



Request for Proposals

Midcontinent Independent System Operator Transmission Interconnection Projects

July 12, 2021

PUBLIC



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Acronyms

A	Amp (or Ampere)
AC	Alternating Current
AFUDC	Allowance for Funds Used During Construction
BD	Business Days
BPM	Business Practice Manual
CEII	Critical Energy Infrastructure Information
CPT	Central Prevailing Time
CWIP	Construction Work in Progress
DC	Direct Current
EHV	Extra-High Voltage
FERC	Federal Energy Regulatory Commission
FTP	File Transfer Protocol
GPS	Global Positioning System
Hz	Hertz
IRP	Integrated Resource Plan
ISO	Independent System Operator
kV	Kilovolt
LBA	Local Balancing Authority
MISO	Midcontinent Independent System Operator
MLGW	Memphis Light, Gas and Water Division
MVA	Megavolt-Amps
NDA	Non-Disclosure Agreement
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
OPGW	Optical Ground Wire
ϕ	Phase
PSS/E	Power Transmission System Planning Software (Siemens)
Q & A	Question and Answer
RFP	Request for Proposals
TO	Transmission Owner
TVA	Tennessee Valley Authority

Section 1: Introduction and Summary

1.1 Purpose of this Request for Proposals

Memphis Light, Gas and Water Division (MLGW) is a municipal utility providing electricity, gas, and water to customers in Shelby County, Tennessee. MLGW, acting through its Board of Commissioners, is issuing this Request for Proposals (“RFP”) to solicit submissions (“Proposals”) from qualified vendors to construct a set of 500 kV and 230 kV substations and transmission lines (hereinafter referred to collectively as “Interconnection Projects” or “Project”) located in the states of Tennessee, Mississippi, and Arkansas.

Proposals shall be Design-Build, including all siting, routing, permitting, substation land procurement, transmission line ROW procurement, engineering, equipment and material procurement, construction, and commissioning activities.

1.2 Background

In 2019, MLGW commissioned Siemens PTI to complete a comprehensive Integrated Resource Plan (IRP) for the purpose of evaluating reliable and cost-effective alternatives to the existing full requirements contract with the Tennessee Valley Authority (TVA). As a result of this IRP process, which included extensive stakeholder input, a set of three (3) resource portfolios were recommended for further evaluation¹. The three resource portfolios contain various levels of natural gas-fired generation as well as renewable energy resources to be installed in Memphis/Shelby County. In addition, all three resource portfolios are coupled with a set of interconnection projects designed to permit up to 2,400 MW of simultaneous import capability from MISO South to MLGW. Additionally, MISO completed a Membership Assessment Report in July 2020 which supports the findings contained in the IRP and affirmed the need for a Base Transfer of 2,400 MW from MISO to MLGW under 2024 Summer Peak conditions².

1.3 Clarifications and Amendments to this RFP

MLGW may from time to time and before the Proposal Submission Deadline, post on its website, answers to questions, clarifications, and/or revisions to this RFP to the portal <https://contractsrfp.mlgw.org>. Please note, access to this website will require an executed NDA from the RFP Respondent. This portal will open for RFP Respondents to view on August

¹ See IRP document: http://www.mlgw.com/images/content/files/pdf/MLGW-IRP-Final-Report_Siemens-PTI_R108-20.pdf

² See redacted MISO Assessment:

[http://www.mlgw.com/images/content/files/pdf/MLGW%20Membership%20Assessment%20Report%207-29-20_Redacted\(1\).pdf](http://www.mlgw.com/images/content/files/pdf/MLGW%20Membership%20Assessment%20Report%207-29-20_Redacted(1).pdf)



11, 2021, after MLGW confirms the RFP Respondent has signed the NDA. The NDA form can be found in Attachment A of this RFP. RFP Respondents will need to send the completed NDA to the following email address powersupplyrfp@mlgw.org. Such answers, clarifications, and/or revisions are incorporated by reference into this RFP and shall supplement or amend this RFP according to their terms. Oral answers or clarifications to this RFP, to the extent given, shall not be deemed supplements or amendments to this RFP.

1.4 RFP Key Dates and Meetings

Participation at the RFP Informational Meeting is mandatory and requires timely submission to MLGW of the executed NDA in Attachment A. Subsequent Q & A will be conducted in writing. Please consult the portal at <https://contractsrfp.mlgw.org> for specific meeting time, and webcast information as dates are subject to change. Please register for the RFP Informational Meeting through the meeting notification posted at <https://contractsrfp.mlgw.org>.

Event	Date
RFP Posted for the Project	July 12, 2021
The Portal Will Open for Bidders	August 11, 2021
Mandatory RFP Informational Meeting Webcast and Conference Call	August 19, 2021
Deadline for Proposal Respondent(S) to Submit their 1 st Set of Questions in Writing	August 26, 2021
MLGW to Post Answers to Questions from Informational Meeting	September 8, 2021
Deadline for Proposal Respondent(S) to Submit their 2 nd Set of Questions in Writing	October 13, 2021
MLGW To Post Answers to 2 nd Set of Questions	October 27, 2021
Deadline for Proposal Respondent(S) to Submit their 3 rd Set of Questions in Writing	November 10, 2021
MLGW to Post Answers to 3 rd Set of Questions	November 24, 2021
Proposal Submission Deadline	February 4, 2022
Deadline to Notify Proposal Respondent(S) of a Deficient Proposal	30 Calendar Days from Proposal Submission Deadline (last day: March 4, 2022)
Deadline for Proposal Respondent(S) to Cure a Deficient Proposal	30 Calendar Days from Deficiency Notification (last day: April 4, 2022)
Deadline for MLGW to Announce Short-List of three (3) Proposal Respondent(S)	May 16, 2022



Presentations by Short-Listed Proposal Respondent(S)	July 13, 2022
Best and Final Offer Deadline	August 16, 2022
Final Award	December 1, 2022

1.5 **Confidential and/or Critical Energy Infrastructure Information**

Any Confidential and/or Critical Energy Infrastructure Information will be provided to RFP Respondents subject to executing an NDA and any required compliance training.

1.6 **Questions and Communications**

Any questions or inquiries related to this RFP, Project, or the submission of Proposals and their evaluation, shall be directed solely to MLGW's Contracts Management Team through the contact information provided below. Other MLGW staff should not be contacted directly. MLGW will post a list of questions and/or requests for clarifications it receives at <https://contractsrfp.mlgw.org>.

MLGW Contracts Management Contact Information for this RFP:

E-mail Address: powersupplyrfp@mlgw.org

Subject Line: Contract # 12137 POWER SUPPLY - TRANSMISSION

1.7 **No Obligation to Continue Project or Accept a Proposal**

This RFP does not constitute an offer of any kind, including an offer to enter any contract, and is merely a request for the RFP Respondent to submit information. MLGW may decline to accept any or all Proposals. MLGW's issuance of this RFP does not constitute any commitment by MLGW to move forward with the Project, and MLGW may cancel the Project and withdraw this RFP at any time.

Award of any contract requires the approval of the MLGW Board of Commissioners and the Memphis City Council.

1.8 **Contract Key Terms**

The winning RFP Respondent will be required to negotiate a turnkey contract for the construction and delivery of the Interconnection Projects, which shall include, but not be limited to, the following requirements:

Turnkey/Scope of Work – The contract will be a turnkey contract and provide for a clear scope of work to complete the Interconnection Projects.

Standard of Work – The Contract will include provisions requiring compliance with all

applicable laws and regulations and that the work will be performed in accordance with prudent utility practice. The Contract will also include provisions pertaining to (1) MLGW supply chain and cyber security requirements, and (2) debarment.

Subcontractors – The winning RFP Respondent shall be permitted to subcontract work provided the winning RFP Respondent remains solely responsible for the work and ensures that any such subcontractors comply with all requirements applicable to the winning RFP Respondent.

Labor Force – The winning RFP Respondent shall comply with all applicable state and federal labor requirements including, but not limited to, Davis-Bacon, EEOC, OSHA, etc. The contract shall include provisions regarding supplier diversity, maintaining a drug free workplace, and performing employee background checks.

Environmental, Health and Safety and Other Procedures – The winning RFP Respondent shall ensure a safe work site and conditions. The contract shall include language addressing the use of and responsibility for all hazardous materials.

Accounting and Recording Keeping – Provisions providing for accounting requirements, record keeping, and audit rights.

Progress Meetings and Reporting – Provisions providing for regular project updates through meeting and reporting requirements, including, but not limited to, progress and safety updates.

Change Orders – Provisions establishing a process for requesting change orders and schedule/price adjustments when appropriate. Schedule/cost adjustments will only be granted in the event a condition arises that was unforeseeable and could not have been anticipated through the exercise of due diligence or site analysis. MLGW is relying on RFP Respondent's expertise in the construction of a project of this nature, and therefore RFP Respondent is expected to conduct all due diligence necessary to ensure that the Project is constructed within budget and without delay.

Payment Provisions – Provisions providing for progress payments for work completed and language required to complete with MLGW funding/budgeting approval process/requirements.

Taxes/Tax Exempt – Provisions allocating tax responsibility and an obligation to preserve and maximize the benefit of MLGW's tax exempt status.

Bonding Requirements - The winning RFP Respondent shall be required to provide a performance bond to ensure completion of the Project.

Retainage – Provisions providing for a 10% retainage to be released upon completion of the Project.

Risk of Loss/Transfer of Title – Provisions providing that the winning RFP Respondent shall maintain the risk of loss and title of the Project until transfer to MLGW upon Completion of Project.

Insurance – The winning RFP Respondent shall be required to procure Builder's All Risk Insurance; Cyber Liability Insurance; Professional Insurance; Workers' Compensation and Employer's Liability Insurance; Commercial General Liability Insurance; Business Automobile Liability Insurance; and any other insurance required by applicable law in the amounts specified by MLGW. MLGW, MLGW's officials, employees, agents, contractors, and consultants shall be listed as an additional insured on all policies.

Completion of Project/Testing – The Contract will include provisions establishing testing requirements to establish Substantial Completion and Completion of Project.

Delay Damages – The Contract will recognize that time is of the essence and include provisions providing for the payment of delay damages if Completion of Project is not achieved by a date certain.

Representations and Warranties – Representations and Warranties typical to contracts for projects of this nature.

Right to Inspect/Access to Project – Provisions allowing MLGW access to site and the right to inspect work during construction.

Warranties – Provisions providing warranties on the work performed and equipment installed. Manufacturer warranties must be transferrable to MLGW upon completion of the Project.

Encumbrances/Release of Liens – Provisions preventing encumbrances/liens on the associated property other than permitted liens, and requiring all liens be released prior to the completion of Project.

Default/Suspension/Termination – Provisions establishing events of default and each party's rights and remedies in the event of a default, include the right to suspend or termination work, or the contract.

Dispute Resolution – Disputes shall be resolved pursuant to the following process: first by

meeting of senior personnel and finally by litigation in courts situated in Shelby County, TN.

Indemnity – The winning RFP Respondent shall indemnify and hold MLGW harmless from third party claims resulting from the winning RFP Respondent’s negligent action/inaction.

Confidentiality – Standard provisions requiring the non-disclosure of confidential information, except as may be required by law (including, but not limited to, the Tennessee Open Records Act).

Governing law – Tennessee.

Section 2: Project Summary

2.1 Summary of the Project

This section of the RFP presents an executive summary of the Interconnection Projects, whereas Section 5 of this RFP contains the Project description that shall be utilized in developing Proposals.

The Interconnection Projects consists of the following:

1. Entergy MISO to Shelby-MLGW Interconnection consisting of:
 - a. New 500 kV line from demarcation structure/tower located in Arkansas at the Mississippi River to New Shelby substation (MLGW), 3,000 A, 2,598/2,598 MVA summer rating, and
 - b. New Shelby substation (MLGW) 500/161 kV with two new 500/161 kV transformers, rated 1,300 MVA each.
2. Entergy MISO to New Allen-MLGW Interconnection consisting of:
 - a. New 500 kV line from demarcation structure/tower located in Arkansas at the Mississippi River to New Allen substation (MLGW), 3,000 A, 2,598/2,598 MVA summer rating, and
 - b. New 500/230/161 kV, New Allen substation (MLGW) with two new 500/161 kV transformers, rated 1,300 MVA each.
3. Entergy MISO to New Allen-MLGW interconnection consisting of:
 - a. New 230 kV line from demarcation structure/tower located in Mississippi at the Tennessee-Mississippi state line to New Allen substation (MLGW), 5,000 A, 1,991/1,991 MVA summer rating, and
 - b. Two new 230/161 kV transformers at New Allen substation (MLGW), rated 1,000 MVA each.

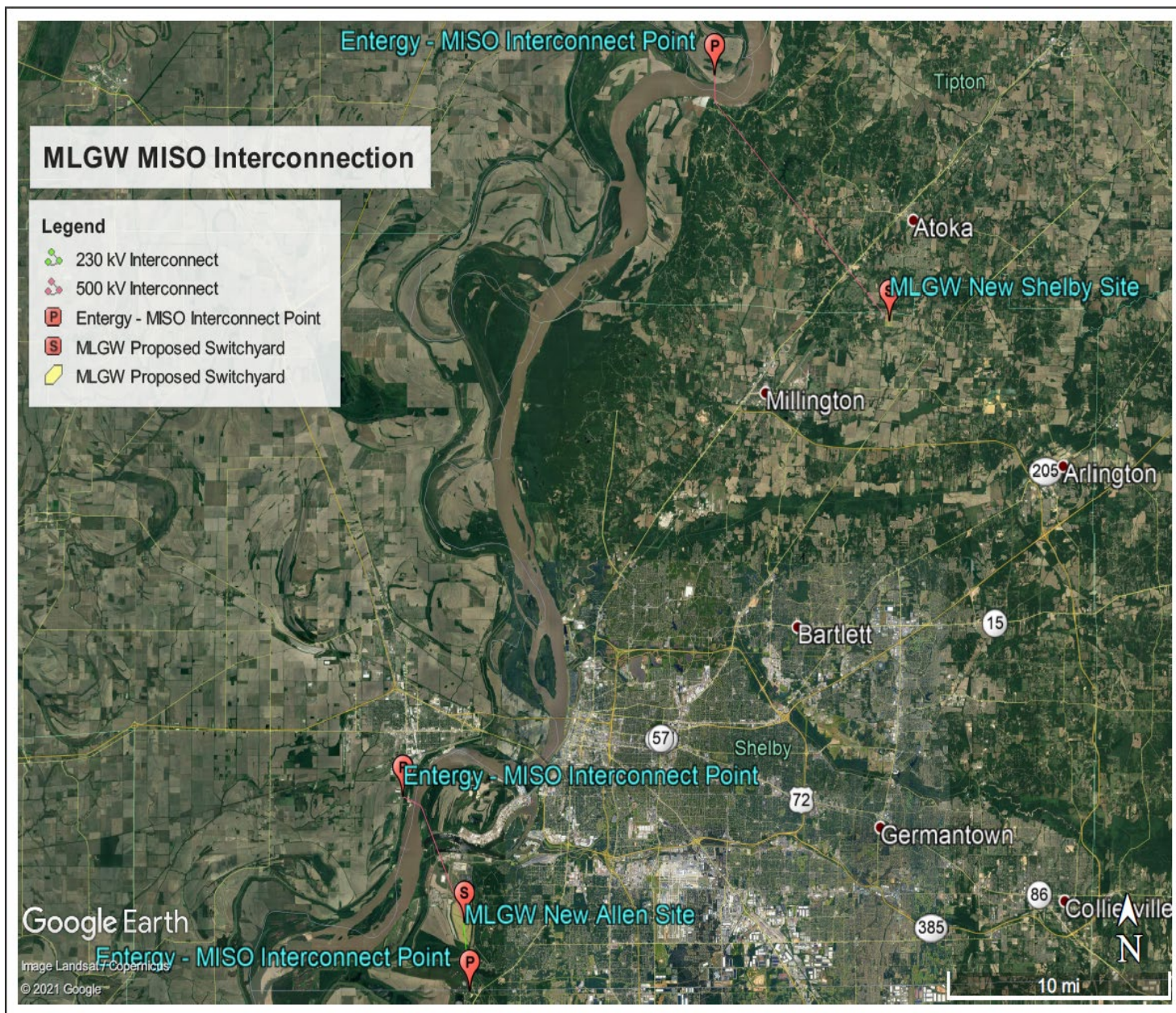


Figure 1: Pictorial Illustration of Project (Line routes are determined by Proposal Respondent(s) and routing authorities)

2.2 Transmission Interconnection to the Project that is Not in Scope

The information provided in this Section 2.2 is related to facilities not part of the Project's scope and shall not be included in responses to this RFP. Proposals shall strictly adhere to the Project description contained in Section 5 of this RFP.

1. Modifications to the existing MLGW 161 kV and 115 kV transmission system
2. Disconnection and re-connection of MLGW 161 kV transmission lines from existing

Allen and Shelby substations to New Allen and New Shelby

3. Entergy intends to construct the facilities in their service territory to connect to this Project, as described in section 2.1.³

Section 3: Proposal Submission, Content, and Format

3.1 RFP Responses

Qualified vendors interested in constructing and commissioning, these Interconnection Projects are required to submit a Proposal.

A Proposal comprises a completed Proposal Template (.doc), a completed Proposal Template for Bid Amount and Payment Schedule Workbook (.xlsx), all required attachments referenced therein, and any additional information deemed necessary by the RFP Respondents.

In developing a proposal, RFP Respondents must use the provided Proposal Template and Proposal Template for Bid Amount and Payment Schedule Workbook. This RFP package is available for download on <https://www.mlgw.com/powersupplyinfo> and includes the following:

Part 1: Request for Proposal (.pdf)

Part 2: Proposal Template (.doc)

Part 3: Proposal Template for Bid Amount and Payment Schedule Workbook (.xlsx)

To be accepted for consideration, qualified vendors must submit a Proposal utilizing the provided Proposal Templates and must strictly to adhere to the instructions and guidance provided therein.

3.2 Description of Services

Qualified vendors must submit proposals that include the following services:

Design-Build services including all siting, routing, permitting, engineering, procurement, construction, and commissioning activities. MLGW will own, operate, and maintain the Interconnection Projects. Vendor will be responsible for development and construction of the Interconnection Projects with input from and coordination with MLGW, except that MLGW shall be responsible for development and construction of improvements or upgrades to its existing assets. Development activities shall include, without limitation: development of

³ MLGW has elected not to seek competitive proposals for portions of the transmission lines in or through Arkansas or Mississippi at this time due to the receipt of information from Entergy and MISO indicating that, under certain terms of the MISO Transmission Owners Agreement and MISO Tariff and Business Practice Manuals, Entergy Arkansas and Entergy Mississippi expect to construct those portions of the new transmission facilities required to interconnect MLGW as a new load in MISO.

Project budget and schedule; Project engineering; completion of routing studies; public outreach; preparation and submittal of applications for regulatory approvals and permits; negotiation of agreements for procurement and construction; right-of-way acquisition; and construction management. The Proposal shall include the Proposal Template and Proposal Template for Bid Amount and Payment Schedule Workbook which details the Proposal Respondent's firm pricing, progress payment schedule, cost and change order containment measures and all other financial information.

3.3 Qualifications to Submit a Proposal

RFP Respondents are to include the following information regarding financial resources and experiences with similar projects.

- Description of Capital Resources including Capital Reserves
- Credit Ratings and reports
- Audited and Pro Forma Financial Statements or similar information
- Description of three (3) similar transmission projects that include EHV transmission line and substation engineering, route selection, permitting, procurement, construction, and commissioning. Provide project cost performance data, adherence to schedules, and applicable references for permitting activities. Provide Health and Human Safety Performance Metrics for those projects including any industry standardized ratings.
- USACE permitting references
- Experience with permitting and construction in TN, MS and AR
- Provide client references associated with the projects.

3.4 Proposal Submission Deadline

An electronic copy of each Proposal shall be submitted to the portal, <https://contractsrfp.mlgw.org>, as specified in this RFP, by no later than 5:00 PM Central Prevailing Time ("CPT") on Friday February 4th, 2022 (the Proposal Submission Deadline).

3.5 Submission Location

One (1) electronic copy of the Proposal are required to be delivered to MLGW prior to the Proposal Submission Deadline. An electronic copy will not be accepted via e-mail. An electronic copy of each Proposal shall be submitted to the portal,

<https://contractsrfp.mlgw.org>.

3.6 Proposal Security

MLGW requires either a standby letter of credit or a bid bond equivalent to 5% of the contract price for each Proposal. The original executed standby letter of credit or bid bond must be delivered to MLGW no later than the Proposal Submission Deadline. A copy of the standby letter of credit or bid bond must be received electronically by MLGW with your Proposal. In addition, a letter of credit, if selected, is subject to the following requirements (i) must be in a form acceptable to MLGW; and (ii) must be issued by a Qualified Institution with a location in TN. As used in this section "Qualified Institution" means a U.S. commercial bank or a licensed U.S. branch of a foreign bank, or other Person having an unsecured bond rating equivalent to A- or better (by S&P and/or Fitch) or A3 or better (by Moody's) as determined by at least two (2) Ratings Agencies, one of which must be either S&P or Moody's, and net tangible assets of at least Thirty Billion Dollars (\$30,000,000,000).

3.7 Proposal Format and Content

MLGW has provided two (2) templates for Proposal submissions titled Proposal Template and Proposal Template for Bid Amount and Payment Schedule Workbook that are publicly posted on the MLGW website. Proposals shall utilize the proposal templates and must complete them to the specified level of detail.

Electronic Submission Format:

Proposals shall be submitted in Microsoft Word (.docx), Microsoft Excel (.xlsx), Adobe Acrobat PDF (.pdf text must be able to be copied and pasted into Microsoft Word as text rather than as an image), or of a similar nature readable by Microsoft's Office suite or Adobe Acrobat applications. No electronic executable files (*.exe) will be accepted by MLGW.

3.8 Proposal Cure Period

MLGW will review Proposals for completeness and will notify RFP Respondents whether their Proposal is complete or deficient within thirty (30) Calendar Days of the Proposal Submission Deadline. Any Proposal deemed to be deficient will have a single Proposal Cure Period of thirty (30) Calendar Days from the date of such notification to submit information necessary to satisfy all the Proposal requirements. Proposals that are not complete at the end of the Proposal Cure Period will be deemed invalid and will not be evaluated or considered further and the Proposal Security will be returned. Changes to the estimated pricing (Total Project Cost) will not be accepted after initial submission of the Proposal.

3.9 List of Proposals Received

Each RFP Respondent will be assigned a unique identification number. Public posting of information related to any proposals received will use this identification number.

3.10 Preparation & Submission Expenses

MLGW is not liable for any expenses incurred in the preparation and submission of a Proposal.

Section 4: Evaluation of Proposals

MLGW will utilize evaluation criteria to perform a comparative analysis of all Proposals submitted prior to the Proposal Submission Deadline, which are valid, have been cured of any deficiencies, and have not been withdrawn.

4.1 Evaluation Criteria

MLGW will consider the following four (4) general categories and associated weighting in evaluating Proposals ("Evaluation Criteria") and an additional bonus category for supplier diversity, contained in the following Transmission Facilities Scoring Rubric:



Request for Proposals

Entergy MISO Transmission Interconnection

Transmission Facilities Score Rubric

Evaluation Principles Applied (Certainty, Risk Mitigation, Cost & Specificity)	Criteria		Sub-criteria	Rating	Score	Example Score
	Cost	40%	Estimated Project Cost & Escalation	('Best', 'Better', 'Good', 'Acceptable', or 'Unacceptable')	0-40 pts	40
			Proposed Incentives (Timing, etc.)			
			Cost Controls			
	Project Schedule & Implementation	15%	Project Schedule	('Best', 'Better', 'Good', 'Acceptable', or 'Unacceptable')	0-15 pts	15
			Project Mgmt Org and Tools			
			Route and Site Evaluation			
			Right of Way and Land Acquisition			
			Engineering and Surveying			
			Material Procurement			
			Regulatory Permitting			
	Facility Design Quality	30%	Transmission Line Civil/Structural	('Best', 'Better', 'Good', 'Acceptable', or 'Unacceptable')	0-30 pts	30
			Substation Civil/Structural/Electrical			
			Environmental Impact of Design			
			Quality of Equipment and Materials			
	Experience	15%	Design	('Best', 'Better', 'Good', 'Acceptable', or 'Unacceptable')	0-15 pts	15
			Construction Management			
			Commissioning			
			Capital Resources and Financing Plan			
Sub-Total Score Before Supplier Diversity Bonus Points					0-100 pts	100
Bonus Points	Supplier Diversity	Local firm and MBWE participation*	If prime contractor includes a subcontractor that is a certified MBE, LSB or WBE and that spend percentage is any of the following tiers: <10% = 1 bonus point >=10 less than 20% = 3 bonus points >=20% = 5 bonus points	0-5 pts	5	
Total Maximum Score After Supplier Diversity Bonus Points					0-105 pts	105

Evaluation Principles:

The evaluation principles are intended to provide a framework for evaluating Proposals. In considering the aspects listed above, MLGW's evaluation of Proposals will be guided and influenced by the collective application of the following:

- **Certainty** - Providing a high degree of certainty and predictability
- **Risk Mitigation** - Reflecting the lowest risk to the success of the project and operating performance
- **Cost** - Meeting all requirements at the lowest overall cost
- **Specificity** - Providing a high degree of specificity and detail

Please note that any proposal scoring as an unacceptable rating in one or more categories will lead to rejection of that proposal.

4.2 Local Firm and MWBE Criteria and Evaluation

In evaluating proposals, MLGW will provide up to five (5) bonus points expressed in percentage adders to the Transmission Facilities Scoring Rubric. If the prime contractor includes a subcontractor that is a certified MBE, LSB or WBE and that spend percentage is any of the following tiers:

<10% = 1 bonus point

>=10 less than 20% = 3 bonus points

>20%= 5 bonus points

Learn more about the Supplier Diversity program, advocate agencies, our business classifications and more, located on the MLGW website, <https://www.mlgw.com/about/supplierdiversityabout>.

4.3 Notification of Transmission Interconnection Projects Award

MLGW will post the name of the selected vendor on its public website by December 1, 2022.

4.4 Contract

No later than January 2, 2023, the selected vendor must execute a Contract which may include Supplementary and other Conditions and specifications furnished by MLGW for the guidance and assistance of the vendor herein referred to as the Contract Documents. The Contract Documents comprising the complete contract should supplement, but not duplicate each other and together constitute one (1) complete set of Specifications. Any work exhibited

in the one and not in the other shall be executed just as if it had been presented in both. The work shall be completed in every respect, according to the complete designs as decided and determined by MLGW.

Section 5: Technical Description of Interconnection Projects

The technical description of the Project is provided below. MLGW requires that all Proposals strictly adhere to the technical description of the Project. Any Proposals failing to do so may be disqualified from further evaluation and consideration. The project is made up of three (3) interconnections to Entergy MISO resulting in two (2) new substations in MLGW's territory, New Allen, and New Shelby:

1. Entergy MISO Interconnect Point to MLGW New Shelby (500 kV) – SSMISO-NS
2. Entergy MISO Interconnect to MLGW New Allen (500 kV) – WMMISO-NA
3. Entergy MISO Interconnect to MLGW New Allen (230 kV) – TTMISO-NA

5.1 Expected In-Service Date

Expected in-service date is January 2, 2028.

5.2 Project Implementation Schedule

This preliminary, high-level project implementation schedule is not intended to be an exhaustive list of all steps or regulatory approvals necessary. Specific deadlines for required regulatory approvals must be proposed by RFP Respondents and shall be based on meeting their proposed development schedules.

Task	Date
Submission of Project Financial Security (5% of estimated Project \$)	February 4, 2022
Deadline for MLGW to announce selected vendor	December 1, 2022
Contract Execution	January 2, 2023
Provide Certificate of Insurance	January 16, 2023
Provide monthly Project status reports	Monthly
Provide regulatory, siting & permitting approvals to MLGW	January 2, 2024
Project in-service date	January 2, 2028

5.3 Transmission Circuits and Voltage

SSMISO-NS: One (1) 500 kV Phase-to-Phase, Overhead

WMMISO-NA: One (1) 500 kV Phase-to-Phase, Overhead

TTMISO-NA: One (1) 230 kV Phase-to-Phase, Overhead

5.4 Transmission Line Minimum Load Ampere Ratings – Normal and Emergency

Interconnection	Summer Normal	Summer Emergency	Winter Normal	Winter Emergency
SSMISO-NS	3,000 A	TBD	3,000 A	TBD
WMMISO-NA	3,000 A	TBD	3,000 A	TBD
TTMISO-NA	5,000 A	TBD	5,000 A	TBD

5.5 Transmission Line Minimum Load MVA Ratings – Normal and Emergency

Interconnection	Summer Normal	Summer Emergency	Winter Normal	Winter Emergency
SSMISO-NS	2,598 MVA	TBD	2,598 MVA	TBD
WMMISO-NA	2,598 MVA	TBD	2,598 MVA	TBD
TTMISO-NA	1,991 MVA	TBD	1,991 MVA	TBD

5.6 Protective Relaying Communications

Two (2) independent fiber optic telecommunications cables, each cable containing a minimum fiber count of one-hundred ninety-two (192), are required to be installed along each interconnection to facilitate the protective relay communication requirements of MISO at the stations and to protect the new Facilities. See Attachment C – MLGW OPGW 192 Count Information.

The fiber optic telecommunications cables shall be installed as either:

- i) OPGW shield wires;
- ii) Underground fiber optic cables buried in the right-of-way;
- iii) Underbuilt fiber optic cables installed on the transmission structures; or
- iv) Any combination of i, ii, and iii above.

For OPGW, Vendor shall determine the required fault current and size the OPGW accordingly.

5.7 Substation Transformer Quantity, Voltage, and MVA

Substation	High Side Voltage	Low Side Voltage	MVA	Quantity
New Shelby	500 kV	161 kV	1,300 MVA	2
New Allen	500 kV	161 kV	1,300 MVA	2
New Allen	230 kV	161 kV	1,000 MVA	2

5.8 Connection to Entergy MISO Interconnection Point WMMISO 500kV

Interconnection Point Name: WMMISO

Interconnection With: Entergy Arkansas

Interconnection Point Location: Approximate location shown in Figure 1 on page 11 of this RFP.

Requirements/Standards: Interconnection Requirements and Guidelines for Entergy can be found here https://www.entergy.com/energydelivery/facility_requirements/.

Point of Interconnection: The interconnection point between the WMMISO-NA transmission line and Entergy MISO shall be the interconnect structure located at the interconnection point described above. This structure and foundation will be part of the Project and provided by the Contractor. The line dead-ends and hardware on the north or west side of the structure will be provided by Entergy. The insulators and hardware required to dead-end the transmission

circuit and OPGW shield wires on the south or east side of the structure, along with the jumpers to the north or west side of the structure, shall be the responsibility of the contractor.

Contract shall provide a fiber optic splice box at the interconnect structure and terminate the OPGW fiber at this location.

Conductor size shall be determined by the contractor.

5.9 Connection to Entergy MISO Interconnection Point SSMISO 500kV

Interconnection Point Name: SSMISO

Interconnection With: Entergy Arkansas

Interconnection Point Location: Approximate location shown in Figure 1 on page 11 of this RFP.

Requirements/Standards: Interconnection Requirements and Guidelines for Entergy can be found here https://www.entergy.com/energydelivery/facility_requirements/.

Point of Interconnection: The interconnection point between the SSMISO-NS transmission line and Entergy MISO shall be the interconnect structure located at the interconnection point described above. This structure and foundation will be part of the Project and provided by the Contractor. The line dead-ends and hardware on the north side of the structure will be provided by Entergy. The insulators and hardware required to dead-end the transmission circuit and OPGW shield wires on the south side of the structure, along with the jumpers to the north side of the structure, shall be the responsibility of the contractor.

Contract shall provide a fiber optic splice box at the interconnect structure and terminate the OPGW fiber at this location.

Conductor size shall be determined by the contractor.

5.10 Connection to Entergy MISO Interconnection point TTMISO 230 kV

Interconnection Point Name: TTMISO

Interconnection With: Entergy Mississippi

Interconnection Point Location: Approximate location shown in Figure 1 on page 11 of this RFP.

Requirements/Standards: Interconnection Requirements and Guidelines for Entergy can be found here https://www.entergy.com/energydelivery/facility_requirements/.

Point of Interconnection: The interconnection point between the TTMISO-NA transmission

line and Entergy MISO shall be the interconnect structure located at the interconnection point described above. This structure and foundation will be part of the Project and provided by the Contractor. The line dead-ends and hardware on the south side of the structure will be provided by Entergy. The insulators and hardware required to dead-end the transmission circuit and OPGW shield wires on the north side of the structure, along with the jumpers to the south side of the structure, shall be the responsibility of the contractor.

Contract shall provide a fiber optic splice box at the interconnect structure and terminate the OPGW fiber at this location.

Conductor size shall be determined by the contractor.

5.11 Connection to New Allen 500/230/161 kV Substation

Substation Name: New Allen 500/230/161 kV Substation

Substation Owner: MLGW (new, by successful RFP Respondent)

Substation Location: County & State: Shelby County, Tennessee

Description: The West Memphis (Entergy) to New Allen 500 kV and Twinkletown (Entergy) to new Allen 230 kV transmission circuits will terminate at the New Allen 500/230/161 kV substation. The New Allen substation will consist of a 500 kV, 3,000 A three-breaker ring bus configuration that will connect to the MISO West Memphis substation and a 230 kV, 5,000 A three-breaker ring bus configuration that will connect to the MISO Twinkletown substation. Each ring bus will be designed such that it will be easily converted to a breaker and a half configuration in the future. Two 1,300 MVA transformers will step down voltage from 500 kV to 161 kV and two 1,000 MVA transformers will step down voltage from 230 kV to 161 kV to connect into the MLGW 161 kV system. The 161 kV portion of the substation will consist of twenty-four circuit breakers, arranged in a breaker and a half bus configuration that will be expandable to thirty-six breakers in the future. Nine 161 kV transmission lines will connect the New Allen substation to existing MLGW substations. Sufficient space will be included in the 161 kV bus for the termination of three future 161 kV transmission circuits. The 161 kV bus will be oriented within the site such that two full breaker and a half line bays can be added later for the termination of four new 161 kV transmission circuits at each end of the bus. The substation will utilize two sets of 161 kV-120/ 208 V three phase SSVTs, located on opposite 161 kV busses for AC station service. The station will be designed and constructed in accordance with all state, local, and MLGW requirements, and applicable technical standards and guidelines including but not limited to RUS, ANSI/IEEE and NEC.

Substation Site Maps and One-Line Diagrams: See Attachment B.

5.12 Connection to New Shelby 500/161 kV Substation

Substation Name: New Shelby 500/161 kV Substation

Substation Owner: MLGW (new, by successful RFP Respondent)

Substation Location: County & State Shelby County, Tennessee

Description: The San Souci (Entergy) to New Shelby 500 kV transmission circuit will terminate at the New Shelby 500/161 kV substation. The New Shelby substation will consist of a 500 kV, 3,000 A three-breaker ring bus configuration that will connect to the MISO San Souci substation. The ring bus will be designed such that it will be easily converted to a breaker and a half configuration in the future. Two 1,300 MVA transformers will step down voltage from 500 kV to 161 kV to connect into the MLGW 161 kV system. The 161 kV portion of the substation will consist of twenty-four circuit breakers, arranged in a breaker and a half bus configuration that will be expandable to thirty-six breakers in the future. Eight 161 kV transmission lines will connect the New Shelby substation to existing MLGW substations. Sufficient space will be included in the 161 kV bus for the termination of six future 161 kV transmission circuits. The 161 kV bus will be oriented within the site such that two full breaker and a half line bays can be added later for the termination of four new 161 kV transmission circuits at each end of the bus. The substation will utilize two sets of 161 kV-120/ 208 V three phase SSVTs, located on opposite 161 kV busses, for AC station service. The station will be designed and constructed in accordance with all state, local, and MLGW requirements, and applicable technical standards and guidelines including but not limited to RUS, ANSI/IEEE and NEC.

Substation Site Maps and One-Line Diagrams: See Attachment B.

5.13 Number of Major River Crossings

Two (2) – Project requires the crossing of the Mississippi River.

5.14 Substation Spare Equipment

The following items will be included in the scope of the project for procurement and delivery by the successful bidder:

500 kV

(1) single-phase 1300 MVA, 500-161 kV autotransformer

(1) 3-phase set of 500 kV autotransformer bushings (1500 A minimum)

- (1) 3-phase set of 500 kV CCVTs
- (1) 3-phase set of surge arresters
- (1) complete 3-phase gang-operated 3000 A switch
- (1) complete 3000 A circuit breaker

230 kV

- (1) single-phase 1000 MVA, 230-161 kV autotransformer
- (1) 3-phase set of 230 kV autotransformer bushings (3000 A minimum)
- (1) 3-phase set of surge arresters
- (1) complete 3-phase gang-operated 5000 A switch
- (1) complete 5000 A circuit breaker

161 kV

- (1) 3-phase set of 161 kV autotransformer bushings (5000 A minimum)
- (1) 3-phase set of surge arresters
- (1) complete 3-phase gang-operated 5000 A switch
- (1) complete 5000 A circuit breaker

Section 6: Standards, Requirements, & Guidelines

This Section of the RFP contains the list of current transmission facility interconnection standards and requirements, established by the interconnecting TO(s) whose substation facilities directly interconnect with the Project. Proposals are required to comply with these transmission facility interconnection standards and requirements.

6.1 Transmission and Substation Minimum Standards

This section of the RFP contains the Transmission Line and Substation minimum design standards and guidelines. Proposals are required to comply with standards and guidelines defined below. Bidders are also required to include a Basis of Design Report (BODR) with their proposals establishing design, construction, and performance specifications of all elements of the Project identifying critical path activities, materials and methods of construction, construction sequencing and other noteworthy items necessary to complete the Project by the required scheduled completion date. A draft BODR shall be submitted with the



Proposal and updated at all subsequent design deliverables throughout out the course of the Project.

Along with following Prudent Industry Practice, at a minimum, the latest edition of the following guides, codes, and standards shall be followed:

- NESC – Nation Electric Safety Code
- RUS Bulletin 1724E-300 – Design Guide for Rural Substations
- RUS Bulletin 1724E-200 – Design Manual for High Voltage Transmission Lines
- ASCE-74 - Guidelines for Electrical Transmission Line Structural Loading
- ASCE-113 - Substation Structure Design Guide
- ASCE-10 - Design of Latticed Steel Transmission Structure
- ASCE-48 - Design of Steel Transmission Pole Structures
- ASCE MOP 141 – Wood Pole Structures for Electrical Transmission Lines
- ACSE 7 – Minimum Design Loads for Buildings and Other Structures

All equipment must meet the requirements of the high seismic qualification level and shall be qualified according to IEEE Standard 693 with frequency modifying devices.



Attachment A: MLGW's Non-Disclosure Agreement

**MEMPHIS LIGHT, GAS AND WATER DIVISION
CITY OF MEMPHIS
MEMPHIS, TENNESSEE**

**CONFIDENTIALTY AND NON-DISCLOSURE AGREEMENT
for Contract No. 12137 POWER SUPPLY – TRANSMISSION**

THIS CONFIDENTIALTY AND NON-DISCLOSURE AGREEMENT is made effective as of the ____ day of _____, 2021 with the {_____} ("Recipient").

WHEREAS Memphis Light, Gas and Water Division ("Discloser") possesses certain utility infrastructure information which is confidential ("Confidential Information");

WHEREAS the Confidential Information is of a nature which may allow a person to identify areas of structural or operational vulnerability of Discloser or that would permit unlawful disruption to, or interference with, the services provided by Discloser; and

WHEREAS the Recipient is willing to receive disclosure of the Confidential Information pursuant to the terms of this Agreement for the purpose of responding to Request for Proposal for Contract No. 12137 POWER SUPPLY – TRANSMISSION;

NOW THEREFORE, in consideration for the undertakings under this Agreement, the Recipient agrees to the below terms as follows:

1. Disclosure. The Recipient agrees to receive the Confidential Information.
2. Confidentiality.
 - 2.1 *No Use*. The Recipient agrees not to use or duplicate the Confidential Information in any way except for the following purpose authorized by the Discloser: submitting a proposal for Contract No. 12137 POWER SUPPLY – TRANSMISSION.
 - 2.2 *No Disclosure*. The Recipient agrees to prevent and protect the Confidential Information, or any part of the Confidential Information, from disclosure to any person other than the Recipient's employees that have a need for disclosure in connection with the Recipient's authorized use of the Confidential Information. Disclosure to an independent contractor or consultant of the Recipient is strictly prohibited without the expressed written consent of Discloser.
 - 2.3 *Protection of Secrecy*. The Recipient agrees to take all steps necessary to protect the secrecy of the Confidential Information and to prevent the Confidential Information from falling into the public domain or into the possession of unauthorized persons.

3. Limits on Confidential Information. Confidential Information shall not be deemed proprietary and the Recipient shall have no obligation with respect to such information where the information:
 - (a) Was known to the Recipient prior to receiving any of the Confidential Information from the Discloser;
 - (b) Has become publicly known through no wrongful act of the Recipient;
 - (c) Was received by the Recipient without breach of this Agreement from a third party without restriction as to the use and disclosure of the information;
 - (d) Was independently developed by the Recipient without use of the Confidential Information; or
 - (e) Was ordered to be publicly released by the requirement of a government agency, court, or operation of law.
4. Ownership of Confidential Information. The Recipient agrees that all Confidential Information shall remain the property of Discloser and that the Discloser may use such Confidential Information for any purpose without obligation to Recipient. Nothing contained herein shall be construed as granting or implying to the Recipient any transfer of rights, any patents, or any other intellectual property pertaining to the Confidential Information.
5. Return of Confidential Information. Immediately upon demand by the Discloser, the Recipient shall deliver to the Discloser all of the Discloser's Confidential Information and copies which are then in the possession of the Recipient. At the request of the Discloser, the Recipient shall certify in writing that the Recipient has destroyed or turned over to the Discloser all documents containing such Confidential Information.
6. Term and Termination. The obligations of this Agreement shall be continuing until the Confidential Information disclosed to the Recipient is no longer confidential.
7. Survival of Rights and Obligations. This Agreement inures to the benefit of, and shall be enforceable by the Discloser, the Discloser's successors and assignees; and shall be binding upon the Recipient, the Recipient's successors and assignees.
8. Governing Law. This Agreement shall be interpreted, construed, and governed according to the laws of the State of Tennessee, regardless of choice of law. For the purposes of any dispute arising out of the subject matter of this Agreement, the parties agree that they shall submit solely to the jurisdiction of the courts of Shelby County, Tennessee.
9. Required Disclosure. If the Recipient becomes legally compelled to disclose any Confidential Information, it shall immediately notify the Discloser to the extent legally permissible, so that the Discloser may, at the Discloser's option, seek a protective order or other appropriate remedy or waive compliance with the provisions of this Agreement. In the event Recipient becomes legally compelled to disclose any

Confidential Information, Recipient, after compliance with the requirements of this paragraph, may disclose only such portion of the Confidential Information as is necessary to comply with the legal requirement compelling such disclosure.

10. Waiver. No failure or delay by a party in exercising any right, power, or privilege under this Agreement shall operate as a waiver of said right, power, or privilege, nor shall any single or partial exercise of said right, power, or privilege preclude any other or further exercise of said right, power, or privilege or the exercise of any other of said right, power, or privilege in this Agreement.

11. Authentication.

IN WITNESS WHEREOF, the Recipient has caused this Agreement to be executed.

{Recipient}

Signature: _____

Name: _____

Title: _____

Date: _____

Approved
MEMPHIS LIGHT, GAS AND WATER DIVISION

By: _____

Title: _____

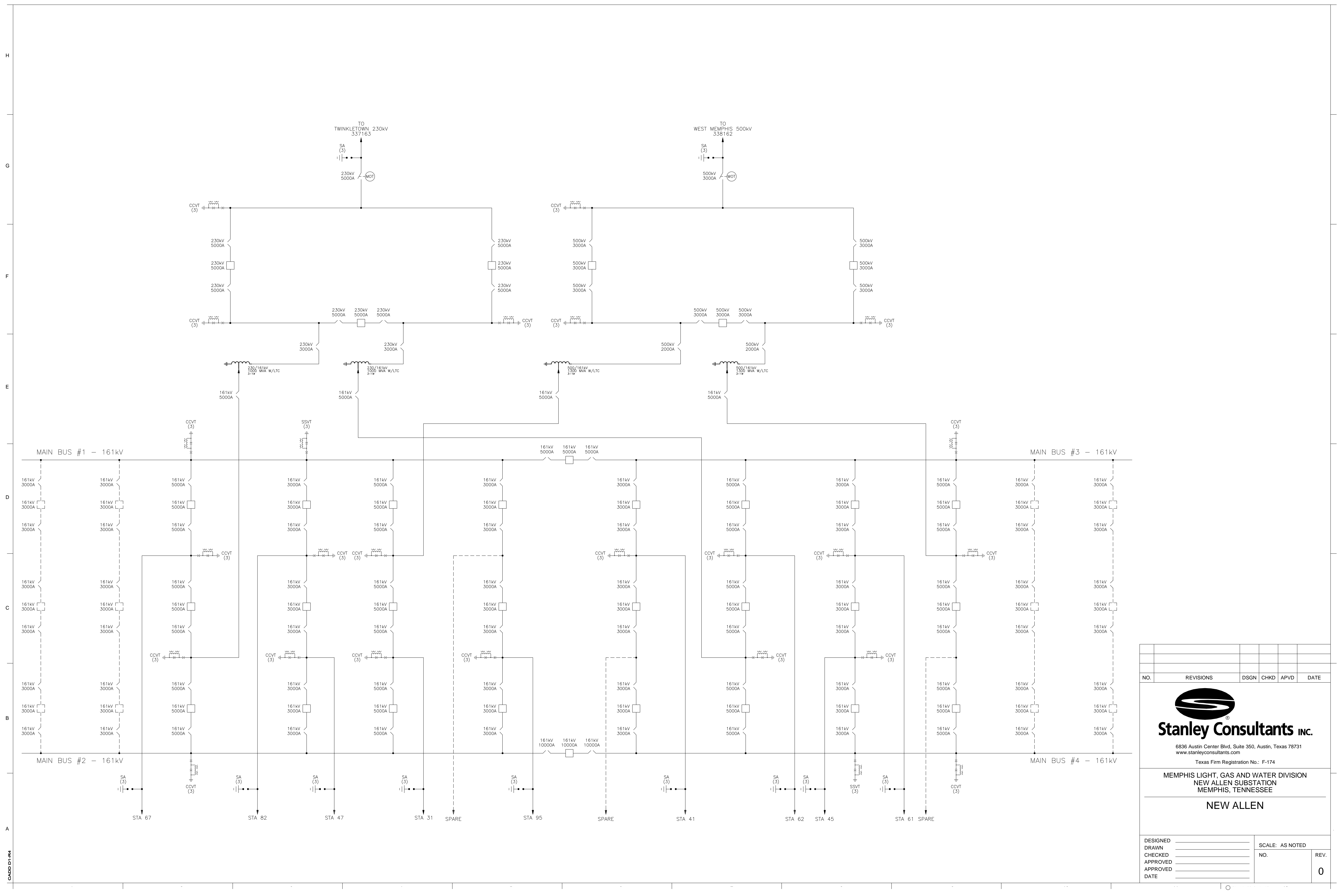
Date: _____

NOTICE: This Agreement MUST be signed by an individual empowered to contractually bind the Recipient. If said individual is not the chief executive, this Agreement shall have attached to said Agreement evidence showing the individual's authority to contractually bind the Recipient.

END



Attachment B: Substation Site Maps and One-Line Diagrams



NO.	REVISIONS	DSGN	CHKD	APVD	DATE

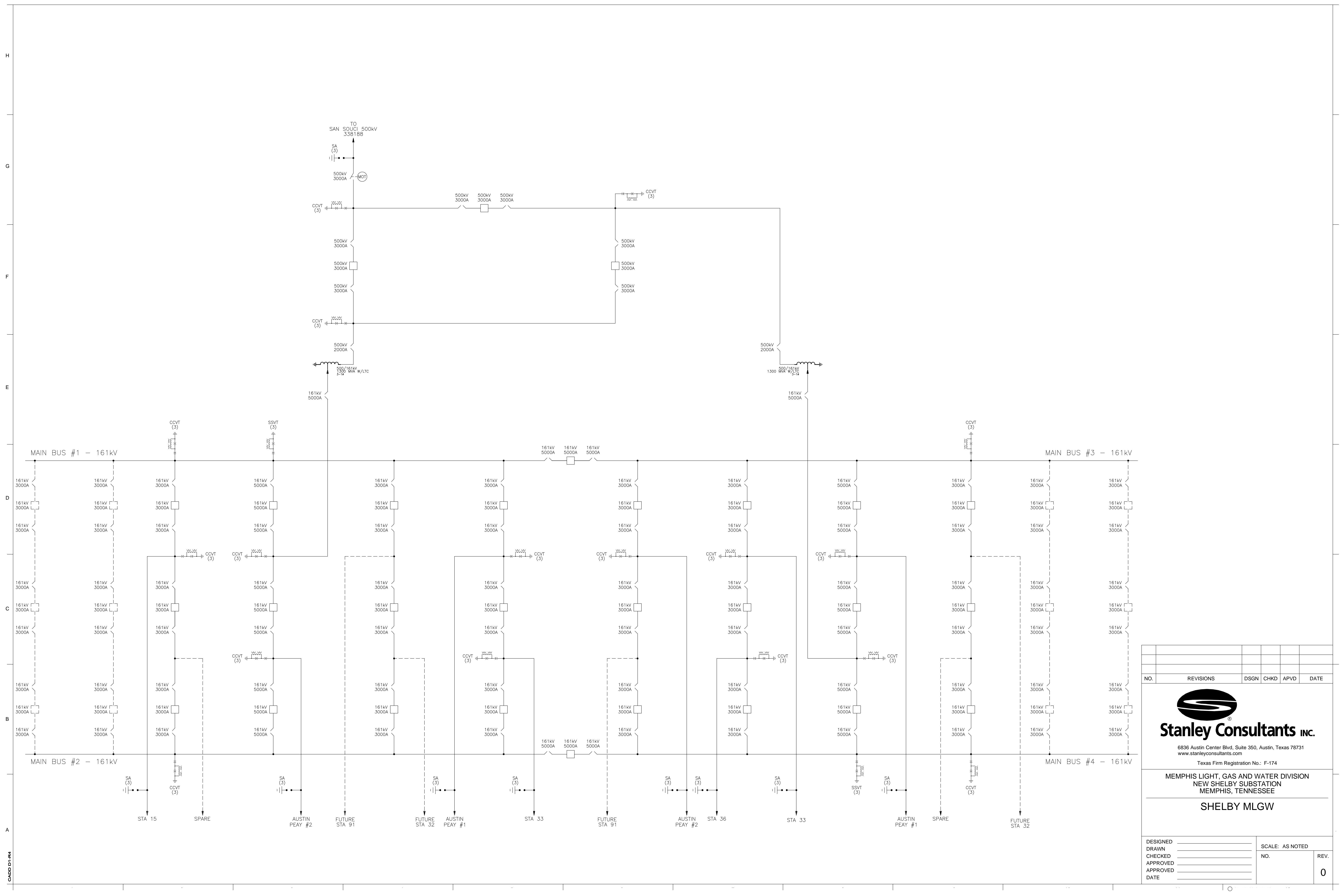


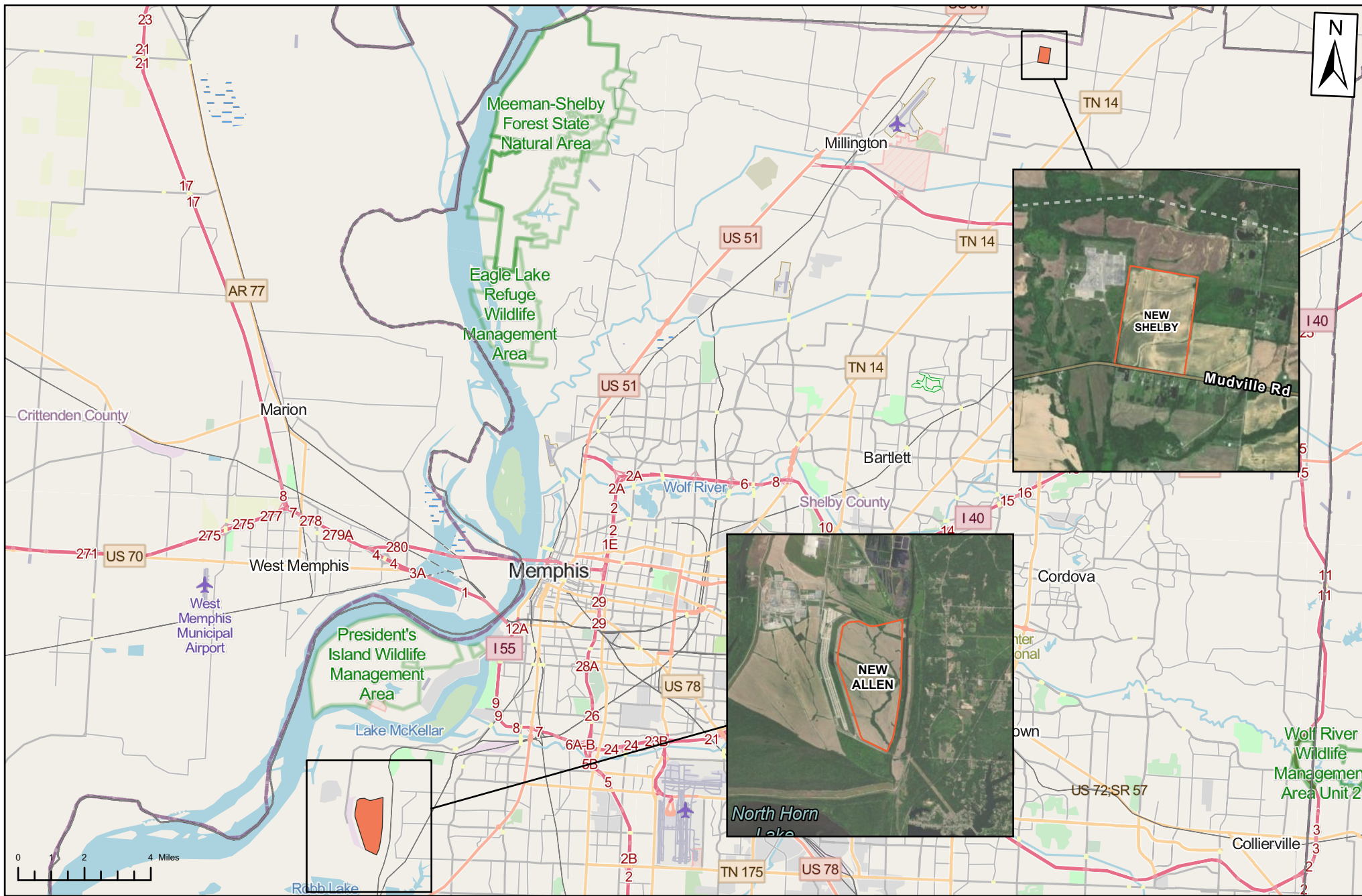
Stanley Consultants INC.
6836 Austin Center Blvd, Suite 350, Austin, Texas 78731
www.stanleyconsultants.com
Texas Firm Registration No.: F-174

MEMPHIS LIGHT, GAS AND WATER DIVISION
NEW ALLEN SUBSTATION
MEMPHIS, TENNESSEE

NEW ALLEN

DESIGNED _____	SCALE: AS NOTED
DRAWN _____	NO. _____
CHECKED _____	REV. _____
APPROVED _____	
DATE _____	0





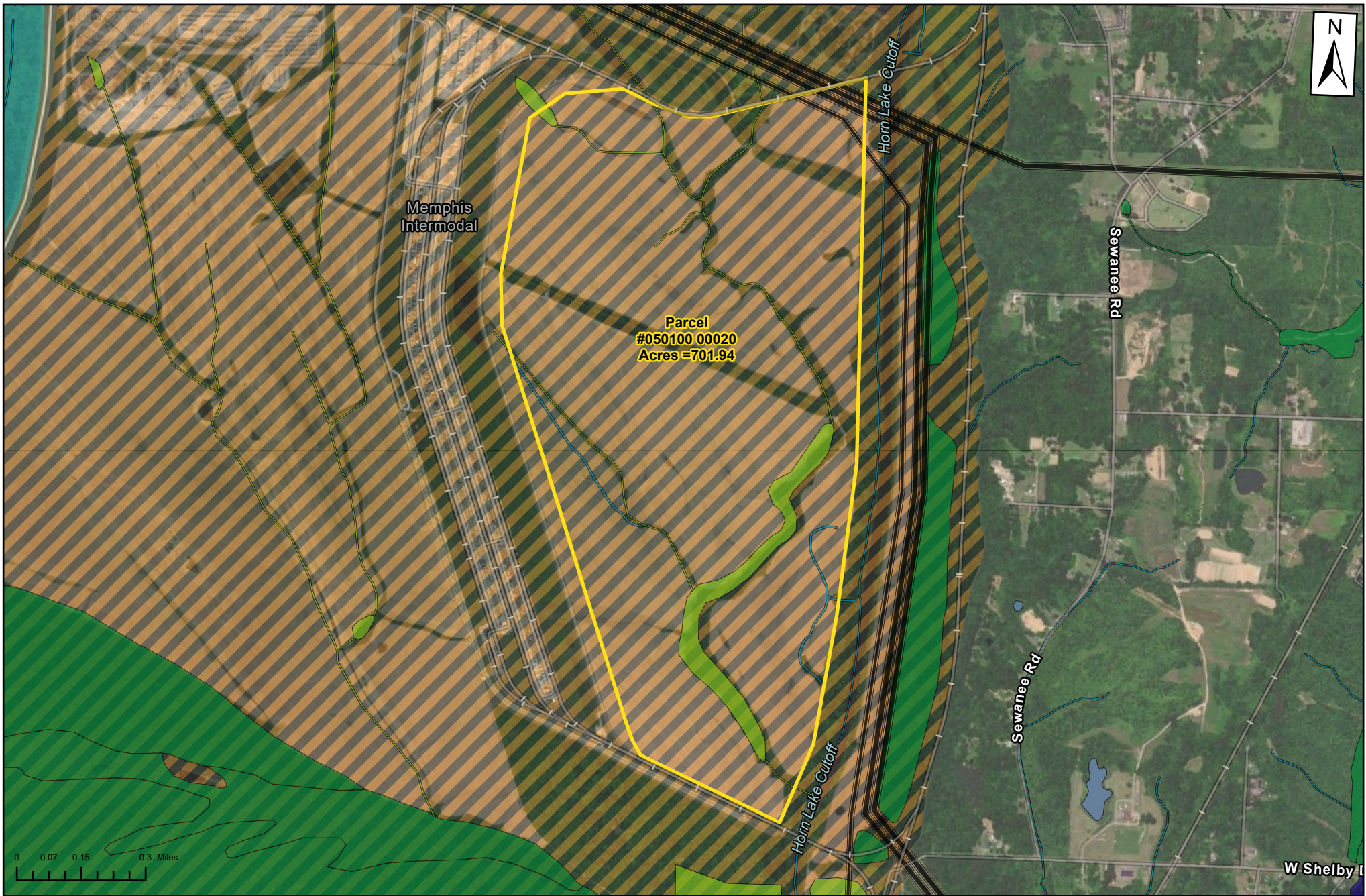
Potential Project Boundary

Stanley Consultants INC.

June 2021

OVERALL SITE OPTIONS

MLGW
Shelby County, TN
Figure 1

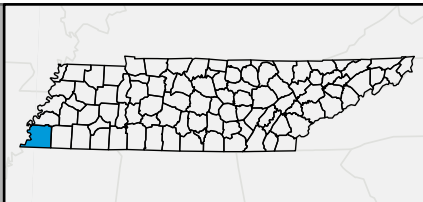
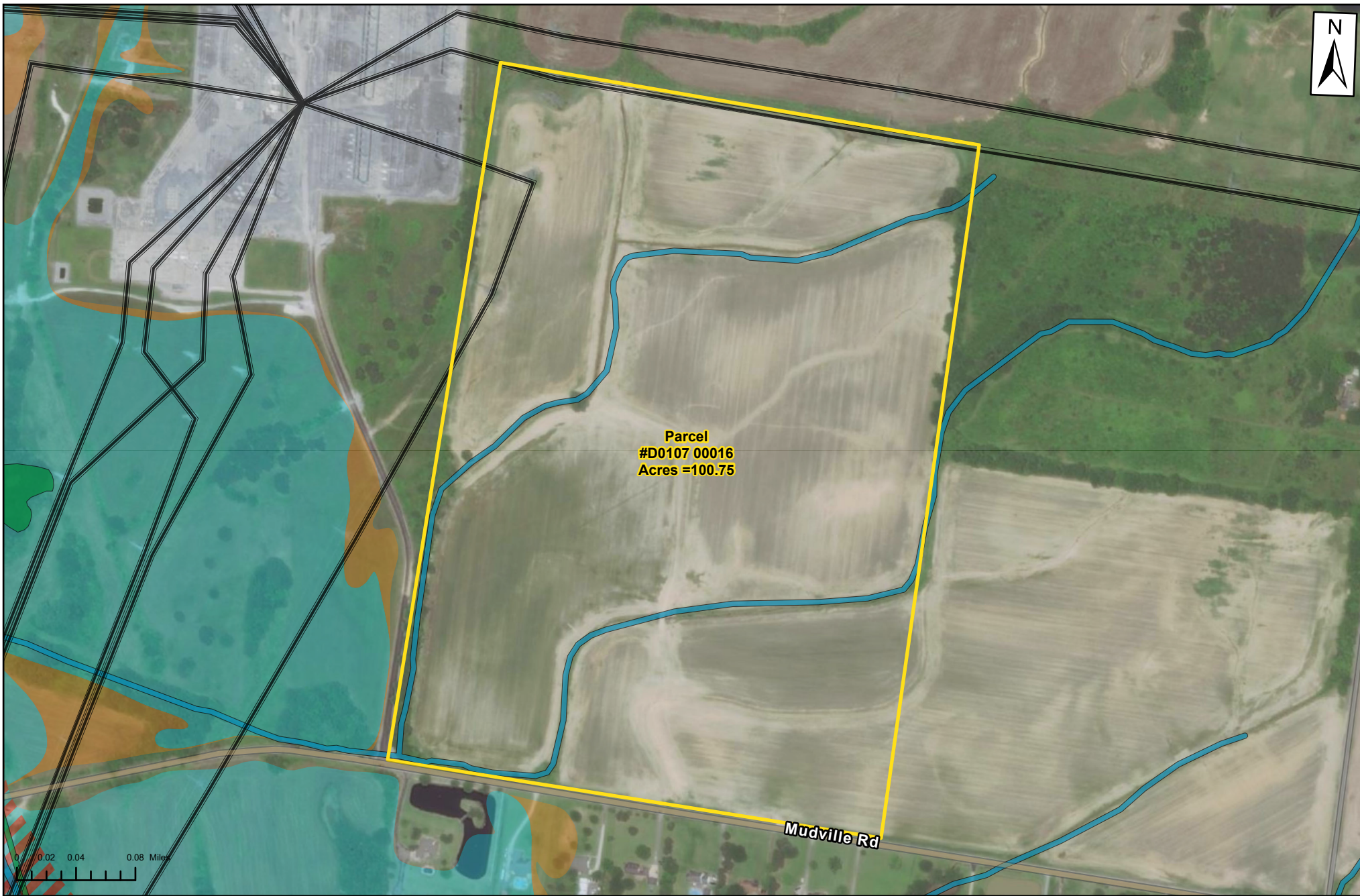


- Transmission Lines
 — AC; OVERHEAD
 Potential Project Boundary
 — Potential Project Boundary
 Flood Hazard Zones
 1% Annual Chance Flood Hazard
 Area with Reduced Risk Due to Levee

- National Wetlands Inventory
 Freshwater Emergent Wetland
 Freshwater Forested/Shrub Wetland
 Freshwater Pond
 Lake
 Riverine



July 2021
**NEW ALLEN SUBSTATION
 Option #1**
 MLGW
 Shelby County, TN
 Figure 3



Transmission Lines	National Wetlands Inventory
— AC; OVERHEAD	Estuarine and Marine Deepwater
Potential Project Boundary	Estuarine and Marine Wetland
— Potential Project Boundary	Freshwater Emergent Wetland
Flood Hazard Zones	Freshwater Forested/Shrub Wetland
1% Annual Chance Flood Hazard	Freshwater Pond
Regulatory Floodway	Lake
0.2% Annual Chance Flood Hazard	Other
	Riverine



July 2021

NEW SHELBY SUBSTATION
Option #1
 MLGW
 Shelby County, TN
 Figure 2



Attachment C: MLGW OPGW 192 Count Information

MLGW OPGW 192 Count Material Short Description:

Wire, fiber optic ground wire, (OPGW)192 fiber for installation on Electric Transmission Structures (115 or 161kV), OPGW is to be of "High Fiber Count" design comprised of a central steel strand surrounded by optical unites located inside stainless steel tubes with stranded wires comprising the remainder of the second and third (outmost) layers, OPGW is to meet MLGW Specification "T161-151" Fiber Optic Ground Wire dated September 19, 2018 and supplied on steel reels that are marked with the Division stock number "42-1192"

MEMPHIS LIGHT, GAS AND WATER DIVISION

MEMPHIS, TENNESSEE

SPECIFICATION

T161-151

FIBER OPTIC GROUND WIRE (OPGW)

GENERAL SPECIFICATIONS

September 19, 2018

I. SCOPE

This specification is intended as a statement of basic requirements for fiber optic ground wire (OPGW) installed in the static wire position on 115kV and 161kV overhead electric transmission line structures. The OPGW will be used to transport communications for protective relaying, supervisory control and data acquisition (SCADA), and telephone in addition to its function as a standard overhead ground wire.

II. REFERENCES

All material provided on this contract shall conform to IEEE Std. 1138, latest edition.

III. PHYSICAL CHARACTERISTICS

The OPGW cable will exhibit the following characteristics:

- A. OPGW shall be of the stainless steel loose tube (SSLT) buffer tube design in which a center solid member is surrounded by stranded SSLT's and solid metallic members which are then surrounded by solid stranded metallic members. The inside layer of the cable shall be right-hand lay and the outside layer of the cable shall be left-hand lay.
- B. The cable shall be furnished in the continuous lengths specified in the Release. These lengths shall be the actual minimum usable cable lengths delivered exclusive of test samples and manufacturing waste.
- C. The cable shall be stranded in such a way as to be essentially free from a tendency for the strands to untwist or spring apart when cut or during pulling. The use of an anti-rotational device shall not be required assuming the pulling tension does not exceed 20% of the cable's rated breaking strength.
- D. All metallic components, excluding central strength members, shall be either aluminum, 6201-T81 aluminum alloy per ASTM B398 latest edition, 20.3% aluminum clad steel per ASTM B415 latest edition, or stainless steel per ASTM A304 latest edition.
- E. Metallic tubes shall be either extruded or longitudinally welded. If welded, the weld shall be essentially smooth both internally and externally. A tube with an open or folded seam is not acceptable.

- F. Any filling compound used inside the fiber tube(s) shall be capable of inhibiting corrosion and serving as a moisture barrier. The compound shall not drip at temperatures up to 70° Celsius. A dry moisture blocking filler is preferred to gel filler.
- G. The cable must be capable of providing satisfactory service, both electrically and optically, under all conditions listed in Section III of these specifications.
- H. The cable design shall be such that freeze damage will not occur.
- I. The cable will allow installation with use of standard equipment used for stringing and sagging conductors. This includes tensioners, pullers, pulling rope, and stringing blocks. Furthermore, no requirements shall call for stringing blocks with an inside groove diameter in excess of 30 times the OPGW diameter for line angles greater than or equal to 60 degrees or 25 times the OPGW diameter for line angles less than 60 degrees, all at a pulling tension less than 20% of the cable's RBS.
- J. Additionally, the OPGW cable will possess the following characteristics:
 - 1. Cable Diameter: 0.528 inches (48 Fibers or less)
0.646 inches (96 Fibers)
0.646 inches (192 Fibers)
 - 2. Maximum Weight: 0.37 lb./ft. (48 Fibers or less)
0.43 lb./ft. (96 Fibers)
0.43 lb./ft. (192 Fibers)
 - 3. Max. D.C. Resistance (20°C): Less than 1.0 ohm/mile
 - 4. Maximum Fault Current
(40°C Initial, 210°C Final
@ hottest point per IEEE
738 latest edition): 12,000 Amps for 30 Cycles
 - 5. Min. Permanent Bending Radius: 20 inches
 - 6. Lay of outermost layer: Left Hand
 - 7. Sag and Tension criteria
for a 1200' ruling span:

48 Fibers or less:

Condition	Temperature	Max. Tension	Max. Sag
Hot (Unloaded Initial)	120° F	-	35.0 ft
Cold (Unloaded Initial)	15° F	2,500 lbs	-
NESC Medium (1/4" ice, 4# wind + 0.2)	15° F	4,500 lbs	-

96 and 192 Fibers:

Condition	Temperature	Max. Tension	Max. Sag
Hot (Unloaded Initial)	120° F	-	35.0 ft
Cold (Unloaded Initial)	15° F	3,000 lbs	-
NESC Medium (1/4" ice, 4# wind + 0.2)	15° F	5,000 lbs	-

That is, there should be a Design Tension that exists in order for all of the above criteria to be satisfied.

- K. The cable must allow use with Alcoa Fujikura Ltd. hardware currently in stock. This hardware includes the deadends, suspensions, and comealongs listed below:

	<u>Item</u>	<u>48 Fibers or less</u>	<u>48+ Fibers</u>
1.	Deadend:	ODES520/529G7	ODES640/649G9
2.	Suspension:	SUME528/555	SUME615/646
3.	Comealong	OCA520/529	OCA640/649

The fabricator will be required to submit test results verifying the above upon request. Hardware will be supplied as required to perform adequate testing. All testing will be performed at the manufacturer's expense.

- L. The bidder will submit in writing all electrical and physical characteristics of the OPGW. This will also include all sag information for use with both Southwire Sag10 and PLS-CADD Programs.

IV. FIBER OPTIC CHARACTERISTICS

The OPGW cable will contain fiber optic communications cable that will possess the following characteristics:

- | | | |
|----|---|--|
| A. | Minimum number of fibers: | As specified |
| B. | Index profile: | Single Mode |
| C. | Wavelengths: | 1310, 1383, 1550, & 1625 Nanometers |
| D. | Attenuation: | 0.35db/km @ 1310 nm
0.35db/km @ 1383 nm (post-hydrogen aging)
0.22db/km @ 1550 nm
0.25db/km @ 1625 nm |
| E. | Operating Temperatures: | -40° C to +85° C |
| F. | Fiber Material: | All glass |
| G. | Fiber type: | Corning SMF-28e |
| H. | Minimum Permanent
Bending Radius of SSLT: | 65mm |
| I. | Fiber Strain Margin: | ≥ 80% RBS of cable |
| J. | The Buffer Tube shall be a filled loose buffer tube design and must provide immunity to moisture, vibration and mechanical stress. | |
| K. | No electrically conducting components shall be housed within any buffer tube. | |
| L. | Fibers shall be distributed in either one (1), two (2), or three (3) SSLT buffer tubes containing multiples of 12 fibers up to a maximum of 48 fibers. The individual fibers shall be distinguishable from each other by means of unique color coding of the buffer tubes and/or the fiber coating. The colors shall be in accordance with EIA/TIA-598. The code coloring shall not be adversely affected by either the cable filling compound or conventional solvents. The coding technique of color plus counting is | |

not acceptable. If more than 12 fibers are in a buffer tube, they shall be readily differentiated by distinctly visible colored banding.

V. TECHNICAL SUPPORT

The vendor shall supply specific installation recommendations including but not limited to techniques, equipment, procedures and methods. The vendor shall make himself or herself available to meet with installation and splicing crews no less than twice a year to review. A single meeting shall be considered a full 8 hr day. A name and phone number shall be provided for an experienced representative to resolve any questions that may arise during a project.

VI. WARRANTY AND GENERAL INFORMATION

The warranty will include the following:

- A. All equipment purchased under this specification shall carry an eighteen (18) month warranty.
- B. All electrical and physical characteristics not already mentioned in the specification shall be supplied in this specification for all equipment being bid.
- C. Two (2) references (users) will be supplied to MLGW for purposes of this specification.

VII. SHIPPING

Shipping and handling of the OPGW cable will conform to the following:

- A. Each reel shall be with one continuous length to a reel.
- B. The billable length of reel supplied on each reel shall be between plus 2% and minus 0% of the stated length.
- C. The shipping reel shall be of steel construction and shall be no-deposit.
- D. Specify the maximum reel length for shipping.
- E. The cable shall be tightly and uniformly spooled onto the reels in layers.
- F. Both ends of each cable shall be accessible for testing while still on the reel.

- G. Each end of each cable shall be suitably sealed to prevent moisture from entering the optical unit, or any other part of the cable, and prevent the escape of filling compound during shipment and storage.

VIII. DESIGN TESTS

The following design tests shall be performed on a representative sample of the OPGW from this order. Certified copies of reports of previous tests made on items of acceptable similar type and design will be accepted in lieu of the design test requirements.

- A. All design tests required in IEEE standard 1138.
- B. Breaking strength per IEEE standard 1138, clause 5.1.1.9, except that the test shall be continued until the cable breaks.

IX. ROUTINE TESTS

The following routine tests shall be performed on each completed reel of OPGW cable.

- A. All routine test requirements of IEEE standard 1138.
- B. In addition to the IEEE requirements, each completed OPGW conductor length shall be measured for:
 - 1. Length
 - 2. Weight
 - 3. Attenuation of each fiber at 1310 nm, 1550 nm either using the cutback method with light source and an optical power meter or bi-directionally using an OTDR.
 - 4. Point attenuation irregularities (OTDR) at 1550 nm. A print or disk of the OTDR trace for each fiber shall be made available if requested.

X. TEST REPORTS

All design and routine tests shall be recorded and included in a test report. Two copies of the test report shall be submitted to Greg Driver, Memphis Light, Gas and Water Division, P.O. Box 430, Memphis, TN 38101. All copies shall be legible. Each report shall be identified by contract number, reel numbers, shop number, dates of test and reviewed and signed by the manufacturer's Q.C. supervisor, project manager, or project engineer.