

Project	Name	•	McDuffie Wareh	ouse			
Project	No.	10861	Task No.	02	Addendum No.	1	
То:	Prospec	ctive Bidd	lers			Date:	9/2/2022

The following items are clarifications to questions received. These items are hereby included in the bid documents by this addendum.

Item	Description
1.	The Pre-Bid sign in sheet is attached and is hereby incorporated into the bid documents by this addendum.
2.	Attached is the revised Division I schedule of prices hereby incorporated into the bid documents by this addendum. Prospective bidders shall replace the original schedule of prices with the attached. ASPA reserves the right to consider bids failing to include the revised schedule of prices as incomplete.
3.	Attached is the revised Division V Specifications (Division 5A 5.2, Division 4B 3.12, Division 2 18.0) and revised drawings hereby incorporated into the bid documents by this addendum.
4.	The bid opening date has been postponed. Delete all previous references to the bid opening and replace with the following:
	Sealed bid proposals will be received via courier to the Alabama State Port Authority, 1400 Alabama State Docks Blvd, Room 216, Administration Building, Mobile, AL 36602 by 1:30 P.M. on Wednesday, September 21, 2022. Sealed bid proposals can also be hand delivered from 1:45 P.M. to 2:00 P.M. on Wednesday, September 21, 2022, to the Alabama State Port Authority in the International Trade Center building, 250 North Water Street, 1 st floor – Killian Room, Mobile, AL. The official bid opening will be conducted in the Killian Room at 2:00 P.M. on Wednesday, September 21, 2022. No faxed or electronic bids will be accepted. Sealed bids shall have the bidder's name, contractor's license number, project name, and time and date of bid opening shown on the outside.
5.	A proposed construction schedule shall be included with each bid.
6.	Question: Is there any fire protection in this project?
	Answer: No, there is no sprinkler system.
7.	Question: Drawing 4043-G2 general notes structural steel calls for all plate to be ASTM A-36 and the specification booklet on page 60 under 5.0 Materials calls for plate to be ASTM A572 Grade 50. Confirm the right grade:
	Answer: All plate shall conform to ASTM A36 unless specifically noted on the drawing.
8.	Question: Three of the data outlets and several camera/security devices shown will be well over 300'

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	from the data room. This is outside of the cable spec. Please advise.
	Answer: Revised fiber optic layout will be provided in a future addendum.
9.	Question: Drawing 4043-S3 Detail 4 calls for a $\frac{1}{2}$ " bent plate pour stop. I would like to know if we can utilize 8"x4"x1/2" angle for this application.
	Answer: The $\frac{1}{2}$ " bent plate is not required as a pour stop and has been removed from the drawing. A standard manufactured metal decking closure is acceptable.
10.	Question: Can MC Cable be used in walls for receptacles in offices:
	Answer: Yes
11.	Question: Can all lighting/receptacle/fire alarm conduit be EMT?
	Answer: Yes in the Office Area. Yes for areas above 15' in the Warehouse.
12.	Question: Does fire alarm EMT need to be painted red?
	Answer: Contractor shall verify with their fire alarm subcontractor.
13.	Will Building Code be IBC 12 or IBC 18?
	Answer: IBC 2018
14.	Question: Will Speed be 161 or 159?
	Answer: 159 mph
15.	Question: Will collateral load be 5# or 8#?
	Answer: 8#
16.	Question: Will Wind Exp. be "D": or "C"?
	Answer: Exposure D
17.	Question: Will MBM Design and Supply Mezzanine (Bar Joist, Support Columns, Decking, ETC.)?
	Answer: yes
18.	Question: Are the primary and secondary framing deflections L/360 or L/240
	Answers: Primany framing $-1/260$, Secondary framing $-1/240$
19.	Question: Will side walls have 4' wall lights at top of wall?
	Answer: Yes the building shall have translucent panels along the East and North walls. The West wall will have translucent panels in the warehouse area. See revised Dwgs 4043-A3 and 4043-A4
20.	Question: Will roof require a MBM Weatherightnss Warranty?
21	Answer: Yes, see Division 13 Section 7.0 for Warranty requirements.
21.	Question. Are there any specs regarding the noor million in the warehouse:
	Answer: See section 11.2 Smooth Monolithic Ground Slab Finish in Division V specifications.
22.	Question: Would Ashford Formula be acceptable for the sealed concrete?



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	Answer: Curing compound and sealer shall be Sika – SCOFIELD SelectSeal Plus or approved equal.
23.	Question: Is there supposed to be an interior column at this frame line in the open area of the south
	elevation? 4043-A1 does not show one, however, 4043-F1A does.
	Answer: Yes, see revised drawing 4043-A1 included in this Addendum
24.	Question: Please provide soils report.
	Answer: Included in this addendum
25	Answer: Included in this addendum.
25.	downspouts and the storm drain nining?
	Answer: Contractor shall install appropriate size boot and pipe for downspout (sized by MBM) and
	ADS Tee Fitting for the downspout pipe/collector pipe connection.
26.	Question: Are you wanting sidelite translucent panels on the metal building sidewalls?
	Answer: See Item #17.
27.	Question: Is an Ashford Formula acceptable for the floor sealer? Cannot find Demicon Cur-hard.
	Answer: Curing compound and sealer shall be Sika – SCOEIELD SelectSeal Plus or approved equal
28	Answer: Curring compound and sealer shall be sike – Scori ELD Selectisear rids of approved equal.
20.	Are there any gates going across the entry road?
	Answer: See revised Dwg 4043-C2 and 4043-C2A for revised fence and gate locations.
29.	Question: The detail of the fence shows 7' tall with barbwire, the detail of the gate shows 8' with
	barbwire. Can you please clarify height?
	Answer: The fance will be 8' tall with barbwire (can revised Dwg 4042 C4P). The 29'wide gates are 8'
	Answer. The fence will be 8 tail with barbwire (see revised Dwg 4045-C4B). The 28 wide gates are 8 tall with barbwire. The $40'$ gate is 6' tall
30.	Question: Clarify which overhead doors get electric motors and which ones are manual. Also, which
	doors they want to be insulated? The fire door model (630) shown on the drawings is non-
	insulated. That area is climate controlled. Should this door be insulated?
	Answer: Electric Openers: 18'x8' FireKing Door, 18'x18' Door b/w column lines 4 & 5.
	All other deers are manual
	All other doors are manual.
	The 18'x8' FireKing Door shall be insulated. The model number has been updated to 635 on the
	drawings. All other doors shall meet minimum insulation requirements per 2018 IBC.
31.	Question: Are all overhead doors electric operated? Drawing A-3 indicates one 18x18 next to the
	loading dock and drawing S-3 indicates the 8x18 fire door to be electric. Are the balance of doors
	electric operated?
	Answer: Electric Openers: 18'x8' FireKing Door, 18'x18' Door b/w column lines 4 & 5. All other doors



are manual.
Question: Reference the finish schedule-All rooms except IT shows sealed concrete. The sealed concrete note indicates "color to be determined by owner" typically the sealer is clear. Is the intent stained concrete, sealer, or epoxy? Please clarify finish and product.
equal.
Question: Room 210 on the finish schedule indicates Hollow Steel Floor and it is labeled IT room. The floor plans labels as office and IT room is 216. Please confirm 210 is office and receives the clear sealer.
Answer: Room 210 is "Office 7" and receives clear sealer. Dwg 4043-A7 has been revised.
Question: What testing is required for the concrete paving in the warehouse? Answer: Concrete cylinders (compression) and Flex beams (flexure). All testing will be provided by the owner.

Please indicate your receipt of this addendum by adding the addendum number in the appropriate place in your Requisition & Proposal or Specification Book.



Alabama State Port Authority Pre-Bid Meeting Attendance Sheet

10180			40004	— • • • • • • • • • • • • • • • • • • •
Project Name	McDuffie Warehouse	Project #	10861	Task # 02
-	August 24, 2022 @ 10:00am			

Contractor (Business) Name	Address 1	Address 2	City, State Zip
BEIM LOON OF LOND	3456 Amus Mill Ro		Mos. 6, Al. 36400
Contact Name	e-mail address	Tel	ephone Fax
BE RANCH IFF JR	tenire benred	Iditt. un 25	1.666.7252 666-7364
Signature	Signature	Signature	Signature
Bur			

Contractor (Business) Name	Address 1	Address 2	City, State Zip	
W.R. Mitchell Cont The	PiJiA= 18031		Mobile, A	L J6617
Contact Name	e-mail address	Tele	phone	Fax
Bill Mc Gourh	magourlow e AOL C	ion 251	1-456-6576	251-456-0047
Signature	Signature	Signature	Signature	
(may				

Contractor (Business) Name	Address 1	Address 2	City, State Zip
MW ROGARS GUIST.	25 MIDTONI PARK W		MOBILE, AC 36606
Contact Name	e-mail address	Tele	phone Fax
JUHA OTTS	J-AME MWRSDF.R	S. JET Z	51-479-5350 251-479-6080
Signature 0	Signature	Signature	Signature
460			

Contractor (Business) Name	Address 1 Addr	ess 2	City, State Zip	
G.A. West	12526 Colosfe R.J		Chuncled-	36521
Contact Name	e-mail address	Teleph	none	Fax
Chad Carlsen	ched. Corlean @servest. Low	251-	-300-2406	
Signature	Signature	ature	Signature	
Clindl				



Contractor (Business) Name

Alabama State Port Authority Pre-Bid Meeting Attendance Sheet

Address 1

McDuffie Warehouse **Project Name** August 24, 2022 @ 10:00am

Project # 10861 **Task #** 02

City, State Zip St Louis 36602 Nobie e-mail address Telephone **Contact Na** -Dees e Rogers Willard, Cor-251-Dees 70 Signature Signature Signature Signature 57 Contractor (Business) Name Address 1 Address 2 City, State Zip 520 Sardand Blud in Buildie Go. **Contact Name** e-mail address Telephone Fax dmosley e dunn building company, con aniel Mosler 251-295-2878 Signature Signature Signature Signature Contractor (Business) Name Address 1 Address 2 City, State Zip GAWest Const. Co. 1200 Andel: FF Rd Contact Name e-mail address Telephone Fax Charles Busbu Charlie, Busby @ gawest. com Signature Signature Signature Signature

Address 2

Contractor (Business) Name	Address 1 Address 2	City, State Zip
G.A. West	1200 Radeliff Rd	Creola IAC
Contact Name	e-mail address	Telephone
Kristian Roe	Kristian. Fre @ aquest.com	251-421-5438
Signature	Signature	Signature
Kit Ron		



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McDuffie Warehouse Project Name August 24, 2022 @ 10:00am

Project # 10861 Task # 02

Contractor (Business) Name	Address 1	Address 2	City, State Zip
KJ Bougett	759 Holcombe Ave		Mobile, AC 34407
Contact Name	e-mail address	Teli	ephone Fax
Bryant Basgett	brante ribesce	H.com	
Signature	Signature	Signature	Signature
1/2 Hegeld			

Contractor (Business) Name	Address 1	Address 2	City, State Zip
Gailland Builders	1505 Telegraph Rd		Mobile, AL 36611
Contact Name	e-mail address	Т	elephone Fax
Crenshaw Poole	Croole Of gaillard bu	ilders.com t	51-433-9315
Signature	Signature	Signature	Signature
lfode			

Contractor (Business) Name	Address 1 Address 2	City, State Zip
RS Bagget Inc	759 Holcembre Ave	Wohile, AL 36406
Contact Nata	e-mail address	Telephone Fax
Joan Dicks	Joey Pribagett. com	251-473-3290
Signature	Signature	Signature
22		

Contractor (Business) Name	Address 1 Add	Iress 2 City, State Zip
Gulf Electric	1917 Halls Mill Dr	Mobile AL 36693
Contact Name	e-mail address	Telephone Fax
Robbie Henriksen	rhensiksen@ gul	F Elec. com 257-331-2728
Signature / / / / Signature	Signature Sign	ature Signature
Rellicht		



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McDuffie Warehouse Project Name August 24, 2022 @ 10:00am

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Contractor (Business) Name	Address 1	Address 2	City, State Zip
Ben Radell FF Contractor	3456 Halls Mill Road		Mobile, AL
Contact Name	e-mail address	. Tele	phone Fax
Ben Rad cliff IIt	5cn3@benradclift	F. Com Zs	1-666-7252
Signature	Signature	Signature	Signature
12 May			

Contractor (Business) Name	Address 1	Address 2	City, State Zip
Chris Brewer Contracting	Dyl St.		
Contact Name	e-mail address	Те	lephone Fax
ElBooth	Ed. booth a) attinet	- 2	57-263-2299
Signature	Signature	Signature	Signature /
alun from			

Contractor (Business) Name	Address 1	Address 2	City, State Zip
PERSONS SERVICES	4474HallsmillRd		MOB, AL 36693
Contact Name	e-mail address	1	Felephone. Fax
WCA3 COOKE	Cooke & personsse	ervices.com 2	2514547429
Signature	Signature	Signature	Signature
Na			

Contractor (Business) Name	Address 1	Address 2	City, State Zip	
Bagby+Russell Elect	5500 Plantation Dr		Theodore .	41 36555
Contact Name	e-mail address	Tel	ephone	Fax
Leron Fuller	Leroy & Bay Kus; C	iom 2ª	51-341-5957	
Signature	Signature	Signature	Signature	



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SCHEDULE OF PRICES

REVISED 9/2/2022

ITEM	DESCRIPTION	QUANTITY	UNIT PRICE	AMOUNT
1.0	General Construction Requirements	1 LS	Lump Sum	\$
1.1	Mobilization	1 LS	Lump Sum	\$
1.2	Demobilization	1 LS	Lump Sum	\$
2.0		<u>Site</u>	<u>e Work</u>	
2.1	Erosion Control	1 LS	Lump Sum	\$
2.2	Clearing/Grubbing/Demo	Acres	\$/Acre	\$
2.3	Grading & Excavation for Building Area	CY	\$/CY	\$
2.4	Structural Sand Fill for Building Area	CY	\$/CY	\$
2.5	Grading & Excavation for Pavement Areas	CY	\$/CY	\$
2.6	Grading & Excavation for Landscape Areas	Сү	\$/CY	\$
2.7	Structural Sand Fill for Pavement Areas	CY	\$/CY	\$
2.8	Crushed Aggregate Base	TONS	TONS	\$
2.9	Asphalt Paving for Roadways	TONS	TONS	\$
2.10	Rigid Concrete Paving (Inside Warehouse)	CY	\$/CY	\$
2.11	Concrete for Warehouse Foundations	CY	\$/CY	\$
2.12	Concrete for Warehouse Perimeter Curb	CY	\$/CY	\$
2.13	Concrete for Office Foundations	CY	\$/CY	\$
2.14	Concrete for Sidewalks	CY	\$/CY	\$
2.15	Generator Foundation	СҮ	\$/CY	\$
2.16	Guard Shack Foundation	CY	\$/CY	\$



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2.17	Site Utility Installation Allowance (Power, Water, Sanitary Sewer Connection, Fire Water, Fiber)	1 LS	Lump Sum	\$
2.18	Antenna Pole	1 LS	Lump Sum	\$
2.19	Security Fence	LF	\$/LF	\$
2.20	Security Gates	1 LS	Lump Sum	\$
2.21	Guard Shack	1 LS	Lump Sum	\$
2.22	Generator	1 LS	Lump Sum	\$
2.23	Stormwater System Appurtenances	1 LS	Lump Sum	\$
3.0				
3.1	4" Top Soil for Landscape Areas	СҮ	\$/CY	\$
3.2	Landscaping: Seeding		SY	\$
4.0		Wai	rehouse	
4.1	Enclosed Warehouse Space (including MEP)	1 LS	Lump Sum	\$
4.2	Covered Warehouse Storage	1 LS	Lump Sum	\$
4.3	Climate Controlled Storage	1 LS	Lump Sum	\$
4.4	Warehouse Office	1 LS	Lump Sum	\$
4.5	Processing Area	1 LS	Lump Sum	\$
5.0	Miscellaneous	1 LS	Lump Sum	\$
TOTAL BID			\$	

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- (1) This is a Lump Sum Bid for the work as shown on the drawings and as specified. The quantity under each item may be increased, decreased, or deleted after award of Contract in accordance with provisions of the Contract Documents. The Unit Prices are for adjustment only.
- (2) The Total Bid amount shall be the sum of Items 1.0 5.0. All optional items to be included in the contract shall be approved by the Owner.
- (3) The general requirements should include insurances, taxes, overhead profit and all other miscellaneous construction activities involved with the specific construction phase included in the drawings or specifications.
- (4) Miscellaneous (Item 5.0) should include final grading, sodding, seeding, and any other items not specifically detailed in the schedule of prices but including in the drawings or specifications.

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CONTRACT DOCUMENTS

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DIVISION 1 – GENERAL REQUIREMENTS

1.0 DESCRIPTION OF THE WORK

1.1 The work consists of, but is not limited to, furnishing of all labor, tools, equipment, materials, services, transportation and supervision necessary to complete the following items: site work, concrete foundations, perimeter grade beam, metal building, mechanical, plumbing, electrical, drainage appurtenances, and all other incidentals as shown on the respective design drawings and as further specified herein.

2.0 WORK INCLUDED

- 2.1 <u>Site Improvements</u>
 - 2.1.1 Furnish and install site grading and drainage appurtenances.
 - 2.1.2 Furnish and install sand fill and crushed aggregate base.
 - 2.1.3 Furnish and install new paving.
 - 2.1.4 Furnish and install new stone.
 - 2.1.5 Furnish and install security fence and gates.
 - 2.1.6 Furnish and install site utilities and radio antenna pole.
- 2.2 Furnish and Install Metal Building
 - 2.2.1 Furnish and install building as shown on plans.
 - 2.2.2 Furnish and install concrete foundations, concrete paving and perimeter grade beam for building as shown on plans.
 - 2.2.3 Furnish and install mechanical ventilation, plumbing and electrical service.
 - 2.2.4 Furnish and install new office finishes.
 - 2.2.5 Furnish and install new handrails and stairs as shown on plans.



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2.2.6 Furnish and install backup generator.



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3 <u>REFERENCE DOCUMENTS</u>

Latest edition of the following:

ASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGC	Associated General Contractors of America
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CRSI	Concrete Reinforcing Steel Institute
NEC	National Electric Code
NEMA	National Electrical Manufacturer's Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
SBCCI	Standard Building Code
UL	Underwriters' Laboratories, Inc.

4.0 COOPERATION AND COORDINATION WITH OWNER

- 4.1 Contractor shall be responsible for providing any required temporary barricades or fencing for protection of adjacent property and the construction area.
- 4.2 The Contractor is responsible for the coordination and protection of his work until acceptance by the Owner.



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5.0 CONSTRUCTION AREA

5.1 The Contractor shall provide lights, barricades and warning signs, as necessary, to protect the required construction area. Contractor shall coordinate, with the Owner and his representatives, the area required for Construction purposes. An area for Contractor's field office and/or material storage shall be coordinated with Owner.

6.0 <u>SHOP DRAWINGS</u>

- 6.1 Shop drawings shall be submitted, as required, for Owner's review. The first submittal of the shop drawings will be the only time allowed by Owner for approval within the time schedule of the work, unless directed otherwise. Rejection and resubmittal of shop drawings due to Contractor error will not extend the completion date of the work. Resubmittal of shop drawings will be required until all corrections have been made.
- 6.2 The review of these drawings will not relieve the Contractor from responsibility or implemented deviations from drawings or specifications during his fabrication process; nor from the responsibility for errors in all types of shop drawings furnished by him.

7.0 MATERIALS AND WORKMANSHIP

- 7.1 All materials will be new, unless salvaged material is specified to be used, and the new materials shall be of the best quality of their respective kinds.
- 7.2 Where a specified manufacturer's name and/or number is mentioned herein or indicated on the drawings in connection with manufactured articles, materials or items of equipment, it shall be considered to set a standard for any requested substitute by the Contractor. However, it is intended that the exact item, service and/or material shall be provided.
- 7.3 Items of reputable manufacturers other than those names herein may be used if they are approved by the Owner prior to installation or use during the project.



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7.4 In connection with the use of any alternate item approved, it shall be the Contractor's responsibility to see that any such items meet all space requirements, and that any alterations are properly made.

8.0 <u>CONSTRUCTION PHASING</u>

- 8.1 Timely completion is an essential element of this Contract. The Contractor's proposed Work Progress Schedule (to be delivered to the Owner at the Preconstruction Conference) shall be developed taking into account all factors, which will affect phasing, or performance of the work.
 - 8.1.1 Scheduling, sequencing, procedures and performance of work shall comply with all provisions of the general conditions and technical specifications.
- 8.2 The Contractor shall submit a construction sequence, which provides for completion of all items, as outlined above.
- 8.3 As noted in the specifications, the Owner reserves the right to decrease the Scope of Work by removing any of the items outlined in the Schedule of Prices. The Scheduled completion dates would require adjustment, accordingly.



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DIVISION 2 - SITEWORK

EXCAVATION, FILL, AND PREPARATION OF SUBGRADE

1.0 <u>SCOPE OF WORK</u>

1.1 The work included under this section shall consist of furnishing all the labor, tools, equipment, material, services and supervision necessary for the final grading of the new structures and excavations or backfill required to complete the foundation work.

2.0 <u>SITE INFORMATION</u>

2.1 The soil data furnished is made available to the Contractor for information only. The data on indicated subsurface conditions are not intended as representations or warranties of the continuity of such conditions. It is expressly understood that the Owner will not be responsible for interpretations or conclusions drawn there from by the Contractor. The soils data is available upon request.

3.0 <u>EXCAVATION</u>

- 3.1 <u>General</u>. The term fill used hereinafter is defined as "unclassified excavation". Excavation of every description, regardless of material encountered within the limits of the project, shall be performed to the lines and grades indicated or specified. Suitable excavated material shall be stockpiled or transported to and placed in fill areas within the limits of the work. (During construction, excavation and filling shall be performed in a manner and sequence that will provide drainage at all times.)
- 3.2 <u>Stockpiling</u>. Generally, it will be necessary to stockpile excavated materials prior to final placement or disposal. Suitable materials shall be kept segregated from unsatisfactory materials.
- 3.3 <u>Structures</u>. Excavation for structures shall be made accurately to the lines, grades, and elevations shown or as directed. Trenches and foundation pits shall be of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations as shown.



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Excavation to the final grade level shall not be made until just before the concrete is to be placed.

- 3.4 <u>Temporary Excavations</u>. Temporary excavation above the water table may proceed with vertical side slopes to depths of three (3) feet. Shoring will be required for vertical cuts to deeper depths. Large area excavations above the water table should have 2.5 to 1 (horizontal: vertical) side slopes or flatter as required for stability. Excavations deeper than the existing water surface shall require engineering design to address dewatering requirements and potential soil instabilities due to seepage pressures.
- 3.5 <u>Permanent Slopes</u>. Permanent slopes should not be steeper than 3 horizontal to 1 vertical for fill materials and compacted in-situ soils unless otherwise recommended by the geotechnical engineer. Permanent slopes of 4 horizontal to 1 vertical may be required for loose in-situ soils. Erosion protection shall be provided for slopes above mean low water elevation. Erosion protection may include placement of topsoil, erosion control netting, grass sod, seeding, or geotextile/rip-rap.
- 3.6 <u>Trenches</u>.

3.6.1 General.

- a. Perform all excavation of every description and of whatever substance encountered so that pipe can be laid to the alignment and depth shown on the drawings.
- b. Brace and shore all trenches, where required, in accordance with the Safety and Health Regulations for Construction, Occupational Safety and Health Administration, Department of Labor.
- c. Make all excavations by open cut unless otherwise specified or indicated on the drawings.
- 3.6.2 <u>Width of Trenches</u>. Excavate trenches sufficiently wide to allow proper installation of concrete, pipe, fittings, and other materials and not less than 12" clear of pipe and formwork on either side at any point. Do not widen trenches by scraping or loosening materials from the sides. Where supports, sheeting, and bracing are required, trench may be of extra width to permit the placing



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of the trench supporting material.

3.6.3 <u>Trench Excavation in Earth</u>. Earth excavation includes all excavation of whatever substance encountered. In locations where pipe is to be bedded in earth excavated trenches, fine grade the bottom of such trenches to allow firm bearing for the bottom of the pipe on undisturbed earth. Where any part of the trench has been excavated below the grade of the pipe, fill the part excavated below such grade with pipe bedding material and compact at the Contractor's expense.

4.0 <u>BORROW MATERIAL</u>

4.1 <u>Selection of Borrow Material</u>. Borrow material shall be in accordance with these specifications. Minimal borrow should be available on site. Additional borrow material is required; it shall be obtained from approved off-site sources by the Contractor. Service records of the source and analysis of the material by a reputable laboratory shall be submitted to the Engineer.

5.0 <u>BACKFILL</u>

- 5.1 <u>Backfill Around Structures</u>
 - 5.1.1 <u>General</u>. Unless otherwise specified or indicated on the drawings, use suitable material for backfill, which was removed in the course of making the construction excavations.
 - 5.1.2 <u>Material</u>. Approved selected materials available from the excavations may be used for backfilling around structures. Obtain material needed in addition to that of construction excavations from approved sites or other approved deposits. Furnish all borrow material needed for the work. Place and compact all material, whether from the excavation or borrow, to make a dense, stable fill. Use fill material which contains no vegetation, masses of roots, individual roots over 6" long or more than ¹/₂" in diameter, stones over 4" in diameter, or porous matter
 - 5.1.3 <u>Placing Backfill</u>.



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- a. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected without distortion, cracking, or other damage. Use the best of the excavated materials in backfilling within 2 ft. of the structure. Avoid unequal soil pressures by depositing the material evenly around the structure.
- b. Place fill and backfill in layers not more than 6" thick, except as specified otherwise herein, and compact each layer evenly to the specified density. Do not backfill against concrete without Engineer's approval.

5.2 <u>Trench Backfill</u>

5.2.1 <u>General</u>.

- a. Unless otherwise specified or indicated on the drawings, use suitable material for backfill, which was removed in the course of making the construction excavations. Start backfilling as soon as practicable after the pipes have been laid or the structures have been built and are structurally adequate to support the loads, including construction loads, to which they will be subjected, and proceed until its completion.
- b. With the exception mentioned below in this paragraph, do not backfill trenches at pipe joints until after that section of the pipeline has successfully passed any specified test required. Should the Contractor wish to minimize the maintenance of lights and barricades and the obstruction of traffic, he may, at his own risk, backfill the entire trench as soon as practicable after installation of pipe, and the related structures have acquired a suitable degree of strength. He shall, however, be responsible for removing and later replacing such backfill, at his own expense, should he be ordered to do so in order to locate and repair or replace leaking or defective joints or pipe.
- 5.2.2 <u>Materials</u>. The nature of the materials will govern both their acceptability for backfill and the methods best suited for their



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placement and compaction in the backfill. Both are subject to the approval of the Engineer. Place no stone or rock fragment larger than 4" in greatest dimension in the backfill. Drop no large masses of backfill material into the trench in such a manner as to endanger the pipeline. Use a timber grillage to break the fall of material dropped from a height of more than 5 feet. Exclude pieces of bituminous pavement from the backfill unless their use is expressly permitted.

5.2.3 <u>Zone Around Pipe</u> Place bedding material to the level shown on the drawings and work material carefully around the pipe to ensure that all voids are filled. For backfill up to a level of 2 ft. over the tops of the pipe, use only selected materials containing no rocks, clods, or organic materials. Place the backfill and compact thoroughly under the pipe haunches and up to the mid-line of the pipe in layers not exceeding 6" in depth. Place each layer and tamp carefully and uniformity so as to eliminate the possibility of lateral displacement. Place and compact the remainder of the zone around the pipe and to a height of 1 ft. above the pipe in layers not exceeding 6" and compact to a maximum density of at least 95% as determined by ASTM D1557 modified.

5.2.4 <u>Tamping</u>

- a. Deposit and spread backfill materials in uniform, parallel layers not exceeding 12" thick before compaction. Tamp each layer before the next layer is placed to obtain a thoroughly compacted mass. Furnish and use, if necessary, an adequate number of power-driven tampers, each weighing at least 20 pounds, for this purpose. Take care that the material close to the bank, as well as in all other portions of the trench, is thoroughly compacted.
- b. When the trench width and the depth to which backfill has been placed are sufficient to make it feasible, and it can be done effectively and without damage to the pipe, backfill may, on approval, be compacted by the use of suitable rollers, tractors, or similar powered equipment instead of by tamping. For compaction by tamping (or rolling), the rate at which backfill material is deposited in the trench shall not exceed that permitted by the facilities for its spreading, leveling, and compacting as furnished by the Contractor.



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c. Wet the material by sprinkling, if necessary, to ensure proper compaction by tamping (or rolling). Perform no compaction by tamping (or rolling) when the material is too wet from rain or applied water to be compacted properly.

6.0 PREPARATION OF SUBGRADE

- 6.1 Ground surface on which fill is to be placed shall be stripped of live, dead, or decayed vegetation, rubbish, debris, boulders, and other unsatisfactory material; plowed, disked, or otherwise broken up; pulverized; and moistened or aerated as required just prior to placement of fill materials to assure adequate bond between fill material and the prepared ground surface. The exposed ground surface of area graded to elevations as noted above shall be compacted by means of a heavy vibratory roller working at slow speed. Compact to 95% standard proctor density as determined by ASTM D698.
- 6.2 Filling required to attain design subgrade elevations shall be performed utilizing a combination of "select sand" and "structural fill" as outlined in these specifications.
- 6.3 "Select sand" used to fill within saturated zones shall consist of a locally available borrow material herein defined as a medium to coarse sand fill containing less than 90% passing the No. 40 sieve and less than 5% passing a No. 200 sieve by weight. Select sand fill shall be placed in maximum loose lift thicknesses of 12" and compacted to 95% of the material's Standard Proctor Density as per ASTM D-698. Select sand fill may be used to obtain a maximum grade level of 12" below underside of railroad subbase.
- 6.4 "Structural fill" used to attain design grade elevations shall consist of a locally available borrow material herein specified as silty or clayey sand containing less than 95% passing a No. 40 sieve, and between 12 and 18% passing the No. 200 sieve, by weight. Maximum loose lift thicknesses of 12" shall be compacted to 98% of the soil's Standard Proctor Density as per ASTM D-698.

7.0 <u>STRUCTURAL FILLS</u>

7.1 Fills shall be constructed from satisfactory materials free of organic



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material from the required excavations and from borrow, if necessary. The material shall be placed in successive horizontal layers of loose material not more than 10" in depth. Each layer shall be spread uniformly on a prepared surface, i.e., a soil surface that has been moistened or aerated as necessary and scarified or otherwise broken up in such a manner that the fill will bond with the surface on which it is placed; plowed, disked, or otherwise broken up; moistened or aerated as necessary; thoroughly mixed; and compacted to at least 98% standard proctor density. Compaction requirements for the upper portion of earth fills forming subgrade for base course shall be identical with those requirements specified herein. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

8.0 SUBBASE PREPARATION

- 8.1 <u>Construction</u>. The final lift for subgrade shall not be more than 6" in depth. Subgrade shall be shaped to line, grade and cross section, and compacted as specified. This operation shall include plowing, disking, and any moistening or aerating required to obtain proper compaction. Soft or otherwise unsatisfactory material shall be removed and replaced with satisfactory excavated material or other approved material as directed. After rolling, the surface of the subbases for base shall not show deviation greater than ¹/₄" when tested with a 10 ft. straightedge applied both parallel and at right angles to the centerline of the area. The elevation of the finished subbase shall not vary more than 0.05 ft. from the established grade and approved cross section.
 - 8.2 <u>Compaction</u>. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.
 - 8.3 <u>Densities</u>. Subgrade for base course shall be compacted to at least 95% standard proctor density.



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9.0 <u>FINISHING</u>

The surface of all excavations, fills, and subgrades shall be finished to a reasonably smooth and compact surface substantially in accordance with the lines, grades, and cross sections or elevations shown. The degree of finish for all graded areas shall be within 0.1 ft. of the grades and elevations indicated except that the degree of finish for subgrades shall be as specified above.

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10.0 SUBBASE AND FILL PROTECTION

During construction, fills and excavations shall be kept shaped and drained. Ditches and drains along subgrade shall be maintained in such a manner as to drain effectively at all times. The finished subgrade shall not be disturbed by traffic or other operation and shall be protected and maintained by the Contractor in a satisfactory condition until base course is placed. The storage or stockpiling of materials on the finished subgrade will not be permitted. No base course shall be laid until the subgrade has been checked and approved, and in no case shall base be placed on a muddy, spongy, or frozen subgrade.

11.0 DETERMINATION OF DENSITY

- 11.1 One density test per lift per 2500 square feet of fill material placed, shall be performed by owner. The contractor shall coordinate the testing with the owner, engineer and designated testing lab. Any areas not tested in accordance with specifications will be removed, reworked and tested in accordance with the specifications at "no additional cost to the owner".
- 11.2 The surface of the final subgrade elevation after excavation shall be tested the same as structural fill.
- 11.3 Results of compaction testing shall be forwarded to the Engineer on a regular basis such that prior to the placement of a lift, the results of the previous lift are known.

12.0 DISPOSAL OF UNSUITABLE OR EXCESS MATERIAL

The Contractor shall dispose of all unsuitable or excess materials resulting from the excavation that are not permitted or required in the fills or required in other



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features of the work. Materials shall be disposed of on the Owner's property.

13.0 <u>MEASUREMENT</u>

13.1 <u>Borrow</u>. The unit of measurement for borrow will be the cubic yard. Yardage of borrow to be paid for will be the number of cubic yards of borrow based upon in place measurement as determined by the average end area method.

14.0 SUBSIDIARY OBLIGATIONS

- 14.1 <u>General</u>. The following operations and construction will not be measured for direct payment, but will be considered subsidiary obligations of the Contractor, and will be covered under the contract prices for the structures involved or under the unit prices per yard as specified below.
- 14.2 <u>Excavation</u>. Excavation for drainage structures, foundations, and operations required in connection therewith, including bracing or sheeting, drainage, and pumping, will be covered under the contract price for drainage structures or the subject structure.
- 14.3 <u>Backfill</u>. Backfill for drainage structures and other structures below grade, including attendant operations, will be covered under the contract price for drainage structures or the subject structure.
- 14.4 <u>Fill</u>. Fill construction including the preparation of ground surface for placement of fill up to the finished subgrade elevation will be covered under the unit prices per cubic yard for Excavation or Fill.
- 14.5 <u>Subgrade preparation</u>. Subgrade preparation, including dressing, shaping, wetting, aerating, and compacting of the subgrade, will be covered under the unit prices per cubic yard for Excavation or Fill.
- 14.6 <u>Water</u> used for sprinkling and wetting materials during construction in connection with compaction of fills, unless otherwise specified, will be covered under the contract unit prices per cubic yard for Excavation or Fill.



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14.7 <u>Disposal of Unsuitable Material</u> will be covered under the unit prices per cubic yard for Excavation to required elevations.

15.0 <u>REMOVAL AND DEMOLITION WORK</u>

15.1 <u>Scope of Work</u>

The work included under this Section shall consist of furnishing all the labor, tools, equipment, material, services, and supervision necessary for the removal, and disposal of existing miscellaneous debris, and other items within the Contract limits shown on the Drawings and specified.

15.2 Protection of Existing Structures

The removal and disposal work required shall be performed in such a manner so as not to damage any existing structures that are to remain and any damage thereto caused by the Contractor's operations shall be repaired by the Contractor at no cost to the Owner.

15.3 Disposal of Removed Materials

Removed materials as noted herein or as may be designated by the Engineer shall remain the property of the Owner and shall be neatly stockpiled as directed. Material specified to be disposed of shall become the Contractor's property and shall be disposed of off Owner's property.

15.4 Existing Construction

It shall be the Contractor's responsibility to determine all necessary details of the existing construction as relative to its effects on his work.

16.0 <u>EROSION CONTROL</u>

16.1 During this site construction process and until all site drainage improvements are operational, the Contractor shall maintain an erosion control system satisfactory to the Engineer, the Owner, ADEM and all local authorities. Erosion control shall consist of silt fences, hay bales, ditches, pipes, inlets, and appurtenances required to prevent the transportation of sediments in stormwater runoff to the existing



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watercourse.

- 16.2 The Contractor shall provide, establish, maintain, and install erosion control as required by the parties noted above.
- 16.3 All erosion control shall be maintained by the Contractor during the contract period, and until contract acceptance.
 - 16.3.1 The Contractor shall examine the site and site conditions.
 - 16.3.2 Once the work has begun on a section it will be the responsibility of the Contractor to control all erosion during construction. This may include, but is not limited to, seeding, sodding, fences, berms, dikes, drains, netting, hay bales, sand bags, etc., as specified herein.
- 16.4 All practices and materials shall conform to the Alabama Highway Department Standard Specification for Highway Construction, Latest Edition.
- 16.5 A BMP plan shall be submitted to the Engineer for approval 15 days prior to the start of excavation and earthwork.
- 16.6 All materials shall comply with the plans and specifications. Certain materials can be substituted if authorized by the Engineer.
 - 16.6.1 Hay bales may either be hay or straw containing 5 Cu. ft. of material.
 - 16.6.2 Sand bags may be of cotton or burlap which will confine the sand inside the bag and be of a volume of approximately 1 Cu. ft.
 - 16.6.3 Silt fences shall consist of a woven wire fabric mounted on wood stakes or posts with a polymeric filter fabric attached to the fence fabric. Filter fabric shall be a polymeric fabric formed from a plastic yam of a long-chain synthetic polymer composed of at least 85% by weight of propylene ethylene, amide, ester, or vinyledenechloride and shall contain stabilizers to make the filaments resistant to deterioration from ultraviolet and heat exposure for at least six months.



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16.7 <u>Performance Requirements</u>

- 16.7.1 Sand bags shall be securely fastened when placed. The bags shall have a thickness of approximately 6".
- 16.7.2 Hay bales shall be securely anchored by the use of stakes and wire or other approved methods.
- 16.73 Silt fences shall be constructed at locations as required. Field splices can be made by overlapping the fabric a minimum of 3 ft. and securely fastening the fabric to the wire fence. Contractor shall maintain the fence until the contract has been accepted.
- 16.7.4 If the fabric should become damaged an additional layer of fabric can be attached with at least a 3 ft. overlap.
- 16.7.5 Temporary drainage sumps or sediment basins can be constructed near the ends of excavations or ditches to control silting.
- 16.7.6 Sumps shall be cleaned periodically by the removal of the silt to keep the sump functional.
- 16.8 The Contractor shall be responsible for protecting the site and all adjacent surface waters from any and all erosion. If erosion does occur, the Contractor shall repair all damage and provide all additionally needed topsoil at the Contractor's expense.

17.0 <u>FENCE</u>

17.1 SCOPE OF THE WORK

17.1.1 The work included under this section shall consist of furnishing all labor, tools, equipment, materials, and supervision necessary to complete installation of all fencing as shown on the drawings.



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17.2 PRODUCTS

- 17.2.1 General
 - 17.2.1.1 Framework: ASTM A120 Schedule 40 pipe, hot-dip galvanized.
 - 17.2.1.2 Fabric: Galvanized steel.
- 17.2.2 Components
 - 17.2.2.1 Line Posts: Nominal 2.375" O.D. (3.65 #/ft. min.)
 - 17.2.2.2 Corner and Terminal Posts: Nominal 2.875" O.D. (5.79 #/ft. min.)
 - 17.2.2.3 Gate Posts: Nominal 4.0" O.D.
 - 17.2.2.4 Top and Bottom Brace Rail: Nominal 1" O.D., plain end, sleeve coupled.
 - 17.2.2.5 Fabric: 2" diamond mesh 9 gauge galvanized steel wire, interwoven, top selvage twisted tight and barbed, bottom selvage knuckle end closed.
 - 17.2.2.6 Tension wire: 6 gauge.
 - 17.2.2.7 Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners, and fittings shall be galvanized or stainless steel.

17.3 EXECUTION

17.3.1 Installation

17.3.1.1 Set terminal gate and line posts plumb in concrete footings as shown on drawings. Slope top of concrete for water runoff.



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17.3.1.2 Provide all other requirements as detailed on drawings.

18.0 HEAVY DUTY SWING GATE CHAIN LINK

18.1 GENERAL:

18.1.1 SECTION INCLUDES:

18.1.1.1 The work in this section shall include furnishing all labor, materials, equipment and appliances necessary to complete all Heavy Duty Swing Gates required for this project in strict accordance with this specification section and drawings.

18.1.2 REFERENCES:

- 18.1.2.1 Underwriters Laboratory Gate Operator Requirements (UL 325). See 3.01 C.
- 18.1.2.2 ASTM F 2200 Standard Specification for Automated Vehicular Gate Construction. See 3.01 C.
- 18.1.2.3 American Welding Society AWS D1.2 Structural Welding Code. See 1.03 C.1.
- 18.1.2.4 ASTM F 900 Standard Specification for Industrial and Commercial Swing Gates. See 3.01 B.
- 18.1.2.5 American Society of Civil Engineers ASCE-7 Wind Load Requirements. See 1.03C2

18.1.3 SUBMITTALS:

18.1.3.1 Product Data:



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- 18.1.3.1.1 Provide manufacturer's printed specifications and installation instructions.
- 18.1.3.2 Shop Drawings:
 - 18.1.3.2.1 Supply shop drawings showing the gate system, including details of all major components to be provided.
 - 18.1.3.2.2 Include details of gate construction, gate height, and post spacing dimensions.
- 18.1.3.3 Certifications:
 - 18.1.3.3.1 Gate manufacturer shall provide independent certification as to the use of a documented Welding Procedure Specification and Procedure Qualification Record to ensure conformance to the AWS D1.2 welding code. Upon request, Individual Certificates of Welder Qualification documenting successful completion of the requirements of the AWS D1.2 code shall also be provided. See 1.02 C.
 - 18.1.3.3.2 Gate is to be designed to meet specified ASCE-7 wind load requirements with the gate in the closed and latched condition only. Typical gate design is expected to operate satisfactorily in winds up to 30 MPH. Depending on gate panel infill, winds higher than 30 MPH may cause gate operational problems (operator entrapment sensing may trigger; gate panel may not engage receiver). For sites with higher operational, non-typical, or specified wind loadings, manufacturer should be



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advised of the site conditions and a specifically engineered design will be offered.

18.2 PRODUCTS:

18.2.1 SWING GATE MANUFACTURER:

- 18.2.1.1 The swing gate shall be manufactured by Tymetal Corp.,678 Wilbur Ave, Greenwich, NY 12834 (800) 328-4283.
- 18.2.1.2 Approved Substitution: All other systems must be submitted to the design team in accordance with substitution requirements as set forth in the general provisions of the specification manual for approval prior to the bid date. Products submitted after the bid date will not be approved.

18.2.2 GATE CONSTRUCTION DETAILS:

- 18.2.2.1 Gate Frame:
 - 18.2.2.1.1 The gate frame shall be fabricated from 6063-T6 aluminum alloy extrusions. The top member shall be a 3" x 5" (76mm x 127mm) aluminum structural channel/tube extrusion weighing not less than 3.0 lb/lf (4.4kg/m). The bottom member shall be a 2" x 5" (51mm x 127mm) aluminum structural tube weighing not less than 2.0 lb/lf (2.9kg/m).
 - 18.2.2.1.2 Vertical Members:
 - 18.2.2.1.2.1 (Chain Link): The vertical members at the ends of the opening portion of the frame shall be "P" shaped in cross section with a nominal base dimension of no less than 2" x 2" (51mm x 51mm)



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and weighing not less than 1.6 lb/lf (2.3kg/m). The intermediate vertical members shall alternate between $2'' \times 2''$ (51mm x 51mm) and $1'' \times 2''$ (25mm x 51mm) in cross section weighing not less than 1.1 lb/lf (1.6kg/m) and 0.82 lb/lf (1.2kg/m) respectively. The spacing for the vertical intermediates shall be less than 50% of the gate frame height.

- 18.2.2.1.3 All welds on the gate frame shall conform to Welding Procedure Specification and Procedure Qualification Record to ensure conformance to the AWS D1.2 Structural Welding Code. All individual welders shall be certified to AWS D1.2 welding code. See 1.03 C.1.
- 18.2.2.1.4 Each gate leaf shall be provided with a minimum of two pivoting hinges to allow proper operation, and shall be connected to the gate side of the hinge by means of two through-bolts.

18.2.2.2 Diagonal Bracing:

18.2.2.2.1 Diagonal "X" bracing of 3/16" or 1/4" diameter stainless or galvanized steel cable shall be installed throughout the gate to provide additional vertical adjustment.

18.2.2.3 Posts:

18.2.2.3.1 Gate hanger posts shall be sized in accordance with gate dimensions as specified by the manufacturer. Height of the post and depth of footing shall be as specified by the engineer.



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- 18.2.2.4 Lock:
 - 18.2.2.4.1 Single gates shall have a latch assembly to provide a means for locking with a padlock.
 - 18.2.2.4.2 Double gates shall have a drop-bar mechanism extending into the ground, and a center locking kit to provide a means for locking with a padlock.
- 18.2.2.5 The gate shall be completed by installation of approved filler as specified.
 - 18.2.2.5.1 Chain Link: 2" x 2" x 9 gauge aluminized steel chain link fabric shall extend the entire length of the gate panel. Fabric shall be attached at each end of the gate frame by standard fence industry tension bars and tied at each 2" x 2" (51mm x 51mm) vertical member with standard fence industry ties. ASTM F 2200 requires attachment method that leaves no leading or bottom edge protrusions (cannot exceed 0.5 inch).

18.2.2.6 Finish:

18.2.2.6.1 Gate to be mill finish aluminum or color coated with polyester powder as specified. If powder coated, the gate (including track member) and all accessories shall be pretreated chemically by sand blasting or other acceptable method to ensure proper coating adherence.

18.3 EXECUTION:

18.3.1 INSTALLATION:



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- 18.3.1.1 Excavate, place concrete and install specified sized posts as detailed, and in accordance with approved shop drawings. Install hinges on gate frame and gateposts. Make final adjustments to maintain alignment of gate leaves. Install equipment of this section in strict accordance with the company's printed instructions unless otherwise shown on the contract drawings.
- 18.3.1.2 The gate and installation shall conform to ASTM F 900 standards for aluminum swing gates. See 1.02 D.
- 18.3.1.3 If the gate system is automated, the gate and installation shall comply with UL 325 Gate Operator Requirements and ASTM F 2200, Standard Specification for Automated Vehicular Gate Construction. See 1.02 A and 1.02 B.

18.3.2 SYSTEM VALIDATION:

- 18.3.2.1 The complete system shall be adjusted to assure it is performing properly.
- 18.3.2.2 The system shall be operated for a sufficient period of time to determine that the system is in proper working order.
- 18.3.2.3 For operated gate systems test and explain safety features:
 - 18.3.2.3.1 Each system feature and device is a separate component of the gate system.
 - 18.3.2.3.2 Read and follow all instructions for each component.



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- 18.3.2.3.3 Ensure that all instructions for mechanical components, safety devices and the gate operator are available for everyone who will be using the gate system.
- 18.3.2.3.4 The warning signs shipped with the gate operator must be installed in prominent position on both sides of the gate.
- 18.3.2.3.5 Ensure the owner is clear with regard to the safety points concerning the basic operational guidelines of the safety features of the gate operator system. These safety points are listed in the gate operator manual and must be read prior to system use.

19.0 GATE SYSTEM CHAIN LINK

19.1 GENERAL:

19.1.1 SECTION INCLUDES:

19.1.1.1 The work in this section shall include furnishing all labor, materials, equipment and appliances necessary to complete all Fortress TYM-SL4000DC Structural Gate System(s) required for this project in strict accordance with this specification section and drawings. The gate and operator shall be specifically designed to complement each other as a system and be provided by a single manufacturer. Components (operator from one source and gate panel from another) assembled at the job site to form a system will not be approved.

19.1.2 REFERENCES:


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19.1.2.1 UL 325 Gate Operator Requirements. See 1.03 D-2.

- 19.1.2.1.1 Automated / operated vehicular gates are not to be used for pedestrian traffic. Separate pedestrian gates must always be provided if pedestrian traffic is expected.
- 19.1.2.2 ASTM F 2200 Standard Specification for Automated Vehicular Gate Construction. See 1.03 D-1.
- 19.1.2.3 ASTM F 1184 Standard Specification for Industrial and Commercial Horizontal Slide Gates, Type II, Class 2. See 3.02 B.
- 19.1.2.4 American Welding Society AWS D1.2 Structural Welding Code. See 1.03 D-3.
- 19.1.2.5 ASCE-7 American Society of Civil Engineers Minimum Design Loads and Assoicated Criteria for Buildings and Other Structures. See 1.03 C(i).

19.1.3 SUBMITTAL:

- 19.1.3.1 Product Data:
 - 19.1.3.1.1 Provide manufacturer's catalog cuts with printed specifications and installation instructions.
 - 19.1.3.1.2 Deliver two copies of operation and maintenance data covering the installed products. Manual to include parts list showing manufacturer's names and part numbers for the gate operator.
- 19.1.3.2 Shop Drawings:



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- 19.1.3.2.1 Supply shop drawings showing the relationship of operating systems with gate components, including details of all major components.
- 19.1.3.2.2 Include complete details of gate construction, gate height and post spacing dimensions.
- 19.1.3.3 Certification of Performance Criteria:
 - 19.1.3.3.1 Manufacturer of gate system shall provide certification stating the gate system includes the following material components that provide superior performance and longevity. Alternate designs built to minimum standards that do not include these additional structural features shall not be accepted.
 - 19.1.3.3.1.1 Gate track system shall be keyed to interlock into gate frame member (providing 200% additional strength when compared to weld only keyless systems). When interlocked with and welded to the "keyed" frame top member, gate track forms a composite structure.
 - 19.1.3.3.1.2 Gate shall have minimum а counterbalance length of 50% opening width which provides a 36% increase in lateral resistance (when compared to ASTM minimum 40% of counterbalance). If gate is ever to be automated, counterbalance section shall be filled with fabric or other specified material.



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- 19.1.3.3.1.3 To provide superior structural integrity, intermediate vertical members shall be used with spacing between verticals to be less than 50% of the gate frame height.
- 19.1.3.3.1.4 Entire gate frame (including counterbalance section) shall include 2 adjustable stainless or galvanized steel cables (minimum 3/16") per bay to allow complete gate frame adjustment (maintaining strongest structural square and level orientation).
- 19.1.3.3.1.5 Gate truck assemblies shall be tested for continuous duty and shall have precision ground and hardened components. Bearings shall be prelubricated and contain shock resistant outer races and captured seals.
- 19.1.3.3.1.6 Gate truck assemblies shall be supported by a minimum 5/8" plated steel bolt with self aligning capability, rated to support a 2,000 # reaction load.
- 19.1.3.3.1.7 Hanger brackets shall be hot dipped galvanized steel with a minimum 3/8" thickness that is also gusseted for additional strength.
- 19.1.3.3.1.8 Gate top track and supporting hangar bracket assemblies shall be certified by a licensed professional engineer to withstand a 2,000 lb. vertical reaction load without exceeding allowable stresses.



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19.1.3.3.1.9 Gate is to be designed to meet specified ASCE-7 wind load requirements with the gate in the closed and latched condition only. Typical gate design is expected to operate satisfactorily in winds up to 30 MPH. Depending on gate panel infill, winds higher than 30 MPH may cause gate operational problems (if automated, operator entrapment may trigger; gate panel may not engage receiver). For sites with higher operational, non-typical, or specified wind loadings, manufacturer should be advised of the site conditions and a specifically engineered design will be offered.

19.1.3.4 Certifications:

- 19.1.3.4.1 Gate in compliance with ASTM F 2200, Standard Specification for Automated Vehicular Gate Construction per section 1.02 B.
- 19.1.3.4.2 If operated gate system, gate operator shall be in compliance with UL 325 as evidenced by UL listing label attached to gate operator. See 1.02 A
- 19.1.3.4.3 Gate manufacturer shall provide independent certification as to the use of a documented Welding Procedure Specification and Procedure Qualification Record to insure conformance to the AWS D1.2 welding code. Upon request, Individual Certificates of Welder Qualification documenting successful completion of the



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requirements of the AWS D1.2 code shall also be provided. See 1.02 D.

19.1.3.4.4 Manufacturer shall supply gate design performance certification as per section 1.03 C.

19.2 PRODUCTS:

19.2.1 CANTILEVER SLIDE GATE SYSTEM MANUFACTURERS:

- 19.2.1.1 The cantilever sliding gate system shall be manufactured by Tymetal Corp., 678 Wilbur Avenue, Greenwich, NY 12834 - (800) 328 - 4283 or (888) 978-4283.
- 19.2.1.2 Approved substitution All other systems must be submitted to the design team in accordance with substitution requirements as set forth in the general provisions of the specification manual for approval prior to the bid date. Products submitted after the bid date will not be approved.

19.2.2 VEHICULAR SLIDE GATE OPERATOR TYM-SL4000DC:

- 19.2.2.1 The TYM-SL4000DC slide gate operator comes equipped with a true integrated long term battery backup. It utilizes a Brushless DC motor and is equipped with a built in loop rack, slow start/stops algorithm, heavy duty frame, and emergency mechanical foot pedal release. The TYM-SL4000DC offers up to weeks of uninterrupted operation in the event of a power failure. In the event of a power failure it seamlessly switches from AC power to backup mode and runs off of its included (2 - 8Ah) batteries.
- 19.2.2.2 Specifications:



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19.2.2.2.1 UL 325 and UL991 compliant.

- 19.2.2.2 The gate operator shall be rated to operate a gate weighing up to 4000 lbs.
- 19.2.2.2.3 Maximum gate opening length: 60 feet.
- 19.2.2.2.4 Gate Speed: 12 inches per second.
- 19.2.2.2.5 Motor: 1 HP continuous duty cycle.
- 19.2.2.2.6 Power: 220 VAC Single Phase.
- 19.2.2.2.7 Gear box ratio 30:1 with internal clutch.
- 19.2.2.2.8 Cover: Steel, split open feature.
- 19.2.2.2.9 Dimensions: 15" wide x 9.5" long x 25" high.
- 19.2.2.2.10 Emergency Release: Mechanical foot pedal.
- 19.2.2.2.11 Integrated full time battery back up.
- 19.2.2.2.12 Battery: Two 8Ah batteries 12 VDC.
- 19.2.2.13 Solar Capabilities: 12 VDC or 24 VDC solar panel input.
- 19.2.2.3 Access Control:
 - 19.2.2.3.1 Entrapment Devices:



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19.2.2.3.1.1 Photoelectric through beams / photo eyes shall be installed to span the clear opening and gate path at the tail section. е

- 19.2.2.3.2 Optional accessories, contact, non-contact, and control devices:
 - 19.2.2.3.2.1 Control devices include pushbuttons, radio controls, keypads, card readers, key switches, telephone entry systems, and revenue control equipment.
 - 19.2.2.3.2.2 Contact and non-contact devices include photoelectric sensors, vehicle detectors, proximity sensors, and contact edges.
 - 19.2.2.3.2.3 Accessories include flashing strobe lights, cycle counters, and intercom systems.
- 19.2.2.4 Factory Inspection and Testing
 - 19.2.2.4.1 Manufacturer shall test each operator at factory to assure smooth, quiet operation.
 - 19.2.2.4.2 Manufacturer shall test all control inputs to ensure proper function.

19.2.3 CANTILEVER SLIDE GATE:

19.2.3.1 Gate Width:

19.2.3.1.1 Structural Gate may be used for clear openings up to 40' wide. For clear openings greater than 40' – contact Tymetal Corp.



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19.2.3.2 Structural Gate Frame:

- 19.2.3.2.1 The gate frame shall be fabricated from 6063-T6 aluminum alloy extrusions. The top member shall be a 3" x 5" aluminum structural channel/tube extrusion weighing not less than 3.0 lb/lf (4.4 kg/m). To maintain structural integrity this frame member shall be "keyed" to interlock with the "keyed" track member. If fabricated as a single horizontal piece, the bottom member shall be a 2" x 5" aluminum structural tube weighing not less than 2.0 lb/lf. If fabricated in two horizontal pieces, the bottom member shall be a 5" aluminum structural channel weighing not less than 2.65 lb/lf, and the two horizontal pieces or sections shall be spliced in the field (the gate frame shall be fabricated in one or multiple sections depending on size requirements or project constraints).
- 19.2.3.2.2 Vertical Members:
 - 19.2.3.2.2.1 The vertical members at the ends of the opening portion of the frame shall be "P" shaped in cross section with a nominal base dimension of no less than 2" x 2" (51mm x 51mm) and weighing not less than 1.6 lb/lf (2.3kg/m). The intermediate vertical members shall alternate between 2" x 2" (51mm x 51mm) and 1" x 2" (25mm x 51mm) in cross section weighing not less than 1.1 lb/lf (1.6kg/m) and 0.82 lb/lf (1.2kg/m) respectively.
 - 19.2.3.2.2.2 Intermediate 1" x 2" (25mm x 51mm) vertical members weighing not less than



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.82 lb/lf shall alternate between $2'' \times 2''$ major members.

19.2.3.3 Splicing:

19.2.3.3.1 A ¹/₄" x 5" x 24" galvanized steel splice plate shall be used to secure the two bottom channel members together utilizing eight (8) plated carriage bolts with lock nuts. The top members will be spliced together using a ¹/₄" x 2" x 24" aluminum splice plate secured with six (6) drive rivets on one side and welded to the top member on the other side. The track is overlapped onto the opposing section in an alternating fashion, interlocking with the top primary member.

19.2.3.4 Gate Track:

- 19.2.3.4.1 The gate shall have a separate semi-enclosed "keyed" track, extruded from 6005A-T61 or 6105-T5 aluminum alloy, weighing not less than 2.9 lb/lf. Track members are to be located on each side of the top member. When interlocked and welded to the "keyed" top member, it forms a composite structure with the top of the gate frame. Welds are to be placed alternately along the top and side of the track at 9" centers with welds being a minimum of 2" long.
- 19.2.3.5 All welds on the gate frame shall conform to Welding Procedure Specification and Procedure Qualification Record to insure conformance to the AWS D1.2 Structural Welding Code. All individual welders shall be certified to AWS D1.2 welding code. See 1.02 D.
- 19.2.3.6 Gate Mounting:



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- 19.2.3.6.1 The gate frame is to be supported from the track by four (4) swivel type, self-aligning, 4-wheeled, sealed lubricant, ball-bearing truck assemblies.
- 19.2.3.6.2 The bottom of each support post shall have a bracket equipped with a pair of 3" (76mm) UHMW guide wheels Wheel cover protectors shall be included with bottom guides to comply with UL325.
- 19.2.3.6.3 Gap protectors shall be provided and installed, compliant with ASTM F 2200.
- 19.2.3.7 Diagonal Bracing:
 - 19.2.3.7.1 Diagonal "X" bracing of 1/4" (6.35mm) minimum diameter galvanized steel aircraft cable shall be installed throughout the entire gate frame.
- 19.2.3.8 The gate shall be completed by installation of approved filler as specified.
 - 19.2.3.8.1 Chain Link: $2'' \ge 2'' \ge 9$ gauge aluminized steel chain link fabric shall extend the entire length of the gate (if operated gate, counterbalance must also have fabric to prevent reach through and comply with ASTM F 2200, see 1.03 C.1) Fabric shall be attached at each end of the gate frame by standard fence industry tension bars and tied at each $2'' \ge 2''$ (51mm ≥ 51 mm) vertical member with standard fence industry ties. ASTM F 2200 requires attachment method that leaves no leading or bottom edge protrusions (cannot exceed 0.5 inch).



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19.2.3.9 Posts:

19.2.3.9.1 Double sets of support posts shall be minimum 4" O.D. (102mm) round SS40 or 4" x 4" x 3/16" wall square steel tubing, grade 500. Gate posts shall be galvanized or coated and supported in concrete footings as specified by the design team.

19.2.3.10 Finish:

19.2.3.10.1Gate to be mill finish aluminum or color coated with polyester powder as specified. If powder coated, the gate (including track member) and all accessories shall be pretreated chemically by sand blasting or other acceptable method to ensure proper coating adherence.

19.2.4 WARRANTY:

19.2.4.1 The cantilever slide gate and operator system shall be warranted by the manufacturer against manufacturing defects for a period of (3) three years from date of sale. The truck assembly shall be warranted against manufacturing defects by the manufacturer for a period of (5) five years from date of sale.

19.3EXECUTION:

19.3.1 SITE INSPECTION:

- 19.3.1.1 Examine final grades and installation conditions.
- 19.3.1.2 Do not begin work until all unsatisfactory conditions are corrected.

19.3.2 INSTALLATION:



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- 19.3.2.1 Install equipment of this section in strict accordance with the company's printed instructions unless otherwise shown on the contract drawings.
- 19.3.2.2 The gate and installation shall conform to ASTM F 1184 standards for aluminum cantilever slide gates, Type II, Class 2. See 1.02 C.
- 19.3.2.3 The gate system is to comply with ASTM F 2200 and UL 325. See 1.02 B and 1.02 A.
- 19.3.2.4 Obstruction Sensing Systems:
 - 19.3.2.4.1 The inherent motor current sensors are part of the gate operator system and may not be removed or bypassed.
 - 19.3.2.4.2 The installing contractor shall be responsible to ensure that appropriate external secondary entrapment protection devices be installed for the specific site conditions to protect against all potential entrapment zones. Proper operation of these safety devices shall be verified and training as to the operation and maintenance of these devices for the users and owners shall be documented.

19.3.3 SYSTEM ACCEPTANCE & VALIDATION:

19.3.3.1 Acceptance Test:

19.3.3.1.1 Test each system function.



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19.3.3.1.2 Supply all equipment necessary for system adjustment and testing.

- 19.3.3.2 Test and Explain Safety Features:
 - 19.3.3.2.1 Each system feature and device is a separate component of the gate system.
 - 19.3.3.2.2 Read and follow all instructions for each component.
 - 19.3.3.2.3 Ensure that all instructions for mechanical components, safety devices and the gate operator are available for everyone who will be using the gate system.
 - 19.3.3.2.4 The warning signs shipped with the gate operator must be installed in prominent position on both sides of the gate.
- 19.3.3.3 System Validation:
 - 19.3.3.3.1 The complete system shall be adjusted to assure it is performing properly.
 - 19.3.3.2 The system shall be operated for a sufficient period of time to determine that the system is in proper working order.
 - 19.3.3.3 Ensure the owner is clear with regard to the safety points concerning the basic operational guidelines of the safety features of the gate operator system. These safety points are listed in the operator manual and must be read prior to system use.



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19.3.3.4 Installer and customer shall complete Operated Gate System Installation Checklist (see operator manual).

DIVISION 3 – NOT USED



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DIVISION 4 - CONCRETE

SECTION 4A – FORMWORK

1.0 <u>SCOPE OF THE WORK</u>

- 1.1 The work included under this section shall consist of furnishing all labor, tools, equipment, materials, and supervision necessary for the complete installation of all concrete formwork, all as specified herein and indicated on the drawings.
- 1.2 The work included, but is not limited to, the following:
 - 1.2.1 Foundation formwork.
 - 1.2.2 Ground slab formwork.
 - 1.2.3 Removal of formwork.

2.0 <u>APPLICABLE SPECIFICATIONS</u>

- 2.1 The Contractor shall follow the practices and standards described in the latest editions of the following specifications, which are made a part of this Specification.
 - 2.1.1 American Concrete Institute (ACI) 347 Recommended Practice for Concrete Formwork

3.0 FORM MATERIALS

3.1 Exposed Concrete

- 3.1.1 Form material for all exposed vertical surfaces shall be plywood forms, form lining, or steel forms with Owner approval, each as defined below.
 - a. Plywood forms shall be minimum 5/8" thickness, and not less than 5-ply, and especially cured moisture-resistant.
 - b. Form lining shall be fiberboard, not less that 3/16" thickness, or especially cured moisture resistant exterior plywood, not less than



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3-ply or 1/4 thickness, or plywood, minimum 5-ply, and minimum 3/4'' thickness for steel forms.

- 3.1.2 An attempt shall be made to eliminate as many small sections as possible. If steel forms are used, they shall not contain more than 6.0 linear feet of form joint per square yard of concrete.
- 3.2 <u>Unexposed Concrete</u>
 - 3.2.1 Forms for concealed concrete shall be smooth and round undressed square-edge lumber of plywood, or other material that will produce equivalent finish.
 - 3.2.2 If soil conditions are acceptable to the Owner and the soil condition will permit; excavations may be neat cut in the soil to accurate sizes as specified on the drawings. The sides of these excavations shall be lined with a waterproof paper.
- 3.3 <u>Coatings</u>
 - 3.3.1 All contact surfaces shall be coated before the placement of any reinforcement, with non-staining colorless mineral oil, form lacquer, or other Owner approved non-staining form oil. The form oil shall be applied per manufacturer's specifications and shall be applied with a brush or spray so as to cover the form evenly without excess drip. Form coating material used to coat formwork to facilitate the removal thereof shall not bond with, or cause softening or permanent staining of the concrete surface.
 - 3.3.2 Reused forms shall have nails withdrawn and contact surfaces thoroughly cleaned before re-use. Those, which have been coated, shall be given an additional application of the coating.
 - 3.3.3 Plywood, previously mill-oiled, need not be re-oiled unless required by the Owner.
 - 3.3.4 Pressed wood fiberboard shall not be oiled.



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4.0 <u>SPECIAL MEMBERS</u>

- 4.1 Wood strip, blocking, molded members, etc., shall be placed in forms as required to produce finished surfaces shown on drawings or specified herein.
- 4.2 All exposed corners, vertical or horizontal, in concrete work shall be chamfered 1" x 1" unless otherwise shown on the drawings. Horizontal surfaces to be chamfered may be rounded with a steel concrete trowel at time of concrete placement if approved by Owner.
- 4.3 Form ties shall be factory-fabricated, removable or snap-off metal ties of design that will not allow deflection and will not spall concrete upon removal. Solid backing shall be provided for each tie. Ties shall be fitted with devices that will leave holes in the concrete surface not less than 3/8", no more than 1" in diameter, and not less than 1" deep.
- 4.4 Provide for installation of inserts, hangers, ties, anchor devices, anchor bolts, dowels, conduit or other embedded items required for other work. Properly locate in cooperation with other trades and secure in position before placement of concrete.

5.0 <u>DESIGN</u>

- 5.1 Forms shall be designed, constructed, and maintained so as to insure that after removal of forms the finished concrete will have true surfaces free of offset, waviness, or bulges and will conform accurately to the indicated shapes, dimensions, lines, elevations, and positions on the drawings.
- 5.2 Studs and wales shall be placed to prevent deflection of form material. Forms and joints shall be sufficiently tight to prevent leakage of grout and cement paste during placement of concrete. Joints in forms shall be arranged vertically and horizontally to conform to the pattern of the design. Juncture of formwork panels shall occur at architectural lines, vertical control joints, including alignment with masonry control joints and construction joints. Forms placed on successive units for continuous surfaces shall be fitted to accurate alignment to assure smooth completed surfaces free from irregularities. Temporary openings shall be arranged in wall forms and where otherwise required to facilitate cleaning and inspection.
- 6.0 <u>REMOVAL</u>



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- 6.1 Removal of forms shall be in a manner to insure the complete safety of the structure and the concrete has had time to harden adequately.
- 6.2 Supporting forms or shoring shall not be removed until structural members have acquired sufficient strength to support safely their own weight and any construction and storage load to which they may be subjected. If a testing laboratory is involved, then forms shall be removed in accordance with requirements of the testing laboratory in regards to time and strength of concrete.
- 6.3 Forms used for curing shall not be removed before expiration of curing period unless specified otherwise.
- 6.4 Care shall be taken to avoid spalling the concrete surface or damaging concrete edges. Wedges or bars must not be inserted between forms and finished surfaces.
- 6.5 Tie-rods to be entirely removed from the wall shall be loosened 24 hours after concrete is placed, and form ties, except for a sufficient number to hold form in place, may be removed at that time. Ties wholly withdrawn from wall shall be pulled toward the face that will be concealed from view in the permanent work. Cutting ties back from face of wall will not be permitted.
- 6.6 Wood forms shall be completely removed in order that no material will be left for termite infestation.
- 6.7 Under normal conditions, the minimum period elapsing before forms may be removed shall be governed by the following schedule. Its use will not operate to relieve the Contractor of responsibility for the safety of the structure.



Side Forms: Columns and Beams 7

Note: When temperature drops below 40°F. supports shall remain in place an additional time equal to period structure has been exposed to the low temperature.



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SECTION 4B - CAST-IN-PLACE CONCRETE

1.0 <u>SCOPE OF THE WORK</u>

- 1.1 The work included under this section shall consist of furnishing all labor, tools, equipment, materials, services, and supervision necessary for the complete installation of all reinforced cast-in-place concrete, all specified herein and indicated on the drawings.
- 1.2 The work includes, but is not limited to, the following:
 - 1.2.1 Concrete footings.
 - 1.2.2 Concrete ground slabs.
 - 1.2.3 The placing, curing, and finishing of all cast-in-place concrete, as indicated on the drawings and specified herein.
 - 1.2.4 The setting of all reinforcing, inserts, anchor bolts, sleeves, blocks, and miscellaneous embedded items as indicated on the drawings, and specified herein.

2.0 <u>APPLICABLE SPECIFICATIONS</u>

- 2.1 The Contractor shall follow the practices and standards described in the latest edition of the following specifications, which are made a part of this Specification:
 - 2.1.1 American Concrete Institute:
 - ACI 211 Recommended Practice for Selecting Proportions for Nominal Weight Concrete.
 - ACI 214 Recommended Practice for Evaluation of Compression Test Results of Field Concrete.
 - ACI 304 Recommended Practice for Measuring, Mixing, and Placing Concrete.
 - ACI 305 Recommended Practice for Cold Weather Concreting.
 - ACI 306 Recommended Practice for Hot Weather Concreting.



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- ACI 315 Manual of Standard Practice for Detailing Reinforced Concrete Structures.
- ACI 318 Building Code Requirements for Reinforced Concrete.
- ACI 347 Recommended Practice for Concrete Formwork.
- 2.1.2 Refer to ACI318 "Building Code Requirements for Reinforced Concrete" for a complete listing of applicable specifications of the American Society for Testing and Materials (ASTM).
- 2.1.3 All applicable local and state codes and regulations.
- 2.1.4 Latest edition of OSHA Safety and Health Regulations.
- 2.1.5 In case of conflict between the referenced standards, the more stringent requirements shall govern.

3.0 <u>CONCRETE MATERIALS</u>

- 3.1 Standards of the American Society for Testing and Materials indicated in the following paragraphs shall be the latest editions.
- 3.2 <u>Cement</u> Cement shall be Portland cement conforming to the requirements of ASTM C-150, Type 1, and be free from dirt and damp set. In the event field conditions require and the Owner approves, high early strength Portland Cement ASTM C-150, Type III, may be used.
- 3.3 <u>Fine Aggregate</u>: Fine Aggregate for normal weight concrete shall be clean sand, conforming to the requirements of ASTM C-33.
- 3.4 <u>Coarse Aggregate</u>: Coarse aggregate for normal weight concrete shall be crushed stone, gravel, or a combination of crushed stone and gravel, conforming to ASTM C-33, size number 67, ³/₄["] to No. 4.
- 3.5 <u>Water</u> Water shall be fresh clean, clear and free from oil, acid, alkali, organic material, and any other deleterious matter in injurious quantities.



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- 3.6.1 Air-entraining materials shall conform to ASTM C-260 and shall be used in accordance with the manufacturer's recommendation. The Contractor shall submit the manufacturer's certificate of the chloride content of the admixture and whether or not chloride was added during its manufacture.
- 3.6.2 Water-reducing admixture, if used, shall be "Pozzolith, Normal Admixture", by Master Builders Company, Cleveland, Ohio, or Ownerapproved equal, and shall be used in accordance with ASTM C-494. Testing for air content shall be in accordance with ASTM C-231.
- 3.6.3 Any other admixtures proposed shall be approved by the Owner in writing before using and shall conform to ASTM C-494. Calcium chloride shall not be used.
- 3.7 <u>Bonding Material</u> Sikadur Hi-Mod", as manufactured by Sika Corporation, Lyndhurst, New Jersey, or Owner-approved equal shall be used as an epoxy bonding material to adhere new concrete to concrete having its initial set. Bonding material shall be used in any construction joints which are not detailed on the drawings and which are approved by the Owner. Construction joints detailed on the drawings do not require bonding.
- 3.8 <u>Expansion Joint Filler</u> Preformed expansion joint filler, ½" thick, unless otherwise indicated, shall be non-extruding and resilient type conforming to ASTM D-994, ASTM D-1751, or ASTM D-1752, unless noted otherwise.

All expansion joints in base slabs on grade shall be fiber expansion joints as deep as the slab thickness and flush with the top of the slab meeting the requirements of ASTM D-1751. In joints exposed to the weather the joint filler shall be depressed $\frac{1}{2}$ " below the top of the slab and the depression filled with joint sealant.

3.9 <u>Joint Sealer</u> – Joint sealer shall be cold applied, elastomeric sealant, conforming to ASTM D-1850. Sealant shall be applied per manufacturer's specifications using their recommended primer.



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- 3.10 <u>Curing Compound</u> Liquid membrane-forming curing compound shall conform to ASTM C-309, Type 1-D (clear or translucent with fugitive dye), or Owner approved equal, and to the testing requirements of ASTM C-156.
- 3.11 <u>Membrane Waterproofing or Vapor Barrier</u> Membrane waterproofing shall be polyethylene sheeting conforming to Commercial Standard CS-238, or ASTM C-171 Type 1, regular, not less than 0>006-inch (6 mils) nominal thickness. The sheeting is to be lapped not less that 12" with the top lap placed in the direction of the placing of the concrete and sealed in accordance with manufacturer's recommendations. The membrane shall be placed on all earth surfaces that are to receive concrete.
- 3.12 <u>Curing-Sealing (Hardening) Compound</u> This compound shall be Sika SCOFIELD SelectSeal Plus or approved equal
- 3.13 <u>Grout</u>
 - 3.13.1 Epoxy grout shall be high strength epoxy grout, installed in strict accordance with manufacturer's recommendations. "Five Star Epoxy Grout", manufactured by U.S. Grout Corporation, Old Greenwich, Connecticut, or Owner-approved equal, is recommended.
 - 3.13.2 Non-shrink grout shall be ready-to-use non-metallic aggregate product requiring addition of only water at site, and shall attain a minimum compressive strength of 5000 psi. "Five Star Grout" as manufactured by U.S. Grout Corporation, "Masterflow 928" as manufactured by Masterbuilders Company, or Owner-approved equal, is recommended.
- 3.14 <u>Waterstops</u> Waterstops, except where otherwise indicated, shall be 6" polyvinyl chloride (PVC) with a center bulb and two end bulbs, or ribbed type with a center bulb. All PVC waterstops shall be manufactured from virgin materials. Dimensions of the waterstops shall not be less than 3/8" for web thickness and 5/8" for bulb diameter. Splicing of the PVC waterstops shall be done with a special thermostatically controlled splicer, furnished by the manufacturer, and shall be done strictly in accordance with the manufacturer's instructions.



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4.1 <u>Mix Design</u> – The mix design shall produce concrete having a slump of not more than 3" for floor slabs and not more than 4" for all other work, and a minimum 28-day compressive strength of 4000 psi. Outside concrete shall have an air content of 4%, +1. The minimum content shall be 6 sacks (564 lbs.) of cement per cubic yard of concrete. The maximum water content shall not exceed 5 gallons per bag of cement.

5.0 **PROPORTIONING CONCRETE**

- 5.1 <u>Control</u>: The proportion of all materials entering into the concrete shall be determined from a design mix by an approved commercial testing laboratory. The Contractor shall provide all necessary equipment and plant to determine and control the actual amounts of material entering into each batch. The proportions will be changed whenever, in the opinion of the Engineer, such change is necessary in order to maintain the standard of quality required by these specifications.
- 5.2 <u>Properties of Concrete</u>: All concrete placed under this contract shall meet all of the requirements hereinafter specified.
 - 5.2.1 Class: AA
 - 5.2.2 Max. water per bag cement: 5.0 gallons
 - 5.2.3 Min. bags of cement per cubic yard: 6
 - 5.2.4 Min. compressive strength at 28 days: 4000 psi
 - 5.2.5 Range in slump: 2" 4"
 - 5.2.6 Class "AA" concrete shall be "air entrained concrete" and the concrete shall have air content of 3.0% with a 0.5% tolerance as determined in accordance with specifications of ASTM C231. The testing for air content will be performed by an independent laboratory paid by the Owner. Class "AA" concrete shall be used <u>for all major structures in the project.</u>

6.0 <u>CONCRETE PLACEMENT</u>



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- 6.1 The placing of all concrete shall be in accordance with the requirements of ACI Standard 304.
- 6.2 Concrete shall not be placed until all reinforcing bars, pipes, conduits, anchor bolts, and other embedded work has been inspected, approved, and definite instructions give by the Owner to proceed with the work.
- 6.3 Excessive water and debris shall be removed from forms and excavations before concrete is placed therein.
- 6.4 Before placing the concrete and reinforcing steel, the contact surfaces of all forms, unless otherwise directed, shall be thoroughly wetted with water or coated with approved form oil. The form oil shall be applied with a brush or spray so as to cover the form evenly without excess drip. Form coating material used to coat formwork to facilitate the removal thereof shall not cause softening or permanent staining of the concrete surface. Reused forms shall have the contact surfaces cleaned thoroughly; those, which have been coated, shall be given an additional application of the coating.
- 6.5 Unless otherwise noted on the drawings all vertical surfaces of the concrete work must be formed except that sides of spread footings may be neat cut in the soil if the soil conditions are acceptable to the Owner.
- 6.6 All concrete materials, reinforcement, forms fillers vapor barrier, and ground with which concrete is to come in contact shall be free from frost. No concrete shall be laid on frozen soil. When concrete is poured during freezing weather, adequate protection against frost action shall be approved by the Owner before any concreting is done.
- 6.7 Dropping of the concrete in excess of 4 feet, depositing in large quantities at any point and running or working it along the forms or any method tending to cause loss or segregation of the aggregates or separation or distortion of the forms will not be permitted. A tremie or other approved means shall be used for pouring where depth is in excess of 4 feet. Concrete shall be placed monolithically between construction joints indicated.
- 6.8 Between construction joints concreting shall be a continuous operation such that concrete is plastic at all times and flows readily into spaces between reinforcement. Fresh concrete shall not be placed on poured concrete sufficiently



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hardened to cause formation of seams or places of weakness. No concrete that has partially hardened or been contaminated by foreign material shall be used. If a section cannot be placed continuously or monolithically, construction joints shall be located at points indicated on the drawings or approved by the Owner. A minimum of 24 hours shall elapse between placements of concrete in adjacent pours.

- 6.9 Immediately after placing, concrete shall be consolidated by vibrating equipment supplemented by hand spading and rodding where vibrating is not feasible. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms. Vibrators must be capable of maintaining a speed of not less that 8000 impulses per minute when submerged in concrete. Use of external form vibrators or tapping forms is not acceptable. Vibrators shall be inserted vertically (not dragged horizontally) at such intervals as to insure uniform consolidation throughout the entire section of concrete being placed. The number of vibrators used shall be sufficient to consolidate the concrete properly. At least one standby vibrator shall be on hand at all times.
- 6.10 The methods and recommended practices described in AC Standard 305 shall be followed for cold weather concreting and ACI Standard 306 shall be followed for hot weather concreting.
- 6.11 All concrete shall finish to the lines and elevations shown on the drawings. All construction joints shall be keyed as indicated on the drawings. If the Contractor desires additional construction joints or different locations for the joints, he shall obtain written approval from the Owner for such changes.
- 6.12 Concrete shall not be carried in or transported through any aluminum items.



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7.0 <u>JOINTS</u>

- 7.1 Construction joints shall be formed as indicated on the drawings and as directed by the Owner. Joints shall be made and located as to least impair the strength of the structure. The rate and method of placing concrete and the arrangement of joint bulkheads shall be such that the concrete between construction joints shall be placed in a continuous operation. When concreting is resumed, the surface of the concrete at all joints shall be thoroughly cleaned and all laitance removed. In addition, vertical joints shall be thoroughly wetted, but not saturated, and slushed with a coat of neat cement grout before placing new concrete. Reinforcing shall continue across joints unless otherwise shown. Keys and dowels shall be provided as indicated or as directed by the Owner.
- 7.2 In general, formed construction joints or keys shall be: in width one-third of the thickness of the concrete and, in depth, one-sixth the thickness of the concrete. All keys shall be continuous and none smaller than 2" in width and 2" in depth shall be used.

8.0 <u>EMBEDDED ITEMS</u>

- 8.1 The Contractor shall examine the drawings and specifications for other work to ascertain any conditions that may affect his work. In laying out his work, the Contractor shall make provisions for installation of all appurtenances.
- 8.2 The Contractor shall furnish and install all embedded items to include but not limited to inserts, anchors, anchor bolts for structural steel and any other miscellaneous metal as may be required for the installation and attachment of other work. The embedded items shall conform to the requirements of Section Miscellaneous Metals. Such miscellaneous items shall be set accurately to template, built into the concrete plumb and maintained so during the pour by securely wiring as may be necessary. Bolts shall project from the face of the concrete the distance called for on the details or a sufficient distance to allow for the proper attachment intended. All threads shall be oiled and protected by waterproofing caps.



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- 8.3 The Contractor shall provide such openings as are required for the passing of work through the concrete.
- 8.4 Great care shall be taken to keep such items embedded in the concrete and openings provided through the concrete at the proper locations. The concrete shall be thoroughly spaded and worked around and under such items so that there will be no voids.
- 9.0 <u>GROUT</u>
 - 9.1 Cement grout, if required, shall be field mixed combination of cement, concrete sand and water approved by the Owner prior to placing. Minimum cement shall be eight bags of cement per cubic yard of finished mixture.
 - 9.2 All column bases shall be grouted solid with high strength non-shrink grout, ready-mixed material requiring only mixing water at the jobsite. Non-shrink grout shall contain non-metallic aggregate as specified.
 - 9.3 Before placing grout the surface shall be cleaned of all dirt, oil, grease, concrete laitance and all loose material shall be removed.
 - 9.4 The grout shall be placed by whatever means are most practicable, depending on the type of equipment to be grouted. The grout shall completely fill the space to be grouted, be thoroughly compacted, and free of air pockets.
 - 9.5 Unconfined areas of non-shrink grout surfaces shall be cut back flush with the base plate and coated with a plastic mortar consisting of one part Portland cement and two parts concrete sand.
- 10.0 <u>CURING</u>
 - 10.1 All concrete shall be maintained above 50°F. in a moist condition and cured for a period of at least the first seven days after placing by one of the approved methods listed herein. If high-early strength concrete has been used, the curing period shall continue for minimum of three days. During the curing period no part of the concrete shall be permitted to become dry.
 - 10.2 All concrete shall be cured in keeping with the methods listed below.
 - 10.2.1 Ponding or continuous sprinkling with water.



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- 10.2.2 Wet sand or absorptive burlap kept continuously wet.
- 10.2.3 Waterproof paper conforming to ASTM C171, or polyethylene film with edges lapped and sealed in such a manner as to prevent moisture escaping from the concrete.
- 10.2.4 Liquid curing compounds sprayed uniformly in a single coat on all surfaces immediately following the final finishing operation. Liquid curing compounds shall not be used on any surface against which additional concrete or other cementitious finishing materials are to be bonded nor on floor surfaces which receive liquid surface-hardening treatment.
- 10.2.5 Steel forms heated by the sun and all wood forms in contact with the concrete during the curing period shall be kept wet. If forms are to be removed during the curing period, one of the above curing materials or methods shall be employed immediately. Such curing shall be continued for the remainder of the curing period.
- 10.2.6 The methods and recommended practice for protecting and curing concrete as described in ACI 305, and ACI 306 shall be followed when the temperature of the surrounding air is below 40 F. or above 90 F. Air and concrete temperatures at times of placing are to be taken and reported on cylinder break forms. No dependence shall be placed on salt or other chemicals for the prevention of freezing.
- 10.2.7 Methods should be taken to protect the concrete from mechanical injury or by action of the elements until such time as the concrete is thoroughly set.
- 10.2.8 Projecting inserts, anchor bolts, etc., shall be protected from disturbances until the concrete has sufficiently set to hold such items immovable.
- 10.2.9 All concrete ground slabs, etc., shall be barricaded immediately after the surfaces are finished and no traffic, other than for curing purposes, shall be allowed on the surfaces until the concrete has obtained (by compressive strength test) 60% of its 28-day strength.

11.0 <u>CONCRETE FINISHES</u>

11.1 <u>Standard Finish for Exposed Concrete Surfaces (Excluding Ground Slab)</u>



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- 11.1.1 As soon as the forms have been removed, the concrete surfaces to be left exposed shall be carefully examined and cavities, stone pockets, irregularities, honeycombing, tie holes, and other defects, which in the opinion of the Owner do not justify rejection of the work, shall be pointed with mortar before the concrete is thoroughly dry. The mortar mix for patching shall be determined by trial usually one part cement and two parts coarse sand to obtain a good color match with the concrete when both patch and concrete are cured and dry. The amount of mixing water shall be as little as consistent with the requirements of handling and placing the mortar.
- 11.1.2 Concrete surfaces, which are to be exposed in the finish construction, shall receive a "rubbed" finish. After the mortar pointing has set, the entire area shall be thoroughly covered with water by means of brush and rubbed with carborundum brick or other approved method to remove all blemishes and to provide a uniform finished appearance to blend in with surrounding concrete surfaces. After rubbed surfaces have dried wipe with burlap to remove any loose powder.

11.2 Smooth Monolithic Ground Slab Finish

- 11.2.1 After the concrete has been screeded; the surface shall be floated with mechanical floats equipped with vibrators, only to the extent necessary to obliterate the screeding irregularities.
- 11.2.2 The slab shall be burnished, by steel troweling, to a hard, smooth and impervious surface. After the first troweling, allow the slab to stand until it has set sufficiently to finish hard and smooth, then apply a second steel troweling. In all cases, the slabs shall be troweled twice, and more often if necessary, to produce the required surface texture. There shall be no evidence, after the slab is finished, of kneeboard impressions, trowel marks or chattered areas.
- 11.2.3 The sprinkling, shaking or applying in any form of dry cement on a prefinished concrete surface is prohibited.
- 11.2.4 Concrete ground slab shall be finished level unless noted otherwise with a tolerance of 1/8'' in 10 ft. If variations greater than this exist, the Owner



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may direct the Contractor to grind the floor to bring the surface within the stated requirements. Patching of low spots shall not be permitted. Grinding shall be done as soon as possible, preferably within three days, but not until the concrete is sufficiently strong to prevent dislodging coarse aggregate particles.

11.2.5 Immediately after finishing, all grade and ground slabs shall receive a liquid curing and sealing compound conforming to ASTM C309, Type 1, clear or translucent. Surface preparation and application shall conform to manufacturer's specifications, but in no case shall application be greater than 350 sq. ft. per gallon. All slabs shall receive a second coat of curing and sealing compound just prior to acceptance of the concrete work.

12.0 INSPECTION AND TESTING

- 12.1 The materials and workmanship to be furnished under this specification shall be subject to inspection in the mill, shop, and field by the Owner.
- 12.2 Inspection and acceptance, or failure to inspect, shall in no way relieve the Contractor or the mill and shops from their responsibility to furnish materials and workmanship in accordance with contract requirements. When materials and/or workmanship do not conform to the specification requirements the Owner reserves the right to reject such material and/or workmanship at any time before final acceptance of the concrete work.
- 12.3 The Contractor shall make the necessary arrangements with the Ownerapproved testing laboratory to facilitate concrete sampling and test.
- 12.4 An independent testing laboratory shall perform compressive strength tests, air entrainment tests and slump tests for each 50 cubic yards of concrete poured but not less than once for each day of concrete pouring. All tests shall be made at the expense of the Owner.
- 12.5 Compressive strength tests shall be conducted in accordance with ACI318, "Concrete Quality". Tests shall be made on four field specimens, one for testing at seven days and two for testing at 28 days. If the 28-day breaks are good, the fourth cylinder may be discarded. If the 28-day breaks are deficient, the fourth cylinder shall be broken as instructed.



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- 12.6 Slump tests shall be made in accordance with ASTM C143 for each set of cylinders submitted to the laboratory.
- 12.7 Air entrainment tests shall be made in accordance with ASTM C138, C173, or C231 for each set of cylinders.
- 12.8 If the ultimate compressive strength of any cylinder falls below specified strength, an investigation shall be made to determine cause of decrease. If it is attributed to a change in materials, a new design of mix shall be made. If low strength and quality of the structure in question, the Owner may require, at no additional cost to the Owner, tests to be made on portions of the structure containing questionable concrete. Such tests shall include one or more of the following: (1) Impact (Swiss) hammer tests, (2) cored cylinder test per ASTM C42, or (3) load actual structure per ACI 318. In that portion of the structure, which contains defective concrete, the defective concrete shall be removed and replaced, or reinforced as directed by the Owner, at Contractor's expense, including cost of tests. If cored tests indicate that the concrete adequately meets the specified strength, the test results of test cylinders will be waived.
- 12.9 Reports of all test and control measures shall be submitted to the Owner in triplicate. Reports shall show the in-place location of concrete.
- 12.10 The minimum compressive strength of test cylinders shall be 4000 psi, unless noted otherwise
- 12.11 Record the atmospheric and concrete temperatures on all test reports.

13.0 <u>CONCRETE DISPOSAL</u>

13.1 The Contractor is prohibited from dumping, wasting, or discarding unacceptable or excess concrete or washing out concrete trucks within the property limits of the Owner(ASPA).



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SECTION 4C - REINFORCING STEEL

1.0 <u>SCOPE OF THE WORK</u>

1.1 The work included under this section shall consist of furnishing all labor, tools equipment, materials, services, and supervision necessary for the complete installation of all reinforcing steel work, as indicated on the drawings and specified herein.

- 1.2 The items of work to be performed shall include, but are not limited to:
 - 1.2.1 Foundation reinforcement.
 - 1.2.2 Ground slab reinforcement.
 - 1.2.3 Miscellaneous Concrete Structure Reinforcement.

2.0 <u>APPLICABLE SPECIFICATIONS</u>

- 2.1 The Contractor shall follow the practices and standards described in the latest editions of the following specifications, which are made a part of this Specification.
 - 2.1.1 American Concrete Institute:

ACI318 - Building Code Requirements for Reinforced Concrete.

- 2.1.2 Refer to ACI 318 "Building Code Requirements for Reinforced Concrete" for a complete listing of applicable specifications of the American Society for Testing and Materials (ASTM)
- 2.1.3 All applicable local and state codes and regulations.
- 2.1.4 Latest edition of OSHA Safety & Health Regulations.
- 2.1.5 In cases of conflict between the referenced standards, the more stringent requirements shall govern.



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3.0 <u>REINFORCING MATERIALS</u>

3.1 Standards of the American Society for Testing and Materials indicated in the following paragraphs shall be the current editions.

- 3.2 All reinforcing steel shall be new, deformed billet steel bars conforming to ASTM A615. Grade of reinforcing steel shall be 60 ksi.
- 3.3 The Contractor shall include all spacers, chairs, bolsters, ties, and other devices necessary for proper placing, spacing, supporting and fastening reinforcement in place. When the legs of any support devices rest directly on formwork, which, after stripping, will expose the concrete to permanent view, these devices shall be zinc-coated after fabrication or provided with plastic button tips at the wire ends to prevent staining of the concrete by rust. Sand chairs shall be used to support reinforcing on earth surfaces.

4.0 SHOP DRAWINGS AND SUBMITTALS

- 4.1 Shop drawings, including placement diagrams, shall be prepared by the fabricator in accordance with the drawings and the standards in ACI 315, "Manual of Standard Practice for Detailing Reinforced Concrete". All dimensions and sizes of reinforcement on the drawings shall be strictly adhered to and shall not be changed without written approval of the Owner.
- 4.2 The Contractor shall submit to the Owner one sepia and three blue line copies of the steel lists and placing plans of all reinforcing steel used in the job.

5.0 <u>INSTALLATION</u>

- 5.1 Reinforcing steel bars stored at job shall be placed in racks or blocked up at least 18" above ground and kept dry by suitable cover.
- 5.2 Reinforcing steel bars shall be shop-bent as indicated on the fabrication drawings. Metal reinforcements shall not be bent or straightened in a manner that will injure or defect material. Reinforcement shall be cold bent to shapes shown on the drawings. The heating of reinforcement for bending will not be



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permitted. Bars with kinks or bends not shown on the drawings shall not be used.

Minimum pin bending diameter will be as follows:

<u>Bar Size</u>	<u>Minimum Pin Diameter (inch)</u>
#3	1.1253
#4	1.5
#5	1.875
#6	2.25
#7	2.625
#8	3.0
#9	4.5
#10	5.0
#11	5.5
#14	8.75
#18	11.25

5.3 All reinforcement at the time concrete is placed, shall be clean new stock, free from defects, mill or rust scale, dirt, oil, dried concrete, or coatings that will reduce bond.

5.4 No heating, welding, or tack welding of reinforcing steel will be permitted.

5.5 Bars of single length shall be used in all cases, except where the length required is greater than stock length or where the Owner gives permission for shorter lengths. Necessary splices shown on the drawings shall be lapped sufficiently to develop the strength of the bars by bond. Splices shall not be made in beams, girders, and slabs at points of maximum bending moment nor shall adjacent bars be spliced at the same point, but staggered.

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Wherever field conditions make it necessary to splice principal reinforcement otherwise than as shown on the drawings, the Owner shall decide character of a splice on basis of allowable bond stress and stress in reinforcement at splice.

The minimum lap splice shall be 12 inches.

<u>Bar Size</u>	<u>Minimum Lab Splice (inches)</u>	
	<u>Top Bars*</u>	Other Bars
#3	13	12
#4	17	12
#5	21	15
#6	27	20
#7	37	27
#8	49	35
#9	62	44
#10	78	56
#11	96	69

* Top bars are defined as horizontal bars so placed that more than 12 inches to concrete is cast below the bar.

- 5.6 Reinforcement shall be accurately placed and secured against displacement by firmly wiring at all intersections and splices with not less that No. 18 U.S. Standard Gauge annealed wire, or by use of acceptable clipping devices.
- 5.7 Reinforcing in footings and slabs on earth shall be supported at proper level with pre-cast concrete blocks at no greater than 24" O.C.
- 5.8 Reinforcing other than that mentioned in Paragraph 5.7 shall be securely positioned at required distances from forms by means of metal spacers and


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chairs, or other accessories spaced in accordance with recommendation of the Concrete Reinforcing Steel Institute.

5.9 Unless otherwise indicated on drawings, steel reinforcement shall have a minimum protection of concrete as follows:

		Minimum Cover (inches)
(a)	Concrete cast against and permanently exposed to earth	3
(b)	Concrete exposed to earth or weather:	
	#6 through #18 bars	2
	#5 bar & smaller, welded wire fabric	1 1/2

(c) Concrete not exposed to weather or in contact with ground:

Slab, walls, joists:

#14 and #18 bars		1 1⁄2
#11 and smaller		3⁄4
Beams, columns, Primary reinforcement,		
ties, stirrups, spirals	1 1⁄2	

In all cases, thickness of concrete over reinforcement shall not be less than diameter of bars.

- 5.10 Exposed bars intended for bonding with future work shall be protected from corrosion by concrete or other adequate covering.
- 5.11 No reinforcing bars shall be forced or driven into concrete after the concrete has attained its initial set.



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5.12 Corner bars shall be required at all corner intersections, unless noted otherwise on the drawings. These bars shall be #4 with a length of 2'-6" placed at 45° to the corner.



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DIVISION 5 - METALS

SECTION 5A - STRUCTURAL METAL

1.0 <u>SCOPE OF THE WORK</u>

- 1.1 The work included under this section shall consist of furnishing all labor, tools, equipment, materials, services, and supervision necessary to fabricate, deliver, and erect complete, all structural steel indicated on the drawings as described in this Specification. Anchor bolts for structural steel shall be furnished and installed by the Contractor performing the concrete work as described in these specifications.
- 1.2 The work includes, but is not limited to, the following:
 - 1.2.1 Fabrication, erection, galvanizing and testing of all structural metal.
 - 1.2.2 The structural metal includes, but is not limited to the following:
 - a Beams
 - b. Base Plates
 - c. Sole Plates
 - d. Anchor Bolts
 - e. All connections and their component parts for the above
 - f. Grouting of Base Plates

2.0 <u>APPLICABLE SPECIFICATION</u>

2.1 The Contractor shall follow the practices and standards described in the latest edition of the following specifications, which are made a part of this Specification.

2.1.1 American Institute of Steel Construction (AISC):



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- a. Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.
- b. Code of Standard Practice for Steel Buildings and Bridges
- c. Specification for Structural Joints Using ASTM A325 Bolts or A490 Bolts.
- 2.1.2 American Iron and Steel Institute: Specification for the Design of Cold-Formed Steel Structural Members
- 2.1.3 American National Standards Institute (ANSI):
 - B18.22.1 Plain Washers
 - B46.1 Surface Texture (Surface Roughness, Waviness, and Lay)
- 2.1.4 The American Society for Testing and Materials (ASTM):
 - ASTM A6 General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use.
 - ASTM A36 Standard Specification for Structural Steel.
 - ASTM A307 Standard Specification for Low-Carbon Steel Externally & Internally Threaded Standard Fasteners
 - ASTM A325 Standard Specification for High-Strength Bolts for Structural Steel Joints, includes suitable nuts and plain hardened washers.
- 2.1.5 American Welding Society (AWS): D.1.1. Structural Welding Code
- 2.1.6 All applicable local and state codes and regulations.

3.0 <u>SUBMITTALS</u>

- 3.1 <u>Certificates of Compliance</u>
 - 3.1.1 Certificates of compliance shall be furnished for structural steel and for welder qualifications. Certified copies of mill test reports shall be furnished for structural steel. Certification that each welder is qualified in accordance with AWS Code D.1.1 shall be provided.



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- 3.1.2 Test reports for high-strength bolts, nuts and washers, including chemical analysis, tensile strength tests, and hardness tests.
- 3.1.3 Specifications for primer paint, including manufacturer's data on chemical composition, adhesion of stray fireproofing, and dry film thickness per applied coat.
- 3.1.4 Specifications for non-shrink grout.

3.2 Shop Drawings

- 3.2.1 Shop drawings shall show all shop and erection details, including, but not limited to, cuts copes, cambers, connections, holes, bolts, and welds in structural steel. All welds, both shop and field shall be indicated by standard welding symbols in the AWS Code for Welding in Building Construction. Shop drawings shall not be complete without specific notations about painting, cleaning, grade of steel and type of welding electrodes. Shop drawings shall be checked and initialed as checked by the Contractor prior to submitting to Owner for review.
- 3.2.2 Material shall not be fabricated or delivered to the site before reviewed shop drawings have been returned to the Contractor.

4.0 QUALITY ASSURANCE

- 4.1 The materials and workmanship to be furnished under this specification shall be subject to inspection in the mill, shop, and field by the Owner.
- 4.2 Inspection and acceptance, or failure to inspect, shall in no way relieve the Contractor or the mill and shops from their responsibility to furnish materials and workmanship in accordance with contract requirements. When materials and/or workmanship do not conform to the specification requirements, the Owner reserves the right to reject such material and/or workmanship at any time before final acceptance of the structure.
- 4.3 The Contractor shall guarantee free access to the fabrication shop and the construction site for the purpose of inspecting the steel work or field connections.



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The Owner shall be allowed to observe the performance of the erection crew while the work is in progress, and ladders or temporary scaffolding shall be made available upon the request of the Owner for the purpose of inspecting any connections, which are difficult to reach.

- 4.4 Inspection of welding shall be in accordance with the AISC Specification for Buildings and high-strength steel shall be marked in accordance with the AISC Specification for Buildings.
- 4.5 The Owner shall be notified well in advance of start of shop work in order to schedule inspections if desired.
- 4.6 Joint welding procedures shall be prequalified or test in accordance with AWS qualification procedures.
- 4.7 <u>Testing and Inspection Agency</u>
 - 4.7.1 The Owner will engage an independent testing and inspection agency to perform testing, to inspect and evaluate connections, and prepare test reports.
 - 4.7.2 Deficiencies in the structural steel work identified by the testing and inspection agency will be corrected at no additional expense to the Owner. Subsequent tests to confirm the adequacy of corrected work will be at the Contractor's expense.

5.0 <u>MATERIALS</u>

All materials shall be new and shall conform to the respective specifications and other requirements listed below:

- 5.1 Structural steel shapes and plates shall conform to ASTM A572 Grade 50.
- 5.2 Structural steel plates shall conform to ASTM A36, unless otherwise noted.
- 5.3 Hot-formed steel tubing shall conform to ASTM A501.
- 5.4 Cold-formed steel tubing shall conform to ASTM A500, Grade B.



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- 5.5 Steel pipe shall conform to ASTM A53, Type E or S, Grade B.
- 5.6 Steel Castings shall conform to ASTM A27, Grade 65-35, medium strength carbon steel.
- 5.7 Unfinished threaded fasteners shall conform to ASTM A307, Grade A, regular low carbon steel bolts and nuts. Provide either hexagonal or square heads and butts, except use only hexagonal units for exposed connections.
- 5.8 High strength threaded fasteners shall conform to ASTM A325. Heavy hexagonal structural bolts, heavy hexagonal nuts, and plain hardened washers, shall be quenched and tempered medium-carbon steel.
- 5.9 Plain washers, other than those in contact with high-strength bolts shall conform to ANSI B18.22.1, Type B.
- 5.10 Welding Electrodes for manual shielded metal-arc welding shall conform to the #70XX series of the "Specification for Mild Steel Covered Arc-Welding Electrodes", AWS A5.1 or the "Specification for Low-Alloy Steel Covered Arc-Welding Electrodes".
- 5.11 Non-shrink grout will be prepackaged material requiring only the addition of water and complying with CRD-C 621. It shall be natural aggregate (non-metallic) type, and high strength (minimum 10,000 psi at 28-day cure).

6.0 <u>DELIVERY AND STORAGE</u>

- 6.1 Deliver all material to the job site properly piece-marked for identification and corresponding to the markings indicated on the shop drawings.
- 6.2 Structural material, either plain or fabricated, shall be stored above the ground upon platforms, skids, or other supports. Material shall be kept free from dirt, grease, and other foreign matter and shall be protected from corrosion. Material shall be adequately supported and protected to avoid bending, twisting, or otherwise damaging the member.



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7.0 FABRICATION

- 7.1 All structural steel shall be in accordance with the lines, dimensions, grades, details and notes shown on the drawings and as specified herein.
- 7.2 Substitutions of sections or modifications of details, or both, and the reasons therefore, shall be submitted with the shop drawings for approval. Approved substitutions, modifications, and necessary changes in related portions or the work shall be coordinated by the Contractor and shall be accomplished at no additional cost to the Owner.
- 7.3 Structural steel sections shall be continuous in length. No splicing, welding, or joining pieces of short lengths shall be permitted without written approval of the Owner.
- 7.4 The Contractor shall be responsible for all errors of detailing, fabrication, and for the correct fitting of the structural members.
- 7.5 Fabrication shall be in accordance with Section 1.23 of the AISC Specifications for Buildings. Said Section 1.23 consists of the following headings:
 - 1.23.1 Straightening Material
 - 1.23.2 Oxygen Cutting
 - 1.23.3 Planing of Edges
 - 1.23.4 Riveted and Bolted Construction holes
 - 1.23.5 Riveted and High Strength Bolted Construction Assembling
 - 1.23.6 Welded Construction
 - 1.23.7 Finishing
 - 1.23.8 Tolerances
- 7.6 Generally, camber requirements shall be in accordance with Section 1.19 of the AISC Specification for Buildings. Special camber requirements, if any, are shown on the drawings.



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- 7.7 In general, connections shall be shop welded and field bolted. All welded connections shall be made with E-70 electrodes. All bolted connections shall be made with ³/₄" diameter A325 H.S. bolts, unless otherwise noted on the design drawings.
- 7.8 Welds shall be made only by welders who have qualified by tests as prescribed in the "Code for Welding in Building Construction" of the American Welding Society, to perform the type of work required.
- 7.9 The design of connections for any part of the structure not indicated on the design drawings shall be completed by the Contractor. Unless otherwise shown, all beam connections shall be a standard frame or seated connections as shown in Part 4 of the AISC Manual of Steel Construction. Unless greater reactions are indicated on the design drawings, connections shall develop the full "T" distance of the beam web. End connections for bracing shall develop the loads shown on the design drawings or one-half the strength of the member in tension, whichever is greater.

8.0 <u>CONNECTIONS</u>

- 8.1 Where structural joints are made using high-strength bolts, hardened washers and nuts tightened to a high tension, the materials, methods of installation and tension control, type of wrenches to be used and inspection methods shall conform to specifications for "Structural Joints using ASTM A325 Bolts" as approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation, latest edition.
- 8.2 The contact surfaces, when assembled with bearing type bolts, shall be painted and all connections shall be free of scale, except tight mill scale, and shall also be free of burrs, oil, pits, and other defects, which would prevent solid seating of the parts.
- 8.3 The contact surfaces within friction type joints shall be free of oil, paint lacquer, or galvanizing. High-strength steel bolted connections, of the friction type, will be called for on the drawings when required.



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- 8.4 Primary field connections shall be bolted, using ³/₄" dia. ASTM A325-X galvanized bolts, bearing type connection with threads excluded from shear plane, with one heavy hexagon structural nut and one galvanized plain, hardened washer, (U.N.O.).
- 8.5 Beam connections shall be furnished in accordance with Part 4 of the AISC Manual of Steel Construction, eighth edition, (U.N.O.). All material in the connection shall be sized to accommodate the shear values shown for ASTM A325 bolts, using values for bearing type bolts with threads excluded from shear plane.
- 8.6 Before erection of structural steel commences, the proposed method of tightening the high-strength steel bolts shall be submitted to the Owner for approval. Recommended method for tightening of all structural bolts shall be by the turnof-nut method as specified in the AISC Steel Construction Manual under "Specification for Structural Joints Using ASTM A325 or A490 bolts".
- 8.7 Minimum field connections shall be two bolts at all diagonal angle bracing members, U.N.O. At all wide flange and channel members, the number of connectors shall be that which will develop the full "T" distance.
- 8.8 Open holes shall be 13/16" dia., (U.N.O.). All holes, both shop and field, shall be drilled, cut or punched, not burned.
- 8.9 Shop connections shall be welded or high strength bolted connections may be substituted if approved by the engineer. For manual ARC, welding electrodes shall conform to AWS A5.1 or A5.5, E70XX series.
- 8.10 All connections shall be sized to develop the load or number of bolts indicated on the drawings.
- 8.11 Erection bolts, clip angles and temporary fastening required for erection shall be furnished by the steel fabricator.
- 8.12 Minimum clip angle thickness shall be 3/8" (U.N.O.).
- 8.13 Bracing members meeting at a point shall have their gravity axes meeting at one point if practical; if not, provisions shall be made for bending stresses due to eccentricity.



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- 8.14 Gusset plates shall be 3/8" thick, minimum (U.N.O.)
- 8.15 All cut, sheared, sawed or burned edges and corners of all structural members (beams, columns, clip angles, etc.) shall have the edges ground smooth so that a round corner exists.
- 8.16 All welds shall be uniform in size and shall be in accordance with the AISC Specification for Architecturally Exposed Structural Steel. Welds that do not represent a reasonable smooth surface will be ground.
- 8.17 No pinholes, slag, or burrs shall be left on welds or steel.
- 8.18 Copes on beams shall be rounded and not squared. Identification of steel by piece-mark shall be by external tag and not by welding on steel.
- 8.19 All holes shall be flush with face of steel.

9.0 COLUMN BASES AND BEARING PLATES

9.1 Base plates or bearing plates shall be provided under columns, beams, girders, and any other steel members resting on concrete or masonry work. Base and bearing plates may be attached or loose as shown on the drawings. Loose base plates, leveling plates, and bearing plates shall be delivered to the job site along with detailed setting plans for placing and grouting by others.

- 9.2 Column bases shall be finished in accordance with Section 1.21.3 of the AISC Specification for Building.
- 9.3 Columns shall be milled or saw-cut to provide full bearing.
- 9.4 Base and cap plates shall be straight and true.



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10.0 <u>GALVANIZING</u>

Galvanizing, shall be in conformance with ASTM A123 zinc (hot galvanized) coatings on products fabricated from rolled, pressed, and forged steel shapes, plates bars, and strips.

11.0 <u>PAINTING</u> (Where Designated)

- 11.1 Surface Preparation
 - 11.1.1 Surfaces of all steel shall be thoroughly cleaned prior to painting, removing rust, loose mill scale, dirt, oil, and grease in accordance with the Steel Structure Painting Council Surface Preparation Specification.
 - 11.1.2 Clean Steel in accordance with SSPC procedures as follows: SSPC-SP-10, Near-White Blast Cleaning.
- 11.2 One or more shop coats of paint shall be applied to all steel surfaces within eight hours of final cleaning. On encased steel in concrete or mortar the initial 2" of embedded steel shall be painted.
- 11.3 Unless instructed otherwise, all paint coats shall be applied in the shop with any touch-up paint applied after installation of steel is complete.
- 11.4 Steel that receives a yellow topcoat shall always have all paint coats applied in the shop with touch-up in the field after complete installation of steel.
- 11.5 Paint System
 - 11.5.1 All structural steel shall receive a shop coat of building manufacturer's standard shop painting system. Application equipment and process shall be as recommended by manufacturer.
 - 11.5.2 Color of the final coat shall be as approved by Owner. Preceding coats shall vary slightly in shade of color.
- 11.6 An inspection of surface preparation and dry film thickness of shop prime coat may be made prior to acceptance of steel. Steel members found to be deficient in these requirements will be brought to acceptable condition prior to acceptance.



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- 11.7 All painting, shop and field touch-up, shall be done by a qualified painter.
- 11.8 Do not paint the following surfaces:
 - 11.8.1 Machined or milled surfaces, unless noted otherwise.
 - 11.8.2 Surfaces adjacent to field welds.
 - 11.8.3 Faying surfaces of bolted connections.
 - 11.8.4 Other surfaces when specifically noted on drawings or schedules.
 - 11.8.5 Areas of friction type connections.
- 11.9 All connection bolts and nuts and all anchor bolt connections shall be cleaned, primed with the red touch-up primer paint, and a topcoat of paint applied after final torqueing of connections is completed.

12.0 SHOP QUALITY CONTROL

12.1 <u>Testing and Inspection</u>

- 12.1.1 General: Provide access to the testing and inspection agency so that specified testing and inspection can be safely accomplished.
- 12.1.2 Shop bolted connections: Comply with testing and verification procedures in AISC Specification for Structural Joints, except test not less than 100 percent of bolts in each bolted connection.
- 12.1.3 Shop welded connections: Inspect and test shop-fabricated welds as follows:
 - a. Perform visual inspection of all welds.
 - b. Inspect 100 percent of full penetration welds, using test method as follows:
 - 1. Ultrasonic Testing (ASTM E164).
 - c. Inspect 100 percent of fillet welds, using test method as follows:
 - 1. Magnetic Particle Inspection (ASTM) E709).



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13.0 <u>ERECTION</u>

- 13.1 The work shall be erected square, straight, and plumb and accurately fitted. Adequate temporary bracing shall be provided to insure stability during the construction period.
 - 13.2 Erection of the structural steel shall be in accordance with Section 1.25 of the AISC Specification for Buildings. Said Section 1.25 consists of the following headings, amended herewith as noted:
 - 1.25.1 Bracing
 - 1.25.2 Adequacy of Temporary Connections
 - 1.25.3 Alignment
 - 1.25.4 Field Welding
 - 1.25.5 Field Painting (Touch-up only)
 - 13.3 Errors or perforations resulting from handling and transportation or improper fabrication that prevents the proper assembly and fitting of the steel shall be reported to the Owner and approval of the method of correction shall be obtained. Approved corrections shall be made at no additional cost to the Owner.
 - 13.4 Before commencing work, the Contractor shall check all governing measurements at the building and the levels of all footings on which the work is to be erected and shall notify the Owner of any discrepancies.
 - 13.5 The Erector shall maintain a complete up-to-date set of erection drawings at the job site and shall keep a daily record by piece number of all material delivered to the job site and all material erected.
 - 13.6 For holes that are improperly aligned, corrections shall be by machine drilling new holes. No burning of holes will be allowed.
 - 13.7 Connection joints shall be cleaned of all dirt and dust before assembly.



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- 13.8 Lifting of structural members shall be done in such a manner as to preclude damage to paint.
- 13.9 All base plates will be grouted by Contractor. A qualified person, experienced in the application of the "5-Star Grout", as manufactured by U.S. GROUT CORPORATION, shall apply grout.



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SECTION 5B - MISCELLANEOUS METALS

1.0 <u>SCOPE OF THE WORK</u>

1.1 The work included under this section shall consist of furnishing all labor, tools, equipment, materials, services and supervision necessary to fabricate, deliver and erect complete miscellaneous metal items including, but not necessarily limited to, the following:

- 1.1.1 All miscellaneous items.
- 1.2 The following miscellaneous items are specified under this section but are to be furnished and installed by the Contractor performing the concrete work as provided by these specifications.
 - 1.2.1 Inserts and anchors
 - 1.2.2 Anchor bolts
 - 1.2.3 Any other miscellaneous items embedded in concrete.

2.0 <u>APPLICABLE SPECIFICATIONS</u>

- 2.1 The Contractor shall follow the practices and standard described in the latest edition of the following specifications, which are made a part of this Specification.
- 2.2 American Institute of Steel Construction (AISC): Manual of Steel Construction.
- 2.3 American National Standards Institute, Inc. (ANSI): A14.3 Safety Requirement for Fixed Ladders.
- 2.4 American Welding Society (AWS):

B3.0 Qualification Procedure.

D1.1 Structural Welding Code.

2.5 Occupational Safety and Health Standards (OSHA).



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3.0 <u>SHOP DRAWINGS</u>

Shop drawings, along with catalog cuts, templates, and erection and installation details, as appropriate, for all miscellaneous metal items shall be submitted for approval in triplicate to the Owner. Submittals shall be complete in detail; shall indicate thickness, type, grade, class of metal, and dimensions; and shall show construction details, reinforcement, anchorage, and installation with relation to the building construction. All welds shall be indicated by standard welding symbols of the American Welding Society.

4.0 <u>GALVANIZING</u>

4.1 Unless noted otherwise, all items specified or noted on the drawings, shall be hot-dipped galvanized in accordance with ASTM A123. All damage due to cutting or field welding, shall be repaired with "Galvalloy", "Galvastick", or equal.

5.0 <u>GENERAL</u>

5.1 In addition to the items listed herein, all miscellaneous metal work required for proper completion of the project, except as specified under other sections, shall be provided in accordance with the drawings.

- 5.2 The Contractor shall coordinate the work under this section with that specified in other sections of these specifications in order that all necessary items are provided as required. Supplementary parts and materials necessary to complete each item, even though such work is not definitely shown or specified, shall be included. All miscellaneous bolts and anchors necessary for the completion of the work shall be furnished as part of this section of the specifications. Anchors not shown in detail on the drawings shall be such as to conform to the accepted practices of the trade and as approved by the Owner. All miscellaneous bolts and anchors, supporting members, braces framing members and connections necessary for completion of the miscellaneous metal work shall be provided as part of the work under this section of the specifications.
- 5.3 Items specified to be galvanized, when practicable and not indicated otherwise, shall be hot-dipped processed after fabrication. Galvanizing shall be in accordance with ASTM A123, A386, or A525 as applicable.



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- 5.4 Inserts of suitable and approved type shall be furnished and installed where necessary for the support of equipment, apparatus, or other work.
- 5.5 Miscellaneous metal work shall be well formed to shape and size, with sharp lines and angles. Shearing and punching shall produce clean, true lines and surfaces. Permanent connections shall be welded, bolted, or riveted. Exposed surfaces shall have a smooth finish and sharp, well-defined lines and arises. Work shall be evenly sprung to curves. Joints shall be milled to a close fit. The necessary rebates, lugs, and brackets shall be provided so that the work can be assembled in a neat and substantial manner. Holes for bolts and screws shall be drilled or punched. Poor matching of holes shall be cause for rejection. Fastenings shall be concealed where practicable. Exposed fastenings shall be compatible materials, shall generally match in color and finish, and shall harmonize with the material to which fastenings are applied. Thickness of metal and details of assembly supports shall give ample strength and stiffness. Joints exposed to the weather shall be formed to exclude water. Welding to or on structural steel shall be in accordance with the Structural Welding Code of the American Welding Society. Welding shall be continuous along entire area of contact, except where tack welding is permitted. Tack welding shall not be permitted on exposed surfaces. All exposed welds shall be ground smooth. Surfaces to be welded shall be properly prepared. Each deposited layer of weld material shall be thoroughly cleaned before additional weld material is applied. All welds shall have complete fusion with the base metal and shall be of uniform thickness free from cracks, oxides, slag inclusions and gas pockets. Corner joints shall be coped or mitered, well formed, and in true alignment. Work shall be accurately set to establish lines and elevations and securely fastened in place. Work shall be executed and finished in accordance with approved drawings, cuts, details and samples.

6.0 <u>DISSIMILAR METALS</u>

Contractor shall take every precaution to prevent the occurrence of electrolytic action between dissimilar metals on all exterior work and on interior work exposed to moisture or high humidity. Copper products shall not be used in connection with aluminum work, nor shall aluminum be used in locations subject to drainage of copper compounds on the bare aluminum. Surfaces of ferrous metals in contact with aluminum shall be painted one coat of Zinc-chromate primer and one coat of aluminum-pigmented bituminous paint. Aluminum in contact with masonry or concrete shall be back painted



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with two coats of aluminum-pigmented bituminous paint. Stainless steel shall not have direct contact with carbon steel or zinc.

7.0 <u>SEALING</u>

It is intended that all work under this section shall be weather tight in every respect as required for good workmanship. All joint filling and sealing to this end shall be done in accordance with the standard practice for this class of work.

8.0 <u>SAMPLES</u>

Samples shall be full size, shall be taken from manufacturer's stock, and shall be complete as required for installation in the structure. After approval, samples may be installed in the work, provided each sample is clearly identified and its location recorded. One sample of any item shall be submitted for approval upon request by the Owner.

9.0 <u>CERTIFICATION</u>

Welding to or on structural steel or miscellaneous items of structural steel such as lintels shall be performed by certified welders qualified in accordance with procedures covered in AWS B3.0 using procedures and materials and equipment of the type required for the work. Verification of certified welders will be required if requested by Owner.

10.0 <u>ANCHORAGE</u>

10.1 Anchorage shall be provided where necessary for fastening miscellaneous metal items securely in place. Anchorage not otherwise specified or indicated, shall include slotted inserts, expansion shield, and power-driven fasteners when approved for concrete; toggle bolts and through bolts for masonry; machine and carriage bolts for steel; through bolts, lag bolts, and screws for wood. Slotted inserts shall be of types required to engage with the anchors and shall be approved by the Owner.

10.2 Anchor bolts shall have two heavy hex nuts and one plain-hardened flat washer, and shall all be ASTM A36 carbon steel.

11.0 <u>MATERIALS</u>

11.1 Structural steel members shall conform to the requirements of ASTM A572, Grade 50, unless otherwise specified.



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- 11.2 Bolts and anchor bolts shall conform to the requirements of ASTM A36 or ASTM A325, unless otherwise specified.
- 11.3 All items specified or indicated to be galvanized shall be hot-dipped galvanized in accordance with ASTM A123.
- 11.4 Anchors and Bolts

Anchors and bolts, in addition to those indicated, shall be provided where necessary for securing the work in place. Sizes, types, and spacings of anchors and bolts not indicated or specified otherwise shall be as necessary for their purposes. Anchors and bolts in contact with ferrous metal shall be of the same or approved metals compatible with the materials, which they adjoin except anchors into concrete, shall be stainless steel.

METAL STAIRS

- 1.0 Metal stairs complete with structural or formed channel stringers, grating threads, landings, columns, handrails, and necessary bolts and other fastenings shall be constructed in accordance with the metal stair manual of the National Association of Architectural Metal Manufacturers and shall conform to the following requirements:
 - 1.1 Structural steel shall conform to ASTM A36.
 - 1.2 Gratings for treads shall be of removable $1\frac{1}{4}$ " x $3\frac{1}{16}$ " galvanized banded standard size with abrasive nosing full width of tread.
 - 1.3 Safety nosings shall be of galvanized steel or painted surface of diamond plated type. Nosing shall be 3" wide and be full width of tread.
 - 1.4 Steel grating shall be supported with minimum ¹/₄" end plates bolted to stringers. Stringers shall be continued around landings as shown, and shall have an angle welded on to support the steel landings. Exposed ends shall be closed.
 - 1.5 Treads shall be capable of sustaining a superimposed load of 100 pounds per square foot.
 - 1.6 Structural steel for framing of landings shall be furnished as part of the stair work.

2.0 <u>INSTALLATION</u>



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Anchor bolts, grating fasteners, washers, and all parts or devices necessary for proper installation shall be furnished and installed. Lock washers shall be used under nuts.

3.0 ANCHORS AND BOLTS

Anchors and bolts, in addition to those indicated, shall be provided where necessary for securing the work in place. Sizes, types, and spacing of anchors and bolts not indicated or specified otherwise shall be as necessary for their purposes. Anchors and bolts in contact with ferrous metal shall be of the same or approved metals compatible with the materials which they adjoin except anchors into concrete shall be stainless steel.

4.0 INSERTS AND SLEEVES

Inserts of suitable and approved types shall be provided where required for the support or anchorage of equipment and finish construction. Inserts shall be gray or malleable iron castings or of galvanized steel unless indicated or specified otherwise. Sleeves required for the passage of pipes through concrete or masonry construction shall be standard cast

iron wall sleeves except that where steel pipe sleeves are indicated, they shall be standard weight zinc coated steel pipe.

5.0 <u>SAFETY CHAINS</u>

Safety chains shall be of ¹/₄" ASTM A304 stainless steel metal, fixed at one end in a swiveled ring and arranged for padlocking to similar ring at the opposite end. The rings shall be welded to the jambs at the openings. Rings shall be mounted 3'-6" above the floor, and the chain shall be sufficient length to allow no more than a 2" drop in the chain at the center.

PIPE AND TUBE RAILINGS (HANDRAILS)

- 1.0 Steel railings shall, unless otherwise indicated, be standard-weight Schedule 40 steel pipe conforming to ASTM A53. Pipe shall be 1¹/₂" size.
- 2.0 <u>Fabrication</u>: Joints of post, rail, and corners shall be by one of the following methods:



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- 2.1 Flush type rail fittings of commercial standard, welded and ground smooth with railing splice locks secured with ³/₈" hexagonal recessed-head setscrews.
- 2.2 Welded joints made by fitting post to top rail and intermediate rail to post, elbow corners, groove welding joints, and grinding smooth. Rail splices shall be butted and reinforced by a tight-fitting interior sleeve not less than 6" long.
- 2.3 Railings may be bent at corners in lieu of elbows provided bends are made in suitable jigs and that the pipe is not crushed.
- 2.4 See Structural Standard Detail Sheet for dimensional details.

3.0 <u>Installation</u>

- 3.1 <u>In Concrete</u>. Rails shall be installed by means of steel pipe sleeve inserts set and anchored in the concrete as indicated. Posts shall be inserted into the steel pipe sleeves, leveled, plumbed, and aligned. The annular space between pipe posts and pipe sleeve inserts shall be filled solid with molten lead or sulfur or a quick-setting hydraulic cement except where railings are indicated to be removable. Anchorage joint shall be covered with pipe collar pinned to post. Ends of rails shall be secured by means of standard steel pipe flange anchored to concrete walls by expansion shields and bolts.
- 3.2 <u>In Masonry</u>. Rails shall be installed by means of standard steel pipe flange secured to masonry with toggle bolts. Rail ends shall be anchored with a standard steel pipe flange through-bolted at the wall into a back plate.
- 3.3 <u>In Steel</u>. Rails shall be installed by means of base plates bolted or welded to stringers or structural framework.

4.0 <u>Ladders</u>

Ladders shall be steel fixed-rail type conforming to ANSI A14.3. Ladders and accessories shall be ASTM A36. Rungs shall be solid-section rods, fitted into punched holes in rails, welded, and ground smooth. All splices and connections shall have a smooth transition with original members without projections that are sharp or more extensive than required for joint strength. Rails shall be fitted with brackets at the spacing indicated for anchorage to structure. See Structural Standard Detail Sheet.



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5.0 <u>Ladder Cages</u>

Ladder cages shall be ASTM A36 and shall be provided as indicated. Bar hoops shall be welded to vertical cage bars. All splices and connections shall have a smooth transition with original members without projections that are sharp or more extensive than required for joint strength. See Structural Standard Detail Sheet.

GRATINGS-BAR GRATINGS AND FLOOR PLATES

- 1.0 Unless otherwise noted, grating shall be galvanized standard rectangular pattern, welded steel grating, with $1" \times 3/16"$ bearing bars W/L spacing, and fastened to structural steel with galvanized clamps. The grating clips shall be manufactured by IKG Borden or equal specifically for the W/L spacing grating. The clips shall be installed in the manner and quantity as recommended by IKG Borden.
- 2.0 No penetration of steel will be allowed by grating galvanized clamp connectors.
- 3.0 No tack welding of grating will be allowed.
- 4.0 Each piece of grating shall be banded on all sides with galvanized flat bar of the same depth as the grating and 3/16" thickness.
- 5.0 Care shall be taken not to cut grating after galvanizing has been applied. If field modification of the grating is required, then the grating shall be tool cleaned as required by SSPC SP 1/2/3 after cutting. After surface preparation has been completed, "Spray-Galv." (Anchor Brand), as manufactured by Dynaflux Co., Cartersville, Ga., shall be applied as required per manufacturer's recommendations. Minimum dry film thickness to be 2.5 mils achieved in minimum of two applications.
- 6.0 If modification of in-place grating is required, and the modification falls on a structural member, then grating shall be removed for modification, modified as required, and replaced back into position. If removal of the grating is not possible, then torch cutting will be permitted with the following stipulations: the angle of the cutting torch shall be as close to parallel to the structural member below to avoid blistering or blackening of the paint below. After grating modification is complete, the grating shall be repaired in accordance with these specifications. The structural member below shall be touched-up as required.



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7.0 All openings in grating greater than 6" diameter or 6" square shall be banded with continuous 3/16" flat bar and shall extend 4" above top of grating. Location of all openings through gratings shall be coordinated with the respective trade requiring the opening, prior to fabrication.

8.0 Floor Loadings

Live	=	100 psf
Dead	=	10 psf
Susp.	=	<u>20 psf</u>
Total		130 psf

9.0 <u>Deflections</u>

- 9.1 Less than ¹/₈" under floor load (130 psf). The Contractor shall provide additional secondary structural members as grating supports for all spans greater than 48" center to center. The detailer shall include the additional members in the shop drawings for review and approval by the Engineer.
- 9.2 Gratings, where indicated, shall be removable or hinged and shall be arranged in sizes to be readily lifted. Frames to receive the gratings shall be fabricated of structural shapes by welding with exposed welds ground smooth. Both the frames and the gratings shall finish flush with the adjacent floors.
- 9.3 Grating shall be fabricated in panels of sizes suitable for delivery and installation, and shall be secured in place by bolted galvanized clips as approved or indicated on the design drawings.
- 9.4 All grating shall receive a hot-dip galvanized coating after fabrication.
- 9.5 Floor plate shall be commercial grade carbon steel with skid resistant raised pattern. The plate shall have a nominal thickness of ¹/₄" and shall be reinforced with angles as shown on the drawings.
- 9.6 Floor plate shall be hot dipped galvanized after fabrication with angle stiffeners and flat bar bearing block.



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DIVISION 6 – NOT USED



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DIVISION 7 - THERMAL AND MOISTURE PROTECTION

INSULATION

1. DESCRIPTION OF WORK

- 1.1. Applications of insulation specified in this section include the following:
 - 1.1.1. Batt-type insulation
 - 1.1.2. Spray-applied insulation
 - 1.1.3. Vinyl Backed Insulation

1.2. Quality Assurance:

1.2.1. <u>Thermal Resistivity:</u> Where thermal resistivity properties of insulation materials are designated by R-Values they represent the rate of heat flow through a homogenous material exactly 1" thick, measured by test method included in referenced material standard or otherwise indicated. They are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

1.3. Submittals:

- 1.3.1. <u>Product Data:</u> Submit manufacturer's product literature and installation instructions for each type of insulation and vapor retarder material required.
- 1.4. Delivery, Storage and Handling:
 - 1.4.1. Protect insulations from physical damage and from becoming wet or soiled. Comply with manufacturer's recommendations for handling, storage and protection during installation

2. <u>PRODUCTS</u>

- 2.1. Batt-Type Insulation
 - 2.1.1. Unfaced Glass Fiber
 - 2.1.2. Fire resistance characteristics per ASTM E84
 - 2.1.3. Manufacturer's standard length and width
 - 2.1.4. Size: 4" or 6" nom.; Developed thermal resistance is as shown on the drawing
 - 2.1.5. Acceptable manufacturer's: John Manville, Owens-Corning, or approved equal.

2.2. Spray-applied insulation

2.2.1. Foam Insulation, applied by spraying and adhering to substrates.



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- 2.2.2. Open Cell content per ASTM D6226, Thermal performance per ASTM C518.
- 2.2.3. Fire resistance characteristics per ASTM E84
- 2.2.4. Developed thermal resistance is as shown on the drawing
- 2.2.5. Installation by licensed installer with 5 year minimum experience.
- 2.2.6. Acceptable manufacturer's: John Manville (JM Corbond OC SPF) or approved equal.

2.3. Vinyl Backed Insulation

- 2.3.1. Vinyl faced glass fiber
- 2.3.2. Fire resistance characteristics per ASTM E84
- 2.3.3. Manufacturer's standard length and width
- 2.3.4. Developed thermal resistance is as shown on the drawing
- 2.3.5. Acceptable manufacturer's: John Manville, Owens-Corning, or approved equal.
- 2.4. <u>Vapor barriers under slabs-on grade</u>: 15 mil polyethylene film with laboratory tested vapor transmission rating of 0.2 perms.

2.5. Miscellaneous Materials:

- 2.5.1. Adhesive for bonding insulation to be as recommended by insulation manufacturer, and complying with the requirements for fire performance characteristics.
- 2.5.2. Mechanical anchors to be the type and size recommended by the insulation manufacturer for type of application and condition of substrate.
- 2.5.3. Mastic Sealer to be type recommended by insulation manufacturer for bonding edge joints between units and filling voids in work.

3. EXECUTION

3.1. Inspection and Preparation:

- 3.1.1. Require installer to examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified. Obtain installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.
- 3.1.2. Clean substrates of substances harmful to insulations or vapor retarders, including removal of projections which might puncture vapor retarders.



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3.2. Installation General:

- 3.2.1. Comply with manufacturer's instruction for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.
- 3.2.2. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.
- 3.3. Installation of batt insulation:
 - 3.3.1. Apply insulation units by method complying with manufacturer's recommendations.

3.4. Installation of spray-applied insulation:

- 3.4.1. Installation per manufacturer's instruction by a licensed installer with 5 years minimum experience.
- 3.5. Installation of vapor retarders:
 - 3.5.1. Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those which have been stuffed with loose fiber-type insulation.
 - 3.5.2. Seal overlapping joints in vapor retarders with adhesives per vapor retarder manufacturer's directions. Seal butt joints and fastener penetrations with tape of type recommended by vapor retarder manufacturer.
 - 3.5.3. Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with tape or another layer of vapor retarder.
- 3.6. Protection:
 - 3.6.1. Protect installed insulation and vapor retarders from harmful weather exposures and from possible physical abuses, where possible by no delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

FLUID-APPLIED AIR BARRIER

- 1. General
 - 1.1. Summary



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1.1.1. Supply labor, materials, and equipment to complete the work as specified herein to bridge and seal the following air leakage pathways and gaps:

- 1.1.1.1. Openings and penetrations of window, door, and louver frames
- 1.1.1.2. Piping, conduit, duct and similar penetrations
- 1.1.1.3. All other air leakage pathways in the building envelope
- 1.1.2. Supply materials and installation methods of the primary vapor permeable air barrier membrane system and accessories.
- 1.1.3. Materials and installation methods of through-wall flashing membranes

1.2. <u>References</u>

- 1.2.1. ASTM E 2357: Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies
- 1.2.2. ASTM E 2178: Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Buildings Materials
- 1.2.3. ASTM E 283: Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- 1.2.4. ASTM E 1677: Specification for Air Retarder (AR) Material of System for Low-Rise Framed Building Walls
- 1.2.5.ASTM E 330: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Door
- 1.2.6. ASTM E 331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
- 1.2.7. ASTM E 96: Water Vapor Transmission of Materials
- 1.2.8. AMMA 2400: Standard Practice for Installation of Windows, Doors and Skylights

1.3. Performance Requirements

- 1.3.1. Air barrier shall be capable of performing as a continuous vapor-permeable air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air barrier membrane assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, and transition at perimeter conditions with deterioration.
- 1.4. Submittals



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1.4.1. Submit documentation certifying the air leakage rates of the air barrier membrane assembly, including primary membrane, primer and sealants have been tested to meet ASTM E 2357.

1.5. Quality Assurance

- 1.5.1. Perform the work in accordance with manufacturer's written instructions and this specification
- 1.5.2. Maintain one copy of manufacturer's written instructions on site
- 1.5.3. Components used shall be sourced from one manufacture, including primary membrane, transition and flashing membranes, air barrier sealants, primers, mastics, and adhesives.
- 1.5.4. Obtain air barrier materials from a single manufacturer regularly engaged in manufacturing the product
- 1.5.5. Provide products which comply with all federal, state and local regulations controlling use of volatile organic compounds (VOCs)

1.6. Delivery, Storage, and Handling

- 1.6.1. Refer to current product MSDS for proper storage and handling
- 1.6.2. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product
- 1.6.3. Store materials in original packaging. Protect materials from direct sunlight until ready for use
- 1.6.4. Store air barrier membranes, adhesives and primers at temperatures of 40 degrees F and rising
- 1.6.5. Keep solvent away from open flame or excessive heat
- 1.7. Coordination
 - 1.7.1. Ensure continuity of the air barrier throughout the scope of this section
- 1.8. Project Conditions
 - 1.8.1. Apply air barrier within the range of ambient and substrate temperatures recommended by air barrier manufacturers. Protect substrates from environmental conditions that affect performance of air barrier. Do not apply air barrier to a damp or wet substrate during rain, fog, or mist

1.9. Warranty

1.9.1. Provide manufacturer's standard 10-year materials warranty.



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- 2. Products
 - 2.1. Materials
 - 2.1.1. Air barrier materials and assemblies for the building envelope shall have a air Permeance not exceeding 0.004 cfm/ft² under a pressure differential of 1.57 psf when tested in accordance with ASTM E 2178.
 - 2.1.2. Components and accessories shall be obtained as a single source from the manufacturer to ensure total system compatibility and integrity
 - 2.1.3. Subject to compliance with requirements, manufacturers offering products that may be incorporated include:
 - 2.1.3.1. Tyvek Brand, Dupont Corp
 - 2.1.3.2. Henry Brand, Carlisle Company
 - 2.1.3.3. Approved Equal
- 3. Execution
 - 3.1. Examination
 - 3.1.1. Examine areas and conditions for compliance with requirements and other conditions affecting performance
 - 3.1.2. All surfaces shall be sound, dry, clean and free of oil, grease, dirt, or other contaminants
 - 3.2. Surface Preparation
 - 3.2.1. Ensure all preparatory work is complete prior to applying air barrier membrane
 - 3.2.2. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air barrier application

3.3. Installation of Air Barrier System

- 3.3.1. The following areas in the building envelope shall be wrapped, sealed, caulked, gasketed, or taped in an approved manner to minimize air leakage
 - 3.3.1.1. Joints around fenestration, door frames, and windows
 - 3.3.1.2. Junctions between walls and floors, between walls at building corners, and between walls and roofs or ceilings
 - 3.3.1.3. Penetrations through the air barrier in building envelope roofs, walls, and floors
 - 3.3.1.4. Building assemblies used as ducts or plenums
 - 3.3.1.5. Joints, seams, connections between planes, and other changes in air barrier materials



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SHEET METAL FLASHING AND TRIM

- 1.0 <u>Vent Flashing</u>. Vent pipes shall be flashed and made watertight at the roof with sheet lead weighing not less than 4 lbs./sq. ft. Flashing shall extend not less than 8" from the pipes in all directions, shall be extended to the tops of the vent piles, and shall be turned down into the pipes. Extreme care shall be taken to prevent rupturing flashing when turning it into pipe. The flashing shall be made to lay flat against inside of vent pipe to prevent stoppage of vent pipe.
- 2.0 <u>Flashing at Curbs for Machinery, Ventilators, or Other Penetrations of Roof</u>. Curbs shall be flashed and made watertight at the roof with 16 oz. copper.
- 3.0 <u>Metal Counterflashing</u>. Shall be 16 oz. copper.

JOINT SEALANTS

All caulking in exterior walls at window and door openings, etc., shall be Sikaflex 1-A. Caulking shall be backed with Ethafoam backer rod, ³/₈" thick.

WATERPROOFING

1.0 <u>Membrane Waterproofing</u>. On below-grade walls and under-grade slabs, lay waterproof membrane composed of two plies of 15 lb. felt, each ply to be lapped 6" and each ply to be mopped completely with hot asphalt.

DOORS

SCOPE OF THE WORK

The work included under this section shall consist of furnishing all labor, tools, equipment, materials, and supervision necessary to complete installation of all doors, frames, and hardware specified herein and indicated on the drawings.



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DOOR HARDWARE

- 1.0 Each door and frame shall be connected by three hinges. Hinges shall not bind or squeak and shall provide smooth operation.
- 2.0 Door knobs shall be centered approximately $3'-5^{3}/_{16}$ " above finished floor.
- 3.0 Weather stripping shall be $3/_{16}$ " polyure than e.
- 4.0 All hardware shall be stainless steel.
- 5.0 Locksets, passage, and strikes are to be furnished as per Owner's master keying system.

STEEL DOORS AND FRAMES

- 1.0 Hollow metal door frame shall be minimum 16 gauge steel with a standard frame profile 5³/₄" by 2" for jambs and heads. Frame shall be factory-assembled, with mitered head-corners, integral stops welded and ground smooth. Frame shall be reinforced, drilled, and tapped for hinges, strikes, closures, and brackets. Frame shall be accurately mortised for hardware. Three rubber mutes shall be furnished on the strike jamb of the frame. Jamb anchors are to be suitable for wall conditions. Frame shall be bonderized and painted one prime coat of rust-inhibitive paint standard with the manufacturer.
- 2.0 Hollow metal door shall be 1³/₄" thick of size indicated on the drawings. Door panels shall be minimum 16 gauge steel with polystyrene core. The hinge edge channel shall be minimum 14 gauge and the lock edge shall be minimum 14 gauge. Door shall be mortised and reinforced for hinges, die cut, and reinforced for hardware and closures. Door shall be rigid and neat in appearance, free from warp or buckle. Door shall have factory applied prime coat, baked on.

DIVISION 8 - NOT USED

DIVISION 9 - NOT USED

DIVISION 10 - NOT USED

DIVISION 11 – NOT USED

DIVISION 12 - NOT USED



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DIVISION 13 - METAL BUILDING

1.0 <u>SCOPE OF WORK</u>

1.1 This division covers the requirements of the metal building system supplier/erector. Metal building system will be completely pre-engineered and supplied by the contractor with complete shop drawings, reactions, calculations, and anchor bolt design and layout. The metal building manufacturers will provide reactions to the engineer for foundation modifications as required. The drawings will bear the stamp of a registered structural engineer in the State of Alabama.

Erector shall have an established tract record, and shall have been in business for at least ten consecutive years.

Erector shall have certified welders, and must be fully insured and bondable.

Erector shall provide an affidavit of compliance that erection is accomplished in accordance with MBMA metal building manufacturer association and supplier standards.

All steel sections and welded plate members shall be designed in accordance with AISC standards.

- 1.2. The building will have a gabled roof with a slope of 1" rise for each 12" of horizontal run. The rigid frames will be clear span with tapered rafters and tapered columns constructed of welded-plate "H" sections. The end wall columns and rafters will be constructed of either hot-rolled structural or welded-plate "H" sections. Light gauge end wall columns and/or rafters shall not be allowed.
- 1.3. Bay spacing will be 25' unless otherwise approved by the Engineer. Horizontal loads not resisted by main frame action shall be resisted by cables, rods, structural brace members and/or portal frames in the sidewalls, end walls and roof. Bracing shall not interfere with any door or crane way openings. Cable or rod bracing will not be permitted in the open area of the building. Cable or rod bracing will not be permitted for crane bracing.

2.0 <u>REFERENCES</u>

ISC - Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design, 1989.



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AISI - Specification for the Design of Cold-Formed Steel Structural Members 1996 Edition with 1999 Addendum.

ASTM A307 - Specification for Carbon Steel Bolts and Studs, 60 KSI Minimum Tensile Strength, 2000.

ASTM A325 - Specification for Structural Bolts, Steel, Heat Treated, 120/105 KSI Minimum Tensile Strength, 2000.

ASTM A792 - Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process, 1999.

AWS D1.1 - Structural Welding Code - Steel , 2000.

MBMA Metal Building Systems Manual, 2002.

SSPC - SP-2 - Specification for Hand Tool Cleaning, 1995

CMAA – Cranes Manufacturers Association of America – Specification No. 70 Revised 2000.

3.0 DESIGN REQUIREMENTS

- 3.1 The building shall be designed by the manufacturer as a complete system. All components of the system shall be supplied or specified by the same manufacturer.
- 3.2 Design load application shall be in accordance with the International Building Code as adopted in the local building regulations.
- 3.3 The dead load shall be the weight of the metal building system as determined by the system manufacturer.
- 3.4 The collateral load shall be 5 psf or as shown on the drawings. The collateral load shall not be applied to the roof panels.
- 3.5 The building system shall be capable of supporting a minimum uniform live load of 20 psf, reducible to the extent allowed by the International Building Code.
- 3.6 The design wind speed for the metal building system shall be 160mph.



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3.7 Deflections shall be limited as follows:

Primary Framing: L/240 for live load.

H/240 wind load.

Secondary Framing: L/240 for roof dead load + roof live load.

- 3.8 The building shall be designed for all load combinations of specific loads as dictated by the International Building Code and ASCE requirements.
- 3.9 Gutters and downspouts shall be designed to handle rainstorms exceeded only once in 10 years, with adequate provision for thermal expansion and contraction. Gutters and downspouts shall be designed, fabricated and erected to withstand a 161 MPH wind.

4.0 <u>SUBMITTALS</u>

Approval by the Engineer is required for the design drawings and they shall bear the professional seal and signature of a licensed professional engineer registered in the State of Alabama. The building design shall conform to the requirements shown on the bid drawings and in this specification. The manufacturer shall be required to submit anchor bolt placement plan and column reactions in advance of the erection drawings.

5.0 QUALITY ASSURANCE

- 5.1 Structural steel members shall be designed and fabricated in accordance with AISC-Specification for Structural Steel Buildings.
- 5.2 Framing members shall be cleaned of loose rust, loose mill scale and other foreign matter and coated with the building manufacturer's standard primer.

6.0 <u>QUALIFICATIONS</u>

- 6.1 The company manufacturing the metal building system shall have a minimum of 10 years experience in the design and manufacture of steel building systems.
- 6.2 The erector shall have at least 10 years specialized experience in the erection of metal building systems. The erector shall have experienced employees and have the proper equipment to undertake a project of this size.


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7.0 <u>WARRANTY</u>

- 7.1 The metal building system shall be warranted against material and workmanship deficiencies for a period of 10 years.
- 7.2 The panel manufacturer's 20-year warranty shall be provided for the roof and wall panels. The roof panels, wall panels and trim shall be Galvalume or color with the color to be selected by the OWNER from manufacturer's standard colors.

8.0 <u>ROOF SYSTEM</u>

- 8.1 The contractor shall furnish and install a standing seam roof system for the building and canopies. The roof panels shall be minimum 24 gage-Galvalume rib panels. The colors of the trim, gutters, downspouts and miscellaneous items will be chosen by the Owner.
- 8.2 Insulation, if required shall be 3" fiberglass blanket type, faced with reinforced white vinyl.
- 8.3 Roof panel to secondary fasteners shall be self-drilling #12 x $1-\frac{1}{4}$ " SS (stainless steel) screws with a weather sealing washer.
- 8.4 Roof side lap fasteners shall be $#12 \times \frac{3}{4}$ SS pierce-point screws with a weather sealing washer.
- 8.5 Lap sealant shall be manufacturer's standard type.

9.0 <u>WALL SYSTEM</u>

- 9.1 The exterior wall covering shall be 26 gage "PBR" profile panels with a minimum yield stress of 80,000 psi. The base steel shall be coated with high-strength Galvalume produced to ASTM A792. The exterior surface will be precoated with a siliconized polyester finish to be selected from the list of the manufacturer's standard colors.
- 9.2 Wall insulation shall be, if required, 3" fiberglass blanket type, faced with reinforced white vinyl.
- 9.3 Wall panel to secondary fasteners shall be self-drilling $#12 \times 1^{-1/4''}$ SS screws with a weather sealing washer, colored to match wall panels.



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9.4 Side lap fasteners shall be $#12 \times \frac{3}{4}$ SS pierce-point screws with a weather sealing washer, colored to match wall panels.

10.0 <u>TRIM</u>

Flashings, rake trim, eave trim, corner trim, window trim, door trim, caps and similar metal accessories shall be of the same material and finish as adjacent material, with the color to be selected BY THE OWNER from manufacturer's standard colors.

11.0 METAL DOORS AND FRAMES

Doors and frames shall be designed by the manufacturer to meet the wind load criteria as specified, maximum wind speed 161 MPH.

12.0 <u>ERECTION</u>

12.1 <u>GENERAL</u>

Verify that the site conditions are in accordance with the provided site drawings. Verify that foundation is of the correct dimensions and properly squared. Verify that the placed anchor bolts are properly sized and in the correct positions. Report any unsatisfactory conditions to the Engineer and do not proceed until the unsatisfactory conditions have been corrected.

12.2 FRAMING

- 12.2.1 Erect framing in accordance with MBMA Metal Building Systems Manual, Common Industry Practices.
- 12.2.2 Erect the building frames true and level with vertical members plumb and bracing properly installed. Maintain the structural stability of frame during erection.
- 12.2.3 Any holes requiring enlargement to admit bolts must be reamed. Burned holes for bolted connections are not permitted without written approval by the building manufacturer.
- 12.2.4 The erector shall furnish temporary guys and bracing where needed for squaring, plumbing, and securing the structural framing against loads acting on the exposed framing during the erection operation. Bracing furnished by the manufacturer for the metal building system cannot be assumed to be adequate during erection and are not to be used to pull



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frames into plumb condition. The temporary guys and braces are the property of the erector, and the erector shall remove them immediately upon completion of erection.

- 12.2.5 The erector shall not field cut or modify any structural members without the prior approval of the metal building manufacturer.
- 12.2.6 After erection, the erector is required to clean and prime any welds, abrasions, and surfaces needing touch-up. The primer color is to match the primer used by the building manufacturer.

12.3 WALL AND ROOFING SYSTEMS

- 12.3.1 Install all wall and roofing systems and insulation in accordance with manufacturer's instructions and details.
- 12.3.2 Exercise care when cutting prefinished material to ensure that cuttings do not remain on finish surface.
- 12.3.3 Fasten cladding system to structural supports, using the proper fasteners, aligned level and plumb.
- 12.3.4 Set purlins and girts according the manufacturer's drawings and bolt to appropriate clips or pre-drilled holes as designed by the building manufacturer.
- 12.3.5 Place roof panels at a right angle to the purlins and girts. Attach and plumb wall panels as shown on drawings. Maintain consistent coverage for entire length of the roof and each wall. Predrill the panels when possible. Panel end laps shall be a minimum of 6" on the roof. No laps will be permitted on the walls. Place end laps over purlins. Apply butyl roof panel side and end lap sealant between panel ends and side laps to provide watertight installation.

12.4 GUTTER, DOWNSPOUT, FLASHINGS AND TRIM

- 12.4.1 Install gutters and downspouts, flashings and trim in strict accordance with manufacturer's drawings, using proper sheet metal procedures.
- 12.4.2 Install downspouts to catch basins and storm drain piping.



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12.5 <u>TOLERANCES</u>

All work shall be performed by experienced workmen in a workmanlike manner to published tolerances.

DIVISION 14 - NOT USED

DIVISION 15 - MECHANICAL

SEE DRAWINGS AND OTHER SHEETS FOR NOTES/SPECS/DETAILS FOR THESE SECTIONS

DIVISION 16 - ELECTRICAL

SEE DRAWINGS AND OTHER SHEETS FOR NOTES/SPECS/DETAILS FOR THESE SECTIONS



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В	REVISED PER ADDENDUM 1	09/02/22	RCC	GDEC	
Α	ISSUE FOR BID	08/10/22	JWM	GDEC	
REV.	DESCRIPTION	DATE	BY	CHK'D	

457 St. Michael St. Mobile, AL 36602 Phone (251) 433-1611 Fax (251) 433-1411



PERFORMANCE • RELIAB

ALABAMA PORT AUTHORITY PORT OF MOBILE

McDUFFIE WAREHOUSE MOBILE, ALABAMA (10861-TASK 2 - AUGUST 2022)







phy, Glover LATES gineering Firm	13 Thrash Rd. LaGrange, GA 30241 Phone (706) 302-2831	PROJECT McDUFFIE WAREHOUSE	
BILITY • EXPERIENCE	Fax (251) 433-1411	McDUFFIE TERMINAL – ASPA MOBILE, AL	

	DRAWING S	CHEDU	<u>JLE:</u>
	4043-C0	-	COVER SHEET
	4043-BCS	-	BUILDING CODE SUMMARY
	4043-G1 4043-G2 4043-G3	_	GENERAL NOTES GENERAL NOTES GENERAL NOTES
	4043-C1 4043-C2	-	EXISTING SITE PLAN NEW SITE PLAN
	4043-C2A	_	SECURITY PERIMETER PLAN
	4043-C4	-	SITE DETAILS
	4043-C4B 4043-C5	_	FENCE DETAILS EROSION CONTROL PLAN
	4043-F1	_	FOUNDATION PLAN
	4043-F1A 4043-F2	_	FOUNDATION CONTROL JOINT PLAN FOUNDATION DETAILS
	4043-F2A 4043-F3	_	FOUNDATION DETAILS FOUNDATION DETAILS
	4043-F4 4043-F5	_	FOUNDATION DETAILS FOUNDATION DETAILS
	4043-F6 4043-F7	_	TRUCK WELL DETAIL STAIR FOOTINGS – PLAN & DETAILS
	4043-F8	-	STAIR FOOTINGS – PLAN & DETAILS
	4043-A1	_	OVERALL FLOOR PLAN
	4043-A2 4043-A3	-	EXTERIOR BUILDING ELEVATIONS
	4043-A4 4043-A5	-	INTERIOR ELEVATIONS
	4043-A7	-	ROOM FINISH SCHEDULE
	4043-LSP1 4043-LSP2	_	LIFE SAFETY PLAN – FIRST & SECOND FLOOR LIFE SAFETY PLAN – WAREHOUSE
	4043–S1 4043–S2	_	FRAMING PLAN DETAILS AND SECTIONS
	4043-S2A 4043-S3	_	DETAILS AND SECTIONS DETAILS AND SECTIONS
	4043-S3A 4043-S4	_	TUBE FRAME OPENING PROTECTOR DETAILS DETAILS AND SECTIONS
	4043-S5 4043-S5A	_	WALL DETAILS AND SECTIONS WALL DETAILS AND SECTIONS
	4043-S6 4043-S7	_	STAIR LAYOUT STAIR DETAILS
	4043-S8 4043-S9	_	STAIR LAYOUT STAIR DETAILS
	4043-S10 4043-S11	_	NOT USED STAIR LAYOUT
	4043-S12 4043-S13	_	STAIR DETAILS STAIR DETAILS
	4043-514 4043-M1	_	WAREHOUSE VENTILATION PLAN
	4043-M2 4043-M3	_	FIRST FLOOR OFFICE MECHANICAL PLAN
	4043-M4 4043-M5	_	HVAC SCHEDULE AND DETAILS
	4043-E1	_	NEW ELECTRICAL SITE PLAN
	4043-E2 4043-E3	_	FIRST FLOOR OFFICE LIGHTING FLOOR PLAN SECOND FLOOR OFFICE LIGHTING FLOOR PLAN
	4043-E4 4043-E5	_	STORAGE LIGHTING FLOOR PLAN FIRST FLOOR OFFICE POWER FLOOR PLAN
	4043-E6 4043-E7	_	SECOND FLOOR OFFICE POWER FLOOR PLAN STORAGE AREA POWER FLOOR PLAN
	4043-E8 4043-E9	_	GROUNDING PLAN PANELBOARD SCHEDULE & AC RISER DIAGRAM
	4043-E10 4043-E11	_	PANELBOARD SCHEDULE STORAGE LIGHTING CONTROL PLAN
	4043-E12 4043-E13	_	OFFICE LIGHTING CONTROL PLAN SECURITY CAMERA AND KEY-PAD FLOOR PLAN
(4043-E14 4043-E15	<u> </u>	NEW FIBER OPTIC SITE PLAN
	4043-E16		
	4043-P1 4043-P2	_	FIRST FLOOR OFFICE PLUMBING PLAN
	4043-P4 4043-P4	_	OFFICE PLUMBING ISOMETRIC
	4043-P6	_	PLUMBING SPECIFICATIONS
	4043-U1	_	UTILITY PLAN
		COAL	TERMINAL STORMWATER TRANSFER - SHEET 6
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COVER SHEET					
SCALE AS NOTED	DRAWN BY JWM	DATE 01/24/22	SHEET OF 22x34 B		
JOB NO. 4043	CHECKED BY WBS	DATE 01/24/22	drawing number 4043-C0		

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COMMERCIAL PROJECT BUILDING CODE SUMMARY JAM 1. GENERAL INFORMATION NAME OF PROJECT MODUFFIE WAREHOUSE PROPOSED USE EQUIPMENT AND PARTS STORAGE OWNERAUTHORIZED AGENT ASPA ADDRESS 250 NORTH WATER ST. MOBILE AL 36602 PHONE 251-433-7260 FAX E-MAIL Morcus.Colema CONTRACTOR TBD ADDRESS 250 NORTH WATER ST. MOBILE AL 36602 PHONE 5 FAX CONTRACTOR TBD ADDRESS 250 NORTH WATER ST. PHONE 4 FAX ADDRESS 5 PHONE 5 FAX ACHTECTURAL DOUCLAS KEARLEY, SR. E-MAIL 58000000000000000000000000000000000000	IUARY, 2020	NDITION OF PE NS TO BE PERF ASHRAE 90.1 2 PPLEMENT OCUMENTS. JECT.	5. BUILI HIGH MIXE INCI INCI ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW ALLOW A	DING OCCUPANCY CLASSIFIC 1 HAZARD: NO SUBSTANCES HAZARDOUS SUBSTANCES WITH PROVISIONS MADE F ED OCCUPANCY_X_YES; PLEASE IDENTIFY ANY EXC DENTAL USE AREAS (508.2) I-SEPARATED MIXED OCCUP, THE REQUIRED TYPE OF C AND AREA LIMITATIONS FO AND AREA LIMITATIONS FO ARATED MIXED OCCUPANCY EACH PART OF THE BUILD BARRIER WALLS AND /OR I EACH USE DIVIDED BY THE DENT AL USE AREAS (TABLE ABLE AREA AND HEIGHT (TAI WABLE AREA ALLOWABLE AREA PER FLOOR ACTUAL AREA PER FLOOR ACTUAL AREA PER FLOOR ACTUAL AREA PER FLOOR ACTUAL BUILDING HEIGHT ALLOWABLE HEIGHT ALLOWABLE HEIGHT: ACTUAL BUILDING HEIGHT ALLOWABLE NUMBER OF S ACTUAL NUMBER OF STOF VG USE AND OCCUPANT LOA UDE OCCUPANT LOAD CALC TISTORY PROJECTS, LARGE ASE NOTE THE USE, AREA AN BUILDING USE — STO OCCUPANCY — S—2 ALLOWABLE OCCUPAN UPANT LOAD SIGNAGE IN AS ROTECTION REQUIREMENTS DING ELEMENT: STRUCTURAL FRAME(COL BEARING WALLS: FLOOR CONSTRUCTION (IN ROOF CONSTRUCTION (IN NON-BEARING WALLS: FLOOR CONSTRUCTION (IN ROOF CONSTRUCTION (IN NON-BEARING WALLS: FLOOR CONSTRUCTION (IN NON-BEARING WALLS: FLOOR CONSTRUCTION (IN NON-BEARING WALLS: FLOOR CONSTRUCTION (IN CEILING-FLOORS: SHAFTS-OTHER: OCCUPANCY ISPARATIONS: OPENING PROTECTION FO ES: 1. ALL FIRE RATED WALLS: SHAFTS-OTHER: CORCIDOR SEPARATIONS: OPENING PROTECTION FO ES: 1. ALL FIRE RATED WALLS: PARTY WALL OR FIRE WALLS 2. IDENTIFY CODE SECTIO * REPRODUCE FULL UL. OI ASSEMBLIES/PENETRATION CORCIDAR SEPARATIONS: OPENING PROTECTION FO ES: 1. ALL FIRE RATED WALLS 2. IDENTIFY CODE SECTIO * REPRODUCE FULL UL. OI ASSEMBLIES/PENETRATION FOR DING PROTECTION FO ES: 1. ALL FIRE RATED WALLS 2. IDENTIFY CODE SECTIO * REPRODUCE FULL UL. OI ASSEMBLIES/PENETRATION DRAFTSTOPPING IN ATTIC FARPRODUCE FULL UL. OI ASSEMBLIES/PENETRATIONE OPENING PROPERTY LINE F E PLAN AND LIFE SAFETY PL SEPARATION DISTANCE:	ATION LISTED IN SECTION 307 3:N/A 'ER CODE SECTION:	' ARE TO BE STORED	IN THE BUILDIN
PROVIDE EVALUATION OF COMPLIANCE ALTERNATIVES IF REQUIRED. CONSISTENCY OF DOCUMENTATION VERIFY ALL SECTIONS AND DETAILS SHOWN ARE REFERENCED CORRECTL REQUIRE ALL MANUFACTURER'S RECOMMENDATIONS BE FOLLOWED AND J DELETE ANY NOTES, DETAILS, REFERENCES AND SPECIFICATIONS THAT AF 4. BUILDING DATA CONSTRUCTION TYPEIAIBIIA_XIIBIIIAIIIBIVVAVB MIXED CONSTRUCTION X_NO_YES CONSTRUCTION TYPESSPRINKLERS X_NO_YES_PARTIAL SYSTEM TYPE13_13R13D STANDPIPES X_NO_YES_WET_DRY_CLASS_COMBINED BUILDING HEIGHT _30_FEET NUMBER OF STORIES HEIGHT INCREASE MEZZANINE: X NO_YES ATRIUM X NO_YES BASEMENT X_NO_YES	Y TO THE CONSTRUCTION DO AVAILABLE ON JOBSITE. RE NOT APPLICABLE TO PROJ	OCUMENTS. JECT.	NOT DRA DIST (SITI FIRE FIRE LIFE DIAC TRA SPA	ES: 1. ALL FIRE RATED WALLS 2. IDENTIFY CODE SECTION * REPRODUCE FULL UL. OF ASSEMBLIES/PENETRATIO FTSTOPPING DRAFTSTOPPING IN FLOOF DRAFTSTOPPING IN ATTIC ANCE TO PROPERTY LINE FI E PLAN AND LIFE SAFETY PL/ SEPARATION DISTANCE: RESISTANCE RATING: SAFETY SYSTEMS IN CODE 1008 EMERGENCY LIGHTIN 1013 EXIT SIGNS:Y 907 FIRE ALARM:YI 1010.1.9 DOOR OPERATION 1010.1.9 DOOR	SHALL BE IDENTIFIED C N WHEN USING ANY SPI R OTHER APPROVED AG INS ON DRAWINGS.(STA R X YES NO ROM EXTERIOR WALL (T AN MUST ILLUSTRATE T NORTH WALL:	IN PLANS BY LINE TYPE ECIAL EXCEPTIONS, E ENCIES DETAILS AND ITEMENT OF REQUIRE INIS INFORMATION) IS SOUTH WALL:F IS.; SOUTH WALL:F IS.; SOUTH WALL:F IONS: IONS: IONS: NO NO; EXCEPTIONS: IONS: NO NO; EXCEPTIONS: IONS: NO NO; EXCEPTIONS: IONS: NO NO; EXCEPTIONS: IONS: NUMBER OF EXIT S NO; EXCEPTION S NO; EXCEPTION S NO S B FT. ACTUAL TRAVEL INITS OF SECTION IAVE CHECKED THE (PE, HATCHING, I TC. SPECIFICATIO D CONFORMIT T.; EAST WALL: HRS.; EAST WALL: HRS.
B REVISED PER ADDENDUM 1 A ISSUE FOR BID REV. DESCRIPTION	09/02/22 RCC 08/10/22 JWM DATE BY	GDEC DBK CHK'D	457 St. Michael Mobile, AL 366 Phone (251) 433- Fax (251) 433-1	St. Cov 502 1611 411 PERFORM	vles, Mui & ASSO Full Service Er MANCE • RELLA	rphy, GI CIATES ogineering Fin ABILITY • EXP	OVER

NG EXCEPT AS NOTED: LIFE SAFETY PLAN PROVIDE A LIFE SAFETY PLAN FOR ALL COMMERCIAL PROJECTS. AT A MINIMUM, THE LIFE SAFETY PLAN SHOULD ILLUSTRATE THE OCCUPANT LOADS FOR ALL AREAS, EXIT LOCATIONS, EXIT ACCESS, EXIT CAPACITY, MAXIMUM TRAVEL DISTANCE, EXIT LIGHTS, MECHANICAL REQUIREMENTS _____ COMPLIANCE WITH THE 2018 INTERNATIONAL MECHANICAL CODE IS REQUIRED. EMERGENCY LIGHTS, FIRE EXTINGUISHERS, FIRE RATED ASSEMBLIES, ASSEMBLY AREA SEATING LAYOUT AND EXIT DISCHARGE. SECOND EMERGENCY ESCAPE REQUIRED FOR RESIDENTIAL & INSTITUTIONAL-1 OCCUPANCIES PROVIDED PER 1026. PROVIDE A COMPLETE MECHANICAL SCOPE-OF-WORK AND VENTILATION CALCULATIONS. THE FOLLOWING ITEMS SHOULD BE IDENTIFIED AND LOCATED ON PLANS: ACCESSIBILITY CHAPTER 11 ALL NEW AND EXISTING SUPPLY AND RETURN AIR DUCTWORK.) BY APPLYING THE MOST RESTRICTIVE HEIGHT DESIGN CONFORMS TO ICC/ANSI A117.1-2009: X YES NO, EXCEPTION: ALL NEW AND EXISTING EQUIPMENT TOGETHER WITH EQUIPMENT SCHEDULES. (RESTROOM PLANS AND ELEVATIONS SHALL BE PROVIDED AT A MINIMUM 3/16" =1'-0" SCALE) RATED PARTITION AND FLOOR/ CEILING ASSEMBLY LOCATIONS AND INFORMATION. AN ACCESSIBLE ROUTE IS PROVIDED THROUGHOUT THIS BUILDING PER 1104 EXCEPT AS NOTED: CLOTHES DRYER VENT ROUTING AND MAKE-UP AIR INFORMATION. SEPARATED FROM ADJACENT USES BY FIRE CONDENSATE DRAIN ROUTING, DRAINING TO STORM, DRYWELL OR LANDSCAPED AREA. THE RATIOS OF THE ACTUAL FLOOR AREA OF ALL FIRE AND SMOKE DAMPER AND DETECTOR LOCATIONS AND INSTALLATION INFORMATION. IS AN ACCESSIBLE ENTRANCES PROVIDED PER 1005: X YES NO, EXCEPTION: EED 1. BATHROOM EXHAUST FANS, DUCT ROUTING AND CFM INFORMATION. IF PLUMBING OR MECHANICAL EQUIPMENT IS INSTALLED ABOVE CEILING OR IN ATTIC SPACES, STRUCTURAL DESIGN PARAMETERS CLASSIFICATION OF BUILDING CATEGORY/USE GROUP ____ [I, II, II, III, IV] A FIXED LADDER OR COMMERCIAL GRADE 300 LB. CAPACITY DISAPPEARING STAIRWAY SHALL BE REQUIRED THE FOLLOWING DETAILS SHOULD BE PROVIDED: ROOF LIVE LOAD: <u>20</u> PSF ATTIC LOAD: 0 PSF 23,000 FLOOR LOAD: 100 PSF TIE-DOWN DETAILS FOR ALL EQUIPMENT EXPOSED TO THE HIGH WIND LOADS. MEZZANINE LOAD: O PSE 7,820 7,820 KITCHEN EQUIPMENT LAYOUT AND EXHAUST HOOD ANCHOR DETAILS UILDING EXPOSURE: WIND SPEED <u>159</u> MPH (ASCE 7-10) IMPORTANCE FACTOR: Martin Ma UL INFORMATION FOR KITCHEN HOODS, GREASE EXHAUST AND PAINT SPRAY BOOTHS. PAINT SPRAY BOOTH EXHAUST, MAKE UP AIR AND SEQUENCE OF OPERATIONS. AREAS IN SECTION 507. LOAD COMBINATIONS CONSIDERED AS PER 1605 X YES NO THE FOLLOWING MUST BE SIGNED AND SEALED BY AN ENGINEER: BUILDING WILL BE DESIGNED AS: X AN ENCLOSED BUILDING AN UNENCLOSED BUILDING METHOD OF DEBRIS PROTECTION TO GLAZED OPENINGS PER 1609.2: X MECHANICAL PLANS FOR BUILDINGS OF MORE THAN 2500 S.F. ALL TYPE 1 (GREASE) EXHAUST HOOD DOCUMENTS ASSUMED SOIL BEARING 1200 POUNDS / SQ. FT.; SOILS REPORT X YES NO. PROVIDE A COMPONENTS AND CLADDING PRESSURE DIAGRAM ON THE CONSTRUCTION DOCUMENTS. ELECTRICAL REQUIREMENTS SPECIAL DETAILED REQUIREMENTS COMPLIANCE WITH THE 2017 NATIONAL ELECTRICAL CODE IS REQUIRED. THE FOLLOWING ITEMS SHOULD BE IDENTIFIED AND LOCATED ON PLANS: THE DESIGN PROFESSIONAL SHALL COMPLY WITH ANY SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY. PLEASE ELECTRICAL SERVICE, AND ALL ELECTRICAL PANELS, INDICATE ALL CONDITIONS THAT APPLY: ALL APPLIANCES AND EQUIPMENT. ALL LUMINARIES AND OUTLETS (INCLUDING THOSE FOR HVAC). N/A 402 COVERED MALL BUILDING LAN. N/A 403 HIGH RISE BUILDINGS ALL EQUIPMENT DISCONNECTING MEANS, TOGETHER WITH SIZES AND RATINGS. Ñ∠A ELECTRICAL EQUIPMENT SHOULD BE SPECIFIED WITH: 404 ATRIUMS N/A 405 UNDER GROUND BUILDINGS EQUIPMENT WORKING SPACE AND CLEARANCES SHOWN. LABELLING BY A RECOGNIZED ELECTRICAL TESTING LABORATORY. 406 MOTOR-VEHICLE RELATED OCCUPANCIES N/A ELECTRICAL PANEL SCHEDULES SHOULD SHOW: 407 GROUP I-2 N/A ALL LOADS, VOLTAGES, PHASES, AND BUS SIZES IN AMPERES. 408 GROUP I-3 N/A PANELS SHOULD BE BALANCED AND SHOWN IN THE CIRCUIT DIRECTORY 409 MOTION PICTURE PROJECTION ROOMS N/A CALCULATIONS FOR EACH PANEL FOR SERVICE, FEEDER AND BRANCH CIRCUITS. **//BLY REFERENCE*** 410 STAGES & PLATFORMS, ETC. N/A ALL BRANCH CIRCUIT CONDUCTORS AND CONDUIT SIZES. 411 SPECIAL AMUSEMENT BUILDINGS N/A 412 AIRCRAFT RELATED OCCUPANCIES N/A AMENDMENTS 413 COMBUSTIBLE STORAGE N/A PRIOR TO SUBMITTING THE CONSTRUCTION DOCUMENTS FOR REVIEW AND PERMITTING, THE 414 HAZARDOUS MATERIALS -----N/A DESIGN PROFESSIONAL SHOULD CONTACT THE MOBILE COUNTY INSPECTION DEPARTMENT TO 415 HAZARDOUS OCCUPANCY GROUPS N/A OBTAIN A COPY OF THE MOST CURRENT AMENDMENTS ADOPTED BY THE MOBILE COUNTY COMMISSION. 416 APPLICATION OF FLAMMABLE FINISHES 417 DRYING ROOMS N/A N/A 418 ORGANIC COATINGS. N/A 419 LIVE / WORK UNITS N/A 420 GROUPS I-1, R-1, R-2, R-3 N/A FERENCE* 421 HYDROGEN CUTOFF ROOMS _____N/A 422 AMBULATORY CARE FACILITIES N/A 423 STORM SHELTERS N/A 424 CHILDREN'S PLAY STRUCTURES CONTRACTOR REQUIREMENTS THE DESIGN PROFESSIONAL WILL NOTIFY THE CONTRACTOR OF HIS RESPONSIBILITY UNDER SECTION 1704.4. THE CONTRACTOR SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE INSPECTION DEPARTMENT AND THE OWNER PRIOR TO COMMENCEMENT OF THE WORK STATING THAT THEY ARE AWARE OF THEIR RESPONSIBILITY CONTAINED IN THE STATEMENT OF SPECIAL INSPECTIONS: CONTRACTOR'S SIGNATURE AT TIME OF PERMITTING: _ SAFETY GLAZING FOR HAZARDOUS LOCATIONS THE REQUIRED LOCATIONS OF TEMPERED SAFETY GLASS SHALL BE IDENTIFIED ON THE CONSTRUCTION DOCUMENTS AS PER SECTION 2406 SAFETY GLAZING. SAFETY GLASS LOCATIONS NOTED: X YES NO, EXCEPTION NO. , ETC.; SHOW LEGEND. PRE-ENGINEERED BUILDINGS AND TRUSSES ONS FOR RATED COMPLETE STRUCTURAL PACKAGES MUST BE SUBMITTED PRIOR TO OBTAINING THE BUILDING PERMIT. TY INSUFFICIENT) THE SUBMITTALS MUST BE SIGNED AND SEALED BY AN ENGINEER REGISTERED IN THE STATE OF ALABAMA. FIRE DEPARTMENT REQUIREMENTS THE DESIGN PROFESSIONAL SHALL PROVIDE THE REQUIRED WATER SUPPLY FOR THE BUILDING. PLEASE INITIAL THE METHOD USED FOR DETERMINING THE REQUIRED WATER SUPPLY AS NOTED BELOW: REQUIRED WATER SUPPLY <u>5250</u> GPM @ <u>20</u> PSI <u>IFC</u> METHOD USED ___ FT.; WEST WALL:___ FT. THE INSURANCE SERVICE OFFICE (ISO) METHOD; IOWA STATE UNIVERSITY (ISU) METHOD; LL:____ HRS.; WEST WALL: ____HRS. ILLINOIS INSTITUTE OF TECHNOLOGY (IIT) METHOD, OR THE INTERNATIONAL FIRE CODE (IFC). PLUMBING FIXTURES _____ PROVIDE A TABLE ON THE CONSTRUCTION DOCUMENTS SHOWING THE NUMBER OF REQUIRED FIXTURES AND THE NUMBER OF FIXTURES _____ PROVIDED PER TABLE 2902.1 - MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES. THE PLUMBING DRAWINGS MUST BE SUBMITTED AND APPROVED BY THE MOBILE COUNTY HEALTH DEPARTMENT WILL RELEASE THE PLUMBING PERMIT. SEPARATE FACILITIES PROVIDED AS PER 2902.2: X YES NO, EXCEPTION NO. NOT REQ'D ENERGY COMPLIANCE THE CONTRACT DOCUMENTS MUST ILLUSTRATE COMPLIANCE WITH THE 2015 INTERNATIONAL ENERGY CONSERVATION CODE. THE S-2 B CONTRACTOR MAY SUBMIT A CERTIFICATE OF COMPLIANCE AS PER THE IECC SECTION R403.1.1. 4 4 PROVIDED: <u>132</u> INCHES ROVIDED: 72 INCHES S-2 B AXIMUM): <u>244 96</u> FT. DAD AND THE ES <u>X</u>NO © COWLES, MURPHY, GLOVER & ASSOCIATES, INC., 2022 CONFIDENTIAL, VALUABLE, AND PROPRIETARY INFORMATION

> 13 Thrash Rd. LaGrange, GA 30241 Phone (706) 302-2831 Fax (251) 433-1411

McDUFFIE WAREHOUSE McDUFFIE TERMINAL

ASPA

BUILDING CODE SUMMARY						
SCALE	DRAWN BY	DATE	SHEET REV.			
N/A	JWM	12/22/21	OF B			
JOB NO.	CHECKED BY	DATE	DRAWING NUMBER			
4043	DBK	12/22/21	4043-BCS			

GENERAL NOTES

- 1. NO PROVISION OF ANY REFERENCED STANDARD SPECIFICATION, MANUAL OR CODE (WHETHER OR NOT SPECIFICALLY INCORPORATED BY REFERENCE IN THE CONTRACT DOCUMENTS) SHALL BE EFFECTIVE TO CHANGE THE DUTIES AND RESPONSIBILITIES OF OWNER, CONTRACTOR, ENGINEER, SUPPLIER, OR ANY OF THEIR CONSULTANTS, AGENTS, OR EMPLOYEES FROM THOSE SET FORTH IN THE CONTRACT DOCUMENTS. NOR SHALL IT BE EFFECTIVE TO ASSIGN TO THE STRUCTURAL ENGINEER OF RECORD OR ANY OF THE STRUCTURAL ENGINEER OF RECORD'S CONSULTANTS, AGENTS, OR EMPLOYEES ANY DUTY OR AUTHORITY TO SUPERVISE OR DIRECT THE FURNISHING OR PERFORMANCE OF THE WORK OR ANY DUTY OR AUTHORITY TO UNDERTAKE RESPONSIBILITIES CONTRARY TO THE PROVISIONS OF THE CONTRACT DOCUMENTS.
- 2. CONTRACT DOCUMENTS INCLUDE, BUT ARE NOT LIMITED TO, THE STRUCTURAL DOCUMENTS (DRAWINGS AND SPECIFICATIONS), BUT DO NOT INCLUDE SHOP DRAWINGS, VENDOR DRAWINGS, OR MATERIAL PREPARED AND SUBMITTED BY THE CONTRACTOR.
- 3. REFERENCE TO STANDARD SPECIFICATIONS OF ANY TECHNICAL SOCIETY, ORGANIZATION, OR ASSOCIATION OR TO CODES OF LOCAL OR STATE AUTHORITIES, SHALL MEAN THE LATEST STANDARD, CODE, SPECIFICATION OR TENTATIVE SPECIFICATION ADOPTED AT THE DATE OF TAKING BIDS, UNLESS SPECIFICALLY STATED OTHERWISE.
- 4. CONTRACT DOCUMENTS SHALL GOVERN IN THE EVENT OF A CONFLICT WITH THE CODE OF PRACTICE OR SPECIFICATIONS OF ACI, PCI, AISC, SJI OR OTHER STANDARDS. WHERE A CONFLICT OCCURS WITHIN THE CONTRACT DOCUMENTS, THE STRICTEST REQUIREMENT SHALL GOVERN.
- 5. MATERIAL, WORKMANSHIP, AND DESIGN SHALL CONFORM TO THE REFERENCED BUILDING CODE.
- 6. CONTRACTOR SHALL COORDINATE THE STRUCTURAL DOCUMENTS WITH THE ARCHITECTURAL, MECHANICAL ELECTRICAL, PLUMBING AND CIVIL DOCUMENTS. ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY OR OMISSION. FOR DIMENSIONS NOT SHOWN ON THE STRUCTURAL DRAWINGS SEE THE ARCHITECTURAL DRAWINGS.
- 7. CONTRACTOR SHALL OBTAIN AND COORDINATE EDGE OF SLAB DIMENSIONS, OPENING LOCATIONS AND DIMENSIONS, DEPRESSED SLAB LOCATIONS AND EXTENTS, SLAB SLOPES, CURB LOCATIONS, AND CMU WALL LOCATIONS. STRUCTURAL ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY OR OMISSION.
- 8. CONTRACTOR SHALL VERIFY EXISTING DIMENSIONS, ELEVATIONS, AND SITE CONDITIONS BEFORE STARTING WORK. ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY.
- 9. CONTRACTOR HAS SOLE RESPONSIBILITY FOR MEANS, METHODS, SAFETY, TECHNIQUES, SEQUENCES, AND PROCEDURES OF CONSTRUCTION.
- 10. THE STRUCTURE IS STABLE ONLY IN ITS COMPLETED FORM. TEMPORARY SUPPORTS REQUIRED FOR STABILITY DURING ALL INTERMEDIATE STAGES OF CONSTRUCTION SHALL BE DESIGNED, FURNISHED, AND INSTALLED BY THE CONTRACTOR. CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTIBILITY ANALYSIS, AND ERECTION PROCEDURES, INCLUDING DESIGN AND ERECTION OF FALSEWORK, TEMPORARY BRACING, ETC.
- 11. CONTRACTOR HAS SOLE RESPONSIBILITY TO COMPLY WITH ALL OSHA REGULATIONS.
- 12. REPRODUCTION OF STRUCTURAL DRAWINGS FOR SHOP DRAWINGS IS NOT PERMITTED. ELECTRONIC DRAWING FILES WILL NOT BE PROVIDED TO THE CONTRACTOR.
- 13. SUBMIT SHOP DRAWINGS WHICH ADEQUATELY DEPICT THE STRUCTURAL ELEMENTS AND CONNECTIONS SHOWN IN THE CONTRACT DOCUMENTS. REVIEW OF SHOP DRAWINGS SHALL BE FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS REGARDING ARRANGEMENT AND SIZES OF MEMBERS AND THE CONTRACTOR'S INTERPRETATION OF THE DESIGN LOADS AND CONTRACT DOCUMENT DETAILS. REVIEW OF SUBMITTALS OR SHOP DRAWINGS BY THE STRUCTURAL ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF THE SOLE RESPONSIBILITY TO REVIEW AND CHECK ALL SUBMITTALS AND SHOP DRAWINGS BEFORE SUBMITTING TO THE STRUCTURAL ENGINEER. REVIEW OF SUBMITTALS OR SHOP DRAWINGS BY THE STRUCTURAL ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF FULL RESPONSIBILITY FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS. CONTRACTOR REMAINS SOLELY RESPONSIBLE FOR ERRORS AND OMISSIONS ASSOCIATED WITH THE PREPARATION OF SHOP DRAWINGS AS THEY PERTAIN TO MEMBER SIZES, DETAILS, AND DIMENSIONS SPECIFIED IN THE CONTRACT DOCUMENTS.
- 14. WHERE A SECTION OR DETAIL IS SHOWN OR DETAILED FOR ONE CONDITION, IT SHALL APPLY TO ALL SIMILAR AND LIKE CONDITIONS. DETAILS LABELED "TYPICAL" ON THE DRAWINGS APPLY TO ALL SITUATIONS OCCURRING ON THE PROJECT THAT ARE THE SAME OR SIMILAR. THE CONTRACTOR SHALL CONSIDER ALL OF THE CONTRACT DOCUMENTS IN DETERMINING SIMILAR AND LIKE CONDITIONS.
- 15. SIGNATURE AND REGISTRATION SEAL OF THE STRUCTURAL ENGINEER THAT MAY BE AFFIXED TO THESE DRAWINGS RELATES ONLY TO THE STRUCTURAL DESIGN OF THE PROJECT.

CODE/DESIGN CRITERIA

- 1. STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE 2018 BUILDING CODE, WITH LATEST AMENDMENTS.
- 2. GRAVITY LOADS
- 2.1 UNIFORM FLOOR LIVE LOADS (REDUCED AS ALLOWED BY THE BUILDING CODE):

FLOOR STAIRS

100 PSF 100 PSF

WIND LOADS: SEE TABLE ON THIS SHEET

3. ESTIMATED DEFLECTIONS (IN INCHES) ARE AS FOLLOWS:

LIVE LOAD

L/360 OR 1 IN.

L/360

ROOF MEMBERS:

FLOOR MEMBERS:

DEAD + LIVE LOAD L/240 L/240

WHERE, L = SPAN LENGTH (IN INCHES) BETWEEN CENTERLINES OF SUPPORTS. FOR CANTILEVERS, L IS TWICE THE LENGTH OF THE CANTILEVER.)

4. SPECIAL INSPECTIONS:

4.1 THE FOLLOWING TYPES OF WORK REQUIRE SPECIAL INSPECTION: FOUNDATION ANCHORS & REINFORCING STEEL, STRUCTURAL STEEL, AND LIGHT GAUGE STEEL FRAMING.

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В	REVISED PER ADDENDUM 1	09/02/22	RCC	GDEC	Pho
Α	ISSUED FOR BID	08/10/22	JWM	GDEC	Fax
REV.	DESCRIPTION	DATE	BY	CHK'D	

7 St. Michael St obile, AL 36602 one (251) 433-1611 x (251) 433-1411

Cowles, Mu & ASSO A Full Service E **PERFORMANCE** • RELI

REINFORCEMENT

- REINFORCING, UNLESS NOTED OTHERWISE.

5.2 MASONRY REINFORCING STEEL SHALL BE PLACED IN THE CENTER OF CMU CELLS, UNLESS NOTED OTHERWISE.

CLASS	
Α	
AC	

1. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, PREFABRICATED, UNLESS NOTED OTHERWISE. NO FIELD BURNING ALLOWED.

2. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 AND HAVE MINIMUM SIDE AND END LAPS OF 12". CHAIRS TO BE PLACED 2'-0" O.C.. INDIVIDUAL CHAIRS SHOULD BE ABLE TO SUPPORT 200 LB. LOAD WITHOUT CRUSHING. WIRE MUST RETURN TO PROPER PLACEMENT AFTER BEING STEPPED ON.

3. SUBMIT SHOP DRAWINGS WHICH ADEQUATELY DEPICT THE REINFORCING BAR SIZES AND PLACEMENT. WRITTEN DESCRIPTION OF REINFORCEMENT WITHOUT ADEQUATE SECTIONS, ELEVATIONS, AND DETAILS IS NOT ACCEPTABLE.

4. PROVIDE DOWELS FROM FOUNDATIONS THE SAME SIZE AND NUMBER AS THE VERTICAL WALL OR COLUMN

5. PLACE REINFORCEMENT AS FOLLOWS, UNLESS NOTED OTHERWISE:

5.1 CAST-IN-PLACE (NON POST-TENSIONED) CONCRETE REINFORCEMENT COVER

PERMANENTLY EXPOSED TO EARTH: CAST AGAINST THE EARTH_ _____ 3" CLEAR

EXPOSED TO EARTH OR WEATHER: FOR BARS LARGER THAN A NO. 5 BAR_____ 2" CLEAR NO. 5 BARS OR SMALLER______ 1-1/2" CLEAR

6. REINFORCEMENT SHALL BE SPLICED ONLY AT LOCATIONS SHOWN OR NOTED IN THE STRUCTURAL DOCUMENTS EXCEPT REINFORCEMENT MARKED "CONTINUOUS" CAN BE SPLICED AT LOCATIONS DETERMINED BY CONTRACTOR. SPLICES AT OTHER LOCATIONS SHALL BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER. REINFORCING STEEL SPLICES SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:

CONCRETE REINFORCEMENT: CLASS B TENSION LAP MASONRY REINFORCEMENT: 48 BAR DIAMETERS

7. ADHESIVE FOR REINFORCING DOWELS IN EXISTING CONCRETE SHALL BE EITHER THE HIT HY150 INJECTION ADHESIVE SUPPLIED BY HILTI FASTENING SYSTEMS, THE EPCON SYSTEM CERAMIC 6 EPOXY ADHESIVE SUPPLIED BY ITW RAMSET/RED HEAD, POWER-FAST EPOXY INJECTION GEL SUPPLIED BY POWERS FASTENING, OR APPROVED EQUAL. MINIMUM EMBEDMENT LENGTH SHALL BE 24 BAR DIAMETERS, UNLESS NOTED OTHERWISE.

8. REINFORCING STEEL SHALL BE FREE FROM GREASE, MUD, EXCESSIVE RUST OR OTHER COATINGS THAT WILL DESTROY OR REDUCE BOND STRENGTH. REINFORCING STEEL IN ALL FOOTINGS, WALLS, BOND BEAMS AND PILASTERS SHALL BE MADE WITH BENT BARS WITH A MINIMUM SPLICE LENGTH OF 48 BAR DIAMETERS. PROVIDE GALV. ANCHOR BOLTS SET IN CONCRETE FOR ANCHORING STEEL OR WOOD TO CONCRETE.

CAST-IN-PLACE CONCRETE

1. CONCRETE WORK SHALL CONFORM TO ACI 318 AND CRSI STANDARDS.

2. CONCRETE SHALL HAVE THE FOLLOWING MINIMUM SPECIFIED 28-DAY COMPRESSIVE STRENGTH:

ALL CONCRETE SHALL MEET ALL OF THE FOLLOWING REQUIREMENTS SPECIFIED.

CLASS "A" CONCRETE SHALL BE USED FOR ALL WORK INCLUDED IN THIS CONTRACT, AND CLASS "AC" SHALL BE USED FOR PUMPING.

3. REFER TO ARCHITECTURAL DRAWINGS FOR MOLDS, GROOVES, ORNAMENTS, CLIPS OR GROUNDS REQUIRED TO BE ENCASED IN CONCRETE AND FOR LOCATION OF FLOOR FINISHES AND SLAB DEPRESSIONS.

4. CONSTRUCTION JOINT LOCATIONS SHALL BE APPROVED BY THE STRUCTURAL ENGINEER. NO HORIZONTAL CONSTRUCTION JOINTS ARE PERMITTED EXCEPT THOSE SHOWN ON THE STRUCTURAL DRAWINGS.

5. DEFECTIVE AREAS IN CONCRETE INCLUDING, BUT NOT LIMITED TO, HONEY-COMBING, SPALLS, AND CRACKS WITH WIDTHS EXCEEDING 0.01 INCH SHALL BE REPAIRED. EXTENT OF DEFECTIVE AREA TO BE DETERMINED BY THE STRUCTURAL ENGINEER.

PROVIDE (1) SET OF CYLINDERS, (4) FROM EACH 50 CUBIC YARDS.

MAX. WATER PER BAG OF CEMENT	MIN. CEMENT PER CUBIC YARD	MIN. COMPRESSIVE STRENGTH IN 28 DAYS	SLUMP RANGE
5.5	6.5	4,000 PSI	2"-4"
6.0	8.0	4,000 PSI	5"-7"

FOUNDATION

- 2. GEOTECHINCAL/INSPECTION AGENCY SHALL CERTIFY THE BEARING MEDIUM.
- 3. DENSIFY BUILDING AREAS AND A MINIMUM OF 5'-0" OUTSIDE THE BUILDING PERIMETER USING A VIBRATORY ROLLER.
- PERFORMED ON EACH LIFT. ALL REPORTS SHALL BE SUBMITTED TO THE ENGINEER.
- 5. BACKFILL SHALL BE A SAND CLAY GRANULAR MATERIAL WITH LESS THAN 30% PASSING THE #200 SIEVE AND A LIQUID LIMIT OF LESS THAN 25.
- 7. PROVIDE (1) SET OF CYLINDERS, (4) FROM EACH 50 CUBIC YARDS.
- 8. FOR SITE PREPARATION SEE SOUTHERN EARTH SCIENCES, GEOTECHNICAL REPORT PROJECT #: M21-454.

PRE-ENGINEERED METAL BUILDING NOTES:

- ARCHITECTURAL OR ENGINEERING SPECS WILL GOVERN.
- CODE:
- A. DEAD LOAD OF STRUCTURE
- B. WIND LOAD 159 MPH (3 SECOND GUST) (RISK CATEGORY II) (EXPOSURE D)
- C. ROOF LIVE LOAD 20 PSF
- D. COLLATERAL LOAD = 8 PSF
- F. BUILDING SHALL BE CERTIFIED BY BUILDING MANUFACTURER FOR 159 MPH WIND LOAD.
- 3. DEFLECTIONS SHALL BE LIMITED AS FOLLOWS:

PRIMARY FRAMING

WIND BEAM

SECONDARY FRAMING

- 4. THE ROOF SHALL BE 24 GAUGE STANDING SEAM GALVALUME.
- CAP OVER THE CARBON STEEL HEAD AND STANDARD SEALING WASHER.

R19 VINYL BACKED ROLL INSULATION ROOF: WALLS: **R10 VINYL BACKED ROLL INSULATION**

- 8. ALL ANCHOR BOLT SIZES AND LOCATIONS SHALL BE AS PER BUILDING MANUFACTURER'S CERTIFIED DRAWINGS.
- DESIGNED FOR A MINIMUM 25 YEAR RAINFALL EVENT.

rphy, G lover	13 Thrash Rd.	PROJECT McDUFFIE	
CIATES	LaGrange, GA 30241	WAREHOUSE	
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1. FOUNDATION DESIGN IS BASED ON AN ALLOWABLE BEARING PRESSURE OF 1,200 PSF AND TIMBER PILE SUPPORTED COLUMN FOOTINGS. STRUCTURAL ENGINEER IS NOT RESPONSIBLE FOR SUBSURFACE CONDITIONS ENCOUNTERED IN THE FIELD DIFFERENT FROM THOSE ASSUMED FOR DESIGN.

4. SOIL COMPACTION - 100% STANDARD PROCTOR DENSITY. ALL FILL SHALL BE COMPACTED IN 8" LOOSE LIFTS. COMPACTION TESTING SHALL BE

6. ALL CONCRETE MUST CURE FOR A MINIMUM OF 7 DAYS BEFORE ANY LOAD IS PLACED ON CONCRETE. INSTALL CURING COMPOUND ON ALL EXPOSED CONCRETE SURFACES. CONCRETE SHALL BE CURED WITH MEMBRANE 30% SOLIDS COMPOUND, SPRAY APPLIED.

1. SEE ALSO SPECIFICATIONS PROVIDED BY ARCHITECT. WHERE SPECIFICATIONS CONFLICT OR ARE DUPLICATED THE MORE RESTRICTIVE OF THE

2. BUILDING DIMENSIONS SHALL BE AS SHOWN ON THE DRAWINGS AND SHALL BE DESIGNED AS FOLLOWS AND IN ACCORDANCE WITH THE 2018 BUILDING

E. MAJOR STRUCTURAL COMPONENTS, INCLUDING RIGID FRAMES, BEAMS AND COLUMN WHICH SUPPORT A TRIBUTARY ROOF AREA GREATER THAN 600 SQUARE FEET SHALL BE DESIGNED ON THE BASIS OF A REDUCED LIVE LOAD IN ACCORDANCE WITH THE APPLICABLE CODE.

L/360 FOR LIVE LOAD

H/240 FOR WIND LOAD

1/240 For roof dead load +roof live load.

5. ALL ROOF PANEL FASTENERS SHALL BE "EXTENDED LIFE" WITH EITHER A ZINC/ALUMINUM/MANGANESE ALLOY CASTING OR A 302 STAINLESS STEEL

6. BUILDING TRIM SHALL BE IN ACCORDANCE WITH BUILDING MANUFACTURERS STANDARD. COLOR OF TRIM SHALL BE CHOSEN BY OWNER.

7. ALL STRUCTURAL STEEL SHALL RECEIVE A SHOP COAT OF BUILDING MANUFACTURER'S STANDARD SHOP PAINTING SYSTEM.

8. THE BUILDING SHALL BE INSULATED WITH BUILDING MANUFACTURER'S STANDARD VINYL BACKED INSULATION AS FOLLOWS:

9. WIND BRACING IN ROOF AND WALLS SHALL BE PROVIDED USING ROD TYPE X-BRACING OR WIND FRAMES.

10. GUTTERS AND DOWNSPOUTS SHALL BE DESIGNED FOR THE ABOVE WIND LOAD AND FASTENED AS REQUIRED. GUTTERS AND DOWNSPOUTS SHALL BE

GENERAL NOTES					
SCALE N/A	DRAWN BY JWM	DATE 12/22/21	SHEET OF	^{REV.}	
JOB NO. 4043	CHECKED BY WBS	DATE 12/22/21	drawing number 4043-G1	-	



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NEW SITE PLAN					
SCALE NOTED	DRAWN BY JWM	DATE 12/01/21	SHEET OF	REV.	
JOB NO. 4043	CHECKED BY WBS	DATE 12/01/21	drawing number 4043-C2	_	



McDUFFIE TERMINAL ASPA

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В	REVISED PER ADDENDUM 1	09/02/22	RCC	GDEC	A Full Service Engineering Firm
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REV.	DESCRIPTION	DATE	BY	CHK'D	PERFORMANCE • RELIABILITY • EXPERIENCE

15 Infash Ku., LaGrange, GA 50241					
30 Cranston Dr. Ste 102, Arlington, TN 38002					
Alabama (251) 433-1611					
orgia (706) 302-2831 Tennessee (901) 290-5444					



DATE

BY

CHK'D

DESCRIPTION

REV.

457 St. Michael St., Mobile, AL 36602 13 Thrash Rd., LaGrange, GA 30241 0 Cranston Dr. Ste 102 Arlington, TN 38002	PROJECT McDUFFIE WAREHOUSE	
Alabama (251) 433-1611 orgia (706) 302-2831 Tennessee (901) 290-5444	McDUFFIE TERMINAL ASPA	

NOTE:

SEE REFERENCE DRAWINGS "McDUFFIE COAL TERMINAL STORMWATER TRANSFER" SHEET 4 AND SHEET 11 FOR ADDITIONAL EXISTING UTILITY INFORMATION. THESE DRAWINGS ARE FOR INFORMATION ONLY AND THE ACCURACY OF THESE DRAWINGS ARE NOT GUARANTEED. THE CONTRACTOR IS SOLELY RESPONSIBLE TO VERIFY THE LOCATION OF ALL UTILITIES BEFORE BEGINNING WORK.

ENLARGED AREA PLAN				
SCALE NOTED	DRAWN BY JWM	DATE 12/01/21	SHEET OF	REV.
JOB NO. 4043	CHECKED BY WBS	DATE 12/01/21	drawing number 4043-C3	



457 St. Michael St., Mobile, AL 36602 13 Thrash Rd., LaGrange, GA 30241 0 Cranston Dr. Ste 102, Arlington, TN 38002	PROJECT McDUFFIE WAREHOUSE	
Alabama (251) 433-1611	McDUFFIE TERMINAL	
orgia (706) 502-2651 Tennessee (901) 290-5444	AJFA	



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	GATE DETAILS					
SCALE NOTED	DRAWN BY JWM	DATE 12/01/21	SHEET OF 22x34 B			
JOB NO. 4043	CHECKED BY WBS	DATE 12/01/21	drawing number 4043-C4A			



				CONFIDENTIAL,	VALUABLE, AND PROPRIETARY INFOR	RMATION
457 St. Michael St., Mobile, AL 36602	PROJECT McDUFFIE	TITLE	CHAIN	LINK FENCE	DETAILS	
13 Thrash Rd., LaGrange, GA 30241	WARFHOUSE					
0 Cranston Dr. Ste 102, Arlington, TN 38002		SCALE NTS	DRAWN BY	DATE 07/13/22	SHEET	REV.
Alabama (251) 433-1611	McDUFFIE TERMINAL	JOB NO.	CHECKED BY	DATE	OF DRAWING NUMBER	D
orgia (706) 302-2831 Tennessee (901) 290-5444	ASPA	4043	WBS	07/13/22	4043–C4	В

	TABLE I	I	
WIDTHS	gate post fo	DOTING SIZE	GATE FRAME SIZE
VIDE	1'-0" DIA. x	3'-0" DEEP	1.900" O.D., 2.28 LBS/FT

 TABLE II	
END, CORNER OR INTERMEDIATE POST FOOTING SIZE	LINE POSTS FOOTING SIZE
1'-0" DIA. x 3'-6" DEEP	10" DIA. x 3'-6" DEEP



DESCRIPTION

REV.

Tennessee (901) 290-5444

ASPA

EROSION AND SEDIMENT CONTROL NOTES

- 1. CONTRACTOR WILL PROTECT INLETS AND DRAINS FROM SEDIMENT DEPOSITS WITH STRAW BALES, SECURELY TIED AND ANCHORED TO THE GROUND OR OTHER METHODS AS SHOWN ON THE DRAWINGS. THE EXISTING SITE IS COMPLETELY DEVELOPED, GRADED AND OPERATIONAL.
- 2. THE EXISTING PERMANENT STORM WATER SYSTEM IS IN PLACE, AND WILL BE UTILIZED DURING CONSTRUCTION AND OPERATION OF THE NEW FACILITY.
- 3. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE IN OPERATION PRIOR TO GRADING.
- 4. SEDIMENT DEPOSITION CAUSED BY SHEET FLOW ACROSS PROPERTY LINES SHALL BE PREVENTED BY PLACING AND ANCHORING OF TEMPORARY STRAW BALES/EROSION NETTING. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED AS QUICKLY AS POSSIBLE.
- 5. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED DAILY AND REPAIRED IMMEDIATELY, IF DAMAGED.
- 6. TRENCHES, IF REQUIRED, SHALL BE BACKFILLED WITHIN 7 DAYS OF COMPLETION, TESTING AND ACCEPTANCE OF THE APPROPRIATE LINES.
- 7. THE CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICES TO CONTROL RUN OFF VELOCITIES AND REDUCE EROSION.
- 8. THE OWNER OF PROPERTY WILL BE REQUIRED TO MAINTAIN THE DRAINAGE APPURTENANCES IN WORKING ORDER FOR LIFE OF THE FACILITY.
- 9. ALL PRACTICES AND MATERIALS SHALL CONFORM TO THE ALABAMA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, LATEST EDITION, AND ALABAMA HANDBOOK FOR EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT ON CONSTRUCTION SITES AND URBAN AREAS, LATEST EDITION.



<u>LEGEND</u>



NEW ASPHALT

EXISTING ASPHALT

NEW CRUSHED STONE

SILT FENCE

IIILE	ERO	SION	CONTROL	PLAN	
SCALE NOTED	DRAWN BY JWM	DATE	12/08/21	SHEET OF	^{REV.}
JOB NO. 4043	CHECKED BY WBS	DATE	12/08/21	drawing number 4043-C5	-



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DATE

DESCRIPTION

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McDUFFIE TERMINAL ASPA Fax (251) 433-1411 PERFORMANCE • RELIABILITY • EXPERIENCE

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SCALE NOTED	DRAWN BY RCC	DATE 10/01/21	SHEET OF



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TITLE	EXTERIOR	BUILDING EI	LEVATIONS
SCALE NOTED	DRAWN BY RCC	DATE 10/01/21	SHEET OF B
JOB NO. 4043	CHECKED BY DBK	DATE 10/01/21	drawing number 4043-A3



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McDUFFIE TERMINAL ASPA

B A REV.	REVISED PER ADDENDUM 1 ISSUE FOR BID DESCRIPTION	09/02/22 08/10/22 DATE	RCC JWM BY	GDEC DBK CHK'D	457 St. Michael St. Mobile, AL 36602 Phone (251) 433-1611 Fax (251) 433-1411	Cowles, Murphy, Glover & ASSOCIATES A Full Service Engineering Firm PERFORMANCE • RELIABILITY • EXPERIENCE
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IIILE	EXTERIOR	BUILDING EL	EVATIONS
scale NOTED	DRAWN BY RCC	DATE 10/01/21	SHEET OF B
JOB NO. 4043	CHECKED BY DBK	DATE 10/01/21	drawing number 4043-A4

	FIRST	FLC)()	2	RO	OM	1 F		SH S	SCHEDULE
ROOM		DOR 1	ы Ц		W	ALL	· ·	CEII	LING	REMARKS
		FLO	BA	N	S	E	W	MAT'L	HEIGHT	
100	PROCESSING ROOM		VB	7	7	6	2		9' 0'	•
101	OFFICE 4		VB	1	1	1	2		9' 9'	• •
103	OFFICE 3	CON	VB	1	1	1	2	LI	9'	•
104	OFFICE 2	CON	VB	1	1	1	2	LI	9'	•
105	OFFICE 1	CON	VB	1	2	1	2	LI	9'	•
106	OFFICE BREAKROOM	CON	VB	1	2	3	1		9'	
107	MEN WOMEN		CB	4	8	9	5	S-GYP	9' o'	
109	JANITOR CLOSET	CON	VB	1	1	3	1		9'	
110	I.T.	CON	VB	1	1	1	1	LI	9'	•
111	CONFERENCE ROOM	CON	VB	1	1	6	1	LI	9'	•
112	HALLWAY	CON	VB	1	1	1	1	LI	9'	•
			RO	01	/ 	FIN (E)	IS (I	H S NOTE	CHE ES	DULE
WALLS	<u>:</u>									
17	%" METAL STUD WALL FRAMING	WITH	5⁄4"	PAI	NTED	GYPS	SUM	WITH 3	5" B∆T	INSULATION
י ר <u>י</u>	54" METAL STUD WALL FRANK		∽u 5∕"				21114	WITU C		
z. 3 -	WEINE STUD WALL FRAMING	WIIF	/8	T Alf	11 E U	0173	MU			
3. 6	" METAL STUD WALL FRAMING	WITH	%"P	'AINT	ED G	SYPSU	M W	ITH 6"	BATT	ISULATION
4. 3 A	$\%$ " METAL STUD WALL FRAMING ND $\cancel{4}$ " FRP FULL HEIGHT.	WITH	%"	MOI	STUR	E RE	SISTA	NT PAII	NTED G	YPSUM WITH 3½" BATT INSULATION
5. 6 ½	" METAL STUD WALL FRAMING " " FRP FULL HEIGHT.	WITH 5	%" №	IOIST	URE	RESI	STAN	T PAINT	ED GYF	SUM WITH 6" BATT INSULATION AN
6. 2 T	HOUR FIRE WALL DETAIL WITH YPE X GYP. 5⁄." METAL STUD WALL EDAMING	SPRA	Y FO 5∕"				N, S	EE DETA	AIL "J"	ON DWG. 4043–S5, WITH (2) $\%$
7. 3 8. 3 F	% METAL STUD WALL FRAMING %" METAL STUD WALL FRAMING RP FULL HEIGHT.	WITH	78 5⁄8"	MOI	STUR	E RE	SISTA	NT GYP	. WITH	SPRAY FOAM INSULATION AND $\frac{1}{4}$ "
9. 2 T	HOUR FIRE WALL DETAIL WITH YPE X GYPSUM AND ½" FRP FU	SPRA JLL HI	Y FO EIGHT	AM	INSU	LATIO	N, S	EE DETA	AL "J"	ON DWG 4043-S5, WITH (2) %"
FLOOF	ING:									
	SEALED EVENSED CONCEL	TF (0	יט וט	ο το	ρr	DETE	B MIN	FD D V 4	JMNLDJ	
	FROM CONTER TRADE	((10	DC	ULIE	NIVITIN	יוס טו	J TTINER)	
LLL	LPUXY CUAIED FLOORING									
СТ	CERAMIC TILE									
CAR	COMMERCIAL CARPET									
	VINYL COMPOSITION TILE									
VCT	HOLLOW STEEL FLOOP PA	NELS	OVEI LS, (R CO DR A	NCRE PPRC	ETE F VED	LOOI EQU	R (PRO AL) FINI	ACCESS SH TO	FLOORS, INCLUDE 2 PERFORATED BE DETERMINED BY OWNERS.
VCT HSF	AIR FLOW PANELS, 1250									
VCT HSF <u>CEILIN</u>	AIR FLOW PANELS, 1250									
VCT HSF <u>CEILIN</u> E	AIR FLOW PANELS, 1250 <u>G:</u> EXPOSED CEILING									
VCT HSF <u>CEILIN</u> E LI	AIR FLOW PANELS, 1250 <u>G:</u> EXPOSED CEILING ARMSTRONG-TILE #1.728 6¼" BATT INSULATION.	FINE	FISS	SURE	D 2':	x2'x5⁄{	3" M	INERAL	BOARD	– WITH WITH SQUARE EDGE DETAIL
VCT HSF <u>CEILIN</u> E LI S-GY	AIR FLOW PANELS, 1250 <u>G:</u> EXPOSED CEILING ARMSTRONG-TILE #1.728. 6¼" BATT INSULATION. 5%" GYPSUM, SUSPENDED	FINE	FISS	SURE	D 2': TEED	x2'x¾ SYS ⁻	3" М ГЕМ	INERAL OR APP	BOARD ROVED	– WITH WITH SQUARE EDGE DETAIL EQUAL.
VCT HSF <u>CEILIN</u> E LI S-GY <u>BASE:</u>	AIR FLOW PANELS, 1250 <u>G:</u> EXPOSED CEILING ARMSTRONG-TILE #1.728 6¼" BATT INSULATION. 5%" GYPSUM, SUSPENDED	FINE	FISS	SURE	D 2': TEED	x2'x5⁄{ SYS ⁻	3" M Fem	INERAL OR APP	BOARD ROVED	– WITH WITH SQUARE EDGE DETAIL EQUAL.
VCT HSF <u>CEILIN</u> E LI S-GYI <u>BASE:</u> PVC	AIR FLOW PANELS, 1250 G: EXPOSED CEILING ARMSTRONG-TILE #1.728 6¼" BATT INSULATION. 5%" GYPSUM, SUSPENDED 1x4 PAINTED PVC BASE	FINE	FISS	SURE	D 2': TEED	x2'x5⁄{ SYS ⁻	3" M	INERAL OR APP	BOARD ROVED	– WITH WITH SQUARE EDGE DETAIL
VCT HSF <u>CEILIN</u> E LI S-GY <u>BASE:</u> PVC CB	AIR FLOW PANELS, 1250 G: EXPOSED CEILING ARMSTRONG-TILE #1.728 6¼" BATT INSULATION. 5%" GYPSUM, SUSPENDED 1×4 PAINTED PVC BASE 6" HIGH CEREMIC BASE	FINE	FISS	SURE	D 2': TEED	x2'x¾	з" М ГЕМ	INERAL OR APP	BOARD ROVED	– WITH WITH SQUARE EDGE DETAII

В	REVISED PER ADDENDUM 1	09/02/22	RCC	GDEC
Α	ISSUE FOR BID	08/10/22	JWM	DBK
REV.	DESCRIPTION	DATE	BY	CHK'D

457 St. Michael St. Mobile, AL 36602 none (251) 433-1611 Fax (251) 433-1411



		SECOND	Fl	_0(<u>DR</u>	R	00	M	FIN	<u>ISH</u>	SCHEDULE
_	ROOM		LOOR	ASE		 		w	CEII		REMARKS
Γ	200	DRAWING/PRINT ROOM			2	1	2	1		10'	
╞	200	OFFICE 3	CON	VB	1	1	1	1		10'	·
	202	OFFICE 1	CON	VB	2	1	1	2	LI	10'	•
	203	OFFICE 3	CON	VB	1	1	1	2	LI	10'	
	204	OPEN OFFICE	CON	VB	1	1	2	2	LI	10'	•
	205	COPY/MAIL ROOM	CON	VB	1	1	1	2	LI	10'	•
	206	LOBBY	CON	VB	1	1	1	2	LI	10'	
Ļ	207	OFFICE 4	CON	VB	1	1	1	2	LI	10'	
╞	208	OFFICE 5		VB	1	1	1	2		10'	·
\uparrow	209				1	1	1	2		10	•
Y	211	OFFICE BREAKROOM		VB	1	2	3	1		10'	
	212	MEN	CON	СВ	4	8	9	5	S-GYP	10'	TOILET PARTITIONS
	213	WOMEN	CON	СВ	4	4	9	5	S-GYP	10'	TOILET PARTITIONS
	214	JANITOR	CON	VB	1	1	1	1	LI	10'	
	215	FILE ROOM	CON	VB	1	1	2	1	LI	10'	······
	216	IT ROOM	HSF	VB	1	1	2	1	LI	10'	A RAISED FLOOR W/ HOLLOW METAL FLOOR
-	217	OFFICE 9	CON	VB	1	1	1	1		10'	
F	218	OFFICE 10	CON	VB	1	1	2	1		10'	
F	219	OFFICE 8	CON	VB	1	1	1	1	L	10'	.
	220	TRAINING/CONFERENCE ROOM	CON	VB	1	2	1	1	LI	10'	
	1. T	<u>5.</u> TOILET PARTITIONS TO BE FLOOR	MOU	nted RO) ove	rhe. TIN	ad b ISI	raced, H S	^{powde}	r coated steel. DULE
						k	(E)			ES	
	WALLS	<u>S:</u>				-					
	1 7	254" METAL STUD WALL FRAMING	WITH	∣ 5⁄ <u>,</u> "	DAIN		CYP		WITH 3	4" ΒΛΤΙ	
	1	J/8 METAL STOD WALL FRAMINO	*****	/8			011.		WIIII <i>3</i> /		- INSOLATION
	2. 3	3%/" METAL STUD WALL FRAMING	WITH	%"	PAIN	ITED	GYPS	SUM	WITH S	PRAY FO	DAM INSULATION
	3. 6	5" METAL STUD WALL FRAMING	WITH	∛8" P	AINT	ED G	YPSL	M W	ITH 6"	BATT IN	NSULATION
	4. 3 }	35⁄8" METAL STUD WALL FRAMING ¼" FRP FULL HEIGHT	4. $3\frac{5}{8}$ " METAL STUD WALL FRAMING WITH $\frac{5}{8}$ " MOISTURE RESISTANT PAINTED GYPSUM WITH $3\frac{1}{2}$ " BATT INSULATION AND $\frac{1}{4}$ " FRP FULL HEIGHT								
	5. 6 F	6" METAL STUD WALL FRAMING V FRP FULL HEIGHT.	WITH S	∛8" №	IOIST	URE	RESI	STAN	T PAINT	ED GYP	PSUM WITH 6" BATT INSULATION AND $\frac{1}{4}$ "
	5. 6 F 6. 2	6" METAL STUD WALL FRAMING V FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM	WITH 5	∛8" № .Y FC	ioist Dam I	URE INSUL	RESI ATIO	STAN N, S	T PAINT EE DETA	ED GYP	PSUM WITH 6" BATT INSULATION AND $\frac{1}{4}$ " N DWG. 4043–S5, (2) $\frac{5}{8}$ " TYPE X
	5. 6 F 6. 2 7. 3	5" METAL STUD WALL FRAMING V FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 35%" METAL STUD WALL FRAMING	WITH SPRA	∛8" M Y FC 5⁄8"	IOIST DAM I PAIN	URE INSUL ITED	RESI ATIO	STAN N, S ACT F	T PAINT EE DETA RESISTAN	ED GYP AIL J OI NT GYPS	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) %" TYPE X SUM WITH BATT INSULATION.
	5. 6 F 6. 2 C 7. 3 8. 3 F	5" METAL STUD WALL FRAMING V FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 35%" METAL STUD WALL FRAMING FULL HEIGHT.	WITH SPRA SPRA WITH WITH	∛8" M .Y FC 5⁄8" 5⁄8"	OIST DAM 1 PAIN MOIS	URE INSUL ITED STURI	RESI ATIO IMPA E RE	STAN N, S ACT F SISTA	T PAINT EE DETA RESISTAN	ED GYP AIL J OI AT GYPS 7. WITH	PSUM WITH 6" BATT INSULATION AND $\frac{1}{4}$ " N DWG. 4043–S5, (2) $\frac{5}{8}$ " TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND $\frac{1}{4}$ " FRP
	5. 6 F 6. 2 C 7. 3 8. 3 F 9. 2 C FLOOF	5" METAL STUD WALL FRAMING V FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 35%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG <u>RING:</u>	WITH SPRA WITH WITH SPRA HT.	⁷ 8" M ∖Y FC ∣ ⁵ ⁄8" ∣ ⁵ ⁄8" ∖Y FC	PAIN PAIN MOIS	URE INSUL ITED STURI	RESI ATIO IMPA E RE ATIO	STAN N, S ACT F SISTA N, S	T PAINT EE DETA RESISTAN NT GYP EE DETA	ED GYP AIL J OI AT GYPS . WITH AIL "J"	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) %" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) %" TYPE X
	5. 6 F 6. 2 C 7. 3 8. 3 F 9. 2 C FLOOF	5" METAL STUD WALL FRAMING V FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 3%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG <u>RING:</u>	WITH SPRA WITH WITH SPRA HT.	 № FC № FC № 5%" № FC № FC 	PAIN PAIN MOIS		RESI ATIO IMPA E RE ATIO	STAN N, S ACT F SISTA N, S	T PAINT EE DETA RESISTAN NT GYP EE DETA	ED GYP AIL J OI AT GYPS . WITH AIL "J"	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) 5%" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) 5%" TYPE X
	5. 6 F 6. 2 7. 3 8. 3 F 9. 2 C F LOOF CON	5" METAL STUD WALL FRAMING V FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 35%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ½" FRP FULL HEIG RING: SEALED EXPOSED CONCRE	WITH SPRA WITH WITH SPRA HT.	% N Y FC 5% N 5% N 1 5% N<	AOIST PAIN MOIS PAM I	URE INSUL ITED STURI INSUL BE	RESI ATIO IMPA E RE ATIO DETE	STAN N, S ACT F SISTA N, S RMIN	T PAINT EE DETA RESISTAN NT GYP EE DETA	ED GYP AIL J OI AT GYPS . WITH AIL "J" OWNER)	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) 5%" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) 5%" TYPE X
	5. 6 F 6. 2 C 7. 3 8. 3 F 9. 2 C F LOOF CON EPY	5" METAL STUD WALL FRAMING V FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 35%" METAL STUD WALL FRAMING 5%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG RING: SEALED EXPOSED CONCRE EPOXY COATED FLOORING	WITH SPRA WITH WITH SPRA HT.	[™] ™ Y FC I [™] N FC COLOF	AM I PAIN MOIS	URE INSUL ITED STURI INSUL	RESI ATIO IMPA E RE ATIO DETE	STAN N, S ACT F SISTA N, S RMIN	T PAINT EE DETA RESISTAN NT GYP EE DETA	ED GYP AIL J OI NT GYPS WITH AIL "J" OWNER)	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) 5%" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) 5%" TYPE X
	5. 6 F 6. 2 C 7. 3 8. 3 F 9. 2 C C CON EPY CT	5" METAL STUD WALL FRAMING V FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 35%" METAL STUD WALL FRAMING 5%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG RING: SEALED EXPOSED CONCRE EPOXY COATED FLOORING CERAMIC TILE	WITH SPRA WITH WITH SPRA HT.	[™] ™ Y FC [™] [™] X FC	AM I PAIN MOIS	URE INSUL ITED STURI INSUL	RESI ATIO IMPA E RE ATIO DETE	STAN N, S ACT F SISTA N, S	T PAINT EE DETA RESISTAN NT GYP EE DETA	ED GYP AIL J OI NT GYPS WITH AIL "J"	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) 5%" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) 5%" TYPE X
	5. 6 F 6. 2 C 7. 3 8. 3 F 9. 2 C C CON EPY CT CAR	5" METAL STUD WALL FRAMING V FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 35%" METAL STUD WALL FRAMING 5%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG <u>RING:</u> SEALED EXPOSED CONCRE EPOXY COATED FLOORING CERAMIC TILE COMMERCIAL CARPET	WITH SPRA WITH WITH SPRA HT.	[™] ™ Y FC [™] [™] X FC	AM I PAIN MOIS	URE INSUL ITED STURI INSUL	RESI ATIO IMPA E RE ATIO DETE	STAN N, S ACT F SISTA N, S	T PAINT EE DETA RESISTAN NT GYP EE DETA	ED GYP AIL J OI AT GYPS . WITH AIL "J" OWNER)	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043-S5, (2) %" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043-S5, WITH (2) %" TYPE X
	5. 6 F 6. 2 C 7. 3 8. 3 F 9. 2 C C CON EPY CT CAR	5" METAL STUD WALL FRAMING V FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 35%" METAL STUD WALL FRAMING 5%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG <u>RING:</u> SEALED EXPOSED CONCRE EPOXY COATED FLOORING CERAMIC TILE COMMERCIAL CARPET VINYL COMPOSITION THE	WITH SPRA WITH WITH SPRA HT.	[™] ™ Y FC [™] [™] X FC	AM I PAIN MOIS	URE INSUL ITED STURI INSUL	RESI ATIO IMPA E RE ATIO DETE	STAN N, S ACT F SISTA N, S	T PAINT EE DETA RESISTAN NNT GYP EE DETA	ED GYP AIL J OI AT GYPS AIL "J"	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043-S5, (2) 5%" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043-S5, WITH (2) 5%" TYPE X
	5. 6 F 6. 2 7. 3 8. 3 F 9. 2 C CON EPY CT CAR VCT	5" METAL STUD WALL FRAMING V FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 35%" METAL STUD WALL FRAMING 5%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG <u>RING:</u> SEALED EXPOSED CONCRE EPOXY COATED FLOORING CERAMIC TILE COMMERCIAL CARPET VINYL COMPOSITION TILE	WITH SPRA WITH WITH SPRA HT.	 № FC № FC № FC № FC № FC № FC 		URE INSUL ITED STURI INSUL	RESI ATIO IMPA E RE ATIO DETE	STAN N, S ACT F SISTA N, S	T PAINT EE DETA RESISTAN NT GYP EE DETA	ED GYP	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) 5%" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) 5%" TYPE X
	5. 6 F 6. 2 7. 3 8. 3 F 9. 2 C FLOOF CON EPY CT CAR VCT HSF CEILIN	5" METAL STUD WALL FRAMING V FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 3%" METAL STUD WALL FRAMING 5%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG <u>RING:</u> SEALED EXPOSED CONCRE EPOXY COATED FLOORING CERAMIC TILE COMMERCIAL CARPET VINYL COMPOSITION TILE HOLLOW STEEL FLOOR PA AIR FLOW PANELS, 1250 NG:	WITH SPRA WITH WITH SPRA HT. CTE (C NELS PANE	 № N № FC № %" № FC <li< td=""><td>AM I PAIN MOIS DAM I R TO R TO</td><td>URE INSUL ITED STURI NSUL BE</td><td>RESI ATIO IMPA E RE ATIO DETE</td><td>STAN N, S ACT F SISTA N, S RMIN</td><td>T PAINT EE DETA RESISTAN NNT GYP EE DETA ED BY (R (PRO AL) FINI</td><td>ED GYP AIL J OI AT GYPS AIL "J" AIL "J" OWNER) ACCESS SH TO</td><td>SUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) %" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) %" TYPE X</td></li<>	AM I PAIN MOIS DAM I R TO R TO	URE INSUL ITED STURI NSUL BE	RESI ATIO IMPA E RE ATIO DETE	STAN N, S ACT F SISTA N, S RMIN	T PAINT EE DETA RESISTAN NNT GYP EE DETA ED BY (R (PRO AL) FINI	ED GYP AIL J OI AT GYPS AIL "J" AIL "J" OWNER) ACCESS SH TO	SUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) %" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) %" TYPE X
	5. 6 F 6. 2 7. 3 8. 3 F 9. 2 C FLOOF CON EPY CT CAR VCT HSF CEILIN F	5" METAL STUD WALL FRAMING Y FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 3%" METAL STUD WALL FRAMING 5%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG RING: SEALED EXPOSED CONCRE EPOXY COATED FLOORING CERAMIC TILE COMMERCIAL CARPET VINYL COMPOSITION TILE HOLLOW STEEL FLOOR PA AIR FLOW PANELS, 1250 NG:	WITH SPRA WITH WITH SPRA HT. CTE (C NELS PANE	 № N № FC № %" № FC <li< td=""><td>AM I PAIN MOIS DAM I R TO R TO</td><td>URE INSUL ITED STURI NSUL BE</td><td>RESI ATIO IMPA E RE ATIO DETE</td><td>STAN N, S ACT F SISTA N, S RMIN</td><td>T PAINT EE DETA RESISTAN NNT GYP EE DETA ED BY (R (PRO AL) FINI</td><td>ED GYP AIL J OI AT GYPS AIL "J" AIL "J" OWNER) ACCESS SH TO</td><td>SUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) 5%" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) 5%" TYPE X</td></li<>	AM I PAIN MOIS DAM I R TO R TO	URE INSUL ITED STURI NSUL BE	RESI ATIO IMPA E RE ATIO DETE	STAN N, S ACT F SISTA N, S RMIN	T PAINT EE DETA RESISTAN NNT GYP EE DETA ED BY (R (PRO AL) FINI	ED GYP AIL J OI AT GYPS AIL "J" AIL "J" OWNER) ACCESS SH TO	SUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) 5%" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) 5%" TYPE X
	5. 6 F 6. 2 7. 3 8. 3 F 9. 2 C CON EPY CT CAR VCT HSF CEILIN E LI	5" METAL STUD WALL FRAMING Y FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 35%" METAL STUD WALL FRAMING 5%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG RING: SEALED EXPOSED CONCRE EPOXY COATED FLOORING CERAMIC TILE COMMERCIAL CARPET VINYL COMPOSITION TILE HOLLOW STEEL FLOOR PA AIR FLOW PANELS, 1250 NG: EXPOSED CEILING ARMSTRONG-TILE #1.728. 6¼" RATT INSULATION	WITH SPRA WITH WITH SPRA HT. CTE (C NELS PANE FINE	 № N № FC № FC № N № FC № FISS 	AM I PAIN MOIS PAM I R TO R TO R CO DR A	URE INSUL ITED STURI INSUL BE NCRE PPRO	RESI ATIO IMPA E RE ATIO DETE TE F VED	STAN N, S ACT F SISTA N, S RMIN	T PAINT EE DETA RESISTAN NNT GYP EE DETA ED BY (R (PRO AL) FINI	ED GYP AIL J OI AT GYPS AIL "J" AIL "J" OWNER) ACCESS SH TO BOARD	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) %" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) %" TYPE X
	5. 6 F 6. 2 7. 3 8. 3 F 9. 2 C CON EPY CT CAR VCT HSF CEILIN E LI S-GY	5" METAL STUD WALL FRAMING Y FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 3%" METAL STUD WALL FRAMING 5%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG RING: SEALED EXPOSED CONCRE EPOXY COATED FLOORING CERAMIC TILE COMMERCIAL CARPET VINYL COMPOSITION TILE HOLLOW STEEL FLOOR PA AIR FLOW PANELS, 1250 NG: EXPOSED CEILING ARMSTRONG-TILE #1.728. 6¼" BATT INSULATION. FP \$%" GYPSUM, SUSPENDED	WITH SPRA WITH WITH SPRA HT. CTE (C NELS PANE FINE WITH	 % N Y FC 1 5% N 1 5% N Y FC COLOF COLOF CVEF LS, C FISS CER 	ADIST AM I PAIN MOIS AM I R TO R TO R TO R TO R AI SUREI	URE INSUL ITED STURI BE NCRE PPRO	RESI ATIO IMPA E RE ATIO DETE TE F VED	STAN N, S ACT F SISTA N, S RMIN EQUA	T PAINT EE DETA RESISTAN ANT GYP EE DETA ED BY (R (PRO AL) FINI INERAL OR APP	ED GYP AIL J OI AT GYPS AIL "J" AIL "J" OWNER) ACCESS SH TO BOARD ROVED	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) ½" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) ½" TYPE X S FLOORS, INCLUDE 2 PERFORATED BE DETERMINED BY OWNERS. - WITH WITH SQUARE EDGE DETAIL WITH EQUAL.
	5. 6 F 6. 2 7. 3 8. 3 F 9. 2 C FLOOF CON EPY CT CAR VCT HSF CEILIN E LI S-GY BASE:	5" METAL STUD WALL FRAMING Y FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 3%" METAL STUD WALL FRAMING 5%" GYPSUM AND ¼" FRP FULL HEIG 6%" GYPSUM SUSPENDED 5%" GYPSUM, SUSPENDED	WITH SPRA WITH WITH SPRA HT. CTE (C NELS PANE FINE WITH	% N Y FC I 5% " I 5% " Y FC COLOF COLOF CVEF LS, C FISS CER	AM I PAIN MOIS DAM I R TO R TO R TO R TO R AI	URE INSUL ITED STURI INSUL BE NCRE PPRO	RESI ATIO IMPA E RE ATIO DETE TE F VED	STAN N, S ACT F SISTA N, S RMIN EQUA	T PAINT EE DETA RESISTAN ANT GYP EE DETA ED BY (R (PRO AL) FINI INERAL OR APP	ED GYP AIL J OI AT GYPS AIL "J" AIL "J" OWNER) ACCESS SH TO BOARD ROVED	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) 5%" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) 5%" TYPE X S FLOORS, INCLUDE 2 PERFORATED BE DETERMINED BY OWNERS. - WITH WITH SQUARE EDGE DETAIL WITH EQUAL.
	5. 6 F 6. 2 7. 3 8. 3 F 9. 2 C FLOOF CON EPY CT CAR VCT HSF CEILIN E LI S-GY BASE: PVC	5" METAL STUD WALL FRAMING Y FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 5%" METAL STUD WALL FRAMING 5%" METAL STUD WALL FRAMING FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG RING: SEALED EXPOSED CONCRE EPOXY COATED FLOORING CERAMIC TILE COMMERCIAL CARPET VINYL COMPOSITION TILE HOLLOW STEEL FLOOR PA AIR FLOW PANELS, 1250 NG: EXPOSED CEILING ARMSTRONG-TILE #1.728. 6¼" BATT INSULATION. F 5%" GYPSUM, SUSPENDED 1×4 PAINTED PVC BASE	WITH SPRA WITH WITH SPRA HT. CTE (C NELS PANE FINE WITH	% N Y FC I 5% " I 5% " Y FC COLOF COLOF COLOF CER	AM I PAIN MOIS DAM I R TO R TO R TO R A SUREI	URE INSUL ITED STURI INSUL BE NCRE PPRO	RESI ATIO IMPA E RE ATIO DETE TE F VED	STAN N, S ACT F SISTA N, S RMIN	T PAINT EE DETA RESISTAN ANT GYP EE DETA ED BY (R (PRO AL) FINI INERAL OR APP	ED GYP AIL J OI AT GYPS AIL "J" AIL "J" OWNER) ACCESS SH TO BOARD ROVED	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) 5%" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) 5%" TYPE X S FLOORS, INCLUDE 2 PERFORATED BE DETERMINED BY OWNERS. - WITH WITH SQUARE EDGE DETAIL WITH EQUAL.
	5. 6 F 6. 2 7. 3 8. 3 F 9. 2 C FLOOF CON EPY CT CAR VCT HSF CEILIN E LI S-GY BASE: PVC CR	5" METAL STUD WALL FRAMING Y FRP FULL HEIGHT. 2 HOUR FIRE WALL DETAIL WITH GYPSUM 5%" METAL STUD WALL FRAMING 5%" FRP FULL HEIG RING: 2 HOUR FIRE WALL DETAIL WITH GYPSUM AND ¼" FRP FULL HEIG RING: 2 EPOXY COATED FLOORING CERAMIC TILE COMMERCIAL CARPET VINYL COMPOSITION TILE HOLLOW STEEL FLOOR PA AIR FLOW PANELS, 1250 NG: EXPOSED CEILING ARMSTRONG-TILE #1.728. 6¼" BATT INSULATION. 5%" GYPSUM, SUSPENDED 1 x4 PAINTED PVC BASE 6" HIGH CEREMIC PASE	WITH SPRA WITH WITH SPRA HT. CTE (C NELS PANE FINE WITH	% N Y FC I 5% " I 5% " Y FC COLOF OVEI LS, (C FISS CER	AM I PAIN MOIS PAIN MOIS PAM I R TO R TO R TO R TO R A SUREI	URE INSUL ITED STURI INSUL BE NCRE PPRO	RESI ATIO IMPA E RE ATIO DETE TE F VED	STAN N, S ACT F SISTA N, S RMIN	T PAINT EE DETA RESISTAN ANT GYP EE DETA ED BY (R (PRO AL) FINI INERAL OR APP	ED GYP AIL J OI AT GYPS AIL "J" AIL "J" OWNER) ACCESS SH TO BOARD ROVED	PSUM WITH 6" BATT INSULATION AND ¼" N DWG. 4043–S5, (2) 5%" TYPE X SUM WITH BATT INSULATION. SPRAY FOAM INSULATION AND ¼" FRP ON DWG 4043–S5, WITH (2) 5%" TYPE X G FLOORS, INCLUDE 2 PERFORATED BE DETERMINED BY OWNERS. - WITH WITH SQUARE EDGE DETAIL WITH EQUAL.

13 Thrash Rd. LaGrange, GA 30241 Phone (706) 302-2831 Fax (251) 433-1411

McDUFFIE WAREHOUSE McDUFFIE TERMINAL ASPA

TITLE	ROO	M FINISH SCH	IEDULE	
SCALE NOTED	DRAWN BY VTH	DATE 04/27/22	SHEET OF	^{rev.}
job no. 4043	CHECKED BY DBK	DATE	drawing number 4043-A7	•



rphy, G lover	13 Thrash Rd.	McDUFFIE	
CIATES	LaGrange, GA 30241	WAREHOUSE	
ABILITY • EXPERIENCE	Fax (251) 433-1411	McDUFFIE TERMINAL ASPA	

	DET	AILS AND SEC	CTIONS
SCALE NOTED	DRAWN BY JWM	DATE 01/20/22	SHEET OF B
JOB NO. 4043-21	CHECKED BY WBS	DATE	drawing number 4043-S3



PERFORMANCE • RELIABILITY • EXPERIENCE

DESCRIPTION

REV.

DATE

BY CHK'D

Fax (251) 433-1411

ASPA

	A	NTENNA POLI	E	
SCALE AS NOTED	drawn by VTH	DATE 06/02/22	SHEET OF	^{rev.}
JOB NO. 4043	CHECKED BY GDEC	DATE	drawing number 4043-S14	



	>	TAG	MANUFACTURER	MODEL	DIA. (FT)	# OF AIRFOILS	WEIGHT (LBS)	SOUND LEVEL (DBA)	MOTOR (HP)	RPM	CONTROL	VOLT/PH	FULL LOAD CURRENT	CIRCUIT SIZE (AMPS)	NOTES
	>	BAF-1	BIG ASS FANS	POWERFOIL 8	16	8	264	<55	2.0	98	STANDARD	200-240V/1	8.7	30	1-7
<u>JEIND</u> MOSTAT IIDISTAT		NOTES: 1. VERIF) 2. FAN(S 3. (8) RI 4. SYSTE 5. FACTO 6. IP56 T 7. FAN S	Y EXTENSION TUBE LI) TO BE INSTALLED T EDUNDANT SAFETY FE M DESIGN AND PERFO RY WARRANTY EQUAL TEFC MOTOR; ONBOAR SHALL BE CAPABLE O	ENGTH AND MOUNT O MEET ALL BAF ATURES INCLUDING DRMANCE ANALYSIS TO 15 YEARS ME D NEMA 4X VFD F CONTINUOUS OPI	TING METHODS FAN CLEARAN G AFRS (AIRFO TO BE DEPE CCHANICAL, 7 ERATION IN 5	WITH MANU CE GUIDELIN DIL RESTRAIN ENDENT ON YEARS ELEC F – 104F A	JFACTURER IES IT SYSTEM) CFD MODELI CTRICAL, 1	PRIOR TO ORDERIN SAFETY FEATURE NG, CONSISTENT YEAR LABOR. SEE	IG – COMPLET WITH METHO THE COMPL	TE REDUN DDS IN AS LETE WAR	DANCY FROM TIP OF AIR SHRAE STANDARD 55, AN RANTY FOR MORE DETAIL	FOIL TO CENTER ID TAKING INTO .S.	OF HUB ACCOUNT MAJ	OR OBSTRUCTIONS	5 TO AIRFLOW AT (
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rphy, G lover CIATES	13 Thrash Rd. LaGrange, GA 30241 Phone (706) 202 2821	McDUFFIE WAREHOUSE	
ABILITY • EXPERIENCE	Fax (251) 433-1411	McDUFFIE TERMINAL ASPA	



CIATES, INC., 2022 CONFIDENTIAL, VALUABLE, AND PROPRIETARY INFORMATION

TITLE	WAREH	OUSE VENTILA	TION PLAN	
SCALE NOTED	DRAWN BY MAD	DATE 12/01/21	SHEET OF	22x34
јов no. 4043-21	CHECKED BY JDG	DATE 12/31/21	DRAWING NUMBER 4043	5-M1

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Proposed New Parts Storage Warehouse McDuffie Coal Terminal

Mobile, AL

Report of Subsurface Investigation and

Geotechnical Engineering Evaluation

Prepared for: COWLES, MURPHY, GLOVER & ASSOCIATES SESI Project No: M21-454 March 18, 2022



MOBILE OFFICE

5460 Rangeline Road Mobile, AL 36619

Tel: (251) 344-7711 Fax: (251) 443-9000 www.soearth.com

March 18, 2022

COWLES, MURPHY, GLOVER & ASSOCIATES, INC.

457 St. Michael Street Mobile, AL 36602

ATTENTION: Mr. Bruce Smith, P.E.

 REFERENCE:
 Report of Subsurface Investigation and Geotechnical Engineering Evaluation

 Proposed Parts Storage Warehouse
 McDuffie Coal Terminal

 Mobile, AL
 SESI Project No: M21-454

Dear Mr. Smith,

Southern Earth Sciences, Inc. (SESI) has completed the authorized scope of subsurface investigation and geotechnical engineering evaluation for the referenced project. This report presents our understanding of the available project information and outlines our soil related recommendations and comments regarding construction and foundation support for the proposed project.

We appreciate this opportunity to be of service and look forward to our continued involvement throughout construction phases of the project. Please do not hesitate to contact us if you have any questions.

Sincerely,

SOUTHERN EARTH SCIENCES, INC.

fichola

Curran Nicholas Project Manager

Matt Coaker, P.E. Vice President Registered, Alabama 30835

MC/CN

Attachments

Report of Subsurface Investigation and Geotechnical Engineering Evaluation Proposed Parts Storage Warehouse - McDuffie Coal Terminal SESI Project No: M21-454 March 18, 2022

1.0	Project Information1 -
2.0	Site Description 1 -
3.0	Field Investigation 1 -
4.0	Generalized Subsurface Conditions 2 -
5.0	Groundwater 2 -
6.0	Foundation Considerations 3 -
6.1	Site Stripping and Subgrade Preparation Recommendations
6.2	Shallow Foundation Design Parameters 4 -
6.3	Shallow Foundation Settlement 4 -
7.0	Building Floor Slab/Pavement Evalaution 5 -
7.1	Recommended Pavement Section 5 -
8.0	Flexible Pavement Design Recommendations 6 -
8.1	Flexible Pavements 6 -
8.2	Medium Duty Asphalt Pavement (Driveways and Truck Parking)
8.3	Pavement Subgrade Preparation 7 -
8.4	Pavement Construction Considerations 8 -
8.5	Moisture Control and Permanent Subsurface Drainage 8 -
9.0	General Comments and Limitations9 -

APPENDIX 1

Test Location Plans

APPENDIX 2

CPT Sounding Logs

APPENDIX 3

Forklift Technical Data Sheet



Report of Subsurface Investigation and Geotechnical Engineering Evaluation Proposed Parts Storage Warehouse - McDuffie Coal Terminal SESI Project No: M21-454 March 18, 2022

1.0 PROJECT INFORMATION

Based on our understanding of the provided information, the proposed project will consist of a new steel frame pre-engineered metal building totaling approximately 50,000 ft² in plan area. The building is planned to be used as a maintenance and parts storage warehouse for McDuffie Coal Terminal operations.

We understand that maximum column loads are expected to be on the order of 75 kips. Floor slab loads are assumed to be less than about 200 psf (transient live load) with negligible sustained dead load. No detailed grading or topographic information was available at the writing of this report. For reporting purposes, we have assumed that finished floor elevation and final surrounding site grades will be within about 18 inches of the existing ground surface and that fill heights above existing grade will be minimal.

2.0 SITE DESCRIPTION

The project site is currently covered with coal and miscellaneous fill with mixed debris. The site appears to have been used for years as a laydown and storage area. Based on our visual observations, the project site appears to be relatively flat with exception to a few slightly depressed areas that were holding water after a recent rain at the time of our field investigation. No detailed topographic information was provided.

3.0 FIELD INVESTIGATION

A total of four (4) Cone Penetrometer Test (CPT) soundings a were performed within the proposed building area. A fifth test location was planned but had to be abandoned due to conflicts with existing materials and equipment stored on the site at the time of our investigation. CPT refusal was initially encountered at the ground surface. All test locations had to be pre-drilled to facilitate CPT penetration through the upper dense miscellaneous coal, fill, and debris. Test locations were estimated selected by SES personnel using the provided site plan and a handheld GPS with an accuracy of ±30 feet. The approximate locations of the soundings are shown on the Test Location Plan in **Appendix 1**.

CPT soundings were performed in general accordance with ASTM Specification D-5778 using a 20-ton Hogentogler Electronic CPT rig. CPT soundings were advanced to refusal at depths ranging approximately 90 to 100 feet below the existing ground surface. Soil classifications were interpreted from methods recommended by Robertson and Campanella. Correlations between Cone Resistance values and Standard Penetration Testing "N" values were performed according to the methods developed by Robertson, Campanella and Wightman. The soil types and stratigraphy shown on the CPT Log sheets are based upon material parameters measured and evaluated as the cone is advanced. CPT Log sheets graphically showing



Report of Subsurface Investigation and Geotechnical Engineering Evaluation Proposed Parts Storage Warehouse - McDuffie Coal Terminal SESI Project No: M21-454 March 18, 2022

the cone tip resistance, friction, equivalent N60-value, and interpreted soil behavior type at each sounding location are attached in **Appendix 2**.

4.0 GENERALIZED SUBSURFACE CONDITIONS

Subsurface descriptions below are generalized to highlight the major subsurface stratigraphy encountered across the site. CPT Sounding log sheets attached in **Appendix 2**, present specific information at individual sounding locations including correlated soil behavior type, equivalent SPT values and ground water level. This information is representative of conditions encountered at the test locations. Variations may occur and should be expected between test locations. The stratification represents the approximate boundary between subsurface materials as the actual transition may be gradual.

CPT refusal was initially encountered at the ground surface due to miscellaneous debris and the compacted nature of the coal and miscellaneous fill due to years of heavy traffic. All CPT locations were pre-drilled to a depth of approximately 4 to 4.5 feet and backfilled with sand prior to advancing the CPT soundings.

Below the predrilled upper dense coal and miscellaneous debris, soils encountered generally consist of medium dense sands and silty sands to approximately 15 to 20 feet, underlain by very loose silty and clayey sands to approximately 40 feet below the existing ground surface. Beneath 40 feet, soils consist of medium dense to very dense sands to termination of the investigation approximately 90 to 100 feet below existing ground surface. Detailed descriptions of soils encountered at each test location are shown on the appropriate CPT Sounding logs included in **Appendix 2**.

5.0 GROUNDWATER

Groundwater was encountered at approximately 11 feet below existing ground surface at test location CPT-3 at the time of our investigation. The remaining CPT sounding holes collapsed with no free water being observed at the cave-in depth at depths generally ranging from approximately 9 to 10 feet below the existing ground surface. A hole collapse often occurs at or slightly above the groundwater or saturated soil level but can also occur due to the presence of loose soils without the presence of groundwater.

Groundwater depths or elevations should be verified at the time of construction for cases where groundwater variations are potentially significant for construction. Fluctuation in the groundwater table will occur due to variances in rainfall, elevation, drainage, types of soil encountered and other factors not evident at the time measurements were made. Reference to depth has been made with respect to the existing ground surface encountered at the time of our field investigation. Groundwater levels



Report of Subsurface Investigation and Geotechnical Engineering Evaluation Proposed Parts Storage Warehouse - McDuffie Coal Terminal SESI Project No: M21-454 March 18, 2022

encountered at each test location at the time of our investigation are shown on the appropriate CPT sounding Logs attached in **Appendix 2.**

6.0 FOUNDATION CONSIDERATIONS

Our evaluation of subsurface conditions and foundation alternatives for this project has been based on the project information previously described in this report and subsurface data obtained during the investigation. In evaluating the CPT sounding and soil boring data, we have used empirical correlations previously established between standard penetration resistances, cone tip and side resistance values, soil index properties and foundation stability. Soil parameters used in the evaluation were derived from the CPT sounding data using the interpretation software RAPID CPT^{*} by Dataforensics.

Soils encountered below the inconsistent near surface coal/soil/debris within the upper 15 to 20 feet of this site consist of medium dense sands that, with limited undercutting/replacement, compaction, and proper foundation design, will be capable of supporting the anticipated structural loadings near existing grade using conventional shallow foundations. Detailed subgrade preparation and shallow foundation design recommendations are outlined in the following sections of this report.

6.1 Site Stripping and Subgrade Preparation Recommendations

The initial step in site preparation should be the complete removal of surface debris, existing foundations, and abandoned utilities extending laterally to at least 5 feet outside the construction area. Excavations should extend a minimum of 2 feet below foundation and floor slab bearing elevation.

Exposed surfaces should be leveled and compacted as much as conditions at the time of construction in the excavation bottoms will allow. Care should be taken to ensure that any debris and soft or excessively yielding soils not improved by compaction are undercut to firmer materials and backfilled with well compacted fill. Deeper isolated excavations may be needed to remove miscellaneous debris. We recommend the excavation and backfilling operation should be observed by an experienced soils technician under the direct supervision of the Geotechnical Engineer of Record. Excavated materials should be wasted and not reused in structural areas.

If groundwater and saturated soil conditions are encountered in any deeper excavations that may be required for removal of abandoned utility infrastructure or isolated unsuitable material, backfill should consist of Clean Sand with less than about 10 percent (by weight) passing the No. 200 mesh sieve and 70 percent or less (by weight) passing the No. 40 mesh sieve. Below and within one foot of the groundwater/saturated soil level, in lieu of measured compaction tests, Clean Sand Fill should be thoroughly compacted with heavy tracked equipment to achieve some compaction and fill voids.



Report of Subsurface Investigation and Geotechnical Engineering Evaluation Proposed Parts Storage Warehouse - McDuffie Coal Terminal SESI Project No: M21-454 March 18, 2022

Above the groundwater and saturated soil level, Clean Sand Fill should be compacted to 98 percent of the Standard Proctor maximum dry density as determined by ASTM D-698 with a moisture content between 1 percentage point below and 3 percentage point above the optimum moisture content.

Select Structural Fill placed to achieve subgrade elevation should consist of a sandy material with less than about 30 percent of the soil particles (by weight) passing the No. 200 mesh sieve, less than 70% passing the No. 40 sieve, and a Liquid Limit less than 15. Fill material should be compacted in 12-inch (maximum) lifts to at least 95 percent of the soil's Modified Proctor maximum dry density as determined by ASTM D 1557. In place density tests should be made at frequent intervals to measure the effectiveness of the compaction operations.

6.2 Shallow Foundation Design Parameters

After completion of the recommended subgrade improvements as outlined in the previous sections, shallow footings bearing between a depth of 12 and 24 inches below surrounding grade may be designed for an allowable soil bearing pressure of up to 2,500 psf. Minimum footing widths of 18 and 24 inches for strip and isolated (column) footings, respectively, should be observed.

The bottom of the foundation excavations must be dry, clean, and free of loose, soft materials and construction debris prior to placement of steel or concrete. Excavations should be observed by a qualified inspector prior to steel or concrete placement. Concrete shall be poured as quickly as possible to avoid exposure of the footing materials to moisture changes (wetting or drying). Surface run-off water should be channeled away from the excavation and not be allowed to pond. If for any reason foundation excavations are required to be open for an extended period or if inclement weather is imminent, excavations shall be protected to minimize moisture loss/gain. The bottom of all footing excavations should be stable, free of water, debris and should be compacted 95 percent of the Modified Proctor maximum dry density as determined by ASTM D1557 with moisture content.

6.3 Shallow Foundation Settlement

Shallow foundation settlement resulting from the maximum anticipated 75-kip column loads is expected to be less than about 1 inch. The settlement estimates discussed above do not consider fill or sustained floor slab load induced settlement. Limiting fill heights to 18 inches above existing grade and sustain distributed floor loads to 200 psf or less will help maintain post construction foundation settlement within the estimated ranges stated above.



Report of Subsurface Investigation and Geotechnical Engineering Evaluation Proposed Parts Storage Warehouse - McDuffie Coal Terminal SESI Project No: M21-454 March 18, 2022

7.0 BUILDING FLOOR SLAB/PAVEMENT EVALAUTION

We understand that the building floor slab will be designed as a Rigid Concrete Pavement to support the anticipated forklift traffic. Our pavement evaluation has been based on the provided project information and subsurface data obtained during our investigation. We have used empirical correlations previously established between Cone Penetration tip and sleeve resistances and pavement performance. Design traffic information provided for use in pavement design for this project is summarized below. We should be notified if actual traffic information differs so that we may determine how these changes affect the design.

- Up to 35 LuiGong 2025 forklifts (or similar) per day
- Assumed design life of 50 years

PCASE "Pavement-Transportation Computer Assisted Structural Engineering", (version 2.0) pavement design software was used in the pavement evaluation for this project. PCASE software was developed by the US Army Corps of Engineers and is used by the Air Force Civil Engineer Center (AFCEC), Naval Facilities Engineering Command (NAVFAC), U.S. Army Corps of Engineers (USACE) and the U.S. Army (IMCOM).

7.1 Recommended Pavement Section

The pavement designs presented in the following sections of this report assume that subgrade soils are thoroughly compacted, and that effective site and subgrade drainage will be established and maintained during construction and throughout the design life of the pavement. Subgrade preparation recommendations are outlined in previous sections of this report. Outlined below is our recommended Rigid Pavement Section for forklift traffic inside the building:

- **7** inches Portland Cement Concrete Paving Minimum 4,000 psi compressive strength and 650 psf flexural strength
- 10 inches Crushed Aggregate Base, Type B, Plant Mixed
- **24** inches Select Structural Fill compacted in 12-inch lifts to 95% ASTM 1557

Note 1: Crushed Aggregate Base should extend at least one (1) foot beyond edge of pavement **Note 2:** Select Structural Fill should extend at least two (2) feet beyond edge of pavement

Proper finishing of concrete pavement requires the use of appropriate construction joints to reduce cracking. Construction joints should be designed in accordance with the current Portland Cement Association and the American Concrete Institute guidelines. Joints should be sealed to reduce the



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potential for water infiltration into the supporting soils. Rigid concrete pavements should be constructed with load transfer mechanisms between panels. Portland Cement Concrete (PCC) mixes should be specified to achieve minimum 28-day compression and flexural strengths of 4,000 psi and 650 psi, respectively.

8.0 FLEXIBLE PAVEMENT DESIGN RECOMMENDATIONS

Subsurface investigation was not performed for pavements on this project. Our evaluation of site paving has been based on subsurface information obtained from the building area, references to empirical correlations previously established between soil index properties and pavement/subgrade stability observed in soil conditions similar to those encountered at the subject site.

Average Daily Traffic (ADT) provided as the basis of design for flexible pavement on this project consists of 5 trucks (HL-93) per day. This daily volume totals approximately 150,000 ESALs over a 30-year Design Life which was used as the basis for the pavement design recommendations included in the following sections. We should be notified if actual traffic information differs so that we may determine how these changes affect the design.

8.1 Flexible Pavements

The 1993 AASHTO Flexible Pavement Structural Design Methods were utilized for structural evaluation of flexible pavements for this project. This method utilizes inputs of the anticipated magnitude and frequency of axle loads, the supporting capability of the subgrade soils and the strengths of the pavement materials to yield a "Structural Number" (SN) which represents the structural strength of the pavement section. Once determined, the structural number is converted to thickness of the various courses of a pavement (surface, base, and sub-base) utilizing coefficients representing the strengths of various component materials.



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8.2 Medium Duty Asphalt Pavement (Driveways and Truck Parking)

The pavement section outlined below is recommended for Heavy Duty Asphalt Paving (Driveway or truck parking areas). Item numbers listed below are as designated by the Alabama Department of Transportation:

- **1.5** inches Bituminous Concrete Wearing Surface Layer
- **2.5** inches Bituminous Concrete Upper Binder Layer
- Bituminous Treatment A
- 6.0 inches Crushed Aggregate Base, Type B, Plant Mixed
- 24 inches Select Structural Fill compacted in 12-inch lifts to 95% ASTM 1557

Note 1: ALDOT Item 301A should extend one (1) foot behind curb or beyond edge of pavement **Note 2:** Select Structural Fill should extend two (2) feet behind curb or beyond edge of pavement

8.3 Pavement Subgrade Preparation

Pavement subgrade preparation should be conducted as previously outlined for the building foundation areas to include complete removal of surface debris, existing foundations, and abandoned utilities extending laterally to at least 5 feet outside the construction area. Excavations should extend a minimum of 2 feet below pavement subgrade elevation.

Exposed surfaces should be leveled and compacted as much as conditions at the time of construction in the excavation bottoms will allow. Care should be taken to ensure that any debris and soft or excessively yielding soils not improved by compaction are undercut to firmer materials and backfilled with well compacted fill. Deeper isolated excavations may be needed to remove miscellaneous debris. We recommend the excavation and backfilling operation should be observed by an experienced soils technician under the direct supervision of the Geotechnical Engineer of Record. Excavated materials should be wasted and not reused in structural areas.

Select Structural Fill placed to achieve subgrade elevation should consist of a sandy material with less than about 30 percent of the soil particles (by weight) passing the No. 200 mesh sieve, less than 70% passing the No. 40 sieve, and a Liquid Limit less than 15. Fill material should be compacted in 12-inch (maximum) lifts to at least 95 percent of the soil's Modified Proctor maximum dry density as determined by ASTM D 1557. In place density tests should be made at frequent intervals to measure the effectiveness of the compaction operations.



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Above the Select Structural Fill, base materials should consist of Crushed Aggregate Base Course, Type B, Plant Mixed as specified by ALDOT. All Crushed Aggregate Base material should be compacted to 100 percent ASTM D1557 Modified Proctor Density prior to paving.

8.4 Pavement Construction Considerations

If construction sequencing will allow the site to be graded to facilitate placement of the crushed aggregate base prior to final paving, we support this approach as damage to the pavement system during construction will be reduced and the aggregate surface will provide a stable working platform during construction. If this approach is selected, prior to final paving we suggest planning for removal and replacement of the upper few inches of aggregate base to remove contaminated aggregate and to ensure a good bond to the bituminous pavement. All pavement areas should be inspected by the engineer or their representative prior to final paving and any deficient areas repaired.

8.5 Moisture Control and Permanent Subsurface Drainage

One of the most destructive elements that a pavement will be subjected to in its design lifetime is the presence of excess moisture. The pavement sections presented in the following sections of this report are based on the assumption that effective site and subgrade drainage will be established and maintained during construction and throughout the design life of the pavement.

Pavements should be adequately sloped, and sufficient drainage provided such that excess water is allowed to run off before it can migrate into the pavement system. Sprinkler systems, if utilized in landscaped areas, should be properly installed and aimed such that they do not continually wet the paved surfaces. The use of clayey soils as backfill in nonstructural landscape islands and areas adjacent to pavements may be considered to help reduce moisture infiltration of rainfall and irrigation water into subgrade soils.

Perched groundwater and collection of rainwater within sandy fill soils during construction is possible and should be taken into consideration during the design and planning phases of this project. Trapped groundwater/collected rainwater will negatively affect the construction and service of pavements on this project.

Although groundwater was not encountered within the upper couple of feet of the site at the time of our investigation, surface runoff and perched water during periods of wet weather could collect in the imported sandy fil. Under drains installed just above the lower permeability insitu soils within imported Select Structural Fill material as deemed necessary during construction would allow perched groundwater/collected rainwater to drain from the prepared subgrade section in into the storm water collection system. Under drains should be installed in other areas of the site at the base



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of sloped areas or anywhere that runoff is expected to accumulate to prevent continual saturation of the base course and subgrade soils.

Under drain materials, including the filter material, shall meet the requirements as outlined in the appropriate sections of the current edition of the ALDOT Standard Specifications for Highway Construction (SSHC). The pipe under-drain should be a 4-to-6-inch diameter perforated PVC pipe meeting the requirements of Section 852 of the ALDOT SSHC. The under-drain pipe should be installed in accordance with Section 606 of the current edition of the ALDOT SSHC.

The geotextile filter/separation fabric shall be non-woven material meeting the requirements of AASHTO M 288 for Class 2 Subsurface Drainage Geotextile and Section 810 of the ALDOT SSHC. The geotextile shall be selected from the ALDOT List II-3 of the "Materials, Sources and Devices with Special Acceptance Requirements".

9.0 GENERAL COMMENTS AND LIMITATIONS

While the CPT soundings are representative of subsurface conditions at their respective locations and for their respective vertical reaches, local variations characteristic of the subsurface materials of the region are anticipated and may be encountered. The delineation between soil types shown on the logs is approximate and the description represents our interpretation of subsurface conditions at the designated test locations and on the date explored.

This report has been prepared to aid in the evaluation of this project and to assist the engineers in the project planning and structural design. At the time of writing, changes were still being considered to foundations, site grading, and other aspects of the project that could have a significant impact on the applicability or relevance of the recommendations provided in this report. SESI should be consulted as the design process continues to ensure that the recommendations provided in this report are still applicable, and that they are being properly interpreted.



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This report is intended for use with regard to the specific project discussed herein as we understand it at this time, and any substantial changes in the project, loads, locations, or assumed grades should be brought to our attention so that we may determine how such changes may affect our conclusions and recommendations. We would appreciate the opportunity to review the plans and specifications for construction to ensure that our conclusions and recommendations are interpreted correctly.

Professional judgments on design alternatives and criteria are presented in this report. These are based partly on our evaluations of technical information gathered, partly on our understanding of the characteristics of the project being planned, and partly on our general experience with subsurface conditions in the area. We do not guarantee performance of the project in any respect, only that our engineering work and judgments rendered meet the standard of care of our profession.

The Geotechnical Engineer of Record should be retained by the Owner in the construction phase of the project so they can observe subsurface conditions revealed during construction, confirm that design assumptions are still applicable or provide revised recommendations based on conditions encountered during construction, and to help ensure that our recommendations are properly interpreted. We recommend that Southern Earth Sciences, Inc. be retained to perform observation and field-testing services during the site preparation and foundation construction.


COWLES, MURPHY, GLOVER & ASSOCIATES, INC.

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APPENDIX 1

Test Location Plans







COWLES, MURPHY, GLOVER & ASSOCIATES, INC.

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APPENDIX 2

CPT Sounding Logs



Operator: Brandon Green Sounding: CPT-1 Cone Used: DDG1601 GPS Data: N30.66012 W88.03484 CPT Date/Time: 8/12/2021 9:31:17 AM Location: MCDUFFIE COAL TERMINAL Job Number: M21-454 Groundwater: Collapsed and dry at 9.1-ft.



*Soil behavior type and SPT based on data from UBC-1983

(ft)

Operator: Danny Hines Sounding: CPT-2 Cone Used: DDG1601 GPS Data: N30.65997 W88.03453 CPT Date/Time: 8/12/2021 1:34:03 PM Location: McDuffie Coal Terminal Job Number: M21-454 Groundwater: Collapsed and dry at 9.2-ft.



Operator: Danny Hines Sounding: CPT-3 Cone Used: DDG1601 GPS Data: N30.65965 W88.03493

CPT Date/Time: 8/12/2021 11:38:23 AM Location: McDuffie Coal Terminal Job Number: M21-454 Groundwater measured at 11.0-ft.



*Soil behavior type and SPT based on data from UBC-1983

(ft)

Operator: Danny Hines Sounding: CPT-5 Cone Used: DDG1601 GPS Data: N30.65912 W88.03465

CPT Date/Time: 8/12/2021 12:37:08 PM Location: McDuffie Coal Terminal Job Number: M21-454 Groundwater: Collapsed and dry at 10.1-ft.



*Soil behavior type and SPT based on data from UBC-1983

(ft)

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APPENDIX 3

Forklift Technical Data Sheet



3-SERIES FORKLIFTS

SPECIFICATIONS

General	Model	1			CLG2020A-SC	CLG2025A-SC
	Power Type	2			Electric	Electric
	Base Capacity	3	@ rated load center	kg (lb)	2000 (4000)	2500 (5000)
	Load Center	4		mm (in)	500 (24)	500 (24)
Weights	Service Weight	5	unloaded	kg (lb)	4250 (9370)	4400 (9700)
	Axle Load	6	loaded/unloaded, front	kg (lb)	5180/1730 (11420/3814)	6010/1700 (13250/3748)
		7	loaded/unloaded, rear	kg (lb)	1150/2520 (2535/2556)	950/2700 (2094/5952)
Tires	Tire Type	8			cushion	cushion
	Wheels	9	front / rear		2/2	2/2
	Wheelbase	10		mm (in)	1295 (51.0)	1295 (51.0)
	Tire Size	11	front		21x7x15	21x7x15
		12	rear		16x5x10.5	16x5x10.5
	Tread Width	13	front/rear		890/920 (35.0/36.2)	890/920 (35.0/36.2)
Mast	Maximum Fork Height	14	with std 2-stage mast	mm (in)	3000 (118.1)	3000 (118.1)
	Freelift	15	with std 2-stage mast	mm (in)	140 (5.5)	140 (5.5)
	Height, Upright Lowered	16	with std 2-stage mast	mm (in)	2130 (83.9)	2130 (83.9)
	Height, Upright Extended	17	with std 2-stage mast	mm (in)	4090 (161.0)	4090 (161.0)
	Mast Tilt, Forward/Back	18	with std 2-stage mast	deg	6°/8°	6°/8°
	Carriage	19	width	mm (in)	920 (36.2)	920 (36.2)
	Fork Spread	20	minimum/maximum	mm (in)	244/904 (9.6/35.6)	244/904 (9.6/35.6)
	Fork Dimension	21	T x W x L	mm (in)	40x122x1070 (1.6x4.8x42)	40x122x1070 (1.6x4.8x42)
Chassis	Length to Fork Face	22	with std 2-stage mast	mm (in)	2118 (83.4)	2118 (83.4)
	Overall Width	23		mm (in)	1080 (42.5)	1080 (42.5)
	Overhead Guard Height	24		mm (in)	2235 (88.0)	2235 (88.0)
	Turning Radius	25	minimum outside	mm (in)	1850 (72.8)	1850 (72.8)
	Fork Overhang	26	with std 2-stage mast	mm (in)	425 (16.7)	425 (16.7)
	Right Angle Stack	27	add load length and clearance	mm (in)	3425 (134.8)	3425 (134.8)
	Gound Clearance	28	minimum loaded	mm (in)	75 (3.0)	75 (3.0)
		29	center of wheelbase	mm (in)	100 (3.9)	100 (3.9)
	Battery Compartment	30	length/width/height	mm (in)	760/975/575 (29.9/38.4/22.1)	760/975/575 (29.9/38.4/22.1)
Performance	Travel Speed	31	loaded/unloaded	km/h (mph)	18.5/18.5 (11.5/11.5)	18.5/18.5 (11.5/11.5)
	Lift Speed	32	loaded/unloaded	m/s (fpm)	0.45/0.64 (88/126)	0.40/0.64 (79/126)
	Lower Speed	33	loaded/unloaded	m/s (fpm)	0.52/0.5 (102/98)	0.52/0.5 (102/98)
	Maximum Drawbar Pull	34	5 min. rating	kg (lb)	1450 (3197)	1450 (3197)
		35	60 min. rating	kg (lb)	/	/
	Maximum Gradeability	36	5 min. rating	%	20	20
Systems	Controllers	37	drive/hydraulic (make, type)		AC	AC
	Motors	38	drive output (60 min. rating)	kw (hp)	14 (19.0)	14 (19.0)
		39	hydraulic output (15 min. rating)	kw (hp)	18 (24.5)	18 (24.5)
	Battery	40	type		Lead Acid	Lead Acid
		41	voltage		36/48	36/48
		42	max. capacity (6 hour rating)	Ah	715	715
		43	weight, minimum/maximum	kg (lb)	1089/1431 (2400/3155)	1089/1431 (2400/3155)







LiuGong Construction Machinery N.A, LLC.

22220 Merchants Way - Suite 100 Katy, TX 77449 USA T: 281-579-8882 F: 281-579-8388 www.liugong.com

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