EXHIBIT F-8

PARENT GUARANTEE

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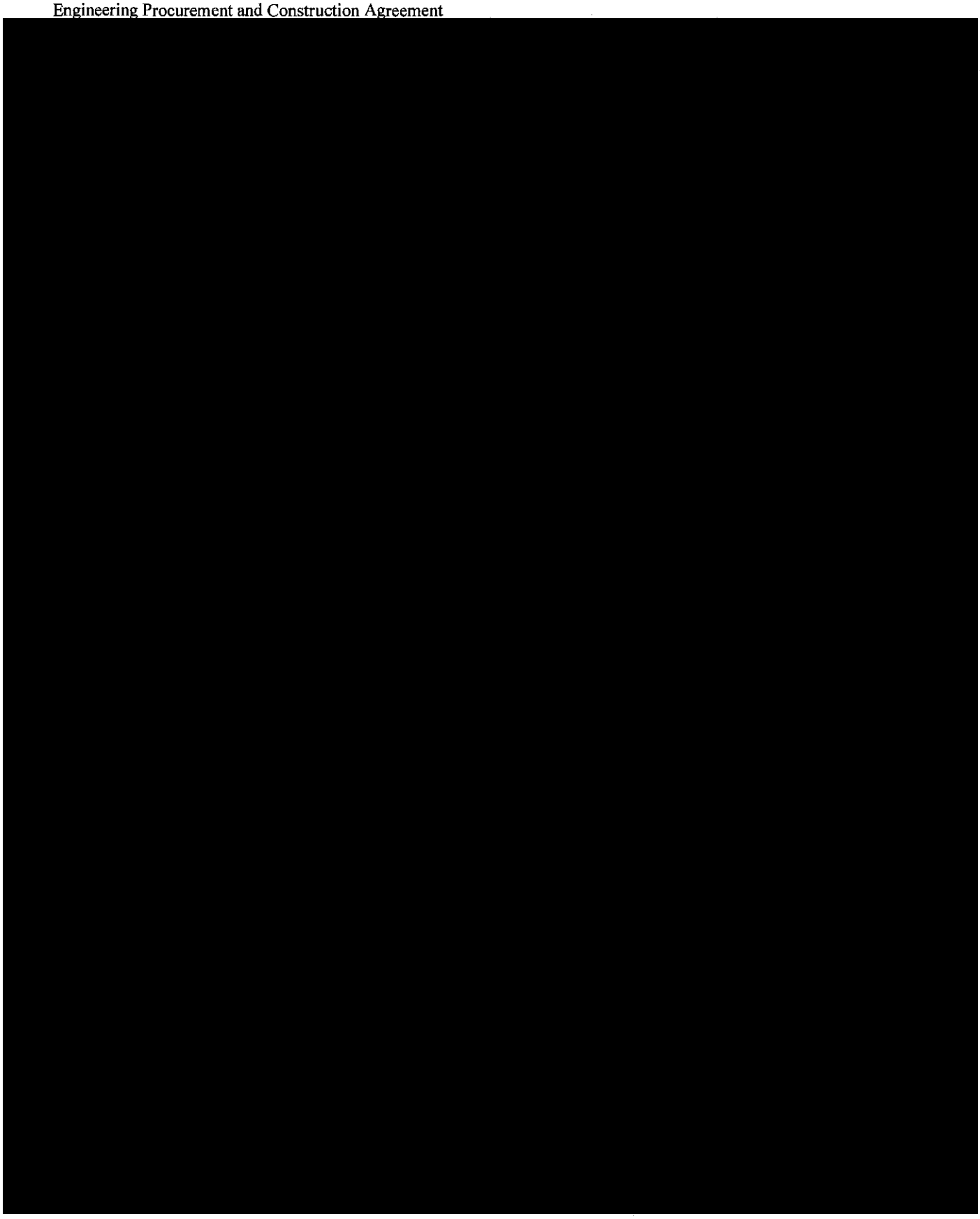

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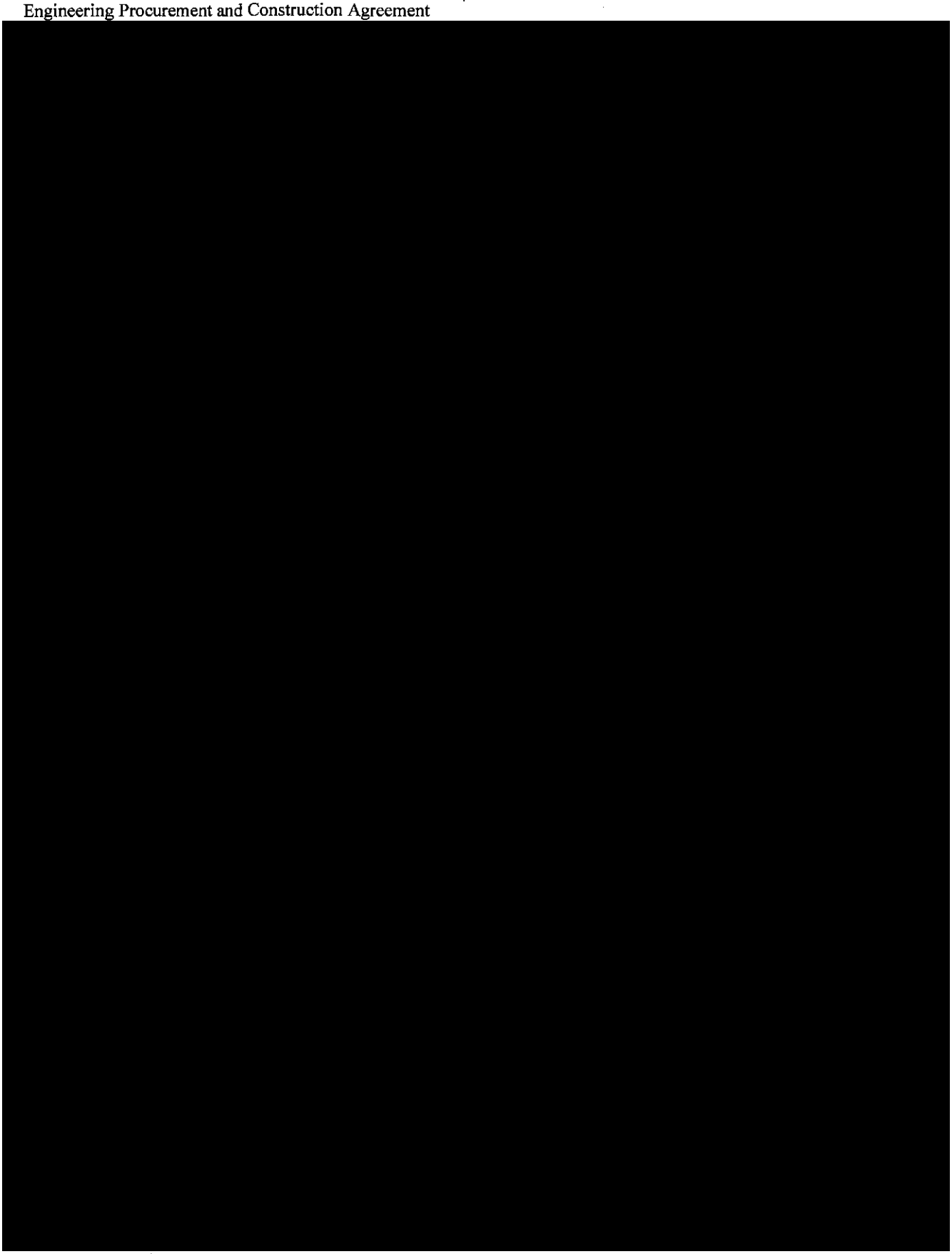

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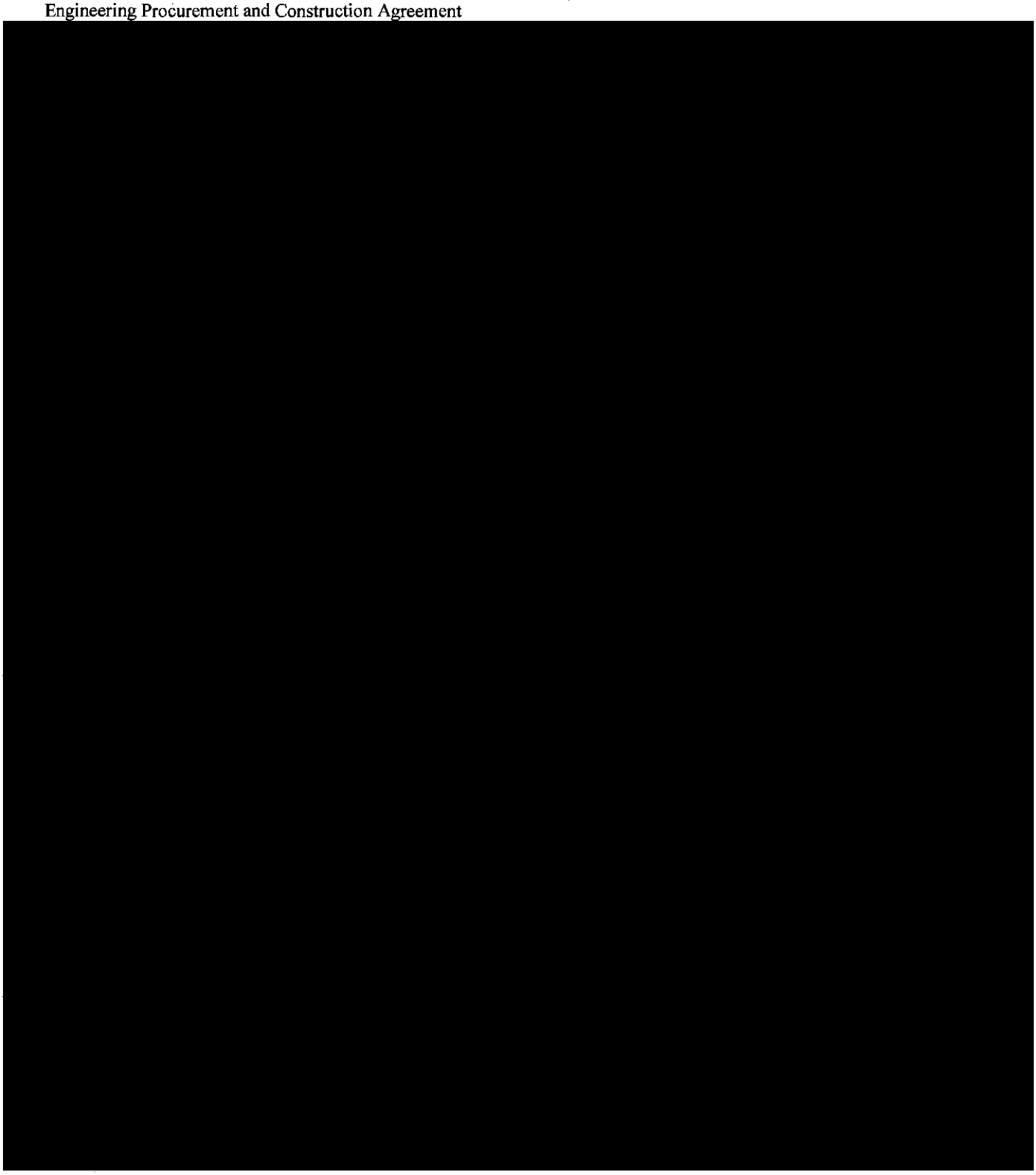

EXHIBIT F-8

PARENT GUARANTEE

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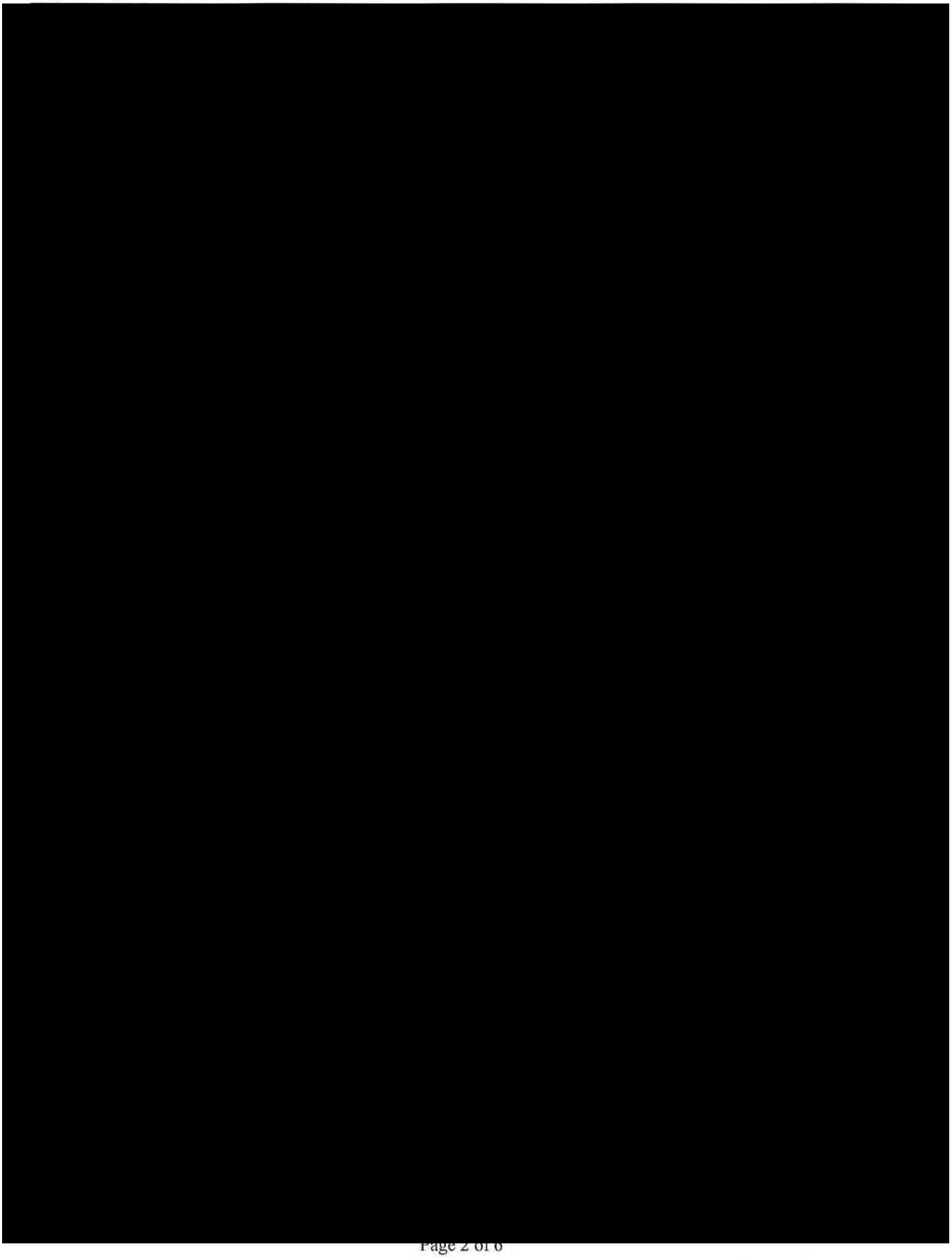

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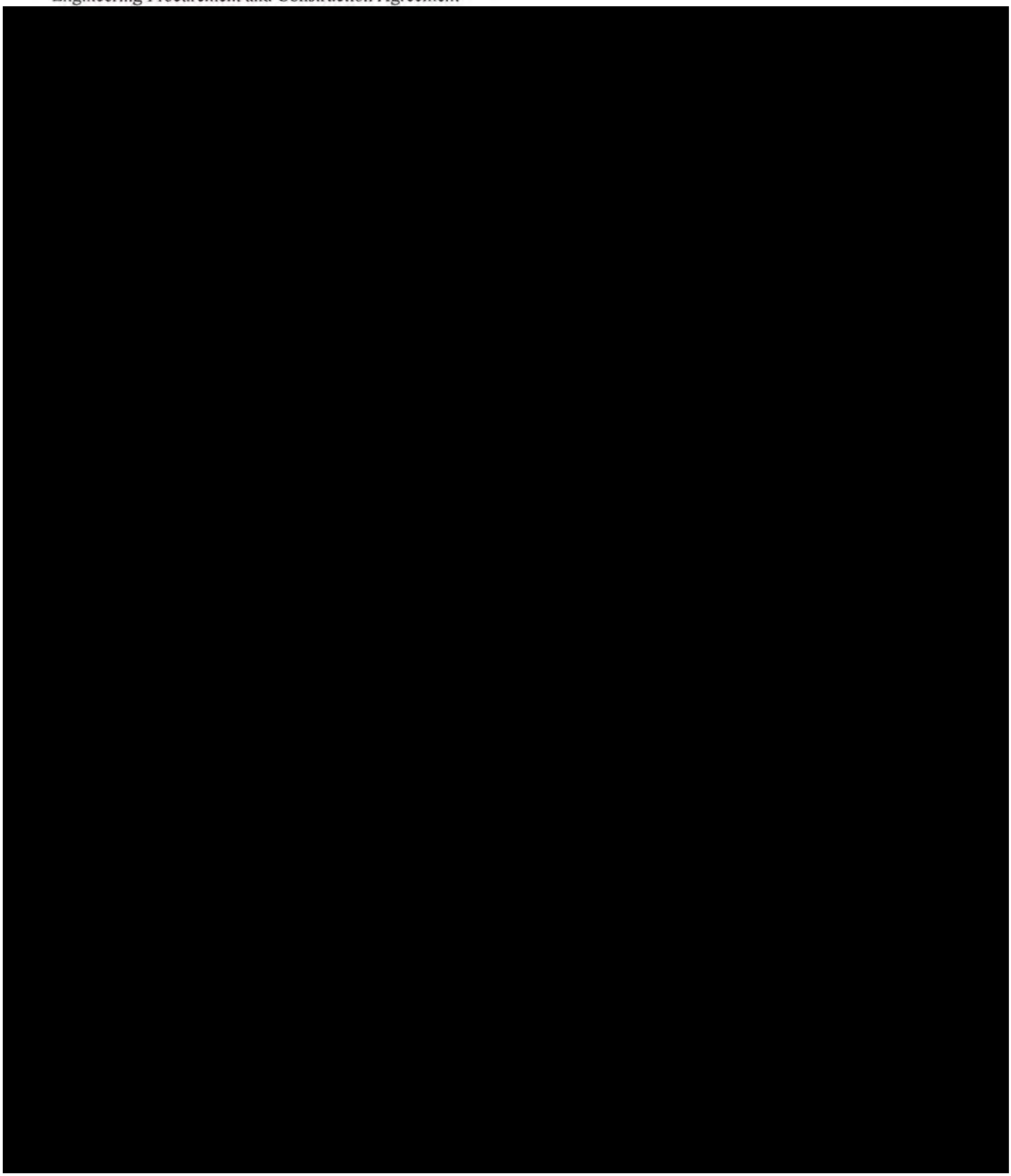

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EXHIBIT F-9
SPECIAL REPORTING REQUIREMENTS

1.0 This **Exhibit F-9** sets forth the reporting that Contractor is required to submit to Owner pursuant to **Sections 25.23 and 25.24** of the Agreement,

2.0 Definitions

2.1 Capitalized terms used but not defined in this **Exhibit F-9** will have the meanings assigned them in the Body of the Agreement.

2.2 **"NUC"** means a non-union contractor (i.e. a business enterprise) with primary operations utilizing non-union labor.

2.3 **"UC"** means a union contractor (i.e. a business enterprise) with primary operations utilizing union labor.

2.4 **"VOB"** means a veteran owned business enterprise Certified as being at least 51% owned by one or more veterans (or in case of any publicly owned business, at least 51% of the stock of which is owned by one or more veterans) whose management and daily business operations are controlled by one or more of such veterans.

3.0 Expenditure Definitions

3.1 Direct expenditures are those equipment, materials and services acquisitions by Contractor or any Subcontractor from MBEs/WBEs/DBEs/VOBs/LCs/UCs/NUCs directly attributable to the Agreement. Direct expenditures shall be reported at 100% of cost.

3.2 Indirect expenditures are those equipment, materials and service acquisitions from MBEs/WBEs/DBEs/VOBs/LCs that cannot be identified or apportioned to any specific customer. For example -- "overhead" items such as paper, computing expenses, or office maintenance incurred by your company. Also included would be any and all equipment, materials and services purchased from MBEs/WBEs/DBEs/VOBs/LCs that are used in the direct production of your product or service. For each MBE, WBE, DBE, VOB, or LCs paid an indirect expenditure during a year, the indirect expenditures shall be proportionately allocated by multiplying the Allocation Factor (see formula below) by the amount of indirect expenditures paid to it. The formula for the Allocation Factor is:

$$\frac{\text{Agreement Price invoiced this reporting year}}{\text{Total sales this reporting year}} = \text{Allocation Factor}$$

For reports made for portions of a year, year to date (YTD) invoicing and sales numbers will be used.

nyb BE

Example: Contractor's total YTD sales are $50 million; Agreement Price invoiced YTD is $3 million, and total indirect expenditures paid to Acme Co. (an MBE) are $5,000,000.

$$\frac{\$3,000,000}{\$50,000,000} = 0.06$$

$5,000,000 X 0.06 = $300,000 (Owner's allocation of the Acme indirect MBE expenditure)

For indirect expenditures, only this allocated amount should be reported. For both direct and indirect expenditures, list the names of the business enterprise, addresses, and dollar amounts.

4.0 Reporting

Complete monthly each of the following two tables with year-to-date information and submit the completed tables with each monthly invoice to:

Sherri Yates
Supplier Diversity
LG&E
820 W. Broadway
Louisville, KY 40202
(502) 627-3806
Sherri.yates@lge-ku.com

With a copy to:

Dianne Ware
Sourcing Assistant – Sr.
LG&E
820 W. Broadway
Louisville, KY 40202
(502) 627-4690
dianne.ware@lge-ku.com

F-9 TABLE 1

MBE/WBE/DBE/VOB/LC/UC/NUC

Date: _____, 20__

Contractor: _____ Agreement/Purchase Order No. (if applicable): _____

Address/Phone: _____ Submitted By: _____

_____ Title: _____

SUBCONTRACTOR/SUBSUPPLIER INFORMATION:

SUB-CONTRACTOR OR SUB-SUPPLIER NAME	CONTACT PERSON	TELEPHONE NO.	TAX ID	DESCRIPTION OF GOODS AND/OR SERVICES PROVIDED	MBE/WBE/ DBE/ VOB/LC/UC /NUC	TOTAL PROCURE-MENT PROPOSED EXPENDI-TURES	YTD DIRECT PAYMENTS	YTD ALLOCATION OF INDIRECT PAYMENTS	PROJECTED ANNUAL TOTAL
			TOTAL				$	$	

F-9 TABLE 2
LOCAL HIRES

Date: _____, 20__

Contractor: _____ Contract/Purchase Order No. (if applicable):_____

Address/Phone: _____ Submitted By: _____

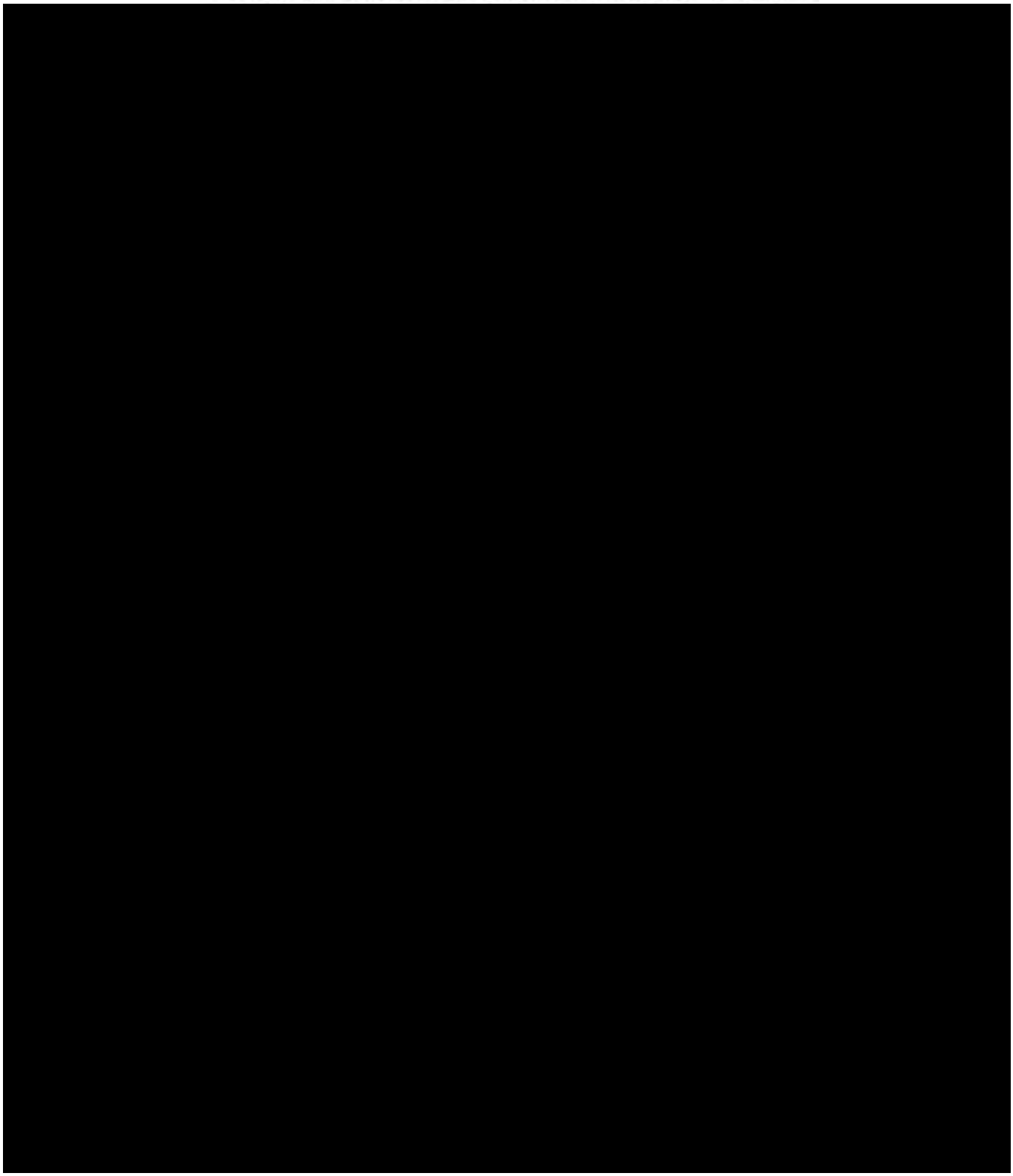
_____ Title: _____

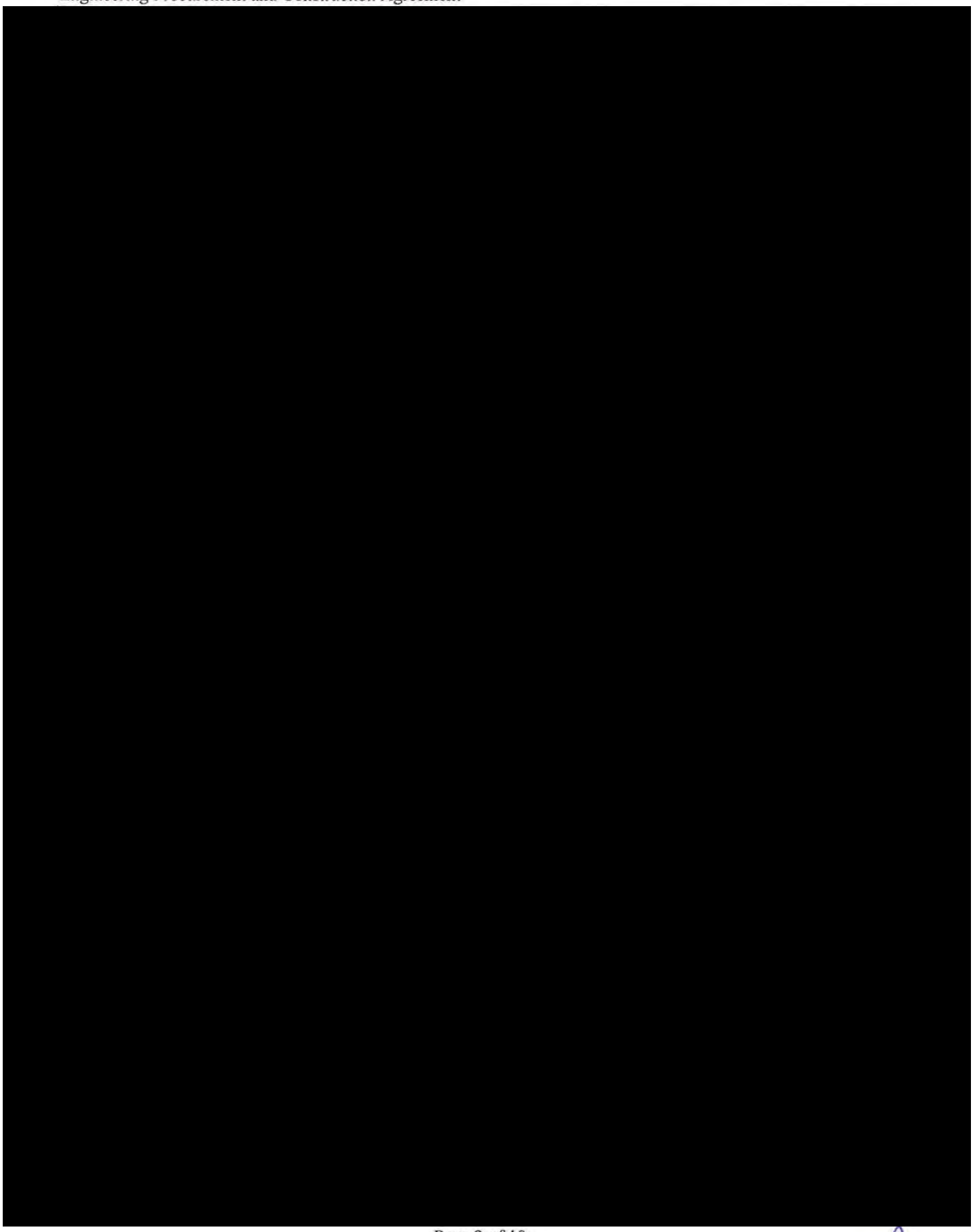
Complete table for Contractor and each Subcontractor that employees any Local Hires to perform Work under this Agreement

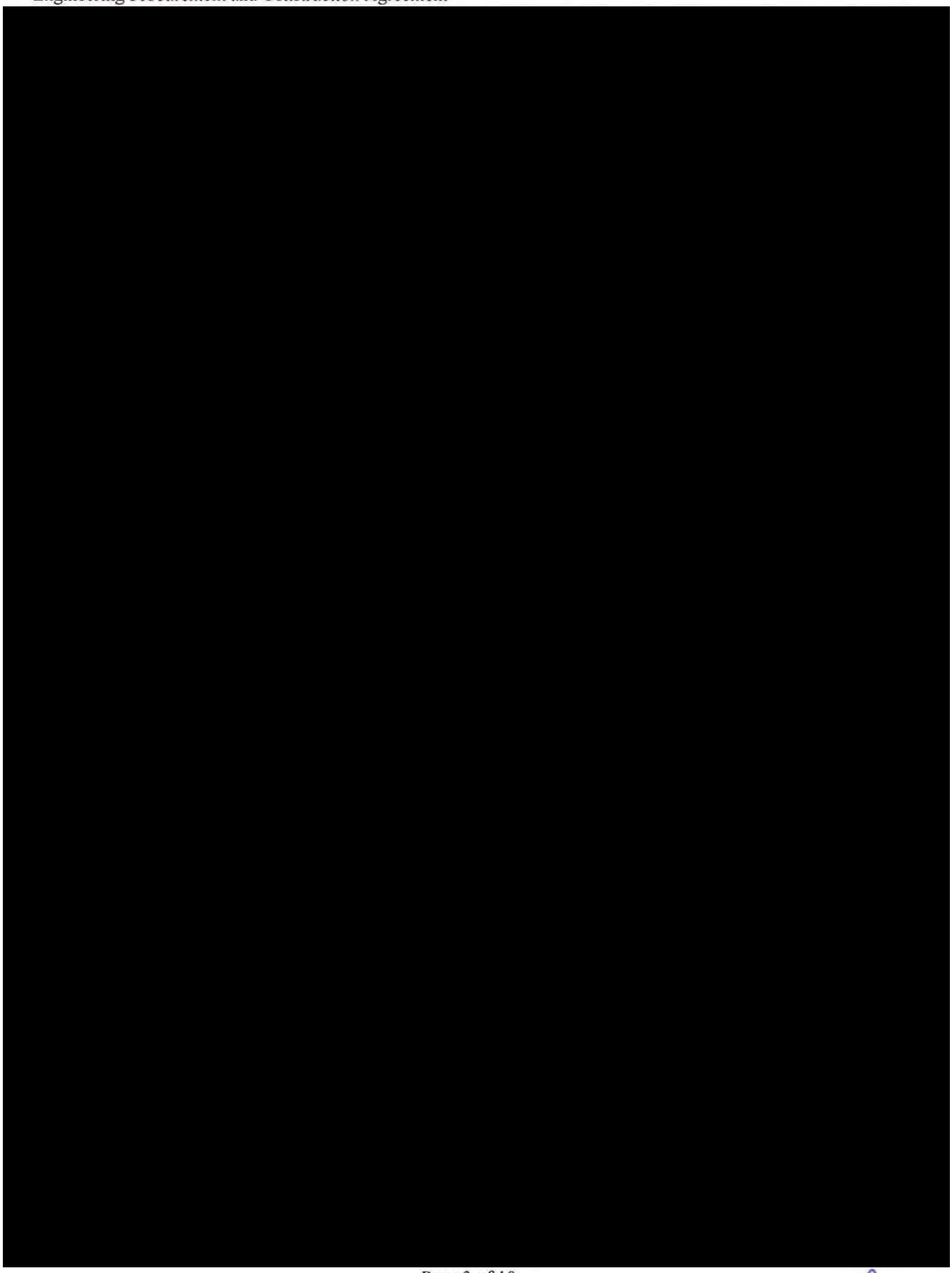
NAME	CONTACT PERSON	TELEPHONE NO.	TAX ID	NUMBER OF LOCAL HIRES PERFORMING WORK	HOURS OF WORK BY LOCAL HIRES	TOTAL PAYROLL PAID TO LOCAL HIRES
			TOTAL			**$**

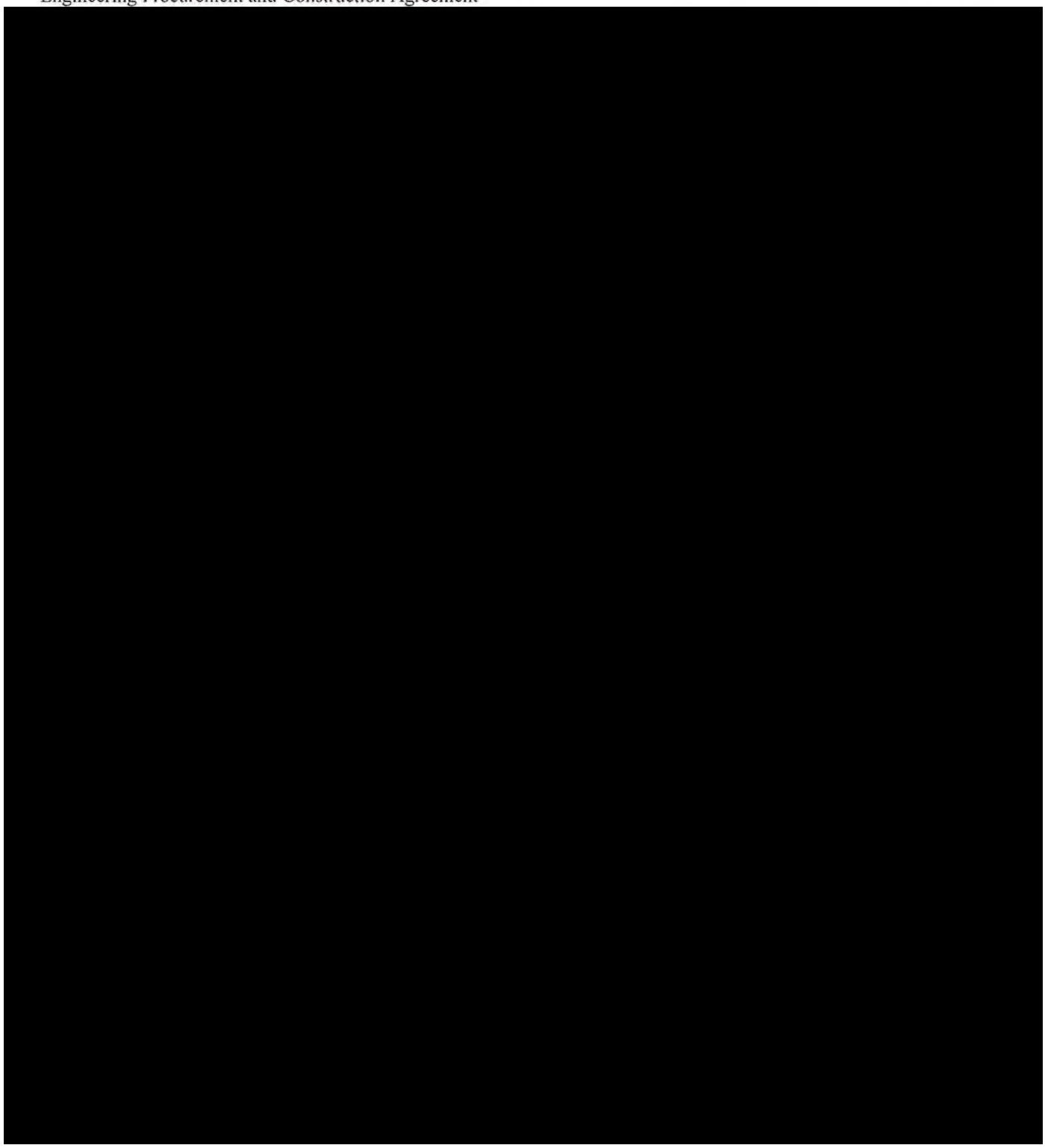
EXHIBIT F-10

FORM OF ACCEPTABLE LETTER OF CREDIT









ATTACHMENT A

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ATTACHMENT B

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ATTACHMENT C

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ATTACHMENT D

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ATTACHMENT E

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ITEM #	SYSTEM	LOCATION	CATEGORY	EQUIPMENT DESCRIPTION	MANUFACTURER	MANUFACTURER PART NUMBER	PART NAME/ DESCRIPTION	MODEL/SERIAL NUMBER OF COMPONENT THAT PART APPLIES TO	O&M MANUAL	MANUFACTURER CONTACT	MANUFACTURER PHONE #	RECOMMMEND QTY	DELIVERY OR LEAD TIME	EXPECTED SHELF LIFE WITH PROPER STORAGE	UNIT PRICE
Examples:															
1	Bottom Ash	RSCC Building	Pumps	Sump Pumps	Flowserve	88477158	Shaft Sleeve FRM#3 VSP Lower CD4MCUN	12FRBHJ233	Flowserve, Book 1, Page 20	Furey Filter and Pump	(262) 293-0366	1	1 wk.	70 days	$ 7,106.00
2	FGD	Absorber	Slurry Spray Nozzles	Nozzles	Babcock Power/Spraying Systems	88237245	Wall Up-Down Silicon Carbide Absorber Slurry Nozzles, 5" Pipe Connection	Model S50362-5CF-SILCNB36390	Babcock Power, Book 2, Page 25	Plajems and Assoc.	(800) 957-7729	18	5 wks.	1 yr.	$ 226.15

	Category	Equipment Description	Part Name/Description
ITEM DESCRIPTION =	*Noun*	*Qualifier*	*Descriptive Elements*

3/22/2016

EXHIBIT G

TRIMBLE COUNTY GENERATING STATION

CCRT PROJECT

GUARANTEES

AND

PERFORMANCE GUARANTEE TEST PROTOCOL

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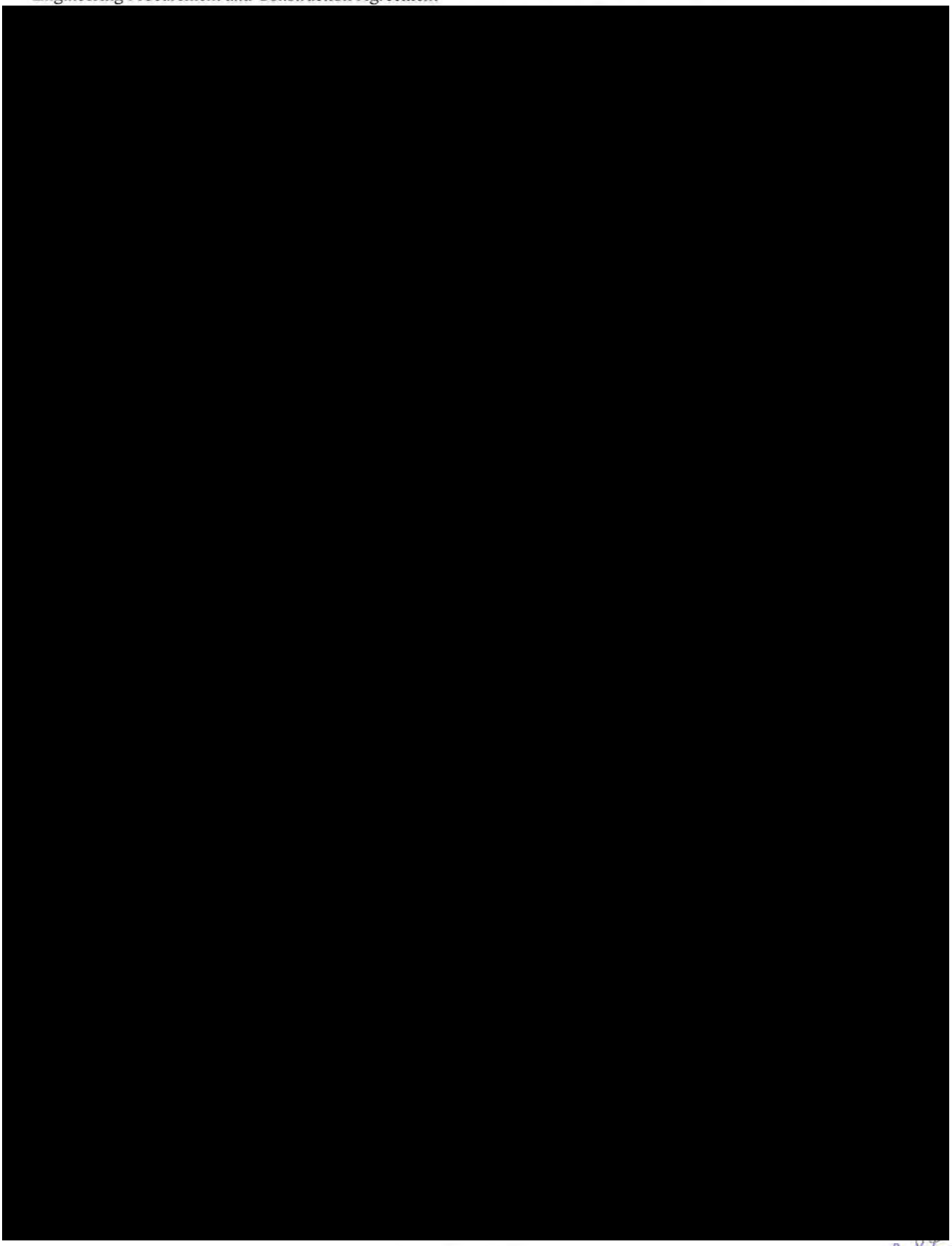

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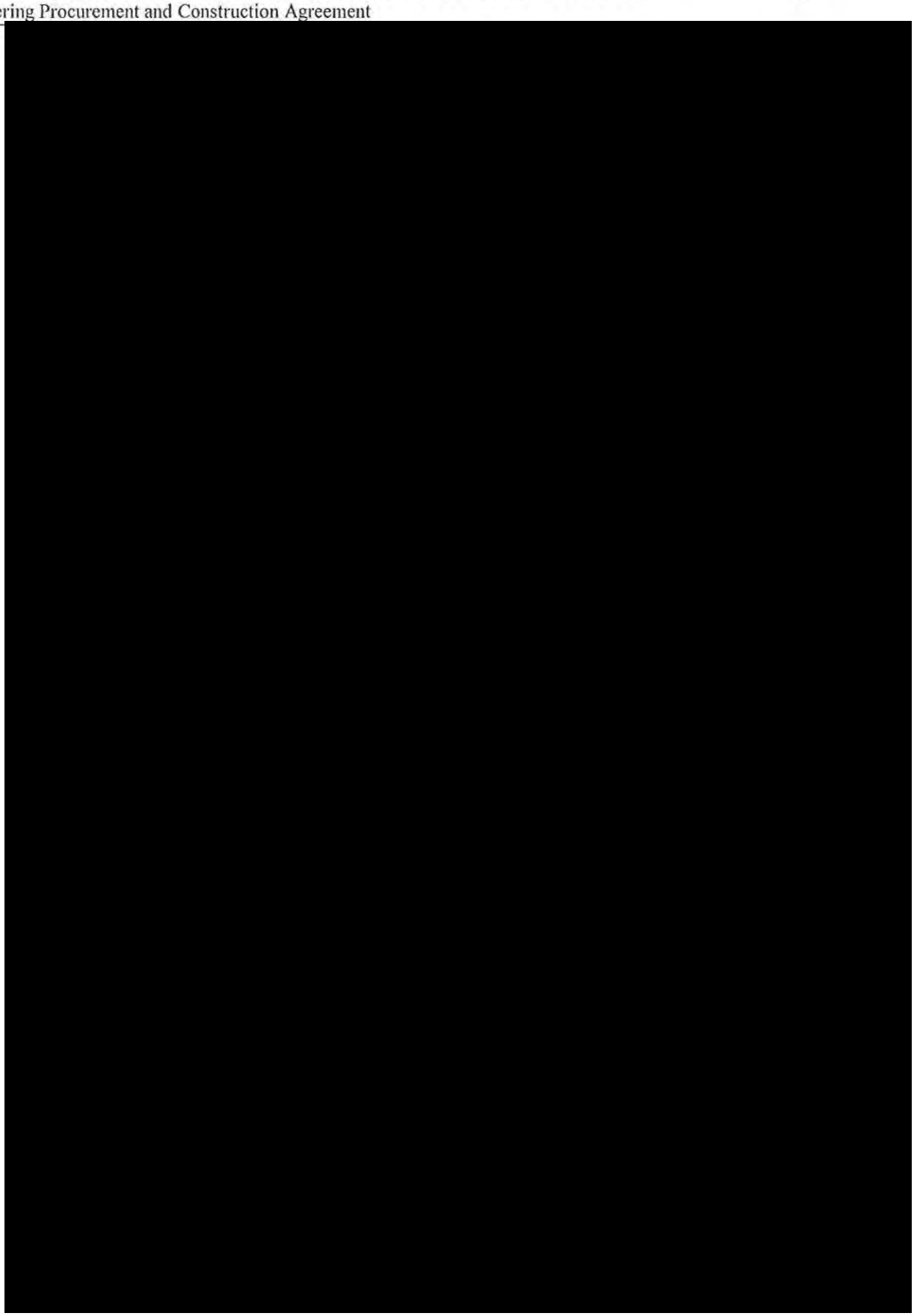

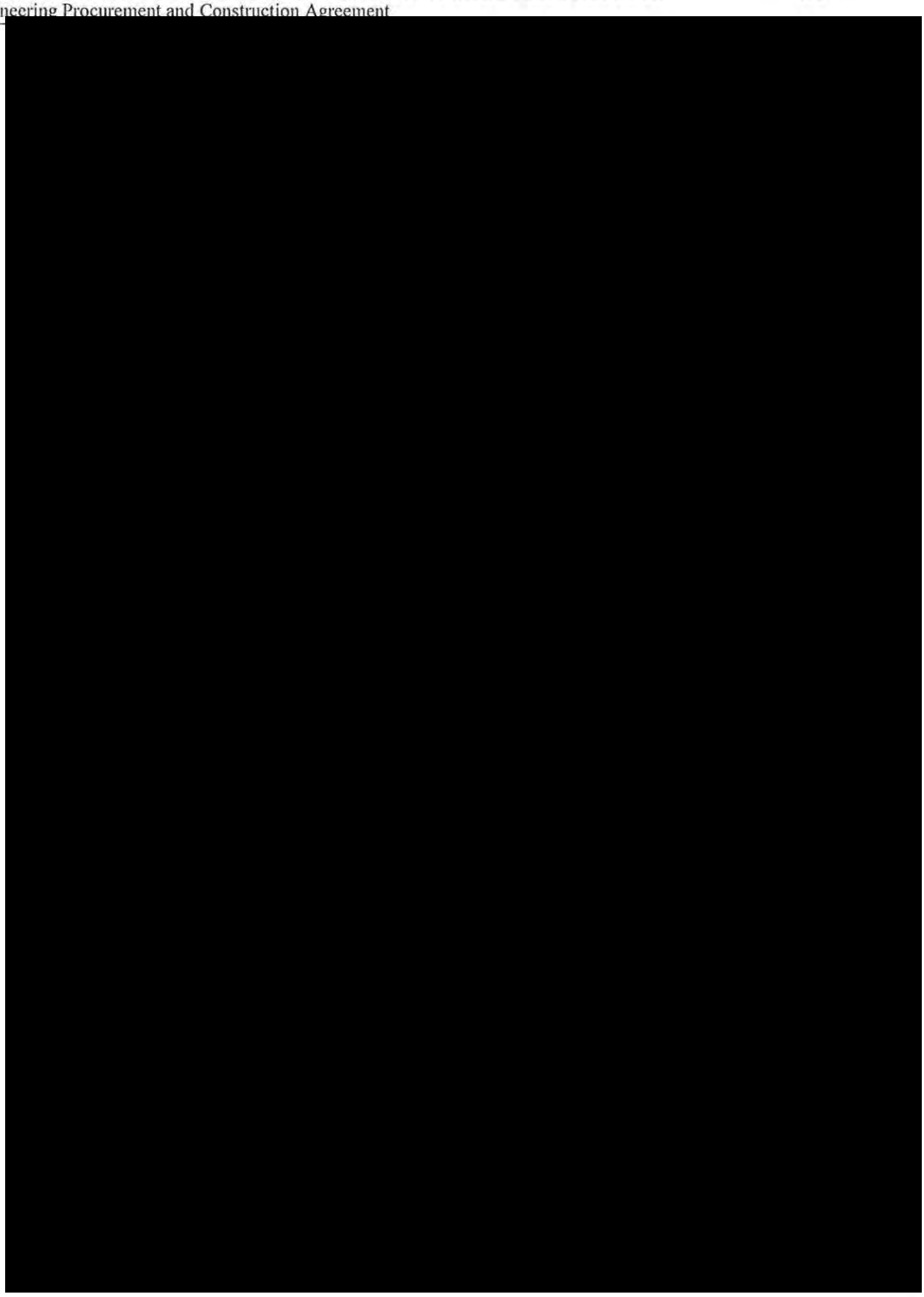

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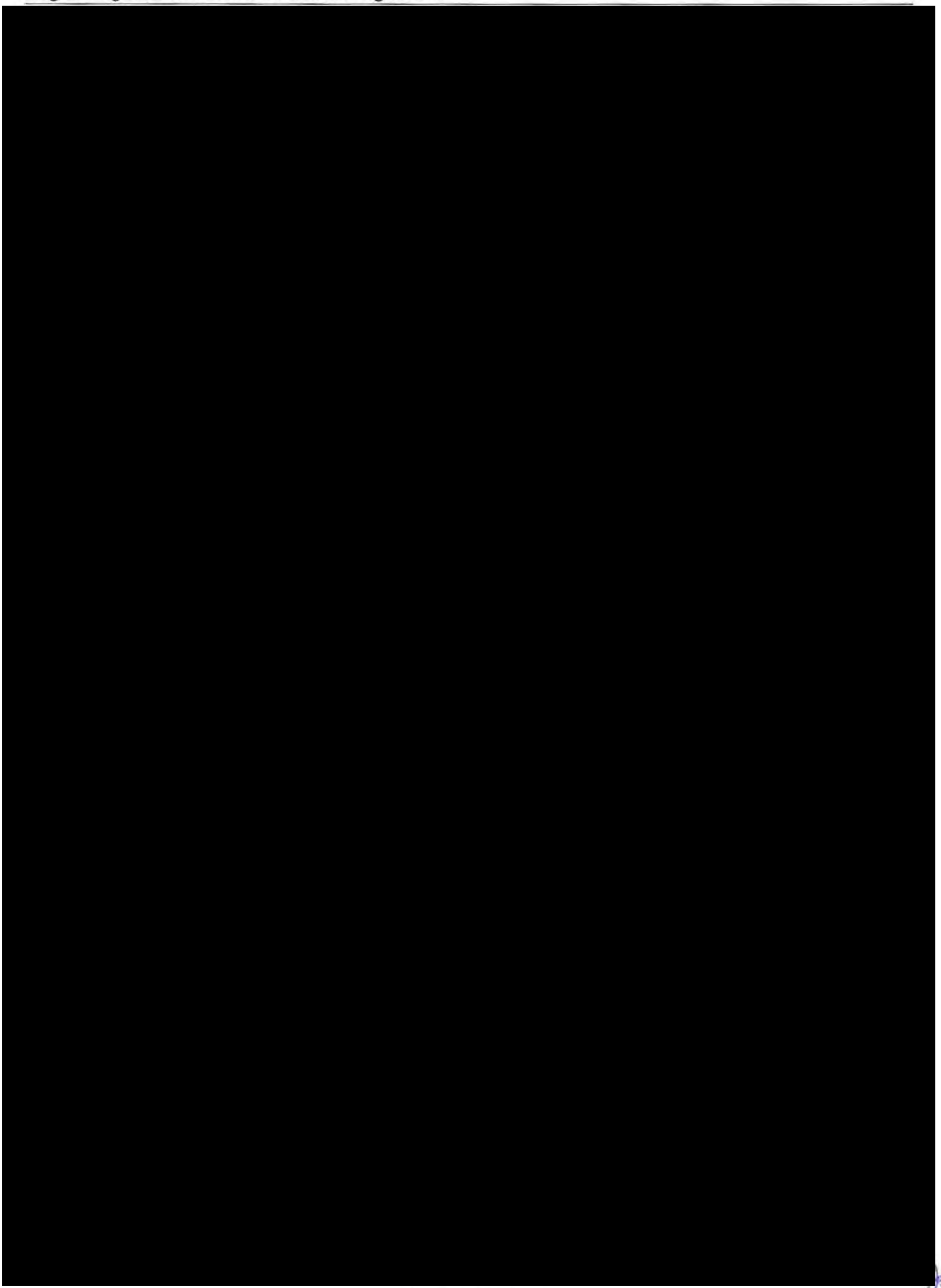

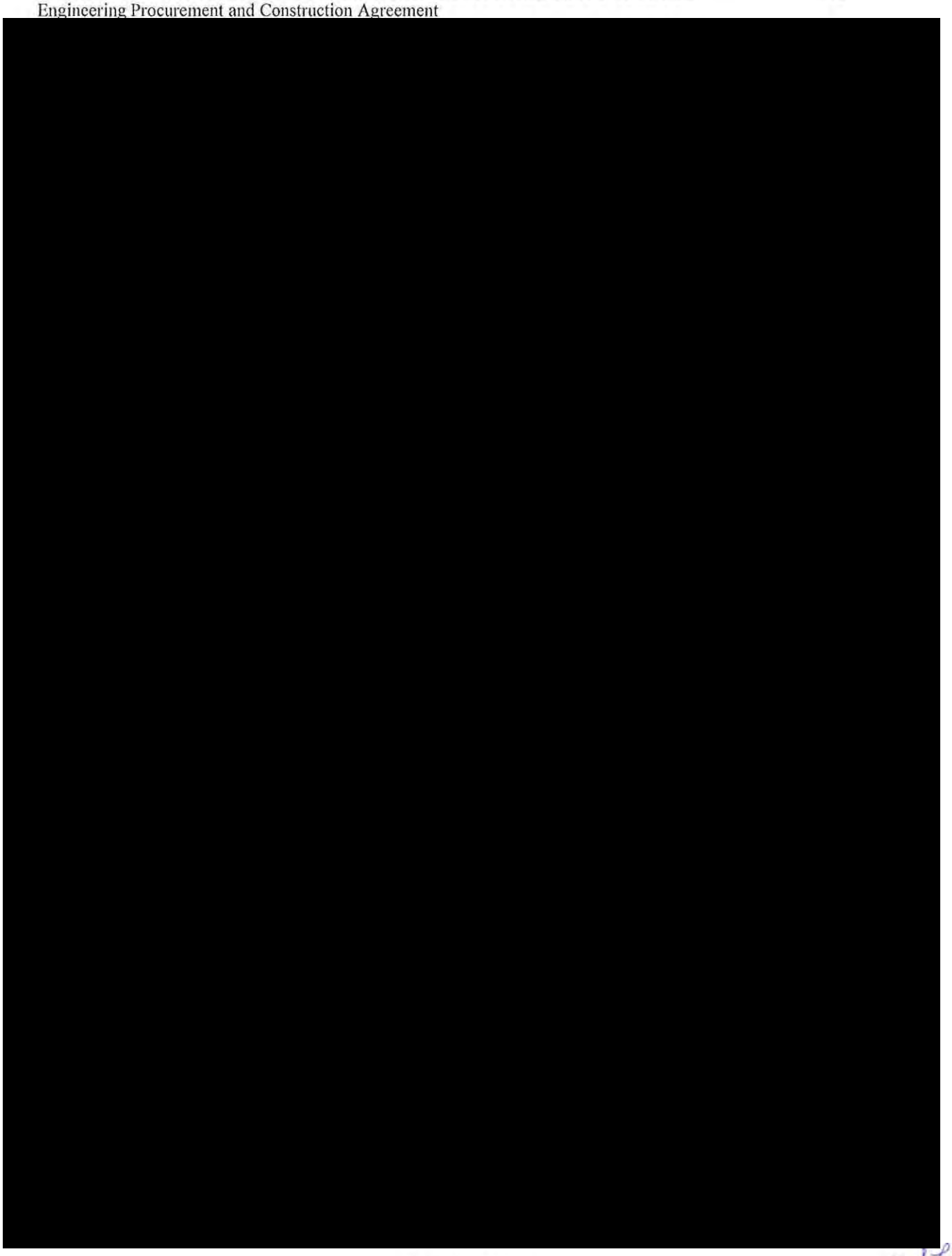

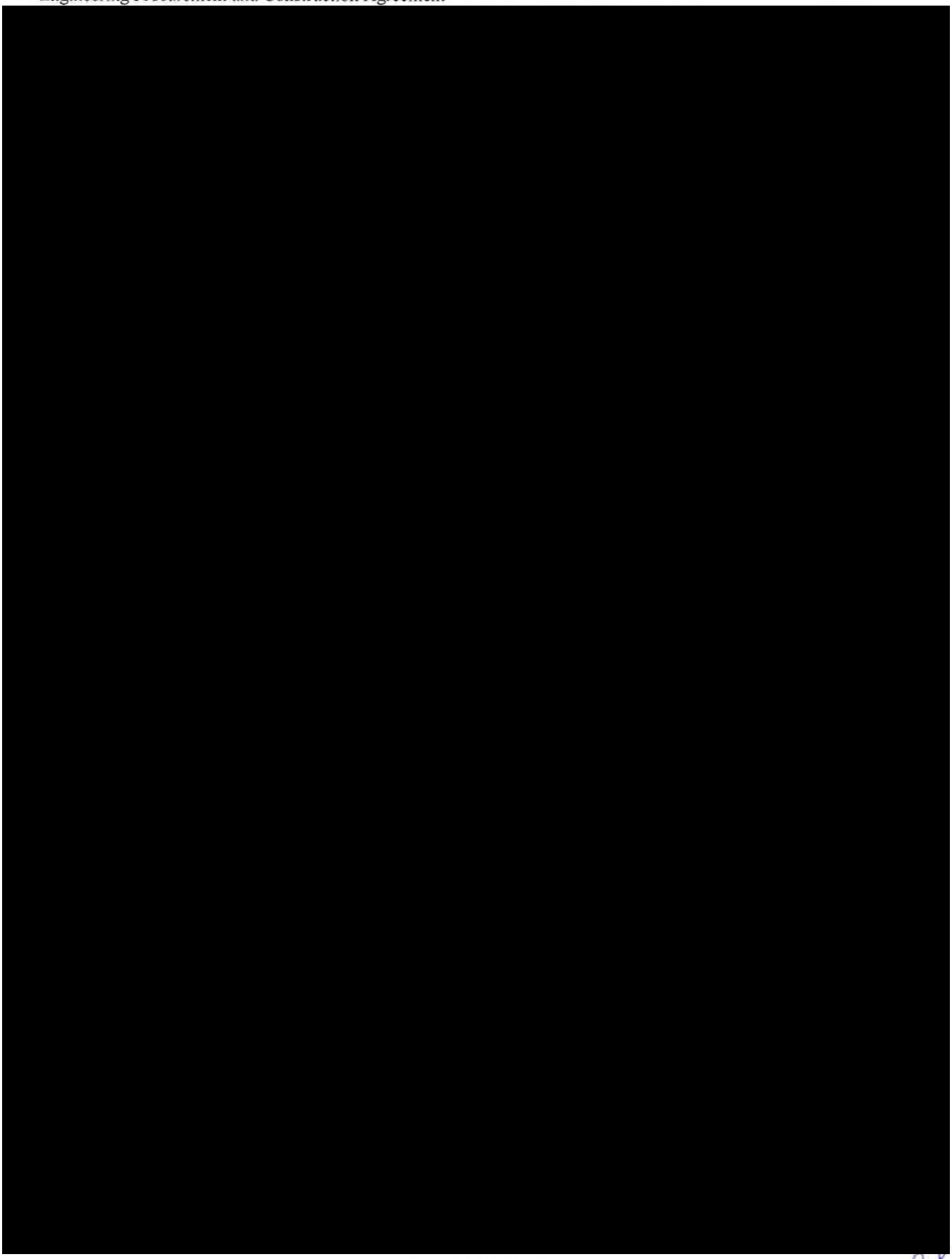

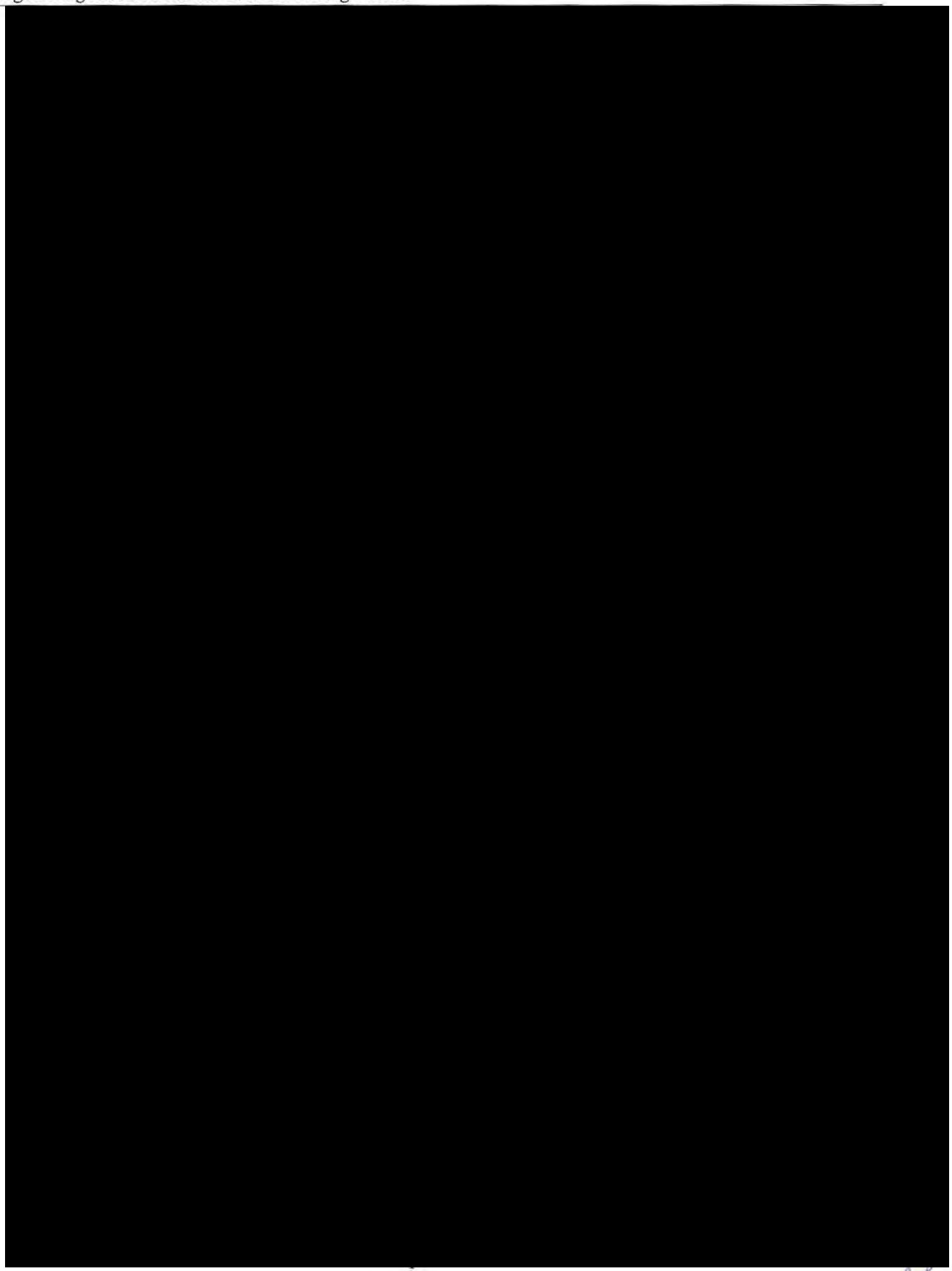

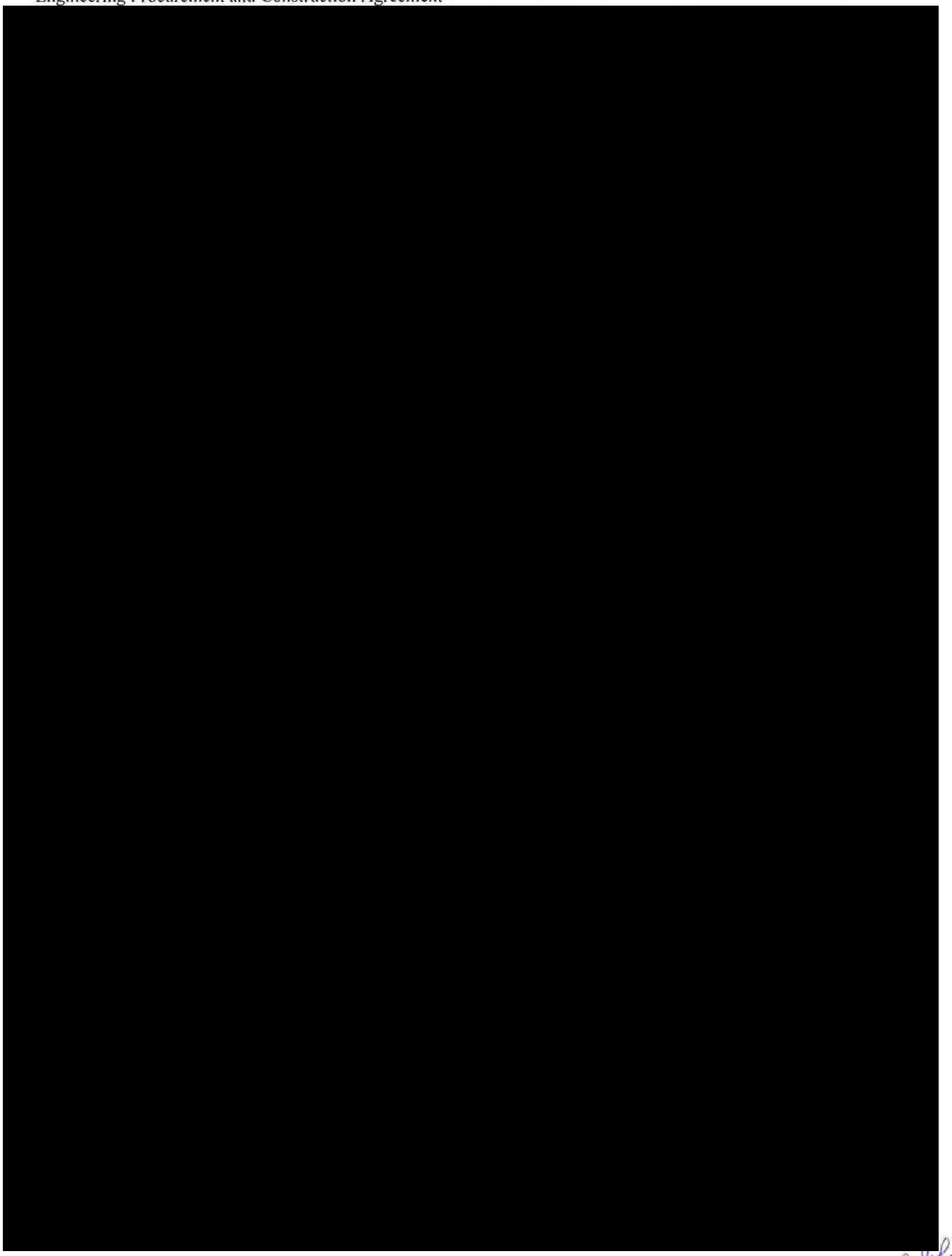

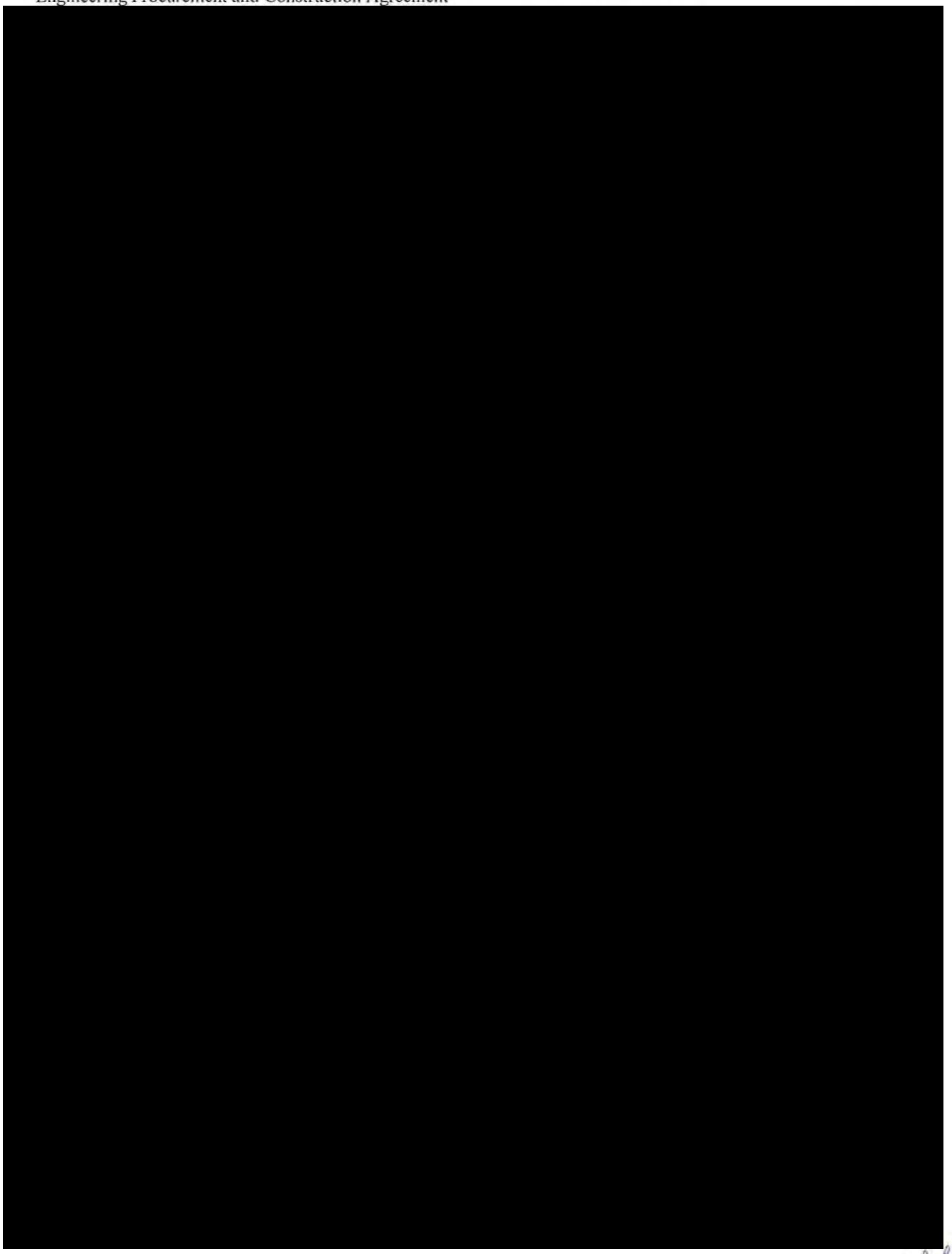

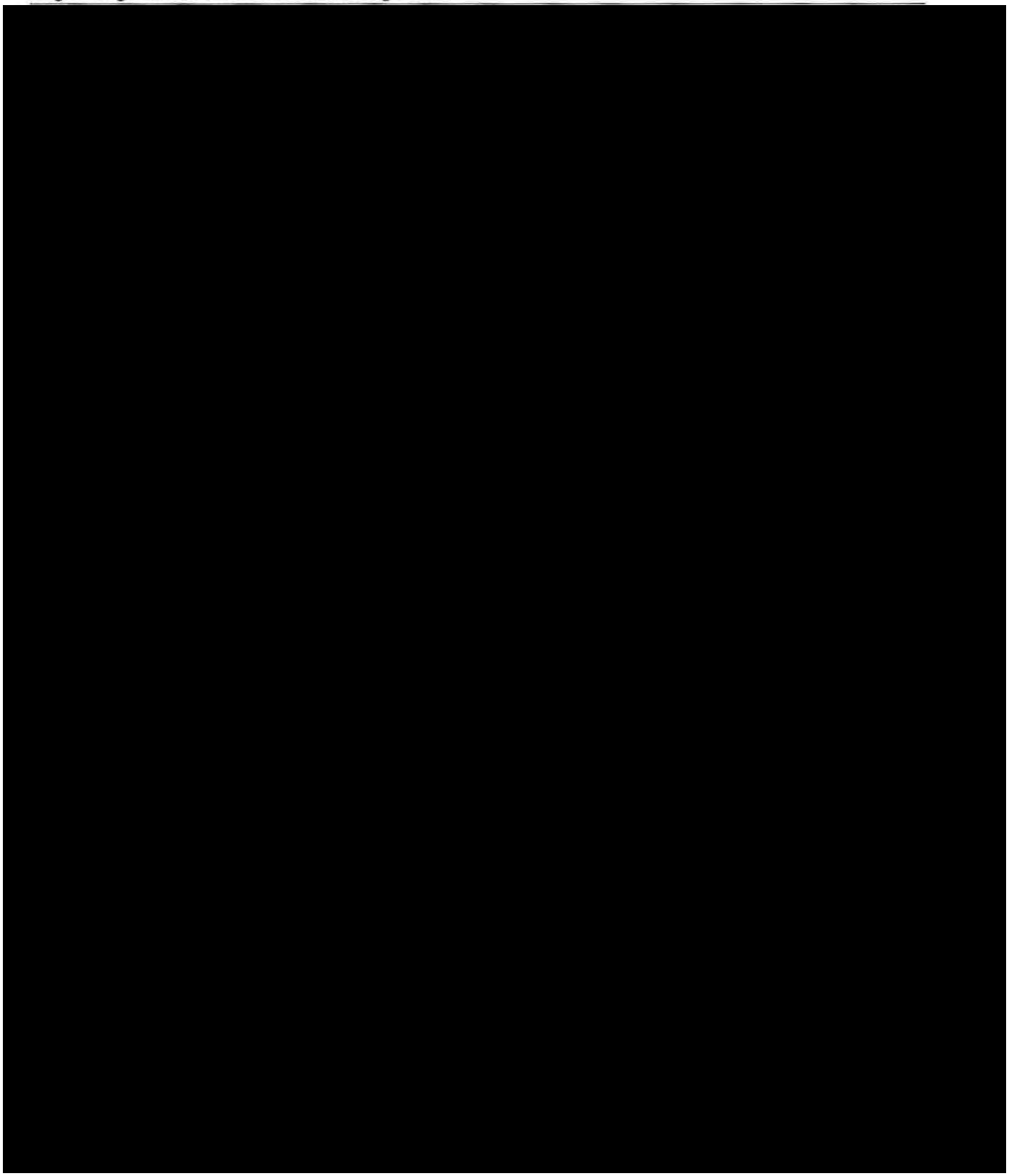

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EXHIBIT G, APPENDIX A

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EXHIBIT G, APPENDIX B

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EXHIBIT G, APPENDIX B, ATTACHMENT B1

[redacted]

EXHIBIT G APPENDIX B, ATTACHMENT B2 - Fly Ash Correction Curve

EXHIBIT G, APPENDIX C

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APPENDIX C, ATTACHMENT C1

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APPENDIX C, ATTACHMENT C2

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APPENDIX C, ATTACHMENT C3

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APPENDIX C, ATTACHMENT C4

APPENDIX C, ATTACHMENT C5

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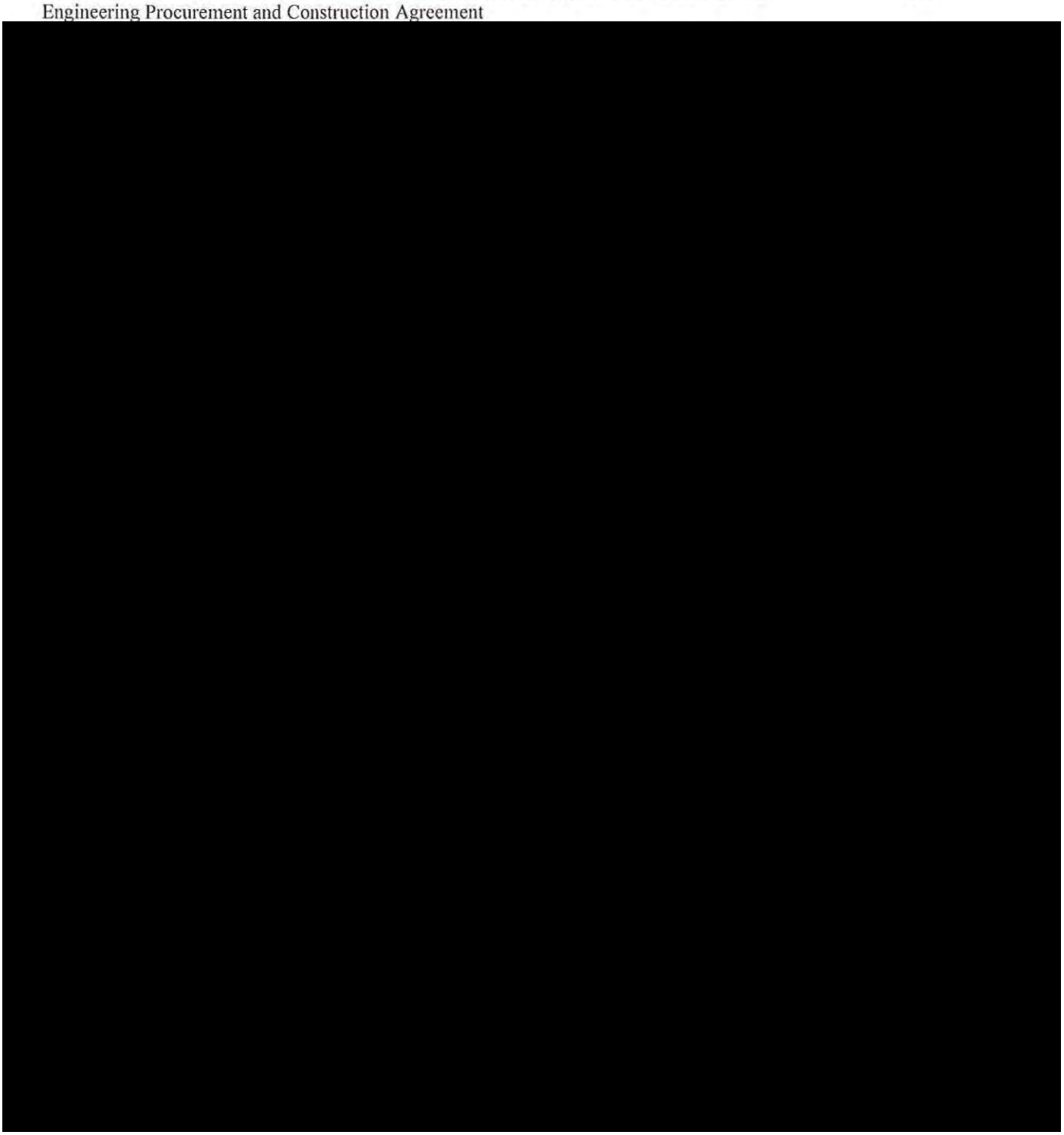


EXHIBIT H
HEALTH AND SAFETY REQUIREMENTS

Table of Contents

Where applicable within this Exhibit H Contractor means EPC Contractor.

1.0 Contractor Safety Policy

2.0 Contractor/Subcontractor Safety and Health Questionnaire and Checklist

3.0 Overview of Passport Program

4.0 Contractor Safety Management Project Specific Hazard Analysis

5.0 Contractor Safety Management Hazard Mitigation Plan

6.0 Contractor Drug and Alcohol Testing Requirements

7.0 Job Performance Monitoring Tool

8.0 Quality Assurance Closure Form for Contractors

1.0 Contractor Safety Policy

LG&E and KU Services Company

Contractor / Subcontractor Safety Policy

PURCHASE ORDER #:_____ CONTRACT JOB #:_____

NAME OF CONTRACTOR: _____

SCOPE OF WORK: _____

WORK LOCATION: _____

CONTACT NAME: _____ WORK ORDER #:_____
(AUTHORIZED CONTRACTOR/SUBCONTRACTOR REPRESENTATIVE)

1. Contractor / Subcontractor Safety Policy

General

LG&E and KU Services Company, is committed to safety excellence and in providing a safe and healthful work environment for anyone working on our property. The personal safety and health of each employee, contractor and the safety of the general public are of primary importance to LG&E and KU Services Company. Accordingly, there is no job so important that safety policies and procedures or legal obligations are compromised.

This Policy does not replace the Contractor's/subcontractor's ("Contractor") existing safety and health program(s), provided that their program(s) meet or exceed these and any additional site specific minimum requirements. Contractor's employees not following this Policy will be subject to removal from the job site.

The Contractor is required to comply with all federal and state safety laws and all provisions of the LG&E and KU Services Company, Health & Safety Manual. The Contractor is responsible for conducting its work and activities safely. LG&E and KU Services Company expect and require that you continuously update your employees with respect to safety issues relevant to the work and to take immediate corrective action when your employees violate safety rules or procedures.

It is the responsibility of Contractors' construction managers, superintendents, safety representatives and foremen/supervisors to ensure workers under their supervision maintain safe work areas and perform their tasks in a safe manner. It is also the responsibility of each worker to follow every precaution and LG&E and KU Services Company safety rule and Policy to protect them and their fellow workers.

Contractors are responsible for ensuring that any subcontractors working under their purview are held to the same performance expectations, and therefore this Policy, as the contractor themselves.

2. Scope

General

This Policy applies to all construction activities performed for LG&E and KU Services Company by Contractor's employees or employees of the Contractor's subcontractors. Construction activities may originate from construction contracts, service contracts, purchase orders, or in-house work orders. This Policy is in addition to the requirements of the General Services Agreement or other contract under which the Contractor is performing construction activities.

3. General Safety Requirements

1. Contractors will comply with all applicable federal and state regulations and the LG&E and KU Services Company safety rules and programs relevant to the work performed.
2. Contractors will ensure that any and all subcontractors working under their purview comply with all applicable federal and state regulations and the LG&E and KU Services Company safety rules and programs relevant to the work performed.
3. Contractors are responsible for their employees and any and all subcontractors working for them. Contractors are responsible for ensuring that the subcontractors follow all provisions of this document. Contractors are responsible for providing their employees, and subcontractors with all information provided by LG&E and KU Services Company regarding:
    * Occupational health and safety;
    * Federal, state and local environmental regulations including LG&E and KU Services Company environmental compliance policies and procedures;
    * Exposure to atmospheric health, serious physical or chemical hazards; and
    * Precautionary measures and procedures for performing the work.
4. All Contractors' employees, and any subcontractor employees, shall receive training under the LG&E and KU Services Company Contractor Health and Safety Passport Program.
5. The LG&E and KU Services Company Policy prohibits the Contractor's employees, agents or representatives from:
    * Consuming or possessing alcohol while on the LG&E and KU Services Company job sites, including the parking lots;
    * Reporting to perform work on the LG&E and KU Services Company job sites with unauthorized drugs on his/her person or while under the influence of drugs or alcohol;
    * Intentionally dumping unauthorized chemicals/materials into a sewer, waterway or on the ground;
    * Mishandling LG&E and KU Services Company waste;
    * Allowing employees to perform work that involves operating heavy equipment or working at elevations when using prescribed medication that can cause drowsiness or otherwise impair the employee's ability to perform the work in a safe manner.
6. The following conduct is prohibited by the Contractor at and about LG&E and KU Services Company property:
    * Theft, horseplay, gambling, sabotage or attempted sabotage.
    * Threatening, intimidating or abusing employees, customers, vendors or guests of LG&E and KU Services Company.
    * Fighting, creating, or inciting a disturbance.
7. LG&E and KU Services Company has a tobacco policy that restricts tobacco and smoking-related products (cigarette, cigar, pipe, chewing tobacco, snuff, snus or e-cigarette) use to company designated areas. Other than such designated areas, tobacco and smoking related products use, and containers of expectorant/saliva associated with smokeless tobacco are prohibited in all administrative offices, buildings, company vehicles, and customer locations. Tobacco and smoking related product use is prohibited in customers' residences or places of business or any other location while interacting with customers on company business.
8. Attendance at job site safety meetings is required of the Contractor at the discretion of the LG&E and KU Services Company authorized representative. At least one representative of the Contractor will attend such job safety meetings.
9. Any Contractor's employee, who appears sick, extremely tired, or otherwise unable to perform his/her job in a safe manner will be reported to the Contractor's supervision for evaluation and possible removal from the job site.

10. Contractors are responsible for establishing control measures to protect their employees, subcontractors or workers under their control, from exposure to hazards (chemical, atmospheric health and physical) present at the job site.
11. The Contractor must provide electrical ground fault protection for employees using construction power (temporary branch circuits to include extension cords) through the use of approved ground fault circuit interrupters (GFCI). Additionally, Contractors must provide ground fault protection when using permanent facility power and using cord and plug equipment in wet or damp locations. Applies to 120-volt single phase 15 and 20-ampere receptacle outlets.
12. Contractor employees will work in full pants and shirts appropriate for the task being performed and in compliance with appropriate regulations. Shorts and tank tops are not allowed unless otherwise specified. (Some jobs will require wearing long sleeve shirts.)
13. Contractors shall not transport employees in the cargo bed of a truck or trailer.
14. All Contractors must receive authorization from the LG&E and KU Services Company authorized representative, before performing work in areas posted as **"DANGEROUS OR HAZARDOUS."**
15. Employees of **Resident Contractors**, defined as those Contractors with an annual contract and who provide day-to-day services for LG&E and KU Services Company, shall be required to have a negative drug pre-test when hired and before reporting to work at an LG&E and KU Services Company site. All contract employees will be required by the Contractor to participate in a drug and alcohol testing program that randomly tests 5% of their employees monthly, while working on an LG&E and KU Services Company site.

    If a Contractor brings "transient" workers on site for "plant outages", "project work" or "major construction", the transient workers shall be required to have a negative drug pre-test when hired and within 7 days before reporting to work at an LG&E and KU Services Company site. If a contractor sends one of their workers to another LG&E and KU Services Company site with no interruption of service, no pre-work drug test is required. If a worker reports to another LG&E and KU Services Company site with an interruption in service of thirty days or more, the worker shall be required to have a negative drug test before reporting to work at that site. All transient contractors are to be placed in a random testing pool and tested at a 10% monthly rate for the duration of the assignment.

4. Specific Safety Requirements

Contractor Safety Qualification

Contractor selection and ultimate certification shall include an evaluation of the Contractor's prior safety performance, current written safety programs, safety training, and qualifications of key Health & Safety (H&S) personnel to assure LG&E and KU Services Company that the Contractor is capable of meeting its safety performance goals. Employees of certified Contractors and any subcontractor employees shall undergo "Passport Training" for those designated as Industrial Workers prior to performing work at an LG&E and KU Services Company facility. This by no means will replace regulated compliance training for the work the contractor employee will be performing.

Subcontractor Safety Qualifications

Subject only to the specific exception stated below, any and all subcontractors used by a Contractor to perform work for LG&E and KU Services Company shall meet or exceed the following criteria:

a) The subcontractor's incident rates for the three (3) most recent calendar years do not exceed, in any one (1) year, the industry average, based on NAISC (or SIC), as published by the Bureau of Labor Statistics;
b) The subcontractor has not experienced any employee fatality identified within any of the three (3) most recent calendar years' statistics.
c) The subcontractor has not received any citation, from OSHA, the Kentucky Public Service Commission or any other state agency regulating utilities in the most recent three (3) calendar years; and
d) The subcontractor has a current Workers Compensation Insurance Experience Modification Rate (EMR) less than or equal to 1.0.

LG&E and KU Services Company may, at the sole option of such company, provided written authorization for the use of a subcontractor not meeting the above criteria; provided that such authorization must specifically identify how the subcontractor fails to meet the criteria and state additional protective measures the Contractor shall put in place in order to use such subcontractor. Such authorization may be withdrawn at any time for any reason.

The criteria stated above are minimum standards and Contractors using subcontractors shall seek out subcontractors with the highest safety performance available.

Contractor On-site Health and Safety Representative

The Contractor shall appoint a qualified on-site Health and Safety Representative, accepted by the LG&E and KU Services Company authorized representative, with the authority to enforce all of the safety requirements of this Policy, including implementation of the Contractor's Injury and Illness Prevention Program.

LG&E and KU Services Company authorized representative and H&S will make a risk-based decision as to the qualification level of the Contractor H&S representative. Requirements may range from a full-time on-site safety professional (Certified Safety Professional) to a craft supervisor or "person in charge" with competency as measured by experience training.

Whenever the Contractor has any employees or subcontractors on the job site, the Contractor must have a designated representative on the construction worksite that is knowledgeable of the project's hazards and has full authority to act on behalf of the Contractor. The Contractor's designated representative must make periodic observations of the construction worksite to identify and correct any instances of noncompliance with the project health and safety requirements.

Qualification Evaluation

Based on the level of H&S qualification determined necessary by LG&E and KU Services Company, the Contractor shall submit documentation, for review and acceptance by LG&E and KU Services Company in support of the proposed designated representative. Suggested qualifications may include, but are not limited to:

- Professional certifications (CSP, CIH, ASP, etc.).
- Curriculum detailing work experience and EH&S responsibilities on projects of similar scope for the previous five years, at a minimum.
- Evidence of construction safety training such as the 10-hour or 30-hour OSHA training.
- Proof of "Competent Person" (as defined below) or "Qualified Person" (as defined below) status attained by the proposed on-site H&S representative.

Contractor Health and Safety Representative Responsibilities

The Contractor H&S Representative shall:

- ❖ Assist in the development of the contractor's safety plan and job site management system.
- ❖ Support training of contractor personnel.
- ❖ Evaluate the Contractor's safety process continuously.
- ❖ Attend any pre-job meetings to discuss their site-specific safety plan.
- ❖ Conduct and formally document job briefings.
- ❖ Assist in the identification of jobs requiring a hazard analysis.
- ❖ Assist in evaluating potential subcontractors in accordance with this Policy.

Competent Person

Each Contractor shall provide to LG&E and KU Services Company a written list of those persons designated as a Competent Person, who shall be available at the work site and capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to workers, and who has authorization to take prompt corrective measures to eliminate them. Persons shall be responsible for conducting periodic observations of the job sites, materials and equipment, and shall maintain the accident prevention program. Contractor shall ensure that each Competent Person listed has been trained in the following areas as applicable:

- Asbestos
- Cranes
- Confined Space

- Demolition
- Excavations
- Fall Protection
- Industrial Trucks
- Ladders
- Scaffold
- Steel Erection
- Tower Climbing

5. Health and Safety Management Plan

Prior to commencement of contract work, the Contractor shall develop and submit to the LG&E and KU Services Company authorized representative a written Health & Safety (H&S) Management Plan on how the contract work will be completed without endangering the health and safety of those performing the work or anyone else working in the general area. The H&S Management Plan will be developed for the following higher risk contracts, including projects:

- All construction projects (new site and refurbishment)
- Contracts with an estimated value of $250,000 and over
- Long term contracts (12 months and over)
- Contracts for which the Contractor will use subcontractors.
- Contracts that provide a service by performing **high risk*** activities.
- Any other contracts at the discretion of the contract manager.

**High risk activities include but are not limited to:*

- *Electrical work requiring an Electrical Work Permit*
- *Asbestos removal*
- *Cooling tower maintenance*
- *Demolition*
- *Hot work in hazardous area*
- *Permit Required Confined Spaces*
- *Scaffolding*
- *Tank cleaning or testing*
- *Welding in hazardous areas*
- *Working at heights*
- *Work on telecommunications towers*
- *Work involving excavations to a depth of more than 4 feet*
- *Work involving the use of explosives*
- *Work on or near pressurized gas pipes*
- *Work over or adjacent to water*
- *Work involving diving*

The Health and Safety Management Plan shall contain at a minimum:

- The name of the On-site Health and Safety representative who is responsible for the implementation of their safety plan.
- LG&E and KU Services Company policy on environment, safety and health.
- LG&E and KU Services Company policy on substance abuse and testing policies if applicable.
- How and when each Contractor will conduct their job briefings.
- Provisions for conducting and documenting weekly job site safety audit/inspections by manager/supervisor level personnel.
- Training methods used to meet OSHA training requirements, and to ensure that safety program requirements are communicated to all Contractor personnel.
- Incident reporting, first aid, and emergency procedures.

- List of all Competent Persons overseeing those tasks in which OSHA requires such person(s), such as excavation, asbestos abatement and scaffolding.

Subcontractors shall be held to the same level of performance as the Contractor's written H&S Management Plan. The Contractor shall submit written documentation for its subcontractors that demonstrates how their subcontractors shall meet compliance with the site safety plan.

6. Hazard Analysis

Contractor shall complete a "Contractor Safety Management / Project Specific Hazard Analysis"* and a "Contractor Hazard Mitigation Plan"*. These documents shall be submitted to the LG&E and KU Services Company authorized representative prior to the initiation of any work. In addition, a "Quality Assurance Closure Form for Contractors"* (see Section 8 for the form) shall be completed and submitted to the LG&E and KU Services Company authorized representative at the completion of the project.

** The Hazard Analysis, Mitigation Plan and Closure Form is presented during the Contractor Passport Train-the-Trainer session.*

All Contractor and subcontractor personnel scheduled to work in the activities identified, shall receive safety training in those activities prior to working on them. (A safety toolbox meeting would be an acceptable forum to meet this requirement). The Contractor shall maintain proof of employee training, and shall make available such proof upon request. Note: This by no means shall replace their regulatory compliance training.

Hazard Analysis Requirements

A hazard analysis shall be written based on the following conditions:

- All major outage work
- Special Projects
- Jobs with the highest injury or illness rates
- Jobs with the potential to cause severe or disabling injuries or illness, even if there is no history of previous accidents
- Jobs complex enough to require written instructions
- At the discretion of the LG&E and KU Services Company authorized representative

7. Engineered Protective Systems

The Contractor shall submit for review to the LG&E and KU Services Company authorized representative such safety system that is required by regulation to be designed by a registered professional engineer. This review is solely to verify that the Contractor has had the required protective systems prepared and stamped by a registered professional engineer.

LG&E and KU Services Company review of any documents showing the design or construction of protective systems for worker and property protections shall not relieve the Contractor of its obligations to comply with applicable laws and standards for the design and construction of such protective work. Contractor shall indemnify and hold harmless LG&E and KU Services Company and their engineering personnel from any and all claims, liability, costs, actions and causes of action arising out of or related to the failure of such protective systems. The Contractor shall defend LG&E and KU Services Company, its officers, employees and agents including without limitation engineer personnel, in any litigation or proceeding brought with respect to the failure of such protective systems.

The cost of required safety engineering services required for safety and protective systems shall be borne solely by the Contractor and shall be deemed to have been included in the amount bid for the work as stated in the contract.

8. Safety Training and Education

Contractor shall ensure that its workforce is compliant trained and qualified to perform the work. Contractor shall ensure that all subcontractor employees demonstrate the same level of competence.

Site Orientation

All Contractors / subcontractors shall undergo an LG&E and KU Services Company "site specific" training/orientation prior to engaging in work activities at a generating station. In addition, Contractors that conduct work at LG&E and KU Services Company generation facilities that process ammonia shall also undergo an ammonia awareness training/orientation prior to conducting work.

Contractor employees conducting work in a substation must first complete a Substation Entry training program.

Contractors Pre-job Orientation

Contractor shall require and administer a pre-job orientation to its employees and all subcontractor employees prior to engaging in work activities. Contractor shall maintain on the work site a detailed outline of the orientation and a signed and dated roster of all employees who have completed the orientation. The orientation shall address the following elements at a minimum:

- Employee rights and responsibilities
- Authority and responsibility to issue Stop Work Order
- Alcohol and drug abuse policy
- Contractor's disciplinary procedures
- First aid and medical facilities
- Hazard recognition and procedures for reporting or correcting unsafe conditions or practices
- Procedures for reporting accidents and incidents
- Hazard Communication Program
- Access to employee exposure monitoring data and medical records
- Protection of the environment, including air, water, and storm drains from construction pollutants
- Location of and access to reviewed Health & Safety Management Plan, Project Specific Hazard Analysis, and Hazard Mitigation Plan.
- Location and contents of required postings

Daily Job Briefings

Contractors shall ensure that all of their personnel (employees and sub-contractors) on the job site receive the daily Job Briefing before they start each job. Job Briefings shall discuss, at a minimum, the hazards associated with the job; work procedures involved; special precautions; energy source controls; and personal protection equipment requirements. This job briefing shall be conducted by the contractor's person in charge. Should the scope of the work change, than another job briefing shall be conducted.

9. Emergency Procedures

An emergency is any situation that poses an immediate threat to life or property. Each Contractor shall maintain one person currently qualified in CPR and First Aid on site at all times. Refer to the site orientation, or the LG&E and KU Services Company authorized representative for specific information for handling of a life threatening or other serious injury, fire, etc. Following the occurrence of an emergency, the contractor shall ensure that all proper incident reports are completed and distributed, and that the LG&E and KU Services Company authorized representative is notified immediately.

Incident Reporting

In the event a job site accident occurs, the Contractor shall immediately implement controls and restrictions on the accident site to ensure the site remains undisturbed until released by the LG&E and KU Services Company authorized representative. All accidents shall be reported to the LG&E and KU Services Company authorized representative immediately after the site is secured. A written incident report shall be furnished within the same day of the incident. A job site accident would include, but not be limited to a fire, explosion, equipment failure, release or exposure to toxic liquids, fumes or vapors, etc.

Near Miss / Injury-free Event

It is the responsibility of the Contractor, to complete all near miss investigations, and to report these occurrences with recommendations / implementation of corrective actions. The report is to be submitted to the LG&E and KU Services Company authorized representative within 24 hours.

Medical Treatment Event

The Contractor shall report all accidents (either occupational injury or illness) requiring medical treatment, as soon as possible, but no later than the end of the work shift, to the LG&E and KU Services Company authorized representative along with a copy of the first report of the injury. Serious injuries (defined as an injury that would require off site medical attention) shall be reported within 15 minutes, even during off shifts. (Review project specific emergency notification procedures.)

Fatality

It is the responsibility of the Contractor to immediately notify LG&E and KU Services Company should a fatality occur. It is the responsibility of the Contractor to notify the Kentucky Occupational Safety & Health, Division of Compliance within the appropriate Kentucky notification periods.

Stop Work Order

A stop work order must be given when imminent danger is identified or where significant damage to equipment or property or environmental degradation could occur if the operation continued. Any employee of a Contractor that observes an imminent-danger situation is responsible for stopping the work and reporting it to their supervisor. When a stop work order is issued, only those areas of a construction project immediately involved in the identified hazardous situation are to be included in the order.

Immediately after stopping work, the person issuing the order, or their supervisor, must report to the LG&E and KU Services Company authorized representative of their action. Work shall not resume until the LG&E and KU Services Company authorized representative has agreed that the imminent danger has been eliminated.

10. Hazard Specific Requirements

The Contractor will ensure that their employees (and all subcontractor employees) are properly equipped and trained to comply with the LG&E and KU Services Company standards and federal and state regulations; including but not limited to the following:

Asbestos

Blasting and the use of explosives

Chemical Safety/Hazard Communication

Commercial Diving Operations

Confined Space Entry

Control of Energy Sources (Lockout/Tagout)

Crane Operations, including rigging

Electrical

Fall Management (personal fall arrest systems, scaffolding, walking & work surfaces, ladders and floor & wall openings)

Hazardous Waste and Chemical Spills

Hot Work

Personal Protective Equipment (PPE)

Powered Industrial Trucks

Trenching

11. Enforcement

The Contractor is responsible for the health and safety of its employees and any subcontractor employees under their control. Enforcement of this Policy, as well as other recognized safety requirements, is the responsibility of the Contractor. The evaluation does not constitute acceptance of the Contractor's safety programs or work practices nor, in any way relieve a Contractor of full responsibility for meeting all appropriate OSHA regulations to ensure the safety of its employees.

Whenever there is a jurisdictional question of which standard will apply, the most stringent safety practice will take precedence. The Contractor must document exceptions and attach them to this form. Contractors and their employees who do not follow this Policy are subject to removal from the worksite as well as being banned from future LG&E and KU Services Company projects/contracts.

LG&E and KU Services Company reserve the right to evaluate the safety of Contractor's work practices to determine if they meet LG&E and KU Services Company standards and state/ federal regulations. In addition to the audit rights under the applicable contract LG&E and KU Services Company reserve the right to audit any and all documents (job briefings, audits, etc.) at any time during the course of the work.

12. LG&E and KU Services Company Safety and Health Issues

Contract work may involve use, handling, storage, or work in vicinity of *hazardous chemicals or materials*. (Concerns are Hazard Communication…spill prevention/response).

Contractor may perform work (operation, maintenance or emergency response function) as necessary.

Contractor may perform *hot work* (e.g. welding, torch cutting, brazing, etc.)

Contract may require Contractor to work in or near *confined spaces*.

Contract work may require using/working under clearance procedures for the control of hazardous energy (*lockout/tagout*).

Contract may involve work on an uncontrolled hazardous substance site, Superfund site, or other contaminated site that could trigger Hazardous Waste Operations and Emergency Response (*HAZWOPER*) planning and training requirements. (Ref: CERCLIS List)

Contract work may involve application, handling or disturbance of *lead*, *cadmium* and/or *zinc chromate containing materials*. An example would be the removal of *toxic surface coatings* (i.e. paint).

Contract work may involve handling, disturbance, abatement or work around *asbestos containing materials* (ACM).

Contract work may involve application of *pesticides, herbicides, etc.*

13. Hazardous Chemical Communication

The following is a list of Hazardous Chemicals and atmospheric contamination that may be encountered at LG&E and KU Services Company sites. It should in no way be deemed as the only contamination that could be encountered at LG&E and KU Services Company sites. Always be aware of the contamination that could be encountered and become familiar with their Material Safety Data Sheets.

Chemical Name	Formula	Trade Name	Description/ Target Organ

Anhydrous Ammonia	NH3 (99-100%)		Liquid colorless gas or compressed liquid with extremely pungent odor. Targets eyes, skin and respiratory system.
Arsenic	AS	Organic Arsenic	Targets skin, kidneys, liver and resp. system.
Asbestos		Hydrated Mineral	Fibers found in insulation, gaskets, packing, vinyl asbestos flooring, roofing, and other materials. Targets respiratory system. Can cause lung cancer.
Carbon Dioxide	CO_2	Carbonic Acid Gas Dry ice	Targets respiratory system and cardiovascular system
Carbon Monoxide	CO	Flue gas/Monoxide	Colorless, odorless gas. Targets lungs, blood, can be immediately fatal.
Chromium Hexavalent	Cr(VI)	Hexavalent Chromium	Metal that targets the respiratory tract, skin and eyes. Irritant.
Hydrogen Sulfide	H_2S	Sewer gas Hydro sulfuric Acid	Colorless gas with strong rotten egg odor, quick loss of sense of smell, can be immediately fatal.
Hydrogen	H_2	Liquid Gas	Colorless, odorless, targets eyes, skin respiratory system
Lead	Pb	Lead metal	Heavy soft gray metal. Targets eyes, kidneys and blood.
Ozone	O_3	Triatomic Oxygen	Colorless, targets eyes and respiratory sys.
Sulfur Dioxide	SO_2	Sulfuric Acid	Targets eyes, skin, and respiratory sys.

14. Definitions

Competent Person: means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to workers, and who has authorization to take prompt corrective measures to eliminate them.

Qualified Person: is one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems relating to subject matter, the work, or the project.

I have read the LG&E and KU Services Company Contractor Safety Policy as outlined above and I understand and agree to abide by the requirements set forth therein; and confirm this by signing below.

CONTRACTOR SENIOR MANAGER:_____

TITLE:_____

DATE:_____

2.0 Contractor/Subcontractor Safety and Health Questionnaire and Checklist

CONTRACTOR/SUBCONTRACTOR SAFETY AND HEALTH QUESTIONNAIRE AND CHECKLIST

THIS QUESTIONNAIRE IS REQUIRED FOR ALL CONTRACTORS AND SUBCONTRACTORS PRIOR TO STARTING WORK

The Company is committed to providing a safe and healthy workplace for employees and Contractors/Subcontractors. To qualify to perform work, the Contractor/Subcontractor shall provide the following information and agree to obtain the following information from all subcontractors utilized.

Contractor/Subcontractor Name:_____ Date: _____

Contracted Activity (please describe):_____

Contractor/Subcontractor Representative: _____ Phone: _____

Please provide a brief description of the work activities and location(s) undertaken by your company: _____

The following information must be from the facilities providing labor. We are not interested in overall statistics at a national or international level. Describe the area to which this questionnaire applies._____
_____

In the table below, provide the three most recent full years of history for the area or region this questionnaire applies. **In addition, attach copies of applicable OSHA 300 Logs (showing the actual injuries, etc. – not the summaries) and verification of your EMR/discount rate information.**

ITEM	DESCRIPTION	20___	20___	20___
A	Interstate Experience Modification Rate (EMR)			
	Using the OSHA 300 Logs from the facilities providing labor, please document the following:			
B	Recordable Incident Rate (RIR)	_____	_____	_____
C	Lost Time Incident Case Rate (LTICR)(only incidents that resulted in days away from work)	_____	_____	_____
D	Lost Workday Injury and Illness Case Rate (LWDCR)(includes days away from work, job transfers and job restrictions)	_____	_____	_____
E	Number of Injuries and Illnesses (Total Line Entries of 300 Log)	_____	_____	_____
F	Number of Lost Work Day Cases (Column H of 300 Log)	_____	_____	_____
G	Number of Job Transfer or Restriction Cases (Column I of 300 Log)	_____	_____	_____
H	Number of Injury Related Fatalities (Column G of 300 Log)	_____	_____	_____
I	Employee Hours Worked/Year (If unknown use # of employees x 2080)			
J	Total Number of Employees			
K	NAISC or Standard Industrial Classification (SIC)			

(B) Rate = E x 200,000 ÷Hours (C) Rate = F x 200,000 ÷ Hours (D) Rate = (F + G) x 200,000 ÷ Hours

	Question	Y / N	Comments
1.	Does your company have a written safety and health program? Please attach a copy with this submission.		
2.	Does your company have a written Hazard Communication Program?		
3.	Does your company have a written environmental compliance assurance program? Does your company have a written DOT Operator Qualification Plan? Please attach a copy with this submission for review. Note: Plan must meet or exceed LG&E and KU Services Company Gas Distribution Operator Qualification Plan.		
4.	Does your company use subcontractors? (This Questionnaire is required for all Subcontractors) If you do use sub-contractors, do you qualify subcontractors based on their ability to address safety, health, and environmental requirements? Do you verify that subcontractors meet regulatory requirements? Does your subcontractor have a DOT Operator Qualification Plan or are they qualified under your plan. If they have their own plan then please submit a copy for review		
5.	Are all documents, pertaining to this questionnaire, available for auditing? If no, please explain		
6.	Who in your company is responsible for coordinating your safety and health program? Name/Job Title:_____ Phone # ( )_____ Is safety and health a full time responsibility for this position?		
7.	Has your company received any citations from a regulatory agency during the last three years? If yes, describe citation(s)		
8.	Does your company perform safety audits/review? If yes, are safety audits documented?		
9.	Who reviews the safety audit/review and how often? Job Title:_____		

10.	Does your company provide/require the following? Eye Protection (ANSI-Z41.1)(29 CFR 1910.133) Fall Protection (ANSI-Z41.1)(29 CFR 1926.501 or 1910.66) Foot Protection (ANSI-Z41.1)(29 CFR 1910.136) Hand Protection (ANSI-Z41.1)(29 CFR 1910.138) Hard Hats (ANSI-Z89.1)(29 CFR 1910.135 Hearing Protection (ANSI-Z41.1)(29 CFR 1910.95) Respiratory Protection (ANSI-Z41.1)(29 CFR 1910.134		
11.	In addition to regulatory required Personal Protective Equipment, what other PPE is required or supplied? If any, please describe or list:_____		
12.	Describe how you will meet the requirements for first aid and medical provision under this contract.		
13.	Does your company have scheduled, documented employee safety meetings? If yes, how often? _____		
14.	Who conducts the safety meetings? Job Titles:_____		
15.	What managers/supervisors participate in the safety meetings? Job Titles:_____		
16.	Are meetings reviewed and critiqued by managers/supervisors?		
17.	Does your company hold on-site (tailgate/toolbox) safety meetings? If yes, how often? _____ Who conducts these safety meetings? Job Titles:_____ Is documentation available?		
18.	Does your company have a written policy regarding drug screening or testing of your employees? If Yes, please provide a copy of your plan to The Company representative.		

19.	Does your drug-testing program conform to DOT requirements? Comments:_____ If yes, which set of DOT regulations does your drug-testing program designed to satisfy? Pipeline and Hazardous Material Safety Administration PHMSA Federal Motor Carrier Safety Administration FMCSA		
20.	Does your company have policy requiring written accident/incident reports (spills, injuries, property damage, etc.)?		
21.	Does your company conduct accident/incident investigating? If yes, please attach a brief outline of procedures		
22.	Does your company document, investigate and discuss near miss accidents? If yes, is documentation available?		
23.	Are accident/incident reports reviewed by managers/supervisors?		
24.	Indicate the circumstances in which your company's employees may be subject to drug screening. Employment Random Probable Cause Post-Accident Periodic Other		

PLEASE RESPOND TO ALL ITEMS WITH "YES, NO, OR NA." (ESTIMATED PERCENTAGE OF EMPLOYEES SHOULD REFLECT THE PERCENTAGE OF EMPLOYEES PROVIDING LABOR WHO HAVE RECEIVED TRAINING).

PROGRAMS/TRAINING	REFERENCE SOURCE	PROGRAM DOCUMENTED AND WRITTEN Y/ N/ NA	EST. %	FREQUENCY OF TRAINING FOR INDIVIDUAL EMPLOYEES
Asbestos Class IV (Awareness)	OSHA 29 CFR 1926.1101			
Asbestos Class III	OSHA 29 CFR 1926.1101			
Asbestos Class I and II	OSHA 29 CFR 1926.1101			
Confined Space Entry	OSHA 29 CFR 1910.146(g)			
Cranes	OSHA 29 CFR 1926 Subpart CC			
Natural Gas Operations	DOT 49 CFR 192, Subpart N			
DOT HM-126\f Hazmat Employee	DOT 49 CFR 172.704			
Generation, Transmission, and Distribution Standard	OSHA 29 CFR 1910.269			
Electrical Safety	OSHA 29 CFR 1910.332			
Emergency Evacuation	OSHA 29 CFR 1910.38(a)			
Excavations	OSHA 29 CFR 1926.651			
Fall Protection	OSHA 29 CFR 1926.500			
First Aid/CPR	OSHA 29 CFR 1910.151(b)			
Forklifts	OSHA 29 CFR 1910.178(l)			
Hazard Communications	OSHA 29 CFR 11910.1200(h)			
Hazwoper - Awareness Level	OSHA 29 CFR 1910.120			
Hazwoper 8 Hour	OSHA 29 CFR 1910.120			
Hazwoper 24 Hour	OSHA 29 CFR 1910.120			
Hazwoper 40 Hour	OSHA 29 CFR 1910.120			
Hazwoper Supervisor 8 Hour	OSHA 29 CFR 1910.120			
Hearing Conservation	OSHA 29 CFR 1910.95			
Incipient Fire Fighting	OSHA 29 CFR 1910.157(g)			
Lead Worker	OSHA 29 CFR 1926.62(l)			
Lead Supervisor	See Above			
Lockout/Tag out Authorized Person	OSHA 29 CFR 1910.147(c)(7)			
Lockout/Tag out Affected Person	See Above			
New Employee Orientation	OSHA 29 CFR 1910.119(g)			
Personal Protective Equipment	OSHA 29 CFR 1910.132(f)			
Process Safety Management	OSHA 29 CFR 1910.119			
Respiratory Protection	OSHA 29 CFR 1910.134			
Scaffolding	OSHA 29 CFR 1926.454			
Substance Abuse	DOT 46 CFR 16.401 & 391.119			

Signature _____

Title _____

Date: _____

3.0 Overview of Passport Program

LG&E AND KU SERVICES COMPANY OVERVIEW OF PASSPORT PROGRAM

Purpose

Safety is a core value at LG&E and KU Services Company. To enhance the welfare of all who work in and around LG&E and KU Services Company facilities, an enhanced contractor safety program has been developed. Building on internal and external best practices, a cross functional team has developed improvements to the existing "Passport Program." The Passport Program is designed to cover industrial workers. For purposes of this overview, "LG&E and KU Services Company" refers to LG&E and KU. The key components of the program are outlined below.

Process Steps

STEP 1 – CERTIFICATION

All contractors working for LG&E and KU Services Company must be certified prior to entering company work sites or performing any work for the company. This process is administered by Supply Chain Support or as part of the specific project competitive bid process.

As part of the certification process, prime contractors (contractors entering into contracts directly with the company must identify any and all sub-contractors they plan on utilizing in work for the company. Each prime contractor is responsible for ensuring that those identified sub-contractors complete the same information and meet the same performance criteria as the prime contractor is expected to meet. In the event not all subcontractors have been identified prior to certification, the contractor shall notify LG&E and KU Services Company before engaging any subcontractor.

STEP 2 – PASSPORT TRAINING

All industrial workers employed by a certified contractor must complete a training program designed to inform them of the importance of safety and the hazards associated with working in an industrial environment. This training will also identify additional specific OSHA, EPA and DOT compliance training that may be needed in certain situations. Passport training, however, does not take the place of any of the compliance training required by the above listed agencies. **It is the responsibility of the contractor to provide any compliance training required for their employees.**

There are two options available to contractors with regard to the Passport Training:

Option 1 – Train-the-Trainer

LG&E and KU Services Company will provide a curriculum and conduct train-the-trainer sessions at appropriate intervals for the contractor's key safety/training personnel. For those contractors choosing this option, a resume for each prospective trainer must be submitted and must include the following information:

- Training delivery and development experience
- Knowledge of OSHA, DOT, and EPA Standards applicable to the work for which Contractor will be performing
- Health and safety knowledge and experience in managing a health and safety program

By virtue of their attendance and ability to pass a written examination, these key personnel would then be approved to provide training to the contractor's employees to meet the requirements of a "Passport."

NOTE: LG&E and KU Services Company reserves the right to reject any contractor employee as a potential trainer if:

- The above referenced information regarding experience and qualifications is not submitted
- The information submitted does not adequately indicate the prospective trainer's ability to perform the duties of a trainer for the Passport program.
- The prospective trainer does not complete the required train-the-trainer session, including successfully passing the final examination.

Option 2 – External Provider

External providers of the LG&E and KU Services Company Passport safety training program will also be assessed and certified by a representative from the Business Unit Training group in accordance with Option 1. This will allow certified contractors to seek Passport training for their employees from an external provider at their expense. A list of currently approved external providers is included in your certification packet.

STEP 3 – ATTESTATION FORM

Contractors will be required to attest to the fact that each employee, including subcontractors working on any LG&E and KU Services Company job site or performing any work on LG&E AND KU Services Company project, has received the required Passport training before starting work. The contractor will also attest that all employees are current on all required compliance training for the work that employee will be performing. Although LG&E and KU Services Company will be looking for confirmation that compliance training has been completed, it is not a requirement that the contractor provide training records for all individuals, and LG&E and KU Services Company will not monitor compliance training delivered by contractors to their employees. However, site compliance audits will be routinely performed to ensure the adequacy of the training provided. If an incident occurs, LG&E and KU Services Company will require the contractor involved to provide individual training records as part of the incident investigation process.

Upon successful completion of the required Passport safety training by a contractor's employee, the contractor will enter that employee's name, date of birth and training information into the LG&E and KU Services Company Contractor Health & Safety Data Base @ www.lge-ku.com. An electronic notification will be sent to the appropriate LG&E and KU Services Company representative for Passport authorization. Upon approval (on-line), the contractor will be notified electronically that the Passport has been approved and that the contractor can print and issue a Passport card to the newly entered worker. The card will have an identification number that will associate the worker with his or her records in the database. The contractor's employee must carry this card and valid government issued photo ID at all times while on LG&E and KU Services Company property or job sites.

The Passport does not serve as security clearance for an employee. The Passport merely attests to the fact that the contractor employee has completed all required training. Site access will be handled in accordance with local site access procedures. For long-term contractors, a photo ID with a magnetic strip may also be issued to a contractor's employee for security purposes. For all other employees of contractors, a sign-in sheet may be utilized to track individuals on site.

STEP 4 – SITE SPECIFIC ORIENTATION

Each employee of a contractor working on LG&E and KU Services Company property or job sites must attend a site specific orientation training identifying parking directions, security procedures, site map, emergency evacuation procedures, emergency contact names, medical facility locations, specific alarms, and site-specific hazardous materials. A separate orientation will be required for each generation site at which a contractor's employee works. This orientation will normally occur on the first day of work on the job site.

STEP 5 - HIRING SUBCONTRACTORS

Prime contractors are responsible for ensuring that any subcontractors working for them in any capacity directly or indirectly are held to the same safety performance expectations as the prime contractor itself. The primary contractor

shall request and review safety data prior to hiring any subcontractors to assure they meet the standards for favorable under the following safety criteria (LG&E and KU Services Company emphasizes that these criteria are minimum standards):

Safety Criteria – INCIDENT RATES*

Favorable: The three most recent years recordable Incident Rates will be compared to the related industry average in such years for the subcontractors' NAISC (or SIC) classification (as published by the Bureau of Labor Statistics). Subcontractors' Incident Rate shall not exceed the industry average in any related year.

Unfavorable: A single fatality identified within any of the three most recent year's statistics.

Safety Criteria – EMR**

Favorable: Workers Compensation Insurance Experience Modification Rate at or better than the average EMR rating for their industry.

Unfavorable: EMR greater than the industry average for their industry.

Note: Contact the LG&E and KU Services Company safety representative for direction in situations where a particular subcontractor does not meet the criteria due to extremely unique circumstances.

STEP 6 – CONTRACTOR REPORTING REQUIREMENTS

All accidents, injuries, dangerous occurrences and near misses shall be reported as soon as possible to the LG&E and KU Services Company Safety contact for the work site. A soon as possible means as soon as communications can be made without jeopardizing the life or health of any person. LG&E and KU Services Company is subject to various regulatory requirements requiring prompt investigation and reporting of certain events making it essential for all contractors to provide information without delay.

Contractors shall also report statistical information to LG&E and KU Services Company on a monthly basis.
The information required is:

- Number of hours worked at each LG&E and KU Services Company job site
- Number of fatalities, Lost Workday Cases and OSHA Recordable Injuries for each job site.

The preceding month's statistical information shall be entered into the LG&E and KU Services Company Contractor Health & Safety Database by the Contractor by Noon on the 5th working day of the month.

All reporting requirements will include any subcontractors working for the prime contractor.

Administration

- **All personnel working for contractors and subcontractors on LG&E and KU Services Company property or job sites must have a Passport.**
- The passport is valid for 12 months or until revoked by LG&E and KU Services Company, whichever is earlier. Refresher training options will be developed and provided annually
- The expenses of training will be the responsibility of the contractor.
- The contractor is responsible for ensuring that all of the above requirements are met for every individual worker utilized in work on LG&E and KU Services Company property or job sites. This includes all subcontractors utilized directly or indirectly by a prime contractor. The prime contractor will be responsible for ensuring that each subcontractor has met all of the requirements regarding issuance of a Passport and for ensuring that all reporting requirements outlined in Step 5, above, are fulfilled.

- LG&E and KU Services Company reserves the right to revoke any individual's Passport. See Passport Revocation and Reinstatement Guidelines below.
- Site audits will be routinely performed to assess effectiveness of and compliance with the information communicated during the Passport Program. These audits will be conducted by Site Safety, Site Contract Proponents, and Managers.
- Corporate Health & Safety will audit contractors for appropriate drug & alcohol, compliance and Passport training documents.

Passport Revocation and Reinstatement Guidelines

LG&E and KU Services Company reserves the right to revoke any individual's Passport. Passports can be revoked for:

- Failure to comply with safety rules, procedures or programs;
- Failure to comply with drug and alcohol rules or testing requirements;
- Creation of an unsafe condition that has potential to result in death or serious injury; or
- Any reason not violating applicable Federal, state or local law deemed appropriate by the responsible site manager.

If a contractor wishes to request that LG&E and KU Services Company reconsider a revocation decision, the request may in writing to the responsible site manager. LG&E and KU Services Company is not obligated to consider such requests.

A Passport may be reinstated in the sole discretion of LG&E and KU Services Company if the contractor has satisfied the responsible manager that the reason for revocation has been corrected.

If an individual's Passport is revoked for a second time, the individual will not be allowed to reapply for an LG&E and KU Services Company passport.

**** Incident Rates***

Incident rates can be used to show the relative level of injuries and illnesses among different industries, firms, or operations within a single firm. Rates are computed from the following formula:
# of injuries or illnesses X 200,000 / employee hours worked.

*****Experience Modification Rates for Workers' Compensation Insurance***

The Experience Modification Rate is a widely used indicator of past safety performance. The insurance industry has developed experience rating systems as an equitable means of determining premiums for workers' compensation insurance. These rating systems consider the average workers' compensation losses for a given firm's type of work and amount of payroll and predict the dollar amount of expected losses to be paid by that employer in a designated rating period, usually three years. Rating is based on comparison of firms doing similar types of work, and the employer is rated against the average expected performance in each work classification. Losses incurred by the employer for the rating period are then compared to the expected losses to develop an experience rating.

Workers' compensation insurance premiums for a contractor are adjusted by this rate, which is called the experience modification rate (EMR). Lower rates, meaning that fewer or less severe accidents had occurred than were expected, result in lower insurance costs. The EMR is adjusted annually by using the rate for the first three of the last four years.

4.0 Contractor Safety Management Project Specific Hazard Analysis

LG&E AND KU SERVICES COMPANY
Contractor Safety Management
Project Specific Hazard Analysis

This Hazard Analysis and the required subsequent Hazard Mitigation Plan shall be completed by the contractor's designee and shall be submitted to the Company's authorized representative and forwarded to their Health and Safety Specialist/Consultant prior to the initiation of any work. It is an expectation that the contractor will identify specific hazards related to the scope of work.

Work description and location:

LG&E and KU Services Company Proponent:

Estimated Total Work Days: Estimated Work Force #:

Equipment Related Compliance and Safety
Will the contractor use any of the following or be exposed to its use?

	Will use it or be exposed to its use?	
Abrasive Wheel Machinery	Yes ☐	No ☐
Aerial Work Platform Operation	Yes ☐	No ☐
Barricades	Yes ☐	No ☐
Excavation Equipment	Yes ☐	No ☐
Cranes: Overhead ☐ Mobile ☐	Yes ☐	No ☐
Overhead Power Lines?	Yes ☐	No ☐
If yes, specify voltage:		
Forklift Operation	Yes ☐	No ☐
Ground Fault Protection (GFI's/GFCI's)	Yes ☐	No ☐
Grounding devices and processes (static)	Yes ☐	No ☐
Hand Tools / Power Tools	Yes ☐	No ☐

Specific Hazardous Substances Compliance and Safety

Anhydrous Ammonia	Yes ☐	No ☐	
Arsenic	Yes ☐	No ☐	
Asbestos	Yes ☐	No ☐	
Bloodborne Pathogens (Applies to all)	Yes ☐		
DOT Hazardous Materials	Yes ☐	No ☐	
EPA Hazardous Waste	Yes ☐	No ☐	
Explosive Gasses, Vapors, or dusts	Yes ☐	No ☐	
Hazard Communication (Applies to all)	Yes ☐		
Hexavalent Chromium (Hot Work)	Yes ☐	No ☐	**(Mandatory contact with H&S Rep.)**
MSDS's supplied on all materials	Yes ☐	No ☐	
Radiation	Yes ☐	No ☐	
Lead or other toxic metal concerns	Yes ☐	No ☐	
Natural Gas	Yes ☐	No ☐	
Hydrogen Sulfide	Yes ☐	No ☐	
Other / Specify	Yes ☐	No ☐	

Personal Protective Hazard

Which of the following PPE will be required?

Electrical protective equipment	Yes ☐	No ☐
Low voltage gloves (Class 0, 50-600 volts)	Yes ☐	No ☐
Boundary Distances Established and Enforced	Yes ☐	No ☐
Arc Flash PPE	Yes ☐	No ☐
Class 2 600 -15kv gloves/sleeves	Yes ☐	No ☐
Rubber insulated blankets/hoses	Yes ☐	No ☐
What will the exposed voltage level be?		
Eye Protection with side shields (at all times)	Yes ☐	
Goggles: directly vented ☐ indirectly vented ☐ cutting ☐	Yes ☐	No ☐
Welding Hood	Yes ☐	No ☐
Face Shield	Yes ☐	No ☐
Fall Protection or Prevention	Yes ☐	No ☐
Gloves (Appropriate to the specific task)	Yes ☐	No ☐
Life lines (horizontal or vertical)	Yes ☐	No ☐
Foot Wear: steel toes ☐ electrical hazard rated ☐	Yes ☐	No ☐
Hard Hats (Applies to all)	Yes ☐	No ☐
Hearing Protection (Reduction to <85db. required)	Yes ☐	No ☐
Natural Gas Exposure PPE		
Fire Suit	Yes ☐	No ☐
Positive Pressure Respirator	Yes ☐	No ☐
Hood	Yes ☐	No ☐
Harness	Yes ☐	No ☐
Life Line	Yes ☐	No ☐
Gloves	Yes ☐	No ☐
PFD (personal flotation device)	Yes ☐	No ☐
Traffic Vest	Yes ☐	No ☐
Respiratory Protection	Yes ☐	No ☐
Portable ventilation equipment	Yes ☐	No ☐

Identify the Respiratory Hazard

Will the contractor have exposure to:

Total dust	Yes ☐	No ☐
Silica	Yes ☐	No ☐
Arsenic / Flyash	Yes ☐	No ☐
Asbestos	Yes ☐	No ☐
Hexavalent Chromium	Yes ☐	No ☐
Lead	Yes ☐	No ☐
SO_2	Yes ☐	No ☐
Others / specify	Yes ☐	No ☐

Has air monitoring been arranged? Yes ☐ No ☐

Has air monitoring been discussed with the H&S Specialist/Consultant? Yes ☐ No ☐

Work/Safety Procedural Requirements	**Will use it or be exposed to its use?**	
Bulk Chemical Unloading	Yes ☐	No ☐
Compressed Gas Cylinders	Yes ☐	No ☐
Confined Space Entry	Yes ☐	No ☐
Specify:		
CPR & First Aid (under 1910.269, > 50 volts)	Yes ☐	No ☐
CPR & First Aid qualified person on site	Yes ☐	No ☐
Mobile Crane Operator Physicals (3 yr. req)	Yes ☐	No ☐

DOT Commercial Driver's License	Yes ☐	No ☐
Excavation / Trenching and Shoring	Yes ☐	No ☐
Explosion Hazard (Deslagging / Blasting)	Yes ☐	No ☐
Fire Protection (Hot work, welding & alike)	Yes ☐	No ☐
Gas Repair Procedures	Yes ☐	No ☐
Lifting and Rigging	Yes ☐	No ☐
Lockout/Tagout	Yes ☐	No ☐
Grounding Procedures	Yes ☐	No ☐
Equipment required to be isolated (list):		
Marine Standard	Yes ☐	No ☐
Scaffold Competent Builder	Yes ☐	No ☐
Scaffold Competent User	Yes ☐	No ☐
Suspended Scaffolding	Yes ☐	No ☐
Work Zone Traffic Safety	Yes ☐	No ☐
Others / specify	Yes ☐	No ☐

Permits

Are there any permits indicated with outside agencies? Yes ☐ No ☐
Asbestos removal, building permits, work zones, RR crossing, environmental impact, etc.)
Detail:

Are there any OSHA related permits? Yes ☐ No ☐
(Permit Required Confined Space Entry, Dig permits and alike)
Detail:

Work Area Lighting

Additional lighting devices will be needed Yes ☐ No ☐
Type of lighting:

Specify Additional Hazards:

Further instructions:
For each Yes box checked or additional hazards identified, a Hazard Mitigation Plan must be submitted along with this Hazard Analysis prior to the initiation of any work.

Name of the contracted firm:

Name of the contractor's Health & Safety designee completing this Hazard Analysis:

Date:

Phone number:

5.0 Contractor Safety Management Hazard Mitigation Plan

LG&E and KU Services Company
Contractor Safety Management
Hazard Mitigation Plan

This Hazard Mitigation Plan shall be filled in by the contractor's designee and must be submitted to the Company's authorized representative or their designee and forwarded to their Health and Safety Specialist/Consultant prior to the initiation of any work.

Description of the general job activity (e.g.: replacing duct work, building SCR):

Contractor's site supervisor:

Contractor's site Health and Safety Representative:

Date:

What is the work, what are the hazards, and how will we specifically protect our employees?

LG&E and KU Services Company
Contractor's Hazard Mitigation Plan

Work Task Sequence Identify the principal steps and the sequence of work activities. (e.g.: Entry into an excavation)	**Identify and Analyze the Hazards** Analyze each step for hazards. (e.g.: cave in, falls, confined space entry)	**Hazard Controls** Develop specific controls for each hazard identified. (e.g.: bench or slope or shore, air monitor, barrier, PPE. Be specific)

Work Task Sequence Identify the principal steps and the sequence of work activities.	**Identify and Analyze the Hazards** Analyze each step for hazards.	**Hazard Controls** Develop specific controls for each hazard identified.

6.0 Contractor Drug and Alcohol Testing Requirements

Effective January 31, 2008, random drug and alcohol testing of all day-to-day and major construction contractors is required as follows:

- "Day to Day" contractors must randomly test 5% of employees working on LG&E and KU sites each month.
- All major construction project contractors must randomly test 10% of all workers each month while working at LG&E and KU locations.
- All (100%) of all construction/transient contractors working at generating plants will be drug tested within 7 days prior to starting work for LG&E and KU. After that, the contracting company must randomly test 10% of those employees each month while working at LG&E and KU sites.
    - ⇒ If contractor employees are moving from site to site with no more than a 30 day break in LG&E and KU work assignments, another pre-work drug test is not required. However, these employees should remain in the 10% per month random testing pool while working at LG&E and KU
- "Day to Day" means contractors who has a daily working relationship with LG&E and KU and are not used solely on an intermittent basis.
- "Major Construction Projects" apply to large initiatives in Energy Services.
- Pre-employment or reasonable suspicion / probable cause testing should NOT be included in calculating the testing rate.
- The contractor is responsible for all testing and administrative costs associated with the random drug and alcohol testing requirements, but any employee's time away from the job for testing will occur during regularly scheduled work hours and paid by LG&E AND KU.
- LG&E and KU Corporate Health and Safety will randomly audit contractor testing programs to ensure requirements are met.
- An LG&E and KU Sourcing Representative will be in touch with each contractor to discuss these requirements.
- Contractors who have additional questions can contact LG&E and KU Corporate Health and Safety by leaving a message on the Contractor Health and Safety Hotline at (502) 627-4841 or by sending an e-mail to CHS.Hotline@LGE-KU.com.

7.0 Job Performance Monitoring Tool

LG&E and KU Services Company
Contractor Safety Management
Job Performance Monitoring Tool

This form shall be filled in by LG&E and KU Services Company contract proponent or designee. The form shall be forwarded to the Health and Safety Specialist/Consultant and the results discussed with contractor management.

Monitoring performed by:

Employee #: **Date:**

Location:

	Check One
Job Briefing conducted	Yes ☐ No ☐
Tools 2 and 3 are in the hands of the crew	Yes ☐ No ☐
Housekeeping	
Job site clean and free of excess trash and debris	Yes ☐ No ☐ N/A ☐
Walkways and passages are clear	Yes ☐ No ☐ N/A ☐
Material or equipment properly stored	Yes ☐ No ☐ N/A ☐
Electrical cords, hoses, welding, leads, and alike (Elevated and protected to prevent hazards)	Yes ☐ No ☐ N/A ☐
Scrap material free of protruding nails or other puncture hazards	Yes ☐ No ☐ N/A ☐
Trash receptacles are provided for work area	Yes ☐ No ☐ N/A ☐
Barricades installed, maintained, and disassembled if job completed	Yes ☐ No ☐ N/A ☐
Break areas, offices, trailers and like areas are specific to the contractor	Yes ☐ No ☐ N/A ☐
Equipment	
Abrasive Wheel Machinery (Proper use / wheels adjusted)	Yes ☐ No ☐ N/A ☐
Aerial Work Platform Operation (Inspected and operated as required)	Yes ☐ No ☐ N/A ☐
Barricades (Installed as required)	Yes ☐ No ☐ N/A ☐
Excavation Equipment (Inspected and operated as required)	Yes ☐ No ☐ N/A ☐
Compressed Gas Cylinders (Stored, connected and used properly)	Yes ☐ No ☐ N/A ☐
Cranes (Area control, power line safety, inspected daily and documents retained)	Yes ☐ No ☐ N/A ☐
Forklift Operation (Proper seat belts, speed & loading)	Yes ☐ No ☐ N/A ☐
Ground Fault Protection (Proper GFI's/GFCI's)	Yes ☐ No ☐ N/A ☐
Grounding devices and processes (Properly applied)	Yes ☐ No ☐ N/A ☐
Hand Tool / Power Tools / Wood Working Machinery (Proper use & guards)	Yes ☐ No ☐ N/A ☐
No safety features by-passed or defeated on any equipment?	Yes ☐ No ☐ N/A ☐
Hazardous Substances	
Anhydrous Ammonia (Related requirements and work practices complied with)	Yes ☐ No ☐ N/A ☐
Arsenic (Complying with required procedures)	Yes ☐ No ☐ N/A ☐
Asbestos (Complying with required procedures)	Yes ☐ No ☐ N/A ☐
Bloodborne Pathogens (Applies to all) (Complying with required procedures)	Yes ☐ No ☐ N/A ☐
DOT Hazardous Materials (Complying with required procedures)	Yes ☐ No ☐ N/A ☐
EPA Hazardous Waste (Complying with required procedures)	Yes ☐ No ☐ N/A ☐
Flammable Atmosphere	Yes ☐ No ☐ N/A ☐

Hazard Communication (Applies to all) (MSDS's available)	Yes ☐	No ☐	N/A ☐
Radiation (Complying with required procedures)	Yes ☐	No ☐	N/A ☐
Lead and other toxic metals concerns (Complying with required procedures)	Yes ☐	No ☐	N/A ☐
Natural Gas	Yes ☐	No ☐	N/A ☐
Hydrogen Sulfide	Yes ☐	No ☐	N/A ☐
Oxygen Deficient Atmosphere	Yes ☐	No ☐	N/A ☐
Other / Specify:	Yes ☐	No ☐	N/A ☐

Personal Protective Equipment

Low voltage gloves (Class 0, 50-600 volts)	Yes ☐	No ☐	N/A ☐
Arc Flash PPE	Yes ☐	No ☐	N/A ☐
Class 2, 600-15kv gloves/sleeves	Yes ☐	No ☐	N/A ☐
Rubber insulated blankets/hoses	Yes ☐	No ☐	N/A ☐
Eye Protection (Required at all times)	Yes ☐	No ☐	
Directly or Indirectly vented goggles; cutting goggles (Applied as required)	Yes ☐	No ☐	N/A ☐
Welding Hood	Yes ☐	No ☐	N/A ☐
Fall Protection or Prevention (Guards, guard rails, body harnesses properly worn) (Lanyards and 5400# anchorage, perimeter guarding, static lines and rat lines installed)	Yes ☐	No ☐	N/A ☐
Foot Wear (With steel toes) (Applied as required)	Yes ☐	No ☐	N/A ☐
Foot wear (Electrical Hazard rated at > 50 volts) (Applied as required)	Yes ☐	No ☐	N/A ☐
Gloves (Applied as required)	Yes ☐	No ☐	N/A ☐
Hard Hats (Applies to all)	Yes ☐	No ☐	
Hearing Protection (Applied as required)	Yes ☐	No ☐	N/A ☐
Natural Gas Exposure PPE			
Fire Suit	Yes ☐	No ☐	N/A ☐
Positive Pressure Respirator	Yes ☐	No ☐	N/A ☐
Hood	Yes ☐	No ☐	N/A ☐
Harness	Yes ☐	No ☐	N/A ☐
Lifeline	Yes ☐	No ☐	N/A ☐
Gloves	Yes ☐	No ☐	N/A ☐
PFD (Personal flotation device)	Yes ☐	No ☐	N/A ☐
Traffic Vest	Yes ☐	No ☐	N/A ☐
Respiratory Protection (Change schedule, proper storage and disposal)	Yes ☐	No ☐	N/A ☐
Portable ventilation equipment (Air monitoring as required to substantiate)	Yes ☐	No ☐	N/A ☐

Specific Work Requirements

Bulk Chemical Unloading (Proper barricades, communication, PPE, showers)	Yes ☐	No ☐	N/A ☐
Confined Space Entry (Air monitoring, permit-if required, hot work permit, non-entry rescue)	Yes ☐	No ☐	N/A ☐
Permit Required	Yes ☐	No ☐	N/A ☐
CPR First Aid qualified person on site	Yes ☐	No ☐	
Cranes / Power lines (Proper clearances maintained by ASME B30.5 standards)	Yes ☐	No ☐	N/A ☐
DOT Commercial Driver's License (Applied as required)	Yes ☐	No ☐	N/A ☐
Excavation/Trenching and Shoring (Sloped and shored, access every 25ft., daily inspection)	Yes ☐	No ☐	N/A ☐
Fire Protection (Hot work, welding, housekeeping, flammable materials & alike) (Oxygen and combustibles separated, containers labeled, fire extinguisher) (Hot work and welding screens, flammable storage cabinets)(Explosive Hazards)	Yes ☐	No ☐	N/A ☐
Gas Operator Qualifications	Yes ☐	No ☐	N/A ☐
Gas Repair Procedures	Yes ☐	No ☐	N/A ☐
Ladders (Proper angles, secured, exceeds landing by 3 ft.)	Yes ☐	No ☐	N/A ☐
Lead work (Abatement, personal protection, disposal, control of the area)	Yes ☐	No ☐	N/A ☐
Lifting and Rigging (Slings tagged, softeners as required, area controlled)	Yes ☐	No ☐	N/A ☐
Lighting (Proper work area lighting)	Yes ☐	No ☐	N/A ☐
Lockout/Tagout 147/269 (Clothing, restricted areas at > 50 volts)	Yes ☐	No ☐	N/A ☐

Marine Standard (Decks clear, equipment stored, life preservers, access/egress)	Yes ☐	No ☐	N/A ☐
Scaffold Competent Builder (Proper access and egress, tagged, inspected prior to each shift)	Yes ☐	No ☐	N/A ☐
Scaffold Competent User (Scaffolds inspected by each user)	Yes ☐	No ☐	N/A ☐
Suspended Scaffolding (Inspected daily or at the start of each shift, torqued J clips)	Yes ☐	No ☐	N/A ☐
Permits (Air, water, environmental, asbestos, building, etc.)	Yes ☐	No ☐	N/A ☐
Permits (OSHA related: Dig permits, hot work, and alike)(Applied as required)	Yes ☐	No ☐	N/A ☐
Traffic control/Work zone hazards properly marked	Yes ☐	No ☐	N/A ☐
Vehicles (Speed, lights working, seat belts, properly maintained, licenses and certificates as req.)	Yes ☐	No ☐	N/A ☐

Contractor Firm Name:

Employee(s) Name:

Valid Passport(s) presented?

Time:

Specific location:

Detail the specifics of any performance correction cited.
Detail:

What contractor Leadership / Management representative was notified and by whom?

NOTE: Contractor can choose to use this form or a Contractor form that is similar in nature to monitor job performance. This is only shown as an example.

8.0 Quality Assurance Closure Form for Contractors

LG&E and KU Services LLC
Contractor Safety Management
Quality Assurance Closure Form for Contractors

At the completion of any project the contractor's representative must inspect and attest to each of the following and shall return this form to their contract proponent prior to departure from the job site. The contract proponent will then forward a copy of the Job Closure Form to their Health and Safety Specialist/Consultant.

Work description and location:_____

Print the name of your LG&E and KU Services LLC Contract Proponent:

1. Has the technical scope of work been completed? Yes ☐ No ☐

2. Has the job site been cleaned and returned to original or better condition? Yes ☐ No ☐

3. Have all materials been properly disposed of and documented as required? Yes ☐ No ☐

4. Have all Lockout and Tagout clearances been removed / released. Yes ☐ No ☐

5. Have all required statistics been entered into the Contractor's Safety Database? Yes ☐ No ☐

Details on each of the five specific requirements may be added to the reverse side of this form. If a "No" box is checked, specific details are required for submission of this job closure document.

Name of the contractor firm:_____

Name of the contractor's representative completing this form (print):

Representative's telephone number:

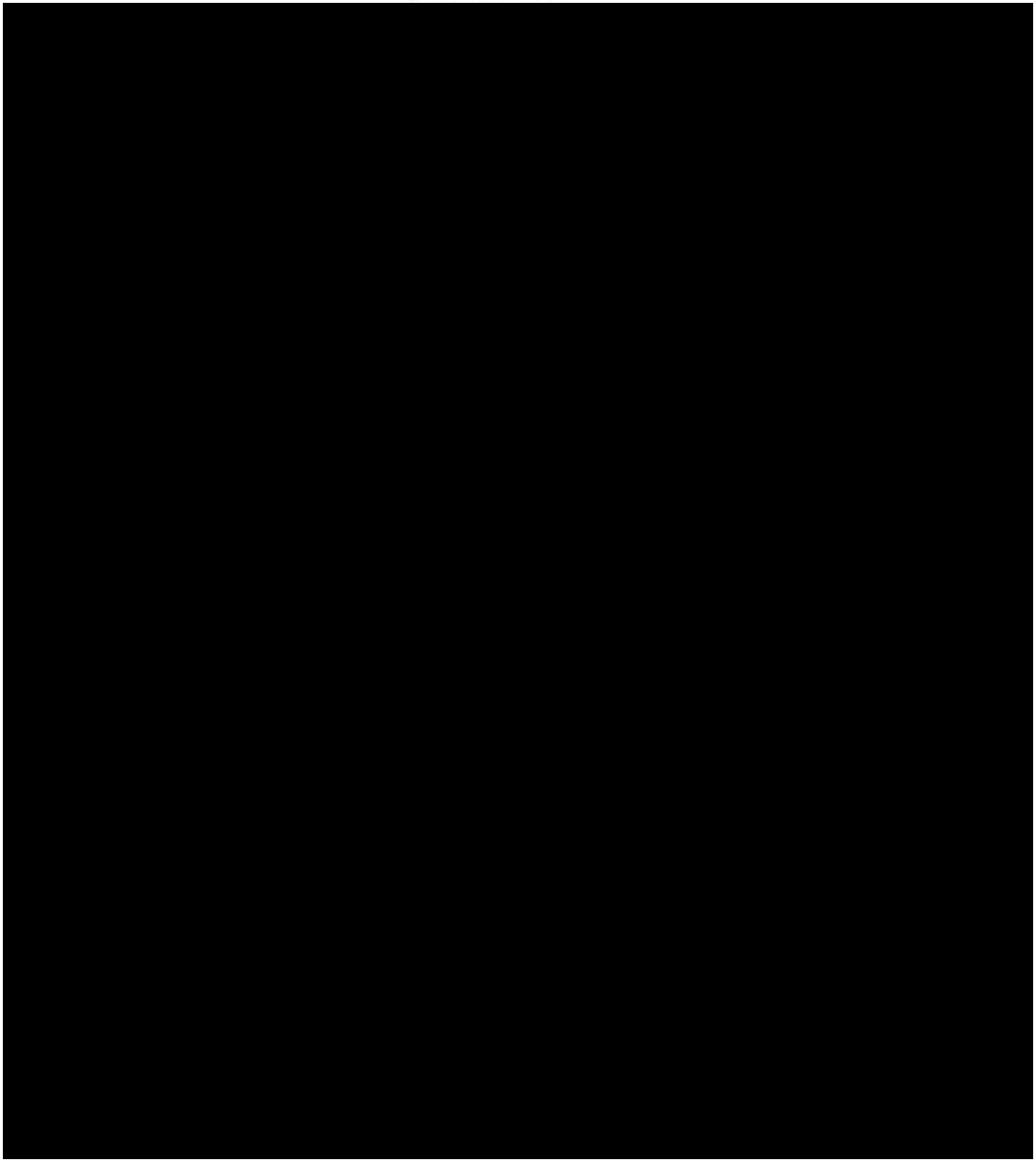
Contractor representative's signature:

Date:

NOTE: List, by number, an explanation of any item that was checked NO

EXHIBIT I

INSURANCE



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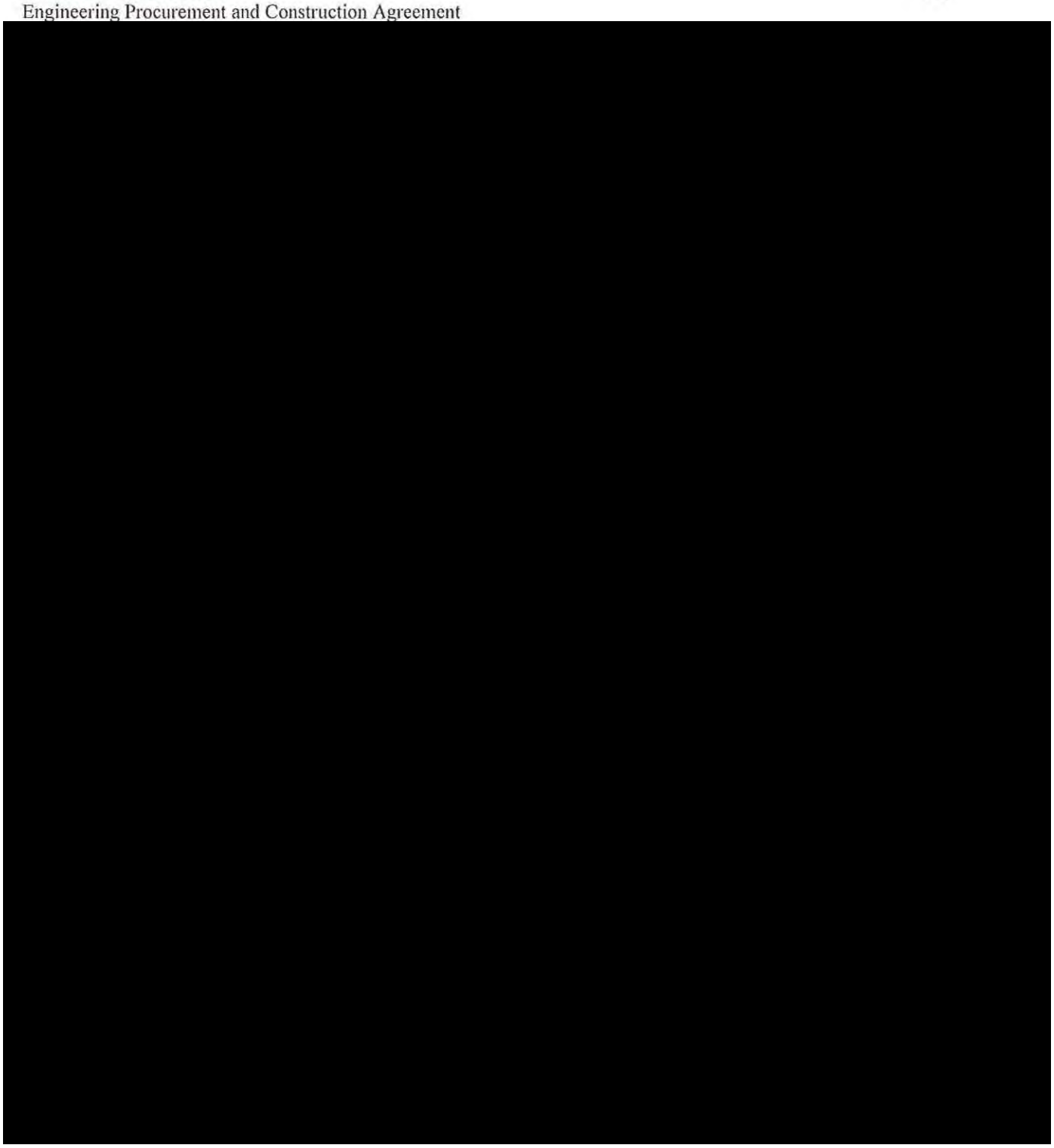

Attachment 1

[redacted]

[redacted]

Project Organization (Trimble County CCRT)

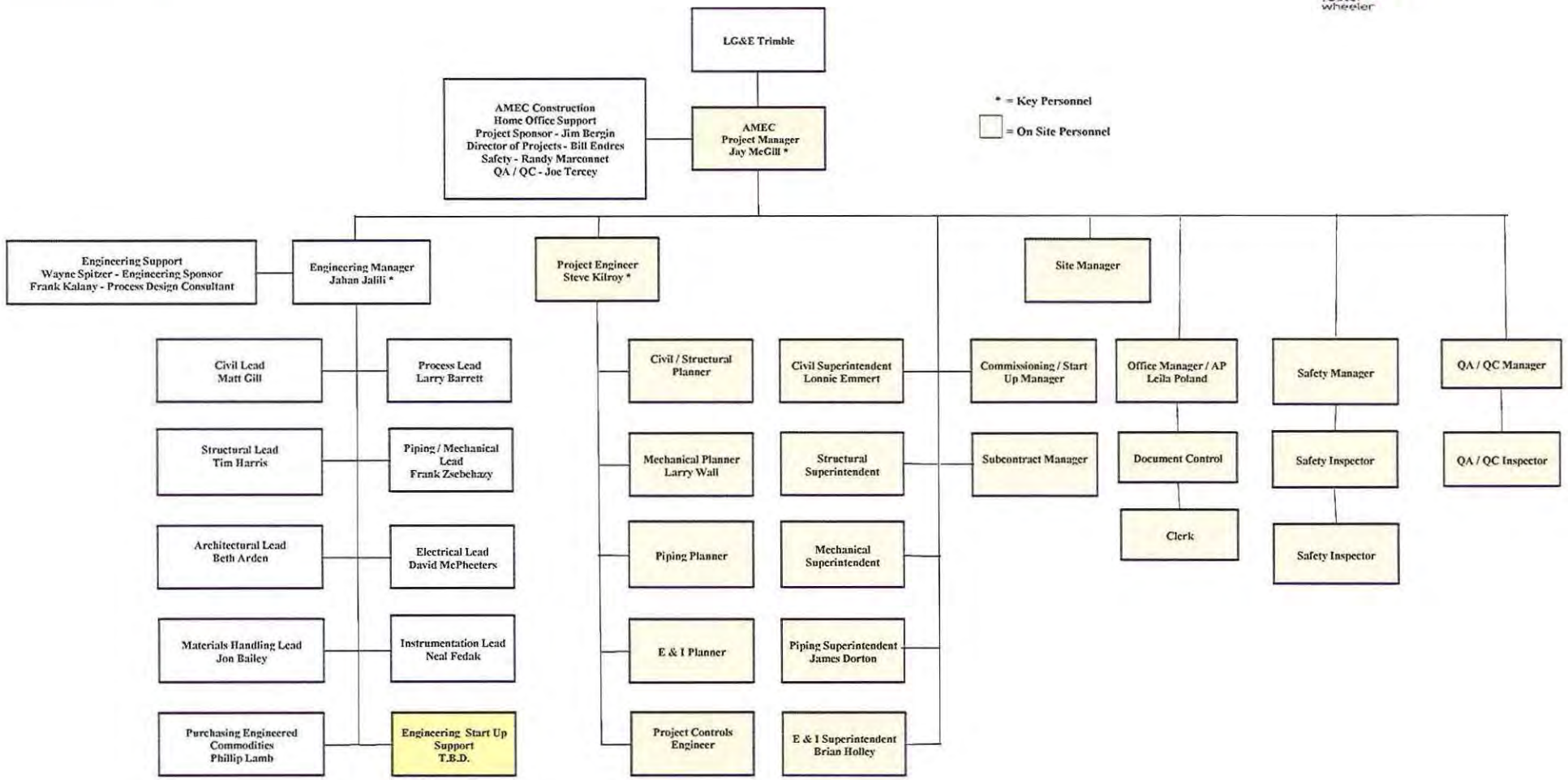

EXHIBIT L

LIQUIDATED DAMAGES

[redacted]

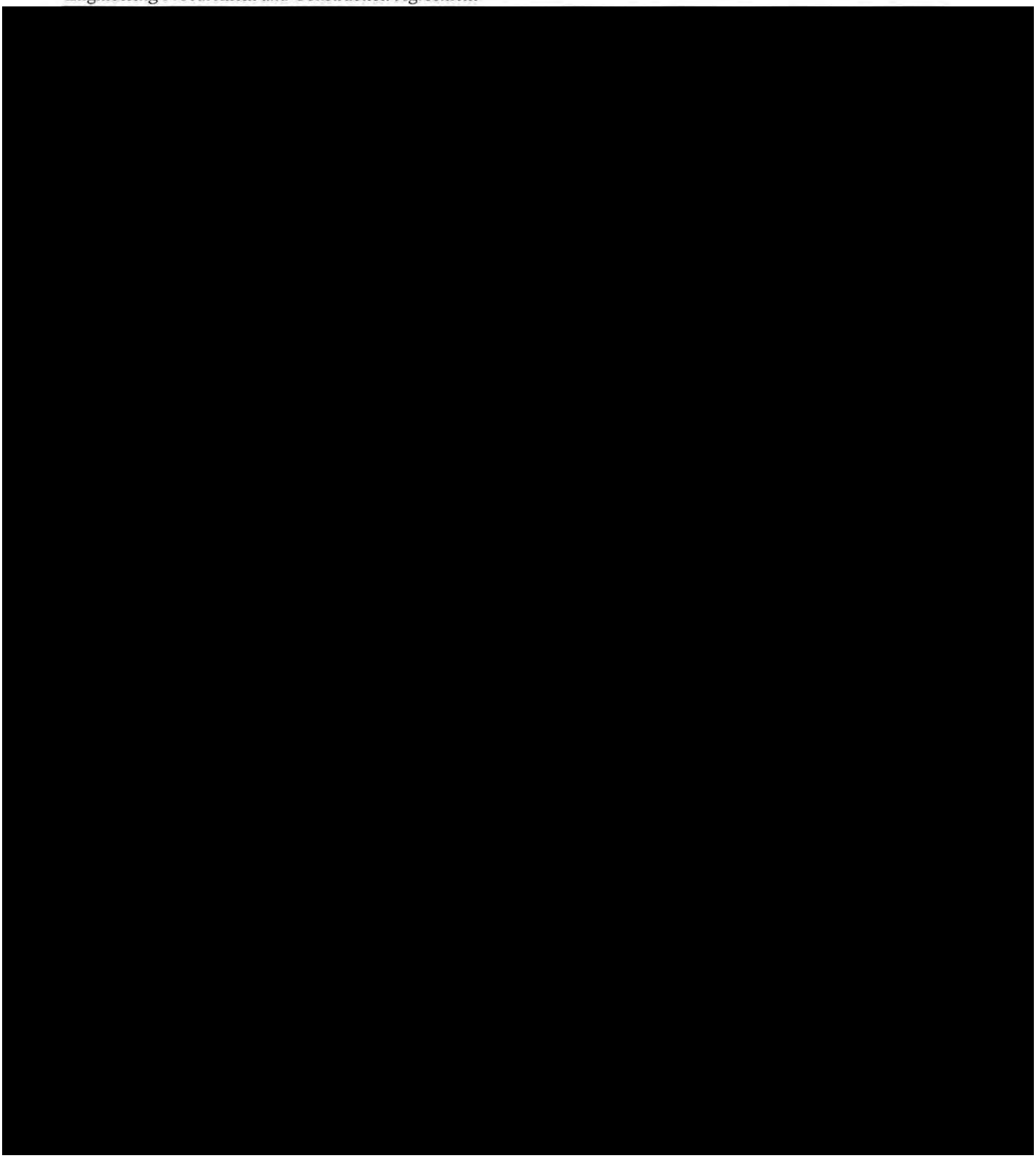

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EXHIBIT M

MEETINGS, COORDINATION AND PROGRESS REPORTS

1. MEETINGS, COORDINATION AND PROGRESS REPORTS DETAILS

1.1 SUMMARY:

A. This section outlines the meeting, coordination, scheduling and reporting requirements for the Agreement. The Contractor shall provide support for these activities as applicable including attending project meetings.

B. Project Meetings:

1. Initial Project Preliminary Conference
2. Monthly (or Weekly) Design and Engineering Coordination Meetings
3. Preconstruction Conference
4. Construction Coordination Activities and Meetings
5. Construction, Outage Coordination and Startup Meetings
6. Quarterly Executive Management Meetings and Management Reports
7. Weekly Site Meetings

C. Schedules and Reports:

1. Initial Coordination Submittals
2. Work Progress Schedule
3. Work Progress Reports – Design and Monthly Management
4. Delivery Schedule and Procurement Activities
5. Project Equipment Supplier Program Reports
6. Weekly Construction Reports
7. Field Progress Measurement System
8. Recovery Plan

D. Related Work Specified Elsewhere:

1. Submittals: **Exhibit X**
2. Acceptable Equipment and Materials: **Exhibit E**

1.2 PROJECT MEETINGS:

A. Initial Project Preliminary Conference:

1. Contractor will conduct a meeting within thirty (30) Business Days after the Effective Date of the Agreement, to review items stated in the agenda and

to establish a working understanding between the Parties as to their relationships during performance of the Work. The conference shall be attended by:

a. Contractor

b. Representatives of principal Subcontractors and suppliers

c. Owner's representative(s)

2. Meeting Agenda:

a. Safety, design and engineering

b. Projected fabrication/construction schedules

c. Project coordination

d. Procedures and processing of:

i. Submittals

ii. Change Orders

iii. Applications for Payment

e. Procedures for testing

3. Location of Meeting: Owner's office or Contractors office

4. Reporting: Contractor shall prepare and distribute minutes of the meeting to each party represented.

B. Monthly (or Weekly) Design and Engineering Coordination Meetings:

1. Contractor shall schedule and conduct a meeting at least monthly for coordination during Contractor's Equipment engineering and design phase of the Work. Contractor shall utilize storyboards during coordination meetings. Meetings shall be attended by:

a. Contractor representative(s) including engineering personnel

b. Major Equipment supplier representative(s) including engineering personnel

c. Representatives of Subcontractors and suppliers

d. Owner's representative(s)

2. Meeting Agenda:

a. Safety

b. Review of action items that describe an activity that a party is responsible for completing

c. Facility design interfaces: Owner

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d. Facility design interfaces: other (Landfill construction activities, Leachate Pump Structure, etc.)

e. Equipment and material procurement status

f. Engineering/fabrication/manufacturing schedules

g. Requests for Information (RFIs) prepared by Contractor and submitted to Owner seeking interpretation or clarification

h. Request for deviation prepared by Contractor and submitted to Owner seeking approval

3. Location of Meetings: engineering office, Job Site or teleconference.

4. Reporting: Within five (5) Business Days after the meeting, Contractor shall prepare and distribute minutes of the meetings to each party represented.

C. Preconstruction Conference:

1. Contractor will conduct a meeting within thirty (30) Business Days prior to Contractor starting work at the Job Site, to review items stated in the following agenda and to establish a working understanding between the Parties as to their relationships during performance of the Job Site Work.

2. Preconstruction conference shall be attended by:

a. Contractor representative(s) including Project Manager

b. Owner representatives

c. Major Subcontractor(s) and Equipment suppliers as appropriate

d. Others as appropriate

3. Meeting Agenda:

a. Safety and first aid

b. Construction schedules

c. Critical Work sequencing

d. Designation of responsible personnel

e. Project coordination (with Project Engineering and Plant)

f. Procedures and processing of:

i. Field decisions

ii. Deliveries

iii. Submittals

iv. Change Orders

v. Applications for Payment

g. Procedures for testing

h. Procedures for maintaining record documents

i. Use of premises:

i. Office, work, and storage areas

ii. Owner's requirements

j. Construction facilities, controls, and construction aids

k. Temporary utilities

l. Security

4. Location of Meeting: Job Site, Owner's office or Contractor's office

5. Reporting:

a. Within five (5) Business Days after the meeting, Contractor shall prepare and distribute minutes of the meeting to all parties.

b. Contractor shall provide copies to Subcontractors and major Equipment suppliers not in attendance.

D. Construction Coordination Activities and Meetings:

1. Coordination: Coordinate construction operations included in the Technical Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, which depend on each other for proper installation, connection, and operation.

a. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

b. Make adequate provisions to accommodate items scheduled for later installation.

c. Where availability of space is limited, coordinate installation of different components to allow optimum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

d. Coordination of Owner and other interfaces (Landfill construction activities, Leachate Pump Structure, etc.)

e. Coordination of deliveries, Work and with ongoing plant activities with Owner.

2. Contractor shall schedule and conduct a meeting at least monthly for coordination during construction phase of the Work. Contractor should utilize storyboards during coordination meetings. Meetings shall be attended by:

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a. Equipment suppliers' representative(s) including engineering personnel

b. Representatives of principal Subcontractors and suppliers

c. Owner's representative(s)

d. Contractor

3. Meeting Agenda (as applicable):

a. Safety

i. Safety Minute

ii. Safety review of recordables, first aids, near miss, incidents

iii. Hazards and risks

iv. Work hours

b. Open items/engineering

i. Review of action items

ii. Review of RFI's

iii. Change Orders

iv. Submittal schedules and status

c. Review of project schedule/construction

i. Review of construction progress since previous meeting

ii. Revisions to construction schedule

iii. Problems impeding construction schedule (if any)

iv. Corrective measures and procedures to regain construction schedule if necessary

v. Equipment and material procurement status

vi. Delivery schedules

vii. Review proposed Agreement modifications for:

a. Effect on construction schedule and on completion date

b. Effect on other contracts of the Project

viii. Engineering/fabrication/manufacturing schedules

ix. Field observations, interface requirements, conflicts

x. Quality and work standards

xi. Key areas of focus for the project team

xii. Critical issues for management intervention

d. Commercial and administrative

i. Documentation of information for payment request

ii. Cash flows

iii. Disadvantaged business procurement

iv. Other business

4. Location of Meetings: Job Site.

5. Reporting: Within three (3) Business Days after the meeting, Contractor shall prepare and distribute minutes of the meetings to each party represented.

E. Construction, Outage Coordination and Startup Meetings:

1. The Contractor and Owner shall jointly conduct onsite construction coordination meetings during the periods of planned construction for pre and post outage periods. Such meetings may, at the Owner's option, occur as often as daily or as necessary to properly monitor and coordinate the efforts of the Contractor's Work with the work the Owner will be performing. Contractor may be required to provide its Work and schedule status on a daily basis as part of its reporting in such meetings.

The Contractor and Owner shall jointly conduct onsite outage coordination meetings during the periods of the planned Unit or system outages and startup. Such meetings may, at the Owner's option, occur as often as daily or twice-daily as necessary to properly monitor and coordinate the efforts of the Contractor's Work with the work the Owner will be performing. Contractor may be required to provide its Work and schedule status on a daily basis as part of its reporting in such meetings.

Contractor shall utilize storyboards during coordination meetings. Meetings shall be attended by:

a. Contractor and applicable Subcontractors

b. Owner's representatives

2. Meeting Agenda

a. Safety review

b. Review outage plan (Agenda as applicable)

i. Contractor shall provide to Owner its detailed plan for its Work. The outage plan shall include, though not be limited to:

a. A delineation of and description of all planned Work Contractor intends to perform or requests performing while the Unit is non-operational during the outage periods.

b. Identification of Equipment and materials Contractor intends to deploy in performance of the Work within the boundaries of the operating Units during the Unit or system outage days.

c. A labor management plan that identifies Contractor's plan for attracting and employing sufficient skilled manpower during the Unit or system outage days, including the Contractor's plan for work hours.

ii. Schedule of planned detailed activities during the Unit or system outage days.

c. Startup (Agenda as applicable)

i. Safety, hazard, and risk consideration.

ii. Review of commissioning progress. Startup observations and deviations from procedures.

iii. Coordination among multiple prime contractors as applicable.

iv. Issues that may impede startup.

v. Construction interfaces affecting startup.

vi. Delivery schedules.

vii. Performance and acceptance testing.

viii. Quality assurance and quality control issues.

ix. Corrective and/or warranty issues.

x. Other items as appropriate.

d. Schedule

i. Weekly

ii. Look ahead

iii. Problems

e. One week look-ahead schedule

f. Problems impeding outage schedule

g. Key areas of focus for the project team

h. Critical issues for management intervention

i. Engineering: Change Orders, RFIs, etc.

3. Location of Meetings: Job Site

F. Quarterly Executive Management Meetings and Management Reports:

1. The Contractor and Owner's executive sponsors will meet with the project management and execution team for an update on the progress of the project. Contractor will be responsible for preparing a Quarterly Report Document to review during the meeting. A draft of the report will be sent to Owner for comment prior to the meeting. See Section 3 for format of the management reports. Meetings shall be attended by the following:
    a. Contractor and Owner executive sponsors
    b. Project management and execution team
    c. Cost control/financial reporting representatives
    d. Procurement representative (as needed)
2. Meeting Agenda
    a. Safety topic and safety status
    b. State of the project (per Subproject and balance of plant (BOP))
        i. Site pictures
        ii. Procurement/Status of major Equipment
        iii. Shared successes
        iv. Critical issues for management attention
        v. Plans for next quarter
    c. Financials
        i. Cost summary
        ii. Change Order status
        iii. Cash flow
        iv. Schedule overview/outage dates
        v. Disadvantaged business company usage
3. Location of Meeting: Rotated between Job Site and Contractor's home office
4. Reporting: Within five (5) Business Days after each meeting, Contractor will prepare and distribute minutes of the meetings to each party presented.

G. Weekly Site Meetings:

1. Contractor and Owner will participate in a weekly meeting to discuss project progress. The meeting will be attended by the following;
    a. Contractor and major Equipment suppliers as appropriate
    b. Owner's representatives
    c. Safety leadership

2. Meeting Agenda

   a. Safety topic and safety status (see item 5 below)

   b. State of the project (per Subproject and BOP)

   c. Procurement of Equipment

   d. Key areas of focus for the project team

   e. Coordination of Owner and other interfaces (Landfill construction activities, Leachate Pump Structure, etc.)

   f. Critical issues for management intervention

   g. Plan for the week

3. Location of Meeting: Job Site (Owner's or Contractors office)

4. Reporting: Contractor shall prepare agenda and distribute it along with a listing of action items. Owner will review the agenda, action items and provide input prior to distribution to the attendees.

5. Weekly Safety Audits

   a. Weekly safety audits should include a joint review of the entire active worksite between Owner project coordinators and the Contractor Safety Manager.

   b. Action items identified during the audit(s) will be documented, and the status of corrections for each of these items will be discussed during the weekly progress meeting between Owner and the Contractor.

1.3 SCHEDULES AND REPORTS:

A. Initial Coordination Submittals: Within the time period(s) defined in **Exhibit X**, the Contractor shall submit to Owner for review and acceptance:

   1. Preliminary Work Progress Schedule

   2. Preliminary Schedule of Submittals, as stated in **Exhibit X**

B. Work Progress Schedule:

   1. After submittal of preliminary Work progress schedule, submit to Owner a detailed Work progress schedule within the time period(s) defined in **Exhibit X**. Base the schedule on the preliminary Work progress schedule and incorporate review comments and other feedback.

   2. The schedule shall show the Work in a graphic format suitable for displaying scheduled and actual progress.

      a. Prepare schedules as a horizontal bar chart with separate bar for each major portion of the Work or operation.

b. The schedule shall also show the Work broken down into major phases and key items with the dates Work is expected to begin and be completed. Sequence of listings shall be in the chronological order of the start of each item of Work.

c. Scale and spacing shall allow space for notations and revisions.

d. Sheet size: Minimum 11 x 17.

3. Provide sub-schedules to define critical portions of entire schedules.

4. Coordinate Work progress schedule with Work progress reports and delivery schedule.

5. Contractor shall review and comment on Work progress schedule:

   a. Contractor shall print and distribute copies of the accepted schedule to Owner, Subcontractors, and other parties required to comply with scheduled dates.

6. Contractor shall not change the accepted Work progress schedule without prior concurrence of Owner.

7. Submit to Owner an updated schedule at least once monthly. Schedule shall show actual progress and any proposed changes in the schedule of remaining Work.

C. Work Progress Reports – Design and Monthly Management:

1. Submit monthly a report on actual Work progress. More frequent reports may be required should the Work fall behind the accepted schedule.

2. Work progress reports shall consist of marked copies of prints from the accepted Work project schedule, and a narrative report which shall include but not be limited to the following:

   a. Coordination of Owner and other interfaces (Landfill construction activities, Leachate Pump Structure, etc.)

   b. A description of current and anticipated delaying factors, if any

   c. Impact of possible delaying factors

   d. Proposed corrective actions

   e. All items as outlined in Section 3 herein

3. A Work progress report shall accompany each application for partial payment. Work reported complete but not readily apparent to Owner must be substantiated with supporting data.

4. Should operations fall behind the accepted schedule to an extent that completion of Work within **Exhibit D** schedule appears doubtful, Contractor shall, at no change in Contract Price, report the recovery plan and corrective actions to Owner to get Work back on schedule.

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5. The monthly report will include a financial report related to Exhibit C. Additionally, milestone payments updates shall be submitted with the monthly report.

D. Delivery Schedule and Procurement Activities:

1. Within sixty (60) Business Days (or as agreed by the Parties), after the Effective Date of the Agreement Owner and Contractor shall agree on a delivery schedule for all major Equipment and materials to be furnished for which the delivery time is not named in the bid or specified. Corresponding delivery dates shall be incorporated into Master Schedule along with procurement dates for construction commodities. Include procurement process activities for the following long lead items and major items (Equipment), or requiring a cycle of more than 60 Business Days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, Submittals, approvals, purchasing, fabrication, and delivery.

   a. Fly ash conveying equipment
   b. Fly ash conditioners
   c. Bottom ash handling equipment
   d. Gypsum horizontal belt vacuum filters
   e. Gypsum vacuum pumps
   f. Portal scraper reclaimer
   g. Apron belt feeder
   h. Belt conveyors
   i. Pipe conveyor
   j. Medium voltage transformers
   k. Medium voltage switchgear and MCC's
   l. Others to be determined (as directed by owner)

2. Actual delivery dates shall be subject to the ability of the Contractor to receive and care for the delivered items.

3. Contractor shall provide notice at least two weeks in advance of any delivery date and shall not receive shipments without approval.

4. No delivery will be approved until the proper Submittals pertaining to storage and installation have been received and accepted.

5. Any items delivered without written approval may be returned to the point of origin, or unloaded and stored at a place and in a manner determined by Contractor. Responsible Subcontractors shall be charged with any additional expense resulting from this delivery.

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E. Project Equipment Supplier Program Reports:

1. Submit monthly a report to Owner on actual Work progress for the Equipment.

2. Reports shall consist of marked copies of prints made from the accepted Work progress schedules, and a narrative report which shall include but not be limited to the following items with respect to supplier management for the Equipment.

   a. Safety reporting

   b. A detailed description of the progress of all Equipment

   c. A description of current and anticipated specific delaying factors, if any

   d. Impact of possible delaying factors

   e. Proposed corrective actions

   f. A compiled Equipment schedule

F. Weekly Construction Reports:

Contractor shall provide to the Owner a weekly report that includes the following:

1. Progress review per Subproject and BOP with current activities and next week's activities listed (denote if Work is being performed by Contractor or Subcontractor).

   a. Civil concrete

   b. Structural steel

   c. Mechanical

   d. Electrical

   e. Subcontracts

   f. Deliveries

   g. Total craft resources by craft code

   h. Total Subcontractor craft resources

   i. Staff resources on Job Site

   j. Safety statistics/man hours

   k. Injury types year to date

   l. Near miss types year to date

   m. First aid / medical cases year to date

   n. Construction look ahead schedules

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G. Field Progress Measurement System (FPMS):

1. Contractor must implement and utilize a quantity tracking system to measure field-made progress and will provide Owner with a summary report updated weekly. The FPMS shall include allocation of predetermined quantities of Work in percentage-increments so that progress of the Work can be physically verified in the field. Such increments will be pre-determined as part of and current to the development of baseline schedule. Examples, which are subject to Owner review and approval, to be measured by the Contractor include, but are not limited to, comparison of planned versus actual quantities of the following:

    a. Cubic yard of concrete installed compared to remaining by project area

    b. Tons of structural steel planned and actually installed by project area

    c. Linear feet of pipe planned and installed, with reference to section large bore and small bore piping by system

    d. Number of planned large bore piping welds and number of such welds completed by system

    e. Linear feet of electrical cable pulling conduit, installed (by system)

    f. Electric terminations

    g. Rework or remediation of previously installed or completed Work

    h. Or any other measurement approved by Owner that provides confirmation of the physical completion of the Work that can be tangibly measured and verified

H. Recovery Plan:

1. Should any phase of the Work fall behind to such extent that key dates in **Exhibit D** may be at risk, Contractor shall submit a recovery plan to Owner as described in the Agreement.

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2. MEETING NOTES TEMPLATE

TRIMBLE COUNTY CCR TREATMENT PROJECT

Document No.:

Date Issued:

Meeting Notes

☐ **Meeting** ☐ **Telecom** ☐ **Conference Report**

Distribution:	**Date, Time & Place:**
Subject:	**Participants:**
Originated By:	**Recorded By:**

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3. Procurement of Major Equipment
4. Construction
5. Startup

G. Bulk Commodity Curves:
1. Concrete
2. Structural Steel
3. Piping
4. Conveyors
5. Cable Tray
6. Above Ground Conduit
7. Cable
8. Terminations

H. System Turnover Curves:
1. Construction to Startup
2. Startup to Owner

I. Staffing Curve

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EXHIBIT N

CODES

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1.0 INDUSTRY STANDARDS:

A. Applicability of Standards: Except where the Design Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Agreement. Such standards are made a part of the Agreement by reference and are stated in each Section.
   1. Referenced standards, referenced directly in this Exhibit or by governing regulations, have precedence over non-referenced standards which are recognized in industry for applicability to the Work.
   2. Where compliance with an industry standard is required, the latest standard in effect at time of opening Bids shall govern.
   3. Where an applicable code or standard has been revised and reissued after the Effective Date of the Agreement and before performance of Work affected by the revision, Owner will decide whether to issue a Change Order to proceed with the revised standard.
   4. In every instance the quantity or quality level shown or specified shall be the minimum to be provided or performed. The actual installation may comply exactly, within specified tolerances, with the minimum quantity or quality specified, or it may exceed that minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum values, as noted, or appropriate for the context of the requirements. Refer instances of uncertainty to Owner for a decision before proceeding.
   5. Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Design Documents.
      a. Where copies of standards are needed for performance of a required construction activity, Contractor shall obtain copies directly from the publication source.

B. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Design Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision.

2.0 GENERAL STANDARDS AND CODES

A. Applicable Design Standards and Codes
   1. 2013 Kentucky Building Code, 2nd Edition, Revised February 2014.
   2. Americans with Disabilities Act of 1990 (ADA).
   3. American National Standards Institute (ANSI).
   4. American Society for Testing and Materials (ASTM).
   5. American Welding Society (AWS).
   6. American Wood Preservers Institute (AWPI).
   7. Interim Federal Specifications.
   8. National Association of Architectural Metal Suppliers (NAAMM).
   9. Society for Protective Coatings (SSPC).
   10. U.S. Department of Commerce Product Standards.
   11. International Building Code (IBC).
   12. International Code Council (ICC).

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13. National Fire Protection Association (NFPA).
14. National Electrical Code (NEC).
15. Insulated Cable Engineer's Association (ICEA).
16. National Electric Safety Code (NESC).
17. National Electrical Manufacturers Association (NEMA).
18. Institute of Electrical and Electronic Engineers (IEEE).
19. Illuminating Engineering Society (IES).
20. The Instrumentation, Systems and Automation Society (ISA).
21. American Bearing Manufacturers Association (ABMA).
22. American Gear Manufacturers Association (AGMA).
23. American Institute of Steel Constructors (AISC).
24. American Iron and Steel Institute (AISI).
25. Air Movement and Control Association (AMCA).
26. American Petroleum Institute (API).
27. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).
28. American Society of Mechanical Engineers (ASME).
29. American Water Works Association Standards (AWWA).
30. Associated Air Balance Council (AABC).
31. Conveyor Equipment Manufacturer's Association (CEMA).
32. Chlorine Institute.
33. Factory Mutual (FM).
34. Federal Register.
35. Federal Specifications (FS).
36. Federal Emergency Management Agency (FEMA).
37. Hydraulic Institute (HI).
38. Industrial Gas Cleaning Institute (IGGI).
39. Midwest Insulation Contractors Association (MICA).
40. Mine Safety and Health Administration (MSHA).
41. Manufacturer Standards Society (MSS).
42. North American Insulation Manufacturers Association (NAIMA).
43. National Board of Fire Underwriters (NBFU).
44. National Environmental Balancing Bureau (NEBB).
45. National Institute of Safety and Health (NIOSH).
46. Kentucky Occupational Safety and Health Standards – for General Industry and Construction (KY OSH).
47. Occupational Safety and Health Act (OSHA).
48. Pipe Fabricators Institute (PFI).
49. Rubber Manufacturers Association (RMA).
50. Society of Automotive Engineers (SAE).
51. Sheet Metal and Air Conditioning Contractors National Association (SMACNA).
52. Testing and Balancing Bureau (TABB).
53. Underwriters Laboratories (UL).
54. American Concrete Institute (ACI).
55. American Institute of Steel Construction, Inc. (AISC).
56. Crane Manufacturers Association of America (CMAA)
57. Metal Building Manufacturers Association (MBMA).

3.0 TECHNICAL SECTION STANDARDS

A. Contractor's work shall conform to the most recent edition of the codes, standards, and guidelines listed in each specific technical SECTION below:

011300 – PROJECT DESIGN BASIS

A. Applicable Standards:
   1. American Society of Mechanical Engineers (ASME):
      a. A21.15 - Flanged Cast Iron and Ductile Iron Pipe with Threaded Flanges.
      b. B16.1 - Cast-Iron Pipe Flanges and Flanged Fittings.
      c. B16.3 - Malleable-Iron Threaded Fittings.
      d. B16.5 - Steel Pipe Flanges and Flanged Fittings.
      e. B16.9 - Factory-Made Wrought Steel Buttwelding Fittings.
      f. B16.10 - Face-to-Face and End-to-End Dimensions of Ferrous Valves.
      g. B16.11 - Forged Fittings, Socket Welding and Threaded.
      h. B16.12 - Cast Iron Threaded Drainage Fittings.
      i. B16.18 - Cast Copper and Copper Alloy Solder - Joint Pressure Fittings.
      j. B16.20 - Metallic Gaskets for Pipe Flanges.
      k. B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges.
      l. B16.22 - Wrought Copper and Copper Alloy Solder - Joint Pressure Fittings.
      m. B16.25 - Buttwelding Ends.
      n. B16.47 - Large Diameter Steel Flanges - NPS 26 Through NPS 60 Metric/Inch Standard.
      o. B31.1 - Code for Pressure Piping - Power Piping.
      p. B36.10 - Welded and Seamless Wrought Steel Pipe.
      q. B36.19 - Stainless Steel Pipe.
      r. Boiler and Pressure Vessel Code.
   2. American Society for Testing and Materials (ASTM) International:
      a. A53/A53M - Pipe, Steel, Black and Hot Dipped, Zinc-Coated, Welded and Seamless.
      b. A74 - Cast Iron Soil Pipe and Fittings.
      c. A105/A105M - Carbon Steel Forging for Piping Applications.
      d. A106 - Seamless Carbon Steel Pipe for High-Temperature Service.
      e. A134 - Pipe, Steel, Electric-Fusion (Arc) - Welded (Sizes NPS 16 and Over).
      f. A139 - Electric Fusion (Arc) Welded Steel Pipe (NPS 4 and Over).
      g. A153/A153M - Zinc Coating (Hot Dip) on Iron and Steel Hardware.
      h. A179/A179M - Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger and Condenser Tubes.
      i. A182/A182M - Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.
      j. A193/A193M - Alloy Steel and Stainless Steel Bolting Material for High-Temperature Service.
      k. A194/A194M - Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service.
      l. A234/A234M - Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
      m. A269 - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

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n. A283/A283M - Low and Intermediate Tensile Strength Carbon Steel Plates.
o. A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
p. A312/A312M - Seamless and Welded Austenitic Stainless Steel Pipes.
q. A335/A335M - Seamless Ferritic Alloy Steel Pipe for High-Temperature Service.
r. A536/A536M - Standard Specification for Ductile Iron Castings
s. A563 - Carbon and Alloy Steel Nuts.
t. A671 - Electric-Fusion-Welded Steel Pipe for Atmospheric and Lower Temperatures.
u. A672 - Electric-Fusion-Welded Steel Pipe for High-Pressure Service at Moderate Temperatures.
v. A691 - Carbon and Alloy Steel Pipe, Electric Fusion-Welded for High-Pressure Service at High Temperatures.
w. B75/B75M - Seamless Copper Tube.
x. B88/B88M - Seamless Copper Water Tube.
y. B241/B241M - Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
z. B464 - Welded UNS N08020, N08024, and N08026 Alloy Pipe.
aa. B581 - Nickel-Chromium-Iron-Molybdenum-Copper Alloy Rod.
bb. B582 - Nickel-Chromium-Iron-Molybdenum-Copper Alloy Plate, Sheet, and Strip.
cc. B622 - Seamless Nickel and Nickel-Cobalt Alloy Pipe and Tube.
dd. B677 - UNS N08904, UNS N08925, and UNS N08926 Seamless Pipe and Tube.
ee. B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
ff. C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
gg. D229 - Test Methods for Rigid Sheet and Plate Materials Used for Electric Insulation.
hh. D429 - Test Methods for Rubber Property - Adhesion to Rigid Substrates.
ii. D638 - Test Method for Tensile Properties of Plastics.
jj. D695 - Test Method for Compressive Properties of Rigid Plastics.
kk. D696 - Coefficient of Linear Thermal Expansion of Plastics.
ll. D1248 - Polyethylene Plastics Molding and Extrusion Materials.
mm. D1527 - Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe, Schedules 40 and 80.
nn. D1785 – Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
oo. D2105 - Test Method for Longitudinal Tensile Properties of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Tube.
pp. D2143 - Test Method for Cyclic Pressure Strength of Reinforced, Thermosetting Plastic Pipe.
qq. D2227 - Natural Rubber (NR) Technical Grades.
rr. D2235 - Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
ss. D2241 – Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR).
tt. D2290 - test Method for Apparent Tensile Strength of Ring or Tubular Plastics and Reinforced Plastics by Split Disk Method.

uu. D2310 - Classification for Machine-Made "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe.
vv. D2412 - Test Method for Determination of External Loading Properties of Plastic Pipe by Parallel-Plate Loading.
ww. D2464 - Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
xx. D2466 - Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
yy. D2467 - Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
zz. D2468 - Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe Fittings, Schedule 40.
aaa. D2513 - Thermoplastic Gas Pressure Pipe, Tubing, and Fittings.
bbb. D2563 - Practice for Classifying Visual Defects in Glass-Reinforced Plastic Laminate Parts.
ccc. D2564 - Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
ddd. D2665 – Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
eee. D2672 - Joints for IPS PVC Pipe Using Solvent Cement.
fff. D2680 - Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.
ggg. D2729 - Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
hhh. D2751 - Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
iii. D2992 - Practice for Obtaining Hydrostatic or Pressure Design Basis for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings.
jjj. D2996 - Filament-Wound "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe.
kkk. D2997 - Centrifugally Cast "Fiberglass" (Glass Fiber-Reinforced Thermosetting-Resin) Pipe.
lll. D3034 - Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
mmm. D3035 - Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
nnn. D3139 - Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
ooo. D3212 - Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
ppp. D3261 - Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
qqq. D3350 - Polyethylene Plastics Pipe and Fittings Materials.
rrr. D3567 - Practice for Determining Dimensions of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin Pipe) and Fittings.
sss. D4024 - Machine Made "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Flanges.
ttt. F714 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
uuu. F 2329 - Zinc Coating, Hot Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.

vvv. F 2619 - Standard Specification for High-Density Polyethylene (PE) Line Pipe.

3. American Water Works Association (AWWA):
   a. C104/A21.4 - Cement-Mortar Lining for Cast-Iron and Ductile-Iron Pipe and Fittings for Water.
   b. C110/A21.10 - Gray-Iron and Ductile-Iron Fittings, 3 inches through 48 inches, for Water and Other Liquids.
   c. C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
   d. C115/A21.15 - Flanged Cast-Iron and Ductile-Iron Pipe with Threaded Flanges.
   e. C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
   f. C153/A21.53 - Ductile-Iron Compact Fittings 3 Inches Through 24 Inches and 54 Inches Through 64 Inches For Water Service.
   g. C200 - Steel Water Pipe 6 Inches and Larger.
   h. C203 - Coal-Tar Protective Coatings and Linings for Steel Water Pipelines--Enamel and Tape--Hot-Applied.
   i. C205 - Cement-Mortar Protective Lining and Coating for Steel Water Pipe--4 Inches and Larger--Shop Applied.
   j. C206 - Field Welding of Steel Water Pipe.
   k. C207 - Steel Pipe Flanges for Waterworks Service--Sizes 4 inches through 144 inches.
   l. C208 - Dimensions for Steel Water Pipe Fittings.
   m. C210 - Coal-Tar Epoxy Coating System for the Interior and Exterior of Steel Water Pipe.
   n. C606 - Grooved and Shouldered Joints.
   o. C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4 Inches through 12 Inches for Water.
   p. C901 - Standard for Polyethylene (PE) Pressure Pipe and Tubing, ½ Inches through 3 Inches for Water Service
   q. C905 - Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 14 Inches through 36 Inches.
   r. C906 - Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4 Inches through 63 Inches for Water Distribution and Transmission
   s. C950 - Fiberglass Pressure Pipe.
   t. M9 - Concrete Pressure Pipe
   u. M11 - Steel Pipe - Design and Installation.
   v. M55 - PE Pipe - Design and Installation.
4. Cast-Iron Soil Pipe Institute (CISPI):
   a. 301 - Hubless Cast-Iron Sanitary System.
5. Federal Specifications (FS):
   a. HH-G-156 - Gasket Material, General Purposes; Rubber Sheets, Strips, and Special Shapes.
6. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS):
   a. SP-6 - Standard Finishes for Contact Faces of Pipe Flanges.
   b. SP-44 - Steel Pipe Line Flanges.
   c. SP-83 - Class 3000 Steel Pipe Unions Socket Welding and Threaded

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d. SP-95 - Swage(d) Nipples and Bull Plugs
e. SP-97 - Integrally Reinforced Forged Branch Outlet Fittings – Socket Welding, Threaded and Buttwelding Ends.
f. SP-106 - Cast Copper Alloy Flanges and Flanged Fittings: Class 125, 150, and 300.

7. NSF/ANSI 61, Drinking Water System Components - Health Effects
8. Pipe Fabrication Institute (PFI):
   a. ES-5 - Cleaning of Fabricated Pipe.
   b. ES-22 - Recommended Practice for Color Coding of Piping Materials.
   c. ES-24 - Pipe Bending Methods, Tolerances, Process and Material Requirements.
9. Society for Protective Coatings (SSPC) Surface Preparation Specifications:
   a. SP1 - Solvent Cleaning.
   b. SP3 - Power Tool Cleaning.
   c. SP5 - White Metal Blast Cleaning.
   d. SP6 - Commercial Blast Cleaning.
   e. SP8 - Pickling.
   f. SP10 - Near-White Blast Cleaning.
   g. SP11 - Power Tool Cleaning to Bare Metal.
10. Underwriters Laboratories, Inc. (UL).
11. Factory Mutual Research Corporation (FM).
12. Federal Emergency Management Agency (FEMA)
    a. FEMA – P320 – Taking Shelter from the Storm
    b. FEMA – P361 – Design and construction Guidance for community Safe Rooms
13. International Code Council (ICC)
    a. ICC – 500 – Standard for the Design and Construction of Storm Shelters

018213 – FOUNDATION DESIGN CRITERIA

A. American Society for Testing and Materials (ASTM):
   1. D1143 - Test MethodS for Deep Foundations Under Static Axial Compressive Load.

023213 – SUBSURFACE INVESTIGATION

A. American Society of Testing and Materials (ASTM):
   1. D 421 - Standard Guide to Site Characterization for Engineering Design and Construction Purposes
   2. D 422 - Standard Test Method for Particle-Size Analysis of Soils
   3. D 516 - Standard Test Method for Sulfate ion in Water
   4. D 854 - Standard Test Methods for Specific Gravity of Soil Solids by Water Pycnometer
   5. D 1140 - Standard Test Methods for Amount of Material in Soils Finer than No. 200 (75-µm) Sieve
   6. D 1293 - Standard Methods for pH of Water
   7. D 1452 - Standard Practice for Soil Exploration and Sampling by Auger borings
   8. D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))

9. D 1586 - Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils
10. D 1587 - Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes
11. D 1883 -Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils
12. D 2027 - Standard Specification for Cutback Asphalt (Medium-Curing Type)
13. D 2113 - Standard Practice for Rock Core Drilling and Sampling of Rock for Site Investigation
14. D 2166 - Standard Test Method for Unconfined Compressive Strength of Cohesive Soil
15. D 2216 - Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
16. D 2435 - Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading
17. D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
18. D 2488 - Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)
19. D 2573 - Standard Test Method for Field Vane Shear Test in Cohesive Soils
20. D 2844 - Standard Test Method for Resistance R-Value and Expansion Pressure of Compacted Soils
21. D 2850 - Standard Test Method for Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils
22. D 2974 - Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils
23. D 3080 - Standard Test Method for Direct Shear Test of Soils Under Consolidated Drained Conditions
24. D 3550 - Standard Practice for Thick Wall, Ring-Lined, Split Barrel, Drive Sampling of Soils
25. D 4186 - Standard Test Method for One-Dimensional Consolidation Properties of Saturated Cohesive Soils Using Controlled-Strain Loading
26. D 4220 - Standard Practices for Preserving and Transporting Soil Samples
27. D 4253 - Standard Test Method for Maximum Index Density and Unit Weight of soils Using Vibratory Table and Calculation of Relative Density
28. D 4254 - Standard Test Method for Minimum Index Density and Unit Weight of soils Using Vibratory Table and Calculation of Relative Density
29. D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
30. D 4373 - Standard Test Method for Rapid Determination of Carbonate Content of Soils
31. D 4428 - Standard Test Methods for Cross-hole Seismic Testing
32. D 4542 - Standard Test Method for Pore Water Extraction and determination of the soluble Salt Content of Soils by Refractometer
33. D 4546 - Standard Test Method for One-Dimensional Swell or Collapse of Cohesive Soils
34. D 4767 - Standard Test Method for Consolidated Undrained Triaxial Compression Test for Cohesive Soils
35. D 4829 - Standard Test Method for Expansion Index of Soils

36. D 5079 - Standard Practices for Preserving and Transporting Rock Core Samples
37. D 5334 - Standard Test Method for Determination of Thermal Conductivity of Soil and Soft Rock by Thermal Needle Probe Procedure
38. D 5434 - Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock
39. D 5777 - Standard Guide for Using the Seismic Refraction Method for Subsurface Investigation
40. D 5778 - Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils (CPT)
41. D 7012 - Standard Test Method for Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying States of Stress and Temperatures
42. D 7400 - Standard Test Methods for Down-hole Seismic Testing
43. G 51 - Standard Test Method for Measuring pH of Soil for Use in Corrosion Testing
44. G 57 - Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four- Electrode Method

B. Conform to applicable federal, state and local codes or regulations, or local utility requirements.
   1. Observe and comply with the provisions of local and State utility protection regulations, which specify contractor's responsibilities during excavation or drilling operations. Prior to proceeding with subsurface explorations or excavations, ascertain the types and position of existing underground lines and utilities at the site by making a timely request from the underground users by calling the appropriate authority for the area. Take all reasonable steps necessary to avoid damage to the utilities pursuant to the regulations.
   2. Adhere to standards of the Occupational Health and Safety Administration (OSHA) and requirements by State and local agencies.

C. In addition to the requirements of the codes and standards and unless stated otherwise by this Specification, follow all recommendations contained in the codes and standards. In the event of any conflict between codes, or specifications and codes, apply the more stringent requirement.

026625 – HIGH DENSITY POLYETHYLENE (HDPE) PIPE

A. American National Standards Institute (ANSI):
   1. B16.5 - Carbon Steel Pipe Flanges and Flanged Fittings, Class 150.

B. American Society for Testing and Materials (ASTM):
   1. D638 - Test Method for Tensile Properties of Plastics.
   2. D790 - Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
   3. D1238 - Measuring Flow Rates of Thermoplastics by Extrusion Plastometer.
   4. D1505 - Test Method for Density of Plastics by the Density-Gradient Technique.
   5. D2513 - Thermoplastic Gas Pressure Pipe, Tubing, and Fittings.
   6. D2657 - Practice for Heat Joining of Polyethylene Pipe and Fittings.
   7. D3261 - Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene Plastic Pipe and Tubing.
   8. D3350 - Polyethylene Plastics Pipe and Fittings Materials.

9. F1417 - Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air.

031000 – CONCRETE FORMWORK

A. Applicable Standards:
   1. American Concrete Institute (ACI):
      a. 117 - Specifications for Tolerances for Concrete Construction and Materials.
      b. 301 - Specifications for Structural Concrete.
      c. 318 - Building Code Requirements for Reinforced Concrete.
      d. 347 - Guide to Formwork for Concrete.
   2. American Society for Testing and Materials (ASTM):
      a. C31 - Making and Curing Concrete Test Specimens in the Field.
      b. C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
      c. C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

032000 - CONCRETE REINFORCEMENT

A. Applicable Standards:
   1. American Society for Testing and Materials (ASTM):
      a. A82 - Steel Wire, Plain, for Concrete Reinforcement.
      b. A185 - Steel Welded Wire Reinforcement, Plain, for Concrete.
      c. A615/A615M - Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
      d. A706/A706M - Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
   2. American Concrete Institute (ACI):
      a. 301 - Specifications for Structural Concrete.
      b. SP-66 - Detailing Manual.
      c. 318 - Building Code Requirements for Structural Concrete.
      d. 117 - Specifications for Tolerances for Concrete Construction and Materials.
   3. American Welding Society (AWS):
      a. A5.5 - Low Alloy Steel Electrodes for Shielded Metal Arc Welding.
      b. B2.1 - Welding Procedure and Performance Qualification.
      c. D1.4 - Structural Welding Code - Reinforcing Steel.
   4. Concrete Reinforcing Steel Institute (CRSI):
      a. Manual of Standard Practice.

033000 - CONCRETE

A. Comply with the provisions of the following codes, specifications, and standards, except as otherwise indicated.
   1. American Concrete Institute (ACI):
      a. 301 - Specifications for Structural Concrete.
      b. 318 - Building Code Requirements for Structural Concrete.

B. Applicable Standards Where Referenced Herein:
   1. American Society for Testing and Materials (ASTM):

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a. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
b. B370 - Copper Sheet and Strip for Building Construction.
c. C31/C31M - Practice for Making and Curing Concrete Test Specimens in the Field.
d. C33 - Concrete Aggregates.
e. C39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.
f. C40 - Test Method for Organic Impurities in Fine Aggregates for Concrete.
g. C42 - Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
h. C78 - Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
i. C88 - Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
j. C94 - Ready-Mixed Concrete.
k. C114 - Test Methods for Chemical Analysis of Hydraulic Cement.
l. C117 - Test Method for Material Finer than 75μ (No. 200) Sieve in Mineral Aggregates by Washing.
m. C136 - Test Method for Sieve Analysis of Fine and Coarse Aggregates.
n. C142 - Test Method for Clay Lumps and Friable Particles in Aggregates.
o. C143 - Test Method for Slump of Hydraulic Cement Concrete.
p. C150 - Portland Cement.
q. C172 - Practice for Sampling Freshly Mixed Concrete.
r. C192/C192M - Practice for Making and Curing Concrete Test Specimens in the Laboratory.
s. C231 - Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
t. C233 - Test Methods for Air-Entraining Admixtures for Concrete.
u. C260 - Air-Entraining Admixtures for Concrete.
v. C289 - Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method).
w. C295 - Guide for Petrographic Examination of Aggregates for Concrete.
x. C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
y. C430 - Test Method for Fineness of Hydraulic Cement by the 45μ (No. 325) Sieve.
z. C494 - Chemical Admixtures for Concrete.
aa. C566 - Test Method for Total Evaporable Moisture Content of Aggregate by Drying.
bb. C595/C595M - Blended Hydraulic Cements.
cc. C618 - Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
dd. C881 - Epoxy-Resin-Base Bonding Systems for Concrete.
ee. C1107 - Packaged Dry, Hydraulic Cement Grout (Nonshrink).
ff. C1193 - Guide for Use of Joint Sealants.
gg. C1315 - Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.

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hh. D1751 - Preformed Expansion Joint Filler for Concrete Paving and Structural Construction. (Nonextruding and Resilient Bituminous Types).
ii. D1752 - Preformed Sponge Rubber, Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
jj. D2240 - Test Method for Rubber Property - Durometer Hardness.
kk. E1155/E1155M - Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers.

2. American Concrete Institute (ACI):
   a. 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
   b. 302.1R - Guide for Concrete Floor and Slab Construction.
   c. 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
   d. 305R - Committee Report on Hot Weather Concreting.
   e. 306R - Committee Report on Cold Weather Concreting.
   f. 308.1 - Standard Specification for Curing Concrete.
   g. 309R - Guide for Consolidation of Concrete.
   h. 313 - Standard Practice for Design and Construction of Concrete Silos and Stacking Tubes for Storing Granular Materials.
   i. 506R - Guide to Shotcrete.
   j. 506.2 - Specification for Shotcrete.
3. Concrete Plant Manufacturers Bureau (CPMB):
   a. 100 - Concrete Plant Standards.
   b. 102 - Recommended Guide Specifications for Batching Equipment and Control Systems in Concrete Batch Plants.
   c. Plant Mixer Manufacturers Division (PMMD) 100 - Concrete Plant Mixer Standards.
4. Federal Specification (FS):
   a. SS-S-200 - Sealants, Joint: Two-Component, Jet-Blast-Resistant, Cold-Applied, for Portland Cement Concrete Pavement.
   b. TT-S-227 - Sealing Compound: Elastomeric Type, Multi-Component (for Calking, Sealing, and Glazing in Buildings and Other Structures).
5. National Bureau of Standards (NBS) Specifications for Scales.
6. Truck Mixer Manufacturers Bureau (TMMB):
   a. Truck Mixer, Agitator and Front Discharge Concrete Carrier Standards.

051200 - STEEL

A. Applicable Standards:
   1. American Institute of Steel Construction (AISC):
      a. Steel Construction Manual.
      b. 303 - Code of Standard Practice for Steel Buildings and Bridges.
      c. 341 - Seismic Provisions for Structural Steel Buildings.
   2. American Welding Society (AWS):
      a. A4.3 - Standard Methods for Determination of the Diffusible Hydrogen Content of Martensitic, Bainitic, and Ferritic Steel Weld Metal Produced by Arc Welding.
      b. A5.1 - Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding.

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c. A5.4 - Specification for Stainless Steel Electrodes for Shielded Metal Arc Welding.
d. A5.5 - Specification for Low-Alloy Steel Electrodes for Shielded Metal Arc Welding.
e. B4.0 - Standard Methods for Mechanical Testing of Welds.
f. B5.1 - Specification for the Qualification of Welding Inspectors.
g. C4.1 - Oxygen Cutting Surface Roughness Gauge and Chart for Criteria Describing Oxygen Cut Surfaces.
h. C5.4 - Recommended Practices for Stud Welding.
i. D1.1 - Structural Welding Code - Steel.
j. D1.6 - Structural Welding Code - Stainless Steel.
k. QC1 - Standard for AWS Certification of Welding Inspectors.

3. ASTM International:
   a. A1 - Carbon Steel Tee Rails.
   b. A6 - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
   c. A36 - Carbon Structural Steel.
   d. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
   e. A106 - Seamless Carbon Steel Pipe for High-Temperature Service.
   f. A108 - Steel Bar, Carbon and Alloy, Cold-Finished.
   g. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   h. A143 - Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
   i. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware – AASHTO No.: M232.
   j. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
   k. A193 - Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications.
   l. A240 - Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
   m. A264 - Stainless Chromium-Nickel Steel-Clad Plate.
   n. A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
   o. A312 - Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
   p. A325 - Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
   q. A384 - Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies.
   r. A385 - Providing High-Quality Zinc Coatings (Hot-Dip)
   s. A449 - Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.
   t. A490 - Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.
   u. A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
   v. A563 - Carbon and Alloy Steel Nuts.

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w. A572 - High Strength Low-Alloy Columbium-Vanadium Structural Steel.
x. A588 - High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance - AASHTO No.: M 222.
y. A673 - Sampling Procedure for Impact Testing of Structural Steel.
z. A780 - Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
aa. A786 - Hot-Rolled Carbon Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
bb. A992 - Structural Steel Shapes.
cc. A1011/A1011M - Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High- Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
dd. B695 - Coatings of Zinc Mechanically Deposited on Iron and Steel.
ee. C1107 - Packaged, Dry Hydraulic Cement Grout (Nonshrink).
ff. F436 - Hardened Steel Washers.
gg. F593 - Stainless Steel Bolts, Hex Cap Screws, and Studs.
hh. F594 - Stainless Steel Nuts.
ii. F959 - Compressible-Washer-Type Direct Tension Indicator for Use with Structural Fasteners.
jj. F1554 - Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
kk. F2329 - Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.

4. The National Association of Architectural Metal Manufacturers (NAAMM):
   a. MBG 531 - Metal Bar Grating Manual.
   b. MBG 532 - Heavy Duty Metal Bar Grating Manual.
   c. MBG 533 - Welding Specifications for Fabrication of Steel, Aluminum and Stainless Steel Bar Grating.
5. Research Council on Structural Connections (RCSC):
   a. Specification for Structural Joints Using High-Strength Bolts.
6. Society for Protective Coatings (SSPC) Surface Preparation Specifications:
   a. SP1 - Solvent Cleaning.
   b. SP3 - Power Tool Cleaning.
   c. SP5 - White Metal Blast Cleaning.
   d. SP6 - Commercial Blast Cleaning.
   e. SP10 - Near-White Blast Cleaning.
   f. SP11 - Power Tool Cleaning to Bare Metal.
7. Occupational Safety and Health Administration (OSHA) - All applicable OSHA regulations, including, but not limited to 29 CFR Part 1910 and Part 1926 Subpart R - Steel Erection.

053100 – STEEL DECKING

A. Applicable Standards:
   1. American Iron and Steel Institute:
      a. North American Specification for the Design of Cold-Formed Steel Structural Members. 2007.
   2. American Welding Society:
      a. AWS D1.3-2008 - Structural Welding Code - Sheet Steel.

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3. ASTM International:
   a. ASTM A653/A653M-07 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   b. ASTM A780-01 (Reapproved 2006) - Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
   c. ASTM A792/A792M-08 - Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
   d. ASTM A1008/A1008M-08 - Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
   e. ASTM C423-08 - Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
   f. ASTM E119-08a - Test Methods for Fire Tests of Building Construction and Materials.
   g. ASTM E329-07a - Specification for Agencies Engaged in Construction Inspection and/or Testing.
4. California Department of Health Services:
   a. Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers. 2004.
5. Department of Defense:
   a. MIL-P-21035B - Paint, High Zinc Dust Content, Galvanizing Repair.
6. FM Global:
   a. FMG Loss Prevention Data Sheet 1-28-2007 - Wind Design.
   b. FMG Loss Prevention Data Sheet 1-29-2009 - Roof Deck Securement and Above-Deck Roof Components.
   c. Approval Guide, Building Materials. 2008.
7. SSPC - The Society for Protective Coatings:
   a. SSPC-Paint 20-2002 (Revised 2004) - Paint Specification No. 20 - Zinc-Rich Coating (Type I, "Inorganic," and Type II, "Organic").
8. Steel Deck Institute:
   a. SDI Publication No. 31-2007 - Design Manual for Composite Decks, Form Decks, and Roof Decks.
9. Underwriters Laboratories Inc.:
   a. UL 209-2005 - Cellular Metal Floor Raceways and Fittings (ANSI).
10. Electrical Construction Equipment Directory. 2008.:
    a. Fire Resistance Directory. 2009.

055000 – METAL FABRICATIONS

A. Applicable Standards:
   1. Americans with Disabilities Act (ADA); Accessibility Guidelines for Buildings and Facilities.
   2. Architectural Aluminum Manufacturers Association (AAMA).
   3. American Galvanizers Association (AGA).
   4. American Institute of Steel Construction (AISC).
   5. American National Standards Institute (ANSI):
      a. A14.3 - American National Standard for Ladders-Fixed-Safety Requirements.

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6. ASME International (ASME):
   a. A17.1 - Safety Code for Elevators and Escalators.
7. American Society for Testing and Materials (ASTM):
   a. A27 - Steel Castings, Carbon, for General Application.
   b. A36 - Carbon Structural Steel.
   c. A47 - Ferritic Malleable Iron Castings.
   d. A48 - Gray Iron Castings.
   e. A53 – Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
   f. A108 - Steel Bars, Carbon, Cold-Finished, Standard Quality.
   g. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   h. A148 - Steel Castings, High Strength, for Structural Purposes.
   i. A197 - Cupola Malleable Iron.
   j. A276 - Stainless Steel Bars and Shapes.
   k. A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
   l. A312/A312M - Seamless and Welded Austenitic Stainless Steel Pipes.
   m. A325 - High-Strength Bolts for Structural Steel Joints.
   n. A354 - Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners.
   o. A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
   p. A575 - Steel Bars, Carbon, Merchant Quality, M-Grades.
   q. A653 - Steel Sheet, Zinc-Coated (Galvanized) Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
   r. A666 - Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
   s. A668 - Steel Forgings, Carbon and Alloy, for General Industrial Use.
   t. B26/B26M - Aluminum-Alloy Sand Castings.
   u. B209/209M - Aluminum and Aluminum-Alloy Sheet and Plate.
   v. B221/B221M - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
   w. B632/B632M - Aluminum-Alloy Rolled Tread Plate.
   x. E894 - Test Method for Anchorage of Permanent Metal Railing Systems and Rails for Buildings.
   y. E935 - Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
   z. E985 - Permanent Metal Railing Systems and Rails for Buildings.
8. American Welding Society (AWS).
9. Code of Federal Regulations (CFR):
   a. 40CFR59 - National Volatile Organic Compound Emission Standards for Architectural Coatings.
10. Federal Specifications (FS).
11. National Association of Architectural Metal Manufacturers (NAAMM).
12. Society for Protective Coatings (SSPC) Surface Preparation Specifications:
   a. SP1 - Solvent Cleaning.
   b. SP2 - Hand Tool Cleaning.
   c. SP3 - Power Tool Cleaning.
   d. SP7 - Brush Off Blast Cleaning.
   e. SP11 - Power Tool Cleaning to Bare Metal.

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055750 – STAINLESS STEEL AND NICKEL ALLOYS

A. Applicable Standards:

1. American Institute of Steel Construction (AISC):
   a. Manual of Steel Construction.
   b. Quality Criteria and Inspection Standards.
2. American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code:
   a. Section V - Nondestructive Examinations.
   b. Section IX - Welding and Brazing Qualifications.
3. American Society of Nondestructive Testing (ASNT):
   a. SNT-TC-1A - Personnel Qualification and Certification in Nondestructive Testing, 1984 Edition.
4. American Society of Testing and Materials (ASTM):
   a. A6 - General Requirements for Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use.
   b. A36 - Structural Steel.
   c. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plates, Sheet and Strip.
   d. A240 - Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels.
   e. A262 - Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels.
   f. A265 - Specification for Nickel and Nickel-Base Alloy-Clad Steel Plate.
   g. A312 - Seamless and Welded Austenitic Stainless Steel Pipe.
   h. A380 - Cleaning and Descaling Stainless-Steel Parts, Equipment, and Systems.
   i. A479 - Stainless and Heat-Resisting Steel Wire, Bars and Shapes for Use in Boilers and Other Pressure Vessels.
   j. A790 - Seamless and Welded Ferritic/Austenitic Stainless Steel Pipe.
   k. A992 – Standard Specification for Structural Steel Shapes.
   l. B574 - Low-Carbon Nickel-Molybdenum-Chromium Alloy Rod.
   m. B575 - Low-Carbon Nickel-Molybdenum-Chromium Alloy Plate, Sheet, and Strip.
   n. B581 - Nickel-Chromium-Iron-Molybdenum-Copper Alloy Rod.
   o. E390 - Reference Radiographs for Steel Fusion Welds.
   p. F593 - Stainless Steel Bolts, Hex Cap Screws and Studs.
   q. F594 - Stainless Steel Nuts.
   r. G28 - Detecting Susceptibility to Intergranular Attack in Wrought Nickel - Rich Chromium - Bearing Alloys.
5. American Welding Society (AWS):
   a. A2.4 - American Welding Society Standard Welding Symbols.
   b. A3.0 - Welding Terms and Definitions.
   c. A5.4 - Specification for Corrosion - Resisting Chromium and Chromium - Nickel Steel - Covered Electrodes.
   d. A5.9 - Specification for Corrosion - Resisting Chromium and Chromium - Nickel Steel Bare and Composite Metal Cored and Stranded Welding Electrodes and Welding Rods.
   e. A5.11 - Specification for Nickel Alloy Covered Welding Rods and Electrodes.

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f. A5.14 - Specification for Nickel Alloy Bare Welding Rods and Electrodes.
g. D1.1 - Structural Welding Code.
h. QC1 - Standard Qualification and Certification of Welding Inspectors.

072000 – BUILDING INSULATION

A. Applicable Standards:
1. American Society for Testing and Materials (ASTM):
a. C552 - Cellular Glass Thermal Insulation.
b. C553 - Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
c. C578 - Rigid, Cellular Polystyrene Thermal Insulation.
d. C612 - Mineral Fiber Block and Board Thermal Insulation.
e. C665 - Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
f. C739 - Cellulosic Fiber (Wood-Base) Loose-Fill Thermal Insulation.
g. C764 - Mineral Fiber Loose-Fill Thermal Insulation.
h. C920 - Elastomeric Joint Sealants.
i. C1015 - Installation of Cellulosic and Mineral Fiber Loose-Fill Thermal Insulation.
j. C1149 - Self-Supported Spray Applied Cellulosic Thermal Insulation.
k. C1158 - Practice for Use and Installation of Radiant Barrier Systems (RBS) in Building Construction.
l. C1289 - Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
m. C1313 - Sheet Radiant Barriers for Building Construction Applications.
n. C1320 - Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
o. C1321 - Practice for Installation and Use of Interior Radiation Control Coating Systems (IRCCS) in Building Construction.
p. C1371 - Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
q. D4397 - Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
r. E84 - Test Method for Surface Burning Characteristics of Building Materials.
s. E119 - Methods for Fire Tests of Building Construction and Materials.
t. E136 - Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.
2. The Cellulose Insulation Manufacturers Association (CIMA):
a. Special Report #3: Standard Practice for Installing Cellulose Insulation. Undated.
3. Underwriters Laboratories Inc. (UL):
a. 181 - Factory-Made Air Ducts and Air Connectors.

074113 – METAL ROOF PANELS

A. Applicable Standards:
1. American Architectural Manufacturers Association (AAMA):
a. 611 - Voluntary Specification for Anodized Architectural Aluminum.

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b. 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
c. 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

2. American Society for Testing and Materials (ASTM):
   a. A641/A641M - Zinc-Coated (Galvanized) Carbon Steel Wire.
   b. A653/A653M - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   c. A755/A755M - Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
   d. A792/A792M - Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
   e. B209/B209M - Aluminum and Aluminum-Alloy Sheet and Plate.
   f. B370 - Copper Sheet and Strip for Building Construction.
   g. C36 - Gypsum Wallboard.
   h. C209 - Test Methods for Cellulosic Fiber Insulating Board.
   i. C236 - Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box.
   j. C273 - Test Method for Shear Properties in Flatwise Plane of Flat Sandwich Constructions or Sandwich Cores.
   k. C297 - Test Method for Tensile Strength of Flat Sandwich Constructions in Flatwise Plane.
   l. C442 - Gypsum Backing Board and Coreboard.
   m. C518 - Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flowmeter Apparatus.
   n. C578 - Rigid, Cellular Polystyrene Thermal Insulation.
   o. C591 - Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
   p. C612 - Mineral Fiber Block and Board Thermal Insulation.
   q. C645 - Nonstructural Steel Framing Members.
   r. C665 - Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
   s. C728 - Perlite Thermal Insulation Board.
   t. C754 - Installation of Steel Framing Members to Receive Screw Attached Gypsum panel Products.
   u. C920 - Elastomeric Joint Sealants.
   v. C991 - Flexible Glass Fiber Insulation for Pre-Engineered Metal Buildings.
   w. C1136 - Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
   x. C1177/C1177M - Glass Mat Gypsum Substrate for Use as Sheathing.
   y. C1289 - Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
   z. C1311 - Solvent Release Sealants.

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aa. D226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
bb. D1621 - Test Method for Compressive Properties of Rigid Cellular Plastics.
cc. D1622 - Test Method for Apparent Density of Rigid Cellular Plastics.
dd. D1970 - Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
ee. D2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
ff. D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
gg. D2856 - Test Method for Open-Cell Content of Rigid Cellular Plastics by the Air Pycnometer.
hh. D4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
ii. E84 - Test Method for Surface Burning Characteristics of Building Materials.
jj. E96 - Test Methods for Water Vapor Transmission of Materials.
kk. E108 - Test Methods for Fire Tests of Roof Coverings.
ll. E119 - Test Methods for Fire Tests of Building Construction and Materials.
mm. E136 - Test Method for Behavior of Materials in a Vertical Tube Furnace at 750oC.
nn. E283 - Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
oo. E329 - Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
pp. E330 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
qq. E331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
rr. E548 - Guide for General Criteria Used for Evaluating Laboratory Competence.
ss. E903 - Test Method for Solar Absorptance, Reflectance, and Transmission of Materials Using Integrating Spheres.
tt. E1514 - Structural Standing Seam Steel Roof Panel Systems.
uu. E1592 - Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
vv. E1637 - Structural Standing Seam Aluminum Roof Panel Systems.
ww. E1646 - Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.
xx. E1680 - Test Method for Rate of Air Leakage through Exterior Metal Roof Panel Systems.

3. American Society of Civil Engineers (ASCE):
   a. 7 - Minimum Design Loads for Buildings and Other Structures.
4. Factory Mutual Global (FMG):
   a. 4470 - Approval Standard, Class I Roof Covers.
   b. 4471 - Approval Standard, Class I Panel Roofs.

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c. Approval Guide.

5. National Association of Architectural Metal Manufacturers (NAAMM):
   a. Metal Finishes Manual for Architectural and Metal Products.
6. The North American Insulation Manufacturers Association (NAIMA):
   a. 202 - Flexible Fiber Glass Insulation Used in Metal Buildings.
7. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA):
   a. Architectural Sheet Metal Manual.
8. The Society for Protective Coatings (SSPC):
   a. Paint Specification No. 12: Cold Applied Asphalt Mastic (Extra Thick Film).
9. Underwriters Laboratories, Inc. (UL):
   a. 580 - Tests for Uplift Resistance of Roof Assemblies.
   b. Fire Resistance Directory.

074213 – METAL WALL PANELS

A. Applicable Standards:
   1. American Architectural Manufacturers Association (AAMA):
      a. 501.1 - Test Method for Exterior Windows, Curtain Walls and Doors for Water Penetration Using Dynamic Pressure.
      b. 502.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage.
      c. 611 - Voluntary Specification for Anodized Architectural Aluminum.
      d. 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
      e. 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
   2. American Hardboard Association (AHA):
      a. A135.4 - Basic Hardboard.
   3. American Society for Testing and Materials (ASTM):
      a. A641/A641M - Zinc-Coated (Galvanized) Carbon Steel Wire.
      b. A653/A653M - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
      c. A666 - Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
      d. A755/A755M - Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Process.
      e. A792/A792M - Steel Sheet, 55 Percent Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
      f. B209/B209M - Aluminum and Aluminum-Alloy Sheet and Plate.
      g. B221/B221M - Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
      h. B370 - Copper Sheet and Strip for Building Construction.
      i. C36 - Gypsum Wallboard.
      j. C209 - Test Methods for Cellulosic Fiber Insulating Board.

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k. C236 - Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box.
l. C273 - Test Method for Shear Properties in Flatwise Plane of Flat Sandwich Constructions or Sandwich Cores.
m. C297 - Test Method for Tensile Strength of Flat Sandwich Constructions in Flatwise Plane.
n. C423 - Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
o. C442 - Gypsum Backing Board and Coreboard.
p. C518 - Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
q. C578 - Rigid, Cellular Polystyrene Thermal Insulation.
r. C591 - Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
s. C612 - Mineral Fiber Block and Board Thermal Insulation.
t. C645 - Nonstructural Steel Framing Members.
u. C665 - Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
v. C754 - Installation of Steel Framing Members to Receive Screw Attached Gypsum Panel Products.
w. C920 - Elastomeric Joint Sealants.
x. C991 - Flexible Glass Fiber Insulation for Pre-Engineered Metal Buildings.
y. C1136 - Flexible, Low Performance Vapor Retarders for Thermal Insulation.
z. C1177/C1177M - Glass Mat Gypsum Substrate for Use as Sheathing.
aa. C1289 - Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
bb. C1311 - Solvent Release Sealants.
cc. D1494 - Test Method for Diffuse Light Transmission Factor of Reinforced Plastic Panels.
dd. D1621 - Test Method for Compressive Properties of Rigid Cellular Plastics.
ee. D1622 - Test Method for Apparent Density of Rigid Cellular Plastics.
ff. D2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
gg. D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
hh. D2856 - Test Method for Open-Cell Content of Rigid Cellular Plastics by the Air Pycnometer.
ii. D3841 - Glass-Fiber-Reinforced Polyester Plastic Panels.
jj. D4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
kk. E84 - Test Method for Surface Burning Characteristics of Building Materials.
ll. E96 - Test Methods for Water Vapor Transmission of Materials.
mm. E108 - Test Methods for Fire Tests of Roof Coverings.
nn. E119 - Test Methods for Fire Tests of Building Construction and Materials.

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oo. E136 - Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Deg. C.
pp. E283 - Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
qq. E329 - Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
rr. E330 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air pressure Difference.
ss. E331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
tt. E548 - Guide for General Criteria Used for Evaluating Laboratory Competence.
uu. E1105 - Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls, and Doors by Uniform or Cyclic Static Air Pressure Difference.
vv. E1592 - Test Method for Structural Performance of Sheet Metal Roof and Sliding Systems by Uniform Static Air Pressure Difference.

4. American Society of Civil Engineers (ASCE):
   a. 7 - Minimum Design Loads for Buildings and Other Structures.
5. Factory Mutual Global (FMG):
   a. 4470 - Approval Standard, Class I Roof Covers.
6. National Association of Architectural Metal Manufacturers (NAAMM):
   a. Metal Finishes Manual for Architectural and Metal Products.
7. The North American Insulation Manufacturers Association (NAIMA):
   a. 202 - Flexible Fiber Glass Insulation Used in Metal Buildings.
8. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA):
   a. Architectural Sheet Metal Manual.
9. The Society for Protective Coatings (SSPC):
   a. Paint Specification No. 12: Cold Applied Asphalt Mastic (Extra Thick Film).
10. Underwriters Laboratories Inc. (UL):
    a. Fire Resistance Directory.

076200 – SHEET METAL FLASHING AND TRIM

A. Applicable Standards:
   1. Aluminum Association (AA):
      a. Designation System for Aluminum Finishes, 7th ed.
   2. American Architectural Manufacturers Association (AAMA):
      a. 605.2 - High Performance Organic Coatings on Architectural Aluminum Extrusions and Panels.
      b. 606.2 - Integral Color Anodic Finishes for Architectural Aluminum.
      c. 607.1 - Clear Anodic Finishes for Architectural Aluminum.
      d. 608.1 - Electrolytically Deposited Color Anodic Finishes for Architectural Aluminum.
   3. American Society for Testing and Materials (ASTM):
      a. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

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b. A653/A653M - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
c. A755/A755M - Steel Sheet, Metallic-Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
d. A792/A792M - Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
e. B32 - Solder Metal.
f. B209/209M - Aluminum and Aluminum-Alloy Sheet and Plate.
g. B221/B221M - Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
h. B370 - Copper Sheet and Strip for Building Construction.
i. D4397 - Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
j. D4586 - Asphalt Roof Cement, Asbestos-Free.
k. E154 - Test Methods for Water Vapor Retarders used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.

4. Factory Mutual Research Corporation (FM):
   a. Loss Prevention Data Sheet 1-49 Perimeter Flashing.
5. Federal Specifications (FS):
   a. UU-B-790a - Building Paper, Vegetable Fiber: (Kraft, Waterproofed, Water Repellent, and Fire Resistant).
6. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
   a. Architectural Sheet Metal Manual.
7. Society for Protective Coatings (SSPC):
   a. Paint 12 - Cold-Applied Asphaltic Mastic (Extra Thick Film).

079200 - JOINT SEALANTS

A. Applicable Standards:
   1. American Society for Testing and Materials (ASTM):
      a. C834 - Latex Sealing Compounds.
      b. C919 - Practices for Use of Sealants in Acoustical Applications.
      c. C920 - Elastomeric Joint Sealants.
      d. C1193 - Guide for Use of Joint Sealants.
   2. Code of Federal Regulations (CFR):
      a. 40 CFR 59, Subpart D - National Volatile Organic Compound Emissions Standard for Architectural Coatings.

081113 – STEEL DOORS AND FRAMES

A. American National Standards Institute (ANSI):
   1. A115 Series - A Collection of A115.1-A115.17, Specifications for Steel Door and Frame Preparation for Hardware.
   2. A224.1 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel doors and Frames.
B. American National Standards Institute/Steel Door Institute (ANSI/SDI):
   1. 100 - Recommended Specifications for Standard Steel Doors and Frames.
C. American Society for Testing and Materials (ASTM):
   1. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

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2. A366/A366M - Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
3. A525/A525M - General Requirements for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process.
4. A526/A526M - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
5. A569/A569M - Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial quality.
6. A620/A620M - Steel, Sheet, Carbon, Drawing, Quality, Special Killed, Cold-Rolled.
7. A642/A642M - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Drawing Quality, Special Killed.
8. A780 - Practice for Repair of Damaged Hot-Dip Galvanized Coatings.
9. C236 - Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box.
10. C578 - Rigid, Cellular Polystyrene Thermal Insulation.
11. C591 - Unfaced Preformed Rigid Cellular Polyurethane Thermal Insulation.
12. C976 - Test Method for Thermal Performance of Building Assemblies by Means of a Calibrated Hot Box.
13. E152 - Methods for Fire Tests of Door Assemblies.

D. Department of Defense (DOD):
   1. P-21035A (SH) - Paint, High Zinc Dust Content, Galvanizing Repair.

E. Door and Hardware Institute (DHI):
   1. Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.

F. Federal Specifications (FS):
   1. TT-P-641G (1) - Primer Coating, Zinc Dust Zinc Oxide (for Galvanized Surfaces).

G. National Association of Architectural Metal Manufacturers (NAAMM):
   1. Metal Finishes Manual for Architectural and Metal Products.

H. National Fire Protection Association (NFPA):
   1. 80 - Fire Doors and Windows.

I. Steel Door Institute (SDI):
   1. 105 - Recommended Erection Instructions for Steel Frames.
   2. 107 - Hardware on Steel Doors (Reinforcement-Application).
   3. 112 - Galvanized Standard Steel Doors and Frames.
   4. 117 - Manufacturing Tolerances Standard Steel Doors and Frames.

J. Steel Structures Painting Council (SSPC):
   1. PA 1 - Paint Application Specification No. 1.
   2. Paint 20 - Paint Specification No. 20 Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic").
   3. SP 1 - Surface Preparation Specification No. 1: Solvent Cleaning.
   4. SP 5 - Surface Preparation Specification No. 5: White Metal Blast Cleaning.
   5. SP 8 - Surface Preparation Specification No. 8: Pickling.

083323 - OVERHEAD COILING DOORS

A. American Society for Testing and Materials (ASTM):
   1. A36/A36M: Carbon Structural Steel.
   2. A123: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

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3. A240/A240M: Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.
4. A653/A653M: Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
5. A666: Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar.
6. B209/B209M: Aluminum and Aluminum-Alloy Sheet and Plate.
7. B221/B221M: Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
8. E84b: Test Method for Surface Burning Characteristics of Building Materials.

B. National Association of Architectural Metal Manufacturers (NAAMM):
1. Metal Finishes Manual for Architectural and Metal Products.

C. National Electrical Manufacturers Association (NEMA):
1. ICS 1: Industrial Control and Systems General Requirements.
2. ICS 2: Industrial Control and Systems Controllers, Contactors, and Overload Relays Rated Not More Than 2000 Volts AC or 750 Volts DC.
3. ICS 6: Industrial Control and Systems Enclosures.
4. MG 1: Motors and Generators.

D. National Fire Protection Association (NFPA):
1. 70: National Electrical Code.
2. 80: Fire Doors and Fire Windows.

E. Underwriters Laboratories Inc. (UL):
1. 10b: Fire Tests of Door Assemblies.

087100 – FINISH HARDWARE

A. Applicable Standards:
1. American National Standards Institute (ANSI):
   a. A115 Series - Door and Frame Preparation.
   b. A156 Series - Hardware.
   c. A117.1 - Buildings and Facilities - Providing Accessibility and Usability for Physically Handicapped People.
2. Builders Hardware Manufacturers Association (BHMA):
   a. 1301 - Materials and Finishes.
3. Door and Hardware Institute (DHI):
   a. Keying - Procedures, Systems and Nomenclature.
   b. Architectural Hardware Scheduling Sequence and Schedule Format.
   c. Abbreviations and Symbols.
   d. Hardware for Labeled Fire Doors.
   e. Recommended Locations for Builders Hardware for Standard Steel Doors and Frames.
   f. Recommended Procedure for Processing Hardware Schedules and Templates.
4. National Fire Protection Association (NFPA):
   a. 80 - Standards for Fire Doors and Windows.
   b. 101 - Life Safety Code.
5. Underwriters Laboratories (UL):
   a. Building Materials Directory.
   b. 305 - Panic Hardware.

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099000 - PROTECTIVE COATINGS

A. Applicable Standards:
   1. American National Standards Institute (ANSI):
      a. A13.1 - Scheme for the Identification of Piping Systems.
      b. Z53.1 - Safety Color Code for Marking Physical Hazards.
   2. American Society for Testing and Materials (ASTM):
      a. D2092 - Guide for Treatment of Zinc-Coated (Galvanized) Steel Surfaces for Painting.
      b. D4258 - Surface Cleaning Concrete for Coating.
      c. D4259 - Abrading Concrete.
      d. D4260 - Acid Etching Concrete.
      e. D4261 - Surface Cleaning Concrete Unit Masonry for Coating.
   3. Society for Protective Coatings (SSPC) Surface Preparation Specifications:
      a. SP1 - Solvent Cleaning: Removes oil, grease, soil, drawing and cutting compounds, and other soluble contaminants.
      b. SP2 - Hand Tool Cleaning: Remove loose material. Not intended to remove adherent mill scale, rust, and paint.
      c. SP3 - Power Tool Cleaning: Removes loose material. Not intended to remove all scale or rust.
      d. SP5 - White Metal Blast Cleaning: Removes all scale, rust, foreign matter. Leaves surface gray-white uniform metallic color.
      e. SP6 - Commercial Blast Cleaning: Two-thirds of every nine square inches free of all visible residues; remainder only light discoloration.
      f. SP7 - Brush-Off Blast Cleaning: Removes only loose material, remaining surface tight and abraded to give anchor pattern.
      g. SP10 - Near-White Blast Cleaning: At least 95% of every nine square inches shall be free of all visible residues.
      h. SP11 - Power Tool Cleaning to Bare Metal.
      i. SP12 - Surface Preparation and Cleaning of Steel and Other Hard Materials by High and Ultrahigh Pressure Water Jetting Prior to Recoating.
      j. SP13 - Surface Preparation of Concrete.

133419 - METAL BUILDING SYSTEMS

A. American Architectural Manufacturers Association (AAMA):
   1. 603.8 - Voluntary Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum.
   2. 701/702 - Combined Voluntary Specifications for Pile Weather-stripping and Replaceable Fenestration Weather seals.

B. American Institute of Steel Construction (AISC):
   1. S303 - Code of Standard Practice for Steel Buildings and Bridges.
   2. S360 - Specification for Structural Steel.

C. American Iron and Steel Institute (AISI):
   1. NAS-01 – North American Specification for the Design of Cold-Formed Steel Structural Members.

D. American National Standards Institute (ANSI):
   1. ANSI/AHA A135.4 - Basic Hardboard.
   2. ANSI/DHI A115 Series: Specifications for Steel Door and Frame Preparation for Hardware.

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3. ANSI Z97.1 - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.

E. American Society for Testing and Materials (ASTM):
1. A36/A36M - Carbon Structural Steel.
2. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
4. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
5. A307 - Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
6. A325 - Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
7. A325M - High-Strength Bolts for Structural Steel Joints (Metric).
8. A366/A366M - Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
9. A463/A463M - Steel Sheet, Aluminum-Coated, by the Hot-Dip Process.
10. A475 - Zinc-Coated Steel Wire Strand.
11. A490 - Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength.
12. A490M - High-Strength Steel Bolts, Classes 10.9 and 10.9.3 for Structural Steel Joints (Metric).
13. A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
14. A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
15. A529/A529M - High-Strength Carbon-Manganese Steel of Structural Quality.
16. A568/A568M - Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements.
17. A569/A569M - Steel, Carbon (0.15 Maximum Percent), Hot-Rolled Sheet and Strip Commercial Quality.
18. A572/A572M High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
19. A653/A653M - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
20. A755/A755M - Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
21. A780 - Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
22. A792/A792M - Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
23. A992/A992M – Standard Specification for Structural Steel Shapes.
24. A1008/A1008M - Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
25. A1011/A1011M - Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
26. B221 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
27. B221M - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tube (Metric).
28. B695 - Coatings of Zinc Mechanically Deposited on Iron and Steel.

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29. C36 - Gypsum Wallboard.
30. C423 - Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
31. C442 - Gypsum Backing Board and Coreboard.
32. C578 - Rigid, Cellular Polystyrene Thermal Insulation.
33. C591 - Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
34. C665 - Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
35. C920 - Elastomeric Joint Sealants.
36. C991 - Flexible Glass Fiber Insulation for Pre-Engineered Metal Buildings.
37. C1014 - Spray-Applied Mineral Fiber Thermal or Acoustical Insulation.
38. C1036 - Flat Glass.
39. C1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
40. C1107 - Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
41. C1136 - Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
42. C1149 - Self-Supported Spray Applied Cellulosic Thermal/Acoustical Insulation.
43. D523 - Test Method for Specular Glass.
44. D1494 - Test Method for Diffuse Light Transmission Factor of Reinforced Plastics Panes.
45. D3656 - Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns.
46. D3841 - Glass-Fiber-Reinforced Polyester Plastic Panels.
47. D4214 - Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
48. E84 - Test Method for Surface Burning Characteristics of Building Materials.
49. E94 - Guide for Radiographic Testing.
50. E96 - Test Methods for Water Vapor Transmission of Materials.
51. E119 - Test Methods for Fire Tests of Building Construction and Materials.
52. E136 - Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.
53. E164 - Practice for Ultrasonic Contact Examination of Weldments.
54. E165 - Method for Liquid Penetrant Examination.
55. E283 - Test Method for Determining Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
56. E329 - Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
57. E331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
58. E548 - Guide for General Criteria Used for Evaluating Laboratory Competence.
59. E79 - Guide for Magnetic Particle Examination.
60. E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings.
61. E1646 - Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.

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62. E1680 - Test Method for Rate of Air Leakage through Exterior Metal Roof Panel Systems.
63. F568M - Carbon and Alloy Steel Externally Threaded Metric Fasteners.
64. F959/F959M - Compressible-Washers-Type Direct Tension Indicators for Use with Structural Fasteners.
65. F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, 105 ksi Yield Strength.
66. F1852 - Standard Specification for "Twist Off" Type Tension Control Structural Bolt / Nut / Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
67. F2248 - Standard Practice for Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass.

F. American Society of Civil Engineers (ASCE):
   1. 7 - Minimum Design Loads for Buildings and Other Structures.

G. American Welding Society (AWS):
   1. D1.1 - Structural Welding Code - Steel.
   2. D1.3 - Structural Welding Code - Sheet Steel.

H. Code of Federal Regulations (CFR):
   1. 16 CFR 1201: Safety Standard for Architectural Glazing Materials.

I. Door and Hardware Institute (DHI):
   1. Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.

J. Federal Specifications (FS):
   1. RR-W-365A(1)-80 - Wire Fabric (Insect Screening).
   2. TT-P-641G(1)-77 - Primer Coating; Zinc Dust-Zinc Oxide (for Galvanized Surfaces).

K. International Accreditation Services, Inc. (IAS):
   1. AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems.

L. Metal Building Manufacturers Association (MBMA):
   1. Metal Building Systems Manual.

M. National Academy of Sciences:
   1. Expansion Joints in Buildings, Technical Report No. 65.

N. National Association of Architectural Metal Manufacturers (NAAMM):
   1. Metal Finishes Manual for Architectural and Metal Products.

O. National Fire Protection Association (NFPA):
   1. 80 - Fire Doors and Fire Windows.
   2. 252 - Fire Tests for Door Assemblies.

P. North American Insulation Manufacturers Association (NAIMA):
   1. 202 - Standard for Flexible Fiber Glass Insulation Used in Metal Buildings.

Q. Research Council on Structural Connections
   1. Specification for Structural Joints Using ASTM A325 or A490 Bolts.

R. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA):
   1. Architectural Sheet Metal Manual.

S. Steel Door Institute (SDI):
   1. 100 - Recommended Specifications for Standard Steel Doors and Frames (ANSI).

T. Steel Joist Institute (SJI):
   1. JG-1.1 - Standard Specification for Joist Girders.

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2. K-1.1 - Standard Specification for Open Web Steel Joists, K-Series.
3. LH/DLH-1.1 – Standard Specification for Longspan Steel Joists, LH Series and Deep Longspan Steel Joists.

U. Society for Protective Coatings (SSPC):
1. Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).
2. SP1 - Surface Preparation Specification No. 1: Solvent Cleaning.
3. SP2 - Surface Preparation Specification No. 2: Hand Tool Cleaning.
4. SP3 - Surface Preparation Specification No. 3: Power Tool Cleaning.
5. SP6 - Surface Preparation Specification No. 5: Commercial Blast Cleaning.

V. Steel Window Institute (SWI):
1. The Specifier's Guide to Steel Windows. (Undated)

W. Underwriters Laboratories Inc. (UL):
1. 580 - Tests for Uplift Resistance of Roof Assemblies.

133423 – POWER CONTROL MODULE

A. All materials, equipment and labor supplied by Supplier shall be in strict compliance with the statutes, codes and standards listed herein. Where conflicts exist between statutes, codes, and standards, the more stringent requirement shall prevail. Applicable statutes, codes and standards are as listed below:
1. American Institute of Steel Construction (AISC).
2. American National Standard Institute (ANSI).
3. American Society of Testing and Materials (ASTM).
4. American Welding Society (AWS):
   a. D1.1, Structural Welding Code - Steel.
5. National Fire Protection Association (NFPA).
6. National Electric Code (NEC).
7. National Electrical Manufacturers Association (NEMA).
8. Underwriters' Laboratories (UL).
9. International Building Code (IBC) 2012.
10. Kentucky Building Code 2013.

142100 – ELECTRIC TRACTION ELEVATOR

A. American Society of Civil Engineers/Structural Engineering Institute:
1. ASCE/SEI 7-2005 - Minimum Design Loads for Buildings and Other Structures.

B. ASME International/Canadian Standards Association:
1. ASME A17.1/CSA B44-2007 – Safety Code for Elevators and Escalators.

C. ASTM International:
1. ASTM A240/A 240M-08a - Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
2. ASTM A276-08a - Specification for Stainless Steel Bars and Shapes.
3. ASTM A554-08a - Specification for Welded Stainless Steel Mechanical Tubing.
4. ASTM A1008/A 1008M-09 - Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.

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5. ASTM A1011/A 1011M-09a - Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
6. ASTM B36/B 36M-08a - Specification for Brass Plate, Sheet, Strip, and Rolled Bar.
7. ASTM B135-08a - Specification for Seamless Brass Tube.
8. ASTM B135M-08a - Specification for Seamless Brass Tube.
9. ASTM B151/B 151M-05 - Specification for Copper-Nickel-Zinc Alloy (Nickel Silver) and Copper-Nickel Rod and Bar.
10. ASTM B221-08 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
11. ASTM B221M-07 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
12. ASTM B455-05 - Specification for Copper-Zinc-Lead Alloy (Leaded Brass) Extruded Shapes.
13. ASTM C1107/C 1107M-08 - Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
14. ASTM E84-09 - Test Method for Surface Burning Characteristics of Building Materials.

D. The Institute of Electrical and Electronics Engineers, Inc.:
   1. IEEE 519-1992 - Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems.

E. National Electrical Manufacturers Association:
   1. NEMA LD 3-2005 - High Pressure Decorative Laminates (available in PDF at www.nema.org).

F. NFPA:
   1. NFPA 80-2007 - Fire Doors and Fire Windows.
   2. NFPA 252-2008 - Fire Tests of Door Assemblies.

G. Underwriters Laboratories Inc.:
   1. UL 10B-2008 - Fire Tests of Door Assemblies.

260000 – ELECTRICAL GENRAL REQUIREMENTS

A. National Fire Protection Association (NFPA):
   1. 70 - National Electrical Code (NEC).

B. Underwriter's Laboratories, Inc. (UL):
   1. 1277 - Type TC Power and Control Tray Cables.

260002 – ELECTRICAL EQUIP – GENERAL TECHNICAL REQUIREMENTS

A. Applicable Codes and Standards:
   1. American Society for Testing and Materials (ASTM):
      a. A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
      b. A36/A36M - Standard Specification for Carbon Structural Steel.
      c. A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
      d. A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
      e. A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.

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f. A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
g. B187/B187M - Standard Specification for Copper, Bus Bar, Rod, and Shapes and General Purpose Rod, Bar, and Shapes.

260500 - CABLE BUS EQUIPMENT AND INSTALLATION

A. Design, fabricate, assemble and test all equipment furnished to conform to the applicable divisions of the following codes and standards.
1. American National Standards Institute (ANSI).
2. National Electrical Manufacturer's Association (NEMA).
3. National Electrical Code (NEC).
4. National Electrical Safety Code (NESC).
5. American Society for Testing and Materials (ASTM).
a. A6 - General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
b. A36 – Carbon Structural Steel.
c. A123 - Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products.
d. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
e. A283 - Low and Intermediate Tensile Strength Carbon Steel Plates.
f. A325 – Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
g. B187 – Copper, Bus Bar, Rod, and Shapes and General Purpose Rod, Bar, and Shapes.
6. Insulated Cable Engineers Association (ICEA).
a. S-95-658 – Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy.
b. T-33-655 – Low-Smoke, Halogen-Free (LSHF) Polymeric Cable Jackets.
7. Intitute of Electrical and Electronics Engineers (IEEE).
a. 1202 – Flame-Propogation Testing of Wire and Cable.
8. Underwriters Laboratories (UL).
a. 1685 – Vertical-Tray Fire-Propogation and Smoke-Release Test for Electrical and Optical-Fiber Cables.

260504 - WIRE, CABLE AND ACCESSORIES

A. Applicable Standards:
1. National Fire Protection Association (NFPA):
a. 70 - National Electrical Code (NEC).
2. Underwriter's Laboratories, Inc. (UL):
a. 44 - Rubber-Insulated Wires and Cables.
b. 83 - Thermoplastic-Insulated Wires and Cables.
c. 854 - Service Entrance Cables.
d. 1277 - Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.
3. Insulated Cable Engineer's Association (ICEA):
a. ICEA S-95-658 / NEMA WC70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy.

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b. ICEA S-93-639 / NEMA WC74 - 5-46 kV Shielded Power Cable for Use in the Transmission and Distribution of Electric Energy.
c. ICEA S-97-682 - Sandard for Utility Sheilded Power Cables Rated 5 - 46 kV .

4. Institute of Electrical and Electronic Engineers (IEEE):
   a. 48 - Test Procedures and Requirements for High Voltage Alternating-Current Cable Terminations.
   b. 404 - Cable Joints for Use with Extruded Dielectric Cable Rated 5,000 through 46,000 Volts, and Cable Joints for Use with Laminated Dielectric Cable Rated 2,500 through 500,000 Volts.
   c. 1202 - Standard for Flame-Propagation Testing of Wire and Cable.
   d. 1210 - Tests for Determining Compatibility of Cable-Pulling Lubricants with Wire and Cable.
5. American Society for Testing and Materials (ASTM):
   a. B3 - Soft or Annealed Copper Wire.
   b. B8 - Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
   c. B33 - Tinned Soft or Annealed Copper Wire for Electrical Purposes.
   d. B172 - Rope-Lay-Stranded Copper Conductors, Having Bunch Stranded Members, for Electrical Conductors.
   e. B189 - Lead-Coated and Lead-Alloy-Coated Soft Copper Wire for Electrical Purposes.
6. Fiber-Optic Cable (In addition to the above references):
   a. Electric Industry Association (EIA):
      (1) EIA-455-25A - Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies.
      (2) EIA-455-30A - Frequency Domain Measurement of Multimode Optical Fiber Information Transmission Capacity.
      (3) EIA-455-33A - Fiber Optic Cable Tensile Loading and Bending Test.
      (4) EIA-455-41 - Compressive Loading Resistance of Fiber Optic Cables.
      (5) EIA/TIA-455-46A - Spectral Attenuation Measurement for Long-length, Graded-Index Optical Fibers.
      (6) EIA/TIA-455-47A - Output Farfield Radiation Pattern Measurement.
      (7) EIA-455-104 - Fiber Optic Cable Cyclic Flexing Test.
      (8) EIA/TIA-RS-359A - Color Coding of Fiber Optic Cables.

260506 - SPECIALS

A. Applicable Standards:
   1. American National Standards Institute (ANSI):
      a. C2 - National Electrical Safety Code (NESC).
   2. American Society for Testing and Materials (ASTM):
      a. E814 - Methods for Fire Tests of Through-Penetration Fire Stops.
   3. Factory Mutual System (FM).
   4. National Electrical Manufacturers Association (NEMA).
      a. 250 - Enclosures for Electrical Equipment (1,000 Volts Maximum).
   5. National Fire Protection Association (NFPA):

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a. 70 - National Electrical Code (NEC).

6. Underwriters Laboratories, Inc. (UL):
   a. 50 - Electrical Cabinets and Boxes.
   b. UL-1025 - Electric Air Heaters.
   c. 1479 - Fire Test of Through - Penetration Firestops.
   d. Fire Resistance Directory.
7. Institute of Electrical and Electronics Engineers (IEEE):
   a. 634 - Cable-Penetration Fire Stop Qualification Test.

260507 – PIPE FREEZE PROTECTION SYSTEM

A. Applicable Standards:
   1. National Electrical Code (NEC/NFPA 70).
   2. National Fire Protection Association (NFPA).
   3. Occupational Safety and Health Act (OSHA).
   4. National Electrical Manufacturers Association (NEMA).
   5. American National Standards Institute (ANSI).
   6. Institute of Electrical and Electronic Engineers (C57.12.91).
   7. Institute of Electrical and Electronic Engineers (IEEE 515).
   8. Insulated Cable Engineers Association (ICEA).
   9. American Society of Mechanical Engineers (ASME B31.1).
   10. American Society for Testing and Materials International (A1016/A1016M).

B. Equipment and materials shall be approved and/or listed in accordance with either of the following:
   1. Factory Mutual (FM).
   2. Underwriters Laboratory (UL).

260526 - GROUNDING

A. Applicable Standards:
   1. National Fire Protection Association (NFPA):
      a. 70 - National Electrical Code (NEC).
      b. 780 - Lightning Protection Code.
   2. American Society for Testing and Materials (ASTM):
      a. B8 - Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
   3. American National Standards Institute (ANSI):
      a. C2 - National Electrical Safety Code (NESC).
   4. Underwriters Laboratories (UL).
      a. 96A - Installation Requirements for Lightning Protection Systems
      b. 467 - Standard for Grounding and Bonding Equipment.

260533 - CONDUIT AND ACCESSORIES

A. Applicable Standards:
   1. American Society For Testing and Materials (ASTM):
      a. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
      b. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
      c. A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
      d. A668 - Steel Forgings, Carbon and Alloy, for General Industrial Use.
      e. B241 - Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.

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f. F512 - Smooth-Wall, Poly(Vinyl Chloride) (PVC) Conduit and Fittings for Underground Installation.

2. Federal Specifications (FS):
   a. A-A-55810 - Conduit, Metal, Flexible.
3. National Fire Protection Association (NFPA):
   a. 70 - National Electrical Code (NEC).
4. National Electrical Manufacturers' Association (NEMA):
   a. C80.1 - Electrical Rigid Steel Conduit.(ERSC).
   b. C80.3 - Steel Electrical Metallic Tubing. (EMT).
   c. C80.5 - Electrical Rigid Aluminum Conduit.(ERAC).
   d. FB1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable.
   e. TC2 - Electrical Polyvinyl Chloride (PVC) Conduit.
   f. TC3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing.
   g. TC6 and 8 - Polyvinyl Chloride (PVC) Plastic Utilities Duct for Underground Installations.
   h. TC9 - Fittings for Polyvinyl Chloride (PVC) Plastic Utilities Duct for Underground Installation.
   i. TC14 - Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
   j. RN1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
5. Underwriters' Laboratories, Inc. (UL):
   a. 1 - Flexible Metal Conduit.
   b. 6 - Electrical Rigid Metal Conduit - Steel.
   c. 467 - Grounding and Bonding Equipment.
   d. 514A - Metallic Outlet Boxes.
   e. 514B - Conduit, Tubing, and Cable Fittings.
   f. 514C - Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers.
   g. 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings.
   h. 651A - Schedule 40 and 80 High Density Polyethylene (HDPE) Conduit.
   i. 886 - Outlet Boxes and Fittings for Use in Hazardous (Classified) Locations.

260536 - CABLE TRAY AND WIREWAY

A. Applicable Standards:
   1. American Society For Testing and Materials (ASTM):
      a. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   2. Underwriters' Laboratories, Inc. (UL): Require products which are UL-listed and labeled.
   3. National Electrical Manufacturers Association (NEMA):
      a. VE1 - Metallic Cable Tray Systems.
      b. VE2 - Cable Tray Installation Guidelings.
   4. National Fire Protection Association (NFPA):
      a. 70 - National Electrical Code (NEC).

260551 - ALTERNATING CURRENT ELECTRIC MOTORS

A. Applicable standards:

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1. American National Standards Institute (ANSI):
   a. C50.41 - Polyphase Induction Motors for Power Generating Stations.
   b. C57.13 - Standard Requirements for Instrument Transformers.
2. American Petroleum Institute (API):
   a. 541 - Form-wound Squirrel-Cage Induction Motors – 500 Horsepower and Larger.
3. American Society for Testing and Materials (ASTM):
   a. A 345 - Flat-Rolled Electrical Steels for Magnetic Applications.
4. American Bearing Manufacturers Association (ABMA):
   a. 9 - Load Ratings and Fatigue Life for Ball Bearings.
   b. 11 - Load Ratings and Fatigue Life for Roller Bearings.
5. Institute of Electrical and Electronics Engineers (IEEE):
   a. 43 - Recommended Practice for Testing Insulation Resistance of Rotating Machinery.
   b. 112 - Standard Test Procedure for Polyphase Induction Motors and Generators.
   c. 429 - Recommended Practice for Thermal Evaluation of Sealed Insulation Systems for AC Electric Machinery Employing Form-Wound, Pre-Insulated Stator Coils for Machines 6900V and below.
6. National Electrical Manufacturers Association (NEMA):
   a. MG 1 - Motors and Generators.
   b. MG 2 - Safety Standard for Construction, and Guide for Selection, Installation, and Use of Electric Motors and Generators.
7. Underwriters Laboratories, Inc. (UL):
   a. 674 - Standard for Electric Motors and Generators for Use in Division I (Classified) Hazardous Locations.
   b. 1004 - Standard for Electric Motors.

260810 - ELECTRICAL TESTING

A. Applicable Standards:
   1. American National Standards Institute (ANSI):
      a. C37.20.1 - Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear.
      b. C37.20.2 - Metal-Clad and Station-Type Switchgear.
      c. C37.20.3 - Metal Enclosed Interrupter Switchgear.
      d. C2 - National Electrical Safety Code (NESC).
   2. American Society For Testing and Materials (ASTM):
      a. D1816 - Test Method for Dielectric Breakdown Voltage of Insulating Oils of Petroleum Origin Using VDE Electrodes.
   3. National Fire Protection Association (NFPA):
      a. 70 - National Electrical Code (NEC).
   4. National Electrical Manufacturers Association (NEMA):
      a. SG5 - Power Switchgear Assemblies.
      b. WC7 - Cross-Linked Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (ICEA S-66-524).
   5. Institute of Electrical and Electronic Engineers (IEEE):
      a. No. 43 - Recommended Practice for Testing Insulation Resistance of Rotating Machinery.

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b. No. 62 - Field Testing Power Apparatus.
c. No. 450 - Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.

6. International Electrical Testing Association (NETA):
   a. Acceptance Testing Specifications for Electric Power Distribution Equipment and Systems.

261200 – SMALL POWER TRANSFORMERS

A. Applicable Codes and Standards:
   1. Design, construct, assemble and test all Equipment furnished to conform with, but not limited to, the following:
      a. Institute of Electrical and Electronics Engineers (IEEE):
         (1) No. 21 - General Requirements and test Procedure for Outdoor Apparatus Bushings.
         (2) No. 24 - Electrical, Dimensional, and Related Requirements for Outdoor Apparatus Bushings.
         (3) No. 32 - Neutral Grounding Devices.
      b. American National Standards Institute (ANSI):
         (1) C37.90 - Relays Associated with Electrical Power Apparatus.
         (2) C57.12.00 - General Requirements for Liquid Immersed Distribution, Power, and Regulating Transformers.
         (3) C57.12.10 - Requirements for Transformers 230,000 Volts and Below, 833/958 Through 8333/10417 kVA Single Phase and 750/862 Through 60,000/80,000/100,000 kVA Three Phase.
         (4) C57.12.70 - Terminal Markings and Connections for Distribution and Power Transformers.
         (5) C57.12.80 - Terminology for Power and Distribution and Power Transformers.
         (6) C57.12.90 - Test Code for Liquid Immersed Distribution, Power, and Regulating Transformers and Guide for Short-Circuit Testing of Distribution and Power Transformers.
         (7) C57.13 - Requirements for Instrument Transformers.
         (8) C62.1 - Surge Arresters for AC Power Circuits.
         (9) C62.11 - Metal-Oxide Surge Arresters for AC Power Circuits.
      c. National Electrical Manufacturer's Association (NEMA):
         (1) CC1 - Electric Power Connectors.
         (2) LA1 - Surge Arresters.
         (3) TR1 - Standards for Transformers, Regulators, and Reactors.

261201 - DRY-TYPE SMALL POWER TRANSFORMERS

A. Applicable Codes and Standards:
   1. Design, construct, assemble and test all Equipment furnished to conform with, but not limited to, the following:
      a. Institute of Electrical and Electronics Engineers (IEEE):
         (1) C37.30 - Definitions and Requirements for High-Voltage Air Switches, Insulators, and Bus Supports.

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(2) C37.32 - Schedules of Preferred Ratings, Manufacturing Specifications, and Application Guide for High-Voltage Air Switches, Bus Supports, and Switch Accessories.
(3) C37.90 - Relays and Relay Systems Associated with Electrical Power Apparatus.
(4) C57.12.01 - Standard General Requirements for Dry-Type Distribution and Power Transformers, Including Those with Solid-Cast and/or Resin Encapsulated Windings.
(5) C57.12.51 - Standard for Ventilated Dry-Type Power Transformers, 501 kVA and Larger, Three-Phase, with High-Voltage 601V to 34,500V; Low Voltage 208Y/120V to 4160 V- General Requirements.
(6) C57.12.60 - Standard Test Procedure for Thermal Evaluation of Insulation Systems for Dry-Type Power and Distribution Transformers, Including Open-Wound, Solid-Cast, and Resin-Encapsulated Transformers.
(7) C57.12.70 - Terminal Markings and Connections for Distribution and Power Transformers.
(8) C57.12.80 - Standard Terminology for Power and Distribution and Power Transformers.
(9) C57.12.91 - Standard Test Code for Dry-Type Distribution and Power Transformers.
(10) C57.13 - Requirements for Instrument Transformers.
(11) C57.19.00 - General Requirements and Test Procedures for Outdoor Power Apparatus Bushings.
(12) C57.19.01 - Standard Performance Characteristics and Dimensions for Outdoor Apparatus Bushings.
(13) C62.11 - Metal-Oxide Surge Arresters for AC Power Circuits (>1 kV).
(14) Std. 32 - Standard Requirements, Terminology and Test Procedure for Neutral Grounding Devices.

b. National Electrical Manufacturer's Association (NEMA):
(1) CC1 - Electric Power Connectors for Substations.
(2) TR1 - Transformers, Regulators, and Reactors.

261313 – 4,160-VOLT METALCLAD SWITCHGEAR

A. Applicable Codes and Standards: Design, fabricate, assemble, and test all Equipment furnished to conform to the following codes and standards:
1. American National Standards Institute (ANSI):
a. C37.04 - Rating Structure for AC High-Voltage Circuit Breakers.
b. C37.06 - Preferred Ratings and Related Required Capabilities for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
c. C37.09 - Test Procedure for AC High-Voltage Circuit Breakers.
d. C37.010 - Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
e. C37.11 - Requirements for Electrical Control for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis or a Total Current Basis.
f. C37.20.2 - Metal-Clad and Station-Type Cubicle Switchgear.

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g. C37.23 - Metal Enclosed Bus and Calculating Losses in Isolated Phase Bus.
h. C37.90 - Relays and Relay Systems Associated with Electric Power Apparatus.
i. C37.90.1 - Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems.
j. C37.100 - Definitions for Power Switchgear.
k. C39.1 - Requirements for Electrical Analog Indicating Instruments.
l. C57.13 - Requirements for Instrument Transformers.
m. C62.1 - Surge Arresters for Alternating Current Power Circuits.
n. C62.11 - Metal-Oxide Surge Arresters for AC Power Circuits.

2. National Electrical Manufacturers' Association (NEMA).
   a. CC1 - Electric Power Connectors for Substations.
   b. SG4 - Power Circuit Breakers.
   c. SG5 - Power Switchgear Assemblies.

3. American Society of Testing and Materials (ASTM).
4. American Institute of Steel Construction (AISC).

261923 – MEDIUM VOLTAGE VARIABLE FREQUENCY DRIVES

A. Applicable Codes and Standards: Design, fabricate, assemble and test all equipment furnished to conform to the following codes and standards:
   1. Institute of Electrical and Electronic Engineers (IEEE):
      a. 519 - Guide for Harmonic Control and Reactive Compensation of Static Power Converters.
      b. 1100 - Powering and Grounding Sensitive Electronic Equipment (Emerald Book).
   2. American National Standards Institute (ANSI):
      a. C57.12.00 - General Requirements for Liquid Immersed Distribution, Power, and Regulating Transformers.
      b. C57.12.01 - General Requirements for Dry-type Distribution and Power Transformers.
      c. C57.12.10 - Requirements for Transformers 230,000 Volts and Below, 833/958 Through 8333/10417 kVA Single Phase and 750/862 Through 60,000/80,000/100,000 kVA Three Phase without Load Tap Changing and 370/4687 Through 60,000/80,000/100,000 kVA with Load Tap Changing – Safety Requirements.
      d. C57.12.70 - Terminal Markings and Connections for Distribution and Power Transformers.
      e. C57.12.80 - Terminology for Power and Distribution and Power Transformers.
      f. C57.12.90 - Test Codes for Liquid Immersed Distribution and Regulating Transformers.
      g. C57.12.91 - Dry-Type Distribution and Power Transformers.
      h. C57.13 - Requirements for Instrument Transformers.
      i. C57.19.00 - General Requirements and Test Procedures for Outdoor Power Apparatus Bushings
      j. C57.19.01 - Standard Performance Characteristics and Dimensions for Outdoor Apparatus Bushings

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3. National Electrical Manufacturer's Association (NEMA):
   a. CC 1 - Electric Power Connectors for Substations.
   b. ICS 3 - Industrial Control and Systems: Medium Voltage Controllers Rated 2001 to 7200 Volts AC.
   c. ICS 6 - Industrial Control and Systems Enclosures.
   d. ICS 7 - Industrial Control Systems Adjustable Speed Drives.
   e. TR 1 - Transformers, Regulators, and Reactors.
4. National Fire Protection Association (NFPA).
5. National Electrical Code (NEC).
6. Underwriters Laboratory (UL).
   a. IEC 61800 - Adjustable speed electrical power systems – Part 5-1: Safety requirements - Electrical, thermal and energy.

262300 – 480-VOLT LOAD CENTERS AND BUS EQUIPMENT

A. Applicable Codes and Standards: Design, fabricate, assemble and test all equipment furnished to conform to the following codes and standards:
   1. American National Standards Institute (ANSI):
      a. C37.11 - IEEE Standard Requirements for Electrical Control for AC High-Voltage.
      b. C37.13 - Low-Voltage AC Power Circuit Breakers Used in Enclosures.
      c. C37.16 - Preferred Ratings, Related Requirements, and Application Recommendations for Low-Voltage Power Circuit Breakers and AC Power Circuit Protectors.
      d. C37.17 - Trip Devices for AC and General Purpose DC Low-Voltage Power Circuit Breakers.
      e. C37.20.1 - Metal-Enclosed Low Voltage Power Circuit Breaker Switchgear.
      f. C37.23 - Guide for Metal-Enclosed Bus and Calculating Losses in Isolated Phase Bus.
      g. C37.50 - Test Procedures for Low-Voltage AC Power Circuit Breakers Used in Enclosures.
      h. C37.90 - Relays and Relay Systems Associated With Electric Power Apparatus.
      i. C37.90.1 - Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems.
      j. C37.100- Definitions for Power Switchgear.
      k. C39.1 - Requirements for Electrical Analog Indicating Instruments.
      l. C57.12.01 - General Requirements for Dry-Type Distribution and Power Transformers.
      m. C57.12.51 - Requirements for Ventilated Dry-Type Power Transformers, 501 kVA and Larger, 3-Phase, with High-Voltage 601 to 34,500 Volts, Low-Voltage 208Y/120 to 4,160 Volts.
      n. C57.12.70 - Terminal Markings and Connections for Distribution and Power Transformers.
      o. C57.12.80 - Terminology for Distribution, Power, and Regulating Transformers, and Reactors Other Than Current-Limiting Reactors.
      p. C57.12.91 - Test Code for Dry-Type Distribution and Power Transformers.
      q. C57.13 - Standard Requirements for Instrument Transformers.

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2. National Electrical Manufacturer's Association (NEMA):
   a. CC1 - Electric Power Connectors for Substations.
   b. SG5 - Power Switchgear Assemblies.
   c. TR1 - Transformers, Regulators and Reactors.
   d. ST-20 - Dry Type Transformers for General Applications.

262400 - PANELBOARDS, SWITCHBOARDS AND TRANSFORMERS

A. Applicable Standards:
   1. American National Standards Institute (ANSI):
      a. C57 Series - Transformers, Regulators, and Reactors.
      b. C37.20 - IEEE Standard for Switchgear Assemblies Including Metal-Enclosed Bus.
   2. National Fire Protection Association (NFPA):
      a. 70 - National Electrical Code (NEC).
   3. National Electrical Manufacturers Association (NEMA):
      a. AB1 - Molded Case Circuit Breakers and Molded Case Switches.
      b. ICS1 - Industrial Control and Systems.
      c. ICS2 - Industrial Control Devices, Controllers and Assemblies.
      d. ICS4 - Terminal Blocks for Industrial Use.
      e. PB1 - Panelboards.
      f. PB2 - Deadfront Distribution Switchboards.
      g. ST1 - Specialty Transformers (Except General-Purpose Type).
      h. 250 - Enclosures for Electrical Equipment (1000V Maximum).
   4. Underwriters' Laboratories, Inc. (UL):
      a. 50 - Enclosures for Electrical Equipment.
      b. 67 - Panelboards.
      c. 506 - Specialty Transformers.
      d. 508 - Industrial Control Equipment.
      e. 891 - Dead-Front Switchboards.
   5. Federal Specifications:
      a. FED-STD-595B - Colors Used in Government Procurement.
      b. W-P-115C - Panel, Power Distribution.
      c. W-C-375 - Circuit Breakers, Molded Case, Branch Circuit and Service, Type I, Series Trip, Three Pole (10 through 100 Amperes).

262419 - 480 VOLT MOTOR CONTROL CENTER EQUIPMENT

A. Applicable Standards:
   1. National Fire Protection Association (NFPA):
   2. National Electrical Code (NEC).
   3. National Electrical Safety Code (NESC).
   4. National Electrical Manufacturers' Association (NEMA):
      a. AB1 - Molded Case Circuit Breakers.
      b. CC1 - Electric Power Connectors.
      c. ICS1 - General Standards for Industrial Control and Systems.
      d. ICS2 - Standards for Industrial Control Devices, Controllers and Assemblies.
      e. ST1 - Specialty Transformers.
   5. Underwriters' Laboratories Inc. (UL):
      a. 508 - Industrial Control Equipment.

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b. 845 - Motor Control Centers.

262419 - 480 VOLT MOTOR CONTROL CENTER EQUIPMENT

A. Provide equipment in full accordance with the latest applicable rules, regulations, and standards of:
   1. National Electric Code (NEC).
   2. Underwriters' Laboratories (UL).
   3. American National Standards Institute (ANSI).
   4. National Electrical Manufacturers Association (NEMA).
   5. Institute of Electrical and Electronics Engineers (IEEE).
   6. Federal Communications Commission (FCC).

262900 - POWER SWITCHING AND CONTROL DEVICES

A. Applicable Standards:
   1. Institute of Electrical and Electronic Engineers (IEEE):
      a. C37.90 - Relays and Relay Systems Associated with Electric Power Apparatus.
   2. National Fire Protection Association (NFPA):
      a. 70 - National Electrical Code (NEC).
      b. 110 - Emergency and Standby Power Systems.
   3. National Electrical Manufacturer's Association (NEMA):
      a. AB1 - Molded-Case Circuit Breakers and Molded Case Switches.
      b. ICS1 - General Standards for Industrial Control and Systems.
      c. ICS2 - Industrial Control Devices, Controllers and Assemblies.
      d. ICS4 - Terminal Blocks for Industrial Use.
      e. 250 - Enclosures for Electrical Equipment (1,000 Volts Maximum).
      f. ICS-2-447 - AC Automatic Transfer Switches.
   4. Underwriters' Laboratories, Inc. (UL):
      a. 50 - Enclosures for Electrical Equipment.
      b. 508 - Industrial Control Equipment.
      c. 89 - Molded-Case Circuit Breakers and Circuit Breaker Enclosures.
      d. 1008 - Automatic Transfer Switches.
      e. 1087 - Molded Case Switches.
   5. Federal Specification (FS):
      a. W-C-375B - Molded Case Circuit Breakers.
   6. American National Standards Institute (ANSI):
      a. 446 - Emergency and Standby Power Systems for Industrial and Commercial Applications.

263353 - UNINTERRUPTIBLE POWER SYSTEM

A. Applicable Standards:
   1. Institute of Electrical and Electronics Engineers (IEEE):
      a. 450 - Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.
      b. 484 - Recommendations for Installation of Large Lead Storage Batteries.
      c. 485 - Recommended Practice for Sizing Large Lead Storage Batteries for Generating Stations and Substations.
   2. National Electrical Manufacturer's Association (NEMA):
      a. CC1 - Electric Power Connectors for substations.

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b. AB1 - Molded Case Circuit Breakers.
c. IB1 - Definitions for Industrial Lead-Acid Storage Batteries.
d. TR1 - Transformers, Regulators, and Reactors.
e. ICS - Industrial Controls and Systems.
f. ST2 - Specialty Transformers.

3. Underwriters' Laboratories (UL):
   a. 508 - Industrial Control Equipment.
   b. 67 - Panelboards.
   c. 506 - Specialty Transformers.
4. National Fire Protection Association (NFPA):
   a. 70 - National Electrical Code (NEC).
   b. National Electric Safety Code (NESC).
5. American National Standards Institute (ANSI).

264100 - LIGHTNING PROTECTION SYSTEMS

A. Applicable Standards:
   1. Underwriters' Laboratories, Inc. (UL):
      a. 96A - Installation Requirements for Lightning Protection Systems.
      b. 467 - Standard for Grounding and Bonding Equipment.
   2. American Society for Testing and Materials (ASTM):
      a. B8 - Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
   3. National Fire Protection Association (NFPA):
      a. 70 - National Electrical Code.
      b. 780 - Lightning Protection Code.

264200 - CATHODIC PROTECTION EQUIPMENT AND MATERIALS

A. Applicable Standards:
   1. American National Standards Institute (ANSI) Publications:
      a. B36.10 Welded and Seamless Wrought-Iron Pipe.
      b. C2 - National Electrical Safety Code.
      c. C80.1 - Rigid Steel Conduit, Zinc-Coated.
   2. National Fire Protection Association (NFPA):
      a. 70 - National Electrical Code.
   3. National Electrical Manufacturers Association (NEMA):
      a. MR 20 - Cathodic Protection Units (R 1971).
   4. National Association of Corrosion Engineers (NACE):
      a. RP-01-69 - Recommended Practice - Control of External Corrosion on UNderground or Submerged Metallic Piping Systems.
      b. RP-05-72 - Recommended Practice - Design, Installation, Operation and Maintenance of Impressed Current Deep Groundbeds.
   5. Underwriters' Laboratories, Inc. (UL):
      a. UL-6 - Rigid Metal Electrical Conduit.
      b. UL-486 - Wire Connectors and Soldering Lugs for Use with Copper Conductors.
      c. UL-510 - Insulating Tape.
   6. American Society for Testing and Materials (ASTM):
      a. D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.

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b. D2104 - Polyethylene (PE) Plastic Pipe, Schedule 80.
c. D2241 - Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).
d. 3261 - Butt Heat fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

264210 - CATHODIC PROTECTION INSTALLATION

A. Applicable Standards:
1. American National Standards Institute (ANSI):
   a. C2 - National Electrical Safety Code.
2. American Society for Testing and Materials (ASTM):
   a. D2774 - Underground Installation of Thermoplastic Pressure Piping.
   b. D2855 - Making Solvent-Cemented Joints with PVC Pipe and Fittings.
3. National Fire Protection Association (NFPA):
   a. 70 - National Electrical Code.
4. National Association of Corrosion Engineers (NACE):
   a. RP-01-69 - Recommended Practice - Control of External Corrosion on Underground or Submerged Metallic Piping Systems.
   b. RP-05-72 - Recommended Practice - Design, Installation, Operation and Maintenance of Impressed Current Deep Groundbeds.

265000 - LIGHTING, RECEPTACLES AND CONTROLLING DEVICES

A. Applicable Standards:
1. American National Standards Institute (ANSI):
   a. WD6 - Dimensions of Caps, Plugs and Receptacles (ANSI/NEMA).
   b. C62 Series: Surge voltages.
   c. C78 Series:
      (1) Electric Discharge Lamps (Fluorescent).
      (2) Electric Discharge Lamps (HID).
   d. C81 Series - Electric Lamp Bases and Holders.
   e. C82 Series - Lamp Ballasts.
   f. Z55.1.24 - No. 24 Dark Gray Finish.
2. Certified Ballast Manufacturers (CBM).
3. Electrical Testing Laboratories (ETL).
4. Illuminating Engineering Society of North America (IESNA).
5. National Fire Protection Association (NFPA):
   a. 70 - National Electric Code (NEC).
6. National Electrical Manufacturers Association (NEMA).
7. Reflector and Lamp Manufacturers (RLM) Standards Institute (RLMSI):
   a. Industrial Lighting Units.
8. Underwriters' Laboratories, Inc. (UL):
   a. 943 - Ground-Fault Circuit Interrupters.
   b. 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products
9. National Appliance Energy Conservation Act of 1987 (Public Law 100-357).
10. Energy Policy Act of 1992 (Public Law 102-486).

275116 – INTERCOMMUNICATIONS AND PUBLIC ADDRESS SYSTEM

A. Applicable Standards:
1. National Fire Protection Association (NFPA):

a. 70 - National Electrical Code (NEC).

2. Underwriters Laboratories, Inc. (UL):
   a. 813 - Commercial Audio Equipment.
3. American with Disabilities Act (ADA).
4. Factory Mutual, Inc. (FM).

312050 – SITE PREPARATION AND EARTHWORK

A. Applicable Standards:
   1. American Society for Testing and Materials (ASTM) (Equivalent AASHTO standards may be substituted as approved):
      a. C33 - Concrete Aggregates.
      b. C88 - Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
      c. C94 - Ready-Mix Concrete.
      d. C144 - Aggregate for Masonry Mortar.
      e. C150 - Portland Cement.
      f. C173 - Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
      g. C231 - Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
      h. C403 - Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance.
      i. C618 - Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
      j. C939 - Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method).
      k. C940 - Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory.
      l. D698 - Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3).
      m. D1556 - Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method.
      n. D1557 - Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3)
      o. D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
      p. D2487 - Classification of Soils for Engineering Purposes (Unified Soil Classification System).
      q. D3776 - Test Methods for Mass per Unit Area (Weight) of Fabric.
      r. D4253 - Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
      s. D4254 - Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
      t. D4318 - Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
      u. D4546 - Test Methods for One-Dimensional Swell or Collapse of Cohesive Soils.
      v. D4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles.

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w. D4751 - Test Method for Determining Apparent Opening Size of a Geotextile.
x. D4832 - Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.
y. D4833 - Test Method for Index Puncture Resistance of Geomembranes and Related Products.
z. D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

2. Kentucky Transportation Cabinet Standard Specifications for Road and Bridge Construction.
   a. Section 601 - Concrete.
   b. Section 805 - Coarse Aggregates.

321100 – CRUSHED ROCK BASE AND SURFACE COURSE

A. Applicable Standards:
   1. American Society for Testing and Materials (ASTM): Equivalent AASHTO standards may be substituted as approved.
      a. C29 -Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate.
      b. C88 Test Method for Soundness of Aggregates by use of Sodium Sulfate or Magnesium Sulfate.
      c. C117 - Test Method for Materials Finer than No. 200 Sieve in Mineral Aggregates by Washing.
      d. C131 - Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
      e. C136 - Test Method for Sieve Analysis of Fine and Coarse Aggregates.
      f. D75 - Practice for Sampling Aggregates.
      g. D698 - Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3).
      h. D2419 - Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
      i. D4318 - Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
      j. D6938 - Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
   2. Kentucky Transportation Cabinet Standard Specification for Road and Bridge Construction.
      a. Section 805 – Coarse Aggregates.

321217 – HOT MIX ASPHALTIC-CONCRETE PAVEMENT

A. Applicable Standards:
   1. American Society for Testing and Materials (ASTM):
      a. C29 - Test Method for Unit Weight and Voids in Aggregate.
      b. C117 - Test Method for Material Finer than No. 200 Sieve in Mineral Aggregates by Washing.
      c. C131 - Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
      d. C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

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e. C183 - Practice for Sampling and the Amount of Testing of Hydraulic Cement.
f. D75 - Practices for Sampling Aggregates.
g. D140 - Practice for Sampling Bituminous Materials.
h. D242 - Mineral Filler for Bituminous Paving Mixtures.
i. D946 - Penetration-Graded Asphalt Cement for Use in Pavement Construction.
j. D979 - Practice for Sampling Bituminous Paving Mixtures.
k. D1560 - Standard Test Methods for Resistance to Deformation and Cohesion of Bituminous Mixtures by Means of Hveem Apparatus.

2. American Association of State Highway and Transportation Officials (AASHTO):
   a. M29 - Fine Aggregate for Bituminous Paving Mixtures.
   b. T102 - Spot Test of Asphaltic Materials.
3. Kentucky Transporation Cabinet (KTC), Standard Specifications for Road and Bridge Construction
   a. Division 300 - Aggregate Base Courses.
   b. Division 400 - Asphalt Pavements.

329200 - SEEDING

A. Applicable Standards:
   1. Kentucky Transportation Cabinet Standard Specifications:
      a. Section 212 - Erosion Control.

334100 - STORM DRAINAGE SYSTEM

A. Applicable Standards:
   1. American Water Works Association (AWWA).
   2. American Society for Testing and Materials (ASTM):
      a. C76 - Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.
      b. C270 - Mortar for Unit Masonry.
      c. C443 - Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
      d. C478 - Precast Reinforced Concrete Manhole Sections.
      e. C506 - Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe.
   3. American Association of State Highway and Transportation Officials (AASHTO):
      a. M252 - Corrugated Polyethylene Drainage Pipe.
      b. M294 - Standard Specification for Corrrugated Polyethylene Pipe, 12" to 60" Diameter.

409125 – MEASUREMENT AND CONTROL INSTRUMENTATION FOR PACKAGED SYSTEMS

H. Applicable Standards:
   1. American Society of Mechanical Engineers (ASME):
      a. Boiler & Pressure Vessel Code.
      b. MFC-3M - Measurement of Fluid Flow in Pipes Using Orifice, Nozzle and Venturi.
      c. Power Piping - Code for Pressure Piping, B31.1.
      d. Steam Turbines - Performance Test Code Committee 6 on Steam Turbines.

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2. American Welding Society (AWS).
3. ASTM International (ASTM):
   a. A182/A182M - Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.
   b. A213/A213M - Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes.
   c. A1016/A1016M - General Requirements for Ferritic Alloy Steel, Austenitic Alloy Steel, and Stainless Steel Tubes.
   d. B75 - Standard Specification for Seamless Copper Tube.
4. Institute of Electrical and Electronics Engineers (IEEE).
   a. 383 - IEEE Cable Flame Test.
   b. 472 - Surge Withstand Capability Test.
   c. 518 - IEEE Guide for the Installation of Electrical Equipment to Minimize Electrical Noise Inputs to Controllers from External Sources.
5. The Instrumentation, Systems and Automation Society (ISA).
6. Insulated Cable Engineers Association (ICEA).
7. National Electrical Code (NEC).
8. National Electrical Manufacturers Association (NEMA):
   a. ICS - Industrial Controls and Systems.
   b. 508 - Industrial Control Equipment.
9. National Electrical Safety Code (NESC).
10. National Fire Protection Association (NFPA).
    a. 85 - Boiler and Combustion Systems Hazards Code.
11. The Measurement, Control & Automation Association (MCAA):
    a. Functional Diagramming of Instrument and Control Systems.
12. Underwriters Laboratories (UL).
13. FM Global (FM).

409400 – CONTROL SYSTEM GENERAL REQUIREMENTS

A. Applicable Standards:
   1. ANSI - American National Standards Association.
   2. FM - Factory Mutual.
   3. ISA - The International Society of Automation:
      a. 5.1-2009 - Instrumentation Symbols and Identification (includes PMC 22.1 - 1981, functional diagraming of instrument and control systems).
      b. 77.20-1993 - Fossil Fuel Power Plant Simulators Functional Requirements. IEEE - Institute of Electrical and Electronics Engineers.
   4. NEMA - National Electrical Manufacturers Association.
   5. NESC - National Electrical Safety Code.
   6. NFPA - National Fire Protection Association:
      a. 70 - National Electric Code.
      b. 85 - Boiler and Combustion Systems Hazards Code.
   7. OSHA - Occupational Safety and Health Administration.
   8. ASME - American Society of Mechanical Engineers.
   9. ICEA - Insulated Cable Engineers Association.
   10. IPC/WHMA-A-620 - Requirements and Acceptance for Cable and Wire Harness Assemblies (Class 3 shall apply).
   11. NERC CIP - North American Electric Reliability Council Critical Infrastructure Protection.

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411209 - BELT CONVEYORS

A. Applicable Standards:
   1. American Gear Manufacturers Association (AGMA):
      a. 151.02 - Application Classification for Helical, Herringbone and Spiral Bevel Gear Speed Reducers.
      b. 250.02 - Lubrication of Industrial Enclosed Gearing.
      c. 420.04 - Practice for Helical and Herrington Gear Speed Reducers and Increasers.
   2. American Iron and Steel Institute (AISI):
      a. C-1042.
      b. C-1045.
      c. C-4140.
   3. American National Standards Institute (ANSI):
      a. B15.1 - Safety Standards for Mechanical Power Transmission Apparatus.
      b. B20.1 - Safety Standards for Conveyors and Related Equipment.
      c. B105.1 - Welded Steel Conveyor Pulleys with Compression-Type Hubs.
      d. Z535.4 - Product Safety Signs and Labels.
   4. American Society of Mechanical Engineers (ASME):
      a. B106.1M - Code for the Design of Transmission Shafting.
   5. American Society for Testing and Materials (ASTM):
      a. A36 - Structural Steel.
      b. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
   6. American Bearing Manufacturer's Association (ABMA).
   7. Conveyor Equipment Manufacturer's Association (CEMA):
      a. Belt Conveyors for Bulk Materials.
   8. Mine Safety and Health Administration (MSHA).
   9. National Electrical Manufacturer's Association (NEMA).
   10. Rubber Manufacturers Association (RMA):
      a. Conveyor and Elevator Belting Handbook.

411215 – PORTAL SCRAPER-RECLAIMER

A. Applicable Standards:
   1. As specified in DIVISION 1.
   2. American Gear Manufacturers Association (AGMA):
      a. 152 - Application Classification for Helical, Herringbone, and Spiral Bevel Gear Speed Reducers.
      b. 250.02 - Lubrication of Industrial Enclosed Gearing.
      c. 420.04 - Practice for Helical and Herringbone Gear Speed Reducers and Increasers.
   3. American Bearing Manufacturers Association (ABMA).
      a. 9 - Load Ratings and Fatigue Life for Ball Bearings.
      b. 11 - Load Ratings and Fatigue Life for Roller Bearings.
   4. National Electrical Code (NEC).
   5. National Electrical Manufacturers Association (NEMA).
   6. American Welding Society (AWS):
      a. D1.1 - Carbon Structural Welding Code.
   7. American Institute of Steel Construction (AISC):
      a. Manual of Steel Construction.

b. Quality Criteria and Inspection Standards.

8. American Society for Testing and Materials (ASTM):
   a. A1 - Carbon Steel Rails.
   b. A36 - Carbon Structural Steel.

411217 – PIPE CONVEYOR

A. Applicable Standards:
   1. American Gear Manufacturers Association (AGMA):
      a. 151.02 - Application Classification for Helical, Herringbone and Spiral Bevel Gear Speed Reducers.
      b. 250.02 - Lubrication of Industrial Enclosed Gearing.
      c. 420.04 - Practice for Helical and Herrington Gear Speed Reducers and Increasers.
   2. American Iron and Steel Institute (AISI):
      a. C-1042.
      b. C-1045.
      c. C-4140.
   3. American National Standards Institute (ANSI):
      a. B15.1 - Safety Standards for Mechanical Power Transmission Apparatus.
      b. B20.1 - Safety Standards for Conveyors and Related Equipment.
      c. B105.1 - Welded Steel Conveyor Pulleys with Compression-Type Hubs.
      d. Z535.4 - Product Safety Signs and Labels.
   4. American Society of Mechanical Engineers (ASME):
      a. B106.1M - Code for the Design of Transmission Shafting.
   5. American Society for Testing and Materials (ASTM):
      a. A36 - Structural Steel.
      b. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
   6. American Bearing Manufacturer's Association (ABMA).
   7. Conveyor Equipment Manufacturer's Association (CEMA):
      a. Belt Conveyors for Bulk Materials.
   8. Mine Safety and Health Administration (MSHA).
   9. National Electrical Manufacturer's Association (NEMA).
   10. Rubber Manufacturers Association (RMA):
      a. Conveyor and Elevator Belting Handbook.

411230 - CHUTES, HOPPERS, AND GATES

A. Applicable Standards:
   1. American Institute of Steel Construction (AISC):
      a. Manual of Steel Construction.
      b. Quality Criteria and Construction Standards.
   2. American Iron and Steel Institute (AISI):
      a. C-1042.
      b. C-1045.
      c. C-4140.
   3. American Society for Testing and Materials (ASTM):
      a. A6 - General Requirements for Rolled Plates for Structural Use.
      b. A36 - Carbon Structural Steel.

c. A666 - Austenite Stainless Steel, Sheet, Strip, and Flat Bar for Structural Applications.

4. American Welding Society (AWS):
   a. D1.1 - Structural Welding Code - Steel.
5. National Electrical Code (NEC).
6. National Electrical Manufacturers Association (NEMA).

411240 – WET SUPPRESSION SYSTEMS

A. Applicable Standards:
   1. As specified in DIVISION 1.
   2. American National Standards Institute (ANSI):
      a. B15.1 - Safety Standards for Mechanical Power Transmission Apparatus.
      b. B16.5 - Pipe Flanges and Flanged Fittings.
   3. National Fire Protection Association (NFPA):
      a. 70 - National Electrical Code (NEC).
   4. National Electrical Manufacturers' Association (NEMA).
   5. State and local air quality codes.
   6. National Institute for Occupational Safety and Health (NIOSH):
      a. Method 0600.
      b. Method 7500.

411250 - SAFETY GUARDS AND CAGES

A. American Society of Mechanical Engineers (ASME):
   1. B15.1 - Safety Standard for Mechanical Power Transmission Apparatus.
   2. B20.1 - Safety Standards for Conveyors and Related Components.

411323 – APRON BELT FEEDER UNLOADING SYSTEM

A. Applicable Standards:
   1. American Iron and Steel Institute (AISI):
      a. C-1042.
      b. C-1045.
      c. C-4140.
   2. American Society of Mechanical Engineers (ASME):
      a. B20.1 - Safety Standards for Conveyors and Related Equipment.
      b. B106.1M - Design of Transmission Shafting.
   3. American National Standards Institute (ANSI).
   4. American Bearing Manufacturer's Association (ABMA):
      a. 11 - Load Ratings and Fatigue Life of Roller Bearings.
      b. 9 - Load Ratings and Fatigue Life of Ball Bearings.
   5. American Gear Manufacturer's Association (AGMA):
      a. 152 - Application Classification for Helical, Herringbone, and Spiral Bevel Gear Speed Reducers.
      b. 290.02 - Lubrication of Industrial Enclosed Gearing.
      c. 420.04 - Practice for Helical and Herringbone Gear Speed Reducers and Increasers.
   6. American Society for Testing and Materials (ASTM):
      a. A36 - Carbon Structural Steel.
      b. A484 - Stainless Steel and Heat-Resisting Bars, Billets, and Forgings.
   7. Mine Safety and Health Administration (MSHA).

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411435 – BELT SCALES

A. Applicable Standards:
   1. Weighing and Inspection Bureau (applicable to area) or National Institute of Standards and Technology (NIST), Handbook 44 (whichever applicable).
   2. Conveyor Equipment Manufacturers Association (CEMA):
      a. Belt Conveyors for Bulk Materials Manual - latest edition.
   3. National Electric Code (NEC).
   4. National Electrical Manufacturers Association (NEMA).
   5. National Type Evaluation Program (NTEP).

411525 – CONTROL DEVICES FOR MATERIAL HANDLING

A. Applicable Standards:
   1. American National Standard Institute (ANSI):
      a. B20.1 - Safety Standards for Conveyors and Related Equipment.
   2. American Society for Testing and Materials (ASTM).
   3. Institute of Electrical and Electronics Engineers (IEEE).
   4. International Power Cable Engineers' Association (IPCEA).
   5. National Institute of Standards and Technology, Handbook 44 (where specified for load cells).
   6. National Fire Protection Association (NFPA):
      a. 70 - National Electrical Code (NEC).
      b. 850 - Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations.
   7. National Electrical Manufacturers' Association (NEMA).
   8. National Electric Safety Code (NESC).

412433 – MAGNETIC SEPARATORS

A. Applicable Standards:
   1. As specified in DIVISION 1.
   2. American Bearing Manufacturers' Association (ABMA):
      a. 9 - Load Ratings and Fatigue Life of Ball Bearings.
      b. 11 - Load Ratings and Fatigue Life of Roller Bearings.
   3. American National Standards Institute (ANSI):
      a. B15.1 - Safety Standards for Mechanical Power Transmission Apparatus.
      b. B20.1 - Safety Standards for Conveyors and Related Equipment.
      c. B105.1 - Welded Steel Conveyor Pulleys with Compression Type Hubs.
   4. Rubber Manufacturers Association (RMA).
   5. National Fire Protection Association (NFPA):
      a. 70 - National Electric Code (NEC).
   6. National Electrical Manufacturers Association (NEMA).
   7. American Iron and Steel Institute (AISI).
      a. C-1045.
   8. Underwriters Laboratories (UL).

412436 – METAL DETECTORS

A. Applicable Standards:
   1. As specified in DIVISION 1.
   2. National Fire Protection Association (NFPA):
      a. 70 - National Electrical Code (NEC).

3. National Electrical Manufacturers Association (NEMA).

485272 – BOTTTOM ASH EQUIPMENT

A. Applicable Standards:
   1. American National Standards Institute (ANSI):
      a. B29.1 - Precicsion Power Transmission Roller Chains, Attachments, and Sprockets.
   2. American Society for Testing and Materials (ASTM):
      a. A283 - Low and Intermediate Tensile Strength Carbon Steel Plates of Structural Quality.
   3. Society of Automotive Engineers (SAE):
      a. SP-68 - Inverted Tooth (Silent) Chain and Sprocket Teeth.

485280 - FLY ASH, ECONOMIZER ASH AND AIR HEATER ASH EQUIPMENT

A. Applicable Standards:
   1. Air Movement and Control Association, Inc. (AMCA).
   2. American Society of Mechanical Engineers (ASME):
      a. B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.
      b. B16.5 - Pipe Flanges and Flanged Fittings.
   3. American Society for Testing and Materials (ASTM):
      a. A283/A283M - Low and Intermediate Tensile-Strength Carbon-Steel Plates, Shapes, and Bars.
   4. National Electrical Manufacturer's Association (NEMA).

485285 – GYPSUM DEWATERING SYSTEM

A. Applicable Standards:
   1. Air Movement and Control Association, Inc. (AMCA).
   2. American Society of Mechanical Engineers (ASME):
      a. B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.
      b. B16.5 - Pipe Flanges and Flanged Fittings.
   3. American Society for Testing and Materials (ASTM):
      a. A283/A283M - Low and Intermediate Tensile-Strength Carbon-Steel Plates, Shapes, and Bars.
   4. National Electrical Manufacturer's Association (NEMA).

485290 - ASH AND GYPSUM HANDLING PIPE, VALVES & FITTINGS

A. Applicable Standards:
   1. American Society for Testing and Materials (ASTM):
      a. A53 - Welded and Seamless Steel Pipe.

485422 - HORIZONTAL END-SUCTION PUMPS

A. Applicable Standards:
   1. American Bearing Manufacturer's Association (ABMA).
   2. American National Standards Institute (ANSI).
   3. American Water Works Association (AWWA).
   4. Hydraulic Institute (HI).
   5. American Welding Society (AWS).
   6. American Society for Testing and Materials (ASTM).
   7. Society for Protective Coatings (SSPC).

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485422 – VERTICAL SUMP PUMPS

A. Applicable Standards:
   1. American Bearing Manufacturer's Association (ABMA).
   2. American National Standards Institute (ANSI).
   3. American Water Works Association (AWWA).
   4. Hydraulic Institute (HI).
   5. American Welding Society (AWS).
   6. American Society for Testing and Materials (ASTM).
   7. Society for Protective Coatings (SSPC).

485460 - HORIZONTAL HARD METAL SLURRY PUMPS

A. Applicable Standards:
   1. American Bearing Manufacturers Association (ABMA).
   2. American National Standards Institute (ANSI).
   3. American Society for Testing and Materials (ASTM).
   4. American Society of Mechanical Engineers (ASME).
   5. American Welding Society (AWS).
   6. American Water Works Association (AWWA).
   7. Hydraulic Institute (HI).
   8. National Electrical Manufacturers Association (NEMA).
   9. Society for Protective Coatings (SSPC).

485502 – COMPRESSED AIR SYSTEM EQUIPMENT

A. Applicable Standards:
   1. American Gear Manufacturers Association (AGMA):
      a. 421-06.
   2. American National Standards Institute (ANSI):
      a. B31.1 - Power Piping.
      b. C2 - National Electrical Safety Code.
   3. American Society for Testing and Materials (ASTM):
      a. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless.
   4. American Society of Mechanical Engineers (ASME):
      a. B19.1 - Safety Standard for Air Compressor Systems.
      b. B19.3 - Safety Standard for Compressors for Process Industries.
      c. B31.1 - Power Piping.
      d. Section VIII. Code for Unfired Pressure Vessels.
   5. Institute of Electrical and Electronics Engineers (IEEE):
   6. Heat Exchange Institute (HEI).
   7. National Electrical Manufacturers Association (NEMA).
   8. National Electrical Code (NEC).

485655 – TANKS AND AIR RECEIVERS (SHOP FABRICATED)

A. Applicable Standards:
   1. American Water Works Association (AWWA):
      a. D100 - Steel Tanks for Water Storage.
      b. D102 - Painting Steel Tanks.
   2. American Society of Testing Materials (ASTM):
      a. A36 - Carbon Structural Steel.

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b. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless Pipe.
c. A106 - Seamless Carbon Steel Pipe for High Temperature Service.
d. A283 - Low and Intermediate Tensile Strength Carbon Steel Plates.
e. A285 - Pressure Vessel Plates, Carbon Steel, Low and Intermediate Tensile Strength.
f. A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
g. A515 - Pressure Vessel Plates, Carbon Steel, for Intermediate and Higher Temperature Service.

3. American Welding Society (AWS):
   a. A5.1 - Mild Steel Arc-Welding Electrodes.
   b. Standard Welding Terms and Definitions.
   c. Standard Welding Symbols.
4. American National Standards Institute (ANSI):
   a. B16.1 - Bolting for Slip-On Flanges
   b. B16.5 - Steel Pipe Flanges and Flanged Fittings.
   c. B16.9 - Wrought Steel Buttweld Fittings.
   d. B16.11 - Forged Steel Fittings, Socket Welded and Threaded.
   e. B16.25 - Buttwelding Ends.
   f. B18.2.1 and B18.2.2 – Nuts for Slip-On Flanges
5. American Society of Mechanical Engineers (ASME):
   a. Boiler and Pressure Vessel Code, Sections II, VIII, and IX.
   b. RTP-1 - General Design and Fabrication – Noncertified and Certified
6. Society for Protective Coatings (SSPC) Surface Preparation Specifications:
   a. SP5 - "White Metal Blast."
   b. SP6 - "Commercial Blast Cleaning."
   c. SP8 - "Pickling."
   d. SP11 - "Power Tool Cleaning to Bare Metal."
7. American Petroleum Institute (API):
   a. Specifications for Welded Oil Storage Tanks, API Standard 650.

485660 – FIELD-ERECTED TANKS

A. Applicable Standards:
   1. American Water Works Association (AWWA):
      a. D100 - Steel tanks for water storage.
      b. D102 - Painting steel tanks.
   2. American Society of Testing and Materials (ASTM):
      a. A36 - Carbon Structural Steel.
      b. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
      c. A106 - Seamless Carbon Steel Pipe for High-Temperature Service.
      d. A181 - Forgings, Carbon Steel for General-Purpose Piping.
      e. A283 - Low and Intermediate Steel Plates of Structural Quality.
      f. A285 - Low and Intermediate Steel Plates for Pressure Vessels.
      g. A307 - Carbon Steel Externally Threaded Standard Fasteners.
      h. A312 - Seamless and Welded Austenitic Stainless Steel Pipe.
      i. A515 - Carbon Steel Plates for Pressure Vessels for Intermediate and Higher Temperature Service.
   3. American Welding Society (AWS):

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a. A5.1 - Mild Steel Arc-Welding Electrodes.
b. Standard Welding Terms and Definitions.
c. Standard Welding Symbols.

4. American National Standards Institute (ANSI):
   a. B16.5 - Steel Pipe Flanges.
   b. B16.9 - Steel Butt Weld Fittings.
   c. B16.11 - Steel Socket Weld Fittings.
   d. B16.25 - Butt Welding Ends.
5. American Society of Mechanical Engineers (ASME):
   a. Boiler and Pressure Vessel Code, Sections II and IX.
6. Society for Protective Coatings (SSPC) Surface Preparation Specifications:
   a. SP1 - Solvent Cleaning.
   b. SP3 - Power Tool Cleaning.
   c. SP5 - Blast Cleaning to White Metal.
   d. SP6 - Commercial Blast Cleaning.
   e. SP8 - Pickling.
7. American Petroleum Institute (API):
   a. Specifications for Welded Oil Storage Tanks, API Standard 650.
8. National Fire Protection Association (NFPA):
   a. National Fire Codes, Sections 22, 30, 37.
9. Occupational Safety and Health Act (OSHA).

485935 - POWER PIPING WELDING AND FABRICATION

A. Applicable Codes and Standards:
   1. American National Standards Institute (ANSI):
      a. B16.25 - Butt-welding Ends.
   2. American Society of Mechanical Engineers (ASME):
      a. B31.1 - Code for Pressure Piping - Power Piping.
      b. Boiler and Pressure Vessel Code.
      c. LOS-1M - Recommended Practices for Cleaning, Flushing and Purification of Steam and Gas Turbine Lubrication Systems.
   3. American Welding Society (AWS).
   4. Pipe Fabrication Institute (PFI):
      a. ES3 - Fabricating Tolerances.
      b. ES16 - Access Holes, Bosses and Plugs for Radiographic Inspection of Pipe Welds.
      c. ES21 - Internal Machining and Fit-up of GTAW Root Pass Circumferential Butt Welds.
      d. ES24 - Pipe Bending Methods, Tolerances, Process and Material Requirements.
   5. Society for Protective Coatings (SSPC):
      a. SP3 - Power Tool Cleaning.
      b. SP5 - White Metal Blast Cleaning.
      c. SP6 - Commercial Blast Cleaning.

485940 – POWER PIPING HANGERS & SUPPORTS

A. Applicable Codes and Standards:
   1. American Society of Mechanical Engineers (ASME):
      a. B31.1 - Code for Pressure Piping - Power Piping.

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b. Boiler and Pressure Vessel Code.

2. American Society of Testing and Materials (ASTM):
   a. A125 - Steel Springs, Helical, Heat-Treated.
   b. A193 - Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
   c. A194 - Carbon and Alloy Steel Nuts for Bolts for High Pressure or High-Temperature Service.
   d. A335 - Seamless Ferritic Alloy-Steel Pipe for High-Temperature Service.
   e. A387 - Pressure Vessel Plates, Alloy Steel, Chromium-Molybdenum.
3. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS):
   a. SP58 - Pipe Hangers and Supports - Materials Design and Manufacture.
   b. SP69 - Pipe Hangers and Supports - Selection and Application.
   c. SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
   d. SP90 - Guideline on Terminology for Pipe Hangers and Supports.
4. Society of Protective Coatings (SSPC) Surface Preparation Specifications:
   a. SP1 - Solvent Cleaning.
   b. SP3 - Power Tool Cleaning.
   c. SP5 - White Metal Blast Cleaning.
   d. SP6 - Commercial Blast Cleaning.
   e. SP10 - Near-White Blast Cleaning.
   f. SP11 - Power Tool Cleaning to Bare Metal.

485965 - EQUIPMENT ERECTION

A. Applicable Codes and Standards:
   1. American National Standards Institute (ANSI):
      a. B16.25 - Butt Welding Ends.
      b. B31.1 - Code for Pressure Piping, Power Piping Section, hereinafter referred to as the Power Piping Code.
   2. American Society of Mechanical Engineers (ASME):
      a. Boiler and Pressure Vessel Code.
   3. American Waterworks Association (AWWA).
   4. Pipe Fabrication Institute (PFI):
      a. Standard ES-1 - End Preparation and Machined Backing Rings for Butt Welds.
      b. Standard ES-5 - Cleaning Fabricated Piping.
      c. Standard ES-21 - Manual Gas Tungsten Arc Welding End Preparation.
   5. American Society of Testing and Materials (ASTM):
      a. A304 - Steel Bars, Alloy, Subject to End Quench Hardenability Requirements.
      b. C150 - Specification for Portland Cement.
      c. C157 - Test Method for Length Change of Hardened Hydraulic Cement Mortar and Concrete.
   6. Manufacturers Standardization Society of the Valves and Fittings Industry (MSS):
      a. MSS Standard Practice SP-58 - Pipe Hangers and Supports.
   7. Society for Protective Coatings (SSPC):
      a. Surface Preparation Standard SP-1: Solvent Cleaning.

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8. American Welding Society (AWS):
   a. D1.1 - Structural Welding Code.
9. Underwriters Laboratories (UL):
   a. Building Materials Directory.

485990 – ERECTION AND INSTALLATION OF POWER PIPING

A. Applicable Codes and Standards:
   1. American Society of Mechanical Engineers (ASME):
      a. Boiler and Pressure Vessel Code.
      b. B31.1 - Code for Pressure Piping - Power Piping.
   2. American Welding Society (AWS).
   3. Pipe Fabrication Institute (PFI):
      a. ES-3 - Fabricating Tolerances.

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EXHIBIT O
OPTIONS

Owner shall have the option to change the scope for the corresponding Adjustment to the Contract Price set forth below.

Option:	Option Pricing	Final Date to Accept Option
Option No. 1: Option to replace the 4160 volt VFDs for three (3) Hydrocyclone Feed Pump Drives with 480 volt VFDs based on final design approved by Owner - OPTION DEDUCT	[redacted]	6/3/2016
Option No. 2: Option to eliminate the alternate power feed to the telecommunications tower that includes the medium voltage breaker, cable, and ductbank from the breaker to the telecommunications tower based on final design approved by Owner. Refer to Exhibit A1 – Section 011300 – 1.13N – Item 5 – OPTION DEDUCT	[redacted]	FNTP for Transport Subproject
Option No. 3: Option to decrease size of two (2) new Reclaim Water Tanks each from 620,000 gallons working volume to 105,000 gallons working volume based on final design approved by Owner – OPTION DEDUCT	[redacted]	5/6/2016
Option No. 4: Option to eliminate Bottom Ash heat exchangers by piping bottom ash SFC overflow to boiler room sump based on final design approved by Owner. Refer to Exhibit A1 – Section 011100 – 1.01A – Item 2b(1)(f)(3) – OPTION DEDUCT	[redacted]	5/6/2016

EXHIBIT P
PERMITS

A. Critical permits required for the development, design, engineering, financing, procurement, construction, and operation of the Project, include but are not limited to those detailed below. Required permits must be obtained prior to the start of construction.

1. Owner's Responsibility:

The Contractor shall assist Owner in obtaining, preparing, and maintaining the following necessary permits in the name of the Owner, and shall obtain and maintain all other permits and licenses as applicable.

a. Prevention of Significant Deterioration (PSD) permit
b. Construction Permit
c. Title V Operating Permit
d. Acid Rain Permit
e. Kentucky Pollutant Discharge Elimination System (KPDES) Operating Permit
f. Hydrostatic Discharge Request with Kentucky Division of Water (KYDOW)
g. Site Compatibility Certificate
    i. Owner requires a 10-working day prior notification for a "renovations" involving friable asbestos.
    ii. All demolitions even if they don't involve asbestos also require a 10-working day prior notification.
    iii. Kentucky Division for Air Quality (KYDAQ) requires a 10-working day prior notification for all "demolitions" and "renovations" that will involve friable asbestos abatements. Asbestos inspectors for the state of Kentucky are assigned regions in which they have responsibility. For Trimble County, the regional contact is 859-525-4923.
    iv. Although not required by law, we also recommend a courtesy notification for "renovations" that will involve nonfriable asbestos abatements. Owner encourages Contractor to contact the regional asbestos inspector to see if they would like courtesy notifications for nonfriable asbestos abatements as that also allows the KYDAQ to address concerns if calls are received by the public. Notifications can be made with the DEP 7036 form found on their website (see below). If any of the information on the courtesy notification changes, the notification would need to be updated with the regional office.

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2. Contractor's Responsibility:

The Contractor shall secure and pay for any and all construction related Permits, certificates, or licenses not listed above which are required in connection with the performance of the Work. Contractor is responsible for any other statute or non-statutory clearance/permits, including but not limited to:

a. Compliance as required with federal, state, or local requirements applicable to the design, manufacture, supply, and erection of the Equipment and the Work required for erection and commissioning on Job Site.
    i. Kentucky Revised Statutes Chapter 236 shall be included, as applicable
b. Any documentation associated with these permits and approvals, as may be required for the ongoing operation of the plant, shall be made available to Owner prior to substantial completion.
c. Federal and state requirements applicable to construction and operation safety and health.
d. KPDES Storm Water Discharges during construction Permit, including spill prevention, control, and countermeasure plans and Construction Best Management Practices (BMP) (See **Appendices A and B** to this **Exhibit P**). The Contractor is not expected to obtain a separate permit but operate under the KPDES Permit for Trimble County site.
e. Erosion and Sedimentation Control Plan approval
f. Building permits
g. Plant safety permits, e.g., hot work permit
h. Demolition Permits
i. Contractor generated waste management programs consistent with Resource Conservation Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and other applicable laws. Waste management includes the Treatment, Storage, and Disposal (TSD) of generated wastes by the Contractor.

APPENDIX A
CONSTRUCTION BEST MANAGEMENT PRACTICES (BMP) PLANS

LG&E and KU Generating Stations
Construction Projects BMPs at Power Plants Which Already Have KPDES Permits
December 2011 – Environmental Affairs

Executive Summary

Prepare site-specific Construction BMPs for projects disturbing >1 acre of soil.

Construction BMPs must be subordinate to the existing BMP at sites that already have KPDES permits.

The plant environmental coordinator should initially receive a copy of the Construction BMP and should regularly receive copies of any required documented inspections of erosion controls.

Reference information is included here for proper BMP preparation (this document and state brochure pdf file and/or state web-link).

Contractor and Subcontractors must certify the Construction BMP.

General Overview

Construction projects that disturb >1 acre of soil must obtain a KDOW - KPDES General Permit for Construction Activities except, for example, where such projects occur at Owner power plants. Owner's plants are major industries and must have a KPDES Industrial Wastewater Discharge Permit to operate; such permits are KPDES "Individual" permits (versus a "General" permit) which regulate both our pipe/point-source discharges and our site/non-point runoff flows. Both types of KPDES permits require preparation of a BMP plan which prevents and/or minimizes the release of any pollutants in runoff waters that would degrade surface streams and harm the environment.

In recent years, the KDOW prohibits the application for a new KPDES General Permit for Construction Activities at a site with an existing KPDES permit. Instead, KDOW requires a new construction project to have a project site-specific BMP prepared, but which is managed under the site's existing KPDES Permit BMP. From the state's perspective, this is logical and theoretically minimizes the KDOW permit-management workload by avoiding one site having multiple KPDES permits.

Therefore, any significant construction activities still require development of a work-specific BMP plan to be prepared before undertaking the project and implemented as the work progresses. The BMP plan should focus on preventing erosion and controlling sedimentation and is sometimes referred to as an Erosion Prevention and Sediment Control (EPSC) or Storm Water Pollution Prevention (SWPP) plan. The BMP plan should be prepared, either by the Contractor or a third

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party consultant and identify specific measures intended to prevent pollution (generally from erosion) during construction-specific activities. The plan should also note any measures that are implemented for these controls. The plan should also include a certification section, wherein the primary and other key contractors sign the plan to acknowledge their understanding of its goals. Finally, the plan should include provisions for inspections (and documentation) of enacted controls and sensitive areas (like streams and other surface waters) to assure that the implemented measures are working as designed and with the intended effect.

The BMP prepared for a construction site must be subordinate to the existing BMP at sites that already have KPDES permits. The new construction BMP and existing BMP are tied together by a "pointer section" in the site's existing which basically states that:

- Such construction projects will have properly prepared BMPs

- That a copy of the construction BMP, and periodically required EPSC inspection documents, will be provided to the site environmental coordinator.

The existing site BMP table of contents can be provided, and the text of the "pointer section" if useful to the construction contractor for preparation of his BMP.

Inspections & Recordkeeping

Typically, documented inspections are required by BMPs for installed EPSC measures such as silt fences and straw bales to be performed periodically/monthly and after large rain events. Regulations allow KDOW staff to inspect anytime and ask to see construction EPSC inspection documents which, in several instances of recent years, nearly resulted in Notice of Violation (NOV) citations being issued to Owner because the inspection records were unavailable when requested. Therefore, Owner recommends that copies of the construction EPSC inspection documents be regularly provided (e.g., weekly or monthly) to plant environmental coordinators because they are always involved when an inspector comes on-site. Although the site environmental coordinator will not conduct the EPSC inspections (because construction personnel should repair damaged EPSC controls immediately upon discovery), they can file copies of the inspection documents for easy access when an inspection does occur without requiring construction personnel direct involvement.

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BMP Preparation Specifics

For your reference, included with this document is a more detailed summary of the components of a typical BMP for construction activities; this was excerpted from provisions identified in the state brochure for KY-DOW's Storm Water General Permit for Construction Activities.

For BMP preparation, both the detailed summary and the state brochure include the following sections:

Site Description

Sediment and Erosion Control Measures

Other Control Measures

Other State or Local Plans

Maintenance

Inspections

Non-Storm Water Discharges

Contractors and Subcontractors Certifications

Please contact the Owner Environmental Affairs Department at 502-627-4621 **if questions arise or if further issues require discussion.**

APPENDIX B
CONSTRUCTION BMP PLANS – PREPARATION SUMMARY

Site Description:

The BMP plan shall include a clear description of the nature of the construction activity, the order of major soil disturbing activities, estimates of the total project area and the total disturbed area, the post construction runoff coefficient, any existing date describing soil condition or discharge quality, receiving water name, and a site map. The site map shall indicate drainage patterns and show approximate slopes after grading, areas of disturbance, the location of control measures, surface waters or wetlands, and storm water discharge locations.

Sediment and Erosion Control Measures:

The BMP plan shall include a clear description of what sediment and erosion control measures will be used and when they will be implemented. (For example, perimeter controls for one (1) portion of the site will be installed after the necessary clearing and grubbing, but before clearing and grubbing the remaining portions of the site. Perimeter controls will be actively maintained until upward portions of the site are stabilized). The following control measures shall be used as a minimum.

- Soil Stabilization Practices - Existing vegetation shall be preserved where possible. All disturbed areas of the site shall be stabilized. Stabilization shall begin within 14 days on areas of the site where construction activities have permanently or temporarily (for 21 days or more) ceased. When snow cover causes delays, stabilization shall begin as soon as possible. Stabilization practices include seeding, mulching, placing sod, planting trees or shrubs, and using geotextile fabrics and other appropriate measures.

- Perimeter Structural Practices - Silt fences or other equivalent structural practices shall be used on all side and down slope borders of the site. Alternatively, a sediment basin shall be used that provides 3,600 cubic feet of storage capacity per disturbed acre drained. For common drainage locations that serve more than ten (10) disturbed acres at one time, a sediment basin must be used if possible.

  Structural practices include protecting drain inlets and outlets and using silt fences, earthen dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, reinforce soil retaining systems, gabions, sediment basins and other appropriate measures. The installation of these devices may be subject to Section 404 of the Clean Water Act (CWA).

- Storm Water Management Devices - Management devices shall be installed during construction to control the pollutants in storm water discharges that will occur after construction has been completed. Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive flow so that the original physical and biological characteristics and functions of the receiving waters, such as hydroperiod and hydrodynamics, are maintained and protected. When considering storm water management devices, the goal should be 80% removal of

the total suspended solids that exceed predevelopment levels. If this goal is not met, the permittee shall provide justification for refusing each device based on site conditions.

Storm water management devices include velocity dissipation devices, storm water retention and detention basins, wet ponds, vegetated swales and natural depressions used for flow reduction, runoff infiltration devices, sequential systems that combine several devices and other appropriate measures. The installation of these devices may be subject to Section 404 of the CWA.

The permittee is not responsible for the maintenance of these devices once discharges associated with construction activity have been eliminated.

Other Control Measures:
No solid materials, including building materials, shall be discharged to waters of the Commonwealth of Kentucky, except as authorized by a Section 404 permit.

Off-site vehicle sediment tracking and dust generation shall be minimized.

Waste disposal methods and sanitary sewer or septic systems shall comply with applicable state or local regulations.

Other State or Local Plans:
The BMP plan shall include any requirements specified in sediment and erosion control plans, storm water management plans or permits that have been approved by other state or local officials. Upon submittal of the Notice of Intent, other requirements for surface water protection are incorporated by reference into and are enforceable under this permit (even if they are not specifically included in the BMP plan required by this permit). This provision does not apply to master or comprehensive plans, non-enforceable guidelines or technical guidance documents that are not identified in a specific plan or permit issued for the construction site by state of local officials.

Maintenance:
The BMP plan shall include a clear description of the maintenance procedures necessary to keep the control measures in good and effective operating condition.

Inspections:
Qualified personnel shall inspect all storm water control measures, discharge locations, vehicle exits, disturbed areas of the construction site and material storage areas at least once every seven (7) days (and within 24 hours of the end of a storm that is 0.5 inches or greater) and areas that have been temporarily or finally stabilized at least once a month. Revisions to the BMP plan based on the results of the inspection shall be implemented within seven (7) days.

Control measures shall be inspected to ensure correct operation. Accessible discharge locations shall be inspected to ensure that velocity dissipation devices are effective in preventing significant impacts to receiving waters. Vehicle exits shall be inspected for evidence of, or the potential for, pollutants entering the drainage system.

A report summarizing the scope of the inspection, names and qualifications of personnel making the inspections, the date of the inspection, major observations relating to the implementation of the BMP plan, and any corrective actions taken shall be made and kept as part of the BMP plan for at least three (3) years after the date of inspection, or until one (1) year after coverage under this permit ends. The report shall be signed in accordance with Part II of this permit.

Non-Storm Water Discharges:
The BMP plan shall identify and ensure the implementation of appropriate pollution prevention measures for any non-storm water component of a discharge as listed in Part III C, except for flows from firefighting activities.

Contractors and Subcontractor Certifications:
The BMP plan shall clearly state the Contractor or Subcontractors that will implement each control measure identified in the BMP plan. All Contractors and Subcontractors identified in the BMP plan must sign a copy of the certification statement below in accordance with Part II of this permit before conducting any professional service at the site:

> "I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification."

The certification must include the name and title of the person providing the signature, the name, address, and telephone number of the contracted firm, the address or other identifying description of the site and the date the certification is made. All certification statements must be included in the BMP plan.

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EXHIBIT Q

OWNER PROVIDED ITEMS

The following items will be provided by Owner to support the Work and, as applicable, in accordance with the interface requirements (e.g. – location, pressures, and flow rates) as identified in **Exhibit A** (SECTION 015100 - TEMPORARY UTILITIES AND FACILITIES). Contractor shall strive to conserve and minimize the amount of materials used during the start-up, commissioning and testing period in a manner consistent with Prudent Utility Practice and Contractor's obligations under this Agreement, including Professional Standards and by the Guaranteed Commercial Operation Date.

The personnel, services, information and other items specified in this **Exhibit Q**, (e.g. utilities available, O&M staff available,) will be provided no later than the dates stated therefore in **Exhibit D** Project Schedule and Key Dates (or, if Contractor is behind schedule, on such later date as may be reasonably required by Contractor for the performance of the Work). The furnishing of personnel, services, information and other items not specified in this **Exhibit Q** shall be at such time and manner as may be reasonably required by Contractor for the performance of the Work to support the Project Schedule.

As used below, "reasonable quantities," means the aggregate quantities that should reasonably be anticipated to be required for the construction and commissioning of a project of the size, type, and complexity of the Work.

In addition to the limitations set forth below regarding aggregate quantities of product usage to be provided by Owner, Contractor shall submit to Owner for approval Contractor's projected needs (including timing) for the items; provided.

1. Temporary Electrical

   a. CCRT area at 475 ft.: Owner will provide reasonable quantities of temporary electrical power at the Owner's construction power (12kV/480v or 7kV/480v) transformer distribution bank disconnect switch(es) that the Contractor can connect to its construction facilities. Contractor shall be responsible to coordinate the location, size and source of temporary power. Contractor shall provide cable to hook up its temporary power to any Contractor panels or equipment. Note: Plant-transport corridor/landfill area: Owner will not provide temporary electrical power.

   b. Owner will provide the permanent source for electrical power to the Work in order to operate the Equipment during start-up, commissioning, testing and operation.

   c. Other Contractor requests for temporary power will be subject to the approval of Owner.

2. Temporary Water

   a. Owner will provide reasonable quantities of non-potable (e.g. – ash water return, service water, fire protection as authorized by the Parties) water to support construction and commissioning activities. Commissioning water supply for cleaning, flushing and hydro shall be provided by Owner as specified in **Exhibit A**.

   b. Owner will provide reasonable quantities of service water to support start-up, commissioning, testing and operation of the CCRT Equipment or Work.

c. Owner will provide reasonable quantities of potable water, including for washing and toilet facilities for Contractor office buildings, CCRT area at 475 ft. only. Other facilities are the responsibility of the Contractor. Contractor shall provide temporary sanitary toilet accommodations, where directed, for use by Contractor's employees. Owner's restroom facilities and wash areas are not available for use by Contractor's personnel. Tapping into the on-site sewer system is not allowed. Contractor shall utilize day tanks/holding tanks for proper disposal as necessary. Contractor shall be responsible for providing waste removal plan in accordance with **Exhibit X**.

4. Site

a. Owner will provide reasonable quantities of available Job Site space for a Contractor office building, laydown areas, storage, fabrication, plant access and other necessary spaces, in accordance with the requirements as identified in **Exhibit S**. As part of the Job Site space, the Owner has unused office/storage space available which can be utilized by the Contractor for the duration of the Agreement. In accordance with **Exhibit T** and consistent with **Exhibit S**, the Contractor will provide the proposed Job Site space on a general arrangement (GA) drawing for Owner review and approval. Changes to the Job Site GA drawing will require Owner approval.

b. Any temporary enclosures/structures being utilized more than two months must have weatherproof siding and roofing that matches existing plant buildings. Any temporary material being utilized more than thirty (30) days must be either galvanized or painted so it does not rust.

5. Product Usage

a. Owner will provide the Project with Owner generated flyash, bottom ash, pyrites and gypsum slurry from Unit 1 and Unit 2 in reasonable quantities as needed by Contractor for the construction, start-up, commissioning, testing and operation of the Work.

b. A temporary spoil area on the Job Site will be agreed upon between the Parties for material that is to be reused as fill.

c. Owner will allow Contractor to reuse clay, topsoil and rock excavated during the execution of the Work.

6. Waste Disposal

a. Owner is responsible for disposal of only waste products resulting from normal operations (including startup, commissioning and testing), such as ash, waste water and oils.

b. Owner is not responsible for off-site disposal of trash, scrap material, demolished paving (asphalt and concrete), flushing oils, and chemical wastes generated by the Contractor or its Subcontractors during the execution of the Work.

c. Owner will not permit the use of the existing sanitary system for office building staff, nor provide waste disposal systems for the Contractors field staff.

d. If agreed by Owner, the Owner may provide suitable on-site locations for Contractor disposal of reusable dredged materials and excess excavated material.

7. Owner O&M Personnel

Owner may supply to Contractor a normal complement of personnel (working normally scheduled shifts) for the training, checkout and operation of the Work.

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EXHIBIT R

LABOR, CONSTRUCTION EQUIPMENT, EQUIPMENT SUBCONTRACTS AND MATERIAL RATES RELATED TO ADJUSTMENTS

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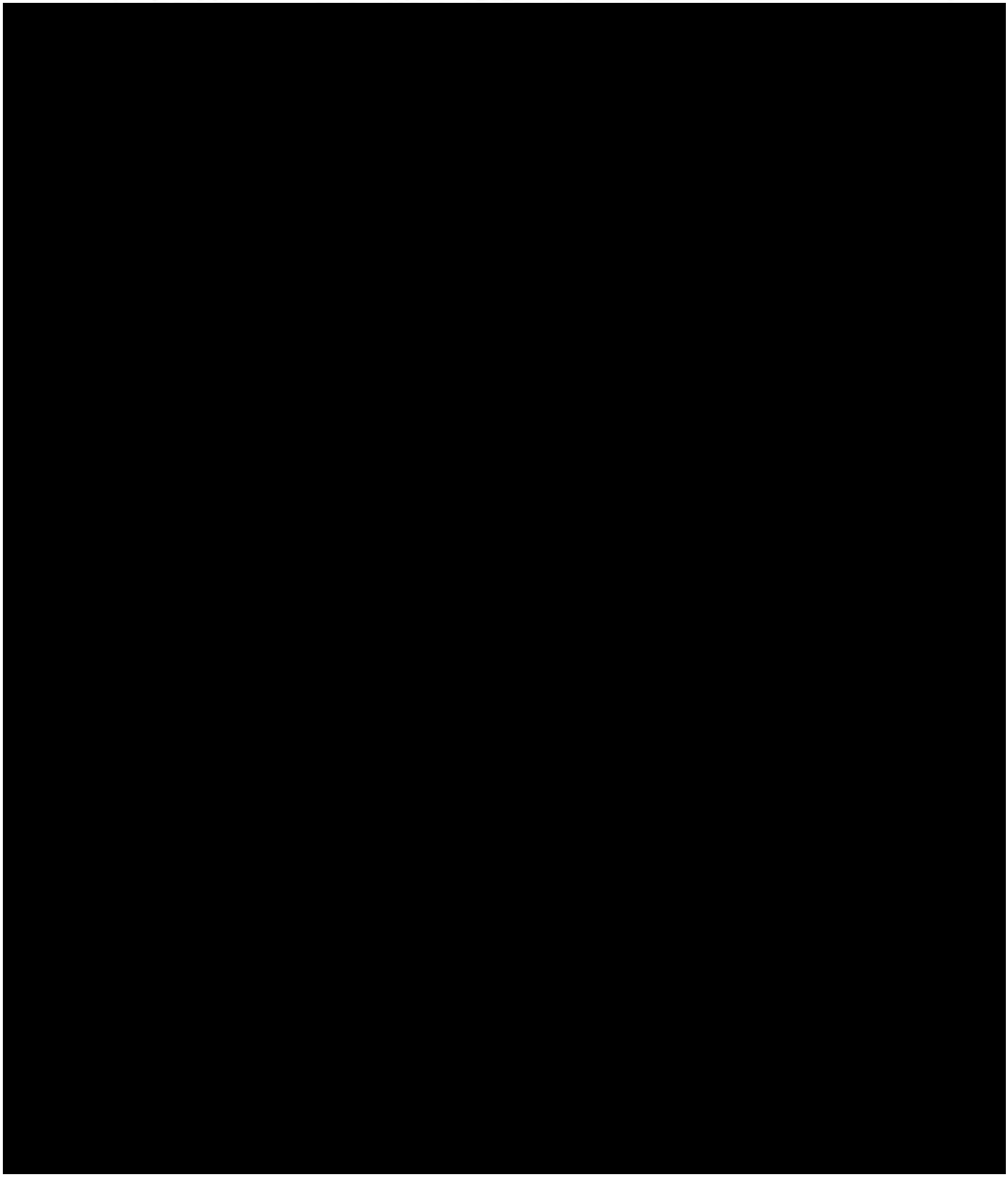

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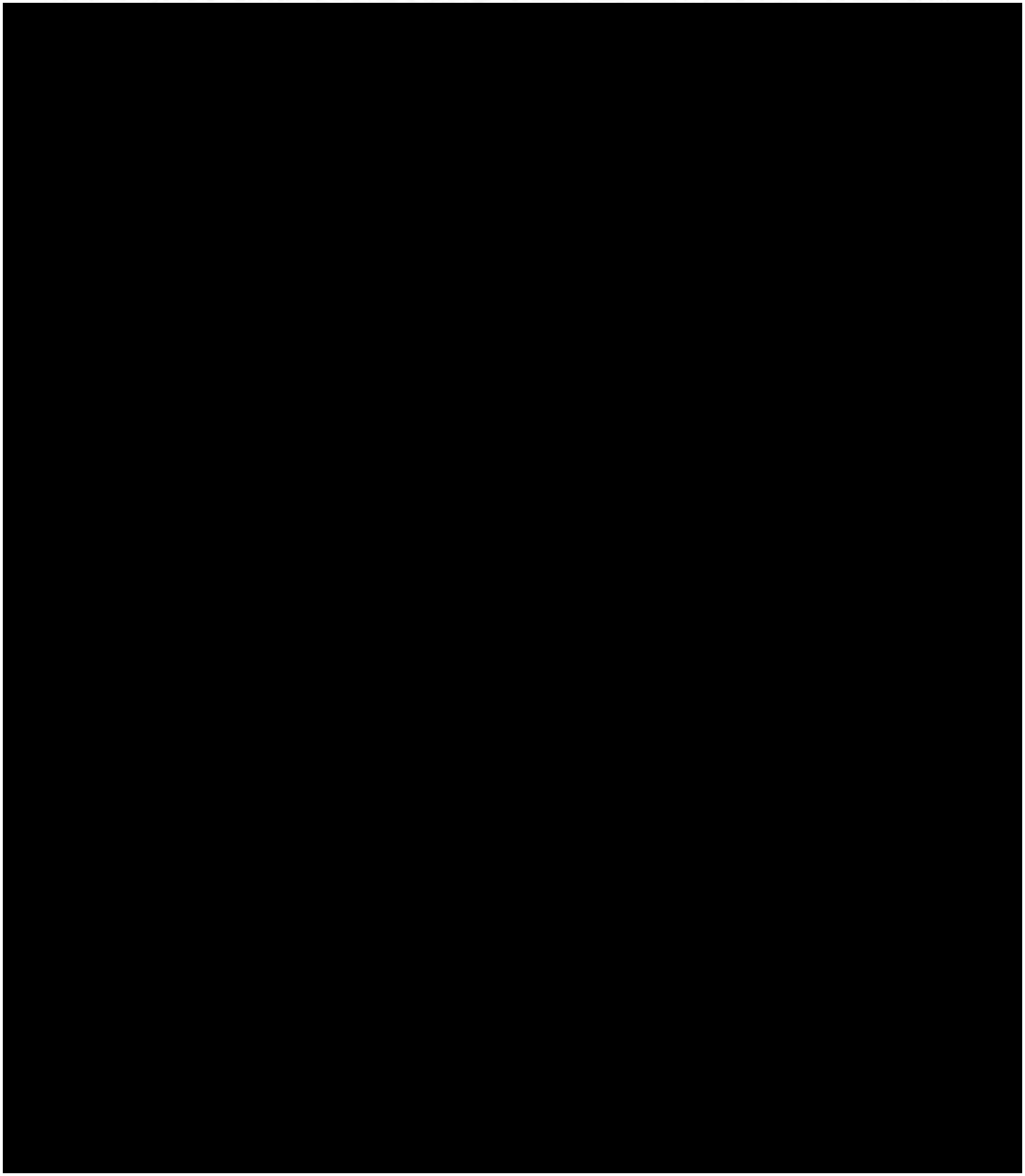

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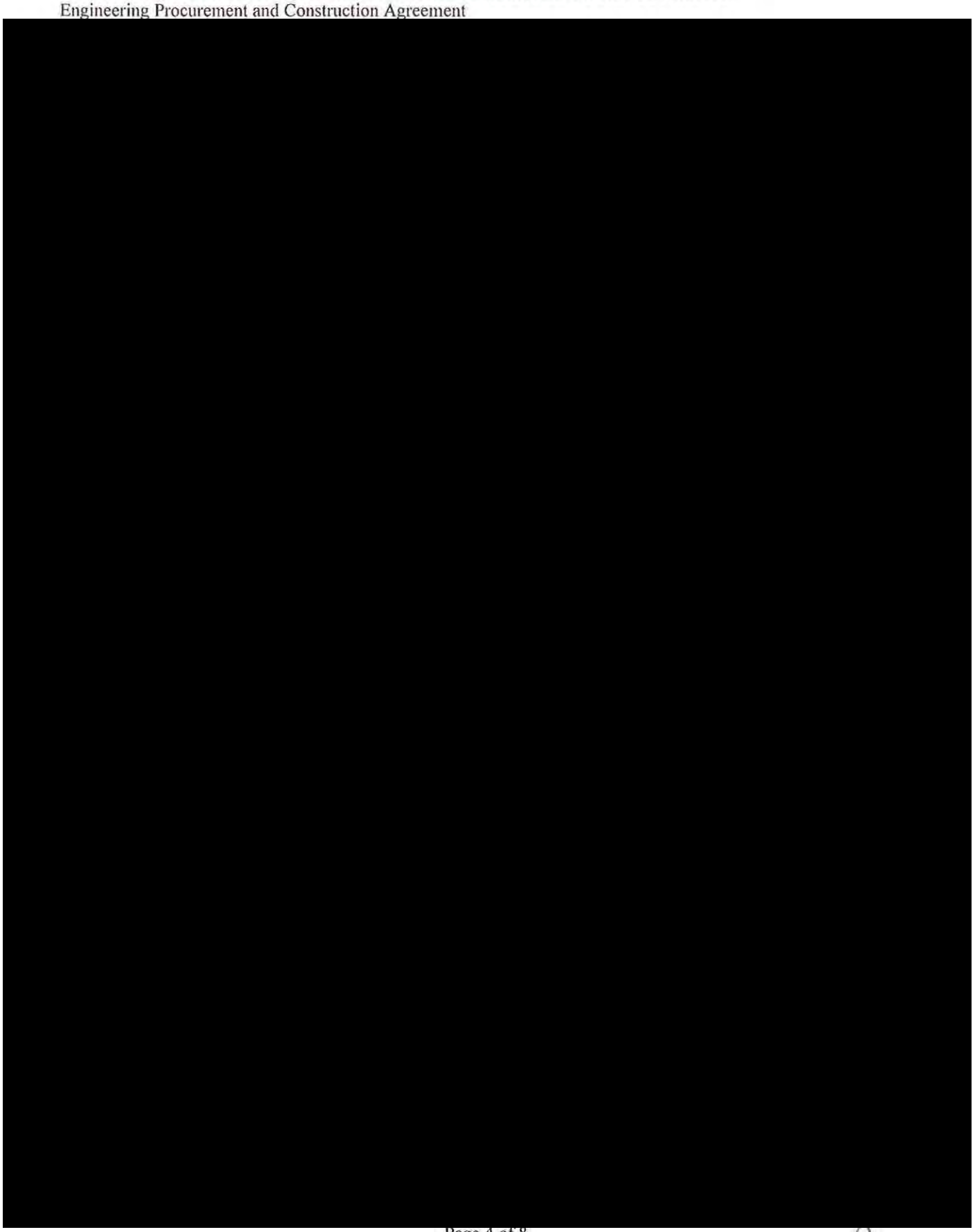

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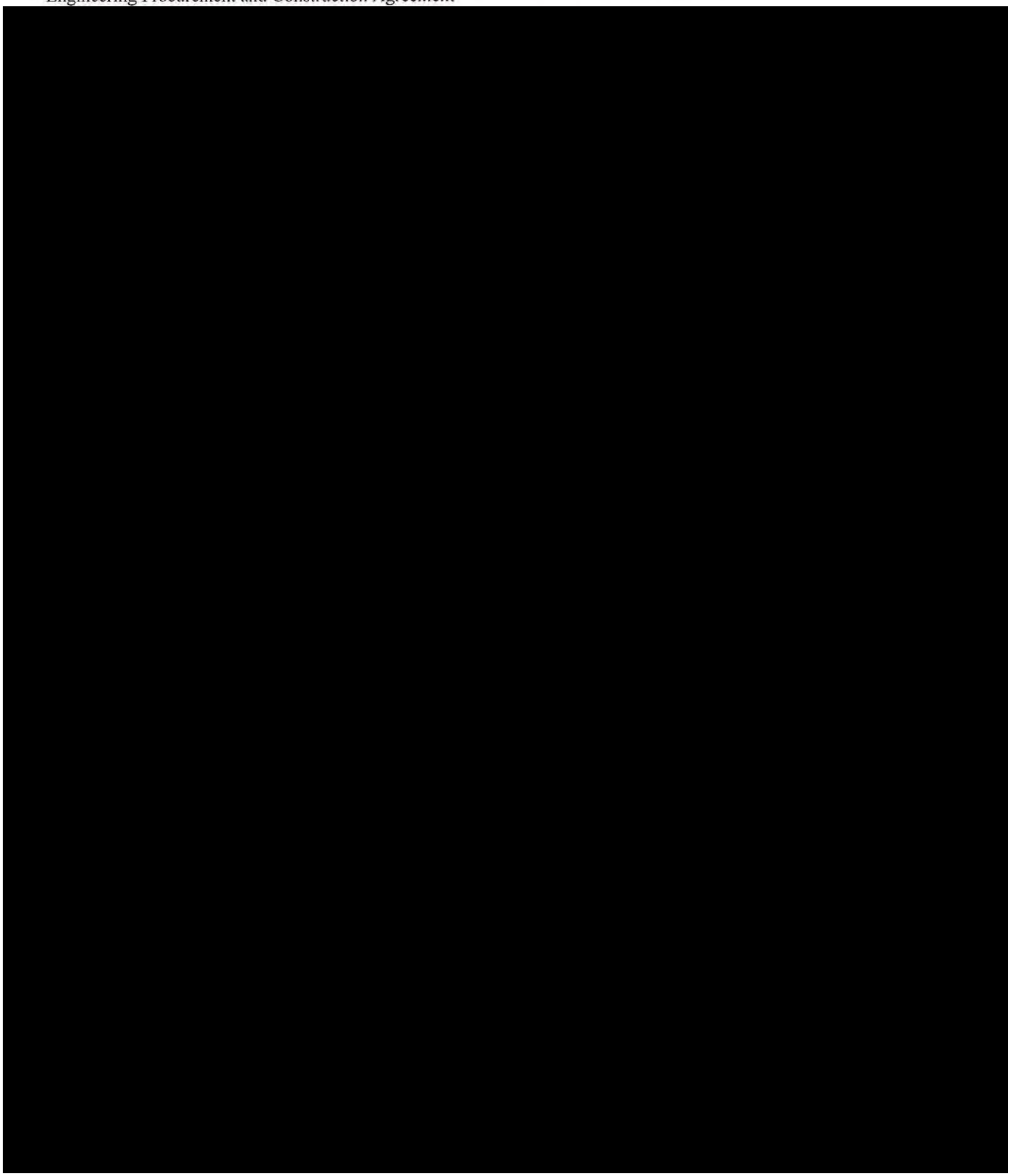

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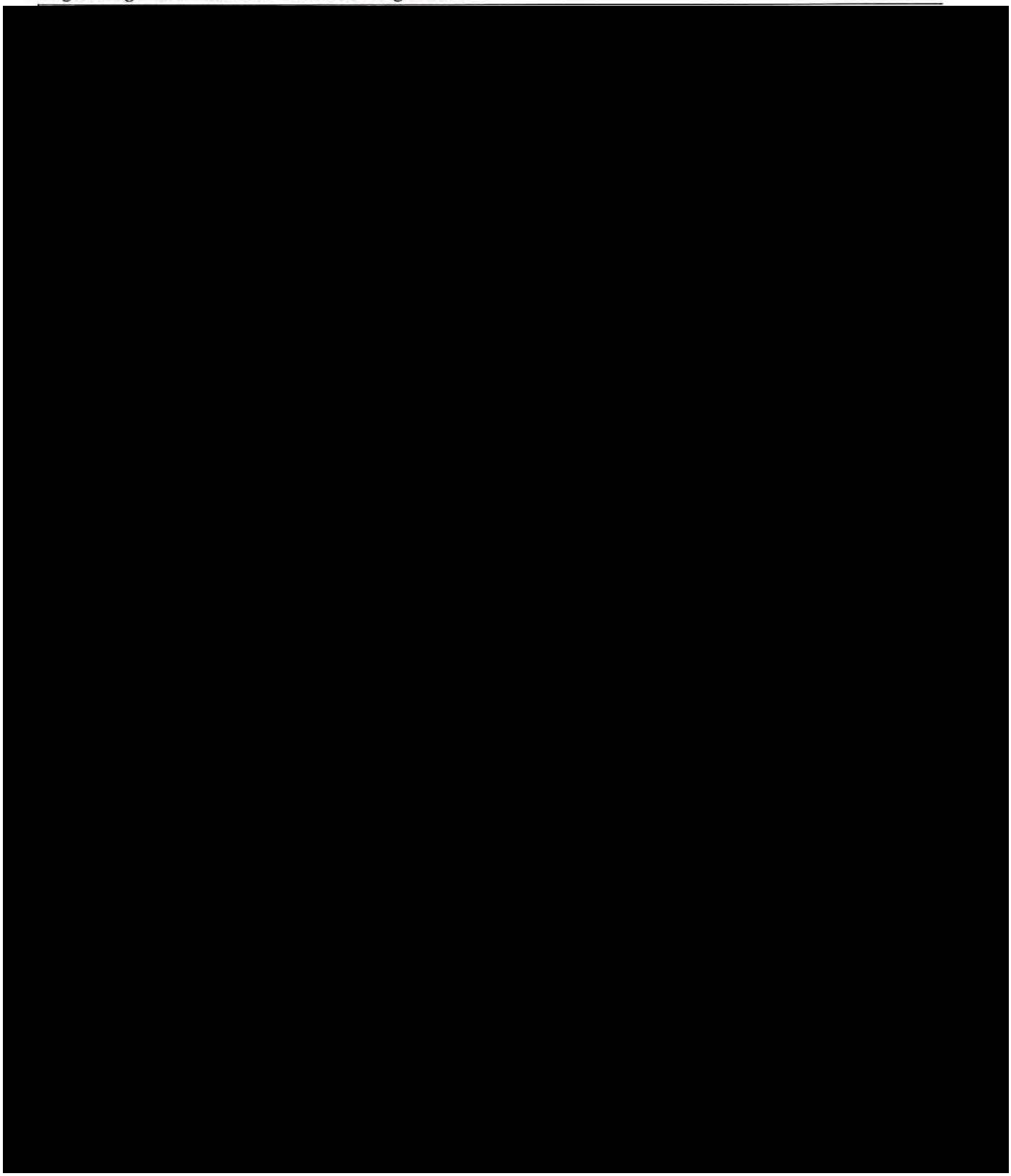

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EXHIBIT R ATTACHMENT 1

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CONFIDENTIAL INFORMATION REDACTED

Exhibit R Attachment 1

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