull boxes shall be constructed of code gauge galvanized steel of the dimensions required by Article 314 of the NEC, according to the number, size, and position of conduits entering the box.

B. Pull boxes installed in vertical runs of conductors shall be provided with Red Seal type VVC or approved equal cable supports as required by Table 300-19 of the NEC.

C. Pull boxes for horizontal runs of feeder conductors which contain more than one feeder shall be provided with reinforced flange and removable 12 gauge 1-1/2" by 1-1/2" galvanized channel for support of conductors. Wood supports shall not be used.

D. Pull boxes installed in finished spaces shall be flush mounted and shall be provided with trim, hinged door, and flush latch with lock to match trims for flush mounted panelboards.

2.12 OUTLET BOXES

A. All outlet boxes shall be constructed of code gauge galvanized steel.

B. Outlet boxes specified herein are minimum size boxes. Larger boxes of the same type shall be provided if required by the NEC in consideration of the number and size of conductors installed.

C. Outlet boxes for surface mounted and pendant mounted lighting fixtures shall be four-inch

octagon boxes, 1-1/2 inches deep. Fixtures studs shall be provided for support of fixtures if required.

D. Outlet boxes for flush mounted lighting fixtures shall be four inches square boxes, 1-1/2 inches deep with blank cover.

E. Outlet boxes for switches, receptacles, and wall mounted junction boxes shall be four inches square boxes, 1-1/2 inches deep. Where only one conduit enters box, 3-1/2 inches deep single gang switch boxes may be used. Outlet boxes for GFCI receptacles shall be 2-3/4 inches deep.

F. Outlet boxes recessed in concrete block walls and partitions shall be designed especially for installation in concrete block and tile walls and partitions. Single gang or multi-gang square cornered masonry boxes shall be used for one or more devices at the termination of a conduit run. Conventional four inch octagonal or 4-11/16 inches square boxes fitted with square tile covers of proper depth for concrete block shall be used where two or more conduits enter a box.

G. Where specialty equipment such as fire alarm components, security components, etc., are installed, provide outlet boxes suitable in size for these devices.

H. Outlet boxes to be used in exposed conduit run shall be cast, ferrous alloy type. Outlet boxes for vapor-tight lighting fixtures shall be cast, corrosion resistant type.

2.13 FLOOR BOXES

A. Floor outlet boxes shall be adjustable, sheet steel, designed for use in concrete slabs, and watertight if noted on drawings.

B. Boxes for use in a floor to be carpeted shall be supplied with an adjustable brass carpet flange.

C. Unless otherwise noted on the drawings, boxes installed in slabs less than four inches thick shall be:
1. Hubbell # B-2529
2. Walker # 801
3. Thomas & Betts # 1752

Boxes installed in slabs more than four inches thick shall be:
1. Hubbell # B-2557
2. Walker # 800
3. Thomas & Betts # 1754

E. Watertight boxes shall be cast metal and adjustable. Provide rubber gasket and bronze disk. Boxes shall be:
1. Hubbell # B-2536
2. Walker # 800-C1
3. Thomas & Betts # 1810

F. Covers for all floor boxes shall be supplied in accordance with the use of the box.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Unless otherwise specifically noted on the drawings, ALL CONDUCTORS installed on this project shall be installed in conduit as specified herein.

B. Any conduit installed on this project shall be no smaller than ¾", except as specifically otherwise noted on the drawings. Where desirable for ease of installation, larger sizes than those called out on the drawings may be used. The contractor is responsible for resolution of any conflicts arising from the use of larger sizes.

C. Conduit shall be continuous from outlet to outlet, from outlet to panelboard cabinet, junction box, and/or pull box. Conduit shall enter and be secured to all boxes, etc., in such a manner that each raceway system will be electrically continuous from the service entrance to all outlets. All conduit from panelboard cabinets and junction boxes shall terminate in approved outlet boxes or conduit

fittings. Conduit connection to any box, which has no threaded hub for its reception, shall be installed with two locknuts.

D. In general, the conduit installation shall follow the general layout shown. However, this layout is diagrammatic only; and where changes are necessary due to structural conditions, other apparatus, or other causes, such changes shall be made without any additional cost to the Owner. Offsets in conduit are not indicated and must be provided by the contractor as required.

E. Junction boxes and pull boxes shall be provided and installed as required to facilitate the systems shown on the drawings. “AX” expansion fittings shall be installed in all conduit runs wherever they cross building expansion joints.

F. At couplings, conduit ends shall be threaded so they meet in the coupling. Right and left couplings shall not be used; conduit couplings of the Erickson type or approved equal shall be used at locations requiring such joints.

G. Connections in conduit installed in outdoor or indoor locations where exposed to continuous or intermittent moisture, shall provide a liquid-tight seal. The sealing hub fittings shall be of steel or malleable iron, with recessed sealing "0" ring and a nylon insulated throat, Thomas and Betts Series 370. All conduit and cable, communications or otherwise, which extend from the interior to the exterior below grade shall be sealed with a fitting designed for that particular use so as to be watertight.

H. No bends will be permitted with a radius less than size (6) times the diameter of the conduit nor more than 90 degrees.

I. All conduits shall be concealed in the wall, below floors or above ceilings unless otherwise directed or indicated. Concealed conduit shall be supported from the building structure at intervals not exceeding 8'-0". Concealed conduit above the ceiling shall be supported independent of ceiling construction. Where ceilings of the lay-in type are used, conduit must be installed high enough to permit removal of ceiling panels and lighting fixtures.

J. Where conduit is expressly shown to be run exposed, the conduit shall be supported at intervals not exceeding 8'-0" with straps and wood screws for wood construction, machine screws for metal construction, and expansion bolts for masonry construction. Exposed conduit in finished spaces that pass through walls or ceilings shall be provided with chrome plated escutcheons. Run exposed conduit, where permitted by this specification, parallel or at right angles to the building with approved galvanized iron clamps or hangers. Devices attached to masonry or slabs shall be secured with inserts and bolts or lead expansion sleeves. Provided a support at each outlet box, at each conduit elbow, and at each junction box. Wooden plugs inserted in drilled holes are not acceptable as support bases.

K. Where two (2) or more conduits are run parallel and adjacent, they shall be installed on gang hangers.

L. Where connections are made to motors more than 2'-0" away from walls or columns, a vertical conduit, minimum size 3/4", securely attached to floor and ceiling shall be installed and the wiring carried into and out of this conduit by means of condulets and flexible conduit.

M. Conduit embedded in concrete, which is in contact with the earth, and conduit installed outside the building below grade shall be PVC with rigid steel elbows where it turns up through floor slabs.

N. In masonry construction, wooden plugs inserted in drilled holes are NOT acceptable as bases for supports for conduit. The Contractor shall use approved types of galvanized wall brackets, beam clamps, strap hangers, or pipe straps secured by means of toggle bolts in hollow masonry units, expansion bolts in concrete or brick, machine screws or bolts and nuts in metal surfaces, and wood screws in wood surfaces.

O. Conduit runs left for future use shall be checked for unblocked passage by the use of a ball mandrel. Contractor shall leave a non-mildewing polyolefin pull line in each such conduit. The line shall have an average tensile strength of 200 lbs. for 1" or smaller conduit and 500-lbs. for

conduit larger than 1". Pull lines shall be based on the standard set by Ideal Co. product #31-343 for 200-lb. line and 32-244 for 500-lb. line.

3.02 CONDUIT PROTECTION

A. Conduit shall not be installed in any manner that will result in the accumulation of water inside the pipe.

B. Conduit shall be located a minimum of 6 inches away from any surfaces which will reach surface temperatures of 140°F. or above.

C. All conduit installed in the ground outside of the building shall be buried a minimum of 36 inches below finished grade, but in no case shall it be buried more than 48 inches deep without the written consent of the Engineer.

D. For all conduit installed in the ground outside of the building, provide identifying marker tape over the entire length of the conduit run. Place tape below finished grade between 12 inches and 18 inches absolute.

E. All conduit shall be secured in place and protected to prevent damage to work during construction. The ends of all conduit and conduit fittings shall be plugged to avoid filling with dirt, plaster, gypsum, etc. Plugs shall be Thomas and Betts series 1470.

F. All conduit shall be blown out and swabbed clear of water and trash prior to the installation of any conductors in the conduit.

3.03 GROUNDING AND TERMINATIONS

A. Connections to all panelboards, cabinets, pull boxes, etc., shall be installed with a grounding wedge lug between the bushings and the box; or with locknuts designed to “bite” into the metal of the box.

B. To ensure continuity of electrical ground and to improve conductivity, use Kopr-Shiel compound, series CP-8 as manufactured by Thomas and Betts on all rigid conduit threaded joints.

C. In ALL conduit runs, rigid or otherwise provide a green colored insulated grounding conductor inside the conduit with the phase conductors.

3.04 PENETRATIONS

A. Where any electrical item such as conduit, cable, communications cable, etc., penetrates a wall, floor, or ceiling, the original integrity for the respective wall, floor, or ceiling shall be restored. The opening around the item making the penetration shall be sealed airtight. If the surface penetrated is fire rated, the sealant shall have a fire rating equal to the original surface. In no case shall the penetration result in a lessening of the fire rating of the surface penetrated.

B. Any openings in surfaces left for future routing of electrical work shall be left sealed as noted in Item A above.

C. Provide sleeves for conduit, cables, etc., accurately before concrete floors are poured; or set boxes in the forms so as to leave openings in the floors so the required sleeves can be subsequently located. This is a post tension slab concrete system project; location of all floor sleeves and penetrations must be done in close coordination with the concrete contractor prior to any pours while the formwork is being built. It is the electrical contractor’s responsibility to understand this requirement and perform coordination accordingly. Core drilling of holes after the slabs are poured shall not be allowed.

D. Sleeves shall be rigid conduit with bushings installed on each end. Sleeves shall extend 6 inches beyond the surface they penetrate.

3.05 FLEXIBLE CONDUIT

A. Non-covered flexible steel conduit shall be used in making short connections from outlet boxes to recessed lighting fixtures. Such conduit runs shall be no longer than 72-inches.

B. Flexible conduit runs to other equipment shall be kept as short as possible, but shall have a minimum length of 12 inches.

C. Flexible conduit connections to dry type transformers, rotating or vibrating machinery, kitchen equipment, or any other equipment, which may result in the conduit being exposed to moisture, shall be PVC covered.

3.06 PVC CONDUIT

A. PVC conduit shall not be used above grade under any circumstances.

B. All PVC conduit joints of any type shall be solvent welded in accordance with the manufacturer's recommendations.

3.07 PULL BOXES

A. Pull boxes shall be provided where indicated on the drawings and/or where required to facilitate the installation of all required conductors or as required by NEC.

B. Pull boxes shall be installed exposed only in unfinished spaces. They shall be accessible.

C. Feeders within pull boxes shall be individually laced with nylon tie straps of the type with enlarged tab to permit identification of each feeder.

D. Conductors shall not be spliced inside pull boxes except with the approval in writing of the Architect. Where splices are permitted, they shall be made with splicing sleeves attached to the conductors with hydraulic crimping tools. Split bolt connectors shall not be permitted.

3.08 OUTLET LOCATIONS

A. Furnish and install outlet, junction, and pull boxes as required to facilitate the installation of the electrical systems as required.

B. All outlet, junction, and pull boxes shall be accessible with covers designed for quick removal. Where boxes are located above non-accessible ceilings, in walls, etc., in finished areas, the removable cover shall be flush with the finished surface all around and shall cover the wall opening completely. Cover finish and the exact location of the boxes shall be approved by the Architect.

C. The drawings are intended to show the locations of outlets, devices, fixtures and arrangement and control of circuits only. Exact locations shall be determined by actual measurement at the building and/or reference to the architectural drawings.

D. The location of any outlet may be moved ten feet with the prior approval of the Architect and before it is installed without any additional expense to the Owner.

E. Contractor shall check the location of all wall outlets including light fixtures, receptacles and switches, to verify that the outlets will clear any wall fixture, shelving, worktables, sinks or similar equipment that will be installed.

F. Outlets occurring in architectural features shall be accurately centered in same. Install wall switch outlets on the STRIKE SIDE of doors with cover plate clearing door trim.

G. Outlet boxes in non-fire rated partitions shall NOT be set back-to-back. Boxes set side by side facing separate rooms or spaces, shall be connected together by offset nipple; after conductors are pulled, the nipples shall be tightly packed with mineral wool to prevent sound transmission.

H. Outlet boxes in fire-rated partitions shown to be mounted on the opposite side of the partition at the same height, shall be separated horizontally by a minimum of 24 inches.

I. The mounting height of all wall outlets is indicated on the architectural or electrical drawings. The height is from the finished floor to the center line of the device or outlet. The Contractor may with the Architect's approval vary the mounting heights to correspond to masonry joints.

J. Were outlets are shown as being adjacent and different mounting heights are indicated for each,

they shall be mounted one directly over the other at the heights specified.

3.09 OUTLET BOXES

A. All outlet boxes shall be flush mounted within the wall regardless of wall construction, unless they are specifically shown as being used with exposed conduit. Cuts for outlet boxes in masonry walls shall be made so that the cover plate will completely cover the cut. The edge of all boxes shall be flush with the surface in which they are installed.

B. The devices that are to be installed in the boxes shall be screwed tight before cover plates are installed. Plates shall not be used as a means for tightening the devices or holding them in place.

C. Provide extension rings for all boxes when required by wall finish.

D. Junction boxes shall be provided with blank covers. Covers on ceiling outlets shall be round and shall be painted to match ceilings. Covers on wall junction boxes shall be of size and finish as used on switch and receptacle outlets.

E. Where outlets are shown as being adjacent and different mounting heights are specified for each, they shall be mounted ONE DIRECTLY over the other, on the center line of the group or on the center line of the room or wall.

F. The mount height of all wall outlets is indicated on the architectural or electrical plans. The mounting height is from finished floor to the centerline of the device or outlet. The Contractor may, with the Architect's approval on the job, slightly vary the mounting height of wall outlet so that the outlet box, top or bottom, will occur at a masonry joint.

G. Outlet boxes shall be provided with 3/8" fixture stud to support light fixtures. Outlet boxes shall be firmly anchored to structural member of the building, using wood screws for wood construction, bolts for steel construction, and expansion bolts secured in place with cement mortar for masonry construction. Ceiling outlet flush in furred acoustical tile ceiling construction for surface or pendant mounted lighting fixtures shall be in 4" square or octagonal pressed steel boxes supported from stud and rod, bars or hangers supported from the building structure independent of the ceiling construction. For outlet boxes located between steel studs, provide Caddy No. BHA; and adjacent to studs, provide Caddy No. MSC.

H. Where drawings indicate ganged installation of switches controlling 277 Volt lighting circuits of opposite phase, switches shall be separated by one full gang width, or separated with a permanently installed barrier between phase and/or different voltages.

I. Outlet boxes shall not be used as support for lighting fixtures.

END OF SECTION

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section includes equipment marking, wire and cable marking, and conduit marking.

1.02 RELATED SECTIONS

A. All conditions and requirements of Division 01 shall apply to the work specified in this section.

B. Painting

1.03 REGULATORY REQUIREMENTS

A. Furnish products that are manufactured and rated for labeling and marking electrical equipment.

PART 2 - PRODUCTS

2.01 EQUIPMENT NAMEPLATES

A. Nameplates shall be engraved three-layer laminated plastic. In all cases, inner layer shall be white in color.

B. Nameplates shall be provided on all electrical enclosures and/or cabinets.

C. Engraved letters shall be 3/8 inches high.

D. Nameplate outer layer color shall be:
   1. Emergency Power Systems - Red
   2. Normal Power Systems - Black

2.02 WIRE AND CABLE MARKERS

A. Markers shall be colored plastic tape for service entrance and feeder conductors and PVC sleeve type markers for branch circuit conductors.

B. PVC sleeve type markers shall be equal to Thomas & Betts E-Z-Code, white with black writing.

C. Service entrance and feeder conductor marking shall consist of phase identification follows:

208Y/120 Volt System	480Y/277 Volt System
Phase A - Black	Phase A - Brown
Phase B - Red	Phase B - Purple
Phase C - Blue	Phase C - Yellow
Neutral - White	Neutral - White with Black Stripe
Ground - Green	Ground - Green

D. Branch circuit conductor marking shall consist of the source panel name and the branch circuit number as listed in the panel schedules on the drawings.

2.03 UNDERGROUND RACEWAY MARKERS

A. Raceway route markers shall be 4” by 4” by 18” long concrete stakes.

B. Raceway route warning tape shall be inert polyethylene, resistant to acids, alkalis, etc., which might be in the soil. The tape shall be a minimum of 4 mils thick, 6 inches wide, and yellow in color. It shall have the words “CAUTION – ELECTRIC LINE BURIED BELOW” imprinted along its entire length with a contrasting color permanent ink. The tape shall be “Terra Tape” as manufactured by Reef Industries, Inc., Houston, Texas; or equal.

2.04 PANELBOARD CIRCUIT DIRECTORIES

A. Circuit directory cards shall be white heavy cardboard manufactured for the purpose, with machine written black ink circuit number legends.

B. Circuit identification shall be in agreement with the actual connections as guided by the panel schedules on the drawings.

2.05 SWITCHBOARD AND DOORLESS PANELBOARD CIRCUIT BREAKER MARKERS

A. Circuit breakers markers shall be as per paragraph 2.01 above.

B. Circuit identification shall be in agreement with the actual connections as guided by the panel schedules on the drawings.

PART 3 - EXECUTION

3.01 Clean and remove grease, etc. from all equipment surfaces that will receive nameplates.

3.02 Provide labels for all electrical panels, switchboards, disconnects, electrical cabinets, feeder and service raceways, motors, and major pieces of electrical equipment installed on this project.

3.03 Provide panelboards that have doors with a directory card of all circuits in the panel.

3.04 Provide circuit breakers in switchboards and in panelboards that do not have doors with labels stating the circuit number and what the breaker is supplying.

3.05 Label all feeder conduits and all single equipment branch circuit conduits in excess of 6 ft. in length with painted labels located at 20 ft. on center along the entire length of the conduit run.

3.06 Mark all underground conduit runs installed outside the building with stakes set with tops flush in the ground directly over the source, end, and bends locations in the conduit run.

3.07 Provide marker tape over the entire length of all underground conduit runs installed outside the building. Tape shall be installed at a depth between 12 and 18 inches below the surface of the ground directly over the conduit.

3.08 Mark all service entrance phase conductors and the neutrals with colored plastic tape to identify phase assignments on each end of the conductor and in all pull and/or junction boxes.

3.09 Branch circuit conductors shall be color-coded via insulation color as follows or existing color-coding system shall be maintained:

208Y/120 Volt System	480Y/277 Volt System
Phase A - Black	Phase A - Brown
Phase B - Red	Phase B - Purple
Phase C - Blue	Phase C - Yellow
Neutral - White	Neutral - White with Black Stripe
Ground - Green	Ground - Green

END OF SECTION

SECTION 26 05 73

ELECTRICAL POWER SYSTEM STUDIES

PART 1 - GENERAL

1.01 SUMMARY

A. The electrical equipment manufacturer shall provide electrical power system studies for the project job. The type and content of each study is specified in the following articles.

1.02 SUBMITTALS

A. Completed electrical power system studies shall be bound and submitted to the Designer.

PART 2 - PRODUCT

2.01 MANUFACTURERS

A. The specified electrical power system studies shall be performed by Square D Company or approved equal.

2.02 ELECTRICAL POWER SYSTEM STUDIES

A. Short-Circuit Analysis

1. Calculation of the maximum rms symmetrical three-phase short-circuit current at each significant location in the electrical system shall be made using a digital computer.
2. Appropriate motor short-circuit contribution shall be included at the appropriate locations in the system so that the computer calculated values represent the highest short-circuit current the equipment will be subjected to under fault conditions.
3. A tabular computer printout shall be included which lists the calculated short-circuit currents, X/R ratios, equipment short-circuit interrupting or withstand current ratings, and notes regarding the adequacy or inadequacy of the equipment
4. The study shall include a computer printout of input circuit data including conductor lengths, number of conductors per phase, conductor impedance values, insulation types, transformer impedances and X/R ratios, motor contributions, and other circuit information as related to the short-circuit calculations.
5. Include a computer printout identifying the maximum available short-circuit current in rms symmetrical amperes and the X/R ratio of the fault current for each bus/branch calculation.
6. The system one-line diagram shall be computer generated and will clearly identify individual equipment buses, bus numbers used in the short-circuit analysis, cable and bus connections between the equipment, calculated maximum short-circuit current at each bus location and other information pertinent to the computer analysis.
7. A comprehensive discussion section evaluating the adequacy or inadequacy of the equipment must be provided and include recommendations as appropriate for improvements to the system.
8. The contractor shall be responsible for supplying pertinent electrical system conductor, circuit breaker, generator, and other component and system information in a timely manner to allow the short-circuit analysis to be completed prior to final installation.
9. Any inadequacies shall be called to the attention of the Designer and recommendations made for improvements as soon as they are identified.

B. Protective Device Time-Current Coordination Analysis

1. The time-current coordination analysis shall be performed with the aid of computer software intended for this purpose, and will include the determination of settings, ratings, or types for the overcurrent protective devices supplied.
2. Where necessary, an appropriate compromise shall be made between system protection and service continuity with system protection and service continuity considered to be of equal importance.

3. A sufficient number of computer-generated log-log plots shall be provided to indicate the degree of system protection and coordination by displaying the time-current characteristics of series connected overcurrent devices and other pertinent system parameters.
4. Computer printouts shall accompany the log-log plots and will contain descriptions for each of the devices shown, settings of the adjustable devices, the short-circuit current availability at the device location when known, and device identification numbers to aid in locating the devices on the log-log plots and the system one-line diagram.
5. The study shall include a separate, tabular computer printout containing the suggested device settings of all adjustable overcurrent protective devices, the equipment where the device is located, and the device number corresponding to the device on the system one-line diagram.
6. A computer-generated system one-line diagram shall be provided which clearly identifies individual equipment buses, bus numbers, device identification numbers and the maximum available short-circuit current at each bus when known.
7. A discussion section which evaluates the degree of system protection and service continuity with overcurrent devices, along with recommendations as required for addressing system protection or device coordination deficiencies.
9. Significant deficiencies in protection and/or coordination shall be called to the attention of the engineer (architect) and recommendations made for improvements as soon as they are identified.
10. The contractor shall be responsible for supplying pertinent electrical system conductor, circuit breaker, generator, and other component and system information in a timely manner to allow the time-current analysis to be completed prior to final installation.

C. Arc-Flash Hazard Analysis
1. The Arc-Flash Hazard Analysis shall be performed with the aid of computer software intended for this purpose in order to calculate Arc-Flash Incident Energy (AFIE) levels and flash protection boundary distances.
2. The Arc-Flash Hazard Analysis shall be performed in conjunction with a short-circuit analysis and a time-current coordination analysis.
3. Results of the Analysis shall be submitted in tabular form, and shall include device or bus name, bolted fault and arcing fault current levels, flash protection boundary distances, personal-protective equipment classes and AFIE levels.
4. The analysis shall be performed under worst-case Arc-Flash conditions, and the final report shall describe, when applicable, how these conditions differ from worst-case bolted fault conditions.
5. The Arc-Flash Hazard Analysis shall be performed by a registered professional engineer.
6. The Arc-Flash Hazard Analysis shall be performed in compliance with IEEE Standard 1584-2002, the IEEE *Guide for Performing Arc-Flash Calculations*.
7. The Arc-Flash Hazard Analysis shall include recommendations for reducing AFIE levels and enhancing worker safety.
8. The proposed vendor shall demonstrate experience with Arc-Flash Hazard Analysis by submitting names of at least ten actual Arc-Flash Hazard Analyses it has performed in the past year.
9. The proposed vendor shall demonstrate capabilities in providing equipment, services, and training to reduce Arc-Flash exposure and train workers in accordance with NFPA 70E and other applicable standards.
10. The proposed vendor shall demonstrate experience in providing equipment labels in compliance with NEC-2002 section 110 and ANSI Z535.4 to identify AFIE and appropriate Personal Protective Equipment classes.

END OF SECTION

SECTION 26 22 13

DRY TYPE TRANSFORMERS

PART 1 - GENERAL

1.01 REFERENCES

A. ANSI/IEEE
   1. C57.110-1998 – IEEE Recommended Practice for establishing transformer capability when feeding non-sinusoidal load currents.
   2. 1100 – IEEE Recommended Practice for Powering and Grounding Sensitive Electronic Equipment.

B. ANSI/NEMA
   1. ST 20 – Dry Type Transformers for General Applications.
   2. 250 Enclosure for Electrical Equipment (1000 Volts Maximum).

C. Efficiency Standards
   1. TP-1 – Guide for Determining Energy Efficiency for Distribution Transformers.
   2. TP-2 – Standard Test Method for Measuring Energy Consumption of Distribution Transformers.
   3. CSA 802.2-00 Minimum Efficiency Values for Dry Type Transformers.

D. Seismic Standards
   1. International Building Code (IBC), 2006 ICC Edition.
   2. Tri-axial shake table test results conducted in accordance with the AC156 test protocol 3 (Acceptance Criteria for Seismic Qualification Testing of Nonstructural Components).

E. International Standards Organization (ISO)
   1. ISO 9001:2000 – Quality Management System.
   2. ISO 14001:2004 – Environmental Management System.

F. Underwriters Laboratory (UL) and Canadian Standard Association
   1. UL 1561 – Dry-Type General Purpose and Power Transformers.
   2. CSA C22.2 No.47-M90 Air-Cooled Transformer (Dry Type).

G. NFPA 70 – National Electrical Code

1.02 PACKAGING FOR SHIPMENT

A. Transformers shall be packaged for shipment using materials that will have the least environmental impact.
   1. Transformer Wrapping
      a. Transformers shall be protected by Cardboard protective material – all plastic wraps will not be accepted.
   2. Transformer Shipping Base
      a. Transformers shall be shipped on a base that uses at least 50% less wood than traditional pallets.

1.03 DELIVERY, STORAGE AND HANDLING

A. Store in a warm, dry location with uniform temperature. Cover ventilation openings to keep out dust, water and other foreign material.

B. Handle transformers using lifting eyes and/or brackets provided for that purpose. Protect against unfavorable external environment such as rain and snow, during handling.

1.04 SUBMITTAL DOCUMENTATION

A. Submit product data including the following:
   1. Copy of ISO 9001:2000 Certification of manufacturing operation.
   2. Copy of ISO 14001:2004 Certification of manufacturing operation.
   3. Confirmation that transformer(s) are UL 1561 Listed with a K-9 Rating.

4. Construction Details including enclosure dimensions, kVA rating, primary and secondary nominal voltages, voltage taps, unit weight.
5. Basic Performance characteristics including insulation class, temperature rise, core and coil materials, impedances and audible noise level, unit weight, inrush data RMS.
6. Efficiency Data:
    a. No load and full load losses will be calculated per NEMA ST20 test methods.
    b. Efficiency Curves:
        1) Linear Loads.
        2) Data per the non-linear load test program.
7. Documentation describing non-linear load test program.
8. Documentation that materials used for shipment packaging meet the environmental requirements identified in paragraph 1.2 above. Provide a representative picture of the packaging materials.

B. Description of manufacturer's factory non-linear load test program.

PART 2 - PRODUCTS

2.01 BASIS OF DESIGN

A. Transformers shall be designed to be a NEMA Premium efficiency standard for the purpose of contributing to LEED Energy & Atmosphere (Optimize Energy Performance) and Utility Rebates.

B. Transformers designed to the lowest legal efficiency standard, thus not providing the contributions listed above, are not acceptable for meeting the requirements of this specification.

C. Premium 30 Efficient transformers with internal losses at 35% loading reduced by 30% when using temperature and material correction factor to 75°C per NEMA Standard TP1.

D. Load Mix: Transformer shall be UL 1561 Listed to feed a mix of equipment load profiles such as computers without derating or significant degradation of efficiency.

2.02 MANUFACTURERS

A. Square-D

B. Siemens

C. General Electric

2.03 PRODUCT

A. The transformer shall be UL 1561 Listed and Labeled with a K-9 Rating (per UL 1561 35.2.1 and 34.2: K-7 is not allowed).

B. Construction: Windings shall be continuous wound copper with brazed or welded terminations.

C. Insulation & Varnish Systems: UL recognized 220 degree C class; Epoxy Polyester impregnation.

D. Maximum Winding Temperature Rise: 130 degree C in a 40 degree C maximum ambient.

E. All terminals, including those for changing taps, must be readily accessible by removing a front cover plate.

F. The transformer shall have a Basic Impulse Level of 10kV BIL.

G. Voltage Taps:
1. For transformers 15kVA-300kVA, provide two 2-1/2% full capacity taps above and four 2-1/2% below nominal primary voltage.

H. Impedance shall be the manufactures standard, but in no case shall it be less than 4.2%.

I. No load losses shall not exceed the following values:
1. 15 kVA: 55 W
2. 30 kVA: 90 W

3. 45 kVA: 125 W
4. 75 kVA: 165 W
5. 112.5kVA: 230 W
6. 150kVA: 290 W
7. 225kVA: 435 W
8. 300kVA: 560 W

J. Three Phase Transformer efficiency shall be as stated below: (tested at 35% of the nameplate rating, per NEMA TP-1, and TP-2)
1. 15 kVA: 97.88%
2. 30 kVA: 98.24%
3. 45 kVA: 98.38%
4. 75 kVA: 98.59%
5. 112.5kVA: 98.73%
6. 150kVA: 98.80%
7. 225kVA: 98.95%
8. 300kVA: 99.02%

K. Enclosure type shall be NEMA 2 with a minimum manufacturing clearance of 3" to comply with NEC – 2008 450.9 Ventilation.

L. Sound Levels
1. kVA Rating Sound Level B 3dB below NEMA Standard
a. 15 to 50 kVA 42 dB
b. 51 to 150 kVA 47 dB
c. 151 to 300 kVA 52 dB

M. The transformer shall have a 200% rated neutral.

N. Voltage Taps:
1. For transformers 15kVA - 300kVA, provide two 2-1/2% full capacity taps above and four 2-1/2% below nominal primary voltage.

O. Electrostatic Shield: Each transformer winding shall have an independent, single, full-width electrostatic shield arranged to minimize interwinding capacitance.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Set transformer plumb and level.

B. Use flexible conduit, 2' minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.

C. Mount transformers on vibration isolating pads suitable for isolating the transformer noise from the building structure.

D. Provide seismic restraints.

3.02 FIELD QUALITY CONTROL

A. Check for damage and tight connections prior to energizing transformer.

B. NEMA ST-20
1. Open Circuit Test (No Load Losses):
a. Use for both Linear and Non-Linear.
b., Measure Power.
2. Short Circuit Test (Load Losses):
a., Short Primary Winding
1) Linear Test B complete with linear profile through secondary winding.
2) Non-Linear Test
a) Complete with non-linear K-9 profile through secondary windings.

b. Measure Power

C. Take data and graph efficiency per NEMA ST-20.
   1. Graph 1 - Linear Loads 0 to 100% loads.
   2. Graph 2 - Non-linear Profile K-9 0 to 100% loads.

D. Test Plans Measuring Power In and Power Out will not be accepted since procedures are not covered by any Standard.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Lighting and appliance panelboards

1.02 RELATED SECTIONS

A. Overcurrent Protective Devices

1.03 REFERENCES

The panelboards and protection devices in this specification shall be designed and manufactured according to latest revision of the following standards, latest editions:

A. ANSI

B. NEMA

C. UL

1.04 DEFINITIONS

A. Overcurrent Protective Device -- a circuit breaker pole or single fuse. Example: a 2-pole device is considered 2 protective devices.

1.05 SYSTEM DESCRIPTION

A. Short circuit rating of panelboards shall be 22,000 aic for all 208/120 Volt panelboards fed from step down transformers. Short circuit rating of panelboards rated at 480/277 volts shall be series rated with the mains that feed these panels. In keeping with the applicable UL series rating for proper main and branch device combinations. Available fault current at the terminals of the service entrance switchboard will be assumed to be 65,000 amps. All series rating calculations shall be based on this number. Contractor shall have the factory verify all series rated panels.

B. Panelboards shall have a maximum of 42 protective devices per panel, including sub-feeders and excluding main overcurrent protective devices. For more than 42 devices, 2 or more panelboards are required.

C. Where 2 or more panelboards are used to provide more than 42 devices in one “panelboard”, sub-feed lugs or thru-feed lugs shall be used in each individual panel except the last panel. Lugs shall have same capacity as incoming mains. Cable inter-connections between panels shall be field installed.

D. Protective devices shall be molded case circuit breakers.

E. Panelboards shall be provided with transient voltage surge suppression per Section 234313 of this specification where indicated on drawings.

1.06 SUBMITTALS

A. Manufacturer shall provide copies of following documents to owner for review and evaluation in accordance with contract general requirements and Division 26:
   1. Product Data on specified product
   2. Shop Drawings on specified product
   3. Certified trip curves for each specified product

1.07 OPERATION AND MAINTENANCE DATA

A. Manufacturer shall provide copies of installation, operation and maintenance procedures to owner in accordance with contract general requirements of and Division 26.

B. Submit operation and maintenance data based on factory and field testing, operation and maintenance of specified product.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products in accordance with recommended practices in manufacturer's Installation and Maintenance Manuals.

B. Deliver each lighting panelboard in individual shipping cases for ease of handling. Each panelboard shall be wrapped for protection.

C. Damage that exists to equipment delivered is the responsibility of the electrical contractor to rectify at no cost to the contract.

D. Store in a clean, dry space. Maintain factory protection or cover with heavy canvas or plastic to keep out dirt, water, construction debris, and traffic. (Heat enclosures to prevent condensation.)

E. Handle in accordance with NEMA and manufacturer's written instructions to avoid damaging equipment, installed devices, and finish.

1.09 WARRANTY

A. Manufacturer warrants equipment to be free from defects in materials and workmanship for 1 year from date of installation or 18 months from date of purchase, whichever occurs first.

1.10 MAINTENANCE SERVICE

A. Furnish complete service and maintenance of lighting and appliance panelboards for 1 year from date of substantial completion.

B. Include parts and labor.

1.11 EXTRA MATERIALS

A. Provide spare circuit breakers as indicated in the panel schedules on the drawings.

1.12 FIELD MEASUREMENTS

A. Make all necessary field measurements to verify that equipment shall fit in allocated space in full compliance with minimum required clearances specified in National Electrical Code.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Square D Company products have been used as the basis for design. Other manufacturers' products of equivalent quality, dimensions and operating features may be acceptable, at the Engineer's discretion, if they comply with all requirements specified or indicated in these Contract documents.

2.02 COMPONENTS

A. Refer to Drawings for: actual layout and location of equipment and components; current ratings of devices, bus bars, and components; voltage ratings of devices, components and assemblies; and other required details.

B. Ratings
   1. Lighting and appliance panelboards shall be rated as indicated in drawings.

   2. Maximum current ratings for mains, sub-feeds and branches, respectively, shall be specified in drawings.

C. Enclosure
   1. Boxes shall be a nominal 20 inches wide and 5.75 inches deep with wire bending space per National Electric Code. Electrical Contractor to Coordinate with Architect to

ensure that any walls which have recessed panels are located and a minimum of 6" deep prior to work.

2. Fronts shall be reinforced steel with concealed hinges and concealed trim adjusting screws. Trim clamps are unacceptable.
3. All door locks shall be metallic corbin latch bolt type or equivalent. All door locks shall be keyed for a single key.
4. Clear Lexan (or equal) directory card holders shall be permanently mounted on front door.
5. All panelboard fault current ratings shall be prominently displayed on dead front shield.
6. Interiors shall permit top or bottom incoming cables.

D. Bus Bars

1. Bus bars shall be phase sequenced, fully insulated and supported by high impact Noryl (or equal) interior base assemblies.
2. Bus bars shall be mechanically supported by zinc finished galvanneal steel frames to prevent vibration and damage from short circuits.
3. Terminations shall be UL tested and listed and suitable for UL copper wire.
4. Provide 1 continuous bus bar per phase. Each bus bar shall have sequentially phased branch circuit connectors bolt-on branch circuit breakers. Bus bars shall be rated as indicated in drawings.
5. Split solid neutral bus shall be plated and located in main compartment for all incoming neutral cables to be same length.
6. Lugs shall be rated for 75 degree C terminations.
7. Main lugs for copper conductors shall be bolted lugs. Lugs for aluminum conductors shall be compression lugs.
8. Lug bodies shall bolt in place.

E. Circuit Breakers

1. Molded case circuit breakers shall be bolt-on devices for 120/240V panels and shall be bolt-on for 277/480V panels.
2. All circuit breakers shall have thermal and magnetic trip elements in each pole.
3. Multi-pole breakers shall have internal common trip crossbars for simultaneous tripping of each pole.
4. Circuit breakers shall not be restricted to any mounting location due to physical size.
5. All branch breakers 15 to 100 amperes shall be able to be mounted in any panel position for twin or double mounting without space penalty. Sum of ratings for 2 such twin mounted devices shall not exceed 180 amperes.
6. Main and sub-feed circuit breakers may be vertically or horizontally mounted.
7. Branch breaker panelboard connections shall be copper to copper.
8. All panelboard terminations shall be rated as indicated in drawings.
9. All breakers shall have an over center mechanism and be quick make and quick break.
10. All breakers shall have handle trip indication and a trip indicator in window of circuit breaker housing.
11. Breaker handle and faceplate shall indicate rated ampacity.
12. Circuit breaker escutcheon shall have standard ON/OFF markings.
13. Main breakers shall be UL listed for use with: Shunt, Under Voltage, and Ground Fault Shunt Trips; Auxiliary and Alarm Switches; and Mechanical Lug Kits.
14. Branch breakers shall be UL listed for use with: Shunt Trips, Auxiliary and Alarm Switches.

2.04 ACCESSORIES

A. Furnish nameplates for each device as indicated in drawings. Color schemes shall be as indicated on drawings.

B. Provide Transient Voltage Surge Suppression system as specified in the TVSS section and on prints where indicated on drawings.

2.06 FINISH

A. Boxes shall be corrosion resistant, zinc finish galvanneal.

B. Fronts shall be powder finish painted ANSI 61 gray.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that A-Series® panelboards are ready to install.

B. Verify field measurements are as shown on Drawings.

C. Verify that required utilities are available, in proper location and ready for use.

D. Beginning of installation means installer accepts conditions.

3.02 INSTALLATION

A. Install per manufacturer's instructions.

B. Provide required safety labels.

3.04 FIELD QUALITY CONTROL

A. Verify, and correct if required, that installed panelboards are correctly anchored, aligned, grounded and physical undamaged.

B. Verify, and correct if required, tightness of all accessible mechanical and electrical connections with calibrated torque wrench. Minimum acceptable values are specified in manufacturer's instructions.

C. Test each key interlock system for proper functioning.

3.05 ADJUSTING

A. Adjust all circuit breakers, access doors, operating handles to insure free operation as described in manufacturer's instructions.

3.06 CLEANING

A. Clean interiors of panels to remove construction debris, dirt, shipping materials.

B. Repaint scratched or marred exterior surfaces to match original finish.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The General Supplementary Conditions, and General Requirements (Divisions 1), apply to the work specified in the Section.

1.02 SWITCHES, RECEPTACLES AND COVERPLATES

A. Provide switches, receptacles, and coverplates as indicated on the plans and as specified herein.

B. All devices used by the contractor shall be UL approved and certified as meeting federal specifications as well as NEMA performance standards.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials provided under this Section shall be manufactured and tested under the following standards:

1. NEMA WD-1 General Wiring Devices
2. ANSI/UL 498 Electrical Attachment Plugs and Receptacles
3. ANSI/UL 20 General Use Snap Switches

B. All devices provided shall be UL listed and labeled.

2.02 SWITCHES

A. Control switches for general lighting shall be quiet action, flush mounted, toggle handle type. Terminals shall be wire-wrap screw type. Switches shall be rated for 120-277 Volt service, 20 amperes.

B. Switches shall be specification grade, color as indicated by Architect in shop drawing review process, and manufactured as follows:

1. Single pole – 20AC1
2. Three way – 20AC3
3. Four way – 20AC4

2.03 RECEPTACLES

A. Convenience receptacles, either single or duplex type, for general-purpose use shall be rated 125 volts, 20 Ampere. They shall have wire-wrap screw type terminals, straight non-locking blade slots, and U-ground as by NEMA 5-20R configuration. They shall be constructed of two-piece molded housing with a wrap around type mounting strap and shall have double-wiping bronze contacts. Devices are to have finder grooves.

B. Colors for plug receptacles shall be indicated by the Architect in the shop drawing review process.

C. Plug receptacles shall be commercial specification grade as manufactured by P&S or equal as follows:

1. Duplex rated at 20 amps – CRF20
2. Ground fault interrupter duplex rated at 20 amps – 2094.

D. Plug receptacles for special purposes or of special construction shall be so stated and specifications given on the drawings.

2.04 FLOOR OUTLETS

A. Floor outlet receptacles shall be duplex as above installed in floor boxes as specified in Section 16131 of these specifications.

2.05 COVERPLATES

A. Coverplates shall be commercial specification grade. Plates shall match the device or combination of devices in question. See drawings for any notes on specialty plates.

B. Covers for weatherproof outlets shall be gasketed and have flip covers for each device. Exposed devices to have in use covers.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Where more than one device is indicated at a location, the devices shall be mounted in combined sectional gang boxes and covered jointly by a common plate.

B. Light switches shall be installed on the strike side of doors as actually installed; advise Architects where drawings contradict.

C. The Architect reserves the right to relocate any wiring device up to a distance of ten feet from the location shown, before rough in, without additional cost.

D. All junction boxes, outlet boxes, sectional switch boxes, utility boxes, etc. shall be covered with a finished coverplate unless specifically noted otherwise.

E. Device plates shall be securely fastened using all required screws. All four (4) edges shall be in continuous contact with finished wall surfaces.

F. Coverplates shall be mounted with vertical orientation, unless otherwise noted or shown on drawings.

END OF SECTION

SECTION 26 28 16

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.01 The term enclosed switch shall refer to fused switches, motor switches, twist-lock receptacles, and any other mechanical device designed to physically interrupt a circuit other than overcurrent protective devices.

1.02 Equipment furnished under this section shall be designed, manufactured, and tested in accordance with the following standards:

A.	NEMA KS1	Air Break Switches
B.	ANSI-C33.64	Safety Standard for Enclosed Switches
C.	UL-98	Safety Standards for Enclosed Switches
D.	NEMA AB-1	Molded Case Circuit Breakers
E.	UL 489	Branch Circuit and Service Circuit Breakers

PART 2 - PRODUCTS

2.01 Switches for use on circuits of voltages at 600 and below, shall be safety switches which:

A. Are UL listed, E-4669

B. Are equipped with full cover interlocks so that they can not be opened with switch in the "ON" position, without manually overcoming the interlock as per the manufacturer's instructions.

C. Are equipped with quick-make, quick-break mechanisms.

D. Are suitable for use as service entrance equipment when installed in accordance with the NEC

E. Housed in NEMA 1 enclosures on indoor dry applications and NEMA 3R enclosures on outdoor or damp applications.

F. Have covers with handles, which can be padlocked, to secure the operating handle in the "OFF" position.

G. All disconnects to be heavy duty.

2.02 Switches shall be fusible types unless otherwise noted on the drawings.

2.03 Switches shall be as manufactured by GE, SIEMENS, Eaton, or Square D.

2.04 CIRCUIT BREAKERS

A. Circuit breakers shall be molded case type, equipped with a quick-make, quick-break mechanism. Breakers shall be thermal-magnetic type and have automatic release by means of thermal elements in each phase.

B. Breakers shall be rated for the application and be ambient temperature compensated.

C. Breakers shall have silver alloy contacts, be equipped with heat-absorbing arc-chutes, and have straight in wiring UL listed lugs of the same rating as the breaker frame.

D. Breaker ampacity shall be marked on the breaker case and be visible from the front when the breaker is installed.

E. When tripped, the breaker handle or toggle shall be in a position between "ON" and "OFF" and shall not be capable of re-closing until the handle or toggle is moved to the "OFF" position first.

F. Breakers with two or three poles shall have handles, which are factory made to trip all poles together. Field-made "tie" handles will not be permitted.

G. Breakers shall match and be manufactured by the same company that manufactures the

panelboard in which they are installed.

H. Breakers shall have an interrupting capacity not less than the available fault current at the breaker. Unless otherwise specified or scheduled on the drawings, all breakers are to be series rated by the manufacturer for the available fault current indicated at the main on the drawings.

I. All circuit breakers shall be bolt in type. Plug in breakers shall not be permitted.

J. All circuit breakers size 125 amp or larger to have interchangeable plug ratings.

2.05 GROUND FAULT CIRCUIT INTERRUPTER BREAKERS

A. Ground fault protective devices shall be constructed so as to have a sensor, which encircles all conductors, including the neutral. This sensor shall react to an unbalance of current in the conductors so as to trip the circuit-interrupting device and open the circuit. The device shall detect leaks of 5 milliamperes and open the circuit within 1-1/2 to 3 cycles of current.

PART 3 - EXECUTION

3.01 Disconnect switches are appurtenances to the project. Their locations, while required to meet the NEC, shall not cause any impediment to the project. Therefore, the contractor shall verify the location of all disconnect switches required by the project, prior to their installation. The installed location of any disconnect shall not impede the access to, or the working space around, any piece of equipment. Neither shall the location cause any loss of equipment performance or maintainability due to impeded air flows, blocked access panels or doors, etc. As disconnect switches are generally shown diagrammatically without dimensions, this requirement applies regardless of the location shown on the drawings. If there is any question as to the location of any disconnect, the contractor shall ask the engineer for clarification prior to installation. (While it may appear that a chosen location is appropriate, coordination with other trades must be made by the contractor to ensure that other equipment to be installed at a later date will not cause the disconnect location to be problematic.) If any disconnect is found to be installed in a location which causes problems for the equipment as implied above, the disconnect shall be relocated at the sole expense of the contractor.

3.02 Switches shall be installed so as to be readily accessible with proper spacing in front per the NEC.

3.03 Switches shall be securely mounted on brackets, unistrut type rails, etc. Do not mount directly to masonry, sheetrock, etc., without proper support from structure or proper standoff brackets. Do not mount disconnects on the equipment they serve.

3.04 Bolts, terminal screws, etc., for switches shall be tightened to securely hold the devices, conductors, or pads to the points of termination or support. Loose connections shall not be permitted. Multiple hole pads or termination plates shall be installed with ALL bolts required so that there are no bolt holes unused.

3.05 All switches shall be identified per the corresponding sections of this specification.

END OF SECTION

SECTION 26 43 13

TRANSIENT VOLTAGE SUPPRESSION FOR LOW VOLTAGE ELECTRICAL POWER SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section describes the materials and installation requirements for transient voltage surge suppressors (TVSS), including integrated TVSS in switchboards, distribution and branch panelboards and motor control centers for the protection of all AC electrical circuits.

1.02 STANDARDS

Most Recent Editions of:

A. ANSI/IEEE C62.41, C62.45 & C62.48

B. National Electric Code

C. Underwriters Laboratories: UL1449 & UL1283

PART 2 - PRODUCT

2.01 TRANSIENT VOLTAGE SURGE SUPPRESSORS

A. Surge Suppressor
   1. TVSS shall be Listed in accordance with UL 1283 and 1449 Second Edition.
   2. TVSS shall be marked with a short circuit current rating and shall not be installed at a point on the system where the available fault current is in excess of that rating. (This is Article 285.6 of the 2002 NEC and is the Engineer's requirement, regardless of whether or not the Authority Having Jurisdiction adopts the 2002 Code.)
   3. Integral TVSS shall be installed by, UL Listed by and shipped from the electrical distribution equipment manufacturer's factory. Field or aftermarket conversions are disallowed.
   4. TVSS shall provide surge current diversion paths for all modes of protection; L-N, L-G, N-G in WYE systems, and L-L, L-G in DELTA systems.
   5. TVSS shall be modular in design. Each module shall be fused with a surge rated fuse and incorporate a thermal cutout device. (Note: thermal cutouts protect against sustained overvoltages.)
   6. At Service Entrance, a UL approved disconnect switch shall be provided as a means of disconnect if a 60A breaker is not available.
   7. TVSS shall meet or exceed the following criteria:
      a. Maximum surge current capability (single pulse rated) per phase or per mode as indicated on the drawings.
      b. UL 1449 Listed and Recognized Component Suppression Voltage Ratings shall not exceed the following:

VOLTAGE	L-N	L-G	N-G
208Y/120	400V	400V	400V

   8. TVSS shall have a minimum EMI/RFI filtering of -50dB at 100kHz.
   9. TVSS shall be provided with 1 set of NO/NC dry contacts.
   10. Service entrance TVSS shall be provided with a surge counter.
   11. TVSS shall have a five-year warranty. Warranty shall be the responsibility of the electrical distribution equipment manufacturer and shall be supported by their respective field service division.

2.02 MANUFACTURERS

A. TVSS units shall be provided for the panelboards by the panelboard manufacturer as an

integral part of the panelboard unit.

PART 3 - EXECUTION

3.01 Provide TVSS units for all panelboards on this project, integral from the factory.

3.02 If necessary, adjust circuit breaker layouts and numbering in the panelboards in reference to the panel schedules on the drawings to accommodate the overcurrent provision by the factory for the TVSS unit.

END OF SECTION

SECTION 26 50 00

LIGHTING FIXTURES

PART 1 - GENERAL

Not used.

PART 2 - PRODUCTS

2.01 INTERIOR LUMINAIRES AND ACCESSORIES

A. All LED light engines (combination of diodes, driver, heat sink, housing and optics), whether screw-in or hardwired, shall meet all of the following:
   1. The rated driver input wattage and total number of LEDs shall be published by the manufacturer for each fixture unit.
   2. The LED fixture manufacturer shall have been in business and producing LED fixtures for a minimum of 10 years.
   3. All LED fixtures shall be dimmable either by CAT 5 communications, or 0 to 10 Volt controls.
   4. All LED fixtures shall be DLC listed.
   5. All LED fixtures shall be Energy Star listed.
   6. All LED fixtures shall be UL listed

B. Housings shall be formed of cold rolled steel. Housings shall be painted after fabrication.

C. LED units shall be manufactured for 50 to 100 thousand hours of operation. LEDs shall exhibit 99% lumen maintenance at 60,000 hours of operation.

D. All drivers and internal components of all fixtures shall be accessible from the floor side of the installed fixture.

2.02 EXTERIOR LUMINAIRES AND ACCESSORIES

A. Enclosures: Complete with gaskets to form weatherproof assembly.

B. Exterior LED fixtures shall be manufactured and rated for outdoor installation.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install fixtures complete and ready to operate.

B. Support surface-mounted luminaires directly from building structure, provide auxiliary support laid across top of ceiling Ts. Install fluorescent luminaires larger than 2' x 4' size independent of ceiling framing.

C. Install recessed luminaires to permit removal from below. All recessed fixtures shall be supported from the structure of the building, not from the ceiling grid. Provide air plane cable ties to structure from 2 of the four corners of the recessed fixtures for seismic support.

D. Luminaire Pole Bases: Size and constructed as indicated on Drawings. Project anchor bolts 2" minimum above base. Install poles on bases plumb; provide double nuts for adjustment. Grout around pole base.

E. Use belt slings or non-chafing ropes to raise and set pre-finished luminaire poles.

3.02 REPLACEMENT

A. Replace failed fixture components as required up to complete fixture for any fixture that is not operating properly at building construction completion prior to turn over to owner.

3.03 ADJUSTING AND CLEANING

A. Align luminaires and clean lenses and diffusers at completion of Work. Clean paint splatters, dirt, and debris from installed luminaires.

B. Touch up luminaire and pole finish at completion of work.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:
   1. Protecting existing trees to remain.
   2. Removing existing trees, shrubs, groundcovers, plants, and grass.
   3. Clearing and grubbing.
   4. Stripping and stockpiling topsoil.
   5. Removing above- and below-grade site improvements.
   6. Disconnecting, capping or sealing, and abandoning site utilities in place or removing site utilities.
   7. Temporary erosion and sedimentation control measures.

B. Related Sections include the following:
   1. Division 31 Section "Earthwork" for soil materials, excavating, backfilling, and site grading.
   2. Division 32 Section "Landscaping" for finish grading, including placing and preparing topsoil for lawns and planting.

1.03 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of weeds, roots, and other deleterious materials.

B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.04 MATERIALS OWNERSHIP

A. Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

1.05 SUBMITTALS

A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

B. Record drawings according to Division 1 Section "Contract Closeout."
   1. Identify and accurately locate capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.06 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1.07 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Protection of Existing Improvements: Provide protection necessary to prevent damage to existing improvements indicated to remain in place.
1. Protect improvements on adjoining properties and on Owner's property.
2. Restore damaged improvements to their original condition, as acceptable to property owners.

C. Improvements on Adjoining Property: Authority for performing indicated removal and alteration work on property adjoining Owner's property will be obtained by Owner before award of Contract.

D. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

E. Notify utility locator service for area where Project is located before site clearing.

F. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

1.08 EXISTING SERVICES

A. General: Indicated locations are approximate; determine exact locations before commencing Work.

B. Arrange and pay for disconnecting, removing capping and plugging utility services. Notify affected utility companies in advance, minimum forty-eight hours, and obtain written approval before starting work.

C. Place markers to indicate location of disconnected services. Identify service lines and capping locations on Project Record Documents.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 31 Section "Earthwork."
1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Locate and clearly flag trees and vegetation to remain or to be relocated.

D. Protect existing site improvements to remain from damage during construction.
1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.02 TEMPORARY SEDIMENT AND EROSION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.03 TREE PROTECTION

A. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.
   1. Do not store construction materials, debris, or excavated material within drip line of remaining trees.
   2. Do not permit vehicles, equipment, or foot traffic within drip line of remaining trees.

B. Do not excavate within drip line of trees, unless otherwise indicated.

C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
   1. Cover exposed roots with wet burlap to prevent roots from drying out.
   2. Temporary support and protect roots from damage until they are permanently relocated and covered with soil
   3. Coat cut faces of roots more than 1-1/2 inches in diameter with emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
   4. Backfill with soil as soon as possible.

D. Maintain fenced area free of weeds and trash.

E. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.
   1. Employ a qualified arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
   2. Replace trees that cannot be repaired and restored to full-growth status, as determined by the qualified arborist.

3.04 UTILITIES

A. Contractor shall arrange for disconnecting and sealing utilities that serve existing structures before site clearing and demolishing begins.
   1. Coordinate schedule with Owner.
   2. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
   1. Arrange to shut off indicated utilities with utility companies. Pay any required fees.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Architect not less than two days in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without Architect's written permission.

D. Excavate for and remove underground utilities indicated to be removed.

3.05 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.
   1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
   2. Cut minor roots and branches of trees indicated to remain in a clean and careful

manner where such roots and branches obstruct installation of new construction.

3. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18 inches (450 mm) below exposed subgrade.
4. Use only hand methods for grubbing within drip line of remaining trees.
5. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding 8-inch (200-mm) loose depth, and compact each layer to a density equal to adjacent original ground.

3.06 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Limit height of topsoil stockpiles to 72 inches (1800 mm).
2. Do not stockpile topsoil within drip line of remaining trees.
3. Dispose of excess topsoil as specified for waste material disposal.
4. Stockpile surplus topsoil and allow for respreading deeper topsoil.

3.07 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

3.08 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property.

B. Burning on Owner’s Property: Burning may be permitted only at designated areas and times as directed by the Owner and by local and state issuing authorities. A burn permit as well as any other associated permit(s) must be obtained by the contractor by the local issuing authority. The contractor shall comply with all local codes. Provide full time monitoring personal for burning materials until fires are extinguished.

END OF SECTION

SECTION 31 20 00

EARTHWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:
   1. Preparing subgrades for slabs-on-grade, walks, pavements, lawns, and plantings.
   2. Excavating and backfilling for buildings and structures.
   3. Drainage course for slabs-on-grade.
   4. Subbase course for concrete walks and pavements.
   5. Base course for asphalt paving.
   6. Subsurface drainage backfill for walls and trenches.
   7. Excavating and backfilling trenches within building lines.
   8. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.

B. Related Sections include the following:
   1. Division 32 Section "Landscaping" for finish grading, including placing and preparing topsoil for lawns and plantings.
   2. Division 3 Section "Cast-in-Place Concrete" for granular course over vapor retarder.
   3. Division 21, 22, 23 and 26 Sections for excavating and backfilling buried mechanical and electrical utilities and buried utility structures.

1.03 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.
   1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
   2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Layer placed between the subbase course and asphalt paving.

C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations.
   1. Additional Excavation: Excavation below subgrade elevations as directed by Architect. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
   2. Bulk Excavation: Excavations more than 10 feet in width and pits more than 30 feet in either length or width.
   3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Layer placed between the subgrade and base course for asphalt paving,

or layer placed between the subgrade and a concrete pavement or walk.

J. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

K. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

L. Rock Excavation
1. Sound, solid rock in its original position in ledges, bedded deposits, or masses of such hardness and texture that, in the opinion of the Engineer, cannot be loosened or broken down and removed by use of heavy construction equipment such as power shovels, bulldozers, heavy-duty rooters, etc., without drilling and blasting, or with an air-hammer shall be classified as rock excavation.
2, Boulders, stones, or pieces of masonry that are one-half cubic yard or larger in volume shall be considered rock excavation.
3. Hard pan, small boulders less than one-half cubic yard in volume, chert, clay, soft shale, soft and disintegrated rock, and similar material shall not be considered as rock even though the Contractor elects to excavate same by drilling and blasting, or with an air hammer.

1.04 SUBMITTALS

A. Product Data: For the following:
1. Each type of plastic warning tape.
2. Separation fabric.

B. Photographs of existing adjacent structures and site improvements

C. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D 698 for each on-site or borrow soil material proposed for fill and backfill.

1.05 QUALITY ASSURANCE

A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.

B. Geotechnical Testing Agency Qualifications: The Geotechnical testing agency will be hired by the Owner. The Contractor shall coordinate testing requirements with the testing agency and provide access to the site.

1.06 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Contact utility-locator service for area where Project is located before excavating.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Imported fill soils should consist of low to moderately plastic clay or silt

with a plastic index of less than thirty (PI<30) and a standard Proctor maximum dry density greater than 90 pounds per cubic feet. The imported fill should contain no rock fragments larger than 4 inches in any dimension, and should be free from organic matter and other deleterious matter. The on-site soils may be used as engineered fill as approved acceptable by the Owner's Geotechnical testing agency. Existing fill soils will require evaluation by the Owner's Geotechnical testing agency to determine if they can be used as structural fill.

C. Unsatisfactory Soils: The Geotechnical testing agency observation will determine unsatisfactory soils.

D. Backfill and Fill: Satisfactory soil materials.

E. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2- inch sieve and not more than 12 percent passing a No. 200 sieve.

F. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

G. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

H. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

I. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 4 sieve.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.02 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
   1. Red: Electric.
   2. Yellow: Gas, oil, steam, and dangerous materials.
   3. Orange: Communicaiton, Alarm or Singal Lines, Cables or Conduit.
   4. Blue: Potable Water systems.
   5. Green: Sewer and Drain systems.
   6. Purple: Reclaimed Water, Irrigation and Slurry Lines, Fire Protection or other Non-potable Water lines.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide

protective insulating materials as necessary.

C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

D. Strip all topsoil, vegetation, and any debris from the construction area and either waste it from the site or use as topsoil or fill in areas to be landscaped. The stripped area should extend at least 10 feet beyond exterior foundation excavations and at least 5 feet beyond the outside edge of paved areas.

3.02 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
   1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
   2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.03 EXPLOSIVES

A. Explosives: Do not use explosives.

3.04 STABILITY OF EXCAVATIONS

A. Comply with all Federal, State and local codes, ordinances and requirements of authorities having jurisdiction to maintain stable excavations.

3.05 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.
   1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
   2. Any reference to rock on the plans or specifications is not to be construed as classification of excavation.

3.06 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
   1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
   2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended for bearing surface.

B. Rock under structures shall be excavated to lines and grades shown on the Drawings. Except as hereinafter provided otherwise where rock excavation has been carried below grade, the Contractor shall backfill to grade with Class B concrete at his/her own expense.

   Where rock foundation is obtained at grade for over 50 percent of the area of any one structure, the portion of the foundation that is not rock shall be excavated below grade to reach a satisfactory foundation of rock .The portion below grade shall be backfilled with Class B concrete.

Where rock foundation is obtained at grade for over 50 percent of the area of any one structure, the portion of the foundation that is not rock shall be excavated below grade to reach a satisfactory foundation of rock. The portion below grade shall be backfilled with Class B concrete.

Where rock foundation is obtained at grade for less than 50 percent of any one structure and satisfactory rock cannot be found over the remaining area by reasonable additional excavation, the rock shall be removed for a depth of 12 inches below grade, and the space below grade shall be backfilled with crushed stone as specified above for pipe lines.

A. Rock excavation for all structures and adjacent trenches under this Contract and any other rock excavation directed by the Engineer shall be completed before construction of any structure is started in the vicinity.

3.07 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.

3.08 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.
   1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
   1. Clearance: 12 inches on each side of pipe or conduit.

C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.
   1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

C. Rock in trenches shall be excavated over the horizontal limits of excavation and to depths as follows:

Size of Pipe Line, Inches	Depth of Excavation Below Bottom of Pipe, Inches	
	Sewer Pipe	Water Pipe
4 to 12 incl.	**6**	6
15 to 33 incl.	**8**	8
36 and over	**12**	12

The space below grade for pipe sewers shall then be backfilled with 3/8 inch crushed rock or gravel or other approved material and tamped to the proper grade. Where pipe sewers are constructed on concrete cradles rock shall be excavated to the bottom of the cradle as shown on the Plans.

D. Rock excavation for all structures and adjacent trenches under this Contract and any other rock excavation directed by the Engineer shall be completed before construction of any structure is started in the vicinity.

3.09 APPROVAL OF SUBGRADE

A. Notify Architect when excavations have reached required subgrade.

B. If Architect or Soils Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof roll subgrade with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water,

or construction activities, as directed by Architect.

E. Avoid overcompaction and smearing of subgrade below infiltrations areas such as pervious pavement and bio-retention. Rake or rip subgrade as necessary to remove any smearing of subgrade.

3.10 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Architect.
   1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

B. Where width of trench exceeds industry standard width, provide stronger pipe or special installation procedures, as required by the Architect at no cost to the Owner.

3.11 STORAGE OF SOIL MATERIALS

A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.12 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:
   1. Construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
   2. Surveying locations of underground utilities for record documents.
   3. Inspecting and testing underground utilities.
   2. Removing concrete formwork.
   3. Removing trash and debris.
   4. Removing temporary shoring and bracing and sheeting.
   5. Installing permanent or temporary horizontal bracing on horizontally supported walls

3.13 UTILITY TRENCH BACKFILL

A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

B. In areas where trench is under paved areas, backfill remainder of trench with Bedding or Engineered fills to subgrade.

C. Backfill trenches excavated under footings and within 18 inches of bottom of footings; fill with concrete to elevation of bottom of footings.

D. Provide 4-inch-thick, concrete-base slab support for piping or conduit less than 30 inches below surface of public roadways, or 24 inches below surface of parking lots or driveways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase.

E. Place and compact initial backfill of satisfactory soil or subbase material, free of particles larger than 1 inch, to 12 inches over pipe or conduit.

F. Where sewers, water lines, etc. are to be installed within the street right-of-way, they shall be backfilled full depth with stone per local code. The trenches under the building and at least 5 feet beyond the building limits shall be backfilled with low plasticity and low permeability soils per the geotechnical reports. If sewer is located in fill and backfill is six feet or over from the top of pipe to finished subgrade, backfill in accordance with paragraph

above.

1. Carefully compact material under pipe haunch and backfill evenly on both sides and along pipe or conduit to avoid damage or displacement of system.

G. Fill voids with approved backfill materials as shoring and bracing and sheeting is removed.

H. Place and compact final backfill of satisfactory soil material to final subgrade.

I. Coordinate backfilling with utilities testing.

J. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.14 FILL

A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills. Areas receiving fill shall be proof rolled in the presence of a Geotechnical Engineer prior to fill placement. Areas identified as unacceptable by the Geotechnical Engineer shall be excavated (undercut) and backfilled prior to fill placement.

1. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. When subgrade or existing ground to receive fill has density less than required for fill, break up surface to depth required, pulverize, moisture-condition or aerate soil and recompact to required density.

C. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use subbase or base material, or satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use drainage fill over subgrade and engineered fill to bring to subgrade.
5. Under footings and foundations, use engineered fill.

D. Compact rock in accordance with the Geotechnical Engineer’s recommendations

3.15 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 3 percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified dry unit weight.

3.16 COMPACTION OF BACKFILLS AND FILLS

A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under structures, building slabs and steps, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material at 100 percent standard Proctor compaction.
2. Under pavements, scarify and recompact top 24 inches of existing subgrade and

each layer of backfill or fill material at 100 percent standard Proctor compaction.

3. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 95 percent standard Proctor compaction.
4. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 85 percent standard Proctor compaction.

3.17 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
   1. Provide a smooth transition between adjacent existing grades and new grades.
   2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
   1. Lawn or Unpaved Areas: Plus or minus 1 inch.
   2. Walks: Plus or minus 1/2 inch.
   3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.18 SUBSURFACE DRAINAGE

A. Subsurface Drain: Place a layer of drainage fabric around perimeter of drainage trench as indicated. Place a 6-inch course of filter material on drainage fabric to support drainage pipe. Encase drainage pipe in a minimum of 12 inches of filter material and wrap in drainage fabric, overlapping sides and ends at least 6 inches.
   1. Compact each course of filter material to 95 percent of maximum dry unit weight according to ASTM D 698.

B. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade. Overlay drainage backfill with one layer of drainage fabric, overlapping sides and ends at least 6 inches.
   1. Compact each course of filter material to 95 percent of maximum dry density according to ASTM D 698.

3.19 SUBBASE AND BASE COURSES

A. Under pavements and walks, place subbase course on prepared subgrade and as follows:
   1. Place base course material over subbase.
   2. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 98 percent of maximum dry density according to ASTM D 698.
   3. Shape subbase and base to required crown elevations and cross-slope grades.
   4. When thickness of compacted subbase or base course is 6 inches or less, place materials in a single layer.
   5. When thickness of compacted subbase or base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

3.20 DRAINAGE COURSE

A. Under slabs-on-grade, place drainage course on prepared subgrade and as follows:
   1. Compact drainage course to required cross sections and thickness to not less than 98 percent of maximum dry unit weight according to ASTM D 698.
   2. When compacted thickness of drainage course is 6 inches or less, place materials in a single layer.

3. When compacted thickness of drainage course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

3.21 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a Geotechnical engineering firm to perform field quality assurance testing.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design-bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
   1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
   2. Footing Subgrade: At footing subgrades, perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on visual comparison of each subgrade with related test strata when acceptable to the Geotechnical Engineer.
   3. Foundation Wall Backfill: At each compacted backfill layer, at least one test for each 100 feet or less of wall length, but no fewer than two tests.
   4. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench length, but no fewer than two tests.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.22 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
   1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.23 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION

SECTION 31 50 00

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.01 Performance Requirements: Design, provide, monitor, and maintain an anchored and braced excavation support and protection system capable of resisting soil and hydrostatic pressure and supporting sidewalls of excavations.

A. System design and calculations must be acceptable to authorities having jurisdiction.

1.02 Existing Utilities: Do not interrupt utilities serving facilities occupied by the Owner or others unless permitted in writing by the Architect and then only after arranging to provide temporary utility services according to requirements indicated.

1.03 Project Site Information: A geotechnical report has been prepared for this Project and is available for information only. The report is not part of the Contract Documents. Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor.

A. Make additional test borings and conduct other exploratory operations as necessary.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.

3.02 Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

3.03 Locate excavation support and protection systems clear of permanent construction and to permit forming and finishing of concrete surfaces.

3.04 Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure excavation support and protection systems remain stable.

3.05 Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.06 Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures as determined by a registered soils engineer. Remove in stages to avoid disturbing underlying soils and damaging structures, pavements, facilities, and utilities.

A. Remove excavation support and protection systems to a minimum depth of 48 inches below overlying construction and abandon remainder.

END OF SECTION

SECTION 32 11 00

SUB-GRADE AND BASE COURSE PREPARATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Sub-grade preparation.

B. Crushed stone or crushed gravel compacted base course.

1.02 RELATED WORK

A. Section 32 13 13 – Portland Cement Concrete Paving

B. Section 32 12 16 – Hot Mix Asphalt Paving

1.03 REFERENCES

A. Where Georgia Department of Transportation Specifications are referred to, the applicable requirements of that Section shall be considered a part of these specifications and all materials and construction methods prescribed therein shall be as binding as if herein specified. The Sections referred to are from Georgia, current edition with latest supplements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Base Courses: Comply with Georgia Department of Transportation specifications, Section 310.

PART 3 - EXECUTION

3.01 SUB-GRADE PREPARATION

A. Grade sub-grade to lines and grades indicated. Preparation of sub-grade shall be in compliance with Georgia DOT Specifications sections referenced herein.

3.02 BASE COURSE

A. Construct crushed stone or crushed gravel base course to thickness indicated on drawings and in compliance with Georgia DOT Specifications, Section 310.

B. All areas to receive paving shall be graded to the indicated sub-grade elevation and proof-rolled as outlined below.

C. All areas (sub-grade) to receive compacted fill, pavements or slabs on grade shall be proof-rolled in the presence of the Owner's Representative or Testing Agency to detect any soft areas that may exist. A four-wheeled, pneumatic-tired roller of not less than 25 tons, or its equivalent, shall be used for this operation. At least four passes shall be made two in each of two directions at right angles. Any soft areas thus disclosed should be stabilized or undercut and replaced with properly compacted material as approved by the Owner's Representative or Testing Agency.

D. Proof rolling should be conducted only on soils in their approximate natural moisture condition. Proof-rolling should not be undertaken after rains while soils are still in a high moisture condition (well above the natural moisture content) or on soils which are desiccated by prolonged drying.

END OF SECTION

SECTION 32 12 16

HOT MIX ASPHALT PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:
   1. Hot-mix asphalt paving.
   2. Hot-mix asphalt patching.
   3. Hot-mix asphalt overlays.
   4. Pavement-marking paint.
   5. Wheel Stops

B. Related Sections include the following:
   1. Section 32 13 73 – Pavement Joint Sealants
   2. Section 31 20 00 – Earthwork
   3. Section 31 11 00 – Subgrade and Base Course Preparation

1.03 SYSTEM DESCRIPTION

A. Provide hot-mix asphalt pavement according to the materials, workmanship, and other applicable requirements of the standard specifications of the state or of authorities having jurisdiction.
   1. Standard Specification: As indicated.

1.04 SUBMITTALS

A. Product Data: For each product specified. Include technical data and tested physical and performance properties.

B. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.

C. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

D. Material Certificates: Certificates signed by manufacturers certifying that each material complies with requirements.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed hot-mix asphalt paving similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Manufacturer Qualifications: Engage a firm experienced in manufacturing hot-mix asphalt similar to that indicated for this Project and with a record of successful in-service performance.
   1. Firm shall be a registered and approved paving mix manufacturer with authorities having jurisdiction or with the DOT of the state in which Project is located.

C. Regulatory Requirements: Conform to applicable standards of authorities having jurisdiction for asphalt paving work on public property.

D. Asphalt-Paving Publication: Comply with AI's "The Asphalt Handbook," except where more stringent requirements are indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location and within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.07 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if substrate is wet or excessively damp or if the following conditions are not met:
   1. Slurry Coat: Comply with weather limitations of ASTM D 3910.
   2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
   3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 50 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.01 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: Sound; angular crushed stone; crushed gravel;; complying with ASTM D 692 and GDOT specifications.

C. Fine Aggregate: Sharp-edged natural sand or sand prepared from stone; gravel, or combinations thereof; complying with ASTM D 1073 and GDOT specifications.
   1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass and GDOT specifications.

D. Mineral Filler: Rock or slag dust, hydraulic cement, or other inert material complying with ASTM D 242 and GDOT specifications.

2.02 ASPHALT MATERIALS

A. Asphalt Cement: ASTM D 3381 for viscosity-graded material; ASTM D 946 for penetration-graded material.

B. Asphalt Cement: ASTM D 3381 for viscosity-graded material.

C. Under-sealing Asphalt: ASTM D 3141, pumping consistency.

2.03 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by Environmental Protection Agency (EPA). Provide granular, liquid, or wetable powder form.

B. Sand: ASTM D 1073, Grade Nos. 2 or 3.

C. Paving Geotextile: Non-woven polypropylene, specifically designed for paving applications, resistant to chemical attack, rot, and mildew.

D. Pavement-Marking Paint: Alkyd-resin type, ready-mixed, complying with FS TT-P-115, Type I, or AASHTO M-248, Type N.

E. Pavement-Marking Paint: Latex, water-base emulsion, ready-mixed, complying with FS TT-P-1952.
   1. Color: As indicated.

F. Wheel Stops: Pre-cast, air-entrained concrete, 2500-psi minimum compressive strength, approximately 6 inches high, 9 inches wide, and 84 inches long. Provide chamfered corners and drainage slots on underside, and provide holes for anchoring to substrate.
   1. Dowels: Galvanized steel, diameter 3/4 inch, minimum length 10 inches.

2.04 MIXES

A. Provide mixes compling with typical specifications of GDOT.

B. Surface Course: Surface course shall conform to GDOT (Hot Mix) with aggregates meeting requirements of Type F, per GDOT Specifications, Section 828 and Section 400.

C. Asphaltic Binder Course: Binder course shall conform to Type B, per GDOT Specifications, Section 828 and Section 400.

D. Prime Coat: Asphalt emulsion prime conforming to GDOT specifications.

E. Tack Coat: ASTM D 977, emulsified asphalt or ASTM d 2397, cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application per GDOT specifications.

F. Base shall be a well-graded crushed stone conforming to GDDT specifictions, Section 815 and Section 310.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that sub-grade is dry and in suitable condition to support paving and imposed loads.

B. Proof-roll sub-base using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.

C. Notify Architect in writing of any unsatisfactory conditions. Do not begin paving installation until these conditions have been satisfactorily corrected.

3.02 COLD MILLING

A. Clean existing paving surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement, including hot-mix asphalt and, as necessary, unbound-aggregate base course, by cold milling to grades and cross sections indicated.
   1. Repair or replace curbs, manholes, and other construction damaged during cold milling.

3.03 PATCHING AND REPAIRS

A. Patching: Saw cut perimeter of patch and excavate existing pavement section to sound base. Re-compact new sub-grade. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically.
   1. Tack coat faces of excavation and allow to cure before paving.
   2. Fill excavation with dense-graded, hot-mix asphalt base mix and, while still hot, compact flush with adjacent surface.
   3. Partially fill excavation with dense-graded, hot-mix asphalt base mix and compact while still hot. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.
   1. Pump hot under-sealing asphalt under rocking slabs until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.
   2. Remove disintegrated or badly broken pavement. Prepare and patch with hot-mix asphalt.

C. Leveling Course: Install and compact leveling course consisting of dense-graded, hot-mix

asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

D. Crack and Joint Filling: Remove existing filler material from cracks or joints to a depth of 1/4 inch. Refill with asphalt joint-filling material to restore watertight condition. Remove excess filler that has accumulated near cracks or joints.

E. Tack Coat: Apply uniformly to existing surfaces of previously constructed asphalt or portland cement concrete paving and to surfaces abutting or projecting into new, hot-mix asphalt pavement. Apply at a uniform rate of 0.05 to 0.15 gal./sq. yd. of surface.
1. Allow tack coat to cure undisturbed before paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.04 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared sub-grade is ready to receive paving.
1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

B. Prime Coat: Apply uniformly over surface of compacted-aggregate base at a rate of 0.15 to 0.50 gal./sq. yd.. Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure for 72 hours minimum.
1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use just enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

C. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared sub-grade or surface of compacted-aggregate base before applying paving materials.
1. Mix herbicide with prime coat when formulated by manufacturer for that purpose.

3.05 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt mix on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness, when compacted.
1. Place Binder.
2. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
3. Spread mix at minimum temperature of 250 deg F.
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
5. Regulate paving machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide, except where fill-in edge strips of a lesser width are required.
1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete asphalt base course for a section before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.06 JOINTS

A. Construct joints to ensure continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.
   1. Clean contact surfaces and apply tack coat.
   2. Offset longitudinal joints in successive courses a minimum of 6 inches.
   3. Offset transverse joints in successive courses a minimum of 24 inches.
   4. Construct transverse joints by bulkhead method or sawed vertical face method as described in AI's "The Asphalt Handbook."
   5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
   6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.07 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.
   1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Accomplish breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Repair surfaces by loosening displaced material, filling with hot-mix asphalt, and re-rolling to required elevations.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling, while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
   1. Average Density: 96 percent of reference laboratory density according to ASTM D 1559, but not less than 94 percent nor greater than 100 percent.
   2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping while surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while still hot, with back of rake or smooth iron. Compact thoroughly using tamper or other satisfactory method.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials. Remove paving course over area affected and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.08 INSTALLATION TOLERANCES

A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:
   1. Base Course: Plus or minus 1/2 inch.
   2. Surface Course: Plus 1/4 inch, no minus.

B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
   1. Base Course: 1/4 inch.

2. Surface Course: 1/8 inch.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.09 ASPHALT CURBS

A. Construct hot-mix asphalt curbs over compacted pavement surfaces. Apply a light tack coat, unless pavement surface is still tacky and free from dust. Spread mix at minimum temperature of 250 deg F.
   1. Asphalt Mix: Same as pavement surface-course mix.

3.10 SURFACE TREATMENTS

A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.15 gal. /sq. yd. to existing asphalt pavement and allow to cure. Lightly dust areas receiving excess fog seal with fine sand.

B. Slurry Seals: Apply slurry coats in a uniform thickness according to ASTM D 3910 and allow curing.
   1. Roll slurry seal to smooth ridges and provide a uniform, smooth surface.

3.11 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow paving to cure for 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturers recommended rates to provide a minimum wet film thickness of 15 mils.
   1. Broadcast glass spheres uniformly into wet pavement markings at a rate of 6 lb./gal.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing agency to perform field inspections and tests and to prepare test reports.
   1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.

B. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.

C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

E. In-Place Density: Samples of uncompacted paving mixtures and compacted pavement will be secured by testing agency according to ASTM D 979.
   1. Reference laboratory density will be determined by averaging results from 4 samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 1559, and compacted according to job-mix specifications.
   2. Reference maximum theoretical density will be determined by averaging results from 4 samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
   3. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
      a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, but in no case will fewer than 3 cores be taken.
      b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188

or ASTM D 2726.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

END OF SECTION

SECTION 32 13 13

PORTLAND CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Concrete sidewalks, roads, aprons, door pads, curbs and gutters.

B. Reinforcement.

C. Surface finish.

D. Curing.

1.02 RELATED WORK

A. Section 32 11 00 - Sub-grade and Base Course Preparation

B. Section 32 13 73 - Pavement Joint Sealants

C. Section 31 20 00 – Earthwork

D. Division 3 Section “Cast-in-Place Concrete”

1.03 REFERENCES

A. ACI 211.1 - Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete.

B. ACI 211.2 - Recommended practice for Selecting Proportions for Structural Lightweight Concrete.

C. ACI 301 - Specifications for Structural Concrete for Buildings.

D. ACI 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete.

E. ACI 305R - Hot Weather Concreting.

F. ACI 306R - Cold Weather Concreting.

G. ACI 315 - Details and Detailing of Concrete Reinforcement.

H. ACI 318 - Building Code Requirements for Reinforced Concrete.

I. ACI 347 - Recommended Practice for Concrete Formwork, Concrete Reinforcing Steel Institute, Manual of Standard Practice.

J. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

K. ASTM A497 - Welded Deformed Steel Wire Fabric for Concrete Reinforcement.

L. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.

M. ASTM C31 - Standard Method of Making and Curing Concrete Test Specimens in the Field.

N. ASTM C33 - Standard Specification for Concrete Aggregates.

O. ASTM C39 - Standard Test Method of Compressive Strength of Cylindrical Concrete Specimens.

P. ASTM C78 - Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).

Q. ASTM C94 - Ready Mixed Concrete.

R. ASTM C143 - Slump of Portland Cement Concrete.

S. ASTM C150 - Portland Cement.

T. ASTM C172 - Sampling Fresh Concrete.

U. ASTM C173 - Air Content of Freshly Mixed Concrete by the Volumetric Method.

V. ASTM C192 - Making and Curing Concrete Test Specimens in the Laboratory.

W. ASTM C231 - Air Content Of Freshly Mixed Concrete by the Pressure Method.

X. ASTM C260 - Air-Entraining Admixtures for Concrete.

Y. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

Z. ASTM C494 - Chemical Admixtures for Concrete.

AA. ASTM D8139 - Semi-rigid, Closed Cell, polypropylene form, preformed joint fillers for Concrete Paving and Structural Construction.

BB. ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301.

B. Obtain materials from same source throughout.

C. Submit laboratory test reports for concrete materials and mix design test as specified.

D. Provide material certificates in lieu of materials laboratory test reports when permitted by Owner's Representative. Material certificates shall be signed by manufacturer and Contractor, certifying that each material item meets specified requirements.

1.05 TESTS

A. As the work progresses, sample concrete in accordance with ASTM C172.

B. Make slump tests according to ASTM C143, one slump test for each set of test cylinders.

C. Test air content of concrete made with normal-weight aggregates having low water absorption according to either ASTM C231 or ASTM C173. For lightweight aggregates or aggregates with high absorptions, use latter test method.

D. Make compression test specimens and cure according to ASTM C31. Each test shall consist of one set of laboratory cured cylinders. A set shall consist of four cylinders. Minimum number of tests shall be one for 100 cubic yards of concrete for each class. Make at least one test per day of each class of concrete used that day.

E. Cure specimens under laboratory conditions. Specimens cured under job conditions may be required when, in Owner's Representative's opinion, there is a possibility of the surrounding air temperature falling below 40°F, or rising above 90°F.

F. Test cylinders according to ASTM C39.

G. Test laboratory cured cylinders one at seven days, two at 28 days, and one at 56 days, if required.

H. Strength level of concrete will be considered satisfactory if averages of any three consecutive strength test results of laboratory cured cylinders equal or exceed specified strength f'c, and no individual strength test result falls below specified strength f'c by more than 500 psi.

I. Make reports on cylinder tests to Owner's Representative and show dates placed and tested, name of job, proportions of cement and aggregate, quantity of water, slump, air content, admixtures, location of concrete in the project, type of concrete, compressive strength in pounds per square inch and atmospheric and concrete temperature at time of sampling.

J. In cases where strength of laboratory cured cylinders shown by tests for any portion of paving falls below required compressive strengths specified, Owner's Representative shall have the right to order change in mix or in cement content for remaining portion of the paving.

K. Make and cure flexural test beam specimens according to ASTM C78. Each test shall consist of one set of laboratory cured beams. A set shall consist of two beams. Minimum number of tests shall be one for each 100 cubic yards of concrete placed, at least one per day. Cure specimens under laboratory conditions.

L. Test beams according to ASTM C78, simple beam with third-point loading. Test beams shall have six inch by six inch cross-section.

M. Test beams at 14 days.

N. Flexural strength level of concrete shall be considered satisfactory as long as averages of any three consecutive test results of laboratory cured beams equal or exceed specified strength, and no individual strength test result falls below specified strength by more than 100 psi.

O. Concrete cylinder and flexural tests shall be made by an independent testing laboratory selected by Owner. Cost of initial tests shall be paid for by Owner. Subsequent tests required as a result of improper strength shall be paid for by Contractor.

PART 2 - MATERIALS

2.01 CONCRETE MATERIALS

A. Cement: ASTM C150, Normal-Type I, gray color.

B. Fine and Coarse Aggregates: ASTM C33. Provide aggregates from single source for exposed concrete.

1. For grading tests of fine and coarse aggregates, use square mesh wire cloth complying with ASTM E11.
2. Fine Aggregate:
   a. Provide washed natural sand of strong, hard durable particles.
   b. Grade from coarse to fine within following limits:

Sieve Size	Percentage by Weight Passing Sieve	
	Minimum	Maximum
3/8"	100	--
No. 4	95	100
No. 8	65	95
No. 16	45	75
No. 30	30	50
No. 50	10	22
No. 100	2	8

3. Coarse Aggregate:
   a. Provide coarse aggregate consisting of clean, hard, fine-grained, sound crushed rock or washed gravel, or combination of both.
   b. Any piece having length in excess of five times average thickness shall be considered flat or elongated.
   c. The maximum size coarse aggregate shall 1½ " with the minimum size being 1 inch.
   d. Grade combined aggregates within following limits:

Sieve Size or Percentage by Weight Passing Sieve				
Size in Inches	1½" Aggregate		1" Aggregate	
	Min	Max	Min	Max
1½"	95	--	--	--
1"	75	90	90	100
¾"	55	77	70	90
⅜"	40	55	45	65
No. 4	30	0	31	7
No. 8	22	35	23	40
No. 16	16	30	17	35
No. 30	0	20	10	23
No. 50	2	8	2	10
No. 100	0	3	0	3

e. Water: Clean, not detrimental to concrete, and conforming to ACI 318, Article 3.4.

f. Form Materials.

1) Conform to ACI 301.

C. Reinforcement

1. Reinforcing Steel: ASTM A615; 60 ksi yield grade; deformed billet steel bars.
2. Welded Steel Wire Fabric: Plain type, ANSI/ASTM A185; in flat sheets; uncoated finish.
3. Tie Wire: Annealed steel, minimum 16 gauge size.
4. Dowels: ASTM A615; 40 ksi yield grade, plain steel, uncoated finish.

D. Accessories

1. Curing Compound: FS TT-C-800, Type 1, 30% solids; ASTM C309, Kurey DR, manufactured by Euclid Chemical Company and L&M Cure Resin by L&M Construction Materials, or approved equal.
2. Expansion Joint Filler: Non-extruding, non-bituminous, resilient type complying with AASHTO M153 and ASTM D1752.
3. Joint Sealant for Pavements Unless Noted Otherwise on Drawings: Urethane complying with ASTM D1850 and ASTM C290 such as "Urexpan NR-200" by Pecora Corp., "VULKEM-245" by Mameco International, "THC-900" by Tremco or approved equal.

E. Admixtures

1. Air Entrainment: Conform to ASTM C260.
2. Water Reducing Admixture: Conform to ASTM C494, Type A, containing not more than 1% chloride ions.
3. High Range Water Reducing Admixture (Super Plasticizer): Conform to ASTM C494, Type F or G, containing not more than 1% chloride ions.
4. Non-Chloride Accelerator Admixture: Conform to ASTM C494, Type C or E. Provide long-term test data proving non-corrosive effect on reinforcing steel.

F. Concrete Mix Design

1. Design concrete for flexural strength of 650 pounds per square inch at 14 days, compressive strength of (f'c) of 3,000 pounds per square inch at 28 days.
2. Unless otherwise noted, concrete shall have minimum cement content of 517 pounds per cubic yard of concrete and maximum water content not exceeding 28.0 gallons per cubic yard.
3. Concrete shall contain no calcium chloride nor shall admixtures contain more than 1 % chloride ions or air entraining cement, unless approved by Owner's Representative.
4. Concrete shall be air entrained and conform to air content limits of Table 1 below.

Table 1 – Air Content for Air-Entrained Concrete	
Maximum Size Coarse Aggregate Inches	**Air Content Percent by Volume**
1”	5.5±1
1½”	5.0±1

5. Concrete shall have maximum water-cement ratio of 0.45.
6. Concrete shall have a slump of 3”, plus or minus ½”.
7. Methods of measuring concrete materials shall be such that proportions can be accurately controlled and easily checked. Measurement of materials for ready-mixed concrete shall conform to ASTM C94.
8. Use accelerating admixtures in cold weather only when approved by Owner’s Representative. Use of admixtures will not relax cold weather placement requirements.
9. Use set-retarding admixtures during hot weather only when approved by Owner’s Representative.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify compacted subgrade ready to support paving and imposed loads.

B. Verify correct gradients and elevations of base.

C. Beginning installation implies acceptance of existing conditions.

3.02 PREPARATION

A. Moisten base to minimize absorption of water from fresh concrete.

B. Notify Owner’s Representative minimum 24 hours before start of concreting operations.

3.03 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 fillers vertical in position, in straight lines. Secure to formwork during concrete placement.

3.04 REINFORCEMENT

A. Where noted on drawings, reinforce concrete paving with welded steel wire fabric.

B. Provide chairs, supports, spacers, bolsters and other devices to keep reinforcement at proper elevations and in place.

C. Interrupt reinforcement at control, contraction and expansion joints.

3.05 FORMED JOINTS

A. Place joints as shown on plans to correct elevation and profile.

3.06 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Hot Weather Placement: ACI 305R

C. Cold Weather Placement: ACI 306R

D. Ensure reinforcements, inserts, embedded parts, formed joints and are not disturbed during concrete placement.

E. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

F. Place concrete to pattern indicated. Saw cut contraction joints at an optimum time after finishing. Saw joints in accordance with details on plans.

G. Chamfer exposed corners of concrete using wood, metal, PVC, or rubber chamfer strips fabricated to produce smooth lines and tight edge strips.

3.07 FINISHING

A. Road and Apron Paving: Light broom.

B. Sidewalk Paving: Light broom and trowel joint edges.

C. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.08 FIELD QUALITY CONTROL

A. Field testing will be performed by an independent testing company as selected by the Owner.

B. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.09 PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessive hot or cold temperatures, and mechanical injury.

END OF SECTION

SECTION 32 13 73

PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:
   1. Expansion and contraction joints within portland cement concrete pavement.
   2. Joints between portland cement concrete and asphalt pavement.

B. Related Sections include the following:
   1. Division 32 Section "Portland Cement Concrete Paving" for constructing joints in concrete paving.

1.03 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Verification: For each type and color of joint sealant required. Install joint-sealant samples in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.

D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

E. Compatibility and Adhesion Test Reports: From joint sealant manufacturer indicating the following:
   1. Materials forming joint substrates and joint-sealant backer materials have been tested for compatibility and adhesion with joint sealants.
   2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
   2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F.
   3. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than that allowed by joint sealant manufacturer for application indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range for this characteristic.

2.02 COLD-APPLIED JOINT SEALANTS

A. Type SL Silicone Sealant for Concrete and Asphalt: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D 5893 for Type SL.

B. Multicomponent Low-Modulus Sealant for Concrete and Asphalt: Proprietary formulation consisting of reactive petropolymer and activator components producing a pourable, self-leveling sealant.

C. Available Products: Subject to compliance with requirements, cold-applied joint sealants that may be incorporated into the Work include, but are not limited to, the following:
   1. Type SL Silicone Sealant for Concrete and Asphalt:
      a. 890-SL; Dow Corning Corp.
      b. Roadsaver Silicone SL; Crafco, Inc.
      c. Sika-1C SL; Sika Corp.
      d. Or Equivalent
   2. Multicomponent Low-Modulus Sealant for Concrete and Asphalt:
      a. SOF-SEAL; W.R. Meadows, Inc.
      b. Roadsaver Silicone; Crafco, Inc.
      c. 888; Dow Corning Corp.
      d. Or Equivalent

2.03 JOINT-SEALANT BACKER MATERIALS

A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint sealant manufacturer based on field experience and laboratory testing.

B. Round Backer Rod for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

C. Backer Strips for Cold- and Hot-Applied Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depths, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

D. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

2.04 PRIMERS

A. Primers: Product recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint- sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

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

3.02 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.03 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of backer materials.
   2. Do not stretch, twist, puncture, or tear backer materials.
   3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

D. Install sealants by proven techniques to comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses provided for each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealants from surfaces adjacent to joint.
   2. Use tooling agents that are approved in writing by joint sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint sealant manufacturer's written instructions, unless otherwise indicated.

3.04 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.05 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

END OF SECTION

SECTION 33 40 00

STORM DRAINAGE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes storm drainage outside the building.

B. Related Sections include the following:
   1. Division 33 Section "Foundation Drainage Systems" for foundation drains connecting to storm drainage.
   2. Division 33 Section "Cast-in-Place Concrete" for concrete structures.

1.03 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. EPDM: Ethylene-propylene-diene-monomer rubber.

C. PE or HDPE: Polyethylene plastic, or High Density Polyethylene plastic.

D. PVC: Polyvinyl chloride plastic.

E. CMP: Corrugated Metal Pipe

F. RCP: Reinforced Concrete Pipe

1.04 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Nonpressure-Piping Pressure Ratings: At least equal to system test pressure.

1.05 SUBMITTALS

A. Shop Drawings: Include plans, elevations, details, and attachments for the following:
   1. Precast concrete manholes and other structures, including frames, covers, and grates.
   2. Cast-in-place concrete manholes and other structures, including frames, covers, and grates.

B. Design Mix Reports and Calculations: For each class of cast-in-place concrete.

C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic structures, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle precast concrete manholes and other structures according to manufacturer's written rigging instructions.

1.07 PROJECT CONDITIONS

A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.

B. Locate existing structures and piping to be closed and abandoned.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others

unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify owner not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without ownert's written permission.

PART 2 - PRODUCTS

2.02 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe and fitting materials.

2.03 PIPES AND FITTINGS

A. Ductile-Iron Sewer Pipe: ASTM A 746, for push-on joints.
   1. Standard-Pattern, Ductile-Iron Fittings: AWWA C110, ductile or gray iron, for push-on joints.
   2. Gaskets: AWWA C111, rubber.

B. Ductile-Iron Culvert Pipe: ASTM A 716, for push-on joints.
   1. Standard-Pattern, Ductile-Iron Fittings: AWWA C110, ductile or gray iron, for push-on joints.
   2. Gaskets: AWWA C111, rubber.

C. Aluminized Steel Type 2 Pipe: AASHTO M274 or ASTM A929.
   1. Fittings: Fabricated to types indicated and according to same standards as pipe.
   2. Connecting Bands: Coupling bands shall be made of the same base metal and coatings as the pipe to a minimum of 18 gage.
   3. Connecting fasteners will be provided by manufacture.
   4. Pipe shall have manning “n” valve of 0.009

D. HDPE Pipe and Fittings: ASTM F 405, ASTM F 667, AASHTO M 252, and AASHTO M 294.
   1. Soiltight Couplings: ASTM F 405, ASTM F 667, AASHTO M 252, and AASHTO M 294, corrugated, matching pipe and fittings to form soiltight joints.

E. PVC Sewer Pipe and Fittings: According to the following:
   1. PVC Sewer Pipe and Fittings, NPS 15 and Smaller: ASTM D 3034, SDR 35, for solvent-cemented or gasketed joints.
      a. Gaskets: ASTM F 477, elastomeric seals.
   2. PVC Sewer Pipe and Fittings, NPS 18 and Larger: ASTM F 679, T-1 wall thickness, bell and spigot for gasketed joints.
      a. Gaskets: ASTM F 477, elastomeric seals.
   3. Perforated PVC Subdrain Pipe: ASTM D1785, Schedule 40.
      a. Hole Pattern: ASTM F-758/ ASSHTO M278, Hole Size 3/8”, Hole Spacing 3” ±1/4”

F. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76, Class III, Wall B, for gasketed joints.
   1. Gaskets: ASTM C 443, rubber.

G. HDPE Sewer Pipe and Fittings: Shall be Double Wall, according to the following:
   1. HDPE Sewer Pipe and Fittings, NPS 4 through NPS 60: ASTM F 2648, for solvent-cemented or gasketed joints.
      a. Gaskets: ASTM F 477, elastomeric seals.
      b. Fittings: ASTM F 2306, bell and spigot connections shall utilize a pun-on or welded bell and valley or saddle gasket meeting the soil tight performance requirements of ASTM F 2306.

2.04 SPECIAL PIPE COUPLINGS AND FITTINGS

A. Sleeve-Type Pipe Couplings: ASTM C 1173, rubber or elastomeric sleeve and band assembly fabricated to mate with OD of pipes to be joined, for nonpressure joints.

1. Sleeve Material for Concrete Pipe: ASTM C 443, rubber.
2. Sleeve Material for Cast-Iron Soil Pipe: ASTM C 564, rubber.
3. Sleeve Material for Plastic Pipe: ASTM F 477, elastomeric seal.
4. Sleeve Material for Dissimilar Pipe: Compatible with pipe materials being joined.

B. Bushing-Type Pipe Couplings: ASTM C 1173, rubber or elastomeric bushing fabricated to mate with OD of smaller pipe and ID of adjoining larger pipe, for nonpressure joints.
1. Material for Concrete Pipe: ASTM C 443, rubber.
2. Material for Cast-Iron Soil Pipe: ASTM C 564, rubber.
3. Material for Plastic Pipe: ASTM F 477, elastomeric seal.
4. Material for Dissimilar Pipe: Compatible with pipe materials being joined.

C. Ductile-Iron Expansion Joints: Three-piece assembly of telescoping sleeve with gaskets and restrained-type, ductile-iron, bell-and-spigot end sections complying with AWWA C110 or AWWA C153. Include rating for 250-psig minimum working pressure and for expansion indicated. Include PE film, pipe encasement.

2.05 MANHOLES

A. Normal-Traffic Precast Concrete Manholes: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.
1. Diameter: 48 inches minimum, unless otherwise indicated.
2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
3. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
4. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
5. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
6. Gaskets: ASTM C 443, rubber.
7. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch-diameter frame and cover.
8. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into base, riser, and top section sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.
9. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.

B. Heavy-Traffic Precast Concrete Manholes: ASTM C 913; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for rubber gasketed joints.
1. Ballast: Increase thickness of one or more precast concrete sections or add concrete to structure, as required to prevent flotation.
2. Gaskets: Rubber.
3. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch-diameter frame and cover.
4. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into base, riser, and top section sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.
5. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.

C. Cast-in-Place Concrete Manholes: Construct of reinforced-concrete bottom, walls, and top; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, dimensions, and appurtenances indicated.
1. Ballast: Increase thickness of concrete, as required to prevent flotation.

2. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch-diameter frame and cover.
3. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.

D. Manhole Frames and Covers: ASTM A 536, Grade 60-40-18, ductile-iron castings designed for heavy-duty service. Include 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange, and 26-inch-diameter cover. Include indented top design with lettering "STORM SEWER" cast into cover.

2.06 CATCH BASINS

A. Normal-Traffic, Precast Concrete Catch Basins: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.
1. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
2. Riser Sections: 4-inch minimum thickness, 48-inch diameter, and lengths to provide depth indicated.
3. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
4. Gaskets: ASTM C 443, rubber.
5. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch-diameter frame and grate.
6. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast steps or anchor ladder into base, riser, and top section sidewalls at 12- to 16-inch intervals. Omit steps for catch basins less than 60 inches deep.
7. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.

B. Heavy-Traffic, Precast Concrete Catch Basins: ASTM C 913, precast, reinforced concrete; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for rubber gasketed joints.
1. Gaskets: Rubber.
2. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch-diameter frame and grate.
3. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast steps or anchor ladder into base, riser, and top section sidewalls at 12- to 16-inch intervals. Omit steps for catch basins less than 60 inches deep.
4. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.

C. Cast-in-Place Concrete, Catch Basins: Construct of reinforced concrete; designed according to ASTM C 890 for structural loading; of depth, shape, dimensions, and appurtenances indicated.
1. Bottom, Walls, and Top: Reinforced concrete.
2. Channels and Benches: Concrete.
3. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast steps or anchor ladder into sidewalls at 12- to 16-inch intervals. Omit steps for catch basins less than 60 inches deep.

D. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for heavy-duty service. Include flat grate with small square or short-slotted drainage openings.
1. Size: 24 by 24 inches minimum, unless otherwise indicated.

2. Grate Free Area: Approximately 50 percent, unless otherwise indicated.

E. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for heavy-duty service. Include 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange, and 26-inch-diameter flat grate with small square or short-slotted drainage openings.
   1. Grate Free Area: Approximately 50 percent, unless otherwise indicated.

F. PVC Surface Inlets: PVC surface drainage inlets shall include the drain basin type as indicated on the contract drawing and referenced within the contract specifications. The ductile iron grates for each of these fittings are to be considered an integral part of the surface drainage inlet and shall be furnished by the same manufacturer.

2.07 STORMWATER INLETS

A. Curb Inlets: Made with vertical curb opening, of materials and dimensions according to utility standards.

B. Combination Inlets: Made with vertical curb and horizontal gutter openings, of materials and dimensions according to utility standards. Include heavy-duty frames and grates.

C. Frames and Grates: Heavy-duty frames and grates according to utility standards.

D. Trench Drains: Shall be manufactured by same vendor as frame and grate.
   1. Channel shape shall be U
   2. Minimum channel slope shall be 0.5%
   3. Grate shall be secured to the frame.
   4. Channel shall have bottom outlet or trench drain catch basin.
   5. Trench drain frame and grates shall be minimum load class “c” unless otherwise noted.

2.08 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
   1. Cement: ASTM C 150, Type II.
   2. Fine Aggregate: ASTM C 33, sand.
   3. Coarse Aggregate: ASTM C 33, crushed gravel.
   4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious ratio.
   1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
   2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

C. Structure Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water-cementitious ratio.
   1. Include channels and benches in manholes.
      a. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
         1) Invert Slope: 1 percent through manhole.
      b. Benches: Concrete, sloped to drain into channel.
         1) Slope: 4 percent.
   2. Include channels in catch basins.
      a. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
         1) Invert Slope: 1 percent through catch basin.

D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water-cementitious ratio.
   1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
   2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

PART 3 - EXECUTION

3.01 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earthwork."

3.02 PIPING APPLICATIONS

A. General: Include watertight, silttight, or soiltight joints, unless watertight or silttight joints are indicated.

B. Refer to Part 2 of this Section for detailed specifications for pipe and fitting products listed below. Use pipe, fittings, and joining methods according to applications indicated.

C. Gravity-Flow Piping: Use the following:
   1. NPS 4 and NPS 6: PVC sewer pipe and fittings, solvent-cemented joints, or gaskets and gasketed joints.
   2. NPS 8 to NPS 15: Ductile-iron sewer pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints in NPS 8 to NPS 12. Use ductile-iron culvert pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints in NPS 14 to NPS 16.
   3. NPS 8 to NPS 15: Corrugated-aluminum pipe and fittings, connecting bands, and banded joints.
   4. NPS 8 to NPS 15: PVC sewer pipe and fittings, solvent-cemented joints, or gaskets and gasketed joints.
   5. NPS 8 to NPS 15: NPS 12 and NPS 15 reinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints. Do not use nonreinforced pipe instead of reinforced concrete pipe in NPS 8 and NPS 10.
   6. NPS 4 to NPS 60: HDPE Sewer Pipe pipe and fittings; corrugated, soiltight couplings; and coupled joints.

3.03 SPECIAL PIPE COUPLING AND FITTING APPLICATIONS

A. Special Pipe Couplings: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
   1. Use the following pipe couplings for nonpressure applications:
      a. Sleeve type to join piping, of same size, or with small difference in OD.
      b. Increaser/reducer-pattern, sleeve type to join piping of different sizes.
      c. Bushing type to join piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.
   2. Use pressure-type pipe couplings for force-main joints. Include PE film, pipe encasement.

B. Special Pipe Fittings: Use where indicated. Include PE film, pipe encasement.

3.04 INSTALLATION, GENERAL

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.

C. Use manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.

D. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. Install gravity-flow piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.
   1. Install piping pitched down in direction of flow, at minimum slope of 1 percent, unless otherwise indicated.

F. Extend storm drainage piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.

3.05 PIPE JOINT CONSTRUCTION AND INSTALLATION

A. General: Join and install pipe and fittings according to installations indicated.

B. Refer to Division 2 Section "Utility Materials" for basic piping joint construction and installation.

C. Hub-and-Spigot, Cast-Iron Soil Pipe and Fittings: With rubber gaskets according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook." Use gaskets that match class of pipe and fittings.

D. Hubless Cast-Iron Soil Pipe and Fittings: With CISPI-type couplings according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook."

E. Hubless Cast-Iron Soil Pipe and Fittings: With heavy-duty-type couplings according to CISPI 310, CISPI's "Cast Iron Soil Pipe and Fittings Handbook," and coupling manufacturer's written instructions.

F. Ductile-Iron Sewer Pipe with Ductile-Iron Fittings: According to AWWA C600.

G. Install with top surfaces of components, except piping, flush with finished surface.

H. PE Pipe and Fittings: As follows:
   1. Join pipe, tubing, and fittings with couplings for soiltight joints according to manufacturer's written instructions.
   2. Install according to ASTM D 2321 and manufacturer's written instructions.
   3. Install corrugated piping according to the Corrugated Polyethylene Pipe Association's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."

I. PVC Pressure Pipe and Fittings: Join and install according to AWWA M23.

J. PVC Sewer Pipe and Fittings: As follows:
   1. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
   2. Install according to ASTM D 2321.

K Concrete Pipe and Fittings: Install according to ACPA's "Concrete Pipe Installation Manual." Use the following seals:
   1. Round Pipe and Fittings: ASTM C 443, rubber gaskets.

L. System Piping Joints: Make joints using system manufacturer's couplings, unless otherwise indicated.

M. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and that fit both systems' materials and dimensions.

3.06 MANHOLE INSTALLATION

A. General: Install manholes, complete with appurtenances and accessories indicated.

B. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere, unless otherwise indicated.

C. Install precast concrete manhole sections with gaskets according to ASTM C 891.

D. Construct cast-in-place manholes as indicated.

E. Install fiberglass manholes according to manufacturer's written instructions.

3.07 CATCH-BASIN INSTALLATION

A. Construct catch basins to sizes and shapes indicated.

B. Set frames and grates to elevations indicated.

C. The specified PVC surface drainage inlet shall be installed using conventional flexible pipe backfill materials and procedures. The backfill material shall be crushed stone or other granular material meeting the requirements of class 2 material as defined in ASTM D2321. Bedding and backfill for surface drainage inlets shall be placed and compacted uniformly in accordance with ASTM D2321. The drain basin body will be cut at the time of the final grade. No brick, stone or concrete block will be required to set the grate to the final grade height. For H-20 load rated installations, a concrete ring will be poured under and around the grate and frame. The concrete slab must be designed taking into consideration local soil conditions, traffic loading, and other applicable design factors. For other installation considerations such as migration of fines, ground water, and soft foundations refer to ASTM D2321 guidelines.

3.08 STORM DRAINAGE INLET AND OUTLET INSTALLATION

A. Construct inlet head walls, aprons, and sides of reinforced concrete, as indicated.

B. Construct riprap of broken stone, as indicated.

C. Install outlets that spill onto grade, anchored with concrete, where indicated.

D. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.

E. Construct energy dissipators at outlets, as indicated.

3.09 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318 and ACI 350R.

3.10 DRAINAGE SYSTEM INSTALLATION

A. Assemble and install components according to manufacturer's written instructions.

B. Install with top surfaces of components, except piping, flush with finished surface.

C. Assemble channel sections to form slope down toward drain outlets. Use sealants, adhesives, fasteners, and other materials recommended by system manufacturer.

D. Embed channel sections and drainage specialties in 4-inch minimum concrete around bottom and sides.

E. Fasten grates to channel sections if indicated.

F. Embed trench sections and drainage specialties in 4-inch minimum concrete around bottom and sides.

3.11 CLEANOUT INSTALLATION

A. Install cleanouts and riser extension from sewer pipe to cleanout at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
   1. Use light-duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.
   2. Use medium-duty, top-loading classification cleanouts in paved foot-traffic areas.
   3. Use heavy-duty, top-loading classification cleanouts in vehicle-traffic service areas.

4. Use extra-heavy-duty, top-loading classification cleanouts in roads.

B. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 by 18 by 12 inches deep. Set with tops 1 inch above surrounding earth grade.

C. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface.

3.12 DRAIN INSTALLATION

A. Install type of drains in locations indicated.

B. Fasten grates to drains if indicated.

C. Set drain frames and covers with tops flush with pavement surface.

3.13 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:
   1. Close open ends of piping with at least 8-inch-thick, brick masonry bulkheads.

B. Abandoned Structures: Excavate around structure as required and use one procedure below:
   1. Remove structure and close open ends of remaining piping.
   2. Backfill to grade according to Division 31 Section "Earthwork."

3.14 FIELD QUALITY CONTROL

A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
   1. In large, accessible piping, brushes and brooms may be used for cleaning.
   2. Place plug in end of incomplete piping at end of day and when work stops.
   3. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.

B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
   1. Submit separate reports for each system inspection.
   2. Defects requiring correction include the following:
      a. Alignment: Less than full diameter of inside of pipe is visible between structures.
      b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
      c. Crushed, broken, cracked, or otherwise damaged piping.
      d. Infiltration: Water leakage into piping.
      e. Exfiltration: Water leakage from or around piping.
   3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
   4. Reinspect and repeat procedure until results are satisfactory.

C. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
   1. Do not enclose, cover, or put into service before inspection and approval.
   2. Test completed piping systems according to authorities having jurisdiction.
   3. Leaks and loss in test pressure constitute defects that must be repaired.
   4. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

END OF SECTION

Ringgold High School Baseball Hitting Facility
29 Tiger Trail
Ringgold, GA 30736

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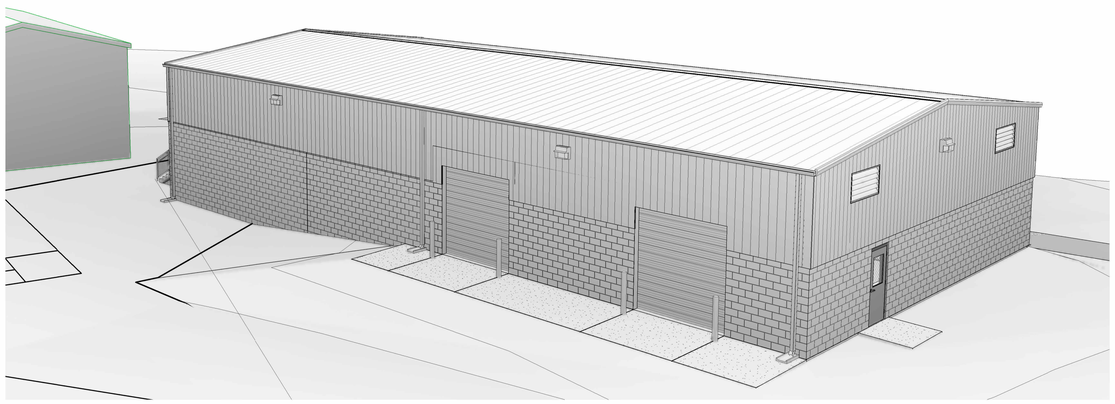
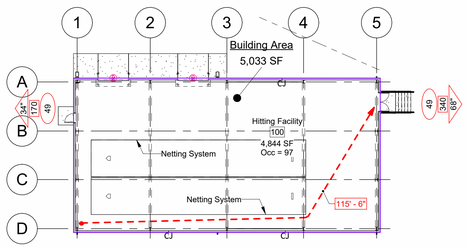


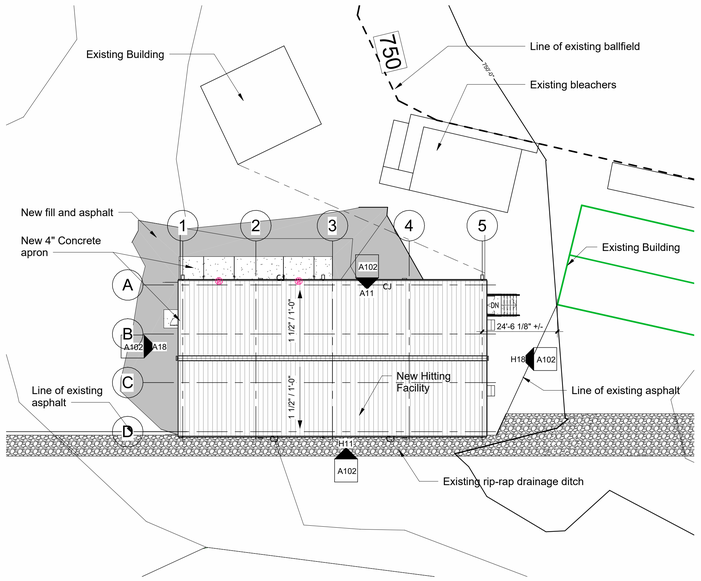
G12 G000 **Cover View**



Life Safety Plan Legend
(view in color for clarity)

34" Egress Component Width
100 Egress Component Capacity
100 Occupant Load
Egress_distance

A6 G000 A100 1" = 20'-0" **Life Safety Plan**



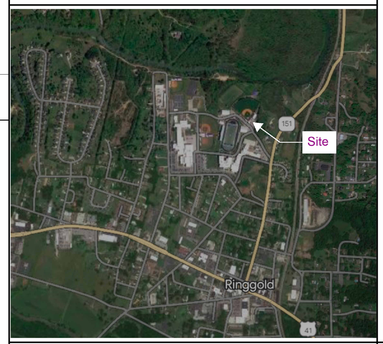
PLAN NORTH

A12 G000 A100 1" = 20'-0" **Site Plan Project North**

SHEET LIST

Sheet Number	Sheet Name	Current Revision Description	Current Revision Date
General			
G000	Cover Sheet	Addendum 1	10-24-23
Civil			
C100	Site Staking		
C200	Existing Conditions and Demolition		
C301	Site Grading		
C302	Site Drainage		
C500	Sediment and Erosion Control Notes		
C501	Sediment and Erosion Control Phase I		
C502	Sediment and Erosion Control Phase II		
C700	Site Details		
Structural			
S001	Structural General Notes and Details		
S002	Structural Details		
S003	Special Inspections		
S100	Structural Plans		
Architecture			
A100	Floor Plan		
A101	Sections		
A102	Elevations	Addendum 1	10-24-23
A103	Ceiling Plan		
A600	Openings	Addendum 1	10-24-23
Mechanical			
M001	Mechanical Schedules & Plan	Addendum 1	10-24-23
Electrical			
ES1.0	Electrical Site Plan		
Electrical			
E001 -	Electrical Project Schedules & Notes	Addendum 1	10-24-23
E101	Electrical Lighting Plan		
E201	Electrical Power Plan	Addendum 1	10-24-23

VICINITY



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GENERAL NOTES

Contractor shall field verify all dimensions, elevations, and locations of existing conditions affecting this project, prior to fabrication or installation of new work. Notify architect of any discrepancies from dimensions shown, noted, or required. Adjust dimensions of new construction at direction of architect to allow for actual field conditions.

Where a detail is shown or note is described for one condition, it shall apply for all like or similar conditions even though not specifically noted on the drawings.

Penetrations through floor slabs and walls shall be carefully cut with saws or drills and patched with same materials and thicknesses as existing.

All penetrations of fire rated walls, floor/ceiling assemblies, and roof/ceiling assemblies by electrical cables, cable trays, electrical conduit, mechanical piping, or plumbing piping shall be protected by through penetration firestop systems as tested by recognized testing laboratories in accordance with (ASTM e 814) UL 1479 "fire tests of through-penetration firestops". Copies of the test of each type penetration to be used shall be submitted for approval by the architect/engineer and building official prior to any installation. Copies of the approved submittal shall be maintained at the jobsite for inspection at all times.

Refer to mechanical, electrical & plumbing drawings for locations of Equipment.

Provide continuous separation between dissimilar materials as required to prevent galvanic corrosion.

Coordinate opening sizes and locations with mechanical, plumbing and electrical drawings.

SUMMARY

Code Analysis (edit for project)

Applicable Codes:
International Building Code, 2018 Edition, with Georgia Amendments (2020), (2022)
International Fire Code, 2018 Edition (Contact State Fire Marshal Below)
International Plumbing Code, 2018 Edition, with Georgia Amendments (2020), (2022), (2023)
International Mechanical Code, 2018 Edition, with Georgia Amendments (2020)
International Fuel Gas Code, 2018 Edition, with Georgia Amendments (2020), (2022)
National Electrical Code, 2020 Edition, with Georgia Amendments (2021)
International Energy Conservation Code, 2015 Edition, with Georgia Supplements and Amendments (2020), (2022), (2023)

Climate Zone 4A

Occupancy Type:
Occupancy Group A-3

Construction Type:
Per Table 601 Building is Type 2B

Fire Resistance Ratings per Table 601:
Structural Columns:0
Exterior Building Walls: 0
Structural Floor Beams:0
Structural Floor Slabs:0
Roofs: 0

Area Summary:

5,033 SF	Building Area

Fire Suppression System: None

Rating Requirements:
713.4, 1009.3.1.2 and 402.4
Elevator Shaft & Room: N/A
Stairs: N/A
Separation between Occupancies: N/A

Building Occupancy:
Per Table 1004.1.2
Hitting Facility: 4827 sf / 50 = 97 occupants

Exits and Exit Capacity:
Per 1005.3

2 exits provided. 102" exit capacity provided.
97 occupants x .2" = 19.4" exit capacity required.

Exit Access Travel Distance:
Per Table 1016.2
Occupancy A-3: 200 feet without sprinkler system

Plumbing Fixtures:
Provided in existing adjacent buildings

5,033 SF	Building Area

DH&W
ARCHITECTURE INTERIORS PLANNING
1001 Carter Street - Chattanooga - 37402
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Catoosa County Public Schools

Ringgold High School Baseball Hitting Facility

29 Tiger Trail
Ringgold, GA 30736

9-29-23
Drawn: Author
File: 8236-D
Permit #ENG23-001211
Project #23-010584

Revisions:

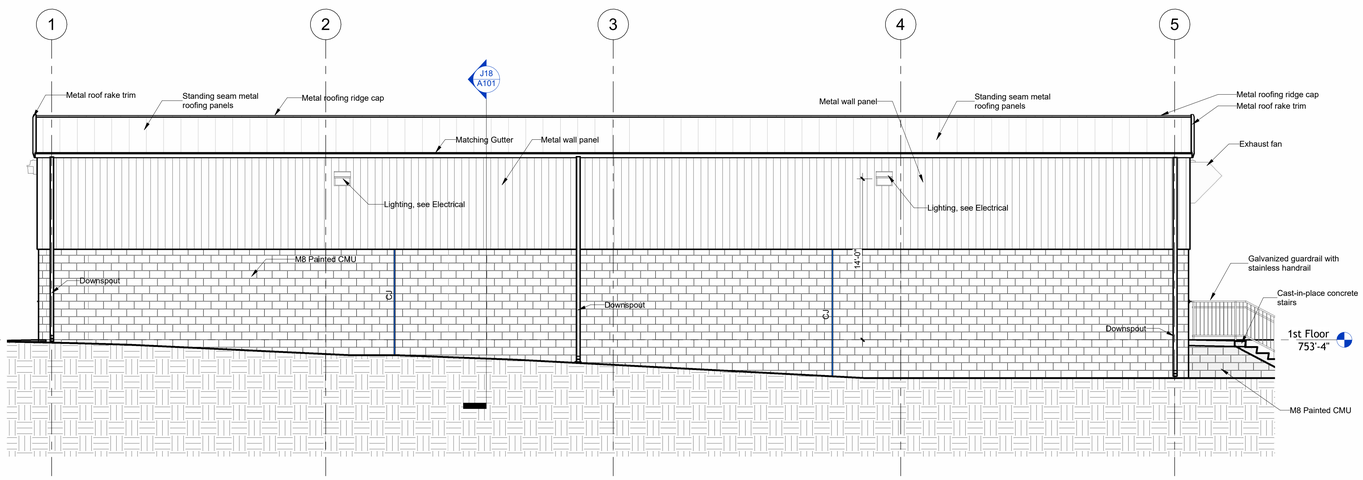
1 Addendum 1 10-24-23

Key Plan

Title:
Cover Sheet

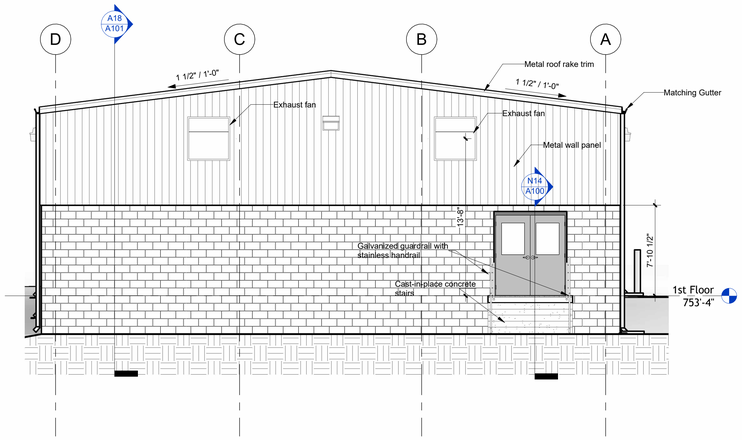
Scale:

Sheet No.
G000



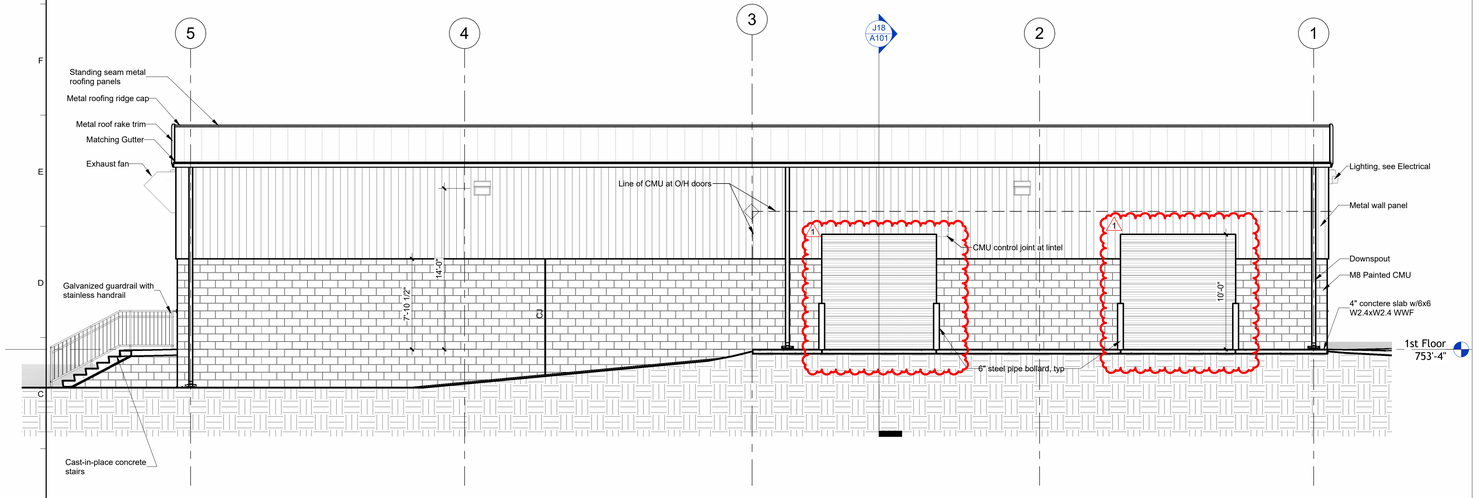
H11 | A100 | Elevation -South

A102 | 3/16" = 1'-0"



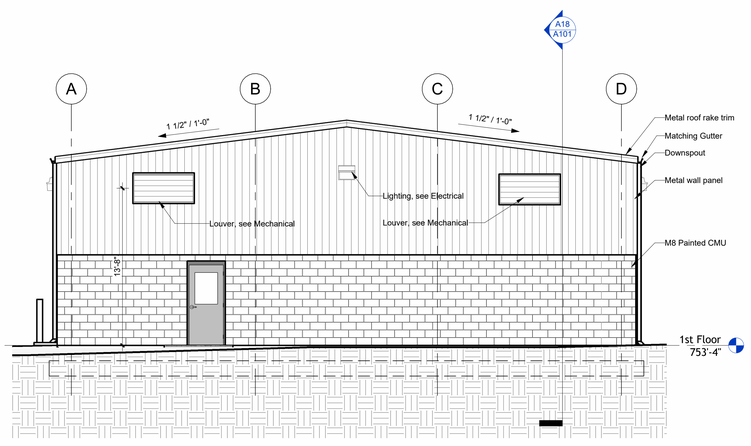
H18 | A100 | Elevation - East

A102 | 3/16" = 1'-0"



A11 | A100 | Elevation - North

A102 | 3/16" = 1'-0"



A18 | A100 | Elevation - West

A102 | 3/16" = 1'-0"

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1001 Carter Street - Chattanooga - 37402
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Catoosa County Public Schools

Ringgold High School Baseball Hitting Facility

29 Tiger Trail
Ringgold, GA 30736

9-29-23
Drawn: Nicholas D.
File: 8236-D
Permit #ENG23-001211
Project #23-010584

Revisions:

1 Addendum 1 10-24-23

Key Plan

Title:
Elevations

Scale:

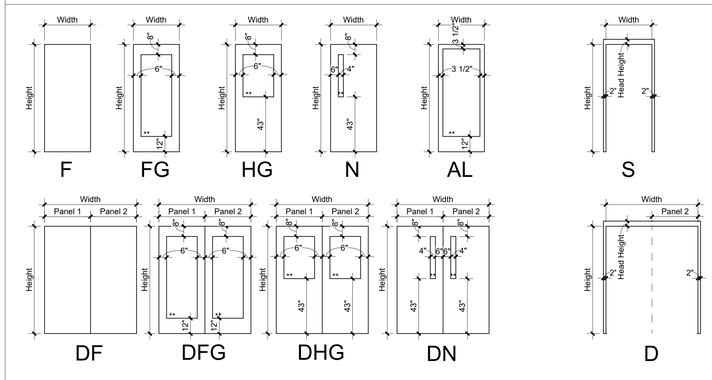
Sheet No.
A102

Door Schedule

Mark	Door Type	Panel Material	Door Size Width	Door Size Panel 1 Width	Door Size Panel 2 Width	Door Size Height	Door Size Thickness	Frame Type	Frame Material	Frame Detail Head	Frame Detail Jamb	Fire Rating	Access Ctl.	Hardware Set	Hardware Set Use	Comments
1st Floor																
100A	HG	HM	3'-0"	3'-0"		7'-0"	1 3/4"	S	HM	4"	A18	D18		1	(none)	
100B	DHG	HM	6'-0"	3'-0"	3'-0"	7'-0"	1 3/4"	D	HM	4"	A18	D18		2	(none)	
100C			10'-0"			10'-0"					A18	D18		■	(none)	Keyed motor control for overhead coiling door
100D			10'-0"			10'-0"					A18	D18		■	(none)	Keyed motor control for overhead coiling door

Hardware Set 1
Closer
Hinges
Rim Panic Bar
Weatherstripping
Threshold

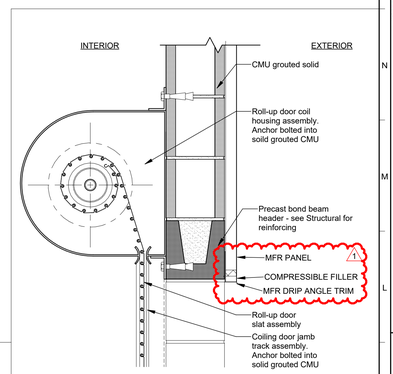
Hardware Set 2
(2) Closers
Hinges
(2) rod Panic
Bars
Weatherstripping
Threshold



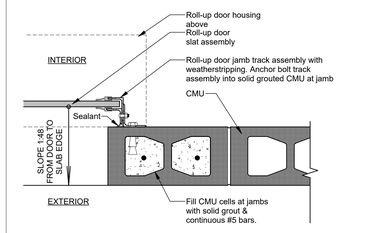
Door Types

** indicates1/4" tempered glass at doors without fire rating
indicates fire rated glass at doors with fire rating

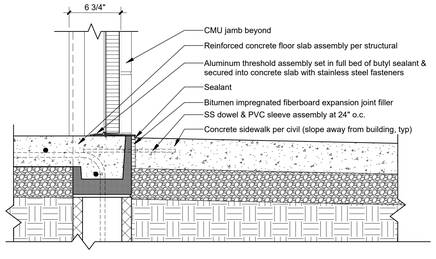
Frame Types



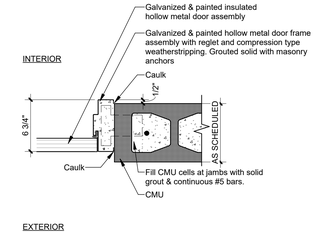
K18 | A600 | 1 1/2" = 1'-0" | **Door Detail - Overhead - 8" CMU - Head**



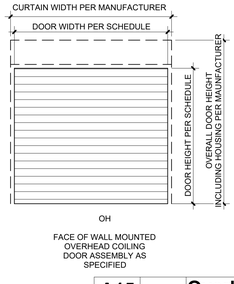
G18 | A600 | 1 1/2" = 1'-0" | **Door Detail - Overhead - 8"CMU - Jamb**



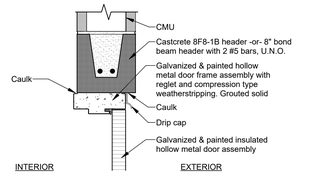
D15 | A600 | 1 1/2" = 1'-0" | **Door Detail - HM - Sill**



D18 | A600 | 1 1/2" = 1'-0" | **Door Detail - Exterior CMU - Jamb**



A15 | A600 | 1/4" = 1'-0" | **Overhead Door**



A18 | A600 | 1 1/2" = 1'-0" | **Door Detail - HM - Head**

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Catoosa County Public Schools

Ringgold High School Baseball Hitting Facility

29 Tiger Trail
Ringgold, GA 30736

9-29-23
Drawn: Author
File: 8236-D
Permit #ENG23-001211
Project #23-010584

Revisions:

1 Addendum 1 10-24-23

Key Plan

Title:
Openings

Scale:

Sheet No.
A600

Louver Schedule

Mark	Manufacturer	Model	Description	Material	Size	Notes	Count
L-1	Greenheck Fan Corp.	EAD-635	Motorized Intake Louver	Aluminum	64"x32"	1-4	2

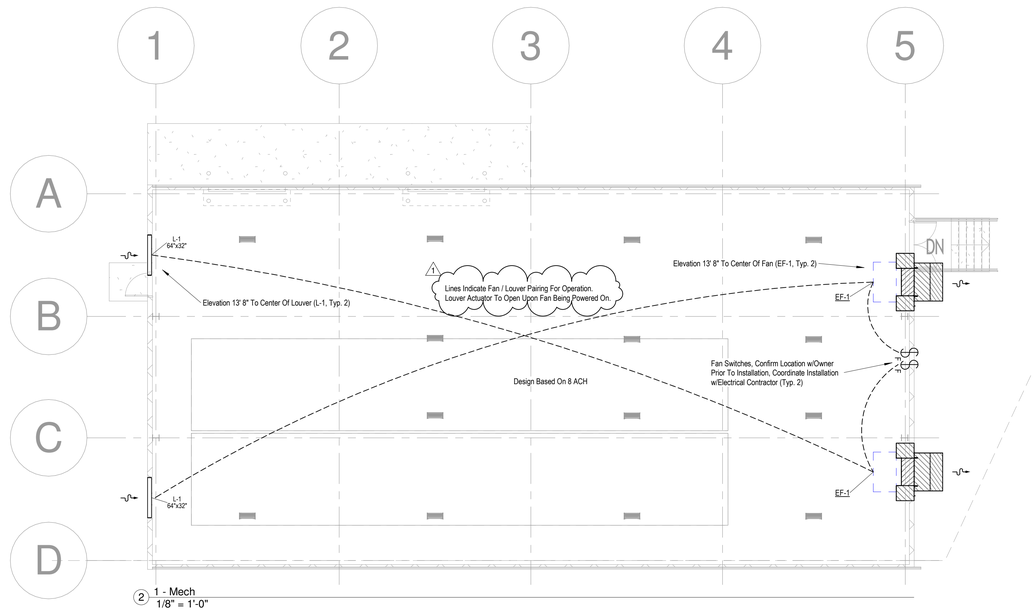
Notes:
1. Louver finishes shall be per Architect.
2. Flanded Frame
3. Insect Screen
4. Provide w/120V Actuator, 2-Position, Fail Close, Interlock w/EF-1 Operation

Approved Alternate Manufacturers: Greenheck, Ruskin

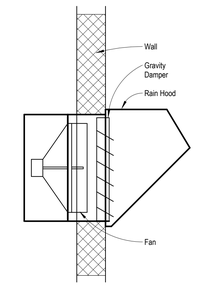
Fan Schedule

Mark	Manufacturer	Model	Description	Air Flow	E.S.P.	Fan Drive Type	Electrical					Control	Sones	Weight	Notes	Count
							Power	Volt	Phase	MCA	MOP					
EF-1	Greenheck	SBE-1H30	Sidewall Belt Drive Exhaust Fan	6500 CFM	0.25 in-wg	Direct	450 W	208 V	3	4.4 A	15 A	Wall Switch	17.2	86 lb	1-4	2

Notes:
1. Electrical Contractor To Install And Wire Disconnect Switch
2. NEMA Premium Efficient Motor
3. 1-Year Standard Warranty
4. Wall Housing (Include Mounted Gravity-Operated Damper)



2 1 - Mech
1/8" = 1'-0"



3 Sidewall Exhaust Fan
NTS

Mechanical Symbols

Sections
- 1 / M301 — Indicates Similar to Noted View When Present; SIM; View Number on Sheet; Sheet on Which Detail Appears

Air Terminals
- CD1 — Mark (See Air Terminal Schedule)
- 6"ø — Duct Connection Size
- 125 — Air Flow (cfm)

Sizing Nomenclature
- 18" x 16" — 18" Width x 16" Height on Floor Plans (Top View), Typical for Ductwork and Louvers

- Supply Air Duct Up | Supply Air Duct Down
- Return / Outdoor Air Duct Up | Return / Outdoor Air Duct Down
- Exhaust Air Duct Up | Exhaust Air Duct Down
- Duct Centerline (Round Duct)
- Damper in Ductwork, if Damper is Unlabeled, Assume Balancing Damper, Manual (B)

Damper Types:
- **B** = Balancing Damper, Manual
- **2-P** = 2-Position Damper, Motorized Actuator
- **M_v** = Full Motorized Variable Damper
- **M₂** = 2-Position Motorized Damper (Open/Close)
- **F** = Fire Damper
- **FS** = Combination Fire / Smoke Damper
- **S** = Duct-Mounted Smoke Detector. Provided, installed, and wired to the FACP by the Electrical Contractor.

- Ceiling Diffuser with Flexible Duct Connection and 4-Way Throw Direction Arrows, if Throw Indication Arrows Are Not Present, Assume 4-Way Throw
- Direction of Air Flow
- Door Undercut (3/4" Unless Otherwise Indincated)
- Mitered Rectangular Duct Elbow with Turning Vanes (Provide Turning Vanes in All Rectangular Supply Ductwork Even if Vanes Are Not Indicated. Turning Vanes Not Required in Return Air, Outdoor Air, And Exhaust Air Ducts Unless Indicated)
- 18"x12" | 18"ø — Rectangular Duct with Dimensions | Round Duct with Dimensions
- T +48" A.F.F. <RTU-*> — Thermostat - Wall Mounted with Unit Designation and Mounting Height to Bottom of Thermostat (Mounting Height 48" A.F.F. Unless Noted Otherwise on Plans). Confirm Location(s) with Owner(s) Prior to Installation. Coordinate Installation with Electrical Contractor.
- T — Thermostat in Lockbox
- H +48" A.F.F. RTU-1 — Humidistat - Wall Mounted with Unit Designation and Mounting Height to Bottom of Thermostat (Mounting Height 48" A.F.F. Unless Noted Otherwise on Plans). Confirm Location(s) with Owner(s) Prior to Installation. Coordinate Installation with Electrical Contractor.
- S — Remote Temperature Sensor
- R — Thermostat Remote Display
- CO2 — Carbon Dioxide Sensor
- CD — Condensate Drain Piping (CD)
- R — Relocate Existing
- Center Line
- Connection - New/Existing
- F — Fan Switch

Sequences of Operation

Louvers:
L-1 Will Open When EF-1 Is On And Close When EF-1 Is Off.

Mechanical Project Notes

1. All mechanical work shall be done in accordance with all state and local laws and ordinances and in a manner satisfactory to the authority having jurisdiction. It shall be the responsibility of the Mechanical contractor to obtain all required permits, inspections and pay all applicable fees.
2. The mechanical contractor shall coordinate the routing of ductwork with other trades and ensure there is available space for all involved occupations before fabrication of ductwork begins. Ductwork sizes noted on mechanical plans are net clear inside dimensions.
3. The mechanical contractor shall not pass ductwork, piping, or place mechanical equipment directly over any electrical panels or electrical equipment. Coordinate with the electrical contractor to maintain clearances as required by codes.
4. Fire dampers are required where ductwork penetrates a one or more hour fire resistance rated assembly. [International Mechanical Code section 607 and International Building code 716.5]. Fire dampers may be omitted in 1-hour rated fire partitions where the duct penetrating the wall is not larger than 100 in², the duct does not terminate at a wall register, steel duct material is at least 0.0217 in. Thick, and the duct is located above a ceiling [International Building Code 716.5.4 and International Mechanical Code 607.5.3]. Fire dampers are also required where ducts pass through fire rated floor assemblies. Coordinate placement of all fire dampers with rated assemblies indicated on the architectural plans.
5. The mechanical contractor shall furnish all labor, materials, equipment, services and incidentals required for a complete and operating facility.
6. All mechanical equipment shall be provided complete with electrical starter, protective devices, and interlocks required for complete operable system.
7. Mechanical equipment placement shall allow for full service/maintenance as recommended by the equipment manufacturer.
8. Color and finish of air terminals, louvers, and wall caps shall be coordinated with the architect.
9. The mechanical contractor is responsible for the testing, adjusting and balancing of all air systems.
10. Outdoor air intakes shall not be located within 10'-0" of exhaust/relief louvers, wall caps, plumbing vents, or roof caps.
11. Units with air flows above 2,000 cfm must have a duct mounted smoke detector mounted in the supply duct downstream of all filters [2002 NFPA 90a 6.4.2.1]. Smoke detectors are also required in the return air stream prior to any exhausting from the building or mixing with outdoor air unless all portions of the building served by the air distribution system are protected by area smoke detectors connected to a fire alarm system in accordance with the international fire code [International Mechanical Code 606.2.1 and exception]. These smoke detectors must be wired to a fire alarm system when one is provided in a constantly attended location for supervisory signals [International Mechanical Code 606.4.1 and 2002 NFPA 90a 6.4.4]. Local ordinances may have more stringent requirements. Coordinate with electrical contractor. See electrical drawings for locations.
12. Insulating materials shall have a flame spread index not more than 25 and a smoke-developed index not exceeding 450 in accordance with ASTM E 84.
13. The mechanical contractor shall size refrigerant line sets in accordance with the equipment manufacturer's guidelines.
14. Furnish mechanical as-built drawings as well as Operations & Maintenance manuals for all mechanical systems to the owner within 90 days of system acceptance by the authority having jurisdiction.

HVAC Submittals
Submittals are required for all equipment specified on schedule sheet. The mechanical contractor shall provide the HVAC equipment submittals with an electrical summary sheet for use by the electrical engineer. The sheet shall indicate voltage, phase, MCA, and MOCP for all HVAC equipment submitted. Electrical values that conflict with information provided in the HVAC equipment submittals is sole responsibility of the mechanical contractor.

Design Conditions

Outdoor	
Design Data Location	Chattanooga, TN
Heating db (99.6%)	19.6
Cooling db (0.4%)	95.0
Mean Coincident wb (0.4%)	74.5
Weather Station	Chattanooga AP, TN, USA (WMO:723240)
Current Energy Code	2012 IECC
Climate Zone	4A
Indoor	
Heating db	70
Cooling db	74
Cooling Relative Humidity	55% (Maximum)

db: Dry Bulb °F
wb: Wet Bulb °F
Note: Outdoor conditions based upon ASHRAE Climatic Design Conditions 2017.

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Ringgold High School Baseball Hitting Facility

29 Tiger Trail
Ringgold, GA 30736

9-29-23
Drawn: SCK
File: 8236-D

Revisions

1	ADDENDUM 1	10-24-23

Key Plan

C. JEFFREY WEST BROOKS — REGISTERED PROFESSIONAL ENGINEER — MECHANICAL — 110509 — STATE OF TENNESSEE — 9-29-23

Title:
MECHANICAL SCHEDULES & PLAN

Scale:

Sheet No.
M001

GENERAL ELECTRICAL PROJECT NOTES

GENERAL:

1. VERIFY ALL DOOR SWINGS WITH THE ARCHITECTURAL DRAWINGS BEFORE ROUGHING IN LIGHT SWITCHES TO INSURE PROPER LOCATION. VERIFY ALL CASEWORK HEIGHTS TO INSURE THAT ALL OUTLETS ABOVE CASEWORK ARE AT THE PROPER HEIGHT.

2. VERIFY THE EXACT LOCATION OF ALL MOTORS AND EQUIPMENT OF ELECTRICAL AND OTHER TRADES BEFORE ROUGHING IN ELECTRICAL WORK. ALSO ADVISE OTHER TRADES OF THE LOCATIONS OF ELECTRICAL WORK WHICH WILL AFFECT THEIR WORK, PRIOR TO THE INSTALLATION OF THE ELECTRICAL WORK. COORDINATE LIGHT FIXTURE LOCATION WITH OTHER TRADES AND ARCHITECTURAL.

3. ALL DIMENSIONS AFFECTING ELECTRICAL WORK ARE TO BE CAREFULLY CHECKED AND VERIFIED WITH THE GENERAL CONTRACTOR BEFORE ANY WORK IS DONE.

4. UNLESS OTHERWISE NOTED IN THE WRITTEN SPECIFICATIONS OR ON THE DRAWINGS, ALL ELECTRICAL WORK AND ELECTRICAL EQUIPMENT ARE TO BE PROVIDED BY THE ELECTRICAL CONTRACTOR.

5. FIRE WALL MEMBRANE PENETRATIONS SHALL CONFORM WITH IBC.

WIRE/CONDUIT:

1. ELECTRICAL CONTRACTOR IS TO PROVIDE CONDUITS AND BOXES FOR THERMOSTAT AND SENSOR LOCATIONS. COORDINATE WITH MECHANICAL FOR LOCATIONS, MOUNTING HEIGHTS, BOXES, & CONDUIT SIZE. PROVIDE MEASURED PULL STRINGS. STUB OUT IN 1/2"C.

2. PROVIDE MEASURED PULL STRINGS IN ALL CONDUIT TO BE LEFT EMPTY.

3. ALL 120V, 20A HOMERUNS OVER 100' SHALL BE #10 AWG.

4. PROVIDE SEPARATE GROUND WIRES FOR ALL CIRCUITS. NO RACEWAY GROUNDS.

5. CONTRACTOR IS REQUIRED TO PROVIDE CONDUIT SLEEVE PENETRATIONS THRU RATED WALLS FOR USE BY HIMSELF AND OTHER TRADES. COORDINATE SIZE AND LOCATION OF CONDUITS REQUIRED BY OTHER TRADES. THE INTERIOR OF ALL CONDUIT SLEEVES PENETRATING RATED WALLS ARE TO BE SEALED AROUND WIRING AND TO THE INTERIOR OF THE CONDUIT AT EACH END WITH FIRE STOP MATERIAL TO PRESERVE THE RATING INTEGRITY OF THE WALL; SEALING IS TO BE DONE ONLY AFTER ALL WIRING IS COMPLETE BOTH BY THE ELECTRICAL CONTRACTOR AND OWNER.

6. CONDUIT ROUTING IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. ROUTING SHOWN ON THESE DRAWINGS ARE FOR SCHEMATIC PURPOSES ONLY. THE ONLY EXCEPTION TO THIS IS THAT NO SURFACE MOUNTED CONDUIT WILL BE PROVIDED EXCEPT AS INDICATED ON THESE DRAWINGS UNLESS APPROVAL IS GIVEN BY OWNERS REP OR ENGINEER. CONDUIT SIZES INDICATED ON THESE DRAWINGS ARE MINIMUM SIZES FOR INDIVIDUAL HOMERUNS. CONTRACTOR IS FREE TO COMBINE DIFFERENT HOMERUNS IN SAME CONDUIT AND RESIZE ACCORDING TO NEC REQUIREMENTS. CONTRACTOR IS TO PROVIDE MULTIPLE RUNS OF CONDUIT AT HIS EXPENSE TO REPLACE LARGER INDIVIDUAL RUNS OF CONDUIT INDICATED ON THESE DRAWINGS WHERE FIELD CONDITIONS WILL NOT ALLOW THEM TO BE INSTALLED IN THE SIZES SHOWN. ELECTRICAL CONTRACTOR FREE TO USE LEAST EXPENSIVE WIRING METHOD AS ALLOWED BY CODE. COORDINATE WITH OTHER TRADES FOR INSTALLATION SO THAT NO TRADES INSTALLED PIPING, DUCTWORK, OR RECESSED LIGHTING FIXTURES INTERFERES WITH THE ARCHITECTS REQUIRED MINIMUM CEILING HEIGHT.CONTRACTOR IS TO PUNCH THRU WALLS WITH CONDUIT RUNS AS REQUIRED BY FIELD CONDITIONS. LOCATE WALL PENETRATIONS ABOVE CEILING AREAS UNLESS OTHERWISE INDICATED. FIRE STOP AS REQUIRED.

7. CONTRACTOR TO RUN ALL POLYPHASE CIRCUITRY IN CONDUIT OR IN MC FEEDERS. ALL OTHER WIRING ALLOWED TO BE LEAST EXPENSIVE INSTALLATION AS ALLOWED BY CODE AND AHJ. THIS NOTE SHALL OVERRIDE WIRE AND CABLE SPECIFICATIONS. ENT IS ACCEPTABLE FOR LOW VOLTAGE WIRING.

8. CONTRACTOR IS FREE TO USE 1/2"C. WHERE ALLOWED BY NUMBER AND SIZE OF CONDUCTORS, FOLLOW NEC. CONTRACTOR IS ALSO FREE TO ROUTE CONDUITS IN THE SLAB IN PVC AS HE DEEMS APPROPRIATE. SEE WIRE/CONDUIT NOTE 6 ABOVE AND ELBOW REQUIREMENTS IN SPECIFICATIONS.

POWER/SYSTEMS:

1. ALL BOXES FOR POWER AND/OR COMMUNICATION DEVICES SHALL BE LOCATED 18" A.F.F. TO CENTER OF BOX UNLESS OTHERWISE NOTED. CONTRACTOR IS TO COORDINATE ALL DEVICE LOCATIONS WITH MILLWORK.

2. PROVIDE SERVICE ENTRANCE GROUNDING IN ACCORDANCE WITH NEC.

3. ALL COMMUNICATIONS SYSTEMS ARE TO BE PROVIDED BY OWNER. THE ELECTRICAL CONTRACTOR IS TO PROVIDE ALL CONDUIT AND STANDARD BACKBOXES IDENTIFIED IN ELECTRICAL DOCUMENTS.

4. CONTRACTOR TO MARK CIRCUIT NUMBERS ON ALL J BOXES. MARK ON EXTERIOR IF NOT PAINTED, INTERIOR IF PAINTED.

5. PROVIDE TAMPERPROOF OUTLETS AS REQUIRED BY CODE.

LIGHTING:

1. CONTRACTOR IS TO VERIFY LIGHT FIXTURE COLOR/FINISHES WITH ARCHITECT PRIOR TO ORDER.

2. ALL LIGHT FIXTURES ARE TO BE CHECKED BEFORE ROUGHING IN TO INSURE THAT THEY CAN BE MOUNTED AS DIRECTED BY THE DRAWINGS AND THAT THERE IS ENOUGH SPACE TO ALLOW SUCH.

3. RECESSED LIGHT FIXTURES IN INSULATED CEILINGS MUST BE I.C. RATED.

4. CONTRACTOR IS RESPONSIBLE FOR COORDINATING LOCATION OF HIS LIGHT FIXTURES WITH OTHER TRADES AND ARCHITECTURAL DRAWINGS PRIOR TO ANY INSTALLATION.

5. PROVIDE PHOTOCELL ON ROOF FOR SWITCHING OF EXTERIOR LIGHTING. SWITCH THRU TIMECLOCK ALSO PROVIDED BY CONTRACTOR.

ELECTRICAL SYMBOLS LEGEND

LED WALL SCONCE. SEE LIGHTING FIXTURE SCHEDULE FOR DETAILS.

LED HIGH BAY LIGHT. SEE LIGHTING FIXTURE SCHEDULE FOR DETAILS.

EXIT SIGN/EXIT COMBO, SEE LIGHTIING SCHEDULE FOR INCLUSION OF EMERGENCY BATTERY PACKS. SHADING INDICATES NUMBER AND ORIENTATION OF FACES UNIVERSAL MOUNTING KIT. ARROW INDICATES PROVIDE KNOCKOUT FOR DIRECTIONAL ARROW IN THE DIRECTION SHOWN. SEE LIGHTING FIXTURE SCHEDULE FOR DETAILS.

WALL MOUNTED SWITCH, MOUNT 48" A.F.F. UNLESS OTHERWISE NOTED. NUMBER INDICATES TYPE (3-WAY, ETC.), PROVIDE NYLON FACEPLATES.
"D" INDICATES SLIDE DIMMER. COORDINATE SIZE WITH FIXTURES CONTROLLED TO AVOID FLICKERING.

PANELBOARDS; RECESSED OR SURFACE MOUNTED AS NOTED IN PANEL SCHEDULE. UNLESS OTHERWISE NECESSARY BY HEIGHT OF CABINET, MOUNT SO THAT TOP IS AT 6'-0" A.F.F.. 3'-0" HORIZONTAL CLEARANCE MUST BE MAINTAINED FROM FLOOR TO CEILING IN FRONT OF ELECTRICAL PANELS.

A-12 HOMERUN TO PANELBOARD IN CONDUIT. LETTER INDICATES PANEL, NUMBER INDICATES CIRCUIT NUMBER. CROSS HATCHES INDICATE NUMBER OF CONDUCTORS TO BE #12 AWG UNLESSOTHERWISE NOTED. ALSO PROVIDE PHASE WIRES. LONG LINE INDICATES NEUTRAL. SEPARATE GROUND WIRES FOR ALL CIRCUITS, SIZE PER NEC.

CONDUIT IN FLOOR SLAB OR UNDERGROUND, 3/4" UNLESS OTHERWISE NOTED.

SURFACE MOUNTED EXPOSED CONDUIT, 3/4" UNLESS OTHERWISE NOTED.

J JUNCTION BOX, SIZE AND USE AS REQUIRED.

DISCONNECT SWITCH. ALL TO BE HEAVY DUTY. FUSE SIZE SHOWN ON DRAWINGS.

DUPLEX RECEPTACLE OUTLET.
"C" INDICATES MOUNTING AT COUNTER TOP HEIGHT, 6" ABOVE BACKSPLASH, VERIFY COUNTER HEIGHTS WITH ARCHITECT PRIOR TO DOING ANY WORK.
"WP" INDICATES A WEATHERPROOF DEVICE MOUNTED HORIZONTALLY.
"G" INDICATES GROUND FAULT PROTECTED DEVICE OR BREAKER (SEE PANEL SCH.).
"U" INDICATES DUPLEX RECEPTACLE WITH TWO EACH USB PORTS.
GROUNDS TO LOCATED UP ON ALL RECEPTACLES.

TELEPHONE OUTLET, MOUNT AT 18" A.F.F. TO CENTER OF BOX, PROVIDE MEASURED PULL STRING, UNLESS OTHERWISE SHOWN. CABLE & FACE PLATES BY OWNER.

SPECIAL PURPOSE RECEPTACLE. CONTRACTOR TO PROVIDE RECEPTACLE TO MATCH NEMA CONFIGURATION OF CORD & PLUG OF DEVICE TO BE PLUGGED INTO RECEPTACLE. "C" INDICATES MOUNTING AT COUNTER TOP HEIGHT, 6" ABOVE BACKSPLASH.

MOTOR RATED SWITCH.

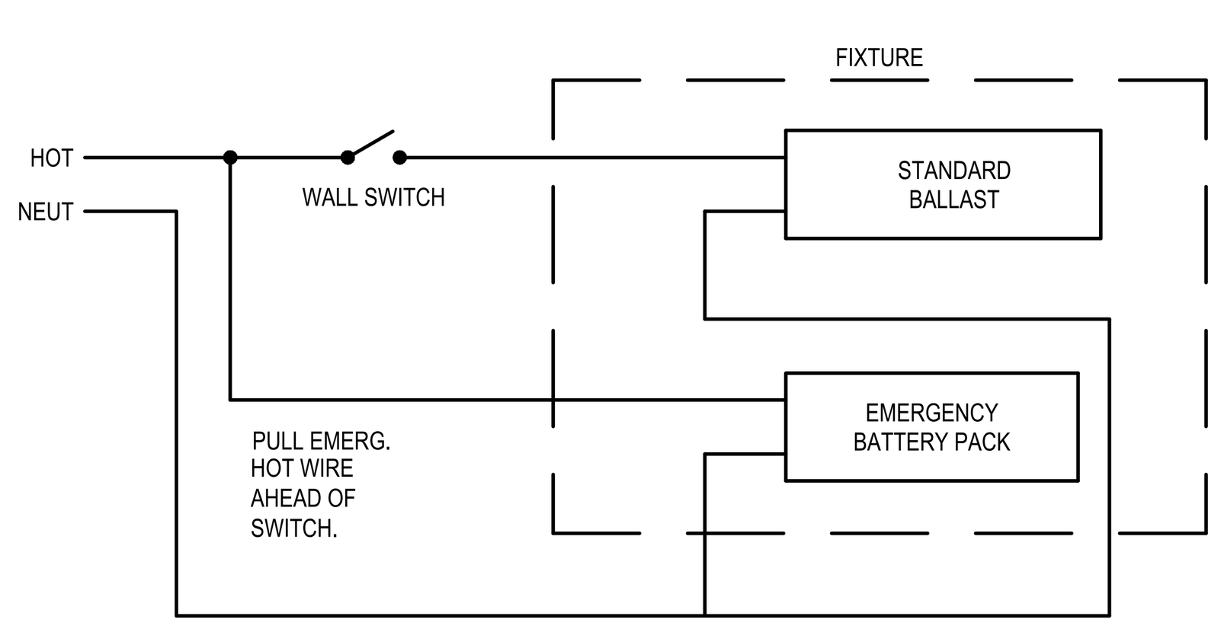
LEGEND NOTES:
1. ALL WIRING DEVICES AND COVERPLATES ARE TO BE PER ARCHITECT.

LIGHTING FIXTURE SCHEDULE

Type	MFG	Model	Description
EM	OWNER PROVIDED	PEH-T20	WALL MOUNTED EMERGENCY LIGHT. LED. TWO HEADS. 120V. NICAD BATTERY.
H	WILLIAMS	GH-2-L240-840-FP-DIM-UNV	LED HIGH BAY. 2' LENGHT, 24000lm, 80 CRI, 4000K CCT, UNIVERSAL VOLTAGE
WP	OWNER PROVIDED	LPW32-90-NW-G3-3-120	EXTERIOR LED WALL SCONCE. 90W, 120V
XC	BEGHELLI	BRZ-LR-U-W	EXIT SIGN/COMBO. RED LETTERS ON WHITE THERMOPLASTIC HOUSING. UNIVERSAL VOLTAGE. NICAD BATTERY. PROVIDE REMOTE BATTERY PACK FOR REMOTE HEAD WHERE NEEDED.
XR	BEGHELLI	BRH-WP-2	REMOTE HEAD. PROVIDE REMOTE BATTERY PACK WITH USE OF EXIT/COMBO.

SCHEDULE NOTES

1. CONTACT ADAM FLOWERS WITH SESCOLIGHTING AT (423) 495-0495 FOR HELP WITH THE ABOVE LISTED FIXTURES.
2. ALL FINISH AND TRIM PER ARCHITECT. CONFIRM WITH ARCHITECT PRIOR TO ORDERING ANY FIXTURE.
3. CONTRACTOR TO PROVIDE CAGES FOR ALL: "EM" AND "XC" TYPE FIXTURES.
4. CONTRACTOR TO PROVIDE ALL MOUNTING AND ACCESSORIES FOR MOUNTING OF FIXTURES.



DETAIL NOTES:

1. THIS DETAIL ALSO APPLIES TO FIXTURES WHICH ARE WIRED DIRECTLY FROM A BREAKER WITHOUT A WALL SWITCH. IN THIS CASE, WIRE THE "HOT" LEAD FROM THE EMERGENCY BATTERY PACK TO ANOTHER BREAKER IN THE PANEL.
2. EMERGENCY EXIT SIGNS AND WALL BUG-EYES TO BE WIRED HOT LEG AHEAD OF ANY SWITCHING.

NO SCALE

01 EMERGENCY FIXTURE WIRING DETAIL

PANEL SCHEDULE

NAME: **A**
FRAME: **125A**
MAIN: **80A MCB**
TRIM: **SURFACE, NEMA 1**
AIC RATING: **SERIES RATED**

VOLTAGE: **208/120, 3PH., 4W.**
FEEDS FROM: **TRANSFORMER**
PROVIDE NEUTRAL BAR
PROVIDE GROUND BAR

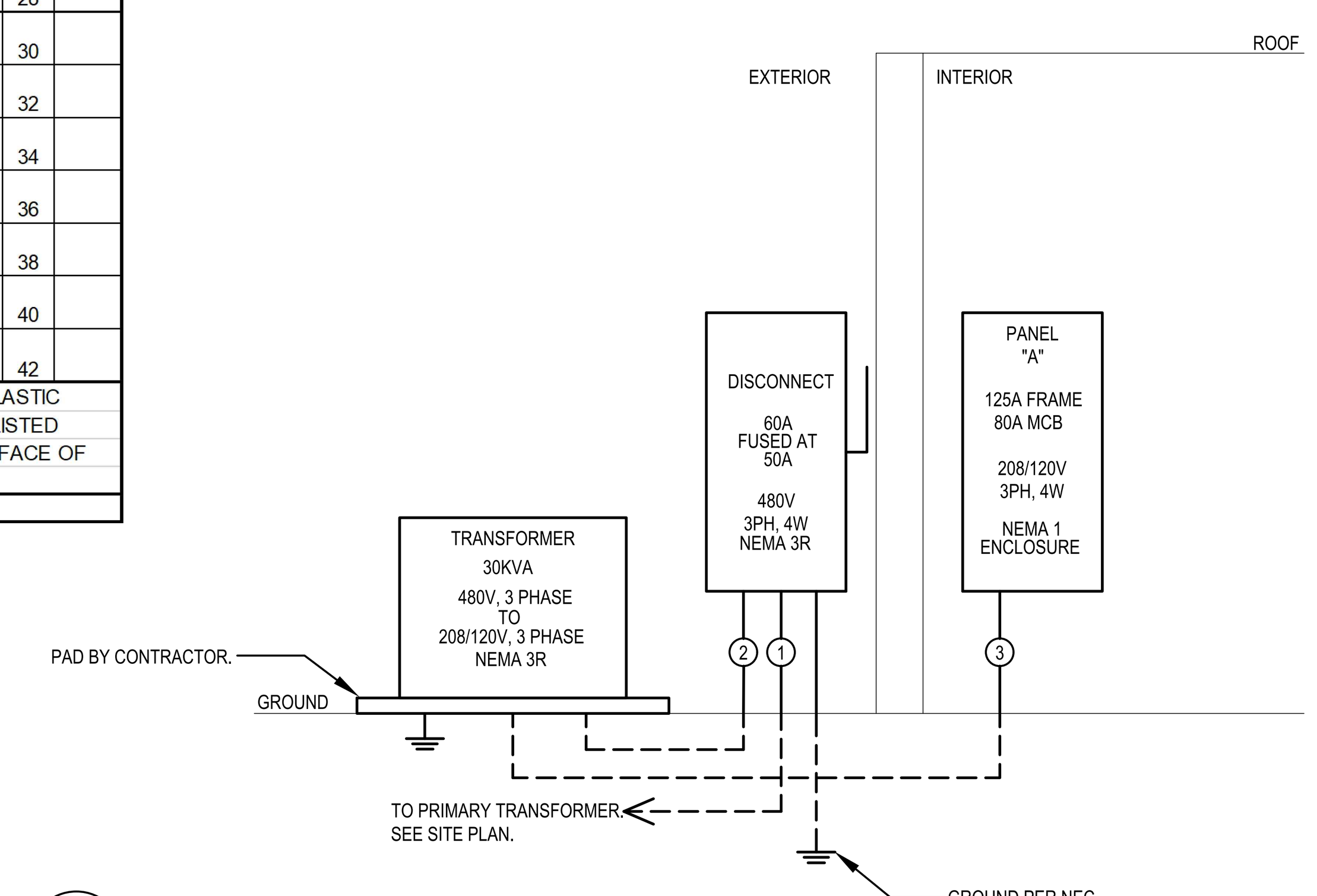
CODE	CKT.	LOAD	TRIP	PLS	A	B	C	PLS	TRIP	LOAD	CKT	CODE
L	1	LTS - Exterior Wall Packs	20	1	540 / 1,080			1	20	LTS - Interior	2	
	3	LTS - Interior	20	1		1,080 / 540		1	20	Rcps. - Interior	4	
	5	Rcps. - Interior	20	1			540 / 360	1	20	Rcps. - Interior	6	
	7	Rcps. - Interior	20	1	540 / 540			1	20	Rcps. - Interior	8	
	9	EF-1	20	3		528 / 528					10	
	11						528 / 528				12	
	13				528 / 528			3	20	EF-1	14	
	15	Garage Door #1	20	2		510 / 510					16	
	17						510 / 510	2	20	Garage Door #2	18	
	19	Rcps. - Pitching Machine	20	1	1,000 / 1,000			1	20	Rcps. - Pitching Machine	20	
	21	Louvers	20	1		360		1	20	SPACE ONLY	22	
	23	SPACE ONLY	20	1				1	20	SPACE ONLY	24	
	25	SPACE ONLY	20	1				1	20	SPACE ONLY	26	
	27	SPACE ONLY	20	1				1	20	SPACE ONLY	28	
	29	SPACE ONLY	20	1				1	20	SPACE ONLY	30	
	31	SPACE ONLY	20	1				1	20	SPACE ONLY	32	
	33	SPACE ONLY	20	1				1	20	SPACE ONLY	34	
	35	SPACE ONLY	20	1				1	20	SPACE ONLY	36	
	37	SPACE ONLY	20	1				1	20	SPACE ONLY	38	
	39	SPACE ONLY	20	1				1	20	SPACE ONLY	40	
	41	SPACE ONLY	20	1				1	20	SPACE ONLY	42	
					PHASE LOAD TOTAL			PROVIDE TYPEWRITTEN SCHEDULES WITH PLASTIC COVER. CIRCUIT NAMES TO BE EXACTLY AS LISTED HERE. PROVIDE ENGRAVED NAMEPLATE ON FACE OF PANEL.				
					A	B	C					
					5,756	4,056	2,976					
		TOTAL CONNECTED LOAD:	12.8	KVA		OR			35.5	AMPS		

RISER WIRING TABLE

MARK	FED FROM	WIRE SIZE	WIRE TYPE	CONDUIT	GROUND PER RACEWAY
1	UTILITY-TRANSFORMER	6	AL.	2"	8
2	DISCONNECT	6	AL.	1-1/4"	8
3	STEP-TRANSFORMER	2	AL.	1-1/2"	6

TABLE NOTES:

1. ALL CONDUITS ABOVE GRADE TO BE EMT OR SCH80. CONDUITS IN CMU BLOCK TO BE EMT.
2. ALL BELOW GRADE ELBOWS TO BE RIGID OR SCH80 EXCEPT WHERE CONVERTING FROM PVC TO EMT INSIDE WALLS, EMT ALLOWED THEN.
3. ALL ABOVE SLAB CONDUIT RUNS ARE TO BE RAN PARALLEL & PERPENDICULAR TO BUILDING STRUCTURE.



1 / E001 ELECTRICAL RISER PLAN
SCALE: N.T.S.

TRANSFORMER NOTES

1. TRANSFORMER TO BE 480V DELTA PRIMARY TO 208Y/120V WYE SECONDARY, SIZE AS INDICATED. TRANSFORMER TO BE 150° RISE.

SHEET LIST - ELECTRICAL

NUMBER	NAME
E001	ELECTRICAL PROJECT SCHEDULES & NOTES
E101	ELECTRICAL LIGHTING PLAN
E201	ELECTRICAL POWER PLAN
ES101	ELECTRICAL SITE PLAN

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RHS BB Hitting Facility

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9-13-23
Drawn: DSA
File: 8236-D

Revisions:
1 ADDENDUM 1 10-24-23

Key Plan

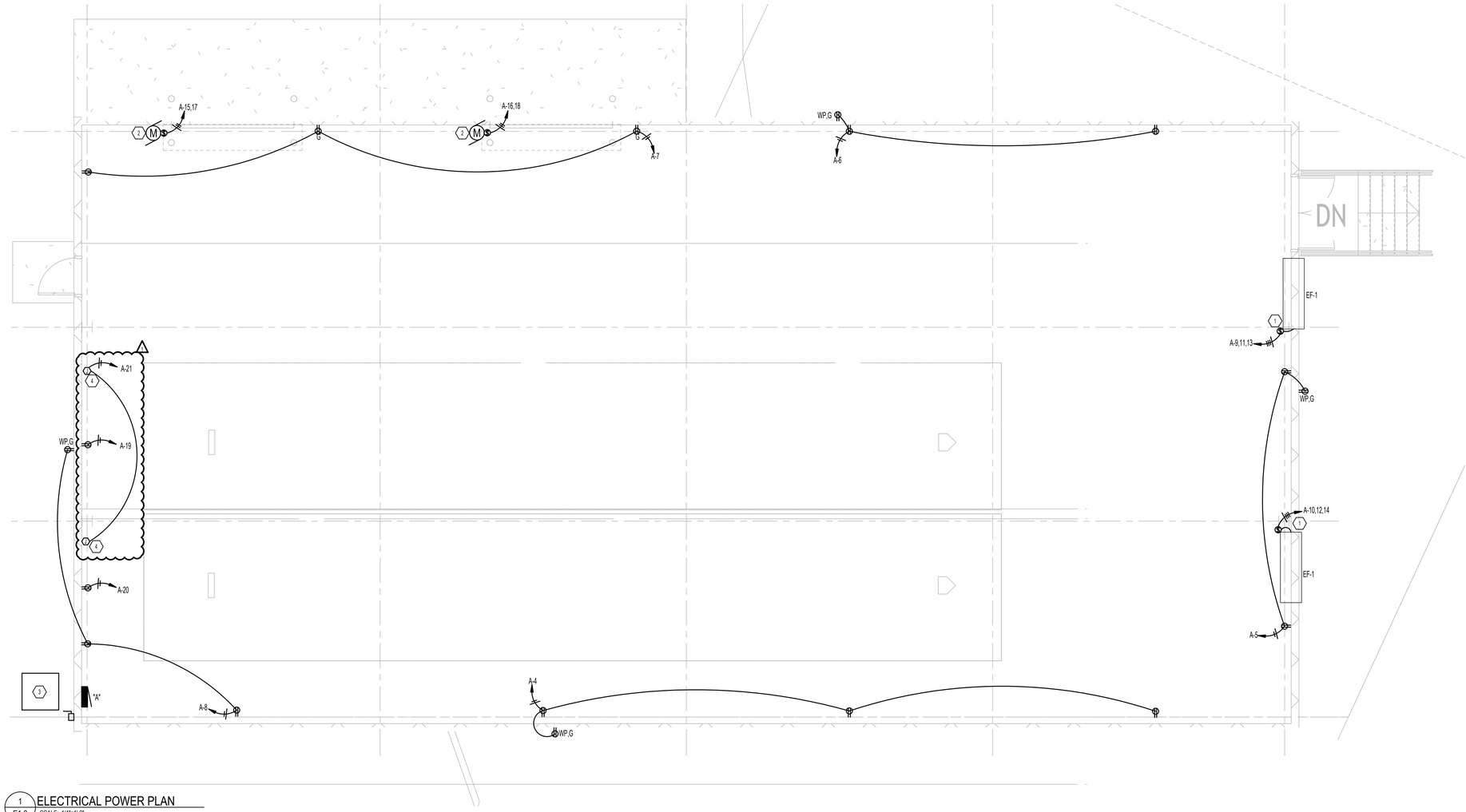
Title:
ELECTRICAL SCHEDULES & NOTES

Scale:

Sheet No.
E001

ELECTRICAL KEYED NOTES

1. PROVIDE A 15A MOTOR RATED SWITCH FOR EF-1. WIRE WITH #12 CU + #12 G IN A 3/4" C.
2. PROVIDE A 15A MOTOR RATED SWITCH FOR GARAGE DOOR MOTOR. WIRE WITH #12 CU + #12 G IN A 3/4" C.
3. APPROXIMATE LOCATION OF STEP-DOWN TRANSFORMER. SEE SITE PLAN AND RISER FOR MORE DETAILS.
4. POWER CONNECTION FOR MOTORIZED INTAKE LOUVERS. INTERLOCK WITH RESPECTIVE EXHAUST FAN. COORDINATE WITH MECHANICAL. PROVIDE ALL REQUIRED CONDUIT.



1 E1.0 ELECTRICAL POWER PLAN
SCALE: 1/4"=1'-0"

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Revisions:

1	ADDENDUM 1	10-24-23

Key Plan

GEORGIA REGISTERED No. 39815 PROFESSIONAL ENGINEER STEVEN B. MARCH 08/29/23

Title:
ELECTRICAL POWER PLAN

Scale:

Sheet No.
E201

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