



**TRANSMISSION LINE & SUBSTATION PROJECTS**

**COMPANY: ELL**

**CUSTOMER: PID216**

**FACILITIES STUDY**

**EJO # F4PPLA0310**

**PID 216 FACILITY STUDY**

**Revision:  
2**

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A	3/3/09	1 <sup>st</sup> Draft	PK	RG
B	3/5/09	2 <sup>nd</sup> Draft, based on JET poll of 3/3/09.	PK	RG
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*\* Note: All required JET approvals and other stakeholder concurrences are shown in the voting polls in eRoom.*

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## 1. PROJECT SUMMARY

### 1.1. Background and Project Need

All data contained in this document supports the request of the Southwest Power Pool (SPP) on behalf of the Customer to evaluate PID 216. The Customer intends to install a generating facility consisting of two (2) steam turbine generators tied to Wilton 230kV switchyard through two (2) 230/18kV transformers. The study evaluates the injection of 251MW to the Entergy transmission system at the Wilton switchyard between the Panama and Romeville 230kV substations. The proposed Wilton 230kV switchyard would be located approximately 2.2 miles south of Panama towards Romeville.

PID 216 was evaluated on an ERIS basis, therefore no line upgrades have been considered.

The facilities study identifies any transmission constraints resulting from the requested power transfer. The facilities study also includes cost estimates to correct any transmission constraints.

### 1.2. Scope Summary

- The overall scope of this project is summarized as follows:
  - The Customer has requested through the Independent Coordinator of Transmission (ICT) that Entergy provide the scope and estimated cost for the facilities necessary to interconnect the Customer's generation to Entergy's transmission system. These facilities include a new substation on the Panama – Romeville line that will connect the Customer's new steel mill to the transmission system. . If Customer elects to proceed with the interconnection, Entergy would design, procure and construct Wilton 230kV Switchyard which will have two (2) lines built to the Customer substation. Likewise, Customer would design, procure and construct the two transmission lines and the Customer (customer owned) substation. Wilton will be built on an existing sugarcane farm that is currently owned by Entergy, but it is assumed that this land will be sold to the Customer. Refer to attachments B, C and D for a schematic representation of the proposed work site. Entergy will make a servitude reservation for all land needed for the substation, transmission lines, distribution lines, temporary lay down yard, and the substation access road.
  - **Wilton 230kV Switchyard:** New four (4) breaker ring bus.
  - **Customer Substation:** Customer owned substation. Install metering only.
  - **Panama 230kV Substation:** Rename Romeville line panel to Wilton Line panel, and any associated drawing changes that need to be made.
  - **Romeville 230kV Substation:** Replace Line tuning equipment to coordinate with Wilton based upon new frequency assigned by relay settings. Rename Panama line panel to Wilton Line panel, and any associated drawing changes that need to be made.

- **Panama - Romeville Transmission Line:** The Panama to Romeville line will be cut into by Wilton Switchyard. This will require two (2) dead end structures to be placed in the existing T line right of way (ROW.) From these two new dead ends Entergy will extend a small section of T line to Wilton Switchyard where two (2) additional dead end structures will be placed. There are also two (2) final dead end structures that will be placed on the west side of Wilton Switchyard for the Customer to tie in their two (2) new transmission lines running to the Customer Substation.
- **Distribution Lines:** The existing lateral that runs along highway 3125 will be extended to Wilton and provide the backup station service.

### **1.3. Cost Summary**

- The estimated total project cost is \$16,015,663. This cost does not include Tax Gross Up which may apply.
- The estimate is reflective of labor and overhead rates as of 3-5-09. Any assumptions made regarding scoping and estimating are explained in the specific portions of the facility study.
- Nothing in this Facilities Study addresses the funding for the facilities identified herein. Cost allocation for the upgrades will be pursuant to Attachment T to Entergy's OATT.

### **1.4. Schedule Summary**

The customer requested in service date (ISD) is 1-1-2010. This is not an achievable date based on a project funding date of 7-1-09. The schedule described in section 6 shows an ISD of 8-2-11 if funding is available for detailed scoping by 7-1-09. This is based on a preliminary project schedule. Funding authorization must be obtained to proceed with any further work such as detailed scoping, design, procurement and construction. The schedule also assumes that all outages will be approved, all permits are obtained and all ROW/servitude agreements are in place prior to starting design.

## **2. SAFETY REQUIREMENTS**

Safety is a priority with Entergy. Safety will be designed into substations and lines. The designs will be done with the utmost safety for personnel in mind for construction, operation, and maintenance of the equipment.

All employees working directly or indirectly for Entergy shall adhere to all rules and regulations outlined within the Entergy Safety manual. Entergy requires safety to be the highest priority for all projects. All Entergy and Contract employees must follow all applicable safe work procedures.

Should the work contained within this Facility Study be approved, a detailed Safety Plan will be formulated and incorporated within the project plan.

### 3. GENERAL ASSUMPTIONS

- Upon execution of a Large Generator Interconnection Agreement (“LGIA”) between Customer and Entergy, Entergy will prepare a detailed project execution plan.
- The Transmission line ROW is known to be swamp for a significant length. ROW wetland mitigation cost will be negotiated during the permitting process.
- The substation site is not being considered as a wetland area, and no estimate is being included for mitigation.
- All permits will be attainable in a reasonable period. The Customer has agreed to obtain the section 10/404 permits from the New Orleans district of the Corps of Engineers. Entergy must be included in any discussions or correspondence between Customer and any agencies granting necessary permits described in this Facilities Study.
- Due to timing and/or funding constraints, site visits, surveys, wetland delineation, and soil borings were not performed in order to develop this facility study.
- The Customer has agreed to take the spoils from Entergy’s construction site.
- All land sale agreements will be completed prior to Entergy beginning design.
- The Customer will have no objections to any ROW servitude requested for the substation site, substation access road, lay down yard, transmission line cut in, and distribution line as described in Attachment B.
- All costs above represent good faith estimates in today’s dollars. Price escalation for work in future years has not been included.

### 4. SCOPE OF WORK

#### **4.1. Scope Details - Panama to Romeville Transmission Line - Cut in Wilton 230kV Switchyard**

**General:** Refer to attachment B for the preliminary line cut in ROW.

- The goal of this cut in is to feed the new Wilton switchyard that will serve the load at the Customer substation.
- The existing line is from Panama – Romeville. Wilton Switchyard will be cut in approximately 2.3 miles from Panama and 5 miles from Romeville. This line segment (183.7) is between structures 141 and 142. The entire line will need to be renumbered based upon the fact that all 9 line segment decimal numbers are currently in use.
- Entergy will install four (4) steel self-supporting dead-ends with baseplated foundations.
- No future expansion or upgrades to the transmission line are planned. The existing ampacity of line 183 is adequate to serve the Customer.
- The existing line is comprised of 1122 ACAR. The new cut in line will be constructed of 1780 ACSR conductor and 7 No. 7.

- Surveying, soil borings, and soil resistivity tests need to be completed during detailed scoping.

### **Right of Way**

- No site/route selection work has been completed. The Customer has requested that Entergy use the land shown in the northeast corner of the sugarcane field at 30 06 04N: 90 50 32.3W to build Wilton 230kV switchyard. Detailed surveying will be required to verify that there are no underground facilities in that location.
- The ROW will be approximately 150' wide by 500 – 600' long. The approximate acreage is 1.27 acres. Entergy is the current property owner, but may be selling this property to the Customer. Entergy will make a servitude reservation at no cost in the purchase agreement for this land.
- Refer to attachment B showing Queen of Angels road and its proposed extension. The existing road will be extended to Wilton switchyard for access. This existing roadway is not suitable for continuous heavy equipment use. It will need to be rebuilt to Entergy standards.
- The ROW for the backup station service distribution line will be run parallel to the access road servitude.
- The Louisiana Department of Wildlife and Fisheries has requested the use of the site to access their property and to conduct Search and Rescue Missions for the swamp area west of Highway 61. A small amount of additional servitude running along side of the substation property will need to be reserved for this.

### **Right of Way Clearing**

- The Transmission line ROW will require heavy vegetation removal in a known wetland. A contractor will be hired by Entergy to develop a Storm Water Pollution Prevention Plan (SWPPP). The contractor will also be responsible for monitoring the site while under construction.

### **Permitting and Wetland Mitigation**

The following permits will be required:

- Federal Permits – Section 10/404 from the New Orleans District of the Corps of Engineers (Supplied by Customer)
- State Permits – Coastal Use Permit from the Louisiana Department of Natural Resources, Coastal Management Division (LDNR/CMD)
- Water Certification and SWPPP from the Louisiana Department of Environmental Quality (LDEQ)
- Highway permit from Louisiana Department of Transportation and Development (LDTOD)
- Local Permits – St James Parish for clearance for drainage impacts

- All of the forested area is wetland and any impacts to the lands will be required to be mitigated. The total transmission line area to be mitigated is 1.27 acres.

### **Structures and Foundations**

- Four (4) Steel Self-supporting Dead-Ends, with baseplated caisson foundations.

### **Conductor**

- 1780 MCM ACSR "Chukar", 13,695 Lbs

### **Insulators**

- Thirty-six (36) 230kV insulator assemblies.

### **Shield Wire**

- 2,200 feet of 7 No.7

## **4.2. Scope Details - Wilton to Customer #1 & #2 Transmission Line - Cut in Wilton 230kV Switchyard**

**General:** Refer to attachment D for the substation electrical arrangement. Two (2) dead end structures will be built on the west side of Wilton for The Customer to tie their two (2) transmission line to. These lines will be referred to as Customer #1 and Customer #2. Entergy will build the line segment from Wilton to these dead end structures.

- The goal of this cut in is to feed the new Wilton switchyard that will serve the load at Customer substation.
- Entergy will install two (2) steel self-supporting dead-ends with baseplated foundations.
- The line segments will be constructed of 1780 ACSR conductor with Optical Ground Wire (OPGW) shield wire.
- Surveying, soil borings, and soil resistivity tests need to be completed during detailed scoping.
- The two (2) west side dead ends are assumed not to be located in wetlands.



**Right of Way**

- No site/route selection work has been completed. The Customer has requested that Entergy use the land shown in the northeast corner of the sugarcane field at 30 06 04N: 90 50 32.3W to build Wilton 230kV switchyard. Detailed surveying will be required to verify that there are no underground facilities in that location.
- The two (2) dead end structures on the Customer lines will be placed on the substation servitude.

**Right of Way Clearing**

- The ROW will require light grubbing. A contractor will be hired by Entergy to develop a SWPPP. The contractor will also be responsible for monitoring the site while under construction.

**Permitting and Wetland Mitigation**

The following permits will be required:

- Federal Permits – Section 10/404 from the New Orleans District of the Corps of Engineers (Supplied by Customer)
- State Permits – Coastal Use Permit from the Louisiana Department of Natural Resources, Coastal Management Division (LDNR/CMD)
- Water Certification and SWPPP from the Louisiana Department of Environmental Quality (LDEQ)
- Highway permit from Louisiana Department of Transportation and Development (LDTOD)
- Local Permits – St James Parish for clearance for drainage impacts
- The two (2) Customer dead end structures are assumed to be in a non wetland area.

**Structures and Foundations**

- Two (2) Steel Self-supporting Dead-Ends, with baseplated caisson foundations.

**Conductor**

- 1780 MCM ACSR “Chukar”, 3,424 Lbs

**Insulators**

- Twenty-four (24) 230kV insulator assemblies.

**Shield Wire**

- OPGW 0.528", 550 ft
- Four (4) splice boxes, two (2) inside Wilton on the sub Dead-Ends, and two (2), one (1) each, on the transmission Dead-Ends, first span outside Wilton substation on the Customer lines

**4.3. Scope Details - Wilton 230kV Switchyard - Build new 4 breaker ring bus****General**

- The one line diagram is illustrated in attachment C and the electrical arrangement is illustrated in attachment D.
- The layout of this substation will be very similar to the Panama Switching Station near the Sunshine Bridge.
- The Wilton 230 kV switchyard will be a four-element ring bus, expandable to six elements built on a green field site. The existing Panama – Romeville 230 kV line will be cut into this station on alternate nodes (in different bays). The two remaining nodes will be used to serve the Customer at 230 kV. The point of delivery will be the first pole outside of Wilton switchyard. While switch racks will be installed for future switches, the breaker disconnect switches will not be installed for the fifth and sixth breakers initially.
- The Romeville line and the Panama line will terminate on 60-foot type "B" deadend towers in different bays from the north. The two Customer lines will terminate on 10AS deadend towers and exit the station toward the west. This will avoid having to route transmission lines over or under each other in order to achieve the alternating node arrangement.
- A breaker-and-a-half scheme layout was considered but not accepted due to cost and it would prove more onerous to install one of the customer's lines beneath Entergy's transmission lines to achieve the alternating element feature that this layout affords.
- This layout is expandable to six elements and will accommodate two more incoming lines either from Customer or Entergy, by adding disconnect switches, breakers, and dead end towers.
- A soil boring will be done and a geotechnical investigation will be completed prior to the start of design to ensure proper foundation design. A soil resistivity study will also be done for ground grid design.
- According to information provided, the substation site is not in wetlands, however the incoming transmission line will traverse wetlands. An environmental impact will be done for that portion of the project.
- There are no planned deviations from the normal design package organization. Design will be done in-house.
- A temporary servitude will be required for a lay down yard on the West side of the Wilton switchyard site. The lay down yard will encompass 2 acres as shown in attachment B.

**Site**

- The proposed site will be 366' by 348'. It will be constructed on an existing sugar cane field that will be accessed off of Hwy 3125. There is an existing roadway that will be used to access the substation called Queen of Angels Rd. The existing roadway will need to be upgraded to meet Entergy's access roadway standard and it will need to be extended about 4000 feet to the substation. This roadway will be a new 20' wide limestone roadway to the entrance of the substation. The sub-grade elevation of the roadway will be about 6" above existing grade with geotextile fabric and 12" of crushed limestone on top of it.
- A topographic and boundary survey will be needed in order to properly design the site. However, this information will not be completed and processed prior to completing the facility study. Therefore, certain assumptions will be made in order to complete the scope and estimate. Two concrete monuments will need to be set in order to provide control for design and construction.
- A soil boring and resistivity study will be needed in order to adequately design the foundations. These borings have not been taken. We will be assuming pile supported foundations for all structures, breakers, etc. The following information will be needed in the soil report:

The soil borings shall include, but not limited to, site development and grading, excavation and trenching, shallow and deep foundation recommendations, soil resistivity and boring logs. More detail information will be provided to the soil boring contractor to ensure we receive the proper information in the soil report.

- All appropriate environmental assessments, permits and licenses will need to be obtained prior to construction. It is assumed that the proposed substation location is not wetlands.
- The site will be approximately 2.93 acres. A SWPPP will be needed. This plan will be contracted out to a qualified contractor. The project manager shall ensure this work is completed prior to the start of the bid process. This will allow the contractors bidding on the work to understand and plan for our expectations.
- The elevation of the site is unknown at this time. It will be assumed that the site will need to be stripped 12" below existing grade and the site will need to be elevated about 4 feet above existing grade. The Base Flood Elevation (BFE) in this area is unknown at this time. We will assume that the additional 4 feet of fill will bring the site to at least the BFE. Once additional information is obtained on the BFE the final grade elevation can be revised.
- Due to the lack of soil boring and survey information the following quantities are based on assumptions. The drainage in the station will be subsurface drainage and will drain towards an open ditch along the north side of the yard. We will elevate the site approximately 4 feet above the existing grade to bring the site to the proper grade. It is assumed that light grubbing will be needed and the vegetation will need to be stripped from the top surface. In order to provide enough area to taper the final grade of substation back to the existing grade, additional land will be needed. This has been accounted for in the area

stated above. Also, we will have a large amount of spoil to remove during the site and foundation construction. It is assumed that spoil removed during site and foundation installation can not be used as structural fill and spread across the site. The Customer has agreed to allow Entergy to place the spoil on their property, and that they will handle any grading/stabilizing that needs to be done to it. Entergy may include this in their SWPPP while construction is taking place, but will turn over that responsibility to The Customer once all of the site work is completed. Entergy will still perform the phase 2 environmental soil testing. This sampling will need to take place before construction begins to ensure that the proposed site is not contaminated. It is assumed that there will be no need for contamination mitigation.

- 2 EA Topographic and boundary survey
- 4 EA Soil borings (for design purposes)
- 1 EA Soil resistivity test
- 1 EA Environmental impact study, permits and licenses
- 1 EA SWPPP
- 1 EA Soil Testing (for phase 2 environmental testing)
- 7,094 CYD Stripping 12" of top soil
- 2.93 ACRE Light grubbing to consist of cutting sugar cane and the removal of sugarcane debris
- 35,470 CYD Structural fill (Raise site 4 feet above existing elevation)
- 8 EA 3'x3' Catch Basins
- 1,050 FT 18" diameter concrete culverts
- 150 FT 12" diameter culvert to be placed in ditches that cross under the access road to the Substation.
- 2.93 ACRE Soil Sterilization
- 1,120 FT Substation access road
- 6,000 FT Access driveway into the substation
- 6,222 CYD 12" Stripping of top soil along proposed roadway
- 9,333 CYD 12" of fill along proposed roadway
- 7,094 TON Limestone surface
- 3,684 TON Stabilize Soil (#125 Man Size Rip Rap)
- 1,240 FT 7' fence with 1' of barb wire with up to eight isolation panels

### Foundations

The foundations for this substation will be pile-supported with concrete caps. The estimated number and type of piles are 246 (each) 50' "Class B" wood piles.

- Install six (6) 230 kV Gas Circuit Breakers Foundations, two with provisions for a lally column to be installed initially.
- Install eight (8) 230 kV Low Switch Support Foundations
- Install six (6) 230 kV High Switch Support Foundations
- Install two (2) 230 kV A-Frame Dead End Foundations

- Install two (2) 230 kV 10AS Dead End Foundations
- Install sixteen (16) 230 kV Single Phase Low Bus Support Foundations
- Install sixteen (16) 230 kV Single Phase High Bus Support Foundations (two high bus supports will be installed on a “future” breaker foundation)
- Install one (1) SSVT Support Foundation
- Install fourteen (14) 230 kV CCVT Support Foundations
- Install twelve (12) 230 kV Line Arrester Support Foundations
- Install one (1) Control House Foundations
- Install 528 feet of Poured-In-Place Cable Trough
- Install two (2) 125' Static Mast Foundations
- Install one (1) Demarcation Box Foundation
- Install twelve (12) Yard Light Foundations
- Install six (6) 230 kV CT Support Foundations
- Install 528 feet of poured-in-place trough (as shown in attachment D).
- Install 3000 feet of two-inch schedule 40 PVC conduit to all equipment as required per Entergy specifications
- Install 5700 feet of #4/0 ground wire for the main grid plus 1200 feet of 19#9 copperweld for above ground connections to equipment. This assumption is based on installing approximately forty foot square meshes and a 20% allowance for equipment and fence connections.

**Electrical:** Wilton Substation will be built as a ring bus, consisting of two north-south bays and two east-west bays. The Panama and Romeville lines will terminate in the north-south bays and the bus elevation will be twenty feet above concrete. The two lines to The Customer will terminate in the east-west bays and the bus elevation will be thirty feet above concrete transitioning to twenty feet above concrete between the main ring and the Customer line disconnect switches.

- Each north-south bay will consist of the following equipment (north to south):
  - Two (2) short lally columns
  - Four (4) 230 kV 3000 A vertical break switches, one (1) with a ground switch
  - One (1) 60-foot type “B” A-frame dead end tower
  - Three (3) 230 kV CCVTs beneath the line terminal
  - Three (3) CCVT pedestals
  - Three (3) 192 kV, 152 kV MCOV station class arresters beneath the line terminal
  - Three (3) arrester pedestals
  - One lot of four-inch schedule 80 T6-6063 aluminum tubing with damper cable
  - One lot of (2) 1780 kcmil Chukar ACSR for flexible connectors to breakers.
  - One lot of (1) 954 kcmil Magnolia AAC for flexible connectors to CCVTs and arresters
  - One lot of grounding material per Entergy standards

- All lally columns are counted as part of the east-west below.
- One (2) 230 kV trap, suspended in “A” frame with appropriate jumpers.
- Each east-west bay will consist of the following equipment (east to west):
  - One (1) 10AS tower (at west end)
  - One 230 kV 2000 A switch with a ground switch, motor operated
  - Three (3) 21-foot switch stands, two w/ insulator supports (no switches, future use)
  - Nine (9) tall lally columns, (three in place of a future breaker)
  - Eight (8) short lally columns
  - Three (3) 230 kV CCVT’s beneath the line terminal
  - Three (3) CCVT pedestals, on the Customer terminal
  - Three (3) 192 kV, 152 kV MCOV station class arresters beneath the line terminals
  - Three (3) arrester pedestals
  - Three (3) 230 kV metering CTs, on the Customer terminal. These CTs will require an in-line 35 kV insulator to route current through the CT.
  - Three (3) CT pedestals
  - One (1) junction box for fiber termination, mounted on the 10AS tower leg
  - One (1) lot of four-inch schedule 80 aluminum tubing
  - One (1) lot of (1) 954 kcmil Magnolia AAC for flexible conductors.
- The east ends of the east west bays will be constructed in a staggered manner such that it can be expanded in the future to form two additional line terminals if it becomes necessary. This is illustrated in the Electrical Arrangement in attachment D. No structures required for future expansion will be installed on these nodes at this time.
- The substation will be shielded by the shield wires of the incoming Panama and Romeville lines and by two 125-foot shield mast on the opposite side of the south bus.
- All structures and equipment will be grounded per Entergy specifications.
- All above-grade conduit will be flexible 2” PVC to junction and control boxes, except to CCVTs and CTs, which will be 1-1/2” flexible PVC.
- There will be one (1) 100 kVA station service voltage transformer (SSVT) mounted on a pedestal beneath the Customer #1 line terminal to provide primary station service. It will be placed on B phase to match the backup distribution station service source.
- The backup station service will come from a single-phase 8 kV lateral extended from the highway. It will be an overhead lateral extended to an overhead transformer outside of the fence and extend 120/240 V single phase service underground to the substation. A 200 A fused disconnect switch will be mounted on the pole outside of the fence.
- The estimate allows for twelve (12) 400 W free standing single yard lights around the perimeter of the yard.

- There will be one telephone de-mark box outside of the fence at the gate.
- A control house will be installed, measuring 20 feet by 42 feet with one battery room.

### **Relay**

- The Customer lines of the ring bus will have motor operated line switches on them for a visual disconnect. Customer will design, procure and construct the two lines from Wilton switchyard to Customer substation, which is located about a mile away. These lines will be constructed with Entergy standard OPGW installed on them for relay and metering communications. Coordination with Customer will be required to determine what information is required.
- The customer will also have generation installed at their substation, but currently have no agreement to sell power to Entergy. High side metering will be installed on the two lines going to Customer. The metering instruments and meter panels will be located at Wilton substation.
- Wilton switchyard will cut into the existing Panama to Romeville line creating the new Wilton-Panama and Wilton-Romeville lines. The existing relay communication between Panama and Romeville is unblocking carrier. The relay communication will remain unblocking when this line cuts into the new Wilton substation. The carrier frequency used on the Panama to Romeville line will now be used on the new Romeville to Wilton line. Romeville is a customer owned substation and it is our intent to limit the relay changes at this substation. A new carrier frequency must be derived by the settings group between Panama and Wilton Substations.
- A new control house will be built to accommodate the relay equipment. Coordination with the telecom group will be required to accommodate the communication needs at the substation.

### **Relay work**

- Purchase, design and install two (2) Entergy standard line/breaker panels with unblocking carrier, SEL 421 primary, SEL 311C backup relays on the Romeville and Panama Line panels. The existing carrier frequency will be used on the Romeville to Wilton line and a new frequency will be established on the Panama to Romeville line
- Purchase, design and install two (2) Entergy standard line/breaker panel with line differential, SEL 421 primary 1 and SEL 311L primary 2. Customer must purchase and install these identical panels at their substation
- Purchase and install a two (2) MOS control panel
- Purchase and install two (2) 2000A line traps
- Purchase and install two (2) line tuners
- Purchase and install (12) metering accuracy 230kV CCVT's to be used for line relaying and metering, (3) Romeville line, (3) Panama line, (3) for each Customer line.

- Purchase and install (2) metering accuracy 230kV CCVT's to be used for hot line indication on each Customer line. These CCVT's will be the same burden and accuracy as the relaying/metering CCVT's so that they are not accidentally installed in the wrong positions during construction.
- Purchase and install four (4) Entergy standard 3 phase High Voltage PT junction boxes for metering and relaying use.
- Purchase, design and install two (2) single phase line CCVT junction boxes for the Customer line indication.
- Purchase and install two (2) patch panels for fiber connections. Coordinate with telecom to get these panels ordered

### **New Control House Miscellaneous Equipment**

- Purchase and install a 130 volts DC battery set with rack. Size batteries by referencing Entergy Standard PM0203 Rev. 00 "Lead-Acid Storage Battery Sizing Guideline".
- Purchase, and install a DC battery charger. Battery charger should be sized by referencing Entergy Standard PM0302, Rev. 00 "Battery Charger Sizing Guideline".
- Purchase and install a DC battery switching panel
- Purchase, design and install a stand-alone AC panel.
- Purchase, design and install a stand-alone DC panel.
- Purchase and install an indoor AC transfer switch
- Purchase and install GE Harris D20 RTU, LP&L design
- Purchase, design and install all communications equipment to line, breaker and meter panels for metering data
- Install SSVT for primary station service, second source may come from local feeder
- Install AC transfer switch
- Purchase and install outdoor telephone demarcation box
- Purchase and install indoor telephone box
- Purchase and install Teletone Gauntlet (SLSS)
- Purchase and install a SEL 2032
- Purchase and install a SEL 2407 for relay time sync.
- Purchase and Install a Static Inverter (to be mounted in the RTU)
- Complete design and installation will be required for the electrical power supplies, controls, monitoring alarms, analog data and communications for the following devices, as applicable:
  - (4) – Line/Breaker Panels
  - (1) – 2 Transformer meter panel
  - (4) – High Voltage Breakers

### **Relay Settings**

Develop settings for the following relays:



Schweitzer Type SEL-421 Distance relay  
Schweitzer Type SEL-311L Line Differential  
Schweitzer Type SEL-311C Distance relay

### **Communications and SCADA**

- A GE Harris D20 RTU will be installed and require a configuration package. The Customer line metering data will be brought into the RTU via DNP 3.0 level 2 protocol from the meter panel
- Purchase and install two patch panels for fiber connections. Coordinate with telecom to get these panels ordered. 19" racks will also need to be coordinated.
- Coordinate with the Communications Group to provide two telephone circuits. One circuit will be a 2-wire voice grade type for the house phone. The other circuit will be a 4-wire data grade type for the RTU

### **Metering**

- Purchase, design and install one (1) 2 transformer meter panel. Designer should determine what telemetering information would be needed by the customer. All communication between the Customer and Entergy can be accomplished over the new fiber optics connections
- Purchase, design and install three (3) free standing extended range metering (0.15sB1.8) accuracy CT's on each Customer line (total 6). CT ratio will be determined by relay designer.
- Purchase, design, and install two metering (2) CT junction boxes.

#### **4.4. Scope Details – Customer Substation (Customer Owned) – Install metering**

##### ***General***

- Customer will design, procure and construct Customer substation. Customer plans to build two (2) 159MW steam turbine generators at the steel mill. The connection of the generator must adhere to the generator interconnection customer requirements standard PM3901, revision 7.
- Customer substation will connect to the Entergy transmission system via two (2) 230kV lines to Wilton 230kV switchyard. As mentioned in previous sections of this document, Customer will have to mirror the Entergy standard designs for protection. Customer must also install a 230kV interrupting device at Customer substation to protect the Customer – Wilton line. Customer must be able to disconnect themselves from the Entergy transmission system for a fault on their side of these breakers.
- Customer substation will be customer owned. Everything in the substation may be constructed to Customer's preference with the exception of the line relaying.
- Customer will provide for all wetland permitting including all of Entergy's substation, distribution, and transmission line work. Entergy will provide its own SWPPP. A wetland delineation study will need to be performed prior to any construction activities beginning. Due to the compressed schedule, no

surveying, soil boring, wetland delineation, or environmental testing has been performed.

**Site**

- Customer will be responsible for the site work at Customer Substation.

**Foundations**

- Customer will be responsible for the foundation work at Customer Substation.

**Electrical**

- Customer will be responsible for the electrical work at Customer Substation.

**Relay**

- Customer will be required to match Entergy standard designs using the latest version of the SEL 421/SEL 311L line protection panel. Entergy will provide Customer with a copy of the latest design standard.

**Relay Settings**

- Customer will need to work with the Entergy settings group to assure that the relay settings coordinate.

**Communications and SCADA**

- 4W to FO equipment manufactured by RLH will need to be installed. This will be procured by Entergy. Customer may choose to install this in their substation if desired.

**Metering**

- Per the Generator Interconnection Customer Requirements document PM3901, Revision 07, Customer will be required to install bidirectional metering at the high side bushings of the generator step up transformer. This will require that metering accuracy instrument transformers be installed as per the Transmission Metering Application Standard document MI0301, Revision 01. A single meter will need to be installed on each generator step up transformer. Entergy will design, procure and install a double meter panel at Customer substation. This data will need to be delivered back to Entergy's SOC via the fiber optic link between Wilton 230kV Switchyard and Customer substation. The installation of RLH RS485 (4W) to fiber optic equipment will need to be installed at Wilton and Customer. The RLH equipment will be connected to the RTU at Wilton 230kV switchyard.

#### **4.5. Scope Details – Panama Substation – Review settings/replace carrier equipment**

##### ***General***

- The Panama – Romeville line will become the Panama – Wilton line once Wilton 230kV switchyard is cut in.
- Since there is no equipment to install at this station no WO will be created. The charges for this will be included under the Wilton switchyard WO.

##### ***Site***

- N/A.

##### ***Foundations***

- N/A.

##### ***Electrical***

- The Romeville line trap will need to be taken down to have it's tuning pack retuned. The trap will then be reinstalled.

##### ***Relay***

- The Panama to Romeville carrier frequency will change to a new frequency inside of the range of the existing equipment when Wilton is cut in. The existing tuning pack, tuner, and carrier set will be re-tuned and re-used.

##### ***Relay Settings***

- The relay settings will need to be reviewed at Panama, Sunshine, Dutch Bayou, and Conway.
- All existing relay firmware will be upgraded to latest version. This includes all of the Panama relays as well as the relays on the lines looking to Panama. The Conway line and the Dutch Bayou line have already been upgraded as part of AS2 and AS3. Only the Sunshine line will need to be upgraded. No changing of any I/O points is being done.

##### ***Communications and SCADA***

- N/A.

##### ***Metering***

- N/A.

#### **4.6. Scope Details – Romeville Substation – Review settings/replace carrier equipment**

**General**

- The Romeville - Panama line will become the Romeville – Wilton line once Wilton 230kV switchyard is cut in.
- Romeville is a customer owned station, and all work will need to be coordinated through major accounts.

**Site**

- N/A.

**Foundations**

- N/A.

**Electrical**

- The Panama line trap will need to be taken down to be replaced. A new trap will then be installed.

**Relay**

- The Romeville to Panama carrier frequency will change to a new frequency outside of the range of the existing equipment when Wilton is cut in. The existing trap will have to be replaced. The existing tuner and carrier set are within range.

**Relay Settings**

- The relay settings will need to be reviewed at Romeville and at Convent.
- All existing relay firmware will be upgraded to latest version. The relays at Romeville looking to Panama are the only SEL relays.
- The relays at Convent looking to Romeville and Romeville looking to Convent are electromechanical. These relays will just have their settings reviewed.

**Communications and SCADA**

- N/A.

**Metering**

- N/A.

**4.7. Scope Details – Willow Glen 138kV Substation – Replace breakers****General**

- During System Impact, Study (SIS) sixteen 138 kV breakers at Willow Glen station were identified as under rated due to proposed generation of PID-216. During the Facility Study, the short circuit analysis was repeated using latest available Short Circuit models. The analysis also considered current SIS queue

and updated plant data submitted by the customer. Results of the revised short circuit did not indicate any under rated breakers due to the addition of PID-216 generators and associated facilities.

**5. COST**

The ICT has reviewed and determined the classification for each required upgrade as either a Base Plan Upgrade or a Supplemental Upgrade. For more information on cost responsibility for Base Plan and Supplemental Upgrades, see Attachment T to Entergy’s OATT.

The costs shown in the table include overheads and AFUDC, but do not include tax gross up. Entergy incurs a tax liability proportional to the amount of customer contributions. In addition to proposed project costs, the customer may be charged a “Tax gross-up” at applicable rates. Rates are subject to change. Current rate for ELL is 28.41% and is not included in any of the estimates.

The costs associated with prior PID studies and without prior PID studies is identical.

**Projected Costs**

	TOTAL			
Wilton 230kV switchyard	\$13,836,120			
Customer substation metering	\$88,962			
Panama 230kV substation	\$168,553			
Romeville 230kV substation	\$178,352			
Panama to Romeville cut in	\$1,743,676			
Total	\$16,015,663			

## 6. UPGRADE CLASSIFICATION

The ICT has reviewed the projects identified and have determined that all projects are classified as Supplemental Upgrades. For more information on cost responsibility for Base Plan and Supplemental Upgrades, see Attachment T to Entergy’s OATT.

	Base Plan	Supplemental
Wilton 230kV Switchyard	N/A	\$13,836,120
Customer Substation Metering	N/A	\$88,962
Panama 230kV Substation	N/A	\$168,553
Romeville 230kV Substation	N/A	\$178,352
Panama to Romeville Cut-In	N/A	\$1,743,676
<b>TOTAL</b>	<b>N/A</b>	<b>\$16,015,663</b>

## 7. SCHEDULE

A detailed schedule will be prepared subsequent to execution of an LGIA between Customer and Entergy. Based on the Task duration schedules listed below, the overall project in-service date is projected to be 8-2-11. The following are rough durations:

Task Name	Proposed Start Date	Proposed ISD
Build Wilton 230kV Sw. Yd. & Customer T line dead ends	7-23-09	8-2-11
Panama – Romeville cut in	7-23-09	8-2-11
Panama 230kV substation	2-9-11	8-2-11
Romeville 230kV sub.	2-9-11	8-2-11
Customer sub metering	2-9-10	6-30-10

### Notes to Duration Schedules:

- All construction work requiring outages will be performed during acceptable periods of system load flow, which most often is the off-peak load season. Line outages will be discussed with the SOC and TOC and the assumption is made

that line outages will be executed as planned. However, last minute denial of outages by the SOC/TOC along with resulting schedule delay is possible.

- Substation construction will be coordinated with the transmission line outages when possible.
- Construction resources are assumed available when required.
- Transmission Line and Substation projects will begin subsequent to Definition phase Project Execution Plan.
- This schedule does not account for adverse weather conditions.
- Schedule durations are high level estimates at this time. A detailed schedule will be prepared upon project approval.



### 8. RISK ASSESSMENT

The following risk events may impact cost and/or schedule during execution of the project:

- Permits not being obtained will result in construction delays. This is addressed by scheduling enough time during detailed scoping to have the permits acquired by the time design begins.
- ROW agreements not signed by the funding approval date will result in schedule delays.
- Land purchase agreements are not executed by the funding approval date will result in schedule delays.
- The substation yard, temporary lay down yard, access road, and transmission dead ends toward Customer are assumed to be in a non wetland area. This has been reviewed by Customer and Entergy, and the site is believed to be non-wetland based on initial data gathered. Wetland mitigation costs will arise if this is determined to be wetlands during the delineation study.
- Underground pipelines may run through the proposed site. The site will need to be moved to a location not crossing a buried pipeline. This should have no serious impact to project costs if the site stays in a non wetland area, but could cause schedule delays.
- BFE is determined to be higher than assumed. This will result in higher fill costs to bring the substation to the current BFE. A detailed survey will be performed during detailed scoping to attain the BFE.

Risk	Comment	Impact
Underground site issues (Pipelines, wells, containments)	Unknown underground factors will add mitigation costs and may impact schedule	***
Substation Site will require substantial site work	Site may be in flood plain, wetlands, Soil Contamination	***
Material transportation could affect cost/schedule	Large transformers(other equipment) may require special transport to substation site	**
Material costs steel & Equipment	Rising steel, copper, fuel and other market conditions could greatly affect estimated cost.	****
Lay-down areas	Cost to be determined during detailed scoping.	*
Storm-water plan implementation	Best guess on SWPPP creation, implementation and monitoring can vary greatly dependant on outcome of environmental study.	**

Weather & Equipment Lead Times (Transformer, Poles)	Unexpected delays on material lead times, unusually inclement weather will impact schedule but might impact AFUDC costs as well.	**
Wetland mitigation	Undetermined until environmental analysis is complete.	***
Outages may not be available	Preliminary schedule only considers general outage constraints. Specific project schedule may be delayed by days, weeks or months dependant on system conditions. Delays of months = increased project costs.	**
Scope based on design assumptions which may change	Varied impact on cost and schedule.	***

\*-low impact to cost, \*\* - moderate impact to cost, \*\*\*- high impact to cost, \*\*\*\* - very high impact to cost.

## 9. CONFIRMED RESERVATIONS

OASIS#		PSE	MW	Begin	End
140912		NRG Power Marketing	103	01/01/98	01/01/08
250778	(delisting)	Entergy Services, Inc. (EMO)	1	07/02/98	07/01/11
392740		Ameren Energy Inc.	165	04/12/99	01/01/09
569011		Entergy Services, Inc. (EMO)	242	03/01/00	01/01/14
731017		South Mississippi Electric Power Assoc.	75	01/01/01	06/01/09
759196		Entergy Services (EMO)	143	01/01/01	01/01/21
759294		East Texas Electric Cooperative	31	01/01/01	01/01/18
810207		South Mississippi Electric Power Assoc.	300	01/01/02	01/01/20
810234		South Mississippi Electric Power Assoc.	300	01/01/02	01/01/20
850239		Municipal Energy Agency of Mississippi	19	05/01/01	01/01/10
850304		Municipal Energy Agency of Mississippi	13	05/01/01	06/01/10
851493		Municipal Energy Agency of Mississippi	13	05/01/01	06/01/10
1019492		South Mississippi Electric Power Assoc.	51	01/01/02	01/01/18
1024194		City Water & Light, Jonesboro	83	01/01/03	01/01/10
1024198		City Water & Light, Jonesboro	168	01/01/03	01/01/10
1035455		South Mississippi Electric Power Assoc.	280	01/01/03	01/01/08
1036858		South Mississippi Electric Power Assoc.	280	01/01/08	01/01/21
1084342		East Texas Electric Cooperative	50	01/01/05	01/01/09
1084344		East Texas Electric Cooperative	50	01/01/05	01/01/09
1084345		East Texas Electric Cooperative	75	01/01/05	01/01/09
1096986		Tennessee Valley Auth BPT	73	09/01/03	09/01/13
1099991		City Water & Light, Jonesboro	83	01/01/10	01/01/16
1099997		City Water & Light, Jonesboro	168	01/01/10	01/01/16
1105665		Entergy Services, Inc. (EMO)	185	02/01/03	02/01/16
1105666		Entergy Services, Inc. (EMO)	91	02/01/03	02/01/27

OASIS#		PSE	MW	Begin	End
1105668		Entergy Services, Inc. (EMO)	206	02/01/03	02/01/27
1126821		Entergy Services, Inc. (EMO)	101	05/01/04	05/01/29
1139973		South Mississippi Electric Power Assoc.	95	05/01/03	12/30/28
1139975		South Mississippi Electric Power Assoc.	95	05/01/04	12/31/29
1139977		South Mississippi Electric Power Assoc.	95	05/01/05	12/31/29
1139982		South Mississippi Electric Power Assoc.	130	01/01/03	01/01/20
1151106		Entergy Services, Inc. (EMO)	20	06/01/10	06/01/29
1161925		Cleco Power LLC (Gen)	12	08/01/03	01/01/10
1161927		Cleco Power LLC (Gen)	7	08/01/03	01/01/10
1161928		Cleco Power LLC (Gen)	7	08/01/03	01/01/10
1168061		Entergy Services, Inc. (EMO)	80	08/01/04	02/01/28
1168408		Entergy Services, Inc. (EMO)	247	08/01/04	02/01/28
1192287	(1140407)	Entergy Services, Inc. (EMO)	725	01/01/05	09/01/33
1202470		NRG Power Marketing	91	04/01/04	04/01/09
1210356		Entergy Services, Inc. (EMO)	290	07/01/05	07/01/07
1210357		Entergy Services, Inc. (EMO)	100	07/01/05	07/01/07
1272606	(renewal)	Entergy Services, Inc. (EMO)	150	05/01/05	05/01/07
1286481		Merrill Lynch Commodities	11	01/01/00	01/01/10
1289686	(delisting)	Entergy Services Inc. (EMO)	1	06/01/07	06/01/30
1294132		Entergy Services, Inc. (EMO)	526	01/01/06	01/01/35
1309874		East Texas Electric Cooperative	75	01/01/09	01/01/17
1309875		East Texas Electric Cooperative	50	01/01/09	01/01/17
1309876		East Texas Electric Cooperative	50	01/01/09	01/01/17
1310448	(1284799) (delisting)	Entergy Services Inc. (EMO)	1	06/01/07	06/01/30
1321868	(renewal)	NRG Power Marketing	320	01/01/06	01/01/07
1328125		CLECO Power Marketing	35	01/01/06	01/01/11
1340017		Plum Point Energy Associates	40	03/01/10	03/01/40
1340019		Plum Point Energy Associates	35	03/01/10	03/01/40
1340028		Plum Point Energy Associates	50	03/01/10	03/01/30
1340029		Plum Point Energy Associates	50	03/01/10	03/01/30

OASIS#		PSE	MW	Begin	End
1340665		Entergy Services, Inc. (EMO)	200	01/01/06	01/01/09
1340673		Entergy Services, Inc. (EMO)	50	06/01/07	06/01/08
1340674		Entergy Services, Inc. (EMO)	50	06/01/08	06/01/09
1346435		Entergy Services, Inc. (EMO)	100	06/01/07	06/01/08
1346437		Entergy Services, Inc. (EMO)	100	06/01/08	06/01/09
1346440		Entergy Services, Inc. (EMO)	200	06/01/07	06/01/08
1346441		Entergy Services, Inc. (EMO)	200	06/01/08	06/01/09
1346444		Entergy Services, Inc. (EMO)	179	02/01/07	02/01/08
1348508		CLECO Power Marketing	10	01/01/06	01/01/10
1352704	(1340032)	Plum Point Energy Associates	5	03/01/10	03/01/40
1353140		Constellation Energy Group	10	01/01/06	01/01/07
1353141		Constellation Energy Group	5	01/01/06	01/01/07
1353344	(renewal)	Merrill Lynch Commodities	85	10/01/05	10/01/06
1353393	(renewal)	Merrill Lynch Commodities	4	11/01/05	11/01/06
1356328		Municipal Energy Agency of Mississippi	40	06/01/10	06/01/40
1366979		MidAmerican Energy	50	01/01/06	01/01/07
1366980		MidAmerican Energy	50	01/01/06	01/01/07
1366981		MidAmerican Energy	50	01/01/06	01/01/07
1366982		MidAmerican Energy	50	01/01/06	01/01/07
1371416		NRG Power Marketing	100	03/01/06	03/01/07
1371481	(delisting)	Entergy Services, Inc. (EMO)	1	01/01/06	01/01/07
1372645		Morgan Stanley Commodities Group	102	01/01/07	01/01/08
1372646		Morgan Stanley Commodities Group	102	01/01/07	01/01/08
1373112		Louisiana Energy & Power Authority	61	01/01/06	01/01/07
1373643		City of Conway	25	03/01/10	03/01/40
1373714		East Texas Electric Cooperative	63	01/01/10	01/01/30
1375001		NRG Power Marketing	3	07/01/06	07/01/07
1375299		Louisiana Generating LLC	11	03/01/06	03/01/11
1375300		Louisiana Generating LLC	8	03/01/06	03/01/11
1375301		Louisiana Generating LLC	5	03/01/06	03/01/11
1375559		CLECO Power LLC	675	12/01/06	12/01/16
1376208		Louisiana Energy & Power Authority	6	02/01/06	02/01/07
1380484		Osceola Light & Power	9	09/01/09	09/01/39
1381068		Plum Point Energy Associates	100	06/01/10	06/01/11

OASIS#		PSE	MW	Begin	End
1381247		Constellation Energy Group	140	01/01/06	01/01/07
1381248	(1349801)	City of West Memphis	70	01/01/06	01/01/07
1381312		Constellation Energy Group	240	01/01/06	07/01/07
1381317		Constellation Energy Group	70	01/01/06	01/01/07
1381318		Constellation Energy Commodities Group	70	01/01/06	01/01/07
1381322		Constellation Energy Commodities Group	6	01/01/06	06/01/07
1381398		Constellation Energy Group	34	01/01/06	01/01/36
1381400		Constellation Energy Group	34	01/01/06	01/01/36
1381404		Constellation Energy Group	17	01/01/06	01/01/36
1381406	(1325187)	Constellation Energy Group	17	01/01/06	01/01/36
1382543		Mid American Energy Company	100	03/01/06	03/01/07
1382544		Mid American Energy Company	100	03/01/06	03/01/07
1383852		AECC	550	01/01/07	01/01/17
1385131		Ameren	12	06/01/06	06/01/07
1385835	(1363730)	City of Prescott	22	04/01/06	04/01/09
1385842		South Mississippi Electric Power Assoc.	100 38	01/01/09 01/01/10	01/01/10 01/01/11
1387272		CLECO Power	11	04/01/06	04/01/16
1387274		CLECO Power	16	04/01/06	04/01/07
1387275		CLECO Power	16	04/01/07	04/01/08
1389008		NRG Power Marketing	270	06/01/07	06/01/08
1389848		Louisiana Energy & Power Authority	6	02/01/07	02/01/08
1389848		Louisiana Energy & Power Authority	6	02/01/07	02/01/08
1393874		NRG Power Marketing	5	09/01/06	09/01/07
1394479		Louisiana Generating LLC	2	06/01/06	06/01/07
1396788		Constellation Energy Commodities	70	06/01/06	06/01/07
1401985		Constellation Commodities Group	42	08/01/06	08/01/36
1403756		Constellation Commodities Group	100	01/01/07	01/01/08
1403757		Constellation Commodities Group	100	01/01/07	01/01/08
1406786		South Mississippi Electric Power Assoc.	100	04/01/10	04/01/40
1407894		Morgan Stanley Commodities Group	102	01/01/08	01/01/09
1407895		Morgan Stanley Commodities Group	102	01/01/08	01/01/09

OASIS#		PSE	MW	Begin	End
1408199		South Mississippi Electric Power Assoc.	100	04/01/10	04/01/40
1408981		NRG	92	01/01/07	01/01/10
1410022	(1340037)	City of North Little Rock	60	03/01/10	03/01/40
1412068		NRG	103	01/01/07	01/01/08
1413110		NRG Power Marketing	100	01/01/07	01/01/09
1414925		Constellation Commodities Group	22	01/01/07	01/01/08
1414927		Constellation Commodities Group	50	01/01/07	01/01/08
1416650		NRG Power Marketing	100	01/01/07	01/01/08
1422496		Constellation Commodities Group	57	01/01/07	01/01/08
1422498		Constellation Commodities Group	9	01/01/07	01/01/08
1422708		Entergy Services, Inc. (EMO)	1	01/01/07	01/01/27
1424384		Constellation Commodities Group	100	01/01/07	01/01/08
1425495		East Texas Electric Cooperative	50	03/01/10	03/01/45
1426761		Merrill Lynch Commodities, Inc.	85	11/01/06	11/01/07
1426762		Merrill Lynch Commodities, Inc.	4	11/01/06	11/01/07
1431165		Cargill Alliant	103	01/01/08	01/01/09
1431621		South Mississippi Electric Power Assn.	200	01/01/07	01/01/08
1432487		Arkansas Electric Cooperative Corp.	50	12/01/07	12/01/19
1443976	(1424383)	Constellation Commodities Group	9	01/01/07	01/01/08
1435972		Entergy Services, Inc. (EMO)	150	05/01/07	05/01/10
1435973		Entergy Services, Inc. (EMO)	135	05/01/08	05/01/10
1436590		MidAmerican Energy	50	01/01/07	01/01/08
1436591		MidAmerican Energy	50	01/01/07	01/01/08
1436592		MidAmerican Energy	50	01/01/07	01/01/08
1436593		MidAmerican Energy	50	01/01/07	01/01/08
1440358		NRG Power Marketing	100	03/01/07	03/01/08
1442295		NRG Power Marketing	3	07/01/07	07/01/09
1442453		NRG Power Marketing	320	06/01/07	06/01/26
1448054		NRG Power Marketing	103	01/01/08	01/01/09
1448057		NRG Power Marketing	103	01/01/08	01/01/09
1449494		Entergy Services, Inc. (EMO)	154	06/01/07	06/01/09
1449495		Entergy Services, Inc. (EMO)	322	06/01/09	06/01/59
1449881		Cargill Power	103	01/01/08	01/01/09

OASIS#	PSE	MW	Begin	End
1452307	NRG Power Marketing	100	01/01/08	01/01/09
1452308	NRG Power Marketing	100	01/01/08	01/01/09
1452603	NRG Power Marketing	100	09/01/07	09/01/08
1453402	NRG Power Marketing	103	01/01/09	01/01/10
1456636	CLECO Power LLC	10	10/01/07	10/01/12
1458787	Louisiana Energy & Power Authority	2	03/31/07	03/31/08
1460898	Louisiana Energy & Power Authority	3	01/01/09	01/01/30
1460899	Louisiana Energy & Power Authority	5	01/01/09	01/01/30
1461442	Louisiana Energy & Power Authority	12	01/01/09	01/01/30
1464028	East Texas Electric Coop	168	01/01/10	01/01/40
1466197	NRG Power Marketing	206	01/01/09	01/01/10
1466561	Constellation Energy	50	01/01/08	01/01/09
1466562	Constellation Energy	25	01/01/08	01/01/09
1470811	East Texas Electric Coop	186	01/01/10	01/01/40
1477069	Entergy Services	10	11/01/07	11/01/37
1477256	NRG Power Marketing	103	01/01/08	01/01/09
1479051	Ameren Energy Mktg	103	07/01/08	07/01/09
1483485	Entergy Services (EMO)	100	01/01/08	01/01/11
1483490	Entergy Services (EMO)	1	01/01/08	01/01/11
1485805	NRG Power Marketing	103	07/01/08	07/01/09
1487880	NRG Power Marketing	300	01/01/08	01/01/10
1494443	Constellation Energy	35	01/01/08	01/01/09
1494445	Constellation Energy	75	01/01/08	01/01/09
1494446	Constellation Energy	75	01/01/08	01/01/09
1494450	Constellation Energy	25	01/01/08	01/01/09

### Pre-888 Transactions

See the following hyperlink for a complete listing of all Pre-888 transactions.

<http://oasis.e-terrasolutions.com/documents/EES/Pre-Order888Transactions.xls>



## 10. STUDY QUEUE

OASIS		PSE	MW	Begin	End
1338832		Louisiana Energy & Power Authority	13	9/1/2005	9/1/2010
1338849		Louisiana Energy & Power Authority	45	9/1/2005	9/1/2010
1402842	(1385842)	South Mississippi Electric Power Assoc.	62 100	01/01/11 01/01/12	01/01/12 01/01/25
1413255		American Electric Power Service Corp	225	01/01/07	01/01/09
1460876		Aquila Networks – MPS	75	03/01/09	03/01/29
1460878		Aquila Networks – MPS	75	03/01/09	03/01/29
1460879		Aquila Networks – MPS	75	03/01/09	03/01/29
1460881		Aquila Networks – MPS	75	03/01/09	03/01/29
1460900		Louisiana Energy & Power Auth	116	01/01/09	01/01/30
1468113		Muni energy Agcy of Miss	20	06/01/11	06/01/41
1468285		Mid American Energy	103	09/01/07	09/01/08
1468286		Mid American Energy	103	09/01/07	09/01/08
1468288		Mid American Energy	103	01/01/08	01/01/09
1468289		Mid American Energy	103	01/01/08	01/01/09
1478781		Entergy Services	804	01/01/08	01/01/58
1481059		Constellation Energy	60	02/01/11	02/01/30
1481111		City of Conway	50	02/01/11	02/01/46
1481119		Constellation Energy	30	02/01/11	02/01/30
1481235		Louisiana Energy and Power Authority	50	02/01/11	02/01/16
1481438		NRG Power Marketing	20	02/01/11	02/01/21
1483241		NRG Power Marketing	103	01/01/10	01/01/20
1483243		NRG Power Marketing	206	01/01/10	01/01/20
1483244		NRG Power Marketing	309	01/01/10	01/01/20
1495910		Southwestern Electric Cooperative	78	05/01/10	05/01/13
1498120		Constellation Energy	60	04/01/12	04/01/42
1498122		Constellation Energy	30	04/01/12	04/01/42
1498129		Conway Corporation	50	04/01/12	04/01/42

OASIS		PSE	MW	Begin	End
1499610		NRG Power Marketing	300	01/01/08	01/01/13
1500582		Entergy Services (EMO)	1	01/01/08	01/01/38
1500584		Entergy Services (EMO)	1	01/01/08	01/01/38
1507312		Entergy Services (EMO)	350	07/01/12	07/01/42

## 11. CUSTOMER COMMENTS

### Appendix 1

Questions from PID 216 customer  
On the Interconnection Draft Facilities Study  
With Entergy Responses

Entergy’s responses to PID 216 customer questions from the scoping and review meeting of the draft Facilities study.

**Q1.** Section 1.4 Page 5 What is driving the August 2, 2011 in service date? Will Entergy allow PID 216 customer to assume certain roles and responsibilities in the station development process to bring the in service date more in line with PID 216 customer’s expectations?

**Entergy’s response:**

Funding for the long lead material items would need to be secured in addition to funding for detailed scoping by July 1, 2009 so that these items can be ordered by August 2009. Doing so will allow the longer lead items to be purchased earlier in the proposed schedule which would reduce the ISD to 1-22-2011.

Entergy will follow the requirements of the LGIA with regard to upgrades the PID 216 customer could perform. Entergy considers a “stand alone network upgrade” to be a “Greenfield” facility that does not require construction work either in or on Entergy owned facilities. Should PID 216 customer wish to pursue this option, Entergy would present PID 216 customer with an Engineer, Procure, and Construct (EPC) agreement to execute that details Entergy’s requirements with regard to design, construction, acceptance, and transfer of transmission facilities to Entergy.

**Q2.** Section 1.5 Page 5 Why is Automatic Generation Control included in this Facility Study?

**Entergy’s response:**

This section has been removed from the facilities study.

**Q3.** Section 3 Page 6 PID 216 customer takes exception to the servitude language as written. There are no boundaries set as to what Entergy can request as to size and location. PID 216 customer does not object to linking this section with Attachment B of the Facility Study.

**Entergy's response:**

The servitude language has been revised to reference attachment B.

**Q4.** Section 4 Page 7 PID 216 customer may wish to rebuild Queen of Angels Road to sustain continuous heavy equipment use, and provide access to Wilton Substation. Will Entergy provide its specification/ standard to which the road would need to be built?

**Entergy's response:**

Entergy will follow the requirements of the LGIA with regard to upgrades the PID 216 customer could perform. Entergy considers a "stand alone network upgrade" to be a "Greenfield" facility that does not require construction work either in or on Entergy owned facilities. Should PID 216 customer wish to pursue this option, Entergy would present PID 216 customer with an "EPC agreement" to execute that details Entergy's requirements with regard to design, construction, acceptance, and transfer of transmission facilities to Entergy.

**Q5.** Section 4.3 Page 12 Would Entergy allow PID 216 customer to perform the Wilton Substation site preparation work?

**Entergy's response:**

Entergy will follow the requirements of the LGIA with regard to upgrades the PID 216 customer could perform. Entergy considers a "stand alone network upgrade" to be a "Greenfield" facility that does not require construction work either in or on Entergy owned facilities. Should PID 216 customer wish to pursue this option, Entergy would present PID 216 customer with an "EPC agreement" to execute that details Entergy's requirements with regard to design, construction, acceptance, and transfer of transmission facilities to Entergy.

**Q6.** Section 4.3 Page 12 Why were wood pilings chosen for foundations? Would other materials be acceptable (i.e. steel)? Could PID 216 customer perform the foundation work to Entergy's specification?

**Entergy's response:**

Wood pilings were chosen by licensed civil engineers. Wood pilings are adequate to support all of Entergy's designed foundations. Entergy takes no exception to the use of steel pilings barring any additional cost over wood poles to Entergy for their installation.

Entergy will follow the requirements of the LGIA with regard to upgrades the PID 216 customer could perform. Entergy considers a "stand alone network upgrade" to be a "Greenfield" facility that does not require construction work either in or on Entergy owned facilities. Should PID 216 customer wish to pursue this option, Entergy would present PID 216 customer with an "EPC agreement" to execute that details Entergy's requirements with regard to design, construction, acceptance, and transfer of transmission facilities to Entergy.

**Q7.** Section 6 & 8 Page 23 & 25 To what extent has risk been factored into the overall cost of the project?

**Entergy's response:**

The estimate was not calculated using any contingency dollars. The cost estimate does include funding for unknown factors such as site elevation. Entergy used sound engineering judgment to determine whether a risk factor was likely enough to occur to warrant being included in the estimate.

**12. ATTACHMENTS**

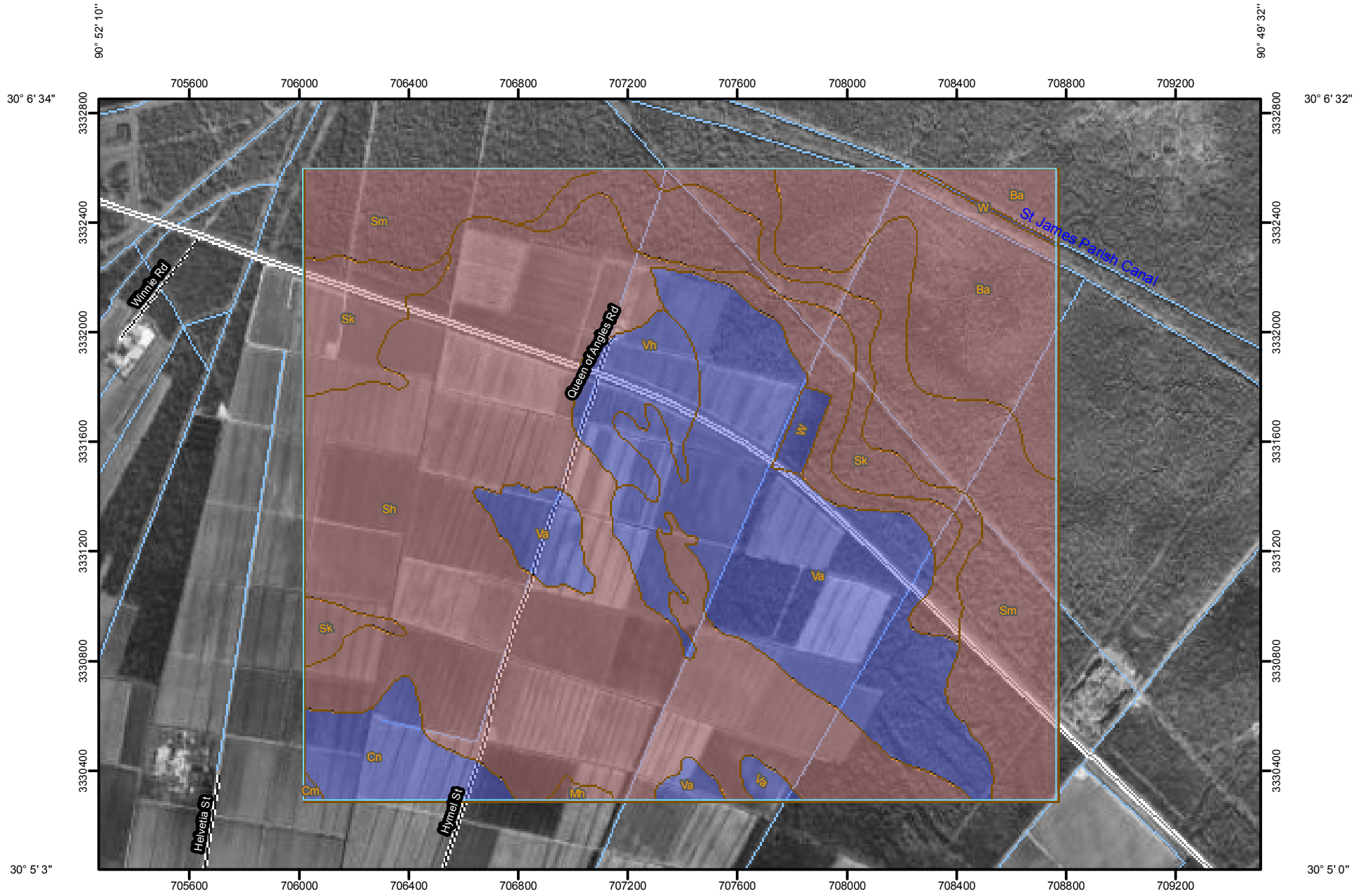
***A. USDA Natural Resources Conservation Department Hydric map***

***B. Wilton aerial plat***

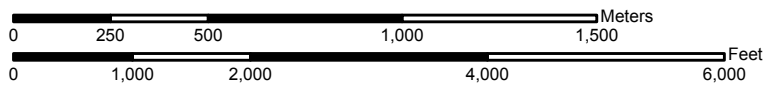
***C. Wilton 230kV switchyard oneline***

***D. Wilton 230kV switchyard electrical arrangement***

***E. Distribution line work***




Map Scale: 1:20,100 if printed on A size (8.5" x 11") sheet.



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Units

### Soil Ratings

 All Hydric

 Partially Hydric

 Not Hydric

 Unknown Hydric

 Not rated or not available

### Political Features

 Cities

### Water Features

 Oceans

 Streams and Canals


### Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

## MAP INFORMATION

Map Scale: 1:20,100 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
Coordinate System: UTM Zone 15N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: St James Parish, Louisiana  
Survey Area Data: Version 2, Apr 13, 2007

Date(s) aerial images were photographed: 1998

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Suitabilities and Limitations for Use

Suitabilities and Limitations for Use— Summary by Map Unit — St James Parish, Louisiana				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Ba	Barbary association	All Hydric	154.8	9.9%
Cm	Cancienne silt loam	Not Hydric	1.1	0.1%
Cn	Cancienne silty clay loam	Not Hydric	50.0	3.2%
Mh	Mhoon silty clay loam	All Hydric	3.3	0.2%
Sh	Schriever silty clay loam	All Hydric	616.1	39.4%
Sk	Schriever clay	All Hydric	138.2	8.8%
Sm	Schriever association, frequently flooded	All Hydric	241.2	15.4%
Va	Vacherie fine sandy loam, sandy variant	Not Hydric	301.2	19.3%
Vh	Vacherie silt loam	Not Hydric	47.5	3.0%
W	Water	Not Hydric	10.1	0.6%
<b>Totals for Area of Interest</b>			<b>1,563.6</b>	<b>100.0%</b>



## Description

This rating indicates the proportion of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is designated as "all hydric," "partially hydric," "not hydric," or "unknown hydric," depending on the rating of its respective components.

"All hydric" means that all components listed for a given map unit are rated as being hydric, while "not hydric" means that all components are rated as not hydric.

"Partially hydric" means that at least one component of the map unit is rated as hydric, and at least one component is rated as not hydric. "Unknown hydric" indicates that at least one component is not rated so a definitive rating for the map unit cannot be made.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

### References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

## **Rating Options**

*Aggregation Method:* Absence/Presence

*Tie-break Rule:* Lower

**Wilton Switchyard**  
**Proposed Entergy Servitudes**  
Revised 3/9/09

**NOT TO SCALE**

20' wide access road  
with additional 20' wide  
distribution right of way  
(total of 40' width, approx. 6,000'  
length)

approx.  
600'

150'

T-Line  
Servitude

approx.  
500'

100'  
turning  
radius

242'

Temporary  
Laydown  
Yard  
Servitude

Wilton  
Switchyard  
Servitude with  
Transmission  
dead end  
structures

Access Road &  
D-Line Servitude

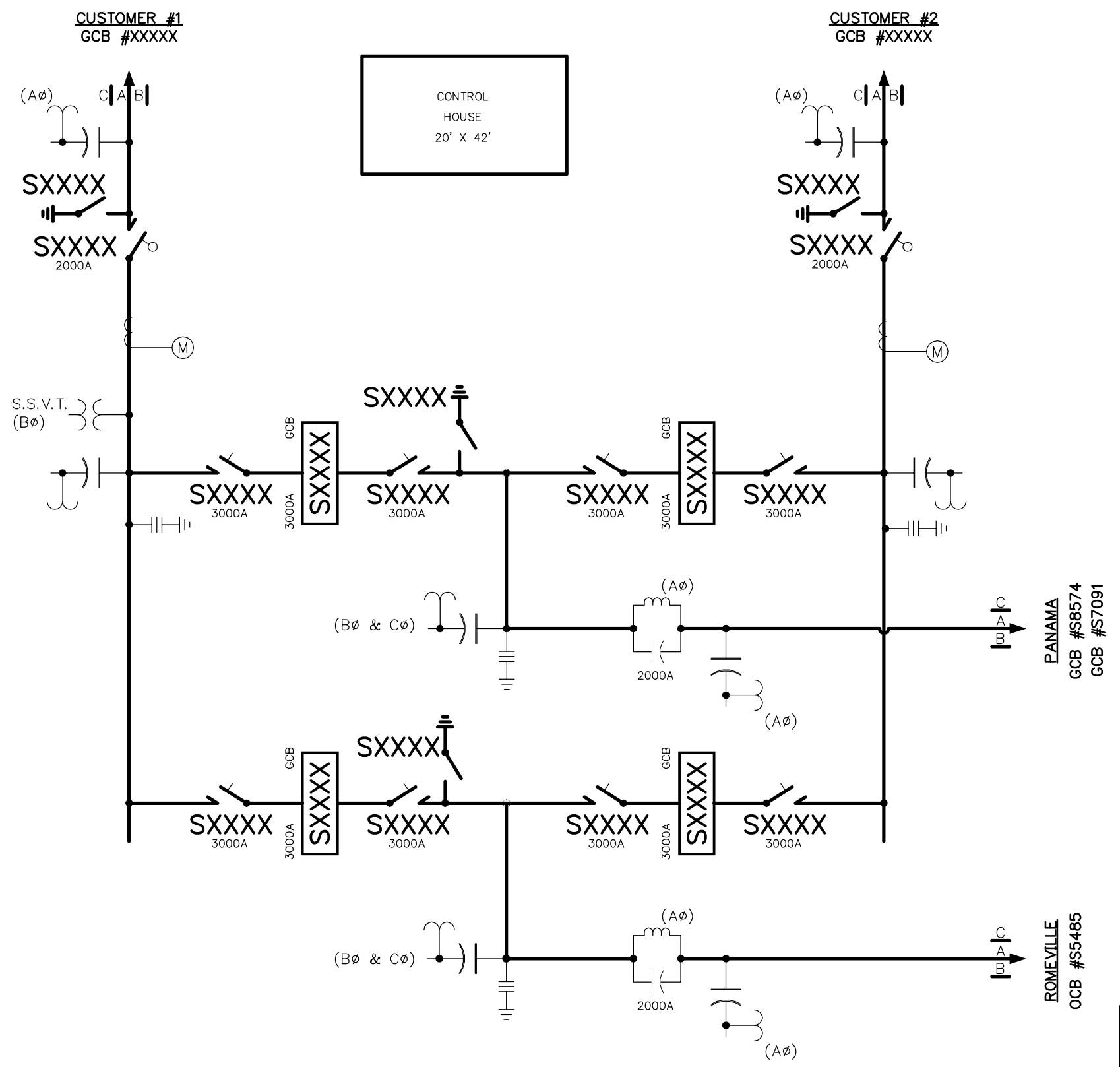
360'

50'

366'

348'


Queen of Angles Rd

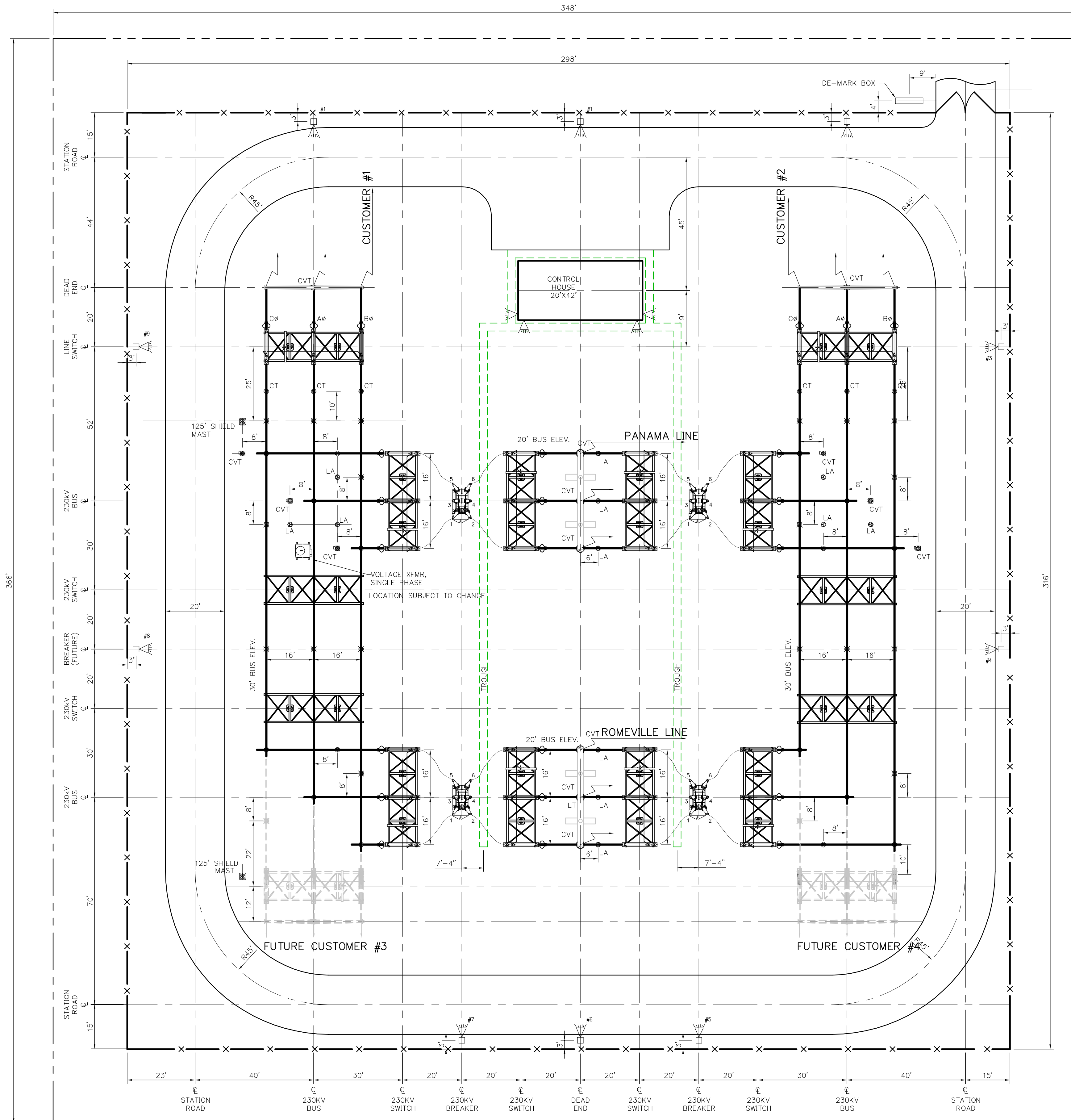
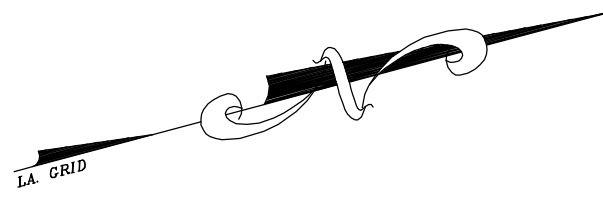


mchampa 2/10/2009

0	02-10-09	DEVELOP PEP	MKC		
NO.	DATE:	REVISION	BY:	CHK:	APPR:




ENTERGY LOUISIANA, INC.	
<b>WILTON 230kV SWITCHYARD</b>	
STATION ONELINE DIAGRAM	
PRELIMINARY	
FRANCHISE: SOUTHERN	SCALE: NONE
No. <b>WILTONS01</b>	
PLOT 1=1	SH. 1 OF 1





PROPERTY LINE/  
TOE OF BERM

**LEGEND:**

-  LOW BUS SINGLE PHASE BUS SUPPORT
-  HIGH BUS SINGLE PHASE BUS SUPPORT
-  STATION LIGHT

**REFERENCE DRAWINGS:**

- FOUNDATION PLAN WILTONFP1
- GROUNDING PLAN WILTONGP1
- CONDUIT & LIGHTING PLAN WILTONCL1

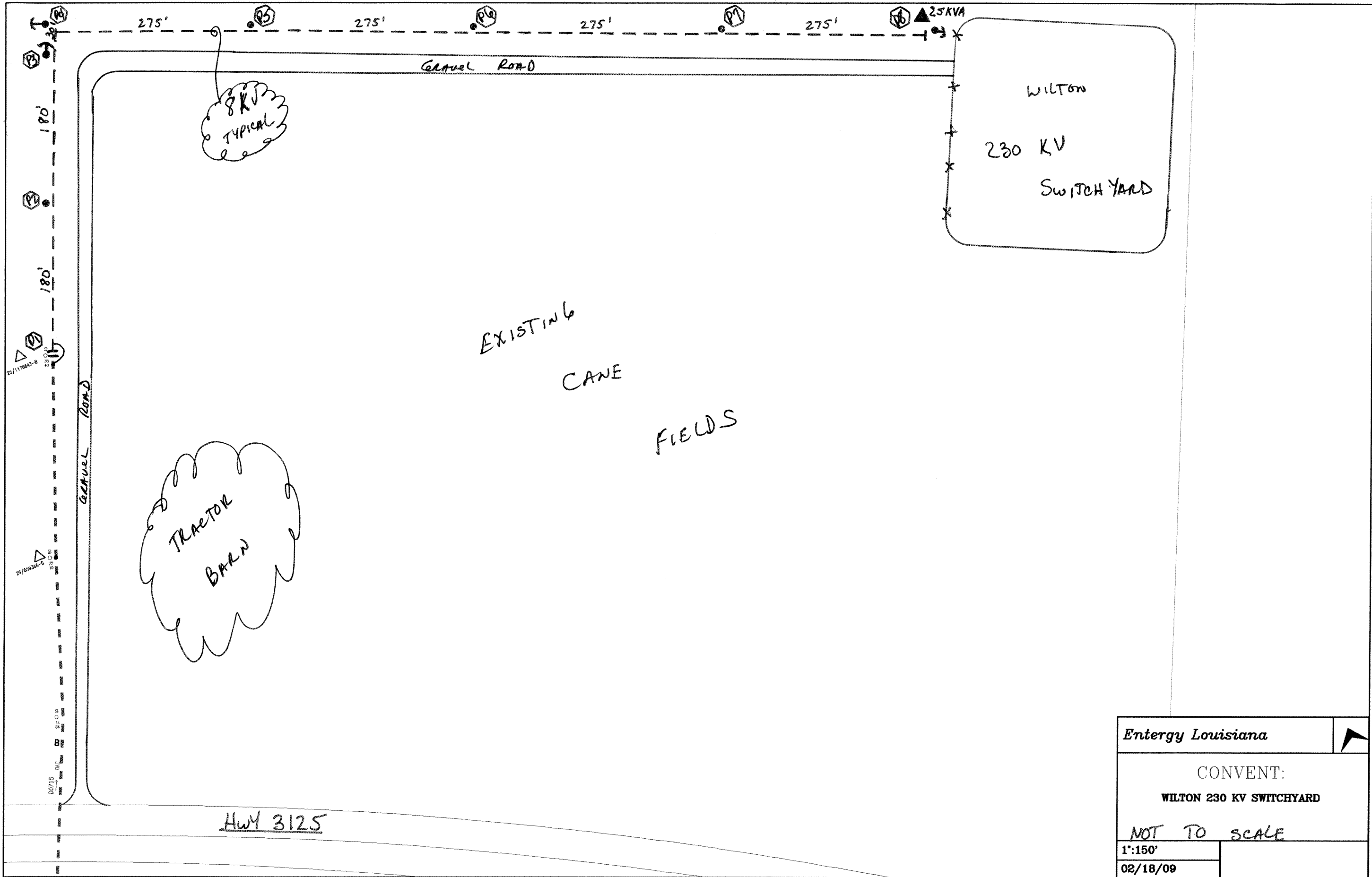
**NOTES:**

BERM SLOPES AWAY FROM FENCE 25 FEET (HORIZONTALLY) ON ALL SIDES.

7/14/2005

ENTERGY LOUISIANA, INC.	
<b>WILTON 230KV SWITCHYARD</b>	
ELECTRICAL ARRANGEMENT	
JOB NO.: TS6173	SCALE: 1"=20'
<b>No. WILTONEA1</b>	PLOT 1=240 SH. 1 OF 1

0	02-10-09	DEVELOP PEP	BY:	CHK:	MKC
		REVISION			APPR:



Entergy Louisiana		▲
CONVENT: WILTON 230 KV SWITCHYARD		
NOT TO SCALE		
1":150'		
02/18/09		

**F. Table of Acronyms**

<b>ACSR</b>	<b>Aluminum Conductor Steel Reinforced</b>
<b>ACSS</b>	<b>Aluminum Conductor Steel Supported</b>
<b>AFUDC</b>	<b>Allowance for Funds Used During Construction</b>
<b>AGC</b>	<b>Automatic Generator Control</b>
<b>AS2/3</b>	<b>Amite South phase 2 and 3</b>
<b>ATC</b>	<b>Available Transfer Capability</b>
<b>BFE</b>	<b>Base Flood Elevation</b>
<b>CCVT</b>	<b>Coupling Capacitor Voltage Transformer</b>
<b>CT</b>	<b>Current Transformer</b>
<b>DNP</b>	<b>Distributed Network Protocol</b>
<b>EES</b>	<b>Entergy Control Area</b>
<b>EHV</b>	<b>Extra-High Voltage</b>
<b>GCB</b>	<b>Gas Circuit Breaker</b>
<b>I/O</b>	<b>Input/Output</b>
<b>ICT</b>	<b>Independent Coordinator of Transmission</b>
<b>ISD</b>	<b>In Service Date</b>
<b>kV</b>	<b>Kilo-Volt</b>
<b>LDEQ</b>	<b>LA Department of Environmental Quality</b>
<b>LDNR/CMD</b>	<b>LA Department of Natural Resources, Coastal Management Division</b>
<b>LDTOD</b>	<b>LA Department of Transportation and Development</b>
<b>MCM</b>	<b>(M) Thousand Circular Mils</b>
<b>MVA</b>	<b>Mega-Volt Amp</b>
<b>MW</b>	<b>Mega-Watt</b>
<b>NOI</b>	<b>Notice of Intent</b>
<b>OASIS</b>	<b>Online Access and Same-time Information System</b>
<b>OATT</b>	<b>Open Access Transmission Tariff</b>
<b>OCB</b>	<b>Oil Circuit Breaker</b>
<b>OPGW</b>	<b>OPTical Ground Wire</b>
<b>POD</b>	<b>Point of Delivery</b>
<b>POR</b>	<b>Point of Receipt</b>
<b>ROW</b>	<b>Right of Way</b>
<b>RTU</b>	<b>Remote Terminal Unit</b>
<b>SES</b>	<b>Steam Electric Station</b>
<b>SHV</b>	<b>Super High Voltage</b>
<b>SOC</b>	<b>System Operations Center</b>
<b>SPP</b>	<b>Southwest Power Pool</b>
<b>SSVT</b>	<b>Station Service Voltage Transformer</b>
<b>SW</b>	<b>Switch Station</b>
<b>SWPPP</b>	<b>Storm Water Pollution Prevention Plan</b>
<b>TOC</b>	<b>Transmission Operations Center</b>
<b>USDA</b>	<b>United States Department of Agriculture</b>
<b>WO</b>	<b>Work Order</b>

