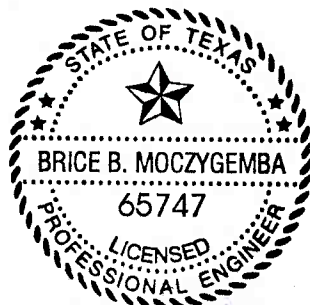


**ADDENDUM NO. 2**  
**to**  
**PLANS and SPECIFICATIONS**  
**for**

**Medina River Sewer Outfall, Segment 2**  
**SAWS Job No. 11-2503**



*Brice Moczygemba*  
*11/19/10*

**Issue Date: November 19, 2010**

**SAN ANTONIO WATER SYSTEM  
MEDINA RIVER SEWER OUTFALL, SEGMENT 2  
SAWS PROJECT # 11-2503  
ADDENDUM NO. 2**

**November 19, 2010**

This addendum, applicable to the project noted above, is an amendment to the bidding and specification documents and as such shall be a part of and included in the Contract. Acknowledge receipt of this addendum by entering the addendum number and issue date in the spaces provided on all submitted copies of the proposal.

**1.0 Addendum Purpose**

The purpose of this addendum is to issue revisions and clarifications for the Medina River Sewer Outfall (MRSO), Segment 2 (SAWS Job No. 11-2503).

**2.0 Clarifications**

A. The mandatory Pre-Bid Conference was held on November 10, 2010. Minutes from the meeting are attached and are considered part of this Addendum.

**B. Access to MRSO easement east of Leon Creek in the Toyota Property – Access to construct the portion of the MRSO, Segment 2 east of Leon Creek and west of the Union Pacific Railroad ROW in Toyota Motor Manufacturing of Texas property is only available through the proposed gate on Applewhite Road, through the pipeline easement and across Leon Creek. No access across Union Pacific Railroad Tracks into Toyota property east of Leon Creek exists.**

**3.0 Specifications**

A. Invitation to Bidders - Bids will not be accepted from any company not represented at the mandatory pre-bid meeting held on November 10, 2010 at 10:00 am. The following list is a record of the represented firms:

- Oscar Renda Contracting
- Eutaw Construction
- Holloman Corp. (Utilities)
- Laughlin-Thyssen, Inc.
- S. J. Louis Construction
- Ledcor CMI, Inc.
- Davis Excavation
- ACE Pipe Cleaning
- Merryman Excavation
- J. M. Eagle
- Hobas Pipe USA
- Lewis Contractors
- Morgan Contracting
- E. P. Brady, LTD
- Ameron International

- Ballenger Construction
- Silverado Group
- KFW Surveying
- Wright Construction Co., Inc.
- BRH-Garver Construction. LP
- BRB Contractors
- Flatiron-Redcliff
- US Composite Pipe South
- Cash Construction
- Don Kelly Construction, Inc.
- Pipelayers, Inc.
- I.T.T. Water and Wastewater
- D C Civil Construction
- Sundt Construction
- L-F-M Fiberglass Manholes

B. Bid Proposal – The Bid proposal quantities have been revised. Remove and replace the Bid Proposal with the one attached to this addendum.

C. Special Conditions, SC-1 – Add the following items:

6. SAWS is acquiring LCP Tracker, a web based system to track certified payrolls for prime contractors and subcontractors. This system is scheduled to be in full use by the end of 2010. Therefore, contractors are advised that the use of this system will be a requirement for this project. The reporting requirements are listed below, as well as a link to the LCP web site.

#### **Electronic Web submittal of Labor Compliance Reports**

- a. Each contractor and every lower-tier subcontractor will be required to submit certified payrolls and labor compliance documentation electronically utilizing the LCP Tracker web-based application as of the first Certified Payroll Report (CPR) and with every CPR thereafter.
- b. Electronic submittal of CPRs will be accessed through a link on SAWS' "Business Center" web page. Each contractor and subcontractor will be provided a logon identification and password to access the SAWS LCP Tracker reporting system.
- c. Training on the use of the system will be provided by SAWS and LCP Tracker telephone support. Electronic submittals will require data entry of weekly payroll information including: employee identification, labor classification, total hours worked and hours worked on this project, wage and benefit rates paid, etc.

- d. This electronic submission requirement also applies to every lower-tier subcontractor required to provide labor compliance documentation.
    - e. Additional information regarding the LCP Tracker System may be found on [www.lcptracker.com](http://www.lcptracker.com).
  - 7. Upon award of this Project by the SAWS Board of Directors, a pre-construction conference will be held with the Contractor, Owner, and the Consultant along with any other pertinent attendees, including the TWDB project representative. At this time, a date time, and frequency of project status meetings will be determined.
- D. Supplementary Conditions, Page GC 19 - Delete paragraph 5.7.1.15 and replace with the following:

An Umbrella Liability (UL) insurance in the amount of \$5,000,000.00. This policy shall be of an "Occurrence" type and the limit of liability shall be concurrent with and in excess of the EL, and AL insurance coverage described in paragraphs 5.7.1.2, 5.7.1.3, and 5.7.1.4 of this contract. Specifically state which coverage form is being used for the Excess/Umbrella Liability insurance – please include whether the coverage form is Excess **or** Umbrella in the Description of Operations on the Certificate of Insurance.
- E. Contract Agreement, Page CA1-CA2 - Remove the Contract Agreement in its entirety and replace with TWDB 06/10 Addendum 2 included as an attachment to this addendum.
- F. TWDB Supplemental Contract Conditions, TWBD - Remove the TWDB Supplemental Contract Conditions in its entirety and replace with TWDB Supplemental Contract Conditions (TWDB-551 Revised 8/30/10: Addendum 2). These Conditions also include the TWDB Mandatory Davis-Bacon Act Contract Conditions. (See Attached)
- G. Special Conditions, Attachment A “Geotechnical Data Report”, Page 1, Introduction Section 1.2; Scope - First sentence delete “Segment “A” (STA 10+00 to STA 549+19), “B” (STA 549+19 to STA 738+64), “C” (STA 738+64 to STA 1466+53), “D-1” (STA 1+00 to STA 96+83), “D-2” (STA 1+00 to STA 60+00), and “F” (STA 1500+00 to STA 1722+00)” and replace with “Segment 1 (STA 11+25.00 to STA 306+14.19), Segment 2 (STA 306+14.19 to STA 600+13), Segment 3 (STA 600+13 to STA 1000+20), Segment 4 (STA 1000+20 to STA 1230+16.15, the 18-inch main STA 1+00 STA 60+15.15, and the 24-inch main STA 1+00 to STA 96+87), Segment 5 (STA 1230+16.15 to 1552+08.26), and Segment 6 (STA 1552+08.26 to STA 1722+00)”.

- H. Section 01010, Summary of Work, Paragraph 1.07.A – Add the following sentence to the end of item A: “The CONTRACTOR shall provide a SECURITY Guard at the proposed gate entrance into Toyota property.
- I. Section 01025, Measurement and Payment, Item No. 11 – Delete the description and replace with the following: The CONTRACTOR shall provide all labor, supervision, tools, equipment, and materials necessary to connect the special manufactured tee base manhole to the existing 10” sanitary sewer main. Such work shall include cutting of existing 10” sanitary sewer main, connection of the special manufactured tee base manhole to the existing 10” sanitary sewer main and removal of interior “bridge” 10” pipe upon acceptance of the MRSO (See construction plans and details for further information).
- J. Section 01120, Disputes Review Board, paragraph 1.03.B – Change the first sentence to the following: “It is desirable that all the disputes review board members are experienced with the type of construction involved in this project; experienced in interpretation of contract documents; and experienced with Disputes Review Boards or have Disputes Review Board Training.”
- K. Section 01120, Disputes Review Board, paragraph 1.03.D – Add the following items:
  - 7. No member shall have financial interests to any of the parties directly involved in the contract.
  - 8. No member shall have close personal or professional relationships with a key member of any party directly involved in the contract.
  - 9. All previous contract relationships, financial interests, or close personal or professional relationships must be disclosed.
- L. Section 01120, Disputes Review Board, paragraph 1.04.B – Change the second sentence to the following: “Thereafter the Disputes Review Board shall meet quarterly or when called upon by either the contractor or the owner to hear a dispute.”

#### **4.0 Plans**

- A. Drawing No. G-01, Sheet No. 2 – The Bid Quantities have been revised. Remove and Replace this sheet with the attached plan sheet.
- B. Drawing No. C-28, Sheet No. 15 – Add a note to the 1-12” Siphon Barrel (FRP, SN 72) that states the following: Note: The 12” Siphon Barrel can also be 12” (PVC, SDR 26)
- C. Drawing No. D-16, Sheet No. 51 – A temporary construction fence detail has been added to this sheet. Remove and Replace this sheet with the attached plan sheet.

#### **5.0 Pre-Bid Meeting Questions**

Question: Will there be a SW3P with the plans?

Answer: *The SWPPP was uploaded to the SAWS website the day the project began advertisement.*

Question: What about the 95% compaction requirement. Will it be all disturbed areas?

Answer: *SAWS standard requires 98% compaction in all areas.*

Question: Is there a spoil site for excess material?

Answer: *All excess materials/spoils generated from construction shall be removed from the site and legally disposed of by the contractor.*

Question: Can the topsoil stripping material be hauled off and put back at a later time?

Answer: *Yes, the topsoil material can be relocated and put back at another time.*

Question: Can native material be used for backfill?

Answer: *Native material that conforms to Specification section SS804 and SAWS Specification Item # 804 can be used as secondary backfill material.*

Question: Is there a Pay Item for over excavation (i.e. unstable conditions at trench bottom)?

Answer: *There is no separate pay item for over excavation due to unstable trench conditions. Currently, there are not any known, unstable areas where the gravel sub-grade filler/filter fabric is needed. If unstable areas are discovered during construction, the cost will be incidental to bid Items No. 4 and 18-21. The CONTRACTOR must use their own judgment when estimating the amount of material and work required.*

Question: Are there details on the existing Highline Tower footing?

Answer: *The CPS Energy Specification for Towers, Steel, Transmission is included as an attachment to this addendum. Kevin Phillips, Transmission Engineering, CPS Energy indicated that the piers for the tower are approximately 13' in the ground. During design preliminary coordination with CPS about the transmission tower took place and additional coordination with CPS Energy will be necessary during construction to obtain the design information for the Transmission Tower if the contractor elects to install the pipe by the method described in the plans.*

Question: Is the access to the property during construction only via the gate on Pleasanton Road?

Answer: *See Addendum No. 2, Item 2.B.*

Question: Are all of the construction materials (pipe, bedding/backfill material, etc.) to be delivered via the access gate and within the easement?

Answer: *Yes all of the construction material shall be delivered via the proposed access gate on Applewhite Road and within the easement.*

## **6.0 Questions and Answers**

Question: In Measure and Payment section of the specification page 454 Bid Item 6 Special MH Tee refers to the special MH # 83 used in the Toyota Lift Station Tie in. Further down page 455 Bid Item Toyota Lift Station Tie in also refers to providing and installing the Special MH Tee. Its looks like there are 2 bid items for the same item of work. Please clarify.

Answer: *Bid Item No. 11 shall only be used for connecting the special tee base manhole to the existing 10" sanitary sewer main as described on the Tee Base Connection Note found on Drawing No. C-144, Sheet No. 32. Bid Item # 6 shall be used for furnishing and installing the Special Tee Base Manhole as described in the Measurement and Payment Section (i.e. no additional money for connection of the Existing 10" Sanitary Sewer Main).*

Question: It was stated during the Pre-Bid that all excess spoils from the trench excavation is to be evenly spread within the sewer easement located within the Toyota property. Is this correct?

Answer: *All excess materials/spoils generated from construction shall be removed from the site.*

Question: Can the clearing & grubbing materials (trees, bushes etc.) be permanently windrowed along the easement and become part of the SWPPP plan. This method currently exists at other locations within the Toyota property. If not can this material be grounded into mulch like material and spread within the easement to act as erosion control ground cover?

Answer: *The Contractor shall remove all excess materials/spoils generated from construction from the site.*

Question: OSHA requires all Contractors to designate a "First Responder" in case of an accident prior to construction. With the security requirements of

Toyota, will their medical emergency personnel be classified as the “First Responders”?

*Answer: The CONTRACTOR must identify their own “First Responder” and shall not use Toyota’s emergency personnel.*

Question: Will a full time Security Guard be required at the proposed East Gate Entrance between Segment 1 and Segment 2 during construction?

*Answer: See Addendum No. 2, Item 2.B.*

Question: The project call for 12” (FRP, SN 72) pipe to be used for Siphon # 2. The smallest pipe size manufactured is 18”.

*Answer: Based on certain manufacturer’s specifications 12” (FRP, SN 72) is available. The 12” Siphon Barrel can also be 12” (PVC, SDR 26).*

Question: We are requesting that Golden Harvest be included as one of the named "Acceptable Manufacturers" in the specifications on this project for Spec Section 15113 - Stop Log Frames.

*Answer: All substitutions, alternate materials, and approved equals will not be considered at this time but will be evaluated in the submittal phase after the contract has been awarded. The CONTRACTOR must use their own judgment when including a substitute, alternate or “equal” in their bid.*

Question: Compaction requirements – will 98% compaction be required in ALL areas even unimproved areas, (farm fields wooded areas etc.)?

*Answer: Yes, SAWS standard requires 98% compaction in all areas.*

Question: Whatever compaction is required; will it be required on all disturbed area (pre-dig) or for just the width of the pipe trench? Or will different compaction requirements be allowed for the pre-dig, or any other disturbed area?

*Answer: Compaction testing will be required on all backfill areas within the project easement.*

Question: For initial backfill, the SAWS standard spec references sec. 804.4.2 (a) 3, which is the bedding spec. Please clarify the difference in the two?

*Answer: The initial backfill material and bedding material shall be the same .*

Question: Is it your expectation that all Initial Backfill, above the 6” of stone bedding under the pipe, will be native material, or do you anticipate having to haul in suitable material for this initial and final backfill?



- Answer: The initial backfill material is specified in Section SS804, Paragraph 2.01.C which refers to SAWS Standard Specification Item No. 804.4.*
- Question: What exactly will be required as far as testing the pipeline? Will Joint Air Test be an acceptable testing method in lieu of pressure testing or televising the line?
- Answer: Testing shall be conducted in accordance with SAWS Standard Specification Item # 849 and Supplementary Specification Section SS849.*
- Question: Can there be a pay item added for excavation of unstable material Per LF(or over excavation), being that it will be difficult to quantify a cost for this item, because it will only be used at the direction of the engineer/inspector?
- Answer: No additional pay item will be added for such work. Currently, there are not any know, unstable areas where the gravel sub-grade filler/filter fabric is needed. If unstable areas are discovered during construction, the cost will be incidental to bid Items No. 4 and 18-21. The CONTRACTOR must use their own judgment when estimating the amount of material and work required.*
- Question: Will there be any access allowed through the north or south gates of the Toyota facility?
- Answer: The CONTRACTOR is allowed to pursue access to the pipeline easement from other locations outside of the easement. The OWNER will require the CONTRACTOR to provide a copy of any agreement made with Toyota or other property owners.*
- Question: In the project plans, it states that any shoring required to protect the transmission power lines will have to be designed and stamped by a Texas registered engineer; will this be required?
- Answer: If open cut method is chosen for construction of the pipeline near the highline tower the CONTRACTOR will be required to provide and submit shop drawings and design calculations for the excavation support system. The support system shall be designed and sealed by a Texas Registered Professional Engineer.*
- Question: Will the 500 LF Test section of pipe that has to be installed prior to starting work, be performed in the pipe alignment where the project will start, or will it take place elsewhere?
- Answer: The pre-installation inspection of the 500 LF test section can be performed within the pipeline alignment.*

Addendum No. 2  
Medina River Sewer Outfall, Segment 2  
Saws Project # 11-2503  
November 19, 2010

**ACKNOWLEDGEMENT BY BIDDER**

Each bidder is requested to acknowledge receipt of this Addendum No. 2 and the associated attachments by his/her signature affixed hereto and to file same and attach with his/her bid.

The undersigned acknowledges receipt of this Addendum No. 2 along with the bid submitted herewith is in accordance with the information and stipulations set forth.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

END OF ADDENDUM NO. 2

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LAND DEVELOPMENT ENVIRONMENTAL TRANSPORTATION WATER RESOURCES SURVEYING

**PROJECT:** San Antonio Water System  
Medina River Sewer Outfall  
Segment 2 Project  
SAWS Job No. 11-2503

**DATE:** 11/15/10

**CONFERENCE LOCATION:** SAWS – Tower II – 1st Floor  
Conf. Room CR-C145

**CONFERENCE DATE:** 11/10/10  
10:00 a.m.

**PURPOSE OF MEETING:** Mandatory Pre-Bid Meeting

**ATTENDEES:** See Attached Sign In Sheet for Attendees

**FROM:** David M. Evans

**PROJECT NO.:** 6866-00 (2.6)

**CC:**

**DISCUSSION:**

**Introduction**

- Patrick O'Connor introduced himself as the San Antonio Water System (SAWS) Project Manager for this project, along with Diana W. Dwyer (SAWS Contract Administration Division).
- Patrick then turned the meeting over to Diana to discuss the requirements of the bidding process.
- Diana indicated that since this was a mandatory Pre-Bid meeting, she requested that all in attendance be sure to sign the "sign-in" sheet that was being circulated, in order to be allowed to submit a Bid, per the *Invitation to Bidders*.

**Bidding Process**

- Diana reported that sealed bids will be received by SAWS Contract Administration Division, per the *Invitation to Bidders* until 10:00 a.m., December 1, 2010.
- All technical questions, questions regarding this solicitation, or any additional information, should be submitted in writing via email or by fax to Diana W. Dwyer, Contract Administration, no later than 4:00 p.m. (CST) on November 12, 2010. Answers to the questions will be posted to the web site on November 18, 2010 as a separate document or included as part of an Addendum.
- This project has an estimated cost of \$13,800,000.00, and is a 540 calendar day contract.
- Addendum No. 1 of the project was issued on November 5, 2010.
- This project is funded by the Texas Water Development Board (TWDB), and Diana asked that all bidders read the TWDB Supplemental conditions.

## CONFERENCE MEMO

San Antonio Water System

Medina River Sewer Outfall – Segment 2 Project; SAWS Job No. 11-2503

Mandatory Pre-Bid Meeting

November 15, 2010

Page 2 of 7

- Diana reviewed the mandatory items to be submitted with the Bid Packet, which are shown on the ***Bid Proposal Checklist*** in the bidding documents, and attached.
- The Small, Minority and Woman Business (SMWB) Goal for this project is 17%. Bidders may contact the SMWB Manager, Marisol Robles, for assistance up to the bid opening date. Her phone number is 210-233-3420.
- Mobilization for this project will be shown as a percentage (%) as well as the dollar amount on the Bid Proposal form, and is 5%.
- Wage and Hour classifications, as well as payment to subcontractors, will be monitored on this project by SAWS and TWDB. The current prevailing wage rates are included in the bidding documents and should be used unless a revised listing is made available prior to the bid opening via Addendum. If the prevailing wage rates should change after the bid opening, those included in the specifications (or addendum) will remain. Bidders should review the Wage and Labor Standard Provisions, as well as the Mandatory David-Bacon Conditions for additional information, which are included in the specifications.
- Diana also reported that SAWS intends to use the *LCP Tracker* computer software to monitor payroll information on this project, although this software is not available at this time. A condition requiring the contractor to use this software, once it is available, will be added to the addendum.
- A sample Insurance Certificate or a letter from the insurance company providing coverage should be submitted with the contractor's bid package. The umbrella amount will be \$5,000,000.00 and be revised by Addendum No. 2
- Liquidated Damages on this project will be \$2,808.00 per day.
- Diana turned the meeting over to Jerry Berry to provide details of the project.

### Program Overview

- 32 miles of sanitary sewer pipeline from the Dos Rios Water Recycling Center, westerly to southwest San Antonio, in the vicinity of US Hwy 90 and Montgomery Road (an extension of Hwy 211), south of US Hwy 90.
- Proposed alignment is north of the Medina River.
- This project is the "backbone" for the SAWS South sewershed.
- This project also will allow SAWS to eliminate several Lift Stations within their system, thereby reducing the maintenance cost for those lift stations.
- Overall project is being bid in six (6) segments.
- Segments 1 and 6 have already been Bid and awarded.
- Segments 3, 4 & 5 are currently scheduled to go to bid in late 2011.

### Segment 2 Overview

- Segment 2 limits begin on the Toyota Motor Manufacturing, Texas, Inc. (TMMTX) property, and traverses westerly to just beyond Applewhite Road.
- Approximately 20,600 LF of seventy-eight inch (78") diameter fiberglass sanitary sewer pipe in the project.

## **CONFERENCE MEMO**

San Antonio Water System

Medina River Sewer Outfall – Segment 2 Project; SAWS Job No. 11-2503

Mandatory Pre-Bid Meeting

November 15, 2010

Page 3 of 7

- Approximately 175 LF of bore under Applewhite Road, and 20 LF of bore under an existing gas main.
- One (1) three barrel (12"/36"/42") siphon with 30" Air Jumper.

### **Easement Status**

- All easements have been obtained. One on the TMMTX (Toyota) property and one on the Hanford-Southport property on the west side of Applewhite Road.

### **Construction Management Team**

- Pape-Dawson Engineers will be providing Construction Management services on the project.
- Jerry will be the Construction Manager for the project. Joe Molina, of Pape-Dawson Engineers, will be the Project Manager on the project. There will also be a Construction Observer for each project. Jerry introduced Charles Griffin as the Construction Observer, currently serving Segment 6.
- SAWS has two (2) Inspectors who will also be checking in on the project.

### **Other Projects**

- Medina River Sewer Outfall – Segment 1
  - Notice to Proceed was issued November 1, 2010
- Leon Creek Interconnect Sewer Main
  - Currently in the Preliminary Design Phase of the project.
- Medina River Sewer Outfall - Segment 3
  - Bid Opening in October 2011

### **Addendum No. 1**

- Issued November 5, 2010.
- Notification of Project Site Visit (non-mandatory) scheduled for November 10, 2010 at 1:30 p.m.
- Added Special Conditions, Attachment B - the Geotechnical Data Report (GDR) for the tunnels.
- Added Special Conditions, Attachment C - the Geotechnical Baseline Report (GBR) for tunnels.
- Responded to questions (12 each) received prior to the Pre-Bid Meeting.
- Revised Section 01025, Measurement and Payment, Item No. 14 and 15 to include grout in the description of these items.

## CONFERENCE MEMO

San Antonio Water System

Medina River Sewer Outfall – Segment 2 Project; SAWS Job No. 11-2503

Mandatory Pre-Bid Meeting

November 15, 2010

Page 4 of 7

- Revised sheets G-01, Sheet 2; C-25, Sheet 12; C-26, Sheet 13; C-28, Sheet 15; C-44, Sheet 31; C-144, Sheet 32; D-02, Sheet 42; D-08, Sheet 44; D-11, Sheet 47 and D-12, Sheet 48.

### Permits

- Special Condition 3 (shown on Sheet SC-1) requires Contractor to obtain all necessary permits and pay all associated fees in obtaining the permits.
- The City of San Antonio (CoSA) Tree Permit has been approved.
- Status of remaining permits –
  - TPDES (NOI, etc.) are included in the TPDES and Storm Water Pollution Prevention Plan (SW3P) issued with the plans.
  - CoSA Floodplain Development Permits – Have been preliminary reviewed by CoSA and await formal submittal request for the permit by the contractor.
  - Bexar County Floodplain Development Permits – Have been preliminary reviewed by Bexar County Department of Public Works (BCDPW), and await formal submittal request for the permit by the contractor.
  - BCDPW also has a Stormwater Quality Site Development Permit (similar to the TPDES), which will be required to be submitted by the contractor.
  - Roadway crossing permit - Applewhite Road – has been preliminary reviewed by CoSA and await formal submittal request for the permit by the contractor.
  - Pape-Dawson will assist the contractor in coordinating with the agencies to obtain the remaining permits.

### General Requirements

- Work Area Limit
  - Section 01010, Paragraph 1.06.A defines the contractor's work area limits.
  - Contractor shall be confined to the easement limits.
  - Contractor will be issued a warning one (1) time if found to be working outside of the easement limits. Contractor will be required to install fence on easement limits if work outside of easement limits is performed after the first warning is issued.
  - Contractor to provide copies of any agreements outside of the easement area with the landowner (Toyota) to the Construction Manager and SAWS.
- Toyota Requirements
  - Section 01010, Paragraph 1.07 and Appendix A shows what the contractor will be required to comply with while on Toyota property.
  - Access for the MRSO construction, east of Leon Creek, on the Toyota property, will be via a gate north of the proposed sewer line construction on Pleasanton Road.
  - All contractor personnel will be required to attend a Toyota Site Safety Orientation Class.

## CONFERENCE MEMO

San Antonio Water System

Medina River Sewer Outfall – Segment 2 Project; SAWS Job No. 11-2503

Mandatory Pre-Bid Meeting

November 15, 2010

Page 5 of 7

- Survey
  - Section 01050 defines contractor's responsibilities for surveying on the project.
  - A Registered Professional Land Surveyor is required.
  - Control points have been provided along the proposed pipeline alignment. The contractor is responsible for all of his survey control to construct the project.
  - The contractor will be required to submit a report to Pape-Dawson that he verified the primary control points, and secondary control point set by the contractor's surveyor.
  
- Disputes Review Board & Escrow Bid Documents
  - Sections 01120 and 01130 define the Disputes Review Board and Escrow Bid Documents, respectively.
  - The Disputes Review Board consists of three (3) members. One selected by SAWS, one selected by the Contractor, and one selected by the two members selected by SAWS and the Contractor.
  - Escrow Documents shall be submitted three (3) days after the bid opening.
  
- QC/QA Testing
  - Section 01400 and individual specification sections define various QC/QA testing requirements.
  - Contactor provides Quality Control (QC) testing, and is required to contract their own testing laboratory.
  - SAWS provides Quality Assurance (QA) testing.
  
- Field Offices
  - Contractor
    - Section 01500, Paragraph 1.02 defines the requirements for the Contractor's Field Office and Temporary Construction Facilities.
    - Space is available, and permitted, at SAWS Leon Creek WRC.
  - Owner
    - Pape-Dawson Engineers' field office is currently at Leon Creek WRC.
  
- Digital As Builts
  - Section 01720 defines the requirements of the Contractor to furnish Project Record Documents (As-Builts).
  - SAWS will be using a new system to develop Project Record Documents on this project. The use of a Records Document Application (RDA) will be utilized on this project.
  - Digital drawings will be required on a monthly basis.
  - Contractor to provide actual survey data after installation.
  - File requirements are provided in the referenced specification section.

## CONFERENCE MEMO

San Antonio Water System

Medina River Sewer Outfall – Segment 2 Project; SAWS Job No. 11-2503

Mandatory Pre-Bid Meeting

November 15, 2010

Page 6 of 7

### Technical Requirements

- Specifications
  - SAWS Standard Specifications govern. See Special Conditions SC-5.0 (sheet SC-1) for web site locations.
  - Supplementary Specification Sections amend those specifications.
- Stop Logs
  - Section 15113 defines the requirements of Stop Log Frames
  - Contractor is only to provide Frames.
  - Stop Logs are owned by SAWS and are stored at the Dos Rios WRC.

Jerry asked if there were any questions from those in attendance. The following questions were presented:

1. Will there be a SW3P with the plans?
2. What about the 95% compaction requirement. Will it be all disturbed areas?
3. Is there a spoil site for excess material?
4. Can the topsoil stripping material be hauled off and put back at a later time?
5. Can native material be used for backfill?
6. Is there a Pay Item for over excavation (i.e. unstable conditions at trench bottom)?
7. Are there details on the existing Highline Tower footing?
8. Is the access to the property during construction only via the gate on Pleasanton Road?
9. Are all of the construction materials (pipe, bedding/backfill material, etc.) to be delivered via the access gate and within the easement?

Diana again reminded everyone that all questions, even those asked during today's meeting should be sent in writing to her attention no later than 4:00 p.m. on November 12, 2010.

As per the *Invitation to Bidders*, the following companies were in attendance at the Mandatory Pre-Bid Meeting and will be allowed to bid the project:

- Oscar Renda Contracting
- Eutaw Construction
- Holloman Corp. (Utilities)
- Laughlin-Thyssen, Inc.
- S. J. Louis Construction
- Ledcor CMI, Inc.
- Davis Excavation
- ACE Pipe Cleaning
- Merrymen Excavation
- J. M. Eagle
- Hobas Pipe USA



**CONFERENCE MEMO**

San Antonio Water System

Medina River Sewer Outfall – Segment 2 Project; SAWS Job No. 11-2503

Mandatory Pre-Bid Meeting

November 15, 2010

Page 7 of 7

- Lewis Contractors
- Morgan Contracting
- E. P. Brady, LTD
- Ameron International
- Ballenger Construction
- Silverado Group
- KFW Surveying
- Wright Construction Co., Inc.
- BRH-Garver Construction. LP
- BRB Contractors
- Flatiron-Redcliff
- US Composite Pipe South
- Cash Construction
- Don Kelly Construction, Inc.
- Pipelayers, Inc.
- I.T.T. Water and Wastewater
- D C Civil Construction
- Sundt Construction
- L-F-M Fiberglass Manholes

The "Minutes of the Meeting" outlined herein reflect Pape-Dawson Engineers' understanding of what was discussed and presented at this meeting. The minutes will stand for the record unless comments are received in writing within (3) days of the date of these minutes.

END OF MEMO

Attachments:

1. Attendance List
2. Bid Proposal Checklist

P:\68\66\00\02.0 Project Management\2.6 Meetings\101110 Segment 2 Pre-Bid Meeting\101111a1.doc

**SAN ANTONIO WATER SYSTEM**  
**MEDINA RIVER SEWER OUTFALL**  
**Segment 2 Project; SAWS Job No. 11-2503**  
**Solicitation No. B-10-055-DD**  
**November 10, 2010; 10:00 am**  
**SAWS Tower II, 1<sup>st</sup> Floor Conference Room; CR-145**  
**Purpose: Mandatory Pre-Bid Meeting**

NAME	COMPANY	PHONE#	FAX	EMAIL
Jerry Berry	Pape-Dawson	(210) 375-9000	(210) 375-9010	jberry@pape-dawson.com
Joseph Ortega	Pape-Dawson	(210) 375-9000	(210) 375-9010	jortega@pape-dawson.com
David Evans	Pape-Dawson	(210) 375-9000	(210) 375-9010	devans@pape-dawson.com
Justin Lieck	Pape-Dawson	(210) 375-9000	(210) 375-9010	jlieck@pape-dawson.com
Joe Molina	Pape-Dawson	(210) 375-9000	(210) 375-9010	jmolina@pape-dawson.com
Diana W. Dwyer	SAWS	(210) 233-3372	(210) 233-5218	ddwyer@saws.org
Patrick O'Connor	SAWS	(210) 233-3520	(210) 233-5468	Patrick.OConnor@saws.org
<del>Kerry Averyt</del>	<del>SAWS</del>	<del>(210) 233-3591</del>		<del>Kerry.Averyt@saws.org</del>
Dennis Bailey	Oscar Renda	817 491-2703	817 491-1627	dbailey@oscarrenda.com
Lane Williams	Eutaw Construction	662 436 2211	601 544 0195	LWilliams@eutawconstruction.com
MATT McQUEEN	EUTAW CONSTRUCTION	662.436.5720	601.544.0195	MATTQUEEN@EUTAWCONSTRUCTION.COM
Sherry Burghart	Holloman Utilities	210-667-9925	210-667-9968	sherryburghart@hollomanCorp.com
KEVIN COURTNEY	LAUGHLIN-THYSSEN	713-429-6500	713-675-7022	chad@laughlin.com
SAM MONROYA	S.S. LOUIS CONST.	210-340-9998	210-340-9997	SAM@SSLouis.com
Keith Baldwin	LedCor Const	480-225-6791		Roy.Baldwin@LedCor.com
MICHAEL DALZIEL	LED COR CM INC.	210-651-0578	888-788-2702 888-259-8756	MICHAEL.DALZIEL@LEDCOR.COM

NAME	COMPANY	PHONE#	FAX	EMAIL
Drew Davis	DAVIS EXCAVATION	214-735-8042	214-735-8043	Drew@DavisExcavation.com
CHARLES GRAFFIN	VICKREY ASSOCIATES	210-349-3271		C.GRAFFIN@VICKREYNET.COM
BRUCE JAMESON	ACE PIPE CLEANING	817-401-3639	210-224-5920	BJAMESON@ACEPIPE.COM
Christopher Cameron	ACE PIPE CLEANING	512-663-1661	210-224-5920	CJC-1477@hstmsnks.com
Tim Golyzinak	Merrymen Excavation	815-482-3271	815-337-1966	Tim.Golyzinak@Merrymenexcavation.com
TIM HESSLER	JIM EAGLE	281-883-6072	832-201-7179	timhessler@jmcagle.com
VICTOR RIVERA	HOBAS PIPE USA	713-907-4406	281-821-7715	vrivera@hobaspipe.com
Matt Lewis	Lewis Contractors	512-260-9900	512-260-9902	Matt@LewisContractors.com
Gary Gartner	Morgan Contracting	763-688-0493	763-420-0000	Gartner@MorganI.com
DANIEL BEAZLEY	E.A. BEAZLEY	713-691-0923	713-691-5423	dan@epbeazley.com
Jay Warren	Ameron Int.	817-416-7775	817-416-7778	Jwarren@ameron.com
Jim MARLEN	Ameron Ind'l	214 914 2485	817-488-6326	JIM MARLEN@AMERONINDUSTRIAL.COM
Fernando Botello	Ballenger Construction	210-237-0976	512-233-0845	fbotello@bal-con.com
TED ZAMORA	STANLEY GROUP	210-617-4350	210-617-4572	tzamora@stanleygr.com
BLAINE LOPEZ	KFW SURVEYING	210-979-8444	210-979-8941	bllopez@kfwengineers.com
BRAO MEIJER	WEST COAST CONSTRUCTION	817-481-2594	817-481-2369	BMEIJER@WESTCOASTCONSTR.COM
Phil Reed	BRH-GARVER CONSTRUCTION, L.P.	713-921-2929	713-921-2987	PhilReed@BRHGARVER.COM
John Risky	BRB Contractors	785-232-1245	785-235-8045	www.brbccontractors.com
NATHAN MIGNAND	FLATION - RED CLIFF	915-532-2610	915-908-7406	BN0010@TEAMREDCLIFF.COM
Rocky Lorenz	US Composite Pipe South	817-829-4525		RLorenz@KTIPIPE.COM
Ace Dickelhut	Cash Construction	512-251-7872	512-251-7472	T.dickelhut@ccctex.com
JOHN SIMONSON	HOBAS PIPE	832-683-1008	281-821-7715	Jsimonson@HOBASPIPE.COM
BILL GEISER	DON KELLY CONSTRUCTION	817-472-8169	817-472-5481	billg@donkellyconstruction.com
Mark Medlin	Don Kelly	817-472-8169	817-472-5482	mmmedlin@DonkellyConstruction.com



**BID PROPOSAL CHECKLIST:**  
**Medina River Sewer Outfall – Segment 2 Project**  
**SAWS Job No. 11-2503**  
**Solicitation No. B-10-055-DD**

**Mandatory items to be submitted with the Bid Packet for the above-referenced project:**

- Bid proposal (BP-1 through BP-6)
- Bid Proposal Certification (BP-7)
- Bid Bond
- Signed page(s) of Addendum(s)
- Good Faith Effort Plan
- Conflict of Interest Questionnaire (Form CIQ)
- Letter of Insurance Verification and/or sample Certificate of Insurance verifying insurance coverage
- Bidder's Certifications (TWDB Form WRD-255)
- Vendor Compliance with Reciprocity on Non-Resident Bidders (TWDB Form WRD-259)
- Financial Statement prepared within the last twelve months by an independent Certified Public Accountant (per Supplementary Conditions, page SS-1)
- Company Information Packet (per Supplementary Conditions, page SS-1)
- Prepared statement regarding ability to complete project (per Supplementary Conditions, page SS-1)
- Statement of Bidder's Experience (Attachment A)/Record of Performance on three (3) similar projects in the last five (5) years (per Supplementary Conditions, page SS-1)
- Attachment D – Geotechnical Data Report and Geotechnical Baseline Report Acknowledgement Form
- Attachment E – Escrow Bid Documents Acknowledgement Form

**Items to be submitted with Awarded Contract:**

1. Contractor's Act of Assurance (TWDB Form ED-103)
2. Contractor's Resolution (TWDB Form ED-104)

**BID PROPOSAL**

PROPOSAL OF \_\_\_\_\_

A corporation \_\_\_\_\_

A partnership consisting of \_\_\_\_\_

An individual doing business as \_\_\_\_\_

**THE SAN ANTONIO WATER SYSTEM**

Pursuant to Instructions and Invitations to Bidders, the undersigned proposes to furnish all labor and materials as specified and perform the work required for the construction of pipelines and appurtenances, San Antonio Water System Job Number 11-2503 in accordance with the Plans and Specifications for the following prices to wit:

ITEM NO.	DESCRIPTION & ESTIMATED QUANTITIES (Unit Price to be written in words)	UNIT	QTY	UNIT PRICE (Figures)	TOTAL PRICE (Figures)
1.	Erosion & Sedimentation Controls _____ Dollars _____ Cents	LS	1	\$XXXXXXXX	\$ _____
2.	Trench Excavation Safety Protection _____ Dollars _____ Cents	LF	21,743	\$ _____	\$ _____
3.	Revegetation _____ Dollars _____ Cents	SY	237,146	\$ _____	\$ _____
4.	78" FRP (all depths) _____ Dollars _____ Cents	LF	20,663	\$ _____	\$ _____
5.	78" Tee Base MH _____ Dollars _____ Cents	EA	5	\$ _____	\$ _____
6.	78" Special Tee Base MH _____ Dollars _____ Cents	EA	1	\$ _____	\$ _____

Job No. 11-2503  
 Medina River Sewer Outfall  
 Segment 2

ITEM NO.	DESCRIPTION & ESTIMATED QUANTITIES (Unit Price to be written in words)	UNIT	QTY	UNIT PRICE (Figures)	TOTAL PRICE (Figures)
7.	78" Tee Base MH, Miter _____ Dollars _____ Cents	EA	11	\$ _____	\$ _____
8.	78" Tee Base MH (Drop) _____ Dollars _____ Cents	EA	8	\$ _____	\$ _____
9.	78" Tee Base MH Miter (Drop) _____ Dollars _____ Cents	EA	6	\$ _____	\$ _____
10.	Tee Base MH, 60" Riser Extra Depth (>15') _____ Dollars _____ Cents	LF	307	\$ _____	\$ _____
11.	Toyota Lift Station Tie-In _____ Dollars _____ Cents	LS	1	\$XXXXXXXX	\$ _____
12.	Fence Gate 16' (Type 1) _____ Dollars _____ Cents	EA	3	\$ _____	\$ _____
13.	Remove and Replace Fencing _____ Dollars _____ Cents	LF	410	\$ _____	\$ _____
14.	Boring or Tunneling for 78" DIA. FRP _____ Dollars _____ Cents	LF	192	\$ _____	\$ _____
15.	Carrier Pipe Installed in Steel Casing or Tunnel Liner Plate (78" DIA FRP) _____ Dollars _____ Cents	LF	192	\$ _____	\$ _____

Job No. 11-2503  
 Medina River Sewer Outfall  
 Segment 2

ITEM NO.	DESCRIPTION & ESTIMATED QUANTITIES (Unit Price to be written in words)	UNIT	QTY	UNIT PRICE (Figures)	TOTAL PRICE (Figures)
16.	Downstream Siphon Structure No. 2 _____ Dollars _____ Cents	LS	1	\$XXXXXXXX	\$ _____
17.	Upstream Siphon Structure No. 2 _____ Dollars _____ Cents	LS	1	\$XXXXXXXX	\$ _____
18.	12" FRP for Siphon No.2 _____ Dollars _____ Cents	LF	530	\$ _____	\$ _____
19.	36" FRP for Siphon No.2 _____ Dollars _____ Cents	LF	530	\$ _____	\$ _____
20.	42" FRP for Siphon No.2 _____ Dollars _____ Cents	LF	530	\$ _____	\$ _____
21.	30" HDPE (Air By-Pass Pipe) _____ Dollars _____ Cents	LF	550	\$ _____	\$ _____
22.	Air Bypass Manhole (FRP) _____ Dollars _____ Cents	EA	2	\$ _____	\$ _____
23.	Rock Rip Rap (12" to 18") _____ Dollars _____ Cents	SY	889	\$ _____	\$ _____
24.	Concrete Cap _____ Dollars _____ Cents	LF	250	\$ _____	\$ _____
25.	Concrete Encasement _____ Dollars _____ Cents	LF	373	\$ _____	\$ _____



Job No. 11-2503  
 Medina River Sewer Outfall  
 Segment 2

ITEM NO.	DESCRIPTION & ESTIMATED QUANTITIES (Unit Price to be written in words)	UNIT	QTY	UNIT PRICE (Figures)	TOTAL PRICE (Figures)
26.	Bypass Pumping _____ Dollars _____ Cents	LS	1	\$XXXXXXXX	\$ _____
27.	Abandonment of Sanitary Sewer Main and Manholes _____ Dollars _____ Cents	LF	400	\$ _____	\$ _____
28.	Tree Protection _____ Dollars _____ Cents	LS	1	\$XXXXXXXX	\$ _____
29.	Connection to MRSO Segment 1 _____ Dollars _____ Cents	LS	1	\$XXXXXXXX	\$ _____
30.	Connection to MRSO Segment 3 _____ Dollars _____ Cents	LS	1	\$XXXXXXXX	\$ _____
31.	Gravity Sewer Outfall Testing _____ Dollars _____ Cents	LF	21,084	\$ _____	\$ _____
32.	Disputes Review Board _____ Dollars _____ Cents	LS	1	\$XXXXXXXX	\$30,000.00

**LINE ITEM "A"**

**SUB TOTAL BASE BID**

**\$ \_\_\_\_\_**

Job No. 11-2503  
 Medina River Sewer Outfall  
 Segment 2

ITEM NO.	DESCRIPTION & ESTIMATED QUANTITIES (Unit Price to be written in words)	UNIT	QTY	UNIT PRICE (Figures)	TOTAL PRICE (Figures)
33.	Mobilization  _____ Percent (Maximum of 5% of the <u>Line Item "A"</u> Sub-total Base Bid amount)	LS	1	\$XXXXXXXX	\$ _____

**LINE ITEM "B"**

**MOBILIZATION SUB TOTAL** \$ \_\_\_\_\_

Note: Mobilization lump sum bid amount shall be limited to a maximum of 5% of the Sub-total base bid amount. **In the event of a discrepancy between the written percentage and dollar amount shown for the Mobilization bid item the written percentage will govern. If the percentage written exceeds the allowable maximum stated for mobilization, SAWS reserves the right to cap the amount at the percentage shown and adjust the extension of the bid item accordingly.**

**TOTAL BID AMOUNT (LINE ITEM "A" + LINE ITEM "B")** \$ \_\_\_\_\_

**DOLLARS AND**  
**CENTS**

\_\_\_\_\_  
BIDDER'S SIGNATURE & TITLE

\_\_\_\_\_  
FIRM'S NAME (TYPE OR PRINT)

\_\_\_\_\_  
FIRM'S ADDRESS

\_\_\_\_\_  
FIRM'S PHONE NO./FAX NO.

\_\_\_\_\_  
FIRM'S EMAIL ADDRESS

The Contractor herein acknowledges receipt of the following

Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_ Signed: \_\_\_\_\_

Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_ Signed: \_\_\_\_\_

Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_ Signed: \_\_\_\_\_

Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_ Signed: \_\_\_\_\_

OWNER RESERVES THE RIGHT TO ACCEPT THE OVERALL MOST RESPONSIBLE BID.

The bidder offers to construct the Project in accordance with the Contract Documents for the contract price, and to complete the Project with 540 calendar days after the start date, as set forth in the Authorization to Proceed. The Bidder understands and accepts the provisions of the contract Documents relating to liquidated damages of the Project if not completed on time.

Complete the additional requirements of the Proposal which are included on the following pages.

**CONTRACT**  
**C-XX-XXX-DD**

STATE OF TEXAS     §  
COUNTY OF BEXAR §

**KNOW ALL MEN BY THESE PRESENTS:**

That this Agreement made and entered into this XX day of XXXXXX, A.D, 2010, by and between **THE SAN ANTONIO WATER SYSTEM BOARD OF TRUSTEES**, hereinafter called **THE SAN ANTONIO WATER SYSTEM, COUNTY OF BEXAR, STATE OF TEXAS**, Acting through its Contracting Officer, First Party, hereinafter termed the Owner, and XXXXXXXXXXXXXXXXXX, of the City of XXXXXXXXXX, County of XXXXXXXXXX, State of XXXXXXXXXX, Second Party, hereinafter termed the Contractor.

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned to be made and performed by said First Party, (Owner), the said Second Party, (Contractor), hereby agrees with the First Party to commence and complete the construction of certain improvements for XXXXXXXXXXXXXXXXXXXXXXXXXX no/100's Dollars \$000.00, at the prices set forth in the Contractor's Proposal for the San Antonio Water System Job No. 11-2503, dated XXXXXX, 2010, the same being designated as San Antonio Water System Project Medina River Sewer Outfall, Segment 2.

The Contractor shall perform all work shown on the Plans and described Specifications and shall meet all requirements of this Agreement, The General and Special Conditions of the Agreement; and such Orders and Agreements for Extra Work as may subsequently be entered by the above named parties to this Agreement.

The Contractor shall not offer, confer, or agree to confer any benefit or gift to any San Antonio Water System employee.

This Contract is contingent upon the release of funds from the Texas Water Development Board. The San Antonio Water System may not issue an Authorization to Proceed Letter until the San Antonio Water System has received written approval of the bid and contract document package, and approval of funds from the Texas Water Development Board.

The Contractor hereby agrees to commence work under this Contract within seven (7) days after issuance by the SAWS of the written Authorization To Proceed. Under no circumstances shall the work commence prior to the Contractor's receipt of SAWS issued, written Authorization To Proceed. Computation of Contract Time will begin upon actual commencement of Work by the Contractor during the seven (7) calendar day period referenced above, or upon the eighth (8th) calendar day (assuming the eighth day is a day upon which Work may lawfully and Contractually be performed), *whichever occurs first*. All work specified in these Contract Documents shall be completed within 540 calendar days.

It is agreed and understood by the Owner and the Contractor that the provisions of Chapter 252, of the Texas Local Government Code, apply to this contract. The terms of the aforementioned state law are incorporated herein by reference. Contractor and Owner Agree that as a public body, Owner is authorized by such state law to negotiate change orders up to and including the amount of \$25,000.00 acting by and through its duly designated administrative officer (Contracting Officer). It is agreed and understood that any change orders which increase the work of the contract in excess of 25% of the bid contract price, must be subject of a supplemental agreement approved by the San Antonio Water System Board of Trustees of San Antonio as in case of original contracts. The work of the contract may be decreased over 25% with the consent of the Contractor.

The Owner agrees to pay the Contractor in current funds, and to make payments on account, for the performance of the work in accordance with the Contract, at the prices set forth in the Contractor's Proposal, subject to additions and deductions, all as provided in the General Conditions of the Agreement.

The following documents, together with this Contract, comprise the Agreement, and they are as fully a part thereof as if herein repeated in full:

- The Invitation to Bidders
- The Instructions to Bidders
- The Proposal
- The Payment Bond
- The Performance Bond
- The General Conditions of the Contract
- The Special Conditions of the Contract
- The Supplemental Conditions of the Contract
- The Construction Specifications
- The Standard Drawings
- Addenda
- Change Orders
- Good Faith Effort Plan

The Plans, designated San Antonio Water System Project Job No. 11-2503: Medina River Sewer Outfall, Segment 2.

In witness thereof of the Parties of these presents have executed this Agreement in the year and day of first above written.

**SAN ANTONIO WATER SYSTEM BOARD  
OF TRUSTEES, OWNER**

By \_\_\_\_\_  
Robert R. Puente  
President/Chief Executive Officer

Date: \_\_\_\_\_

By \_\_\_\_\_ Contractor  
Contractor

By \_\_\_\_\_  
(Signature)

Date: \_\_\_\_\_

\_\_\_\_\_  
(Print/Type)

Title \_\_\_\_\_

# Texas Water Development Board

## SUPPLEMENTAL CONTRACT CONDITIONS

For Projects Funded through the

Clean Water State Revolving Loan Program (Tier II),

### Table of Contents

#### Instructions to Bidders

1. [Contingent Award of Contract](#)
2. [Equal Employment Opportunity and Affirmative Action](#)
3. [Bid Guarantee](#)
4. [Award of Contract to Nonresident Bidder](#)

Forms to be submitted with bids (attached)

1. [Bidder's Certifications regarding Equal Employment Opportunity and Non-Segregated Facilities \(WRD-255\)](#)
2. [Vendor Compliance with Non-Resident Bidder Requirements \(WRD-259\)](#)

#### [Supplemental Contract Conditions](#)

1. [Supersession](#)
2. [Privity of Contract](#)
3. [Definitions](#)
4. [Laws to be Observed](#)
5. [Review by Owner, TWDB, and EPA](#)
6. [Performance and Payment Bonds](#)
7. [Progress Payments and Payment Schedule](#)
8. [Workman's Compensation Insurance Coverage](#)
9. [Changes](#)
10. [Prevailing Wage Rates – Wage Rate Determinations](#)  
[Mandatory Davis-Bacon Act Contract Conditions](#)
11. [Equal Employment Opportunity and Affirmative Action](#)
12. [Archeological Discoveries and Cultural Resources](#)
13. [Endangered Species](#)
14. [Hazardous Materials](#)
15. [Project Sign](#)
16. [Operation and Maintenance Manuals and Training](#)
17. [As-built Dimensions and Drawings](#)

Required Forms to be submitted with executed contracts:

1. [Contractor's Act of Assurance \(ED-103\)](#)
2. [Contractor's Resolution on Authorized Representative \(ED-104\)](#)

# **TWDB SUPPLEMENTAL CONDITIONS**

## **Instructions to Bidders**

### **1. CONTINGENT AWARD OF CONTRACT**

This contract is contingent upon release of funds from the Water Development Board.

Any contract or contracts awarded under this Invitation for Bids are expected to be funded in part by a loan or grant from the Texas Water Development Board, and a grant from the United States Environmental Protection Agency (U.S. EPA.) Neither the State of Texas, or U.S. EPA nor any of its departments, agencies, or employees are or will be a party to this Invitation for Bids or any resulting contract.

### **2. EQUAL EMPLOYMENT OPPORTUNITY AND AFFIRMATIVE ACTION**

Equal Opportunity in Employment - All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, handicap or national origin. Bidders on this work will be required to comply with the President's Executive Order No. 11246, as amended by Executive Order 11375, and as supplemented in Department of Labor regulations 41 CFR Part 60.

The Bidder's Certifications regarding Equal Employment Opportunity and Non-Segregated Facilities (WRD-255) must be submitted with the bid.

### **3. BID GUARANTEE**

Each bidder shall furnish a bid guarantee equivalent to five percent of the bid price. (Water Code 17.183) If a bid bond is provided, the contractor shall utilize a surety company which is authorized to do business in Texas in accordance with Art. 7.19-1. Bond of Surety Company; Chapter 7 of the Insurance Code

### **4. AWARD OF CONTRACT TO NONRESIDENT BIDDER**

A governmental entity may not award a governmental contract to a nonresident bidder unless the nonresident underbids the lowest bid submitted by a responsible resident bidder by an amount that is not less than the amount by which a resident bidder would be required to underbid the nonresident bidder to obtain a comparable contract in the state in which the nonresident's principal place of business is located. A non-resident bidder is a contractor whose corporate offices or principal place of business is outside of the state of Texas. (Source: Texas Government Code Chapter 2252 Subchapter A Nonresident Bidders, (§ 2252.002) The bidder will complete form WRD-259 which must be submitted with the bid.

Forms to be submitted with Bid:

- **Bidder's Certifications regarding Equal Employment Opportunity and Non-Segregated Facilities (WRD-255)**
- **Vendor Compliance with Non-Resident Bidder Requirements (WRD-259)**

# Supplemental Contract Conditions

## Conditions:

### **1. SUPERSESSION**

The Owner and the contractor agree that the TWDB Supplemental Conditions apply to that work eligible for Texas Water Development Board assistance to be performed under this contract and these clauses supersede any conflicting provisions of this contract.

### **2. PRIVITY OF CONTRACT**

Funding for this project is expected to be provided in part by the Texas Water Development Board. Neither the State of Texas, nor any of its departments, agencies or employees is, or will be, a party to this contract or any lower tier contract. This contract is subject to applicable provisions 31 TAC Chapters 363 and 375 in effect on the date of the assistance award for this project.

### **3. DEFINITIONS**

- (a) The term Owner means the local entity contracting for the construction services.
- (b) The term "TWDB" means the Executive Administrator of the Texas Water Development Board, or other person who may be at the time acting in the capacity or authorized to perform the functions of such Administrator, or the authorized representative thereof.

### **4. LAWS TO BE OBSERVED**

In the execution of the Contract, the Contractor must comply with all applicable Local, State and Federal laws, including but not limited to laws concerned with labor, safety, minimum wages, and the environment. The Contractor shall make himself familiar with and at all times shall observe and comply with all Federal, State, and Local laws, ordinances and regulations which in any manner affect the conduct of the work, and shall indemnify and save harmless the Owner, Texas Water Development Board, and their representatives against any claim arising from violation of any such law, ordinance or regulation by himself or by his subcontractor or his employees.

### **5. REVIEW BY OWNER, and TWDB**

- (a) The Owner, authorized representatives and agents of the Owner, and TWDB shall, at all times have access to and be permitted to observe and review all work, materials, equipment, payrolls, personnel records, employment conditions, material invoices, and other relevant data and records pertaining to this Contract, provided, however that all instructions and approval with respect to the work will be given to the Contractor only by the Owner through authorized representatives or agents.
- (b) Any such inspection or review by the TWDB shall not subject the State of Texas to any action for damages.

### **6. PERFORMANCE AND PAYMENT BONDS**

Each contractor awarded a construction contract furnish performance and payment bonds:

- (a) the performance bond shall include without limitation guarantees that work done under the contract will be completed and performed according to approved plans and specifications and in accordance with sound construction principles and practices; and



(b) the performance and payment bonds shall be in a penal sum of not less than 100 percent of the contract price and remain in effect for one year beyond the date of approval by the engineer of the political subdivision.

(c) The contractor shall utilize a surety company which is authorized to do business in Texas in accordance with Art. 7.19-1. Bond of Surety Company; Chapter 7 of the Insurance Code

## **7. PROGRESS PAYMENTS AND PAYMENT SCHEDULE**

(a) The Contractor shall submit for approval immediately after execution of the Agreement, a carefully prepared Progress Schedule, showing the proposed dates of starting and completing each of the various sections of the work, the anticipated monthly payments to become due the Contractor, and the accumulated percent of progress each month.

(b) The following paragraph applies only to contracts awarded on a lump sum contract price:

**COST BREAKDOWN** - The Contractor shall submit to the Owner a detailed breakdown of his estimated cost of all work to be accomplished under the contract, so arranged and itemized as to meet the approval of the Owner or funding agencies. This breakdown shall be submitted promptly after execution of the agreement and before any payment is made to the Contractor for the work performed under the Contract. After approval by the Owner the unit prices established in the breakdown shall be used in estimating the amount of partial payments to be made to the Contractor.

(c) Progress Payments

(1) The Contractor shall prepare his requisition for progress payment as of the last day of the payment month and submit it, with the required number of copies, to the Engineer for his review. Except as provided in Paragraph (3) of this subsection, the amount of the payment due the Contractor shall be determined by adding to the total value of work completed to date, the value of materials properly stored on the site and deducting (1) five percent (5%) minimum of the total amount, as a retainage and (2) the amount of all previous payments. The total value of work completed to date shall be based on the actual or estimated quantities of work completed and on the unit prices contained in the agreement (or cost breakdown approved pursuant to section 6.b relating to lump sum bids) and adjusted by approved change orders. The value of materials properly stored on the site shall be based upon the estimated quantities of such materials and the invoice prices. Copies of all invoices shall be available for inspection by the Engineer.

(2) The Contractor shall be responsible for the care and protection of all materials and work upon which payments have been made until final acceptance of such work and materials by the Owner. Such payments shall not constitute a waiver of the right of the Owner to require the fulfillment of all terms of the Contract and the delivery of all improvements embraced in this Contract complete and satisfactory to the Owner in all details.

(3) This clause applies to contracts when the Owner is a Municipal Utility District, or Water Control and Improvement District. The retainage shall be ten percent minimum of the amount otherwise due until at least fifty percent of the work has been completed. After the project is fifty percent completed, the District may reduce the retainage from ten percent to no less than five percent.

(4) The five percent (5%) minimum retainage of the progress payments due to the Contractor may not be reduced until the building of the project is substantially complete and a reduction in the retainage has been authorized by the TWDB.

- (5) The following clause applies only to contracts where the total price at the time of execution is \$400,000 or greater and the retainage is greater than 5% and the Owner is not legally exempted from the condition (i.e. certain types of water districts).

The Owner shall deposit the retainage in an interest-bearing account, and the interest earned on such retainage funds shall be paid to the Contractor after completion of the contract and final acceptance of the project by the Owner.

- (d) **Withholding Payments.** The Owner may withhold from any payment otherwise due the Contractor so much as may be necessary to protect the Owner and if so elects may also withhold any amounts due from the Contractor to any subcontractors or material dealers, for work performed or material furnished by them. The foregoing provisions shall be construed solely for the benefit of the Owner and will not require the Owner to determine or adjust any claims or disputes between the Contractor and his subcontractors or Material dealers, or to withhold any moneys for their protection unless the Owner elects to do so. The failure or refusal of the Owner to withhold any moneys from the Contractor shall in no way impair the obligations of any surety or sureties under any bond or bonds furnished under this Contract.
- (e) **Payments Subject to Submission of Certificates.** Each payment to the Contractor by the Owner shall be made subject to submission by the Contractor of all written certifications required of him and his subcontractors by Section 3 hereof (relating to labor standards) and other general and special conditions elsewhere in this contract.
- (f) **Final Payment.**
- (1) Upon satisfactory completion of the work performed under this contract, as a condition before final payment under this contract or as a termination settlement under this contract the contractor shall execute and deliver to the Owner a release of all claims against the Owner arising under, or by virtue of, this contract, except claims which are specifically exempted by the contractor to be set forth therein. Unless otherwise provided in this contract, by State law or otherwise expressly agreed to by the parties to this contract, final payment under this contract or settlement upon termination of this contract shall not constitute a waiver of the Owner's claims against the contractor or his sureties under this contract or applicable performance and payment bonds.
  - (2) After final inspection and acceptance by the Owner of all work under the Contract, the Contractor shall prepare his requisition for final payment which shall be based upon the carefully measured or computed quantity of each item of work at the applicable unit prices stipulated in the Agreement or cost breakdown (if lump sum), as adjusted by approved change orders. The total amount of the final payment due the Contractor under this contract shall be the amount computed as described above less all previous payments.
  - (3) The retainage and its interest earnings, if any, shall not be paid to the Contractor until the TWDB has authorized a reduction in, or release of, retainage on the contract work.
  - (4) Withholding of any amount due the Owner, under general and/or special conditions regarding "Liquidated Damages," shall be deducted from the final payment due the Contractor.

## 8. WORKMAN'S COMPENSATION INSURANCE COVERAGE

- (a) The contractor shall certify in writing that the contractor provides workers' compensation insurance coverage for each employee of the contractor employed on the public project.
- (b) Each subcontractor on the public project shall provide such a certificate relating to coverage of the subcontractor's employees to the general contractor, who shall provide the subcontractor's certificate to the governmental entity.
- (c) A contractor who has a contract that requires workers' compensation insurance coverage may provide the coverage through a group plan or other method satisfactory to the governing body of the governmental entity.
- (d) The employment of a maintenance employee by an employer who is not engaging in building or construction as the employer's primary business does not constitute engaging in building or construction.
- (e) In this section:
  - (1) "Building or construction" includes:
    - (A) erecting or preparing to erect a structure, including a building, bridge, roadway, public utility facility, or related appurtenance;
    - (B) remodeling, extending, repairing, or demolishing a structure; or
    - (C) otherwise improving real property or an appurtenance to real property through similar activities.
  - (2) "Governmental entity" means this state or a political subdivision of this state. The term includes a municipality.

## 9. CHANGES

- (a) The Owner may at any time, without notice to any surety, by written order, make any change in the work within the general scope of the contract, including but not limited to changes:
  - (1) In the specifications (including drawings and designs);
  - (2) In the time, method or manner of performance of the work;
  - (3) In the Owner-furnished facilities, equipment, materials, services or site, or
  - (4) Directing acceleration in the performance of the work.
  - (5) The original contract price may not be increased under this section by more than 25 percent. The original contract price may not be decreased under this section by more than 25 percent without the consent of the contractor. (Local Government Code 271.060)
- (b) A change order shall also be any other written order (including direction, instruction, interpretation or determination) from the Owner which causes any change, provided the contractor gives the Owner written notice stating the date, circumstances and source of the order and that the contractor regards the order as a change order.
- (c) Except as provided in this clause, no order, statement or conduct of the Owner shall be treated as a change under this clause or entitle the contractor to an equitable adjustment.
- (d) If any change under this clause causes an increase or decrease in the contractor's cost or the time required to perform any part of the work under this contract, whether or not changed by any order, the Owner shall make an equitable adjustment and modify the contract in writing. Except for claims based on defective specifications, no claim for any change under paragraph (a)(2) above shall be allowed for any costs incurred more than 20 days before the contractor gives written notice as required in paragraph (a)(2). In the case of defective specifications for which the Owner is responsible, the equitable adjustment shall include any increased cost the contractor reasonably incurred in attempting to comply with those defective specifications.
- (e) If the contractor intends to assert a claim for an equitable adjustment under this clause, the contractor must, within 30 days after receipt of a written change order under paragraph (a) (I) or the furnishing of a written notice under paragraph (a) (2), submit a written statement to the Owner setting forth the general nature and monetary extent of such claim. The Owner may extend the 30-

day period. The contractor may include the statement of claim in the notice under paragraph (2) of this changes clause.

- (f) No claim by the contractor for an equitable adjustment shall be allowed if made after final payment under this contract.
- (g) Changes that involve an increase in price will be supported by documentation of the costs components in a format acceptable to the Owner.

## 10. PREVAILING WAGE RATES

### INSERT WAGE RATE DETERMINATION

Insert Wage Rate Determinations indicating which construction type is being used. (More than one may be **checked**).

- (a)  Construction Type: Heavy determination

Includes those projects that are not properly classified as either "building," "highway," or "residential." Unlike these classifications, heavy construction is not a homogenous classification. Because of this catch-all nature, projects within the heavy classification may sometimes be distinguished on the basis of their particular project characteristics, and separate schedules may be issued for dredging projects, water and sewer line projects, dams, major bridges, and flood control projects.

- (b)  Construction Type: Highway determination

Includes construction, alteration or repair of roads, streets, highways, runways, taxiways, alleys, trails, paths, parking areas, and other similar projects not incidental to building or heavy construction.

- (c)  Construction Type: Building determination

Includes construction of sheltered enclosures with walk-in access for the purpose of housing persons, machinery, equipment or supplies; all construction of such structures; the installation of utilities and of equipment, both above and below grade levels; as well as incidental grading, utilities and paving. Such structures need not be "habitable" to be building construction. Also, the installation of heavy machinery and/or equipment does not generally change the project's character as a building.

- (d)  Construction Type: Residential

Includes the construction, alteration or repair of single-family houses, apartment buildings of no more than four stories in height. This includes all incidental items such as site work, parking areas, utilities, streets, and sidewalks.

As per DOL guidance, anything that cannot be classified as Building construction, Highway construction, or Residential construction defaults to Heavy construction. Some contracts or projects may require more than one general schedule to be included depending on the nature and extent of the work.

**Texas Water Development Board  
Mandatory Davis-Bacon Act Contract Conditions  
For CWSRF & DWSRF Funded Projects**

**PLEASE NOTE: This language must be included in all Davis-Bacon covered construction contracts and subcontracts. (29 CFR Part 5.5).**

(a) The Agency head shall cause or require the contracting officer to insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole or in part from federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in Sec. 5.1, the following clauses (or any modifications thereof to meet the particular needs of the agency, Provided, That such modifications are first approved by the Department of Labor):

**(1) Minimum wages**

(i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in Sec. 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii) (A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (2) The classification is utilized in the area by the construction industry; and
- (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act must have been met. The Secretary of

Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

**(2) Withholding**

The OWNER shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

**(3) Payrolls and basic records**

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b) (2) (B) of the Davis- Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the OWNER if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to the OWNER. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and

home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the applicant, sponsor, or owner, as the case may be, for transmission to the applicant, sponsor, or owner, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

- (B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
- (1) That the payroll for the payroll period contains the information required to be provided under Sec. 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under Sec. 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
  - (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;
  - (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- (C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.
- (D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.
- (iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the OWNER or the Department of Labor, and shall permit such



representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

**(4) Apprentices and trainees**

- (i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by

formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- (iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended and 29 CFR part 30.

(5) **Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) **Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) **Contract termination: debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) **Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) **Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the

contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

**(10) Certification of eligibility**

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

**(b) Contract Work Hours and Safety Standards Act.** The Agency Head shall cause or require the contracting officer to insert the following clauses set forth in paragraphs (b) (1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Sec. 5.5(a) or 4.6 of part 4 of this title. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b) (1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b) (1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b) (1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The OWNER shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any

liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b) (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b) (1) through (4) of this section.

(c) In addition to the clauses contained in paragraph (b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in Sec. 5.1, the Agency Head shall cause or require the contracting officer to insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Agency Head shall cause or require the contracting officer to insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the OWNER and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

**The following form, Monthly Davis Bacon Act Certificate of Compliance Submittal by Recipient (DB-0154), must be completed by the project recipient and submitted with each monthly/quarterly outlay report. (Information on outlay reporting may be accessed at: <http://www.twdb.state.tx.us/assistance/financial/outlay/>)**

## Additional Forms

The following forms are suggestions only and may be used as tools which may aid in complying with the Davis Bacon requirements.

# STATEMENT OF COMPLIANCE CERTIFICATION BY CONTRACTOR for SRF Davis-Bacon Requirements

In accordance with Title 29 CFR Part 5.5 each monthly pay request estimate must be accompanied by a statement of compliance certificate executed by each prime contractor employing mechanics and laborers at the work site in which the federal government is to participate. The prime contractor may choose to use the statement of compliance located on the back of the DOL Payroll Form WH-347 or the following:

Date: \_\_\_\_\_

Estimate Number: \_\_\_\_\_ for the period \_\_\_\_\_ to \_\_\_\_\_

Name of Project: \_\_\_\_\_ Location: \_\_\_\_\_

Contract Number: \_\_\_\_\_ Date Contract Awarded: \_\_\_\_\_

TWDB SRF Project No.: \_\_\_\_\_

I hereby certify that all of the contract requirements in the “**Mandatory Davis-Bacon Contract Conditions**” (DB-0152) have been complied with by:

\_\_\_\_\_ as principal contractor and by each subcontractor  
Name of Contractor

employing mechanics or laborers at the site of the work, or there is a substantial dispute with respect to the required provisions.

\_\_\_\_\_  
Name and Contractor/Subcontractor

\_\_\_\_\_  
Signature and Title

Notes: This Statement of Compliance Certification by Contractor for SRF Davis-Bacon Requirements (DB-0155) may be placed on the pay request or on a separate sheet attached to the invoice.

**DOL Payroll form WH-347** <http://webapps.dol.gov/libraryforms/go-us-dol-form.asp?FormNumber=38>



**U.S. Department of Labor**  
Wage and Hour Division

**PAYROLL**  
(For Contractor's Optional Use; See instructions at [www.dol.gov/whd/forms/wh347instr.htm](http://www.dol.gov/whd/forms/wh347instr.htm))

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.

OMB No.: 1215-0149  
Expires: 12/31/2011

NAME OF CONTRACTOR  OR SUBCONTRACTOR

ADDRESS

PROJECT AND LOCATION

PROJECT OR CONTRACT NO.

PAYROLL NO.

FOR WEEK ENDING

NO OF EMPLOYEES INCLUDING EMPLOYERS

NO OF WORKERS

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) NO OF EMPLOYEES INCLUDING EMPLOYERS	(3) WORK CLASSIFICATION	(4) DAY AND DATE		(5) TOTAL HOURS WORKED EACH DAY	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS			(9) NET WAGES PAID FOR WEEK	
			MON	TUE				FICA	WITH- HOLDING TAX	OTHER		TOTAL DEDUCTIONS

While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a), The Copeland Act (40 U.S.C. § 3145) contractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(i) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and Federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

**Public Burden Statement**  
We estimate that it will take an average of 55 minutes to complete this collection, including time for reviewing instructions, gathering existing data sources, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W., Washington, D.C. 20210

Date \_\_\_\_\_

I, \_\_\_\_\_ (Name of Signatory Party) \_\_\_\_\_ (Title) do hereby state:

(1) That I pay or supervise the payment of the persons employed by \_\_\_\_\_ (Contractor or Subcontractor) on the \_\_\_\_\_ (Building or Work) \_\_\_\_\_ that during the payroll period commencing on the \_\_\_\_\_ day of \_\_\_\_\_ and ending the \_\_\_\_\_ day of \_\_\_\_\_ all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said \_\_\_\_\_ (Contractor or Subcontractor) from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

— in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

— Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

\_\_\_\_\_

NAME AND TITLE \_\_\_\_\_ SIGNATURE \_\_\_\_\_

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.



# EMPLOYEE RIGHTS UNDER THE DAVIS-BACON ACT

## FOR LABORERS AND MECHANICS EMPLOYED ON FEDERAL OR FEDERALLY ASSISTED CONSTRUCTION PROJECTS

THE UNITED STATES DEPARTMENT OF LABOR WAGE AND HOUR DIVISION

**PREVAILING  
WAGES**

You must be paid not less than the wage rate listed in the Davis-Bacon Wage Decision posted with this Notice for the work you perform.

**OVERTIME**

You must be paid not less than one and one-half times your basic rate of pay for all hours worked over 40 in a work week. There are few exceptions.

**ENFORCEMENT**

Contract payments can be withheld to ensure workers receive wages and overtime pay due, and liquidated damages may apply if overtime pay requirements are not met. Davis-Bacon contract clauses allow contract termination and debarment of contractors from future federal contracts for up to three years. A contractor who falsifies certified payroll records or induces wage kickbacks may be subject to civil or criminal prosecution, fines and/or imprisonment.

**APPRENTICES**

Apprentice rates apply only to apprentices properly registered under approved Federal or State apprenticeship programs.

**PROPER PAY**

If you do not receive proper pay, or require further information on the applicable wages, contact the Contracting Officer listed below:

or contact the U.S. Department of Labor's Wage and Hour Division.



For additional information:

**1-866-4-USWAGE**  
(1-866-487-9243) TTY: 1-877-889-5627



**WWW.WAGEHOUR.DOL.GOV**

U.S. Department of Labor | Employment Standards Administration | Wage and Hour Division

WH 1321 (Revised April 2009)

## 11. EQUAL EMPLOYMENT OPPORTUNITY AND AFFIRMATIVE ACTION

This provision only applies to Clean Water State Revolving Fund Program projects and Drinking Water Financial Assistance Program projects which receive funds made directly available by Federal funding and the contract agreement is for more than \$10,000.

During the performance of this contract, the Contractor agrees as follows:

- (a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, handicap, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, age, handicap, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- (b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, age, handicap, or national origin.
- (c) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (d) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, the Age Discrimination in Employment Act of 1967, 29 U.S.C.A. 621 (1985), Executive Order 12250 of November 2, 1980, the Rehabilitation Act of 1973, 29 U.S.C.A. 701 et seq. (1985), and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (e) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (f) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- (g) The Contractor will include the portion of the sentence immediately preceding paragraph (a) and the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: PROVIDED, HOWEVER, That in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interest of the United States.

- (h) The Contractor will comply with Executive Order 11246 based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4 and its efforts to meet the goals established for the geographical area where the Contract is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the Contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the Contract, the Executive Order, and the regulations in 41 CFR Part 60-4. The goals are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any office of federal contract compliance programs office or from federal procurement contracting officers (512) 229-5835. The Contractor is expected to make substantially uniform progress toward its goal in each craft during the period specified.

Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the notice which contains the applicable goals set for minority and female participation and which is set forth in the solicitations from which this contract resulted.

## **12. ARCHEOLOGICAL DISCOVERIES AND CULTURAL RESOURCES**

No activity which may affect properties listed or properties eligible for listing in the National Register of Historic Places, or eligible for designation as a State Archeological Landmark is authorized until the Owner has complied with the provisions of the National Historic Preservation Act and the Antiquities Code of Texas. The Owner has previously coordinated with the appropriate agencies and impacts to known cultural or archeological deposits have been avoided or mitigated. However, the Contractor may encounter unanticipated cultural or archeological deposits during construction.

If archeological sites or historic structures which may qualify for designation as a State Archeological Landmark according to the criteria in 13 TAC 41.6 - 41.10, or that may be eligible for listing on the National Register of Historic Places in accordance with 36 CFR Part 800, are discovered after construction operations are begun, the Contractor shall immediately cease operations in that particular area and notify the Owner, the TWDB, and the Texas Antiquities Committee, P.O. Box 12276, Capitol Station, Austin, Texas 78711-2276. The Contractor shall take reasonable steps to protect and preserve the discoveries until they have been inspected by the Owner's representative and the TWDB. The Owner will promptly coordinate with the State Historic Preservation Officer and any other appropriate agencies to obtain any necessary approvals or permits to enable the work to continue. The Contractor shall not resume work in the area of the discovery until authorized to do so by the Owner.

## **13. ENDANGERED SPECIES**

No activity is authorized that is likely to jeopardize the continued existence of a threatened or endangered species as listed or proposed for listing under the Federal Endangered Species Act (ESA), and/or the State of Texas Parks and Wildlife Code on Endangered Species, or to destroy or adversely modify the habitat of such species.

If a threatened or endangered species is encountered during construction, the Contractor shall immediately cease work in the area of the encounter and notify the Owner, who will immediately implement actions in accordance with the ESA and applicable State statutes. These actions shall include reporting the encounter

to the TWDB, the U. S. Fish and Wildlife Service, and the Texas Parks and Wildlife Department, obtaining any necessary approvals or permits to enable the work to continue, or implement other mitigation actions. The Contractor shall not resume construction in the area of the encounter until authorized to do so by the Owner.

#### **14. HAZARDOUS MATERIALS**

Materials utilized in the project shall be free of any hazardous materials, except as may be specifically provided for in the specifications.

If the Contractor encounters existing material on sites owned or controlled by the Owner or in material sources that are suspected by visual observation or smell to contain hazardous materials, the Contractor shall immediately notify the Engineer and the Owner. The Owner will be responsible for the testing for and removal or disposition of hazardous materials on sites owned or controlled by the Owner. The Owner may suspend the work, wholly or in part during the testing, removal or disposition of hazardous materials on sites owned or controlled by the Owner.

#### **15. PROJECT SIGN**

A project IDENTIFICATION SIGN will be provided to the contractor. The contractor shall erect the sign in a prominent location at the construction project site or along a major thoroughfare within the community as directed by the Owner.

#### **16. OPERATION AND MAINTENANCE MANUALS AND TRAINING**

(a) The Contractor shall obtain installation, operation, and maintenance manuals from manufacturers and suppliers for equipment furnished under the contract. The Contractor shall submit three copies of each complete manual to the Engineer within 90 days after approval of shop drawings, product data, and samples, and not later than the date of shipment of each item of equipment to the project site or storage location.

(b) The Owner shall require the Engineer to promptly review each manual submitted, noting necessary corrections and revisions. If the Engineer rejects the manual, the Contractor shall correct and resubmit the manual until it is acceptable to Engineer as being in conformance with design concept of project and for compliance with information given in the Contract Documents. Owner may assess Contractor a charge for reviews of same items in excess of three (3) times. Such procedure shall not be considered cause for delay. Acceptance of manuals by Engineer does not relieve Contractor of any requirements of terms of Contract.

(c) The Contractor shall provide the services of trained, qualified technicians to check final equipment installation, to assist as required in placing same in operation, and to instruct operating personnel in the proper manner of performing routine operation and maintenance of the equipment.

(d) Operations and maintenance manuals specified hereinafter are in addition to any operation, maintenance, or installation instructions required by the Contractor to install, test, and start-up the equipment.

(e) Each manual to be bound in a folder and labeled to identify the contents and project to which it applies. The manual shall contain the following applicable items:

- (1) A listing of the manufacturer's identification, including order number, model, serial number, and location of parts and service centers.

- (2) A list of recommended stock of parts, including part number and quantity.
- (3) Complete replacement parts list.
- (4) Performance data and rating tables.
- (5) Specific instructions for installation, operation, adjustment, and maintenance.
- (6) Exploded view drawings for major equipment items.
- (7) Lubrication requirements.
- (8) Complete equipment wiring diagrams and control schematics with terminal identification.

## **17. AS-BUILT DIMENSIONS AND DRAWINGS**

- (a) Contractor shall make appropriate daily measurements of facilities constructed and keep accurate records of location (horizontal and vertical) of all facilities.
- (b) Upon completion of each facility, the Contractor shall furnish Owner with one set of direct prints, marked with red pencil, to show as-built dimensions and locations of all work constructed. As a minimum, the final drawings shall include the following:
  - (1) Horizontal and vertical locations of work.
  - (2) Changes in equipment and dimensions due to substitutions.
  - (3) "Nameplate" data on all installed equipment.
  - (4) Deletions, additions, and changes to scope of work.
  - (5) Any other changes made.

Forms to be submitted with executed contracts:

1. Contractor's act of Assurance (ED-103)
2. Contractor's Resolution on Authorized Representative (ED-104)

## CONTRACTOR'S ACT OF ASSURANCE

STATE OF TEXAS

COUNTY OF \_\_\_\_\_

**BEFORE ME,** \_\_\_\_\_, a Notary Public duly commissioned and qualified in and for the County of \_\_\_\_\_ in the State of Texas came and appeared \_\_\_\_\_, as represented by \_\_\_\_\_, the corporations \_\_\_\_\_, who declares he/she is authorized to represent \_\_\_\_\_ pursuant to provisions of a resolution adopted by said corporation on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ (a duly certified copy of such resolution is attached to and is hereby made a part of this document).

\_\_\_\_\_, as the representative of \_\_\_\_\_, declares that \_\_\_\_\_ assures the Texas Water Development Board that it will construct \_\_\_\_\_ project at \_\_\_\_\_, Texas, in accordance with sound construction practice, all laws of the State of Texas, and the rules of the Texas Water Development Board.

**GIVEN UNDER MY HAND** and seal of office this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ A.D.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name

My Commission expires \_\_\_\_\_

## CONTRACTOR'S RESOLUTION ON AUTHORIZED REPRESENTATIVE

\_\_\_\_\_  
Name or Names

I hereby certify that it was RESOLVED by a quorum of the directors of the

\_\_\_\_\_, meeting  
Name of Corporation  
on the day of \_\_\_\_\_, 20\_\_, that \_\_\_\_\_,  
\_\_\_\_\_, and \_\_\_\_\_, be, and hereby is,  
authorized to act on behalf of \_\_\_\_\_, as its  
Name of Corporation

representative, in all business transactions conducted in the State of Texas, and;

That all above resolution was unanimously ratified by the Board of Directors at said meeting and that the resolution has not been rescinded or amended and is now in full forces and effect; and;

In authentication of the adoption of this resolution, I subscribe my name and affix the seal of the corporation this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Secretary

(seal)

**SHEET INDEX**

DRAWING NUMBER	SHEET NUMBER	DESCRIPTION
G-00	1	TITLE SHEET
G-01	2	SHEET INDEX, BID QUANTITIES AND LEGEND
G-02	3	GENERAL NOTES
G-03	4	INDEX SHEET
G-04	5	OVERALL SURVEY CONTROL SHEET
G-05	6	PRIMARY HORIZONTAL CONTROL SHEET
G-06	7	PRIMARY HORIZONTAL CONTROL SHEET
G-07	8	PRIMARY HORIZONTAL CONTROL SHEET
G-08	9	PRIMARY VERTICAL CONTROL SHEET
G-09	10	PRIMARY VERTICAL CONTROL SHEET
G-10	11	PRIMARY VERTICAL CONTROL SHEET
<b>PLAN AND PROFILE SHEETS</b>		
C-25	12	STA. 296+00 TO STA. 308+00
C-26	13	STA. 308+00 TO STA. 350+50
C-27	14	STA. 350+50 TO STA. 358+00
C-28	15	STA. 358+00 TO STA. 370+00
C-29	16	STA. 370+00 TO STA. 382+00
C-30	17	STA. 382+00 TO STA. 394+00
C-31	18	STA. 394+00 TO STA. 406+00
C-32	19	STA. 406+00 TO STA. 418+00
C-33	20	STA. 418+00 TO STA. 430+00
C-34	21	STA. 430+00 TO STA. 441+00
C-35	22	STA. 441+00 TO STA. 454+00
C-36	23	STA. 454+00 TO STA. 466+00
C-37	24	STA. 466+00 TO STA. 478+00
C-38	25	STA. 478+00 TO STA. 490+00
C-39	26	STA. 490+00 TO STA. 501+50
C-40	27	STA. 501+50 TO STA. 514+00
C-41	28	STA. 514+00 TO STA. 526+00
C-42	29	STA. 526+00 TO STA. 538+00
C-43	30	STA. 538+00 TO STA. 549+00
C-44	31	STA. 549+00 TO STA. 600+13
C-144	32	TOYOTA LIFT STATION TIE-IN
<b>STRUCTURAL SHEETS</b>		
S-12	33	STRUCTURAL GENERAL NOTES
S-13	34	STRUCTURAL DEEP EXCAVATIONS & TEMPORARY SPECIAL SHORING
S-14	35	STRUCTURAL TYPICAL SECTIONS & DETAILS (1 OF 2)
S-15	36	STRUCTURAL TYPICAL SECTIONS & DETAILS (2 OF 2)
S-16	37	INVERTED SIPHON #2 U.S. STRUCTURE
S-17	38	INVERTED SIPHON #2 U.S. SECTION & DETAILS
S-18	39	INVERTED SIPHON #2 D.S. STRUCTURE
S-19	40	INVERTED SIPHON #2 D.S. SECTION & DETAILS
S-20	41	MANHOLE DETAILS

**LEGEND (EXISTING ITEMS)**

---488---	EXISTING 2' CONTOUR		EXISTING TREE
---490---	EXISTING 10' CONTOUR	SS	EXISTING SANITARY SEWER
---x---	EXISTING BARBED WIRE FENCE	FM	EXISTING FORCE MAIN
---o---	EXISTING CHAIN LINK FENCE	SM	EXISTING SEWER MANHOLE
=====	EXISTING CONCRETE WALL/FENCE	8"W	EXISTING 8" POTABLE WATER
o	EXISTING FENCE POST	12"W	EXISTING 12" POTABLE WATER
-----	PROPERTY LINE	16"W	EXISTING 16" POTABLE WATER
---GAS---	EXISTING GAS LINE/PIPELINE	+	EXISTING FIRE HYDRANT
---OHE---	EXISTING OVERHEAD ELECTRIC		EXISTING BENCHMARK LOCATION
---UFO---	EXISTING UNDERGROUND FIBER OPTIC	+	EXISTING SIGN
---TELE---	EXISTING UNDERGROUND TELEPHONE	o-o	EXISTING GUARDRAIL
o	EXISTING POWER POLE	+++++	EXISTING RAILROAD
-----	EXISTING DRAINAGE/UTILITY EASEMENT	=====	EXISTING ASPHALT/ROAD

DRAWING NUMBER	SHEET NUMBER	DESCRIPTION
<b>DETAIL SHEETS</b>		
D-02	42	CONNECTION DETAILS
D-04	43	INVERTED SIPHON #2 GRADING DETAILS
D-08	44	TYPICAL TRENCH DETAILS
D-09	45	CONCRETE CAP AND ENCASEMENT DETAILS
D-10	46	BORING AND TUNNELING DETAILS
D-11	47	TEE BASE AND DROP MANHOLE DETAILS
D-12	48	MANHOLE SCHEDULE AND MANHOLE DETAILS
D-14	49	MISCELLANEOUS DETAILS
D-15	50	SLUICE GATE DETAILS
D-16	51	FENCING DETAILS
D-17	52	SIPHON #2 DIMENSIONAL DETAILS
<b>TREE PRESERVATION PLAN SHEETS</b>		
T-01	53	TREE PRESERVATION PLAN NOTES AND DETAILS
T-05	54	STA. 250+00 TO STA. 356+00
T-06	55	STA. 356+00 TO STA. 435+00
T-07	56	STA. 435+00 TO STA. 515+00
T-08	57	STA. 515+00 TO STA. 644+00
T-46	58	TOYOTA TREE PRESERVATION PLAN
<b>NATIVE SEED MIXTURE PLAN SHEETS</b>		
T-27	59	STA. 250+00 TO STA. 356+00
T-28	60	STA. 356+00 TO STA. 435+00
T-29	61	STA. 435+00 TO STA. 515+00
T-30	62	STA. 515+00 TO STA. 644+00
<b>TRAFFIC CONTROL SHEETS</b>		
TC-01	63	BARRICADE AND CONSTRUCTION STANDARDS - BC(1)-99
TC-02	64	BARRICADE AND CONSTRUCTION STANDARDS - BC(2)-98
TC-03	65	BARRICADE AND CONSTRUCTION STANDARDS - BC(3)-98
TC-04	66	BARRICADE AND CONSTRUCTION STANDARDS - BC(4)-99
TC-05	67	BARRICADE AND CONSTRUCTION STANDARDS - BC(5)-98
TC-06	68	BARRICADE AND CONSTRUCTION STANDARDS - BC(6)-98
TC-07	69	BARRICADE AND CONSTRUCTION STANDARDS - BC(7)-98
TC-08	70	BARRICADE AND CONSTRUCTION STANDARDS - BC(8)-98
TC-09	71	BARRICADE AND CONSTRUCTION STANDARDS - BC(9)-99
TC-10	72	BARRICADE AND CONSTRUCTION STANDARDS - BC(9A)-99
TC-11	73	BARRICADE AND CONSTRUCTION STANDARDS - BC(9B)-98
TC-12	74	BARRICADE AND CONSTRUCTION STANDARDS - BC(9C)-98
TC-13	75	BARRICADE AND CONSTRUCTION STANDARDS - BC-SA(1)-99
TC-14	76	BARRICADE AND CONSTRUCTION STANDARDS - BC-SA(2)-99
TC-15	77	BARRICADE AND CONSTRUCTION STANDARDS - BC-SA(3)-99
TC-16	78	TRAFFIC SIGN MOUNTING AND INSTALLATION DETAILS

1

**BID QUANTITIES**

ITEM NUMBER	DESCRIPTION	UNIT	QTY.
1	EROSION & SEDIMENTATION CONTROLS	LS	1
2	TRENCH EXCAVATION SAFETY PROTECTION	LF	21,743
3	REVEGETATION	SY	237,146
4	78" (FRP, SN 72)	LF	20,663
5	78" TEE BASE MH	EA	5
6	78" SPECIAL TEE BASE MH	EA	1
7	78" TEE BASE MH, MITER	EA	11
8	78" TEE BASE MH (DROP)	EA	8
9	78" TEE BASE MH, MITER (DROP)	EA	6
10	TEE BASE MH, 60" RISER EXTRA DEPTH	LF	307
11	TOYOTA LIFT STATION TIE IN	LS	1
12	FENCE GATE 16' (TYPE 1)	EA	3
13	REMOVE AND REPLACE FENCING	LF	410
14	BORING OR TUNNELING FOR 78" DIA. FRP	LF	192
15	CARRIER PIPE INSTALLED IN STEEL CASING OR TUNNEL LINER PLATE (78" DIA FRP)	LF	192
16	DOWNSTREAM SIPHON STRUCTURE NO. 2	LS	1
17	UPSTREAM SIPHON STRUCTURE NO. 2	LS	1
18	12" (FRP, SN 72) FOR SIPHON NO. 2	LF	530
19	36" (FRP, SN 72) FOR SIPHON NO. 2	LF	530
20	42" (FRP, SN 72) FOR SIPHON NO. 2	LF	530
21	30" HDPE (AIR BY-PASS PIPE)	LF	550
22	AIR BYPASS MANHOLE (FRP)	EA	2
23	ROCK RIP RAP (12" TO 18")	SY	889
24	CONCRETE CAP	LF	250
25	CONCRETE ENCASEMENT	LF	373
26	BYPASS PUMPING	LS	1
27	ABANDONMENT OF SANITARY SEWER MAIN AND MANHOLES	LF	400
28	TREE PROTECTION	LS	1
29	CONNECTION TO MRSO SEGMENT 1	LS	1
30	CONNECTION TO MRSO SEGMENT 3	LS	1
31	GRAVITY SEWER OUTFALL TESTING	LF	21,084

2

**LEGEND**

(PROPOSED ITEMS)

	PROPOSED GRADING CONTOUR
	PROPOSED SEWER EASEMENT
125+00	PROPOSED SEWER CENTERLINE STATION
	PROPOSED SEWER CENTERLINE
	PROPOSED SEWER PIPE
	PROPOSED SEWER FLOW DIRECTION
	PROPOSED DETAIL REFERENCE (SHEET/ITEM)
o	PROPOSED MANHOLE TEE BASE
o	PROPOSED DROP MANHOLE LOCATION
	PROPOSED SIPHON STRUCTURE
	PROPOSED CONCRETE ENCASEMENT
	PROPOSED CONCRETE CAP
	PROPOSED CASING
	PROPOSED EROSION CONTROL MAT
	PROPOSED REMOVABLE BOLLARD

**LEGEND**

(ABBREVIATIONS)

FRP	FIBER-REINFORCED PLASTIC PIPE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
CMP	CORRUGATED METAL PIPE
RCP	REINFORCED CONCRETE PIPE
PVC	POLYVINYL CHLORIDE PIPE
MH	MANHOLE
SS	SANITARY SEWER
FM	FORCE MAIN
WL	WATER LINE
BM	BENCHMARK
ECM	EROSION CONTROL MAT
ROW	RIGHT OF WAY
DS	DOWNSTREAM
US	UPSTREAM
UPRR	UNION PACIFIC RAILROAD
OPR	OFFICIAL PUBLIC RECORDS
PL	PROPERTY LINE
CL	CENTER LINE
EXTG	EXISTING
IRR	IRRIGATION
UFO	UNDERGROUND FIBER OPTIC

APP.	REVISION	DATE
BM		11/2/10
BM		11/16/10



**PAPE-DAWSON ENGINEERS**  
 SAN ANTONIO, TEXAS 78216  
 PHONE: 210.375.9000  
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 TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION # 470

**SAN ANTONIO WATER SYSTEM**  
**MEDINA RIVER SEWER OUTFALL PROJECT**  
 SAWS JOB NO. 11-2503  
**SHEET INDEX, BID QUANTITIES AND LEGEND**

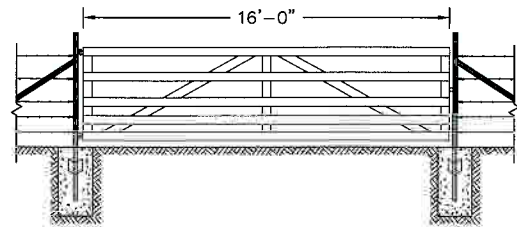
JOB NO.	6866-00
DATE	NOVEMBER 2010
DESIGNER	JJO
DRAWN	BS
CHECKED	BM
DRAWING No.	G-01
SHEET No.	2

Date: Nov 19, 2010, 10:46am User ID: BSmith  
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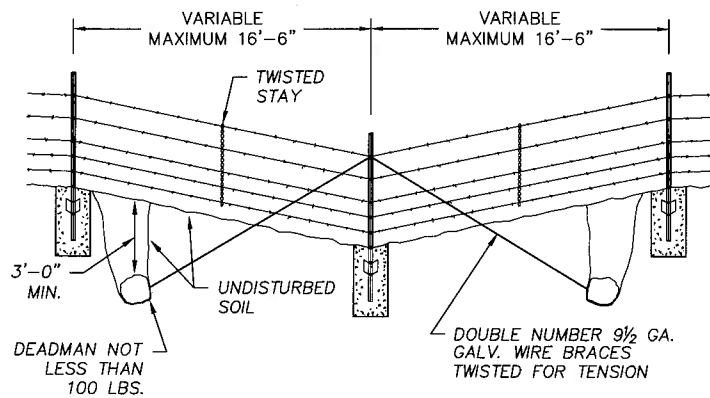
THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.



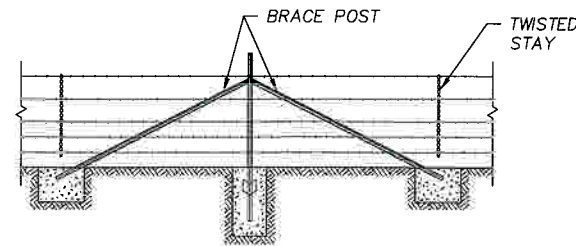
METAL GATE SHALL CONSIST OF 5 PANELS NOT LESS THAN 4'-4" HIGH AND SHALL BE ALUMINUM OR GALVANIZED METAL AND OF GOOD QUALITY. GATE AND HARDWARE SHALL MEET THE APPROVAL OF THE ENGINEER.



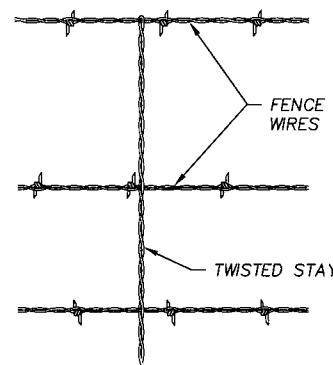
**TYPE 1 GATE DETAIL** D-16  
N.T.S. A



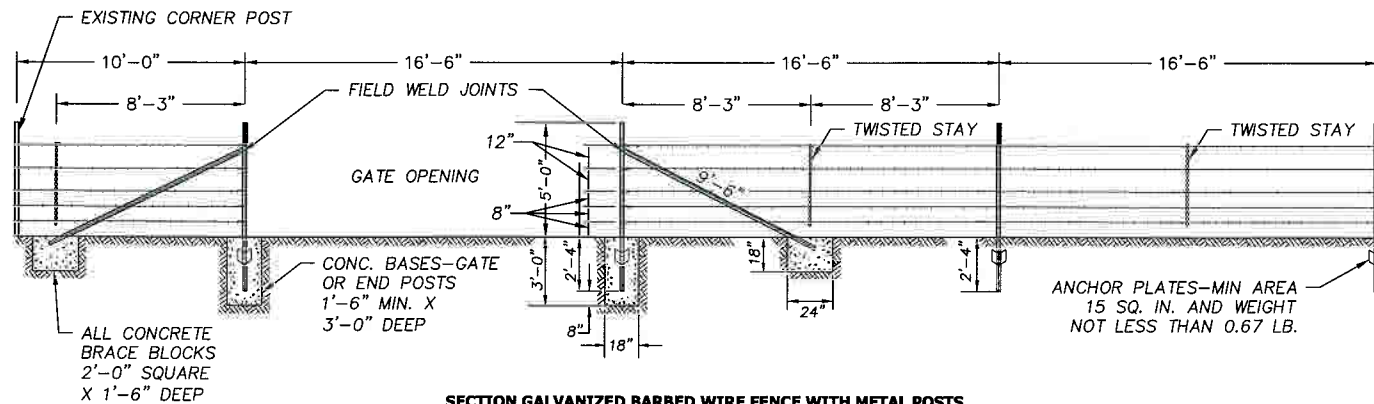
**FENCE SAG DETAIL** D-16  
N.T.S. D



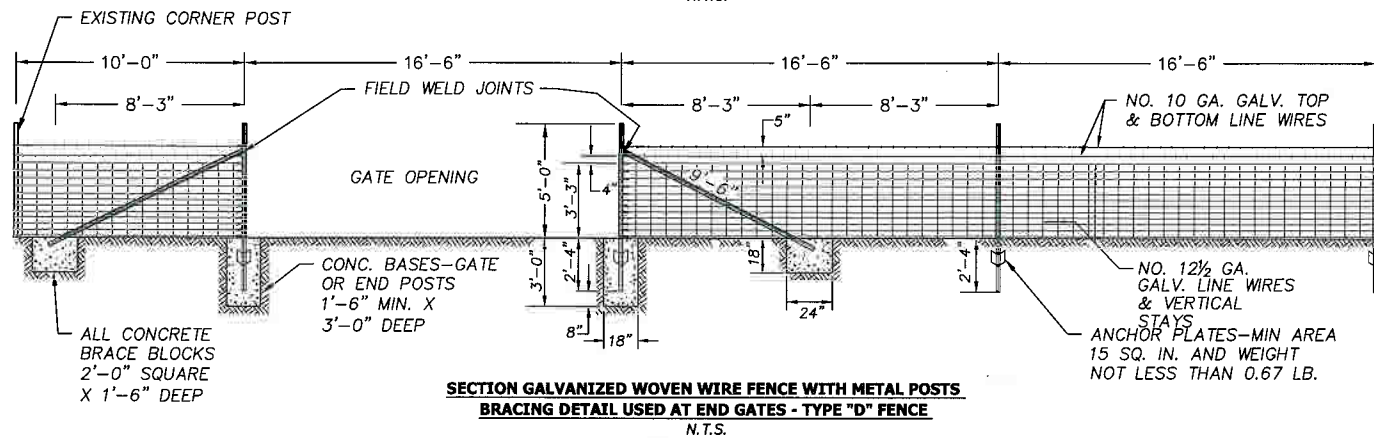
**CORNER OR PULL ASSEMBLY** D-16  
N.T.S. E



**DETAIL OF STAY** D-16  
N.T.S. F

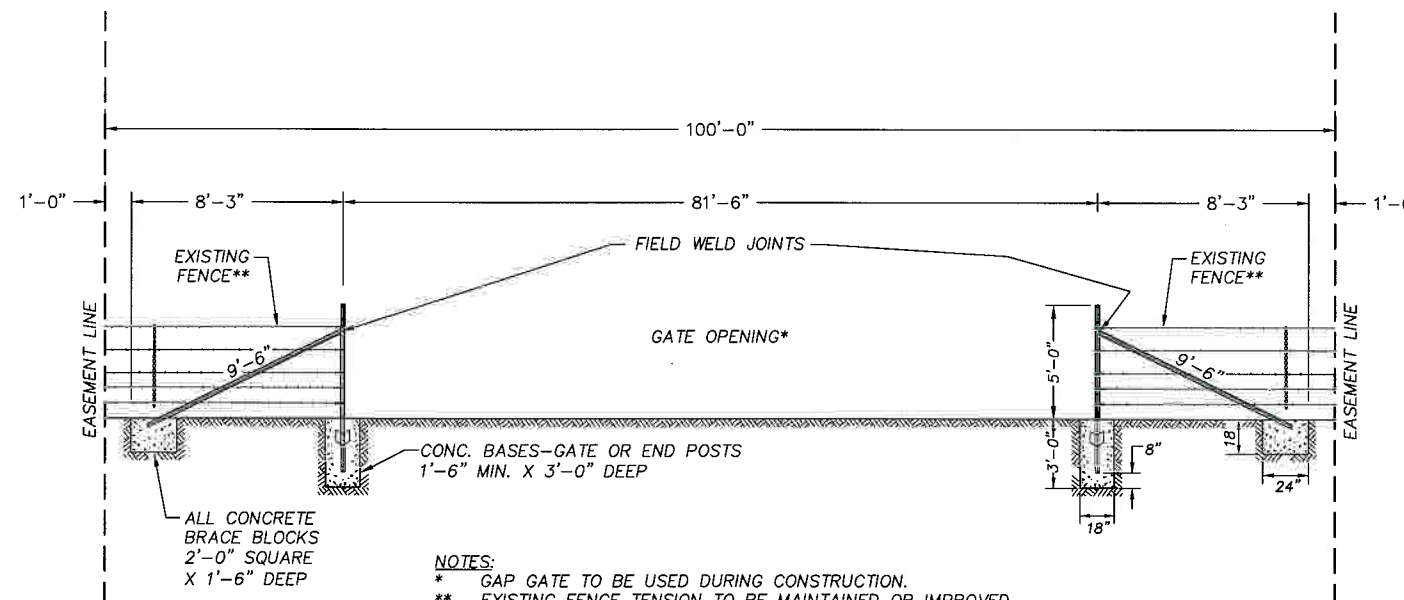


**SECTION GALVANIZED BARBED WIRE FENCE WITH METAL POSTS  
BRACING DETAIL USED AT END GATES - TYPE "C" FENCE**  
N.T.S.



**SECTION GALVANIZED WOVEN WIRE FENCE WITH METAL POSTS  
BRACING DETAIL USED AT END GATES - TYPE "D" FENCE**  
N.T.S.

**PERMANENT TYPICAL  
FENCE DETAILS** D-16  
N.T.S. B



**TEMPORARY CONSTRUCTION  
FENCE DETAIL** D-16  
N.T.S. C

**NOTES:**  
\* GAP GATE TO BE USED DURING CONSTRUCTION.  
\*\* EXISTING FENCE TENSION TO BE MAINTAINED OR IMPROVED.

**GENERAL NOTES**

1. CONTRACTOR SHALL MATCH PROPOSED FENCE TO EXISTING FENCE FOUND ON SITE.
2. ANY HIGH POINT WHICH INTERFERES WITH THE PLACING OF WIRE MESH SHALL BE EXCAVATED TO PROVIDE A 2 INCH CLEARANCE.
3. LATCHES FOR TYPE 1 AND TYPE 2 GATES SHALL BE GOOD COMMERCIAL QUALITY AND DESIGN LATCH OF THE SPRING FORK OR CHAIN TYPE. ALL LATCHES SHALL BE SUITABLE TO THE GATE AND SHALL BE APPROVED BY THE ENGINEER.
4. CONCRETE SHALL BE OF THE DESIGN AND CONSISTENCY APPROVED BY THE ENGINEER AND SHALL CONTAIN NOT LESS THAN 4 SACKS OF CEMENT PER CUBIC YARD.
5. HINGES FOR TYPE 2 GATES SHALL BE A COMMERCIAL DESIGN APPROVED BY THE ENGINEER SUITABLE FOR POST AND GATE.
6. ANCHOR PLATES SHALL BE OF A DESIGN AND THICKNESS SUFFICIENT TO PREVENT TURNING OF THE POST IN FIRM SOIL. METAL END, CORNER AND PULL POST SHALL BE A MINIMUM OF 2 INCH INSIDE DIAMETER PIPE MINIMUM (3.65 LBS./LIN.FT.) WITH MINIMUM 1/4 INCH INSIDE DIAMETER PIPE BRACE MINIMUM (2.27 LBS./LIN.FT.), MINIMUM 2 1/2" X 2 1/2" X 1/4" ANGLE (4.1 LBS./LIN.FT.) WITH MINIMUM 2" X 2" X 1/4" ANGLE BRACE (3.19 LBS./LIN.FT.) OR OTHER SECTION APPROVED BY THE ENGINEER. FASTENERS FOR SECURING BARBED WIRE OR WIRE MESH TO METAL POSTS SHALL BE A MINIMUM OF 11 GAUGE GALVANIZED STEEL WIRE. TUBULAR POSTS SHALL BE FITTED WITH WATER TIGHT MALLEABLE IRON CAPS.
7. GALVANIZED METAL LINE POSTS SHALL BE NOT LESS THAN 6'-6" IN LENGTH AND SHALL WEIGH NOT LESS THAN 1.33 LBS./LIN.FT.
8. THE LOCATION OF GATES WILL BE AS INDICATED IN THESE PLANS.

NO.	DATE	REVISION
1	11/19/10	APPROVAL # REVISIONS



**PAPE-DAWSON ENGINEERS**  
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**SAN ANTONIO WATER SYSTEM  
MEDINA RIVER SEWER OUTFALL PROJECT  
SAWS JOB NO. 11-2503  
FENCING DETAILS**

JOB NO.	6866-00
DATE	NOVEMBER 2010
DESIGNER	JQ
DRAWN	BS
CHECKED	BM
DRAWING No.	D-16
SHEET No.	51

Date: Nov 19, 2010, 10:45am User: BS Smith  
File: P:\6866\00 Design\Civil\Sewer\Bld Package 2\17686600-Sewer.dwg

**SPECIFICATION FOR  
TOWERS, STEEL, TRANSMISSION**

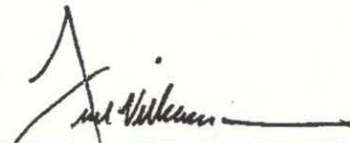
**Specification Number: 295-01**

**Approved Date: December 14, 2005**

**CPS ENERGY**

**P. O. Box 1771**

**San Antonio, Texas 78296**



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**Fred Vilaseñor, Chairman  
Service & Material Evaluation Committee**

Specification 295-01

CONTENTS

<u>SECTION</u>	<u>TITLE</u>
1.0	SCOPE
2.0	DESIGN CRITERIA
3.0	MATERIAL AND FABRICATION REQUIREMENTS
4.0	MARKING
5.0	QUALITY ASSURANCE - INSPECTIONS AND TESTS
6.0	INTERCHANGEABILITY
7.0	STRUCTURE DRAWINGS
8.0	ADDENDUM TO SPECIFICATION
9.0	RESPONSIBILITY
10.0	INFORMATION REQUIRED FROM SUPPLIER
11.0	QUALITY ASSURANCE (NEW STRUCTURE DESIGNS)
12.0	INSPECTION
13.0	SHIPPING INSTRUCTIONS
14.0	GENERAL INSTRUCTIONS
	DRAWINGS

## 1.0 SCOPE

1.1 Application. This specification covers the minimum acceptable requirements for steel transmission towers, which will be used to support electrical transmission line conductors.

1.2 Applicable Standards. Structures covered by this specification shall comply with the national standards listed below, as applicable, except where they conflict with the requirements of this specification. The order of precedence shall be this specification, then the following standards.

ACI 318-05; Building Code Requirements for Reinforced Concrete (American Concrete Institute)

AISC Steel Construction Manual, 9th Edition; (American Institute of Steel Construction)

ANSI/AWS D1.1-04; Structural Welding Code - Steel

ANSI/ASCE 10-97; American Society of Civil Engineers "Design of Latticed Steel Transmission Structures"

ASCE Guide for Design of Steel Transmission Towers, Manual No.52; Second Edition, American Society of Civil Engineers, 1988

ASTM A6-05a; General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling

ASTM A36-05; Carbon Structural Steel

ASTM A123-02; Zinc (Hot-Dip Galvanized) Coatings On Iron and Steel Products

ASTM A143-03; Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement

ASTM A153-05; Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A325-04b; Structural Bolts, Steel, Heat Treated, 120/105ksi Minimum Tensile Strength

ASTM A354-04; Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners

ASTM A370-05; Mechanical Testing of Steel Products

ASTM A384-02; Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies

ASTM A394-05; Steel Transmission Tower Bolts, Zinc-Coated and Bare

ASTM A563-04a; Carbon and Alloy Steel Nuts

ASTM A572-04; High-Strength Low-Alloy Columbium-Vanadium Structural Steel

ASTM A615-05a; Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

ASTM A767-05; Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement

ASTM E23-05; Notched Bar Impact Testing of Metallic Materials

ASTM F436-04; Hardened Steel Washers

ASTM F1554-04; Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength

AWS C2.18-93; Guide for the Protection of Steel With Thermal Sprayed Coatings of Aluminum and Zinc and Their Alloys and Composites

AWS C2.23-03; Application of Thermal Spray Coatings (Metallizing) of Aluminum, Zinc, and their Alloys and Composites for the Corrosion Protection of Steel

AWS TSM-96; Thermal Spray Manual

AWS TSS-85; Thermal Spraying Practice, Theory, and Application

IFI Fastener Standards - 2003; Fastener Standards, Seventh Edition - 2003, (Industrial Fasteners Institute)

## 2.0 DESIGN CRITERIA

2.1 Design Data. All data necessary to design the required tower(s) will be included on the CPS Energy design drawings, which will be sent with this specification. In case of conflict between the design drawings and this specification, the design drawings take precedence.

2.2 Electrical Clearances. The minimum electrical strike distance from any energized components to the tower steel shall be 5 feet for 138 kV structures and 8.5 feet for 345 kV structures unless otherwise noted on the CPS Energy design drawings. These distances are based on static conditions with no conductor swing.

2.3 Anchorage Requirements. Anchorage sections or assemblies for all structures shall be designed to transfer the structural loads to a reinforced concrete foundation. The concrete will have a minimum 28-day compressive strength of 3000 psi.

2.3.1 Wide-Base Type Transmission Structures. Wide base structures shall utilize stub angles fabricated from standard structural steel angle material.

2.3.2 Narrow-Base Type Transmission Structures. Narrow base structures shall utilize a direct-embedment section, and extensions as required, to satisfy the foundation design requirements. Minimum embedment length below grade will be specified on the CPS Energy design drawings.

2.3.3 Line Terminal Structures. Line terminal structures that will be used to terminate transmission line conductors in an electric substation may utilize a base plate and anchor bolt type system.

Anchor bolts may be used by CPS Energy to serve as reinforcing steel for foundations. Therefore, CPS Energy design drawings may specify a greater bolt length than that recommended by the supplier.

2.4 Tower Leg Splices. Towers shall be designed such that, at all leg splices, the upper leg sections shall fit over (on the outside of) the lower leg sections except where splice plates and/or splice angles are used.

2.5 Narrow Base Tower Configuration. Narrow base towers shall be symmetrical with all four sides alike unless otherwise specified on the CPS Energy design drawings.

2.6 Angle of shielding. The angle of shielding on tangent and running angles shall be as follows unless otherwise indicated on the CPS Energy design drawings:

<u>Tangent and Running Angles</u> <u>kV Rating</u>	<u>Angle of Shielding</u> <u>from Vertical</u>
138	30° or less
345	15° or less

2.7 Loading Factors. Structures shall be designed to withstand the combined loading factors as specified in this section.

2.7.1 Wind Loading. Structures shall be designed to withstand an actual wind velocity of 100 mph on the structure, conductors, shield wire(s), insulators and equipment with the applicable safety factor (O.L. Factor) applied. Where supporting structures have an overall height of less than 200 feet, the wind load shall be

determined using a constant wind pressure, "P", on surfaces as computed by the following formula:

$$P = 0.00256 V^2 C_D$$

in which P = pressure on the projected area, in pounds per square foot; V = design wind velocity in miles per hour; and  $C_D$  = drag coefficient. The following drag coefficients shall be utilized as applicable:

$C_D$  = 1.0 for wires and cylindrical surfaces

$C_D$  = 1.4 for octagonal shapes

$C_D$  = 1.6 for flat surfaces

2.7.1.1 Wind Direction. In calculating wind loading on the structure, the wind shall be applied to the structure in the direction(s) that result in maximum total load on the structure and maximum stresses on each structural member.

2.7.1.2 Insulator and Equipment Wind Loading. The projected area of wind loading per phase on insulator assemblies and switches is as follows:

<u>Equipment</u>	<u>Projected Area of Wind Loading* (Sq. Ft.)</u>	<u>Assembly Weight (Lbs.)</u>
138 kV insulator assembly	6.0	216
345 kV insulator assembly	13.3	584
138 kV horizontal switch	22.0	**
345 kV horizontal switch	45.0	**
138 kV 'V' switch, center break	16.0	**
345 kV 'V' switch, center break	32.0	**

\* The projected area of wind loading on equipment not specifically mentioned above shall be specified on the CPS Energy design drawings.

\*\* Weights will be specified on the CPS Energy design drawings when required.

2.7.1.3 Bundled Conductor Wind Loading. Transverse wind loading on bundled conductor shall be equal to the wind loading on a single conductor multiplied by the number of conductors in the bundle.

2.7.2 Weight Loading - Structure and Apparatus. In calculating weight loading on a structure, the weight of the structure and the weights of all apparatus to be mounted on the structure shall be included. When applicable, the weights of any equipment to be mounted on a structure (i.e., switches on a substation line terminal structure) will be specified on the CPS Energy design drawings.

2.7.3 Line Angle. The various types of towers shall be defined in accordance with the following line angle limits unless otherwise indicated on the CPS Energy design drawings:

<u>Tower Classification</u>	<u>Line Angle</u>
Tangent	3° maximum
Running Angle	over 3° to 25° maximum
Dead End	over 25°
Substation Line Terminal	±30°

2.7.4 Eccentric Loading - Dead End Towers. The dead-end plates and arms on dead-end structures shall be designed to withstand eccentric loading when the pull on the plates is in one direction only, as occurs during conductor stringing operations.

2.8 Over Load Factors.

2.8.1 CLASS I: TANGENT AND RUNNING ANGLE TOWERS, WIDE BASE, 138 KV OR LESS, CARRYING SINGLE OR BUNDLED CONDUCTOR

Loading Parameters: Single, Double and Triple Circuit Towers

Case 1 (all lines intact, 100 mph wind)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.25	a) Transverse and longitudinal components of the forces caused by wind on 1.5 faces of the tower
1.25	b) Transverse wind on bare conductors, shield wire and insulators



- 1.00 c) Vertical load of conductors, shield wire and insulator assembly, plus 1000 lbs. each on the outer ends of the conductor arms and 500 lbs. each on the outer ends of the shield wire arms
- 1.00 d) Dead weight of tower
- 1.10 e) Transverse components of longitudinal tensions

Case 2 (all lines intact, 1/2-inch thick radial ice, no wind)

<u>O.L. Factor</u>	<u>Type Loads to be Combined</u>
1.00	a) Dead weight of tower
1.10	b) Transverse components of longitudinal tensions
1.00	c) Vertical load of conductors, shield wire and insulator assembly, with 1/2-inch thick radial ice on conductors and shield wire plus 1000 lbs. each on the outer ends of the conductor arms and 500 lbs. each on the outer ends of the shield wire arms

Case 3 (one broken shield wire, 100 mph wind)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.25	a) Transverse and longitudinal components of the forces caused by wind on 1.5 faces of the tower
1.25	b) Transverse wind on bare conductors, shield wire and insulators
1.00	c) Vertical load on conductors, shield wire and insulator assembly, plus 1000 lbs. each on the outer ends of the conductor arms and 500 lbs. each on the outer ends of the shield wire arms
1.00	d) Dead weight of tower
1.10	e) Transverse components of longitudinal tensions
1.10	f) Transverse and longitudinal tension component of broken shield wire at shield wire attachment point

Case 4 (all lines intact at maximum design tension, no wind, no ice)

O. L. Factor

Type Loads to be Combined

1.00 With all lines intact and subject to the maximum design phase tension with no overload factor and no wind or ice, the structure shall be designed to resist the following additional load:

Each phase position shall be designed to withstand an additional load equal to 50% of the maximum design phase tension applied in the longitudinal direction. The longitudinal load shall be applied to the end, or tip, of the arm at the conductor hardware attachment point that is located farthest from the body of the structure. The structure shall be designed to withstand the forces caused by this load when the load is applied to any one (1) phase position at a time.

Each phase position on each circuit shall be analyzed, one position at a time, to determine the location of the longitudinal load that will have the greatest effect on the design of the main body of the structure.

2.8.2 CLASS II: DEAD END TOWERS, WIDE BASE AND SUBSTATION LINE TERMINAL STRUCTURES, 138 KV OR LESS, CARRYING SINGLE OR BUNDLED CONDUCTOR

Loading Parameters: Single, Double and Triple Circuit Towers

Case 1 (all lines intact, 100 mph wind)

O. L. Factor

Type Loads to be Combined

- |      |   |
|------|---|
| 1.25 | a) Transverse and longitudinal components of the forces caused by wind on 1.5 faces of the structure  |
| 1.25 | b) Transverse wind on bare conductors, shield wire, insulators and equipment  |
| 1.25 | c) Vertical load of conductors, shield wire and insulator assembly, plus 1000 lbs. each on the outer ends of the conductor arms and 500 lbs. each on the outer ends of the shield wire arms |
| 1.00 | d) Dead weight of structure and equipment   |
| 1.25 | e) Transverse component of longitudinal tensions  |

Case 2 (all lines intact, 1/2-inch thick radial ice, no wind)

<u>O.L. Factor</u>	<u>Type Loads to be Combined</u>
1.00	a) Dead weight of structure and equipment
1.25	b) Transverse components of longitudinal tensions
1.25	c) Vertical load of conductors, shield wire and insulator assembly, with 1/2-inch thick radial ice on conductors and shield wire plus 1000 lbs. each on the outer ends of the conductor arms and 500 lbs. each on the outer ends of shield wire arms

Case 3 (one broken shield wire, 100 mph wind) (not required for substation line terminal structures)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.25	a) Transverse and longitudinal components of the forces caused by wind on 1.5 faces of the structure
1.25	b) Transverse wind on bare conductors, shield wire and insulators
1.25	c) Vertical load on conductors, shield wire and insulator assembly, plus 1000 lbs. each on the outer ends of conductor arms and 500 lbs. each on the outer ends of the shield wire arms
1.00	d) Dead weight of structure
1.25	e) Transverse components of longitudinal tensions
1.25	f) Transverse and longitudinal tension component of broken shield wire at shield wire attachment point

Case 4 (structure loads under stringing operations)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.00	a) Dead weight of structure and equipment
1.25	b) Dead-end structures shall be designed for dead-ending on one side of the structure all conductors and shield wires or any combination of conductors and shield wires at maximum tension specified

- 1.00 c) Tower arms and all dead-end attachment points and associated structural members shall be designed to withstand a downward pull 45° from vertical up to the maximum tension specified for the purpose of stringing conductors and shield wires

2.8.3 CLASS III: TANGENT TOWERS AND RUNNING ANGLE TOWERS,  
NARROW BASE, 138 KV OR LESS, CARRYING SINGLE OR BUNDLED  
CONDUCTOR

Loading Parameters: Single and Double Circuit Towers

Case 1 (all lines intact, 100 mph wind)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.25	a) Transverse and longitudinal components of the forces caused by wind on 1.5 faces of the tower
1.25	b) Transverse wind on bare conductors, shield wire and insulators
1.25	c) Vertical load of conductors, shield wire and insulator assembly, plus 500 lbs. each on the outer ends of the conductor arms and the shield wire arms
1.00	d) Dead weight of tower
1.10	e) Transverse components of longitudinal tensions
1.25	f) When guy wires are used, design for downward pull of guy wire at a 45° angle, unless otherwise specified on the CPS Energy design drawings

Case 2 (all lines intact, 1/2-inch thick radial ice, no wind)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.00	a) Dead weight of tower
1.10	b) Transverse components of longitudinal tensions
1.25	c) Vertical load of conductors, shield wire and insulator assembly, with 1/2-inch thick radial ice on conductors and shield wire plus 500 lbs. each on outer ends of the conductor arms and the shield wire arms.

Broken Conductor(s).

The tower arms shall be designed such that, if a conductor breaks on a single conductor installation or all conductors in a bundle break on a bundled conductor installation, that arm will fail under a longitudinal load before the body of the tower is damaged.

2.8.4 CLASS IV: TANGENT AND RUNNING ANGLE TOWERS, WIDE BASE,  
345 KV, CARRYING SINGLE OR BUNDLED CONDUCTOR

Loading Parameters: Single, Double and Triple Circuit Towers

Case 1 (all lines intact, 100 mph wind)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.25	a) Transverse and longitudinal components of the forces caused by wind on 1.5 faces of the tower
1.25	b) Transverse wind on bare conductors, shield wires and insulators
1.00	c) Dead weight of tower
1.25	d) Transverse components of longitudinal tensions
1.10	e) Vertical load of conductors, shield wire and insulator assembly, plus 1000 lbs. each on outer ends of the conductor arms and 500 lbs. each on the outer ends of the shield wire arms

Case 2 (all lines intact, 1/2-inch thick radial ice, no wind)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.00	a) Dead weight of tower
1.25	b) Transverse components of longitudinal tensions
1.10	c) Vertical load of conductors, shield wire and insulator assembly, with 1/2-inch thick radial ice on conductors and shield wires plus 1000 lbs. each on the outer ends of the conductor arms and 500 lbs. each on the outer ends of the shield wire arms

Case 3 (one broken shield wire, 100 mph wind)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.25	a) Transverse and longitudinal components of the forces caused by wind on 1.5 faces of the tower
1.25	b) Transverse wind on bare conductors, shield wires and insulators
1.00	c) Dead weight of tower
1.25	d) Transverse components of longitudinal tensions
1.10	e) Vertical load of conductors, shield wire and insulator assembly, plus 1000 lbs. each on outer ends of the conductor arms and 500 lbs. each on the outer ends of the shield wire arms
1.25	f) Transverse and longitudinal tension component of broken shield wire at shield wire attachment point

Case 4 (all lines intact at maximum design tension, no wind, no ice)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.00	<p>With all lines intact and subject to the maximum design phase tension with no overload factor and no wind or ice, the structure shall be designed to resist the following additional load:</p> <p>Each phase position shall be designed to withstand an additional load equal to 50% of the maximum design phase tension applied in the longitudinal direction. The longitudinal load shall be applied to the end, or tip, of the arm at the conductor hardware attachment point that is located farthest from the body of the structure. The structure shall be designed to withstand the forces caused by this load when the load is applied to any one (1) phase position at a time.</p> <p>Each phase position on each circuit shall be analyzed, one position at a time, to determine the location of the longitudinal load that will have the greatest effect on the design of the main body of the structure.</p>

2.8.5 CLASS V: DEAD END TOWERS, WIDE BASE, AND SUBSTATION LINE  
TERMINAL STRUCTURES, 345 KV, CARRYING SINGLE OR BUNDLED  
CONDUCTOR

Loading Parameters: Single, Double and Triple Circuit Towers

Case 1 (all lines intact, 100 mph wind)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.50	a) Transverse and longitudinal components of the forces caused by wind on 1.5 faces of the structure
1.50	b) Transverse wind on bare conductors, shield wires, insulators and equipment
1.00	c) Dead weight of structure and equipment
1.50	d) Transverse components of longitudinal tensions
1.50	e) Vertical load of conductors, shield wires and insulator assembly, plus 1000 lbs. each on outer ends of the conductor arms and 500 lbs. each on the outer ends of the shield wire arms

Case 2 (all lines intact, 1/2-inch thick radial ice, no wind)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.00	a) Dead weight of structure and equipment
1.50	b) Transverse components of longitudinal tensions
1.50	c) Vertical load of conductors, shield wires and insulator assembly, with 1/2-inch thick radial ice on conductors and shield wires plus 1000 lbs. each on outer ends of the conductor arms and 500 lbs. each on the outer ends of the shield wire arms

Case 3 (one broken shield wire, 100 mph wind) (not required for substation line terminal structures)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.50	a) Transverse and longitudinal components of the forces caused by wind on 1.5 faces of the structure
1.50	b) Transverse wind on bare conductors, shield wires and insulators

- 1.00 c) Dead weight of structure
- 1.50 d) Transverse components of longitudinal tensions
- 1.50 e) Vertical load of conductors, shield wires and insulator assembly, plus 1000 lbs. each on outer ends of the conductor arms and 500 lbs. each on the outer ends of the shield wire arms
- 1.50 f) Transverse and longitudinal tension component of broken shield wire at shield wire attachment point

Case 4 (structure loads under stringing operations)

<u>O. L. Factor</u>	<u>Type Loads to be Combined</u>
1.00	a) Dead weight of structure and equipment
1.25	b) Dead end structures shall be designed for dead-ending on one side of the structure all conductors and shield wires or any combination of conductors and shield wires at maximum tension specified
1.00	c) Tower arms and all dead end attachment points and associated structural members shall be designed to withstand a downward pull 45° from vertical up to the maximum tension specified for the purpose of stringing conductors and shield wires

2.9 Deflection Limitation for Substation Line Terminal Structures. Horizontal and vertical deflection criteria for substation structures used to terminate transmission line conductors will be specified on the CPS Energy design drawings.

### 3.0 MATERIAL AND FABRICATION REQUIREMENTS

#### 3.1 General Material Requirements.

3.1.1 Application. The supplier is responsible for using structural components that will perform properly in their specific applications.

3.1.2 Unit Stress. The structures shall be designed such that the unit stress in the structural components does not exceed the minimum specified yield point of the material used.

3.1.3 Steel Types and Grades. Unless otherwise specified, the types and grades of structural steel, anchor bolt stock, and bolts and nuts used in fabricating the structures



shall be left to the discretion of the supplier; but the components used shall conform to the appropriate ASTM specification covering said item.

3.1.4 Substitution of Structural Shapes. If the supplier proposes to substitute any structural steel members of a size different than that listed on the CPS Energy Drawings, the supplier shall receive written permission from CPS Energy. The supplier shall also re-detail all associated Tower Drawings (this includes, but is not limited to, the structural steel schedule, assembly details, and fabrication details) and shall verify/change the required bolt lengths for the substituted members. The re-detailed drawings must comply with the "STRUCTURE DRAWINGS" requirements, Section 7.0 of this specification.

3.2 Structural Steel. All material shall conform to ASTM A6.

3.2.1 Carbon Steel. All structural quality carbon steel shall be 36 ksi yield point steel and shall conform to ASTM A36.

3.2.2 High-Strength Steel. All high-strength structural steel shall be furnished as shown on the CPS Energy drawings, or as dictated by design, and shall conform to the appropriate ASTM specification covering said item. Yield point strength shall be noted on the Bill of Materials for all high-strength structural steel members.

All high-strength structural steel angles, up to and including 3/4-inch thick angles, shall have a yield point strength of 50 ksi. High-strength structural steel angles over 3/4 inch thick shall have a minimum yield point of 46 ksi.

3.2.3 Impact Properties. The impact properties in the longitudinal direction shall be measured by the Charpy "V" notch test described in ASTM A370 and ASTM E23. All material furnished shall be shown to meet the following minimum absorbed energy requirements:

<u>Specified Yield (Ksi)</u>	<u>Plate Thickness (Inches)</u>	<u>Absorbed Energy (Ft.-Lbs.)</u>	<u>Temperature (°F)</u>
≤ 42	≤ 1/2	(None Required)	
≤ 42	> 1/2	15	+40
> 42	≤ 1/2	15	0
> 42	> 1/2	15	-20

Notch toughness properties shall be obtained from the supplier in a Certified Mill Test Report. These properties shall be retained by the supplier and shall be available to

CPS Energy upon request. For plates 1/2 inch or less in thickness and for quenched and tempered or normalized plates of any thickness, heat lot testing shall be used to determine whether the product meets the impact property requirements. Controlled-rolled or as-rolled shapes and plates over 1/2 inch thick shall be tested on a slab (plate) testing basis. This entails a test on one (1) plate of each separate slab. Mill certification reports shall state the specification that the material is being certified to meet and shall include the actual physical and chemical test data by heat number. These reports shall be retained by the supplier and shall be available to CPS Energy upon request.

3.2.4 Tensile Tests. All material shall be subjected to tensile tests in accordance with ASTM A370. Specimens shall be tested in the longitudinal direction and the results shall be traceable back to the materials used to fabricate the structure. The results shall be retained by the supplier and shall be available to CPS Energy upon request.

3.3 U-Bolts. The supplier shall provide U-bolts on all towers as shown on the CPS Energy design drawings. There shall be a minimum clearance of 15 inches below each U-bolt on tangent and running angle towers to accommodate a stringing block for stringing the static wire.

3.4 Bearing Plates/Shear Connector Studs. Stub angles that are subject to bearing or uplift forces greater than 300 Kips shall have bearing plates in accordance with Section 3.4.1. Stub angles that are subject to bearing or uplift forces of 300 Kips or less shall have either bearing plates in accordance with Section 3.4.1 or standard, round-head shear connector studs in accordance with Section 3.4.2.

3.4.1 Bearing Plates. The bearing plates shall be welded perpendicular to the sides of the stub angle and shall be spaced at least 9 inches apart. No bearing plates shall be attached within 48 inches of the bend line working point of the stub angle. The length to width ratio of the bearing plates shall not be less than two to one (2:1). The area of the bearing plates shall be sized for 3000 psi, 28-day compressive strength concrete, and the bearing plates and welding shall be able to withstand the maximum bearing or uplift.

3.4.2 Shear Connection Studs. The shear connector studs shall be welded to the stub angle on 6-inch vertical centers. The horizontal distance between shear connector studs on the same horizontal plane shall not be less than 4 inches. No shear connector studs shall be attached within 48 inches of the bend line working point on the stub angle. The size and number of shear connector studs required shall be based on the use of 3000 psi, 28-day compressive strength concrete, and the shear connector studs and welding shall be able to withstand the maximum bearing or uplift.

3.5 Lifting Lugs. The top of each tower shall be equipped with lifting lugs of sufficient strength to support the weight of the completely assembled tower excluding the stub section.

3.6 Standard Accessories. Stub angles, anchor bolts, step bolts, locknuts and anti-climbing guards shall be supplied with the towers unless otherwise specified on the Request for Quotation and Purchase Order. The only acceptable locknuts supplied shall be "Palnuts" manufactured by A.B. Chance: Catalog No. 3532 for 5/8-inch diameter, Catalog No. 3533 for 3/4-inch diameter.

Note: Barbed wire will be supplied by CPS Energy.

3.7 Fabrication - Narrow Base Towers. This section of this specification covers fabrication requirements and specific fabrication procedures for narrow base towers. These fabrication procedures shall be followed by the tower fabricator in order to insure proper fit of all narrow base towers.

3.7.1 Tower Sections. Narrow base towers shall be fabricated in sections, and these sections shall be of welded construction.

3.7.2 Tower Alignment. All adjacent tower sections shall be fit together during fabrication in order to insure that these sections align in both planes.

3.7.3 Splices. Splice plates and angles shall be either bolted type (i.e., bolted to both adjoining tower sections) or welded type (i.e., welded to one section and bolted to the adjoining section).

3.7.3.1 Bolted Splices. If bolted splices are used, the splice plate or angle shall be punched in place with the adjoining tower sections in their assembled position to insure alignment of all bolt holes. Each splice shall be marked with respect to the particular tower and position on the tower for which it was punched.

3.7.3.2 Welded Splices. If welded splices are used, the splice plate or angle shall be bolted to the proper tower section first to insure alignment of the bolt holes. The splice shall then be welded in place to the adjoining section while the tower sections are in their assembled position. Welded splice plates and angles shall be chamfered to facilitate field assembly.

3.7.4 Bolts. Tension control/load indicator type bolts shall be used at the splice plates, and standard 5/8-inch bolts shall be used to bolt the tower arms in place unless otherwise noted on the CPS Energy design or fabrication drawing. If the supplier proposes to use different bolts than these, the supplier shall state on the design drawings the type and size of bolts that he proposes to use.

3.7.5 Nuts. The hex nuts supplied with the structural bolts shall be compatible with the bolt strength requirements and shall conform to ASTM A563. Hot dip and mechanically galvanized nuts shall be tapped oversize in accordance with ASTM A563 and shall run free on the coated bolt thread. They shall be provided with an additional

lubricant which shall be clean and dry to the touch. Self-locking type nuts are not acceptable.

3.7.6 Lacing. The lacing adjacent to a welded splice plate or angle shall not be in place until the welding of the splice is completed.

3.7.7 Marking. All fitted sections, plates and angles shall be match-marked and these markings shall be shown on the tower drawings.

3.8 Anchor Bolts. The supplier shall supply anchor bolts as required for each structure, and each anchor bolt shall be furnished with not less than two (2) hex nuts for leveling and securing the base plate. The anchor bolt threads shall be free of imperfections that would reduce holding power. Anchor bolt thread and nut selection shall be compatible with the required anchor bolt strength.

3.8.1 Type. Anchor bolts may be fabricated from either deformed reinforcement bars or smooth (plain) bars, unless a particular type is specified on the CPS Energy design drawings.

#### 3.8.1.1 Deformed Bar Anchor Bolts.

3.8.1.1.1 Reinforcement Bar. Standard No. 14 or No. 18 deformed steel reinforcement bars conforming to ASTM A615, Grade 75, shall be used when fabricating anchor bolts from deformed steel reinforcement bars.

3.8.1.1.2 Length. The anchorage and embedment lengths for the anchor bolts shall be based on a 28-day concrete compressive strength of 3000 psi and shall be computed in accordance with the requirements of ACI 318.

3.8.1.2 Smooth (Plain) Anchor Bolts. When smooth anchor bolts are furnished for structures, the embedment length provided shall be capable of developing 50% of the yield strength of the bolt in concrete having a 28-day compressive strength of 3000 psi. Standard hooks or any mechanical device may be used to develop the required additional 50% of yield strength, provided they do not damage the concrete and provided the reinforcement meets the full-size bar tensile test and bend test requirements covered in ASTM A615.

#### 3.8.1.3 Material Tests.

3.8.1.3.1 Anchor Bolts. The impact properties in the longitudinal direction shall be measured by the Charpy "V" notch test described in ASTM A370 and ASTM E23. All anchor bolt material furnished shall be shown to meet the following minimum absorbed energy requirements:

Specified Yield (Ksi)	Bar Diameter (Inches)	Absorbed Energy (Ft.-Lbs.)	Temperature (°F)
≤ 42	≤ 1/2	(None Required)	
≤ 42	> 1/2	15	+40
> 42	≤ 1/2	15	0
> 42	> 1/2	15	-20

3.8.1.3.2 Nuts. All nuts supplied with anchor bolts shall have a proof load capable of developing the tensile strength of the anchor bolt as measured in accordance with ASTM A370.

3.8.1.3.3 Metallizing or Galvanizing. Anchor bolts shall be metallized or galvanized as specified in Section 3.12.2 of this specification.

3.9 Anchor Bolt Templates. Anchor bolt setting templates shall be furnished for each set (or cluster) of anchor bolts supplied. The top template shall be of sufficient strength to support the weight of an assembled anchor bolt cage during lifting and cage setting operations. Intermediate and bottom templates will be used only as assembly guides.

3.9.1 Material. The type and grade of structural steel used to fabricate the templates shall be left to the discretion of the supplier, but all components used shall conform to the appropriate ASTM specification covering said items.

3.9.2 Template Quantities. The number of templates required per anchor bolt cluster shall be as follows:

- a. One (1) template for anchor bolt lengths of 6 feet or less
- b. Two (2) templates for anchor bolt lengths greater than 6 feet and less than 12 feet
- c. Three (3) templates for anchor bolt lengths 12 feet and greater

3.9.3 Bolt Holes. The boltholes in the templates shall be drilled 1/16-inch oversize and shall be checked to insure clearance around the anchor bolts.

Note: The anchor bolt templates need not be galvanized.

3.10 Structural Bolts. Hex head bolts shall be supplied and shall be furnished with hex nuts.

3.10.1 Type. The type of high-strength bolt supplied and the strength characteristics shall be left to the discretion of the supplier unless otherwise noted on the CPS Energy design or fabrication drawings, but the bolts supplied shall conform to the ASTM specification that covers said type.

3.10.2 Size. Bolt and nut sizes and dimensions shall be in accordance with the recommendations set forth in IFI Fastener Standards - 2003.

3.10.3 Nuts. The hex nuts supplied with the structural bolts shall be compatible with the bolt strength requirements and shall conform to ASTM A563.

Hot dip and mechanically galvanized nuts shall be tapped oversize in accordance with ASTM A563 and shall run free on the coated bolt thread. The nuts shall be provided with an additional lubricant, which shall be clean and dry to the touch.

Self-locking type nuts are not acceptable.

3.10.4 Locknuts. Locknuts shall be supplied with the structural bolts unless otherwise noted. The only acceptable locknuts supplied shall be "Palnuts" manufactured by A.B. Chance: Catalog No. 3532 for 5/8-inch diameter, Catalog No. 3533 for 3/4-inch diameter.

3.11 Welding. All welding shall conform to the best recommended practices set forth in ANSI/AWS D1.1.

3.11.1 Welding Materials. All welding materials shall conform to the latest revision of the "Electrode and Flux Specifications" as set forth in the Structural Welding Code.

3.11.2 Welding Processes. Welding may be performed by the manual shielded metal-arc process, submerged-arc process, gas metal-arc process or gas shielded flux-cored-arc process.

Shielded metal-arc welding shall be done with appropriate strength low hydrogen electrodes, which have been properly conditioned in accordance with the Structural Welding Code.

3.11.3 Preheating. All preheating shall meet minimum requirements as recommended by the steel manufacturer for each type and thickness of steel used.

3.11.4 Welds-General. All welds shall be free from overlaps and cracks.

3.11.5 Major Weld Areas. Base plate-to-column (or leg) welds and welds in other major load carrying "tee" joints shall be as required by the design.

3.11.6 Fillet Welds. All fillet welds shall have 100% fusion throughout the entire cross section of the welds.

3.11.7 Undercutting. All Undercutting shall conform to the following requirements:

- a. Base Plate to Column (or Leg) Welds - there shall be no Undercutting in excess of 1/100 inch with the exception that a 1/32-inch undercut is allowed for two (2) inches in any 12 inches of weld length.
- a. Miscellaneous Welds - there shall be no undercutting in excess of 1/32 inch.

3.11.8 Defects. Porosity, fusion, and inclusion type defects shall not exceed acceptable limits as stated in the Structural Welding Code.

3.11.9 Weld Repair. All weld repair shall be made in accordance with acceptable procedures as stated in the Structural Welding Code.

Note: Repaired welds shall be inspected per the same methods and procedures specified for the original welds (Section 5.2 of this Specification).

3.11.10 Impact Property. Welding procedure and electrode selection shall be adjusted so as to provide a notch toughness of 15 ft.-lbs. absorbed energy at -20°F as measured by the Charpy "V" notch test.

### 3.12 Coatings.

3.12.1 Surface Preparation. Prior to galvanizing, all welds shall be mechanically cleaned to remove any weld flux residue. Scale and rust shall then be removed from the component to be galvanized by pickling in an inhibited acid.

#### 3.12.2 Metallizing or Galvanizing.

3.12.2.1 Anchor Bolts. The anchor bolts shall be either entirely metallized or galvanized as follows:

- a. Metallizing shall be in accordance with AWS C2.18, AWS C2.23, AWS TSM and AWS TSS.
- b. Galvanizing shall be in accordance with ASTM A153. The galvanized coating on the anchor bolts shall be chromate treated in accordance with the applicable sections of ASTM A767.

3.12.2.2 Hex Nuts. The nuts supplied with the anchor bolts shall be galvanized in accordance with ASTM A153.

3.12.2.3 Other. All structural steel, high-strength structural bolts, nuts and washers shall be hot-dip galvanized in accordance with applicable ASTM A123 and A153.

3.12.3 Galvanizing Procedures. Precautions shall be taken against embrittlement, warpage and distortion of galvanized items in accordance with ASTM A143 and A384.

#### 4.0 MARKING

All structural steel shall be plainly marked for assembly by stenciling an impression into the steel before galvanizing. The steel identification marks shall be prefixed as indicated on the CPS Energy design drawings. The stenciled letters and numbers shall be a minimum 1/2-inch high.

#### 5.0 QUALITY ASSURANCE - INSPECTIONS AND TESTS

##### 5.1 Fit and Alignment.

5.1.1 Base Plates. Base plates shall be installed square to the center line of the column (or leg).

5.1.2 Column Plumb. It shall be possible to plumb the column (or leg) without adjusting the anchor bolt nuts more than 1/4 inch from a level plane.

5.2 Welding Inspections. All welds shall be 100% visually inspected for surface flaws such as poor profile, undercut, splatter, arc strikes, cracking or blowholes. Such inspections shall be conducted prior to final inspection and all such flaws shall be corrected prior to the final inspection. Visual inspections shall be conducted at appropriate times during the fabrication sequences to assure that no flaw can be covered or made inaccessible due to subsequent operations.

5.2.1 Welders, Welding Operators and Tack Welders. All welding personnel shall be certified in accordance with the performance qualification tests required by ANSI/AWS D1.1. The fabricator shall submit Welding Performance Qualification Records (WPQR) to serve as written verification of welding personnel certification upon request.

5.2.2 Weld Quality Requirements. The fabricator should use any combination of inspection techniques necessary to assure compliance with the weld quality requirements of Section 3.11 of this specification.



5.2.3 Test Procedures. Where appropriate, 100% shear wave ultrasonic inspection, dye penetrant and/or magnetic particle inspection techniques shall be used.

5.3 Inspection and Test Reports. Certified reports of all inspections, tests, and re-inspections following repairs shall be maintained at the fabricators shops and shall be available for review by CPS Energy representatives. The inspection and test reports on welds and the manner of recording the results shall be traceable back to individual weldments.

## 6.0 INTERCHANGEABILITY

Structural members for a given type and class of structure shall be interchangeable between structures.

## 7.0 STRUCTURE DRAWINGS

7.1 Design Drawings. All data required by the supplier for the design of the structure(s) shall be furnished by CPS Energy on the CPS Energy design drawings. All other design data required on the design drawings shall be filled in by the supplier.

7.2 Sample Drawings. A set of CPS Energy tower drawings (Dwg. No. 36, Sheets 1 of 22 through 22 of 22) is included with this specification as sample drawings. The drawings submitted by the supplier to CPS Energy shall be drawn in the same format as these sample drawings.

7.3 Anti-Climbing Guards. The assembly details, fabrication details and steel schedule for anti-climbing guards shall all be shown on one drawing, if possible. The total weight of the anti-climbing guards shall also be given on this drawing. (See example Drawing No. 36, Sheet 3 of 22.)

7.4 Structural Steel Schedule. The structural steel schedule shall enumerate the structural steel and hardware required for the common structure. The structural steel shall be grouped in accordance with the "Required Material List" on each of the fabrication details drawings (refer to Section 7.8 of this specification). Each group of structural steel shall be identified with the corresponding fabrication details drawing (sheet) number. The total weight of the common structure shall also be given on this schedule. (See example Drawing No. 36, Sheet 16 of 22.)

7.5 Structure Assembly Details. The structure assembly details drawing(s) shall consist of as many views of the common structure as required to show the proper location of each piece of steel in the structure. Each piece of steel shall be identified on the drawing(s) with its identification mark. (See example Drawing No. 36, Sheet 17 of 22.)

7.6 Structure Fabrication Details. The structure fabrication details shall consist of as many drawings as are necessary to dimension each piece of steel in the common structure with the steel pieces shown in the assembly, as they would appear in relation to each other. Each piece of steel shall be identified with its identification mark. Each separate drawing shall also have a "Required Material List" in the upper right hand corner of the drawing. The list shall give the steel identification mark and quantity of each required for the assembly shown in that drawing. (See example Drawing No. 36, Sheets 18 of 22 through 22 of 22.)

7.7 Tower Stubs. The stub assembly, stub setting plan and steel schedule for the tower stubs shall all be shown on one drawing, if possible. The total weight of the stubs shall be given; and transverse and longitudinal information, including ground line loading (bearing, uplift, ground line moment and shear), shall be shown. (See example Drawing No. 36, Sheet 2 of 22.)

7.8 Tower Extension. There shall be two types of drawings for each tower extension: Assembly Details and Fabrication Details. A separate set of these drawings shall be made for each extension.

7.8.1 Assembly Details. The assembly details drawing(s) shall consist of one or more views of the extension as required to show the proper location of each piece of steel in the extension. Each piece of steel shall be identified on the drawing with its identification mark. There shall be a steel schedule for the extension in the upper right hand corner of the drawing, and the total weight of the extension shall be given on this drawing. (See example Drawing No. 36, Sheet 4 of 22.)

7.8.2 Fabrication Details. The fabrication details shall consist of as many drawings as are necessary to dimension each piece of steel in the extension with the steel pieces shown in the assembly as they would appear in relation to each other. Each piece of steel shall be identified with its identification mark. Each separate drawing shall also have a "Required Material List" in the upper right hand corner of the drawing. This list shall give the steel identification mark and quantity of each required for the assembly shown in that drawing. (See example Drawing No. 36, Sheet 5 of 22.)

7.9 Final Drawings.

7.9.1 Drawing Paper. All final drawing originals shall be on 36 x 24-inch, premium grade, white bond paper or equivalent.

7.9.2 Disposition. All final drawing originals shall become the sole property of CPS Energy. CPS Energy shall have full rights to reproduce these drawings and submit these reproductions to other suppliers for bids on future fabrication of steel towers.

## 8.0 ADDENDUM TO SPECIFICATION

In the event that an addendum containing text and/or drawings is attached or special drawings are submitted as an addendum to this specification by CPS Energy, and there

is conflict between the addendum and this specification, the requirements in the addendum will take precedence.

## 9.0 RESPONSIBILITY

Supplier shall be solely responsible for the engineering design, detail and fabrication of all towers furnished under this specification and any special drawings or addenda there of.

## 10.0 INFORMATION REQUIRED FROM SUPPLIER

10.1 Information with Quotation. Each supplier MUST SUBMIT WITH THEIR BID the following minimum information, as applicable to the type of structure under consideration, for each structure design. This information shall be supplied on a computer printout and/or a structure loading diagram and general information sheet.

10.1.1 Loading information. List the following information for each Loading Case associated with each type of structure (Section 2.8 of this specification).

- a. Distributed loads, including wind loading, at the structure loading points
- b. Concentrated loads at each load point on the structures
- c. Resultant ground line moment, shear force, and vertical forces (bearing and uplift) transferred to the foundation
- d. Lateral deflection at the top of the structure (Substation Line Terminal Structures and Narrow-Base Towers only)

10.1.2 Additional Information Required (As applicable to the structure type(s)).

- a. Outline drawings - transverse and longitudinal structure face outline drawings for all structures. These drawings shall include major dimensions, structural component sizes, anchorage requirements, and structural component galvanized weights. Outline drawings shall also include the maximum foundation loads and lateral deflection values specified in Section 10.1.1, Items c. and d.
- b. Structure height and shape - including leg bevel
- c. Structural steel strength
- d. Weights - including weights of all structure component parts and stub angles (or anchor bolts) and all welded structural sections or assemblies
- e. Anchor bolt number, diameter, total length, minimum required embedment length\*, projection length, galvanized length and thread size

- f. Anchor bolt coordinates and orientation
- g. Base plate-overall length, overall width, side length, thickness, and length and location of the resisting width of the base plate against the overturning moment (if applicable)
- h. Actual overload design factors used in structural design

\* Price bids on anchor bolts for each structure shall be based on the minimum embedment length as recommended by the supplier, with an additional price per foot for lengths greater than this minimum, unless the CPS Energy design drawings specify a required embedment length.

#### 10.1.3 Price, Weight and Delivery Schedule Information.

- a. The supplier shall state a price and weight for each item listed on the Request for Quotation and a total price and weight for all items listed on the Request for Quotation. The total price shall include freight FOB jobsite.
- b. The supplier shall provide a detailed delivery schedule (e.g., stubs to be shipped May 3 thru July 25; Towers to be shipped June 1 through September 30). The statement "As Required" is not acceptable.

10.2 Approval Drawings. After a bid has been accepted by CPS Energy, the successful bidder (supplier) shall submit to CPS Energy two (2) complete sets of approval drawings. These approval drawings shall be sent to the CPS Energy Purchasing Division, Attn: (Buyers name). One (1) set of these drawings will be returned to the supplier with either an approval of the design or corrections as required. All design and detail drawings must be approved by CPS Energy before fabrication. The supplier shall be responsible for the correctness of all details and dimensions on these drawings. The approval of these drawings by CPS Energy does not relieve the supplier of this responsibility.

10.3 Information on Final Drawings. The final structure erection drawings shall include the following information as applicable to the type of structure:

- a. Maximum resultant ground line moment and shear force at the base of the column leg
- b. Maximum bearing and uplift forces, and moment and shear forces when applicable, for multi-legged structures
- c. Galvanized weight of each structural component and total weight of the structure
- d. Center of gravity and lifting point of welded sections (if applicable)

- e. Structural member sizes, dimensions, bevel(s), material thickness and material strength
- f. Structural bolt, nut and washer quantities, size and strength
- g. Anchor bolt quantity, size, length, setting plan and orientation
- h. Assembly details
- i. Design data from the CPS Energy design drawings

#### 10.4 Master Bill of Materials.

- a. One (1) copy of the Master Bill of Materials List shall be sent to the CPS Energy receiving storeroom thirty (30) days prior to the shipment of any materials.
- b. One (1) copy of the Master Bill of Materials List shall be included with each set of final drawings.

#### 11.0 QUALITY ASSURANCE (NEW STRUCTURE DESIGNS)

The supplier shall assemble one (1) complete structure of each new structure design after fabrication to assure proper fit. At the same time, the supplier shall verify the sizes and quantities of hardware (bolts, nuts, ring, fills, etc.) that are required for that structure design.

Note: A complete structure includes all leg and body extensions.

#### 12.0 INSPECTION

The structure(s) and associated hardware will be subject to inspection by designated CPS Energy representatives to assure compliance with CPS Energy requirements.

#### 13.0 SHIPPING INSTRUCTIONS

##### 13.1 Bundling and Packaging.

13.1.1 Steel Bundling. All structural steel components shall be bundled by structure unless otherwise specified (e.g., bundled by like pieces) on the Request for Quotation and Purchase Order.

Stubs may be bundled separately.

13.1.2 Hardware. Each size and type of hardware (i.e., bolts, nuts, washers, spacers, etc.) shall be packaged separately. Hardware shall be shipped in wooden or

metal containers that are reasonably weatherproof. The containers shall not exceed 200 pounds gross weight and shall be suitable for handling by two workers.

13.1.3 Anchor Bolts and Templates. All anchor bolts and templates shall be shipped unclustered and bundled by structure.

13.2 Marking. All bundles and containers shall be marked with an indelible black marker. Steel bundles shall be marked in several places on the outside of the bundles, and the identifying letters/numbers shall be a minimum of 2 inches high. All bundles and containers shall be identified with the CPS Energy Purchase Order Number.

13.2.1 Steel Bundled By Individual Structure. When bundling is by structure, the structure type, structure number, extension height, and the number of bundles required to complete the structure (e.g., Bundle 3 of 5) shall be marked on the bundles.

13.2.2 Steel Bundled By Like Pieces. When bundling is by like pieces, the structure type and the identification mark of the pieces shall be marked on each bundle.

13.2.3 Hardware. All hardware shall be identified on the outside of the container by kind of hardware, size and quantity.

13.2.4 Anchor Bolts and Templates. All anchor bolts and templates shall be identified (tagged) so that each can be matched with the appropriate structure.

13.3 Shipping. Each individual shipment of structures shall include the required steel and hardware for the assembly of complete structures including extensions. Shipment of partial structures, whether the steel is bundled by structure or by like pieces, is not acceptable.

Anchor bolts, templates, grillage footings, stub angles and other foundation components shall be shipped prior to shipment of the structures unless otherwise specified on the CPS Energy Purchase Order.

13.4 Delivery. Deliveries shall be made to the jobsite(s) or to a CPS Energy Service Center as specified on the Request for Quotation and Purchase Order. Deliveries may be made by truck or by rail, and CPS Energy will specify nearest rail facilities to the point of delivery. CPS Energy will unload bundled steel at the specified point of delivery unless otherwise specified on the Request for Quotation and Purchase Order that the supplier shall be responsible for the unloading.

13.4.1 Delivery Ticket. A delivery ticket must be furnished with each delivery by the carrier. The delivery ticket must show the CPS Energy Purchase Order number and the number of bundles, containers and individual items that are being delivered to CPS Energy.

13.4.2 Packing List. A packing list must be furnished with each delivery to CPS Energy. The packing list must include the CPS Energy Purchase Order number, a description and the quantity of each type item being delivered to CPS Energy.

- a. One (1) copy of the packing list shall be attached to the rail car or truck and shall be clearly visible and obviously marked.
- b. One (1) copy of the packing list shall be airmailed to the CPS Energy receiving storeroom immediately upon completion of packing the rail car or truck.

13.4.3 Delivery Notification. The CPS Energy receiving storeroom shall be notified of an intended delivery three (3) working days prior to any actual delivery of materials in order that CPS Energy personnel and equipment may be available to accept delivery.

13.5 Invoice. The supplier shall give the following information in a line-by-line order on each invoice submitted to CPS Energy for payment:

- a. CPS Energy Purchase Order Number
- b. The related item number on the Purchase Order
- c. The quantity and description of the material
- d. The structure number
- e. The weight of each item (i.e., common tower, extension, stub)
- f. The cost of each item (i.e., common tower, extension, stub)

13.6 Exceptions. Any allowed exceptions to the above Shipping Instructions shall be listed on the Request for Quotation and Purchase Order.

#### 14.0 GENERAL INSTRUCTIONS

14.1 Ordering Information. All requisitions, Requests for Quotation and Purchase Orders for steel towers covered by this specification shall contain the following information:

- a. Transmission line title and/or job order number
- b. Type and number of towers required
- c. Design drawings or finalized drawings for each tower required
- d. Type of bundling required, if other than by tower

- e. Delivery date
- f. Delivery destination
- g. Reference to this specification by number and latest date

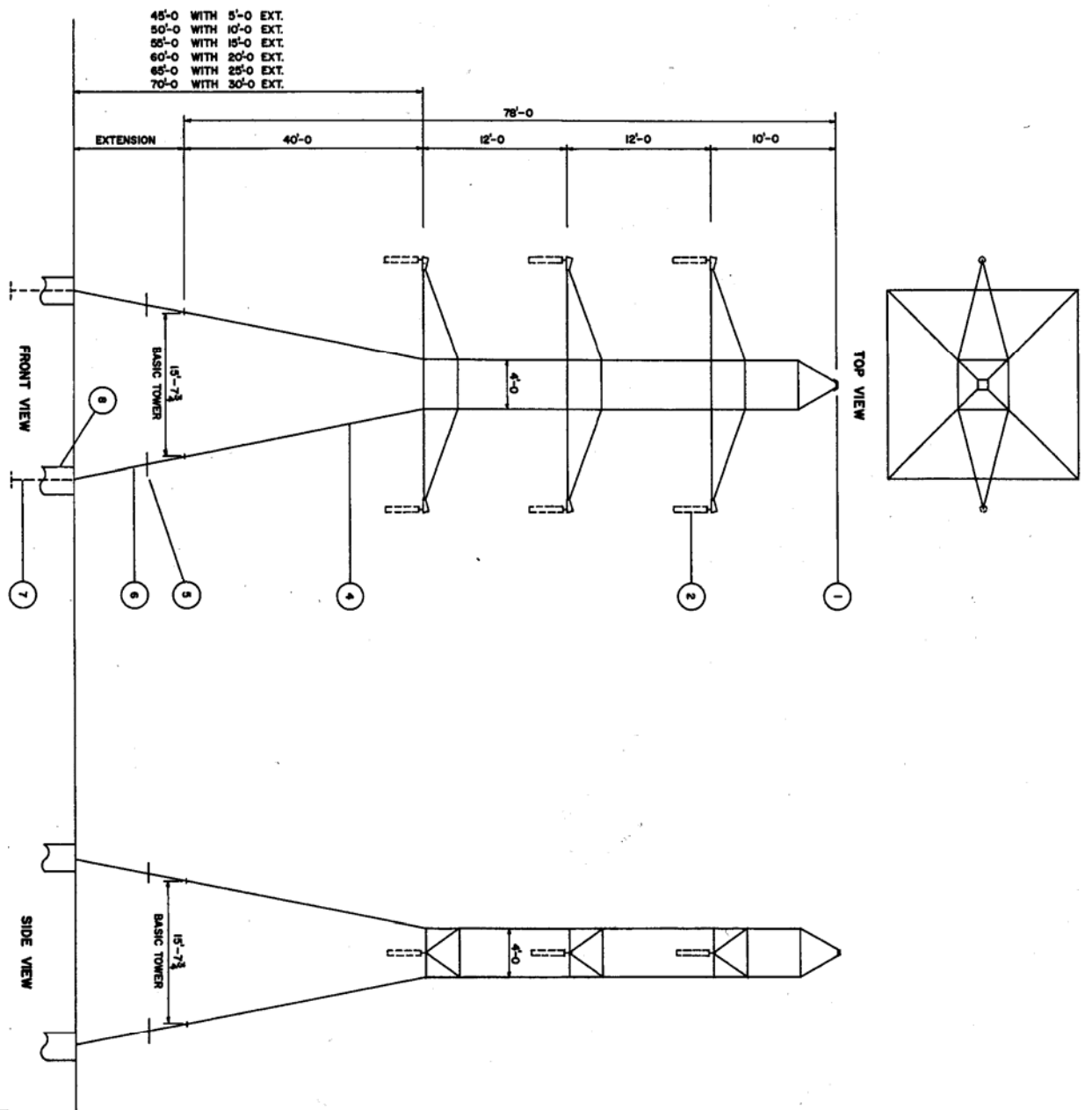
14.2 Requirements for Product Approval. Products must be approved before quotations will be considered on a manufacturer's proposed product. Products covered by this specification shall be approved in accordance with CPS Energy Specification 000-01 and any additional requirements in this specification. Where conflicts may arise between this specification and CPS Energy Specification 000-01, this specification shall prevail.

14.2.1 Welding Performance Qualification Records (WPQR). CPS Energy reserves the right to request qualification documents including, but not limited to, WPQR in accordance with ANSI/AWS D1.1. The WPQR shall serve to verify that welding personnel have successfully passed the performance qualification tests required by said code to determine their ability to produce sound welds.

14.2 Copies of This Specification. Copies of this specification shall be obtained from the Purchasing Division of CPS Energy.

14.3 Exceptions. Any and all exceptions to this specification must be listed individually and accompany the quotation. If there are no exceptions, the words "NO EXCEPTIONS" must appear on the quotation.





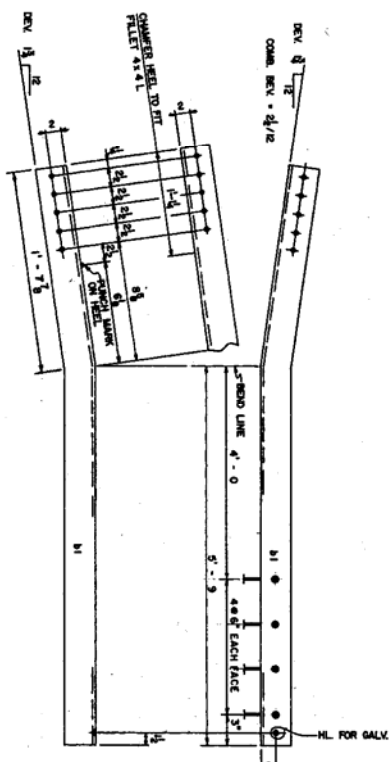
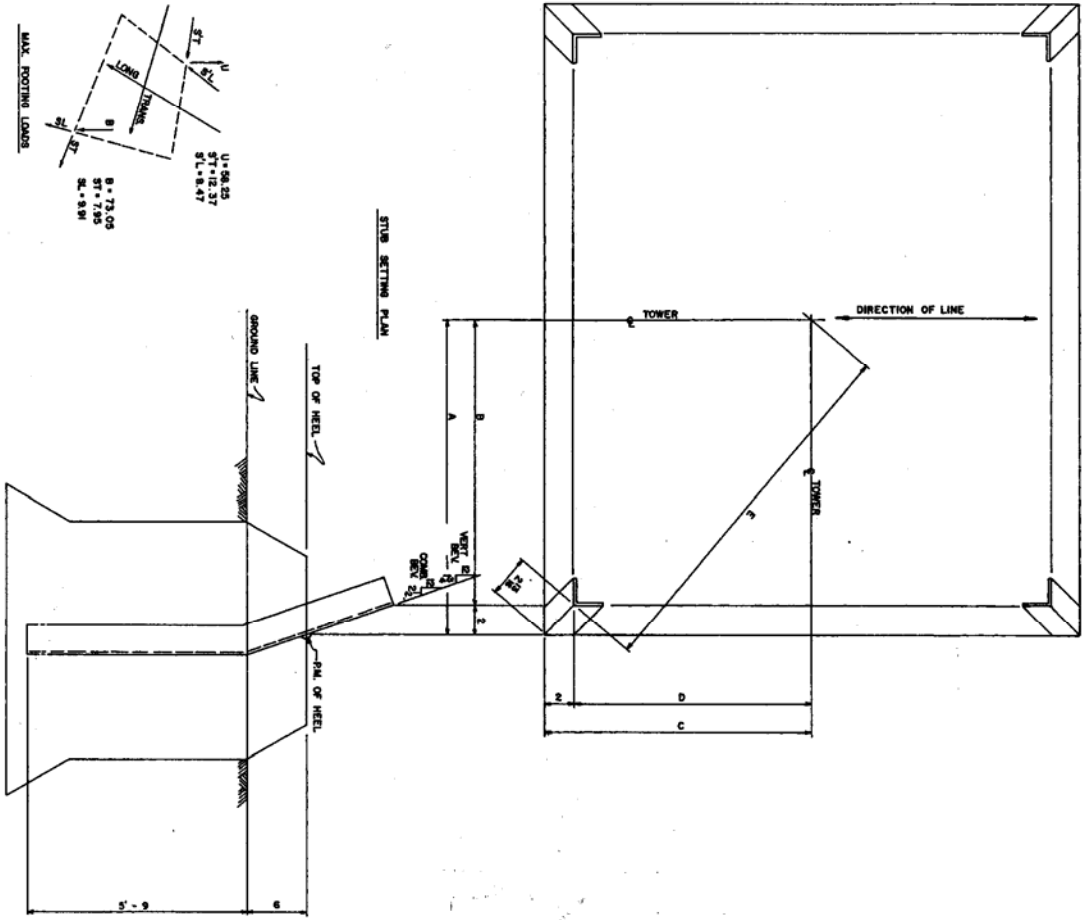
**DESIGN DATA**

- (1) VOLTAGE: 138KV
- (2) STRUCTURE TYPE: 2/C TANGENT TOWER-WIDE BASE
- (3) MAX TENSION
- (4) NO. OF CONDUCTORS/PHASE: ONE
- (5) CONDUCTOR SIZE: 1500 KCM AAC CORELESS
- (6) SHIELD WIRE: 0.800 LBS/PHASE
- (7) MAX. TRANSVERSE LOAD (WIND & TENSION EXCLUDING O.L.F.): 3,400 LBS/PHASE
- (8) PER PHASE: 2,237 LBS
- (9) PER STATIC: 738 LBS
- (10) MAX. VERTICAL LOAD (WITH 1/2" ICE EXCLUDING O.L.F.): 1,836 LBS
- (11) PER PHASE: 597 LBS
- (12) ANY ONE PHASE POSITION SHALL WITHSTAND A LONGITUDINAL LOAD OF ONE ROPEL CONDUCTOR TANG. & RUNNING ANGLE ONLY
- (13) SHALL WITHSTAND DEAD-ENDING OF ALL OR ANY COMBINATION OF CONDUCTORS & SHIELD WIRE DEAD-ENDS ONLY
- (14) OVERLOAD FACTOR: 1.25
- (15) VERTICAL: 110 (WITH 1/2" ICE PLUS 1000#S)
- (16) HORIZONTAL: 700
- (17) MAX SWAY LENGTH: FT.
- (18) VERTICAL: 293'-0" (DATED 25 APR. 66)
- (19) TOWER WEIGHT: 440 LBS
- (20) STUD CLEANS GUARDS: 61 LBS
- (21) AVAILABLE EXTN. & WEIGHTS
- (22) 9FT. 540 LBS
- (23) 8FT. 1,063 LBS
- (24) 90FT. 1,508 LBS
- (25) 25FT. 2,231 LBS
- (26) 30FT. 2,637 LBS
- (27) REFERENCE DWR. TR. 331

1	138KV	2/C	TANGENT	TOWER	WIDE	BASE
2	1500	KCM	AAC	CORELESS		
3	0.800	LBS	PHASE			
4	3,400	LBS	PHASE			
5	2,237	LBS				
6	738	LBS				
7	1,836	LBS				
8	597	LBS				
9	1.25					
10	110					
11	700					
12	293'-0"					
13	440					
14	61					
15	9FT.	540	LBS			
16	8FT.	1,063	LBS			
17	90FT.	1,508	LBS			
18	25FT.	2,231	LBS			
19	30FT.	2,637	LBS			

CITY PUBLIC SERVICE  
 138KV 2 CKT. TANGENT TOWER W/B.  
 CONDUCTOR 1500 KCM AAC

DATE	1-22-66	BY	CS
DESIGNED	EDWARDS	CHECKED	CS
CONDUCTOR	C. Z.	BY	CS
DATE	1-22-66	BY	CS
DATE	1-22-66	BY	CS



HEIGHT TO BOTTOM ANGLE	TYPE EXTENSION	SETTING DIMENSIONS				
		A	B	C	D	E
45'-0"	5'-0" EXT. TO 40'-0" TOWER BODY	5'-0 1/2"	5'-0 1/2"	5'-0 1/2"	5'-0 1/2"	17'-0 1/2"
50'-0"		5'-0 1/2"	5'-0 1/2"	5'-0 1/2"	5'-0 1/2"	17'-0 1/2"
55'-0"		5'-0 1/2"	5'-0 1/2"	5'-0 1/2"	5'-0 1/2"	17'-0 1/2"
60'-0"		5'-0 1/2"	5'-0 1/2"	5'-0 1/2"	5'-0 1/2"	17'-0 1/2"
65'-0"		5'-0 1/2"	5'-0 1/2"	5'-0 1/2"	5'-0 1/2"	17'-0 1/2"
70'-0"		5'-0 1/2"	5'-0 1/2"	5'-0 1/2"	5'-0 1/2"	17'-0 1/2"

QTY	DESCRIPTION	MARK	DRAWING	WT
4	STUB ASSEMBLIES	9794A	SHT. 2	268
8	3/8" x 3" STUDS	9	3	4
TOTAL:				268 #

- NOTES
- ① INCLUDES 3/8" GALV.
  - ROD 1/2" DIA. UNF. NTD.
  - HOLES 1/2" DIA. UNF. NTD.
  - STEEL TO BE ASTM A572 UNF. NTD.
  - BOLTS ASTM A594
  - GALV. PER ASTM A593
  - BOLTS-GALV. PER ASTM A593
  - WAL. BEARER EDGE DIST. 1"
  - ALL HOLES TO BE STEEL STROPPED W/ 1" OR LARGER LETTERS BEFORE GALV.
  - GALV. COMPLETE STUB ANGLE.

MARK ALL MEMBERS WITH PERRY 36

STUB ANGLES 9794A

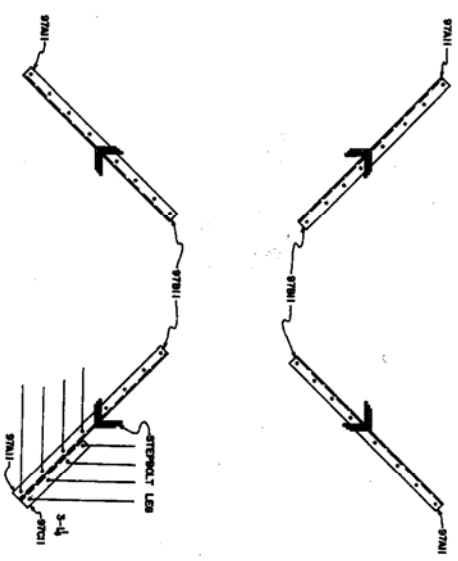
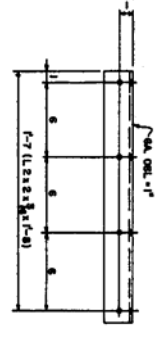
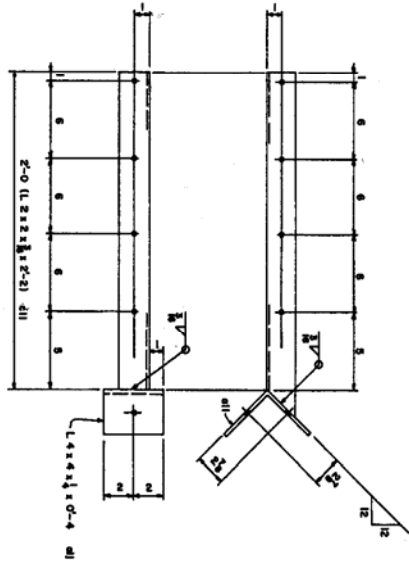
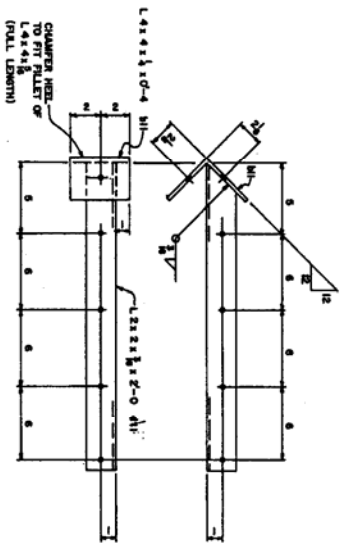
STUB ANGLES

**FABR. DETAILS & STUB SETTING PLAN**  
 1588RV 2 CRT TANGENT TOWER W.B.  
 CONDUCTOR 15890 KCM AAC

**CITY PUBLIC SERVICE**  
 SAN ANTONIO, TEXAS

CAD DRAWING: GND #  
 DRAWN BY: EDWARDS  
 CHECKED BY: NTS  
 DATE: 7-28-78

PROJECT: 1588RV  
 SHEET: 2 OF 2  
 DATE: 7-28-78



NOTE: INSTALL ANTI-CLIMBING GUARDS APPROX. 10' ABOVE GROUND LEVEL.

MARK ALL MEMBERS WITH PROJECT 36

ANTI-CLIMBING GUARDS

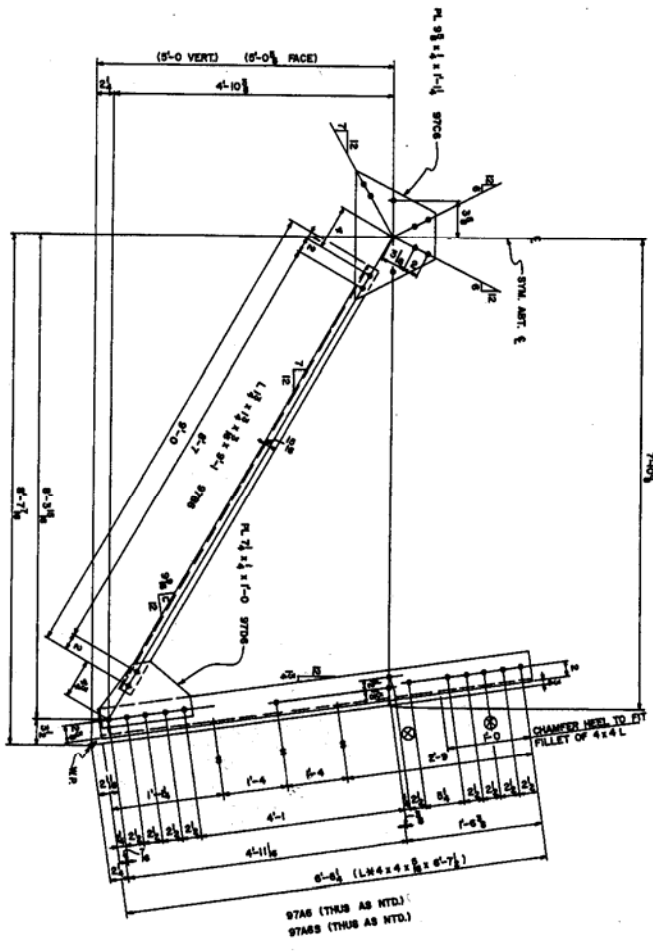
QTY	DESCRIPTION	STEEL SCHEDULE		DRAWING	WT
		MARK	① WT		
4	WELDED ASSEMBLIES	STAIR	28	SHT 3	28
1	L2x2x1/4	STAIR	6		6
0	L4x4x1/4	STAIR	2		2
4	WELDED ASSEMBLIES	STAIR	28		28
1	L2x2x1/4	STAIR	6		6
0	L4x4x1/4	STAIR	2		2
1	L2x2x1/4	STAIR	6		6
TOTAL:					618

① INCLUDES 3/4" FOR GALV.  
 BOLTS 3/8 UNL. NTR.  
 HOLES 1/2" UNL. NTR.  
 STEEL TO BE ASTM A58 UNL. NTR.  
 BOLTS ASTM A304  
 GALV PER ASTM A153  
 BOLTS-GALV PER ASTM A153  
 WEL SHEARED EDGE DIST. 1"  
 ALL PCS. TO BE STEEL, STICKERED W/1"  
 OR LARGER LETTERS BEFORE GALV.

NO.	DATE	BY	CHKD BY	REV.	DESCRIPTION
1	10/12/20	J. K.	J. K.	1	ISSUED FOR FABRICATION

CITY PUBLIC SERVICE  
 ASSEMBLY & FABRICATION DETAILS  
 188KV 2 CKT TANGENT TOWER W/B  
 CONDUCTOR 1890 KCM AAC





STENCIL THIS END  
 \* DENOTES STEPBOLT HOLES TO BE IN STABS ONLY.  
 ⊗ DENOTES COMBINED STEPBOLT & CONN HOLES & STEP ON STRUT.

\* DENOTES 7/8"-90 K&L  
 BOLTS 5/8" UNF. RTD.  
 HOLES 1/2" UNF. RTD.  
 STEEL TO BE ASTM A588 UNF. RTD.  
 BOLTS ASTM A588-4  
 GASK PER ASTM A588  
 BOLTS-GASK PER ASTM A588  
 MIN. SPACED EDGE DET.-1"  
 ALL PCS TO BE STEEL, STENCILED W/1" ON LARGER LETTERS BEFORE GALV.

MARK ALL MEMBERS WITH PENTYLE 36

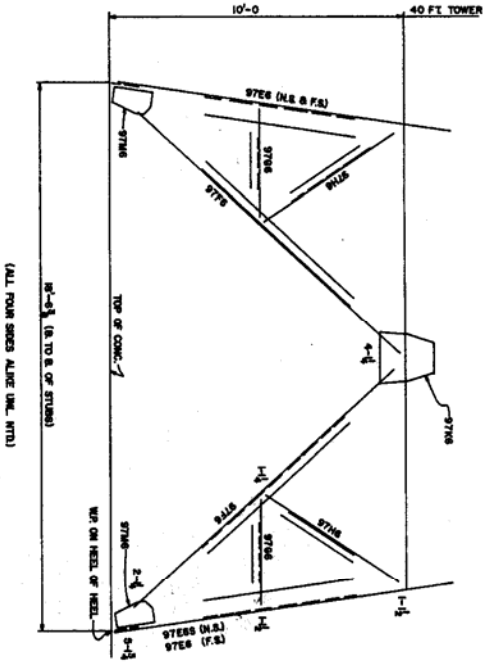
QTY	MARK	REMARKS
3	STAB	
1	STAB	
8	STAB	
4	STAB	
8	STAB	

5 FT. EXTENSION

FABRICATION DETAILS  
 138RY 2 CRT TANGENT TOWER W.B.  
 CONDUCTOR 1580 KCM AAC

CITY PUBLIC SERVICE  
 SAN ANTONIO, TEXAS

NO.	DATE	BY	CHKD BY
1	12-28-78	REYNOLDS	REYNOLDS
2	1-11-79	REYNOLDS	REYNOLDS
3	1-11-79	REYNOLDS	REYNOLDS
4	1-11-79	REYNOLDS	REYNOLDS
5	1-11-79	REYNOLDS	REYNOLDS
6	1-11-79	REYNOLDS	REYNOLDS
7	1-11-79	REYNOLDS	REYNOLDS
8	1-11-79	REYNOLDS	REYNOLDS
9	1-11-79	REYNOLDS	REYNOLDS
10	1-11-79	REYNOLDS	REYNOLDS



(ALL FOUR SIDES ALIKE UNL. INTL)

QAMK	DESCRIPTION	QTY	MARK	DRAWING	WTC
3	L 4 x 4 x 1/2	11	STEEL	SMC 7	300
1	L 4 x 4 x 1/2	11	STEEL		100
6	L 3 x 3 x 1/2	12	STEEL		18
6	L 2 x 2 x 1/2	3	STEEL		6
6	L 2 x 2 x 1/2	3	STEEL		6
4	PL 7 x 1/2	0	STEEL		28
6	PL 7 x 1/2	1	STEEL		49
42	1/2" x 4" x 1/2" GALV. W/1/2" H.H.				11
17	1/2" x 1/2" x 1/2" GALV. W/1/2" H.H.				6
42	1/2" x 1/2" x 1/2" GALV. W/1/2" H.H.				12
1	1/2" x 1/2" x 1/2" GALV. W/1/2" H.H.				1
TOTAL:					5408

① INCLUDES 3/4% FOR GALV.  
\* DENOTES F<sub>y</sub> = 50 KSI

MARK ALL MEMBERS WITH PERKIN 38

10 FT EXTENSION

ASSEMBLY DETAILS  
188RY 2 CRT TANGENT TOWER W/B  
CONDUCTOR 1890 KCM AAC

CITY PUBLIC SERVICE  
DATE APPROVAL: 12/20/76

NO.	DATE	BY	CHK'D BY	APP'D BY	REVISION
1	12-22-76	SOJARD	OS		
2	1-1-77	REYSON	BT	OSV	1"

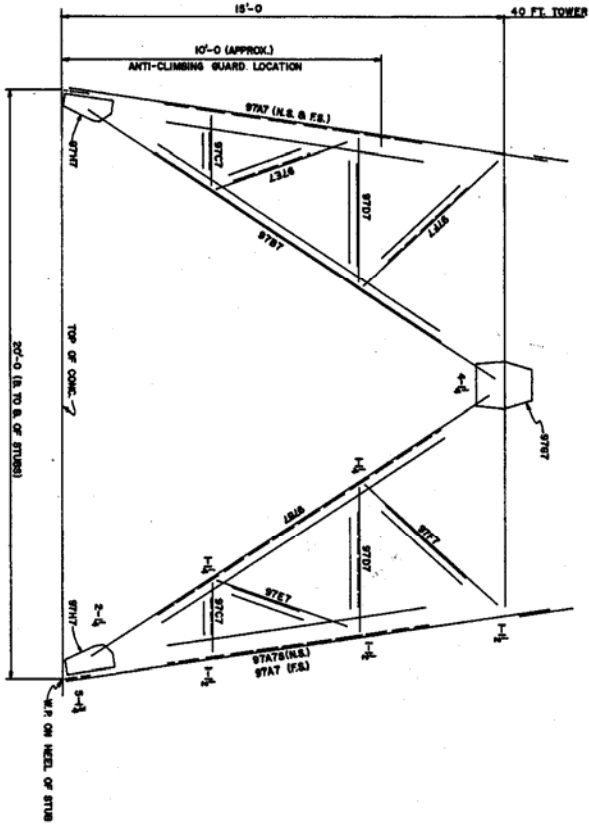
  

NO.	DATE	BY	CHK'D BY	APP'D BY	REVISION
1	7-18-76	EDWARDS	DMK	NTS	
2	7-22-76	EDWARDS	DMK	NTS	

NO.	DATE	BY	CHK'D BY	APP'D BY	REVISION
1	7-22-76	EDWARDS	DMK	NTS	





(ALL FOUR SIDES ALONG LINE, NTD)

MARK ALL MEMBERS WITH PERMITS 38

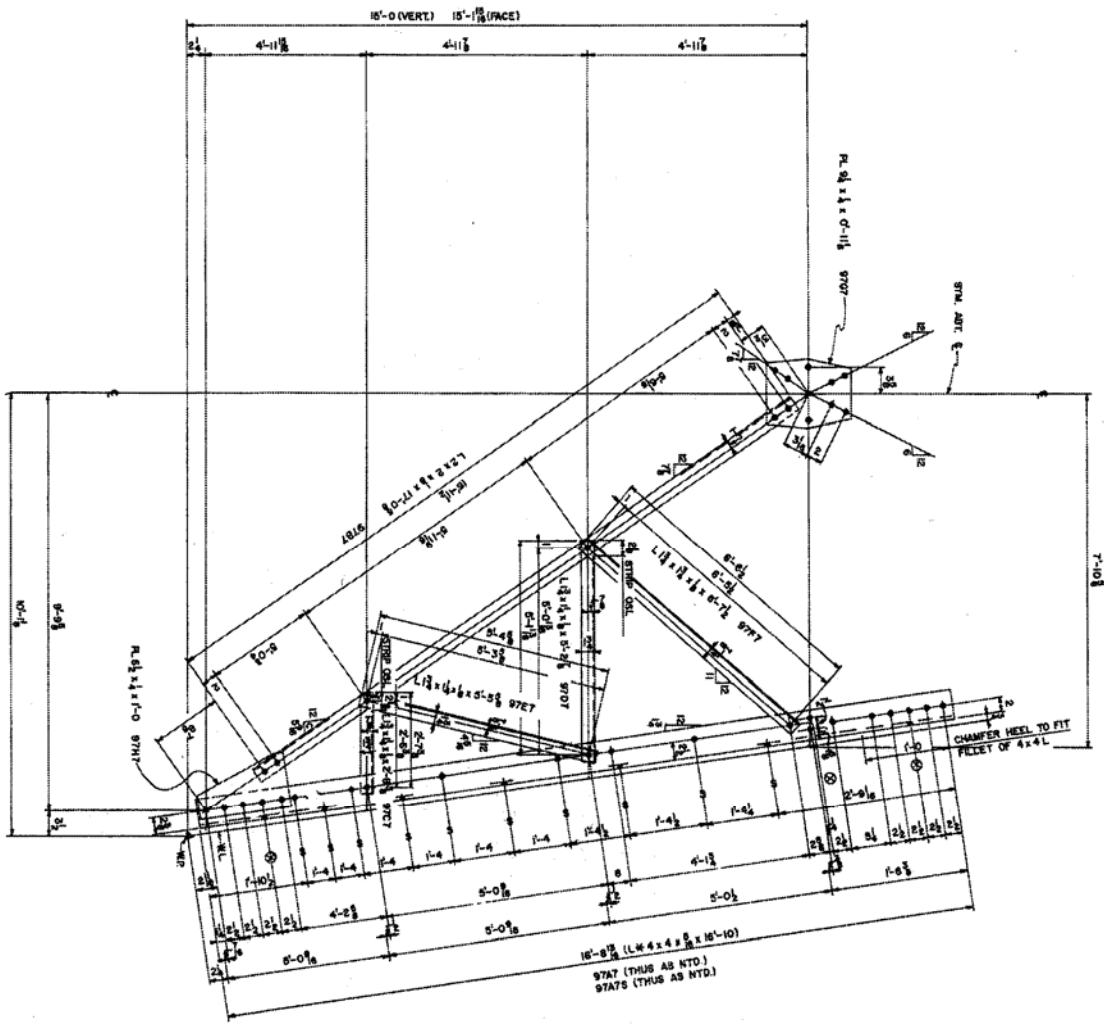
QAM.	DESCRIPTION	STEEL SCHEDULE		MARK	DRAWING	WT.
		IN.	WT.			
1	1/2" x 1/2" x 1/2"	18	10	9707	97C 9	429
2	1/2" x 1/2" x 1/2"	18	10	9708		143
3	1/2" x 1/2" x 1/2"	17	0 1/2	9709		28
4	1/2" x 1/2" x 1/2"	2	0 1/2	9710		27
5	1/2" x 1/2" x 1/2"	5	2 1/2	9711		53
6	1/2" x 1/2" x 1/2"	5	0 1/2	9712		54
7	1/2" x 1/2" x 1/2"	5	7 1/2	9713		79
8	1/2" x 1/2" x 1/2"	0	1 1/2	9714		30
9	1/2" x 1/2" x 1/2"	1	0	9715		44
10	1/2" x 1/2" x 1/2"	1	0	9716		13
11	1/2" x 1/2" x 1/2"	28	0 1/2	9717		7
12	1/2" x 1/2" x 1/2"	42	0 1/2	9718		12
13	1/2" x 1/2" x 1/2"	4	0	9719		2
TOTAL: 9043						9

① INCLUDES 1/2" x FOR GALV.  
\* DENOTES F.Y. = 50 K.S.I.

DATE	BY	CHKD	APP'D
7-22-76	EDWARDS	CLZ	NTS
7-22-76	EDWARDS	CLZ	NTS
7-22-76	EDWARDS	CLZ	NTS

15 FT. EXTENSION  
CITY PUBLIC SERVICE  
ASSEMBLY DETAILS  
188KV 2 CKT TANGENT TOWER W/B  
CONDUCTOR 1590 KCM AAC





STENCIL THIS END  
 PUNCH BOTH LEGS ALIKE EXCEPT AS NTD.  
 "S" DENOTES STEPBOLT HOLES TO BE IN STAYS ONLY  
 ⊗ DENOTES COMBINED STEPBOLT & CONN HOLES & STEP-ON STRUT

**REQUIRED MATERIAL LIST**

QTY	MARK
5	97A7
1	97A2
8	97A2
8	97C2
8	97D2
8	97E2
8	97F2
8	97G2
8	97H2

M DENOTES 1/2" x 50 K.E.L.  
 BOLTS 3/4" DIA. NTR.  
 HOLES 1/2" DIA. NTR.  
 STEEL TO BE ASTM A36 UNL. NTR.  
 BOLTS ASTM A304  
 GALV PER ASTM A123  
 BOLTS - GALV PER ASTM A153  
 MIN. SHEARD EDGE DIST. = 1"  
 ALL PCT. TO BE STEEL, STENCILED W/1"  
 OR LARGER LETTERS BEFORE ONLY.

MARK ALL MEMBERS WITH PROJECT 36

5 FT. EXTENSION

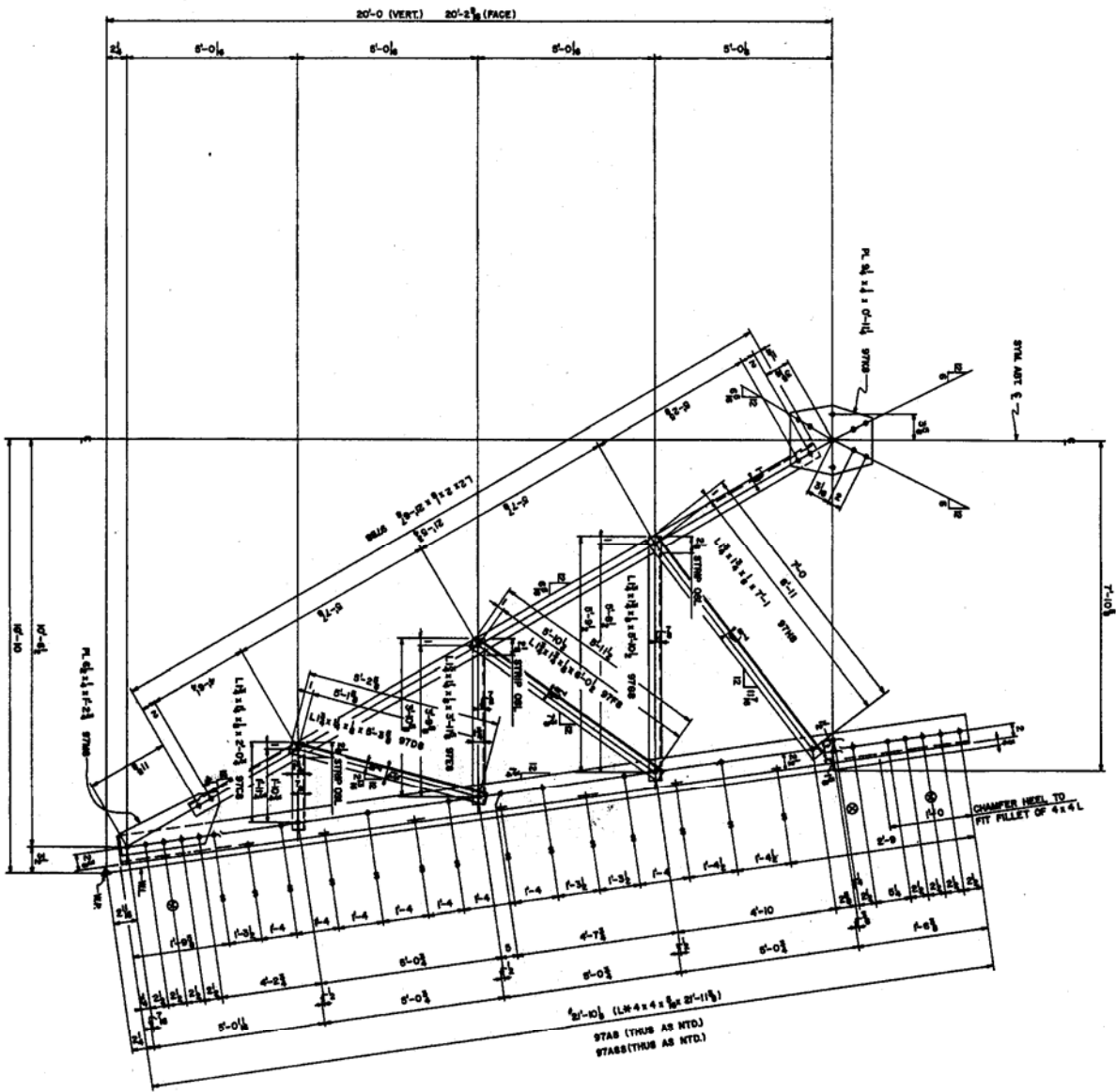
**FABRICATION DETAILS**  
 188RV 2 CRT TANGENT TOWER W.B.  
 CONDUCTOR 1890 KCM AAC

**CITY PUBLIC SERVICE**  
 SAN ANTONIO, TEXAS

NO.	DESCRIPTION	DATE	BY	CHKD BY
1	ISSUED	8-2-76	EDWARDS	EDWARDS
2	REVISED	8-2-76	EDWARDS	EDWARDS
3	REVISED	8-2-76	EDWARDS	EDWARDS
4	REVISED	8-2-76	EDWARDS	EDWARDS
5	REVISED	8-2-76	EDWARDS	EDWARDS

CAD DRAWING: EDWARDS  
 CHECKED: EDWARDS  
 DATE: 8-2-76  
 SCALE: NTS  
 SHEET: 8 OF 22  
 PROJECT: 188RV 2 CRT TANGENT TOWER W.B. CONDUCTOR 1890 KCM AAC  
 CITY PUBLIC SERVICE  
 SAN ANTONIO, TEXAS





STENCIL THIS END  
 PUNCH BOTH LESS ALIKE EXCEPT  
 AS NOTED.  
 "s" DENOTES STEPSHOLE HOLES  
 TO BE IN STUBS ONLY.  
 ⊙ DENOTES COMBINED STEPSHOLE  
 & CONK HOLES & STEP-ON STRUT.

MARK ALL NUMBERS WITH PREFIX 36

\* DENOTES 7/8" 50 KAL.  
 BOLTS 5/8" UNF. NTL.  
 HOLES 1/2" UNF. NTL.  
 STEEL TO BE ASTM A572 UNF. NTL.  
 BOLTS ASTM A572  
 ONLY PER ASTM A572  
 BOLTS-BOLTS PER ASTM A572  
 UNF. SHAWED EDGE INST. 1"  
 ALL PCL. TO BE STEEL STENCILED w/ 1/2"  
 OR LARGER LETTERS BEFORE ONLY

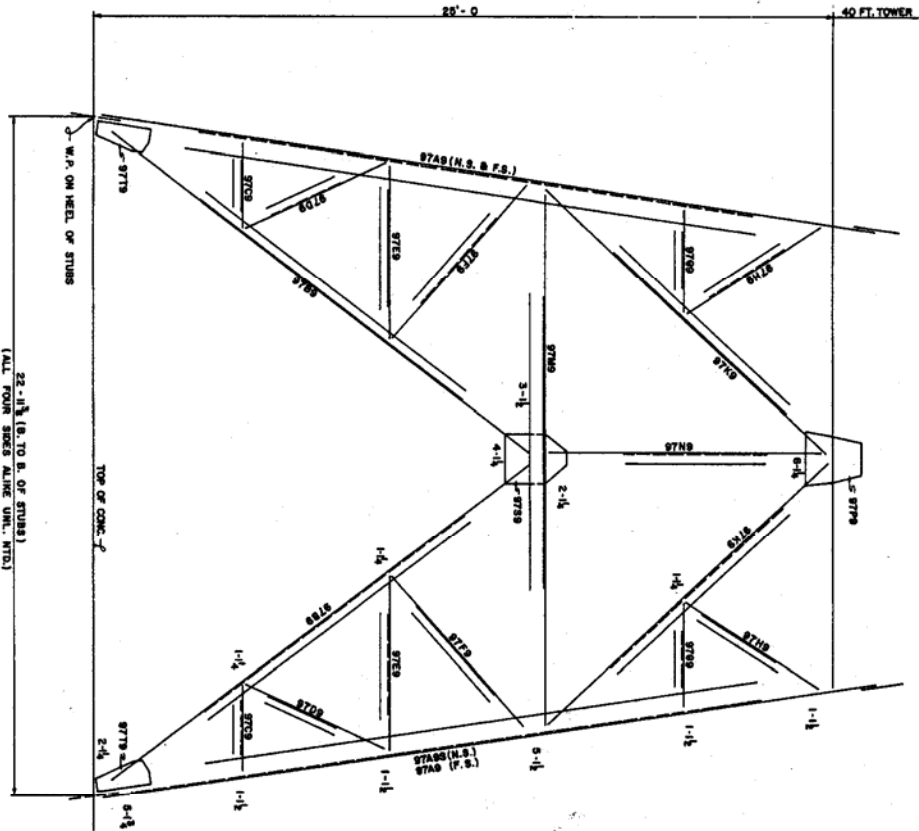
DESIGNED BY	SKAND
CHECKED BY	EDWARDS
DRAWN BY	EDWARDS
DATE	7-24-75
PROJECT	138KV 2 CRT TANGENT TOWER W/B.
CONTRACT NO.	CONDUCTOR 1590 KCM AAC
SCALE	AS SHOWN
APPROVED BY	EDWARDS
DATE	7-24-75

CITY PUBLIC SERVICE SAN ANTONIO, TEXAS	
CAD DRAWING	GRID #
DESIGNED BY	EDWARDS
CHECKED BY	EDWARDS
DRAWN BY	EDWARDS
DATE	7-24-75
PROJECT	138KV 2 CRT TANGENT TOWER W/B.
CONTRACT NO.	CONDUCTOR 1590 KCM AAC
SCALE	AS SHOWN
APPROVED BY	EDWARDS
DATE	7-24-75

QUANTITY	DESCRIPTION	UNIT
1	STUB	EA
1	STRUT	EA
1	STRUT	EA
1	STRUT	EA
1	STRUT	EA
1	STRUT	EA
1	STRUT	EA
1	STRUT	EA
1	STRUT	EA
1	STRUT	EA

20 FT EXTENSION

FABRICATION DETAILS  
 138KV 2 CRT TANGENT TOWER W/B.  
 CONDUCTOR 1590 KCM AAC



QTY	DESCRIPTION	STEEL SCHEDULE		MARK	DRAWING	① WT.
		WT.	WT.			
3	L 4 x 4 x 1/2	27	0 1/2	9774	INT. IS	688
1	L 4 x 4 x 1/2	27	0 1/2	9774		230
8	L 2 x 2 x 1/4	17	10 1/2	9778		248
8	L 3/4 x 1 1/2 x 1/4	3	24	9790		32
8	L 3/4 x 1 1/2 x 1/4	6	7 1/2	9790		88
8	L 3/4 x 1 1/2 x 1/4	6	2 1/2	9775		78
8	L 3/4 x 1 1/2 x 1/4	7	4	9779		87
8	L 3/4 x 1 1/2 x 1/4	3	8 1/2	9786		40
8	L 3/4 x 1 1/2 x 1/4	5	5 1/2	9786		68
8	L 2 x 2 x 1/4	13	26	9780		181
4	L 3 x 3 x 1/4	18	6 1/2	9788		284
4	L 3/4 x 1 1/2 x 1/4	2	10 1/2	9788		88
4	L 3/4 x 1 1/2 x 1/4	0	11 1/2	9789		32
4	L 3/4 x 1 1/2 x 1/4	0	11 1/2	9789		32
8	L 3/4 x 1 1/2 x 1/4	1	0	9779		48
8	L 3/4 x 1 1/2 x 1/4					84
8	L 3/4 x 1 1/2 x 1/4					24
4	L 3/4 x 1 1/2 x 1/4					12
12	3/8 STD. GALV. STEELPLATE			W/2	INT.	9

TOTAL: 2231.8

① INCLUDES 3 1/2 % FOR GALV.  
N DENOTES 7/8" x 50 K.S.I.

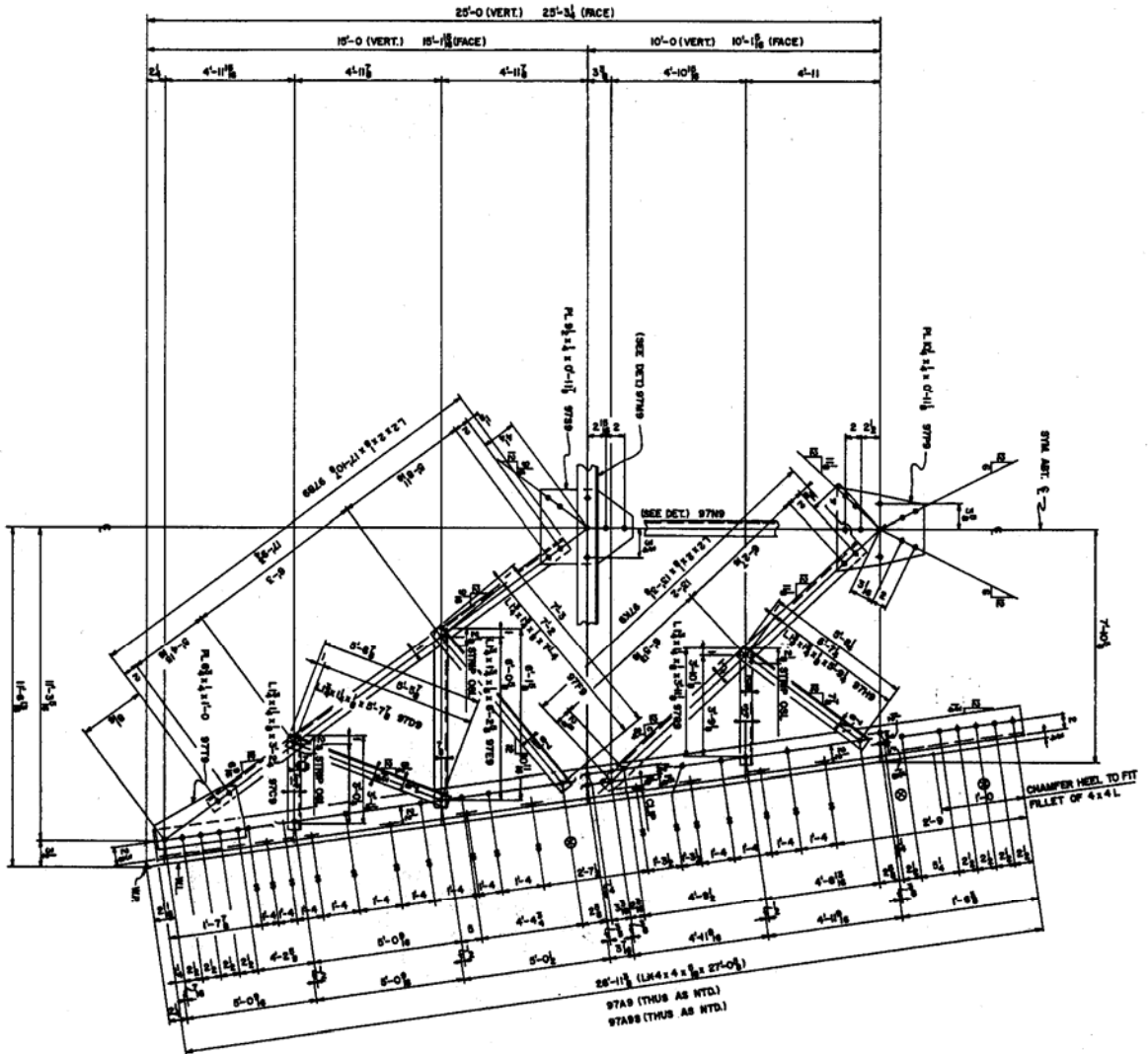
MARK ALL MEMBERS WITH PREFIX 30  
25 FT. EXTENSION

ASSEMBLY DETAILS  
158RY 2 CRT TANGENT TOWER W/B  
CONDUCTOR 1680 KCM AAC

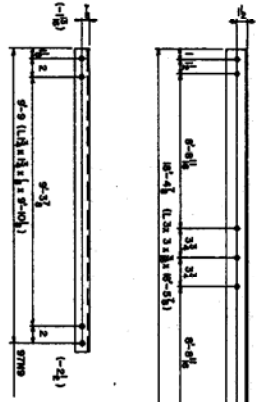
CITY PUBLIC SERVICE

SAN ANTONIO, TEXAS

NO.	DATE	BY	CHKD.	APP.	DESCRIPTION
1	8-22-75	EDWARDS	CZ		CONDUCTOR
2	8-22-75	EDWARDS	CZ		CONDUCTOR
3	8-22-75	EDWARDS	CZ		CONDUCTOR



STENCIL THIS END  
 PUNCH BOTH ENDS ALIKE EXCEPT AS NOTED.  
 \* DENOTES STEPBOLT HOLES TO BE IN STARS ONLY  
 ⊙ DENOTES COMBINED STEPBOLT & CONN. HOLES & STEP-ON STRUT



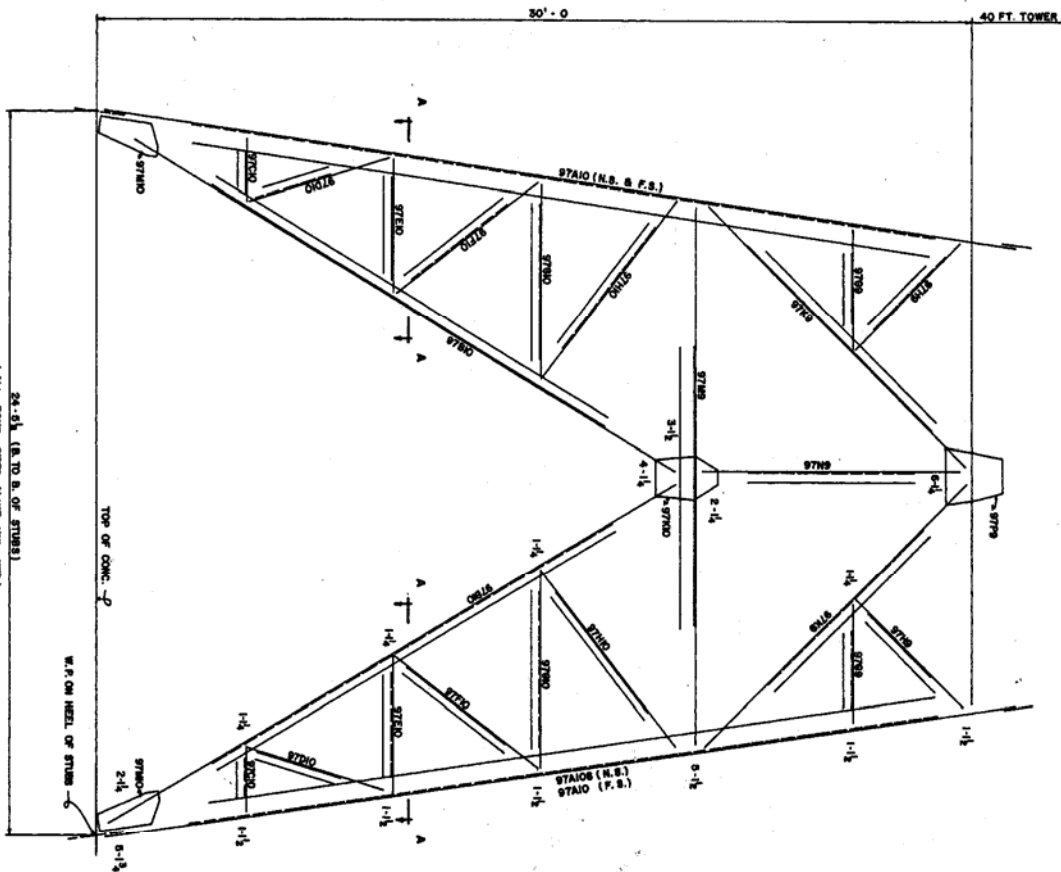
\* DENOTES 5/8\"/>
 HOLES 5/8\"/>
 HOLES 3/4\"/>
 HOLES 3/4\"/>
 STEEL TO BE ASTM A572 UNL. WTL  
 BOLTS ASTM A304  
 WALK PER ASTM A325  
 BOLTS—ONLY PER ASTM A325  
 WALK SEALED END DIST. 1\"/>
 ALL PCL. TO BE STEEL, STENCILED W/\"/>
 OR LAMBER LETTERS ABOVE ONLY

MARK ALL MEMBERS WITH PROJECT 36

QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1

NO.	DESCRIPTION	QTY	UNIT	REVISION
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9
10	10	10	10	10

25 FT EXTENSION  
 FABRICATION DETAILS  
 138KV 2 CRT TANGENT TOWER W/B  
 CONDUCTOR 1590 KCM AAC  
 CITY PUBLIC SERVICE  
 SAN ANTONIO, TEXAS



30'-0"

40 FT. TOWER

ST790 (N.S. & F.S.)

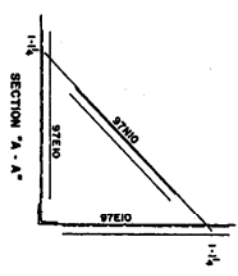
ST780 (N.S.)

ST770 (F.S.)

TOP OF CONC. P

M.P. ON NEEL. OF STUBS

(ALL FOUR SECS ALIVE UNL. NTD)



MARK ALL MEMBERS WITH PREFIX 3M

30 FT. EXTENSION

QTY.	DESCRIPTION	MARK	DRAWING	WT.
3	L 4 x 4 x 1/2"	ST790	819	275
1	L 4 x 4 x 1/2"	ST780	306	28
2	L 2 x 2 x 1/2"	ST770	56	56
2	L 1 1/2 x 1 1/2 x 1/2"	ST760	56	56
2	L 1 1/2 x 1 1/2 x 1/2"	ST750	77	77
2	L 1 1/2 x 1 1/2 x 1/2"	ST740	83	83
2	L 2 x 2 x 1/2"	ST730	108	108
2	L 2 x 2 x 1/2"	ST720	25	25
2	L 1 1/2 x 1 1/2 x 1/2"	ST710	51	51
2	L 1 1/2 x 1 1/2 x 1/2"	ST700	40	40
2	L 1 1/2 x 1 1/2 x 1/2"	ST690	68	68
2	L 2 x 2 x 1/2"	ST680	181	181
2	L 3 x 3 x 1/2"	ST670	284	284
2	L 1 1/2 x 1 1/2 x 1/2"	ST660	33	33
2	L 1 1/2 x 1 1/2 x 1/2"	ST650	38	38
100	1/2" x 1/2" x 1/2" GUS W/IN 8 IN		26	26
56	1/2" x 1/2" x 1/2" GUS W/IN 8 IN		26	26
42	1/2" x 1/2" x 1/2" GUS W/IN 8 IN		12	12
16	1/2" x 1/2" x 1/2" GUS W/IN 8 IN		11	11
TOTAL: 3537 #				

INCLUDES 3 1/2% FOR GALV.

DEMOTES F.Y. = 60 K.S.I.

NO.	DATE	BY	CHKD.	APP.
1	1-14-88	J. EDWARDS	CF	
2	1-22-88	J. EDWARDS	CF	
3	1-22-88	J. EDWARDS	CF	
4	1-22-88	J. EDWARDS	CF	
5	1-22-88	J. EDWARDS	CF	
6	1-22-88	J. EDWARDS	CF	
7	1-22-88	J. EDWARDS	CF	
8	1-22-88	J. EDWARDS	CF	
9	1-22-88	J. EDWARDS	CF	
10	1-22-88	J. EDWARDS	CF	
11	1-22-88	J. EDWARDS	CF	
12	1-22-88	J. EDWARDS	CF	
13	1-22-88	J. EDWARDS	CF	
14	1-22-88	J. EDWARDS	CF	
15	1-22-88	J. EDWARDS	CF	
16	1-22-88	J. EDWARDS	CF	
17	1-22-88	J. EDWARDS	CF	
18	1-22-88	J. EDWARDS	CF	
19	1-22-88	J. EDWARDS	CF	
20	1-22-88	J. EDWARDS	CF	

ASSEMBLY DETAILS W/B  
1389V 2 CRT TANGENT TOWER W/B  
CONDUCTION 1990 KCM AAC

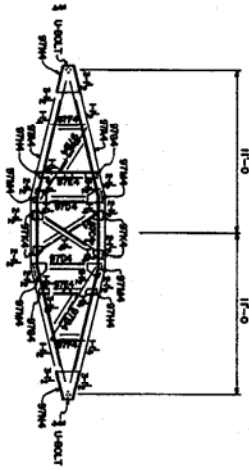
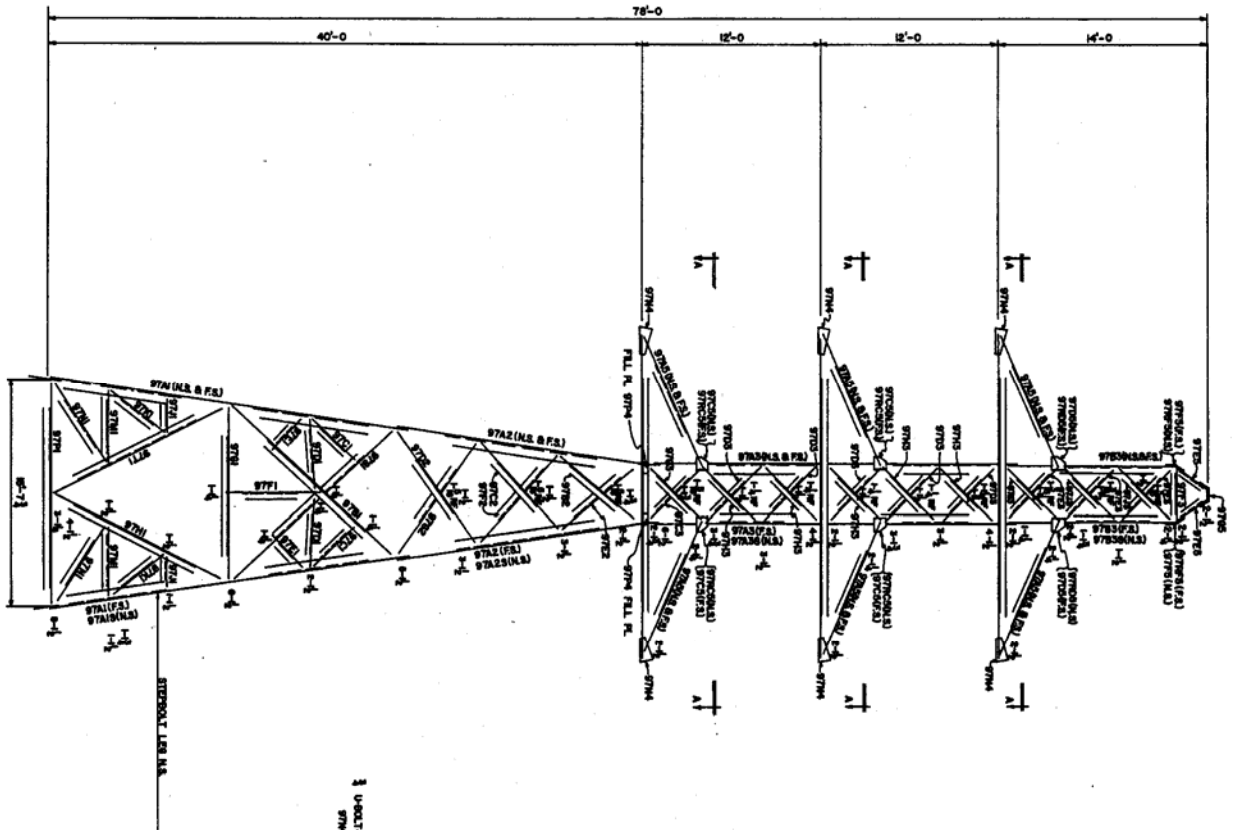
CITY PUBLIC SERVICE

CAD DRAWING NO. 1389V-2  
DESIGNED BY J. EDWARDS  
CHECKED BY J. EDWARDS  
DATE 1-22-88  
SCALE 1/4" = 1'-0"  
SHEET 11 OF 22  
DRAWING NUMBER 1389V-2  
DATE 1-22-88









SECTION A-A

MARK ALL MEMBERS WITH PREFIX 36

ASSEMBLY DETAILS  
138KV 2 CRT TANGENT TOWER W/B  
CONDUCTOR 1690 KCM AAC

CITY PUBLIC SERVICE

SAFETY

DATE

BY

CHKD BY

APP'D BY

SCALE

NO. OF SHEETS

SHEET NO.

DATE

BY

CHKD BY

APP'D BY

SCALE

NO. OF SHEETS

SHEET NO.

DATE

BY

CHKD BY

APP'D BY

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SHEET NO.

DATE

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CHKD BY

APP'D BY

SCALE

NO. OF SHEETS

SHEET NO.

DATE

BY

CHKD BY

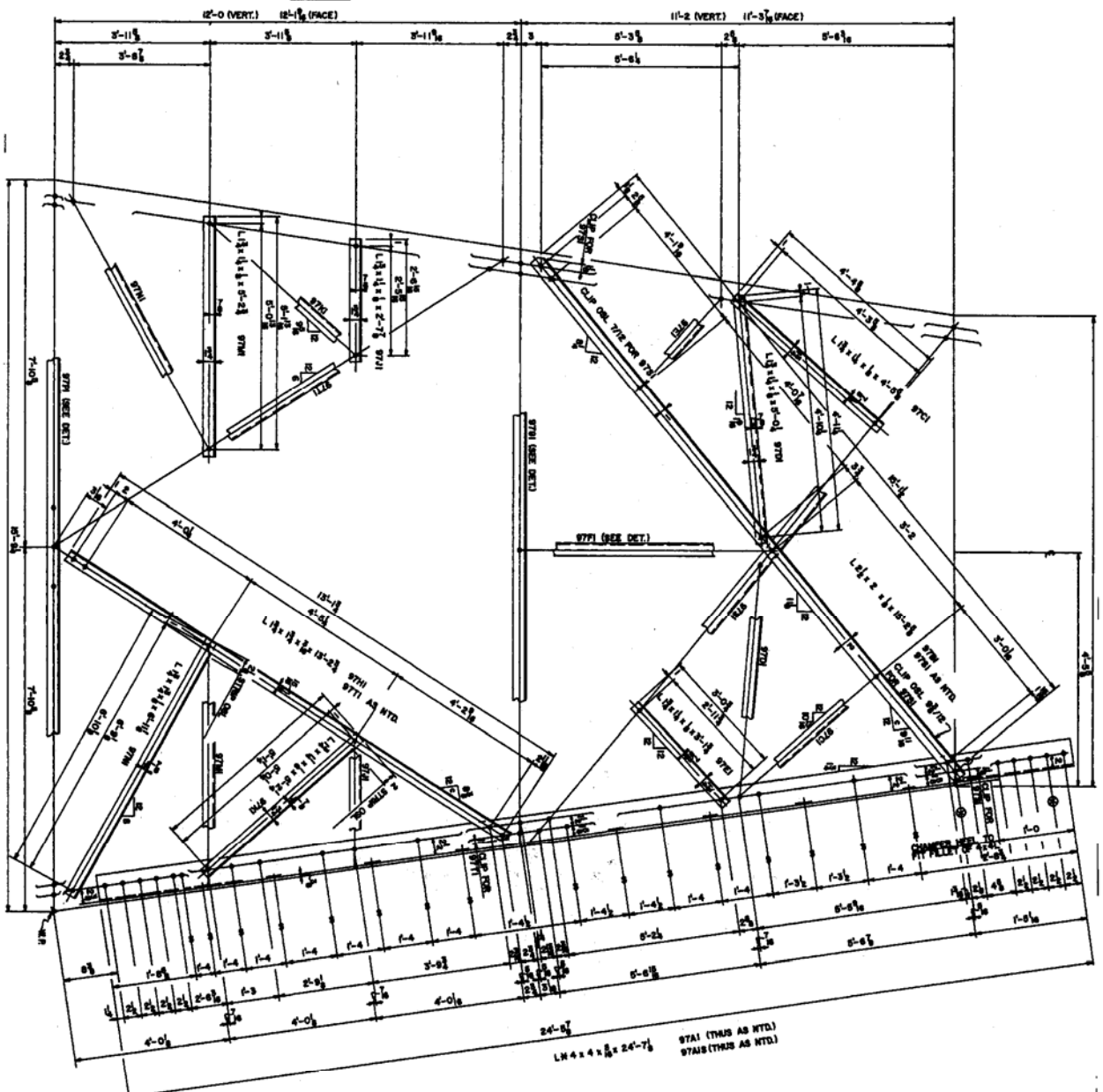
APP'D BY

SCALE

NO. OF SHEETS

SHEET NO.

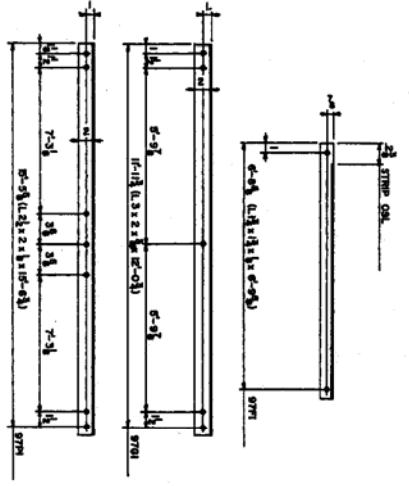
DATE



STENCIL THIS END  
 \* DENOTES STEPPOLT HOLES TO BE IN STAIRS ONLY  
 ⊙ DENOTES COMBINED STEPPOLT & CONN. HOLES & STEP-ON STRUT

LM 4 x 4 x 1/2 x 24'-7 1/2 STAIR (THIS AS MTD.)  
 STAIRS (THIS AS MTD.)

\* DENOTES 1/4" SO KILL  
 BOLTS 3/8" UNL. MTD.  
 HELDS 1/2" UNL. MTD.  
 STEEL TO BE ASTM A572 UNL. MTD.  
 BOLTS ASTM A572-4  
 GALV. PER ASTM A572  
 MULTI-GRIP PER ASTM A572  
 MIN. SPACED EDGE DIST. - 1"  
 ALL PCL TO BE STEEL STICKERED W/1"  
 OR LAMEN LETTERS BEFORE GALV.

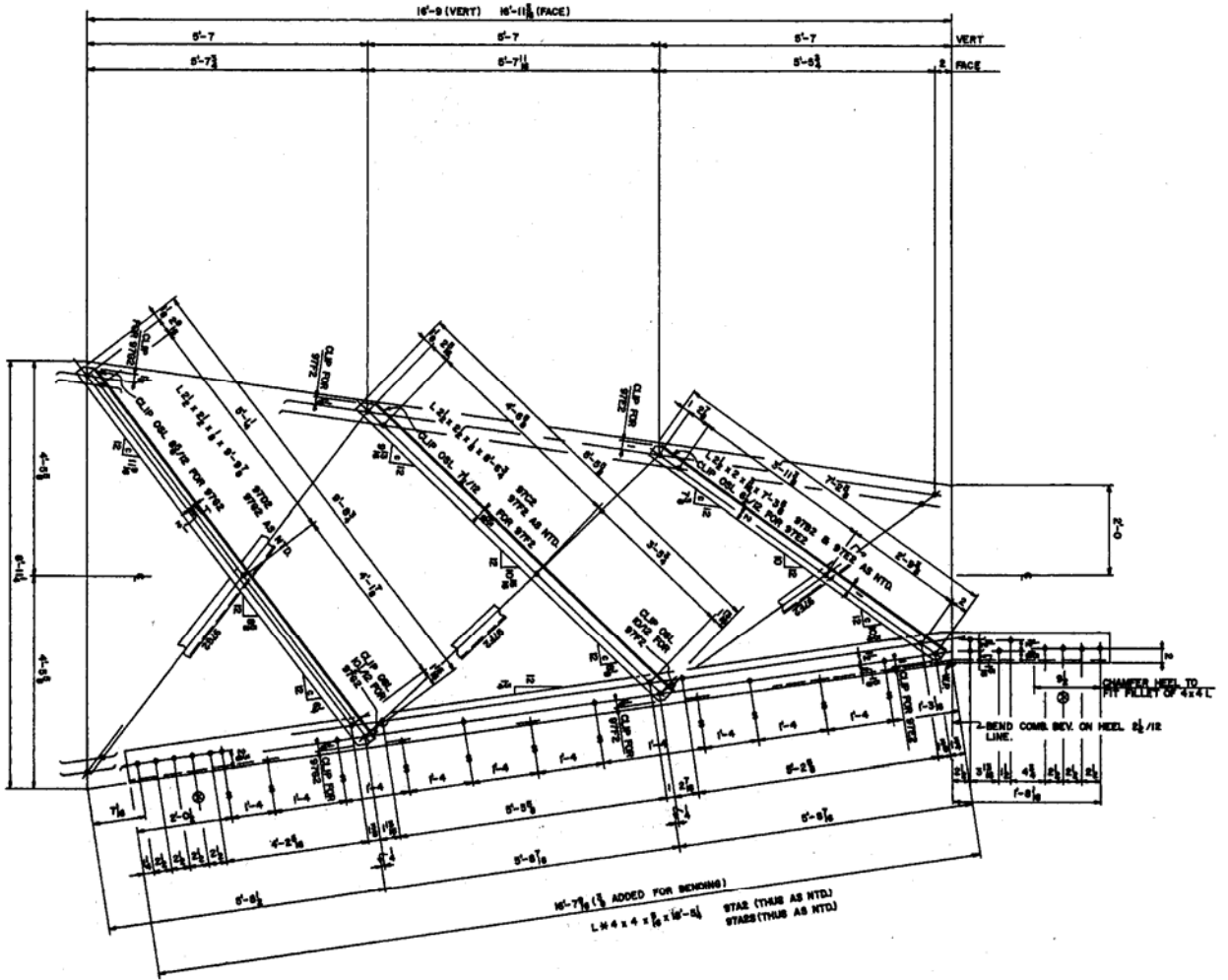


MARK ALL MEMBERS WITH PROJECT 345

QUANTITY	MARK
3	9771
1	STAIRS
8	9771
8	9771
4	9771
4	9771
4	9771
4	9771
4	9771
4	9771

NO.	DATE	BY	CHKD.	APP.
1	8-29-75	EDWARDS	CZ	NTS
2	9-22-75	EDWARDS	CZ	NTS

CITY PUBLIC SERVICE  
 138KV 2 CRT TANGENT TOWER W.B.  
 CONDUCTOR 1590 KCM AAC



STENCIL THIS END  
 FENCH BOTH ENDS ALIKE EXCEPT AS NOTED.  
 "A" DENOTES STEPBOLT HOLES TO BE  
 IN STAIRS ONLY  
 "B" DENOTES COMB. STEPBOLT &  
 COMB. HOLES.

16'-7 1/2" (1/2" ADDED FOR MEMBERS)  
 L 4 x 4 x 1/2" x 16'-5"  
 STAIR (THIS AS NOTED)  
 STAIR (THIS AS NOTED)

MARK ALL MEMBERS WITH NUMBER 26

\* DENOTES 1/2" SO K&L  
 BOLTS 3/8" DIA. INTL.  
 HOLES 1/2" DIA. INTL.  
 STEEL TO BE ASTM A572-50  
 BOLTS ASTM A572-50  
 GALV. PER ASTM A153  
 BOLTS - GALV. PER ASTM A153  
 MIN. BREAKED EDGE DIST. 1"  
 ALL P.C.A. TO BE STEEL, STENCILED W/1"  
 OR LAMEN LETTERS BEFORE GALV.

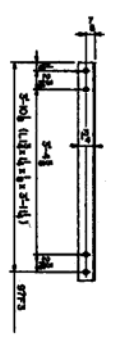
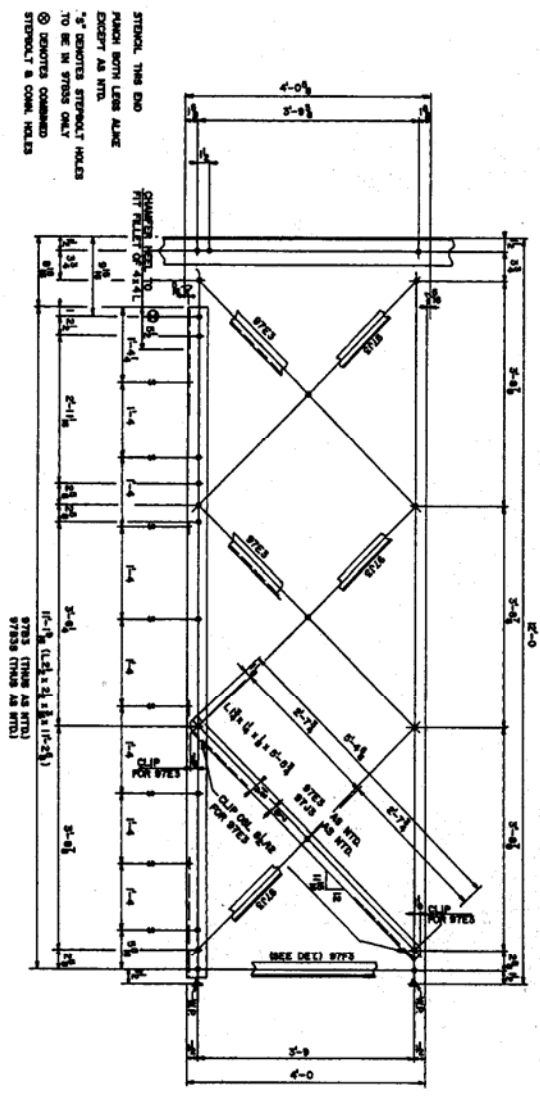
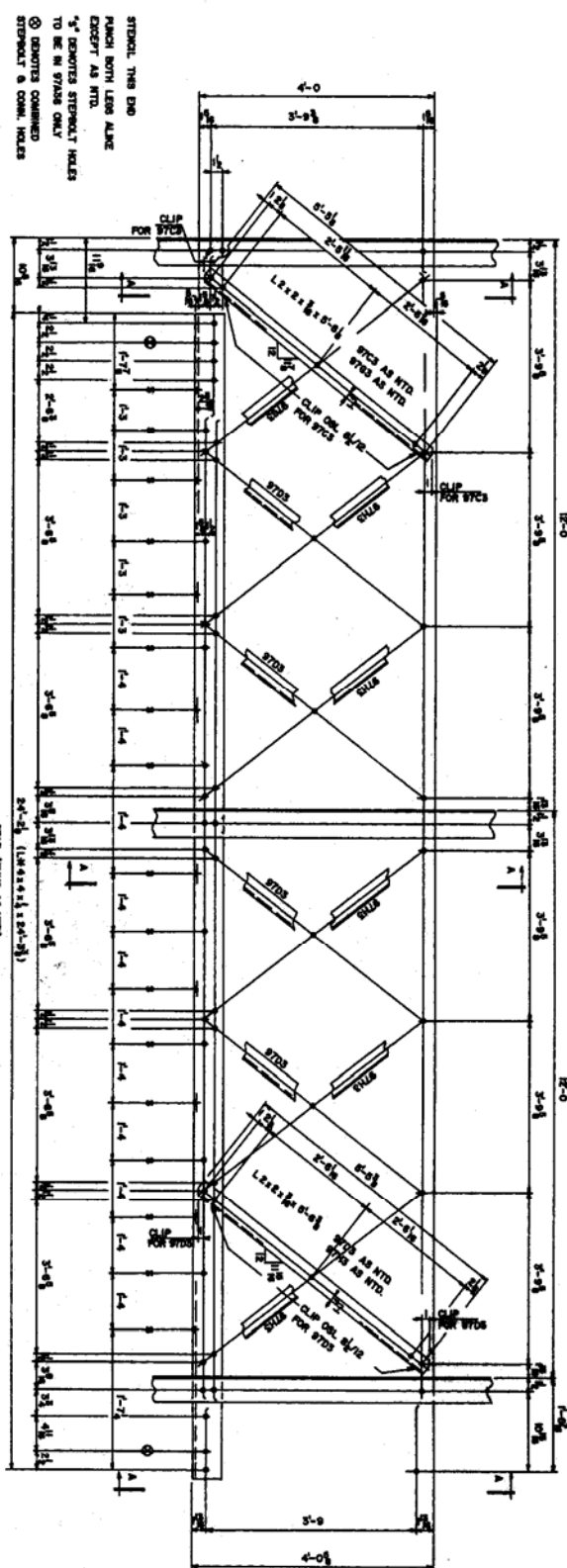
QTY	MARK
1	STAIR
1	STAIR
4	STAIR
4	STAIR
4	STAIR
4	STAIR

NO.	DATE	BY	CHKD.	APP.
1	8-28-76	EDWARDS	NTS	
2	8-28-76	EDWARDS	NTS	
3	8-28-76	EDWARDS	NTS	
4	8-28-76	EDWARDS	NTS	
5	8-28-76	EDWARDS	NTS	
6	8-28-76	EDWARDS	NTS	
7	8-28-76	EDWARDS	NTS	
8	8-28-76	EDWARDS	NTS	
9	8-28-76	EDWARDS	NTS	
10	8-28-76	EDWARDS	NTS	

FABRICATION DETAILS  
 138KV 2 CRT TANGENT TOWER W/B  
 CONDUCTOR 1580 KCM AAC

CITY PUBLIC SERVICE  
 AND APPROVAL TOWER

NO.	DATE	BY	CHKD.	APP.
1	8-28-76	EDWARDS	NTS	
2	8-28-76	EDWARDS	NTS	
3	8-28-76	EDWARDS	NTS	
4	8-28-76	EDWARDS	NTS	
5	8-28-76	EDWARDS	NTS	
6	8-28-76	EDWARDS	NTS	
7	8-28-76	EDWARDS	NTS	
8	8-28-76	EDWARDS	NTS	
9	8-28-76	EDWARDS	NTS	
10	8-28-76	EDWARDS	NTS	



QTY	MARK	DESCRIPTION
1	S-10	STEINBOCK HOLES
1	S-11	STEINBOCK HOLES
1	S-12	STEINBOCK HOLES
1	S-13	STEINBOCK HOLES
1	S-14	STEINBOCK HOLES
1	S-15	STEINBOCK HOLES
1	S-16	STEINBOCK HOLES
1	S-17	STEINBOCK HOLES
1	S-18	STEINBOCK HOLES
1	S-19	STEINBOCK HOLES
1	S-20	STEINBOCK HOLES

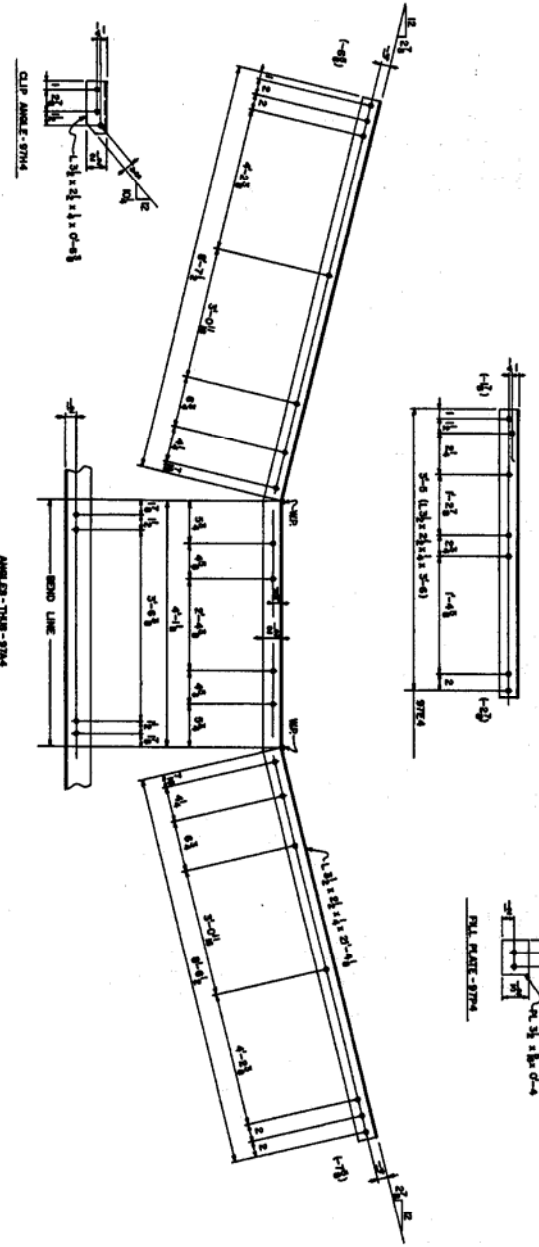
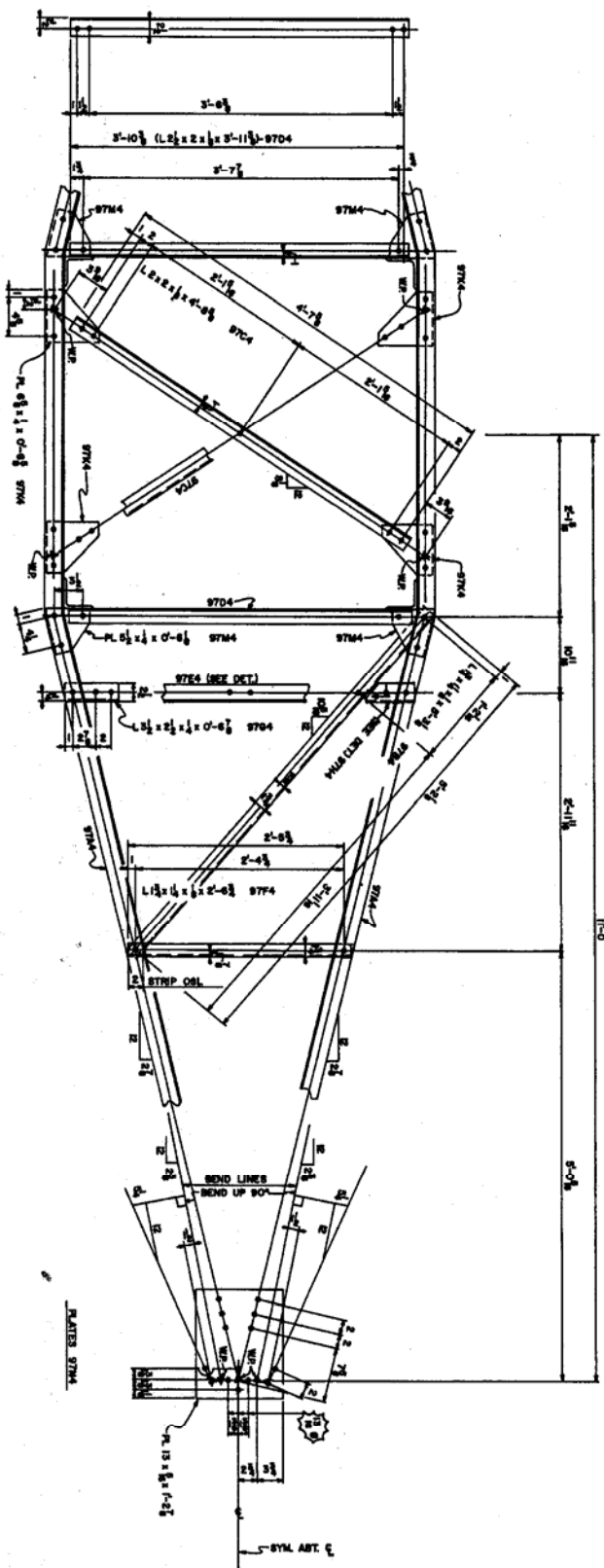
\* DENOTES 1/2" SO KAL  
 HOLES 1/4" DIA. W/10  
 HOLES 1/2" DIA. W/10  
 STEEL TO BE ASTM A36 UNL. W/10  
 S-10 PER ASTM A36  
 S-11 PER ASTM A36  
 S-12 PER ASTM A36  
 S-13 PER ASTM A36  
 S-14 PER ASTM A36  
 S-15 PER ASTM A36  
 S-16 PER ASTM A36  
 S-17 PER ASTM A36  
 S-18 PER ASTM A36  
 S-19 PER ASTM A36  
 S-20 PER ASTM A36  
 ALL PCS. TO BE STEEL STENCILED W/10  
 OR LOWER LETTERS BEFORE QALY

MARK ALL MEMBERS WITH NUMBER 36

FABRICATION DETAILS  
 138KV 2 CRT TANGENT TOWER W.B.  
 CONDUCTOR 1590 KCM AAC

CITY PUBLIC SERVICE

NO.	DATE	BY	CHKD.	APP.
1	5-28-75	EDWARDS		
2	5-28-75	EDWARDS		
3	5-28-75	EDWARDS		
4	5-28-75	EDWARDS		
5	5-28-75	EDWARDS		
6	5-28-75	EDWARDS		
7	5-28-75	EDWARDS		
8	5-28-75	EDWARDS		
9	5-28-75	EDWARDS		
10	5-28-75	EDWARDS		



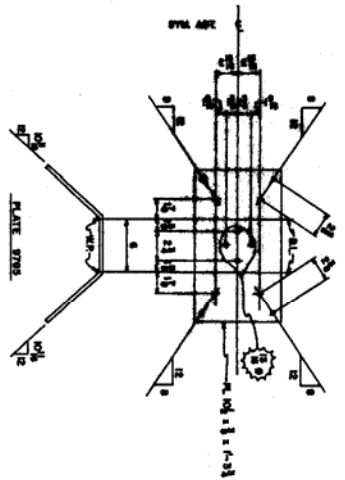
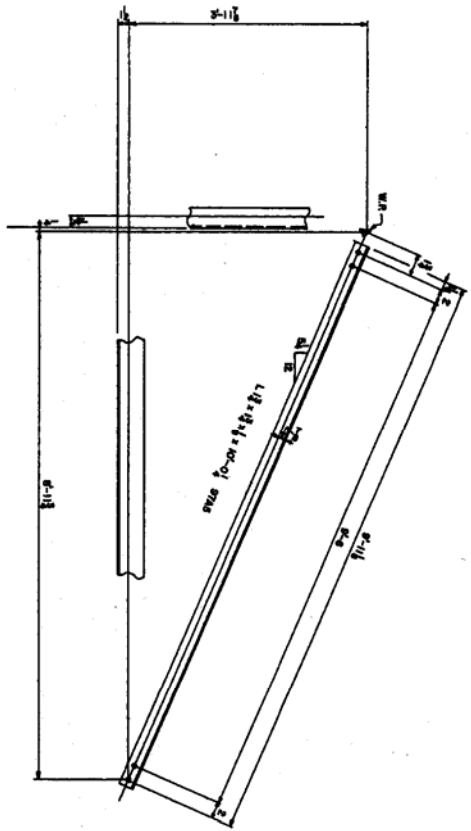
QUANTITY	MARK	DESCRIPTION
1	S-10	...
1	S-11	...
1	S-12	...
1	S-13	...
1	S-14	...
1	S-15	...
1	S-16	...
1	S-17	...
1	S-18	...
1	S-19	...
1	S-20	...
1	S-21	...
1	S-22	...
1	S-23	...
1	S-24	...
1	S-25	...
1	S-26	...
1	S-27	...
1	S-28	...
1	S-29	...
1	S-30	...
1	S-31	...
1	S-32	...
1	S-33	...
1	S-34	...
1	S-35	...
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1	S-37	...
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1	S-39	...
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1	S-41	...
1	S-42	...
1	S-43	...
1	S-44	...
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1	S-94	...
1	S-95	...
1	S-96	...
1	S-97	...
1	S-98	...
1	S-99	...
1	S-100	...

\*DIMENSIONS IN " 90 KAL.  
 SIZES 1/2" UNL. INTL.  
 HOLE 1/4" UNL. INTL.  
 STEEL TO BE ASTM A588 UNL. INTL.  
 BOLTS ASTM A578  
 GALV. PER ASTM A595  
 BOLTS - GALV. PER ASTM A578  
 UNL. SWEATED EDGE DET. - 1"  
 ALL PCL. TO BE STEEL STENCILED W/1"  
 OR LAMEN LETTERS BEFORE GALV.

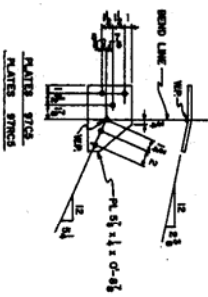
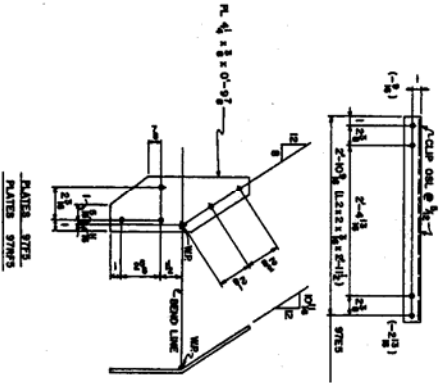
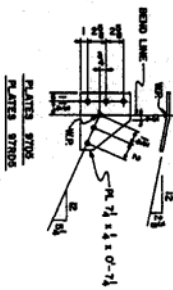
MARK ALL MEMBERS WITH PREFIX 34

FABRICATION DETAILS  
 138KV 2 CRT TANGENT TOWER W.B.  
 CONDUCTOR 1590 KCM AAC  
 CITY PUBLIC SERVICE  
 SAN ANTONIO, TEXAS

NO.	DATE	BY	CHKD.	APP'D.	DESCRIPTION
1	8-24-76	...	...	...	...
2	...	...	...	...	...
3	...	...	...	...	...
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18	...	...	...	...	...
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32	...	...	...	...	...
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36	...	...	...	...	...
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94	...	...	...	...	...
95	...	...	...	...	...
96	...	...	...	...	...
97	...	...	...	...	...
98	...	...	...	...	...
99	...	...	...	...	...
100	...	...	...	...	...



QUANTITY	UNIT	MARK
12	STEEL	W-12
4	STEEL	PLATE
2	STEEL	STAYS
2	STEEL	STAYS
4	STEEL	STAYS
2	STEEL	STAYS
2	STEEL	STAYS



\* DENOTES 7/8" DIA.  
 BOLTS 1/2" DIA. W/12  
 HOLE 1/2" DIA. W/12  
 STEEL TO BE ASTM A572 W/12  
 BOLTS PER ASTM A304  
 ONLY PER ASTM A325  
 BOLTS - ONLY PER ASTM A325  
 W/12 SEAMER EDGE DIST. - 1"  
 ALL P.C.S. TO BE STEEL, STITCHED W/12  
 OR LAMINAR LETTERS BEFORE ONLY

MARK ALL MEMBERS WITH PREFIX 2K

NO.	DATE	BY	CHK'D BY	REV.	DESCRIPTION
1	7-25-78				
2	8-1-78				

CITY PUBLIC SERVICE  
 138KV 2 CKT TANGENT TOWER W.B.  
 CONDUCTOR 1890 KCM AAC

