CITY OF GRAND ISLAND

Working Together for a Better Tomorrow. Today.

BID SPECIFICATION PACKAGE

for

COOLING TOWER REPAIR – FALL 2021 PLATTE GENERATING STATION

C 130630

Bid Opening Date/Time

Tuesday, August 10, 2021 at 2:00 p.m. (local time)
City of Grand Island, City Hall
100 East 1st Street, P.O. Box 1968
Grand Island, NE 68802-1968

Contact Information

Tylor Robinson
City of Grand Island – Utilities Department
Platte Generating Station
308/385-5496

Date issued: July 27, 2021

ADVERTISEMENT TO BIDDERS
FOR
COOLING TOWER REPAIR – FALL 2021
FOR
CITY OF GRAND ISLAND, NEBRASKA

Sealed bids for Cooling Tower Repair-Fall 2021 will be received at the office of the City Clerk, 100 E. First Street, P.O. Box 1968, Grand Island, Nebraska 68802, until **Tuesday, August 10, 2021 at 2:00 p.m. local time,** FOB the City of Grand Island, freight prepaid. Bids will be publicly opened at this time in the Grand Island City Hall City Clerk's Office located on 1st floor of City Hall. **Submit an original and three copies if submitting by mail.** Bid package and any Addendas are also available on-line at www.grand-island.com under Business-Bids and Request for Proposals-Bid Calendar under the bid opening date. Bidding documents, plans and specifications for use in preparing bids may be downloaded from the QuestCDN website www.QuestCDN.com for a fee. Submitting through QuestCDN requires one original document of the bid to be uploaded. **Bids received after the specified time will not be considered**.

The successful bidder will be required to comply with fair labor standards as required by Nebraska R.R.S.73-102 and comply with Nebraska R.R.S. 48-657 pertaining to contributions to the Unemployment Compensation Fund of the State of Nebraska. Successful bidder shall maintain a drug free workplace policy. Every public contractor and his, her or its subcontractors who are awarded a contract by the City for the physical performance of services within the State of Nebraska shall register with and use a federal immigration verification system to determine the work eligibility status of new employees physically performing services within the State of Nebraska.

Each bidder shall submit with the bid a certified check, a cashiers check, or bid bond payable to the City of Grand Island in an amount no less than five percent (5%) of the bid price which shall guarantee good faith on the part of the bidder and the entering into a contract within fifteen (15) days at the bid price if accepted by the City. **Your certified check, cashiers check or bid bond must be submitted in a separate envelope attached to the outside of the envelope containing the bid. Each envelope must be clearly marked indicating its contents. Failure to submit the necessary qualifying information and correct number of copies in clearly marked and separate envelopes will result in your bid not being opened or considered.** Only surety companies authorized to do business in the State of Nebraska may issue bid bonds.

Bids will be evaluated by the Purchaser based on price, schedule, quality, adherence to schedule, plan and specifications, economy and efficiency of operation, experience and reputation of the bidder, ability, capacity, and skill of the bidder to perform contract required and adaptability of the particular items to the specific use intended.

The Purchaser reserves the right to reject any or all bids, to waive irregularities therein, and to accept whichever bid that may be in the best interest of the City, at its sole discretion.

No bidder may withdraw his/her bid for a period of thirty (30) days after date of bid opening.

RaNae Edwards, City Clerk

Advertised

(All bids must be submitted on this form)

COOLING TOWER REPAIR – FALL 2021
PLATTE GENERATING STATION
BID DATA FORM

CITY OF GRAND ISLAND
GRAND ISLAND, NE

The undersigned Bidder, having examined all specifications and other bidding documents, and all addenda thereto, and being acquainted with and fully understanding all conditions relative to the specified materials and equipment, hereby proposes to furnish services and materials (lump sum price) to repair the existing 56,500 GPM Induced Draft Cooling Tower at Platte Generating Station and fill, including all expenses, equipment, labor, mobilization and demobilization, freight, and subcontractors, FOB the City of Grand Island-Platte Generating Station, freight prepaid, at the following price:

ITEM DESCRIPTION	EXTENDED COST
Base Bid:	
Material (breakdown attached)	$ _____
Labor	$ _____
Applicable Sales tax* (select tax option below)	$ _____
Total Base Bid	**$ _____**

*** If bidder fails to include sales tax in their bid price or takes exception to including sales tax in their bid price, the City will add a 7.5% figure to the bid price for evaluation purposes; however, the City will only pay actual sales tax due.**

☐ **Exceptions Noted -** Bidder acknowledges there are *Exceptions* and/or *Clarifications* noted to the above bid, and those exceptions are fully explained on a separate sheet, clearly marked, and included with the Bid.

_____
Bidder Company Name Date

_____
Company Address City State Zip

_____
Print Name of Person Completing Bid Signature

Email:_____ Telephone No._____

According to Nebraska Sales and Use Tax Requirements, Section 1-017, Contractors MUST check which option you have selected to file with the Nebraska Department of Revenue:

Nebraska law provides a sales and use tax exemption on contractor labor charges for the construction, repair, or annexation of any structure used for the generation, transmission, or distribution of electricity. Separately stated contractor labor would be exempt, all materials are taxable according to the contractor's option.

Option 1 (Section 1-017.05)_____ Option 2 (Section 1-017.06)_____ Option 3 (Section 1-017.07)_____

If the Nebraska sales and use tax election is not filed or noted above, the contractor will be treated as a retailer under Option 1 for sales and use tax purposes.

☐ By checking this box, Bidder acknowledges the specified completion date of the project is **October 31, 2021**.

☐ By checking this box, Bidder acknowledges that Addenda Number(s) _____ were received and considered in Bid preparation.

Note: If Bidder supplies individual unit pricing information as supplemental pricing to the base material and labor cost above, said individual pricing is proprietary information and should not be released under a public records request. The total base bid is not considered proprietary information and will be released pursuant to City Procurement Code.

☐ Bidder acknowledges there are no exceptions or clarifications to the Owner's Contract Documents, except those that are fully explained on a separate sheet, clearly marked and included with the Bid.

*** End of Bid Data Form ***

CHECKLIST FOR BID SUBMISSION
FOR
COOLING TOWER REPAIR - FALL 2021
PLATTE GENERATING STATION

Bids must be received by the City Clerk before *2:00 p.m. on Tuesday, August 10, 2021*.

The following items must be completed for your bid to be considered.

- ❑ Submittal of bid documents:
  - ❑ **Option 1 – Mailing**: A signed original and three (3) copies of the bidding documents. Failure to submit the correct number of copies may result in your bid not being considered.
    - ❑ Note: Your certified check, cashiers check or bid bond should be clearly marked in a separate envelope attached to the signed original bid.
  - ❑ **Option 2 – QuestCDN (online)**: Purchase the bid specification through QuestCDN at their $35.00 fee. Upload the signed original of the Bid Data Form, along with any supporting material required to meet the bid specification through QuestCDN. Upload your bid bond online through QuestCDN. *Bidders using Certified check or Cashiers' Check must mail said check to the office of the City Clerk no later than the scheduled bid opening date and time and clearly marked with the project name.*
- ❑ Bidders must complete and sign the Bid Data Form provided in these Documents. All blank spaces must be filled in. Bidders shall acknowledge receipt of any Addenda information on the Bid Data Form.
- ❑ Selection of Nebraska Sales Tax Option. If the Nebraska sales and use tax election is not filed or noted above, the Contractor will be treated as a retailed under Option 1 for sales and use tax purposes.
- ❑ Firm lump sum pricing; firm unit pricing in case adjustments are necessary, and breakout of sales tax pricing.
- ❑ Structure Replacement: Contractor to include procedure for sealing basin with bid.
- ❑ A proposed detailed schedule, including reflecting all key activities with sufficient information to demonstrate the means of completing the work in the allotted period.
- ❑ A reference list of at least three (3) projects of similar scope and complexity.
- ❑ A summary of the experience of the Job Superintendent proposed for this project.
- ❑ An itemized list of materials proposed, including part numbers, detailed description and cost.
- ❑ Exceptions to the specification or Owner's Contract Document.
- ❑ A copy of your OSHA compliant Confined Space Procedure and Respiratory Protection Procedure.
- ❑ Details of all proposed warranties.
- ❑ Acknowledgment of Addenda Number(s) _____.

Please check off each item as completed to ensure compliance. If you have any questions, please feel free to contact our office prior to the bid opening date/time.

INSTRUCTIONS TO BIDDERS

1. GENERAL INFORMATION.

   The following instructions outline the procedure for preparing and submitting Bids. Bidders must fulfill all requirements as specified in these Documents.

2. TYPE OF BID.

   Bidders shall be required to submit prices for all items listed in the Bid Data Form.

3. PREPARATION OF BIDS.

   Bidders shall use only the Bid Data Form provided in these Documents. All blank spaces in the Bid Data Form must be filled in, preferably in BLACK ink, in both words and figures where required. No changes to the wording or content of the forms is permitted. Written amounts shall govern in case of discrepancy between the amounts stated in writing and the amounts stated in figures.

   Prices stated shall be f.o.b. with freight and full insurance paid by Bidder, to the job site located in Grand Island, Nebraska.

   The Bidder shall acknowledge receipt of all Addenda in the Bid Data Form. Bids received without acknowledgement or without the Addendum enclosed will be considered informal.

   Individual unit pricing as listed on the Bid Data Form or supplied as supplemental information may be deemed proprietary information and not be released under a public records request. The total amount of the bid is not considered proprietary information and will be released pursuant to City Procurement Code.

4. SUBMISSION OF BIDS.

   All Bids must be submitted intact with the correct number of copies no later than the time prescribed, at the place, and in the manner set forth in the ADVERTISEMENT FOR BIDS. Bids must be made on the Bid Data Form provided herein. Each Bid mailed must be submitted intact in a sealed envelope, so marked as to indicate its contents without being opened, and delivered in person or addressed and mailed in conformance with the instructions in the ADVERTISEMENT FOR BIDS.

5. BID SECURITY.

   Bids must be accompanied by cash, a certified check, or cashier's check drawn on a bank which is insured by the Federal Deposit Insurance Corporation, or a bid bond issued by a Surety authorized to issue such bonds in the state where the Work is located, in the amount of 5 percent of the bid amount payable to OWNER. This bid security shall be given as a guarantee that the Bidder will not withdraw their Bid for a period of thirty (30) days after bid opening, and that if awarded the Contract, the successful Bidder will execute the attached Contract and furnish a properly executed Performance Bond and Payment Bond, each in the full amount of the Contract price, within the time specified.

   The Attorney-in-Fact that executes this bond on behalf of the Surety must attach a notarized copy of his/her power of attorney as evidence of his/her authority to bind the Surety on the date of execution of the bond. Where State Statue requires, certification by a resident agent shall also be provided.

6. RETURN OF BID SECURITY.

Within fifteen (15) days after the award of the Contract, the OWNER will return the bid securities to all Bidders whose Bids are not to be further considered in awarding the Contract. All other retained bid securities will be held until the Contract has been finally executed, after which all bid securities, other than Bidders' bonds and guarantees which have been fortified, will be returned to the respective Bidders whose Bids they accompanied.

7. BASIS OF AWARD.

The award will be made by the OWNER on the basis of the Bid from the lowest responsive, responsible Bidder which, in the OWNER's sole and absolute judgment will best serve the interest of the OWNER. All Bids will be considered on the following basis:

- Delivery time
- Bid price
- Cost of installation
- Suitability to project requirements
- Conformance with the terms of the Bid Documents
- Responsibility and qualification of Bidder

The OWNER reserves the right to reject all Bids, or any Bid not in conformance with the intent of the Bid Documents, and to waive any informalities and irregularities in said Bids.

8. EXECUTION OF CONTRACT.

The successful Bidder shall, within fifteen (15) days after receiving notice of award, sign and deliver to the OWNER the Contract hereto attached together with the acceptable bonds as required in these Bid Documents. Within fifteen (15) days after receiving the signed Contract with acceptable bond(s) from the successful Bidder, the OWNER's authorized agent will sign the Contract. Signature by both parties constitutes execution of the Contract.

9. PERFORMANCE AND PAYMENT BONDS.

The successful Bidder shall file with the OWNER Performance and Payment Bonds in the full amount (100 percent) of the Contract price, as security for the faithful performance of the Contract and the payment of all persons supplying labor and materials for the Work under this Contract, and to cover all guarantees against defective workmanship or materials, or both, for a period of one (1) year after the date of final acceptance of the Work by the OWNER. The Surety furnishing these bonds shall have a record of service satisfactory to the OWNER, be authorized to do business in the State where the OWNER's project is located and shall be named on the current list of approved Surety Companies, acceptable on Federal bonds as published by the Audit Staff, Bureau of Accounts, U.S. Treasury Department.

The Attorney-in-Fact (Resident Agent) who executes these bonds on behalf of the Surety must attach a notarized copy of his/her power-of-attorney as evidence of his/her authority to bind the Surety on the date of execution of the bond.

10. TIME OF COMPLETION.

The time of completion of the Work to be performed under this Contract is the essence of the Contract. The time allowed for the completion of the Work is stated in the Bid Data Form.

11. GRATUITIES AND KICKBACKS.

City Code states that it is unethical for any person to offer, give, or agree to give any City employee or former City employee, or for any City employee or former City employee to solicit, demand, accept, or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, or preparation of any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy, or other particular matter, pertaining to any program requirement or a contract or subcontract, or to any solicitation or proposal therefor. It shall be unethical for any payment, gratuity, or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor or any person associated therewith, as an inducement for the award of a subcontract or order.

12. FISCAL YEAR.

The City of Grand Island, Nebraska operates on a fiscal year beginning October 1st and ending on the following September 30th. It is understood and agreed that any portion of this agreement which will be performed in a future fiscal year is contingent upon the City Council adopting budget statements and appropriations sufficient to fund such performance.

CONTRACT AGREEMENT

THIS AGREEMENT made and entered into by and between **[SUCCESSFUL BIDDER]**, hereinafter called the Contractor, and the **CITY OF GRAND ISLAND, NEBRASKA**, hereinafter called the City.

WITNESSETH:

THAT, WHEREAS, in accordance with law, the City has caused contract documents to be prepared and an advertisement calling for bids to be published for *COOLING TOWER REPAIR-FALL 2021;* and

WHEREAS, the City, in the manner prescribed by law, has publicly opened, examined, and canvassed the bids submitted, and has determined the aforesaid Contractor to be the lowest responsive and responsible bidder, and has duly awarded to said Contractor a contract therefore, for the sum or sums named in the Contractor's bid, a copy thereof being attached to and made a part of this Contract;

NOW, THEREFORE, in consideration of the compensation to be paid to the Contractor and of the mutual agreements herein contained, the parties have agreed and hereby agree, the City for itself and its successors, and the Contractor for itself, himself/herself, or themselves, and its, his/her, or their successors, as follows:

ARTICLE I. That the following documents shall comprise the Contract, and shall together be referred to as the "Agreement" or the "Contract Documents";

1. This Contract Agreement.
2. City of Grand Island's Specification for this project.
3. [NAME OF SUCCESSFUL BIDDER] bid signed and dated [DATE OF BID].

In the event of any conflict between the terms of the Contract Documents, the provisions of the document first listed shall prevail.

ARTICLE II. That the Contractor shall (a) furnish all tools, equipment, superintendence, transportation, and other construction materials, services and facilities; (b) furnish, as agent for the City, all materials, supplies and equipment specified and required to be incorporated in and form a permanent part of the completed work; (c) provide and perform all necessary labor; and (d) in a good substantial and workmanlike manner and in accordance with the requirements, stipulations, provisions, and conditions of the Contract documents as listed in the attached General Specifications, said documents forming the Contract and being as fully a part thereof as if repeated verbatim herein, perform, execute, construct and complete all work included in and covered by the City's official award of this Contract to the said Contractor, such award being based on the acceptance by the City of the Contractor's bid;

ARTICLE III. That the City shall pay to the Contractor for the performance of the work embraced in this Contract and the Contractor will accept as full compensation therefore the sum (subject to adjustment as provided by the Contract) of **[DOLLAR AMOUNT] ($00.00)** for all services, materials, and work covered by and included in the Contract award and designated in the foregoing Article II; payments thereof to be made in cash or its equivalent in the manner provided in the General Specifications.

The total cost of the Contract includes:

Base Bid:	$	.00
Sales Tax on Materials/Equipment:	$	.00
Sales Tax on Labor:	$	.00
Total	$	.00

Contractor Tax Option _____

The City of Grand Island, Nebraska operates on a fiscal year beginning October 1st and ending on the following September 30th. It is understood and agreed that any portion of this agreement which will be performed in a future fiscal year is contingent upon the City Council adopting budget statements and appropriations sufficient to fund such performance.

ARTICLE IV. The Contractor hereby agrees to act as agent for the City in purchasing materials and supplies for the City for this project. The City shall be obligated to the vendor of the materials and supplies for the purchase price, but the Contractor shall handle all payments hereunder on behalf of the City. The vendor shall make demand or claim for payment of the purchase price from the City by submitting an invoice to the Contractor. Title to all materials and supplies purchased hereunder shall vest in the City directly from the vendor. Regardless of the method of payment, title shall vest immediately in the City. The Contractor shall not acquire title to any materials and supplies incorporated into the project. All invoices shall bear the Contractor's name as agent for the City. This paragraph will apply only to these materials and supplies actually incorporated into and becoming a part of the finished product of the COOLING TOWER REPAIR-FALL 2021.

ARTICLE V. That the Contractor shall start work as soon as possible after the Contract is signed and the required bonds and insurance are approved, and that the Contractor shall deliver the equipment, tools, supplies, and materials F.O.B. Platte Generating Station, and complete the work on or before ***October 31, 2021.***

ARTICLE VI. The Contractor agrees to comply with all applicable State fair labor standards in the execution of this Contract as required by Section 73-102, R.R.S. 1943. The Contractor further agrees to comply with the provisions of Section 48-657, R.R.S. 1943, pertaining to contributions to the Unemployment Compensation Fund of the State of Nebraska. During the performance of this Contract, the Contractor and all subcontractors agree not to discriminate in hiring or any other employment practice on the basis, of race, color, religion, sex, national origin, age or disability. The Contractor agrees to comply with all applicable Local, State and Federal rules and regulations. The Contractor agrees to maintain a drug-free workplace policy and will provide a copy of the policy to the City upon request. Every public contractor and his, her or its subcontractors who are awarded a contract by the City for the physical performance of services within the State of Nebraska shall register with and use a federal immigration verification system to determine the work eligibility status of new employees physically performing services within the State of Nebraska.

ARTICLE VII. Gratuities and kickbacks: City Code states that it is unethical for any person to offer, give, or agree to give any City employee or former City employee, or for any City employee or former City employee to solicit, demand, accept, or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, or preparation of any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy, or other particular matter, pertaining to any

program requirement or a contract or subcontract, or to any solicitation or proposal therefor. It shall be unethical for any payment, gratuity, or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor or any person associated therewith, as an inducement for the award of a subcontract or order.

[SUCCESSFUL BIDDER]

By_____ Date _____

Title_____

CITY OF GRAND ISLAND, NEBRASKA

By_____ Date _____
Mayor

Attest:_____
City Clerk

The Contract is in due form according to law and hereby approved.

_____ Date _____
Attorney for the City

REQUEST FOR BIDS - GENERAL SPECIFICATIONS

The Bid shall be in accordance with the following and with all attached BID DATA and DETAILED SPECIFICATIONS.

All prices are to be furnished and installed FOB, Grand Island, Nebraska. **All prices shall be firm, and shall include all sales and use taxes as lawfully assessed under laws and regulations of the State of Nebraska.** * If bidder fails to include sales tax in their bid price or takes exception to including sales tax in their bid price, the City will add a 7.5% figure to the bid price for evaluation purposes; however, the City will only pay actual sales tax due.

Mailed bids shall include the following on the **outside** of the mailing envelope: **"Cooling Tower Repair-Fall 2021".** All bids submitted by mail must include **an original and three copies** of the bid. The bid specification and on-line bidding forms are also available at http://www.grand-island.com/business/bids-and-request-for-proposals/bid-calendar under the bid opening date and "Click here for bid document link" through QuestCDN for a $30.00 fee. If submitting through QuestCDN, **one** original document of the bid is required to be uploaded. No verbal bids will be considered. All sealed bids are due no later than Tuesday, **August 10, 2021 at 2:00 p.m. local time**. to:

Mailing Address: City Clerk
City Hall
P. O. Box 1968
Grand Island, NE 68802-1968

Street Address: City Clerk
City Hall
100 E. First Street
Grand Island, NE 68801

Bids will be opened at this time in the City Hall City Clerk's Office located on 1st floor of City Hall. Any bid received after the specified date will not be considered.

Bids will be evaluated by the Purchaser based on price, schedule, quality, adherence to schedule, plan and specifications, economy and efficiency of operation, experience and reputation of the bidder, ability, capacity, and skill of the bidder to perform contract required and adaptability of the particular items to the specific use intended.

The successful bidder will be required to comply with fair labor standards as required by Nebraska R.R.S.73-102 and comply with Nebraska R.R.S. 48-657 pertaining to contributions to the Unemployment Compensation Fund of the State of Nebraska. Contractor shall maintain a drug free workplace policy. Every public contractor and his, her or its subcontractors who are awarded a contract by the City for the physical performance of services within the State of Nebraska shall register with and use a federal immigration verification system to determine the work eligibility status of new employees physically performing services within the State of Nebraska.

The equipment and materials must be new, the latest make or model, unless otherwise specified. Prior to approving the invoice for payment, the City reserves the right to thoroughly inspect and test the equipment to confirm compliance with specifications. Any equipment or material which does not meet the City's requirements will be returned at vendor's expense for correction. The invoice will be paid after approval at the next regularly scheduled City Council meeting and occurring after departmental approval of invoice; the City Council typically meets the second and fourth Tuesday of each month. Invoices must be received well in advance of Council date to allow evaluation and processing time.

Each bidder shall submit with the bid a certified check, a cashier's check, or bid bond payable to the City of Grand Island in an amount no less than five percent (5%) of the bid price which shall guarantee good faith on the part of the Bidder and the entering into a contract within fifteen (15) days at the bid price if accepted by the City. **Your certified check, cashier's check or bid bond must be submitted in a separate envelope attached to the outside of the envelope containing the bid. Each envelope must be clearly marked indicating its contents. Failure to submit the necessary qualifying information and correct number of copies in clearly marked and separate envelopes will result in your bid not being opened or considered.** Only surety companies authorized to do business in the State of Nebraska may issue bid bonds.

Successful bidder shall comply with the City's insurance requirements; performance and payment bonds are required for this project as outlined in the Detailed Specifications and Instructions to Bidders. All bids shall be valid for at least thirty (30) working days after the bid deadline for evaluation purposes.

All bids must be on the bid form and must be signed and dated to be accepted. If exceptions and/or clarifications are noted to the bid, those exceptions must be fully explained on a separate sheet, clearly marked, and included with the Bid. Any changes that are found made to the original bid specification, other than Owner generated Addendums, would result in your bid not being considered. Please contact Tylor Robinson at 308-385-5495, for questions concerning this specification.

Table of Contents

Cooling Tower Repair – Fall 2021
Platte Generating Station

Grand Island Utilities Department-Detailed Specification

1.0 PROJECT DECRIPTION

The Grand Island Utilities Department at Platte Generating Station is requesting bids to repair the existing 56,500 GPM Induce Draft Cooling Tower at Platte Generating Station.

1.1 BACKGROUND

TOWER MAKE: Marley
TOWER MODEL NUMBER: 6516-4-05
TOWER SERIAL # 65160120117-78
TOWER ORIGINAL DESIGN:
Doubleflow – Crossflow
Built: 1982
Number of Cells: 5
Flow Rate: 56500 gpm
Length: 5 at 40' = 200'
Width: 54' at basin, 68' at distribution
Height: 36'
Height in 6 Foot Increments (Cubes): 5
Underside of fan deck to top of distribution deck: 6'
Distribution Deck Width: 16'
Fan deck width: 68' (fan deck covers distribution decks)

LOUVERS:
Height: 30'
Vertical spacing: 3'
Dimensions: 12 oz. x 42" x 8' 3".
Number per run: 10
Offset: Sloped

FILL:
Type: 6', 50 mil arch-bar fill
Support: 14GA PVC coated wire grid, clipped at both ends of each bar.
Vertical spacing: 8"
Horizontal spacing: 8"
Air Travel: 16'
Number of decks in louver area: All
Basin curb to bottom fill support: -6"

RISERS:
Number: 2
Diameter: 42"

COLD WATER BASIN:
Distance Above Grade: 1'
Water Depth: 4'
Basin Depth: 5'

TEMPERATURE PARAMETERS:
Hot Water: 105 deg F
Cold Water: 85 deg F
Wet Bulb: 75 deg F

FAN DECK:
Net Thickness: Fiberglass, upgraded fall 2007
Joist Size: 2" x 6", transverse, doubled on columns, plus one between = 2' on center (O.C.).
Joist Support Size: 2" x 4", longitudinal, doubled on columns, 8' O.C.

FAN STACK:
Type: Marley, glass reinforced polyester plastic (GRP), velocity recovery (V.R.), vertical ribs.
Height: 18'
Diameter: 28'
Hole in Deck: 31'

MECHANICAL:
Motors:
HP: 200/50
Volts: 460
Amps: 230/86
RPM: 1785/890
Service Factor: 1.0
Frame Size: 447 T

Gear:
Make: Amarillo
Model: Double reduction.

Fan:
Make: Hudson HP4-8
Diameter: 28'
Number of Blades: 8
Blade Material: GRP
Seal Diameter: 6'

Shaft:
Make: Marley
Diameter: 6"

Much of the cooling tower has been rebuilt over its 30 years of service. Some of this work included:

- Replaced 100% transverse water level basin girts, c/w 304SS bolting and splice blocks.
- Replaced 100% longitudinal water level basin grits, c/w 304SS bolting and splice blocks.
- Replaced outer structural columns and louvers.
- Replaced supporting members with new fire retardant pressure treated West Coastal Region Douglas Fir wood.
- The structural members meet the environmental loads of ASCE-7, 60psf deck load on the fan deck, and 30 psf wind load. All hardware has been 304 and 316 stainless steel.
- Replaced Louvers with fiberglass louvers supported from the main cooling tower structure by pressure treated West Coastal Region Douglas Fir.
- New air seals constructed of treated fir plywood and copper flashing at the base of the louvers to the operating basin depth.
- Replaced the Marley gear drives with Amarillo A-36 right angle gear drives.
- Replaced the original wood deck with FRP decking.

1.2 LOCATION

The Platte Generating Station is located at 1035 W. Wildwood Drive, two (2) miles south of Grand Island, Nebraska. The plant entrance is located two (2) miles south of U.S. Highway 34 and 1 ½ miles east of U.S. Highway 281.

1.3 CONTACT

Question regarding this specification may be directed to:

Tylor Robinson
Platte Generating Station
1035 W. Wildwood Dr.
Grand Island, NE 68801
Ph. (308) 385-5495
trobinson@giud.com

2.0 SCOPE

The Contractor shall furnish services and materials described herein to repair the existing cooling tower structure and fill. The Contractor shall provide all material, freight, equipment, lifting equipment, crane, scaffold, labor, personnel protective equipment, tools, consumables, waste disposal, and supervision to fully perform the specified work without the assistance of City personnel. The Contractor is responsible for arranging the disposal of debris and all documentation needed to prove debris was disposed of properly.

2.1 FILL REPLACEMENT

- Remove and replace (152), 4' W x 6' T x 12' D, bays of splash fill. Remove and dispose of the existing damaged fill and supports.
- Supply and install new PVC Arch-bar splash fill, as described herein.

2.2 FAN STACK REPAIR

- Replace 2 sections of Cell 1B fan stack with like kind. Set required fan blade clearances.

2.3 STRUCTURE REPLACEMENT

- Remove and replace (204) 4"x4" transverse kicker diagonals between the fan deck and hot water basin. Installation shall include new attaching hardware.
- Remove and replace (200) blue spiral target nozzles along the outboard louver face side of the hot deck.
- Existing polyurethane seal on each basin shall be removed by Contractor and new polyurethane caulking shall be placed around the perimeter of each basin to stop leakage. Polyurethane product and/or alternative sealing procedure must be approved by Owner and be installed strictly in accordance with product guidelines. New seal shall not be placed until the area is free of moisture. ***Contractor to include procedure for sealing basin in bid documents.***
- Replace (1) plenum partition handle between cell D&E
- Replace (12) 42" fiberglass flame retardant air inlet louvers.
- Replace (25) 4' louver supports at the top or bottom of the louvers in random locations
- Replace (3) inside air seal sections and reseal the inside air seal to the mist eliminator section.
- Remove and replace all perimeter air seal sections.

2.4 LOUVERS

Louvers shall be 20' x 42", 16 oz. fire retardant corrugate fiberglass construction. All overlapping joints shall be caulked with Vulkem mastic to prevent leakage.

The louvers shall be supported from the main cooling tower structure by pressure treated West Coastal Region Douglas Fir. The system shall be designed so the louvers rest on the top surface of the support arms. The supporting of the louvers from the underside of the louver arms shall not be allowed. The louvers shall be supported by wood horizontal stiffeners at the top and bottom of the louver. The louver stiffeners shall be hemispherical and provide full contact support to the bottom of the louver corrugate.

The support arms shall be attached to the structure near its center by a tie arm. The tie arm shall be fabricated from a nonferrous material such as stainless steel, glass reinforced polyester or polypropylene. The use of bent rod shall not be allowed. The design of the tie arms shall include wiper blades to preclude the flow of water down the arm. The tie arms shall be attached to the main structure by stainless steel hardware.

2.5 LUMBER

All lumber used in the repair of the cooling tower shall be pressure treated West Coastal Region Douglas Fir. Lumber grades shall be in accordance with Cooling Tower Institute STD-114, noting boxed heart lumber, as defined in section 6.1 of CTI STD-114, will not be allowed.

All lumber shall be pressure treated with a solution of Chromated Copper Arsenate of sufficient strength, applied pressure and duration to obtain a minimum of 0.4 pounds per cubic foot (as oxides) retention, as verified by sample borings in accordance with CTI Bulletin WMS-112. All lumber shall be treated after fabrication of the required members. The post- fabrication treatment shall leave no exposed surface untreated. Boring sample reports, treatment reports and solution analysis reports shall be maintained and available upon owner request. All field cuts shall be treated with suitable field treatment compatible with factory pressure treatment per CTI Standards.

2.6 HARDWARE

All bolting material used in the tower shall be type 304 stainless.

All nails where permitted shall be type 304 stainless ring shanked.

All screws where permitted shall be type 304 stainless.

All metal parts used in the repair not specifically mentioned shall be made of 304 stainless or corrosion resistant materials suitable for the service.

2.7 TOWER FILL

Tower fill shall be of the arch bar 50 mil extruded polyvinyl chloride (PVC) type. Fill supports shall be fiberglass or PVC coated wire grids so spaced as to prevent sagging of the splash bars during normal operation of the tower. Fill support grids shall be screw attached to a 2”x4” support with a PVC fill hanger retaining bar. Supplied splash fill shall be installed on 8”x8” spacing parallel to airflow. Filling supports and grids shall be so spaced and have ample strength to prevent damage to the fill during severe winter operation. All PVC splash bars are to be fastened to the support grid with a suitable permanent metal fastener or acceptable metal locking system, at a point near each end of the splash bar. All hardware and fasteners shall be 304 stainless.

2.8 FAN STACK

The new stacks shall be of a high quality, hand laid FRP laminated construction using Class general purpose resin systems with a minimum 3/16 inch cross sectional laminate with a preformed channel rib construction. The new stacks shall have belled inlets and conical, diverging exists with an elliptical flair providing a dimensional match to existing stacks, as well as, a match in air flow, fan efficiency and performance. The final gel coating protective layer shall be a minimum 20 mil thickness color shall be a standard light gray. All stitching hardware and new deck mounting hardware shall be 304 grade stainless steel. The perimeter flanges shall be reinforced with layers of woven roving and have a perimeter cross sectional laminate of no less than 3/8 inch. Fan stacks are to be secured to the structure by though bolts attached to the deck joists. Each stack shall include an access door, shaft guard and 6” view port. The new stacks shall be designed to withstand a design wind load of 90 mph Exp C Importance Factor 1.15.

The Contractor shall remove the exiting stacks and blade assemblies and reinstall the new components. The Contractor shall be responsible for disposal of all blades and stacks being replaced.

The Contractor shall provide general fan stack drawings for all stacks proposed. Such drawings shall have the minimum information:

Overall stack height	Bottom of stack to Base of throat
Stack radius at the throat	Throat height
Radius at 18” above the throat	Top of throat to top of stack
Radius at the top of the stack	Overall flare
Perimeter bolting tab width and thickness	Midpoint of flare
Stack segment bolting tab width and thickness	Interior and rib section thickness

The PGS Electricians will remove the lightening protection systems from the stacks and reinstall the same systems on completion of the work. The Contractor shall coordinate with the PGS representative as to the timing of the removal and re-installation requirements in advance of each cell.

2.9 STRUCTURE

The structural members must meet the environmental loads of ASCE-7, 60psf deck load on the fan deck, and 30 psf wind load. A complete set of load calculations shall be supplied for the wood members used in the repair. The calculations shall be stamped by a registered Nebraska Professional Engineer.

2.10 AIR SEAL

Air seals shall be constructed of treated fir plywood and copper flashing shall be supplied at the base of the louvers to the operating basin depth, to match the existing and prevent air by-pass at the louver face. Air seals shall be composed of ½” pressure treated fir plywood running the length of the cooling tower. Interior air seals shall be sealed to the mist eliminator media with polyurethane caulking.

2.11 PERFORMANCE TEST

The Contractor shall perform a performance test on the tower after the repairs are complete. The test shall be performed pursuant to the procedures set forth by the Cooling Technology Institute as specified by ATC-105 and shall be subject to the tolerances specified herein.

2.12 MATERIALS AND WORKMANSHIP

All materials shall be new materials of high quality.

The Contractor shall at all times keep the premises free from unnecessary debris, dirt, condemned materials, blocking, scaffold, etc. as soon as possible after accumulation and after it has served its useful purpose. After the job is complete all floors, equipment, etc. shall be given a thorough cleaning prior to leaving the jobsite.

The Contractor shall legally dispose of all construction debris off site in an approved landfill. Documentation shall be provided

2.13 ACCEPTANCE OF WORK

The Contractor shall correct any Work that fails to conform to the requirements of the specification herein where such failure to conform appears during the progress of the Work, and shall remedy any defects due to faulty materials, equipment or workmanship which appear within a period of one year from the Date of Final Settlement of the Contract or within such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents. The provisions of this Article apply to Work done by Subcontractors as well as to Work

done by direct employees of the Contractor and are in addition to any other remedies or warranties provided by law.

No act of the Owner or the Owner's Representative, either in superintending or directing the Work, or any extension of time for the completion of the Work, shall be regarded as an acceptance of such Work or any part thereof, or of materials used therein, either wholly or in part. Acceptance shall be evidenced only by the final certificate of the Owner. Before any final certificate shall issue, Contractor shall execute an affidavit on the certificate that it accepts the same in full payment and settlement of all claims on account of Work done and materials furnished under this Contract, and that all claims for materials provided or labor performed have been paid or set aside in full.

2.14 WARRANTY

Contractor agrees to guarantee all work under this Contract for a period of one year from the date of Final Settlement by the Owner. If any unsatisfactory condition or damage develops within the time of this guaranty due to materials or workmanship that are defective, inferior, or not in accordance with the Contract, as reasonably determined by the Owner, then the Contractor shall, when notified by the Owner, immediately place such guaranteed Work in a condition satisfactory to the Owner.

3.0 BIDDING

The Contractor shall submit a lump sum price for all repairs described within this specification. Bids shall include, but not be limited to all expenses, equipment, labor, mobilization and demobilization, freight, and subcontractors.

3.1.1 FILL REPLACEMENT

- Remove and replace (152), 4’ W x 6’ T x 12’ D, bays of splash fill. Remove and dispose of the existing damaged fill and supports.
- Supply and install new PVC Arch-bar splash fill, as described herein.

3.1.2 FAN STACK REPAIR

The Contractor shall replace damaged cell 1B fan stack sections with like kind. The Contractor shall set fan blade clearances after making repairs.

3.1.3 STRUCTURE REPLACEMENT

- Remove and replace (204) 4”x4” transverse kicker diagonals between the fan deck and hot water basin. Installation shall include new attaching hardware.
- Remove and replace (200) blue spiral target nozzles along the outboard louver face side of the hot deck.
- Existing polyurethane seal on each basin shall be removed by Contractor and new polyurethane caulking shall be placed around the perimeter of each basin to stop leakage. Polyurethane product and/or alternative sealing procedure must be approved by Owner and be installed strictly in accordance with product guidelines. New seal shall not be placed until the area is free of moisture. ***Contractor to include procedure for sealing basin in bid documents.***
- Replace (1) plenum partition handle between cell D&E
- Replace (12) 42” fiberglass flame retardant air inlet louvers.
- Replace (25) 4’ louver supports at the top or bottom of the louvers in random locations

- Replace (3) inside air seal sections and reseal the inside air seal to the mist eliminator section.
- Remove and replace all perimeter air seal sections.

The Bid shall detail the Contractors proposed crew size and man hours.

Labor Type	Crew Size	Hours per Day	Days
Superintendent			
General Labor			

The Contractor shall provide a unit price for a comprehensive daily rate based on the proposed crew size.

The Contractor shall provide unit pricing for the following component replacements. The component price shall include materials, freight, and installation.

Description	Unit Price
Daily Labor Rate	
Damaged Fill per 4' x 6' x 16' Bay	
4" x 4" Transverse Kicker and Hardware	
Blue Target Nozzle	
Fiber Glass Louver 16' x 42"	
4' Louver Support	
Inside Air Seal Section	

The Contractor shall include an itemized bill of materials include type, quantity and lead time on all proposed materials. The Contractor shall detail any facilities the Contractor may request to be provided by the Purchaser.

Bids will be evaluated by the Owner based on price, schedule, quality, material quantity and quality, economy of operation, facilities provided by the purchaser, experience of contractor, and adherence to specification. The primary evaluation factor will be the lump sum price. The owner reserves the right to reject any or all bids or waive informalities and to accept whichever bid that may be in the best interest of owner, at its sole discretion. **Bids must be received by 2:00 P.M. Tuesday, August 10th, 2021.**

Bidder is solely responsible for obtaining any clarifications to this specification as may be required for the Bidder to submit an accurate and complete bid proposal.

3.2 SITE VISIT

A site visit prior to proposal submittal is **REQUIRED**. All contractors will be required to visit the plant site to ensure familiarity with the project requirements. Site visits may be arranged via the contact information listed herein. A site visit form shall accompany the bid documents.

3.3 SCHEDULE

The Contractor shall provide with the proposal a detailed schedule reflecting all key activities with sufficient information to demonstrate the means of completing the work in the allotted period.

3.3.1 COORDINATION

The Contractor shall be responsible for coordination of this work with all crafts, subcontractors, manufacturer's representatives, and Owner's representative.

3.3.2 TIME OF COMPLETION

The Contractors schedule shall be coordinated to insure completion in a 14-day outage. Outage is currently scheduled to begin October 5th, 2021, but the outage start date may vary based on the stations market commitments.

3.4 CHANGE ORDERS

If any extra and/or additional work is to be done or any change in the plans and specifications is deemed necessary, the Purchaser may issue the Contractor a written change order directing that such extra work be done or that such change be made, and the Contract shall be modified accordingly. No claim for extra costs shall be allowed in the absence of a written change order. The Contractor shall give prompt written notice of any matter which they believe to involve extra cost. In the absence of such notice by the Contractor on account thereof his right to such claim shall be deemed to have been waived. Compensation to the Contractor will be calculated as an addition to or deduction from the Contract Price, based upon such written terms as may be established between the parties, either (a) by an acceptable lump sum proposal of the Contractor, or (b) on a cost-plus limited basis not to exceed a specified limit, or (c) on a basis of the unit prices as stated in these specifications where such unit prices apply. In the event that none of the foregoing methods are agreed upon with the Contractor, the Purchaser may perform the work. The Purchaser shall be the sole judge of such action and procedure. Determination of cost-plus work shall be based upon actual cost of labor and material plus a maximum of 20% of actual Contractor cost for overhead, profit,

The Contractor shall submit a formal process for addressing work that may arise but is not described herein. All change orders shall be addressed with a detailed scope of work and approved before proceeding with scope of extra work.

Contractor shall be required to maintain accurate job logs describing work performed by each crew throughout each day and daily time sheets detailing all work performed and expenses incurred **in the same format as the bid detail submittal**. Daily time sheets shall identify all individuals by name, craft and all hours worked on each portion of the work. Such job logs and time sheets shall accurately account for all man-hours with clear separation and identification of Time, equipment and Material as required accounting for the actual service hours and expenses. A sample timesheet shall be included in the bid to be approved by the owner's designated representative.

3.5 TERMS AND CONDITIONS

Provide any standard terms and conditions which will be in effect during this completion of this scope of work.

3.6 EXCEPTIONS

The purpose of this specification is to give detail on conditions under which the new equipment will operate, scope of Contract, quality of equipment required, standards used in determining its acceptability and similar data. Each bidder shall carefully read all requirements herein set forth and shall offer equipment and services which fully comply with these requirements or shall plainly set forth all points, features, conditions, specifications, etc., wherein the equipment offered does not meet these specifications. Such exceptions as are made shall be listed by section and subsection number and shall be marked in ink in the sections of these specifications. Exceptions shall be explained in detail in a letter accompanying the bid. References shall not be made to the bidder's Proposal foe exceptions and supplementary terms. Failure to outline such exceptions will require the successful bidder to comply with these specifications.

The City of Grand Island Utilities Department is NOT tax exempt and is subject to 7.5% sales tax. See the Nebraska Department of Revenue web site at www.revenue.state.ne.us for contractor's tax information.

4.0 QUALIFICATIONS

Bids will be received only from qualified bidders. A bidder will be considered qualified if they are a recognized firm specializing in the installation, maintenance, repair, and rebuilding of induced draft cooling towers used in the power generation industry. The bidder shall have facilities with a maximum response time 24 hrs.

The Bidder shall be a firm with qualifications and manpower to complete the scope of work described herein without the help of plant personnel. Any insufficiencies in Contractor manpower, workmanship, or qualifications, without clear written exception, that require the Contractor to employ plant personnel to complete services described in this specification shall be billed to the Contractor at $95 per man hour.

If the Contractor defaults or neglects to carry out the work in accordance with the contract documents or fails to perform any provisions of the work described herein the owner may, after 7 days written notice to the Contractor and without prejudice to any other remedy, make good the deficiencies by whatever method the Owner may deem necessary. The Purchaser may deduct the cost thereof from the payment, then or thereafter due to the Contractor or, at Owner's option, may terminate Contractor's work under the Contract and take possession of the site and all materials associated with the work scope. The Owner may then by whatever method the Owner may deem expedient remedy the deficiencies. If the unpaid balance of the Contract Sum exceeds the expense of finishing the work, such excess shall be paid to the Contractor. If expenses associated with fulfilling the specified scope of work exceeds such unpaid balance the Contractor shall pay the difference to the Owner. These rights and remedies are in addition to any right to damages or other rights and remedies allowed by law.

The Contractor shall substantiate its experience through the submittal of three (3) similar projects' **reference list with the bid**. The Contractor will be expected to perform the work without the assistance of Platte Generating Station personnel or tools and comply with plant safety regulations and equipment lockout/tag out procedures.

Failure to provide this information may, at the option of the purchaser, result in the rejection of the bid.

4.1 SUPERINTENDENT

The Contractor shall provide well qualified supervisor(s) and a Job Superintendent who will fully direct all field operations for the duration of the project, serve as liaison to the Owner's designated representatives, be fully authorized to make any and all decisions affecting the work in the field and coordinate activities between the Contractor and its subcontractors, if any.

5.0 SAFETY

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in conjunction with the work. The Contractor shall comply with all safety practices as required by the regulatory agencies governing the Contractor's operations as well as any and all safety requirements of the Contractor's organization and shall submit historical evidence of such compliance. All personnel working on site will be required to participate in the plant's safety orientation prior to performing any work on site at PGS.

The Contractor is required to follow their OSHA regulations for work in areas that may be considered confined spaces. NOTE: All contractors must submit **with the bid** a copy of their OSHA compliant Confined Space

Procedure and Respiratory Protection Procedure. The Contractor will be required to provide proof that workers have successfully completed respiratory fit testing and pulmonary function testing and have been trained for confined space entry.

The plant has an equipment lockout/tag out procedure to prevent the unauthorized starting of motors and the unauthorized movement of valves and dampers. The Contractor is required to use the procedure and add its own locks/tags on top of the plant lock/tags if required. *Removal of plant locks/tags is not allowed and is cause for removal from the plant site.*

6.0 INSURANCE

The contractor shall comply with the attached City's insurance requirements

7.0 PERFORMANCE AND PAYMENT BOND

The successful Bidder shall file with the OWNER Performance and Payment Bonds in the full amount (100 percent) of the Contract price, as security for the faithful performance of the Contract and the payment of all persons supplying labor and materials for the Work under this Contract, and to cover all guarantees against defective workmanship or materials, or both, for a period of one (1) year after the date of final acceptance of the Work by the OWNER. The Surety furnishing these bonds shall have a record of service satisfactory to the OWNER, be authorized to do business in the State where the OWNER's project is located and shall be named on the current list of approved Surety Companies, acceptable on Federal bonds as published by the Audit Staff, Bureau of Accounts, U.S. Treasury Department.

The Attorney-in-Fact (Resident Agent) who executes these bonds on behalf of the Surety must attach a notarized copy of his power-of-attorney as evidence of his authority to bind the Surety on the date of execution of the bond.

8.0 DRAWINGS AND SITE INFORMATION

A selection of drawings has been provided with the bid package for reference only. Additional drawings are available for review at Platte Generating Station office. The Contractor is responsible for making such pre-bid site visits as required to obtain additional details for bidding and execution of the work and for clarification of any questions or concerns the bidder may have related to the work scope and site conditions.

ATTACHMENTS:

Marley Cooling Tower Co. drawing 72-3886 is attached for reference
Marley Cooling Tower Co. drawing 71-392 is attached for reference
Marley Cooling Tower Co. drawing 75-42434 is attached for reference
Marley Cooling Tower Co. drawing 75-42284 is attached for reference
Marley Cooling Tower Co. drawing 79-4269 is attached for reference
Marley Cooling Tower Co. drawing 79-4276 is attached for reference
Marley Cooling Tower Co. drawing 79-4728 is attached for reference
Marley Cooling Tower Co. drawing 79-4729 is attached for reference
Marley Cooling Tower Co. drawing 79-4255 is attached for reference
Marley Cooling Tower Co. drawing 71-3408 is attached for reference
Marley Cooling Tower Co. drawing 79-3281 is attached for reference
Marley Cooling Tower Co. drawing 79-4149 is attached for reference
Marley Cooling Tower Co. drawing 79-2280 is attached for reference
Marley Cooling Tower Co. drawing 79-3208 is attached for reference

CITY OF GRAND ISLAND

Working Together for a Better Tomorrow, Today.

REQUEST FOR BIDS - SITE CONDITIONS

COOLING TOWER REPAIR – FALL 2021
PLATTE GENERATING STATION

Site Visit: Bidders shall visit the site in order to inform themselves of the conditions under which the work is to be performed, concerning the site of the work, the nature of the existing facilities, the obstacles which may be encountered, the sequence of the work, and all other relevant matters concerning the work to be performed. No extra compensation shall be allowed by reason of the failure of such bidder to fully inform themselves of said site conditions prior to the bidding. The Contractor shall employ, so far as possible, such methods and means in the carrying out of their work as will not cause any interruption or interference with the City's operations and any other contractors.

A site visit may be arranged by contacting Tylor Robinson at (308) 385-5496.

Date of Visit: _____

Signature of person visiting site: _____

Signature of Utilities personnel witnessing visit: _____

Platte Generating Station / 1035 W. Wildwood Drive / Box 1968 / Grand Island, Nebraska 68802-1968
Phone (308) 385-5496 / FAX (308) 385-5353

MINIMUM INSURANCE REQUIREMENTS
CITY OF GRAND ISLAND, NEBRASKA

The successful bidder shall obtain insurance from companies authorized to do business in Nebraska of such types and in such amounts as may be necessary to protect the Bidder and the interests of the City against hazards or risks of loss as hereinafter specified. This insurance shall cover all aspects of the Bidder's operations and completed operations. Failure to maintain adequate coverage shall not relieve Bidder of any contractual responsibility or obligation. Minimum insurance coverage shall be the amounts stated herein or the amounts required by applicable law, whichever are greater.

1. WORKERS COMPENSATION AND EMPLOYER'S LIABILITY

This insurance shall protect the Bidder against all claims under applicable State workers compensation laws. This insurance shall provide coverage in every state in which work for this project might be conducted. The liability limits shall not be less than the following:

Workers Compensation	Statutory Limits
Employers Liability	$100,000 each accident
	$100,000 each employee
	$500,000 policy limit

2. BUSINESS AUTOMOBILE LIABILITY

This insurance shall be written in comprehensive form and shall protect the Bidder, Bidder's employees, or subcontractors from claims due to the ownership, maintenance, or use of a motor vehicle. The liability limits shall not be less than the following:

Bodily Injury & Property Damage	$ 500,000 Combined Single Limit

3. COMPREHENSIVE GENERAL LIABILITY

The comprehensive general liability coverage shall contain no exclusion relative to explosion, collapse, or underground property. The liability limits shall not be less than the following:

Bodily Injury & Property Damage	$ 500,000 each occurrence
	$1,000,000 aggregate

4. UMBRELLA LIABILITY INSURANCE

This insurance shall protect the Bidder against claims in excess of the limits provided under employer's liability, comprehensive automobile liability, and commercial general liability policies. The umbrella policy shall follow the form of the primary insurance, including the application of the primary limits. The liability limits shall not be less than the following:

Bodily Injury & Property Damage	$1,000,000 each occurrence
	$1,000,000 general aggregate

5. ADDITIONAL REQUIREMENTS

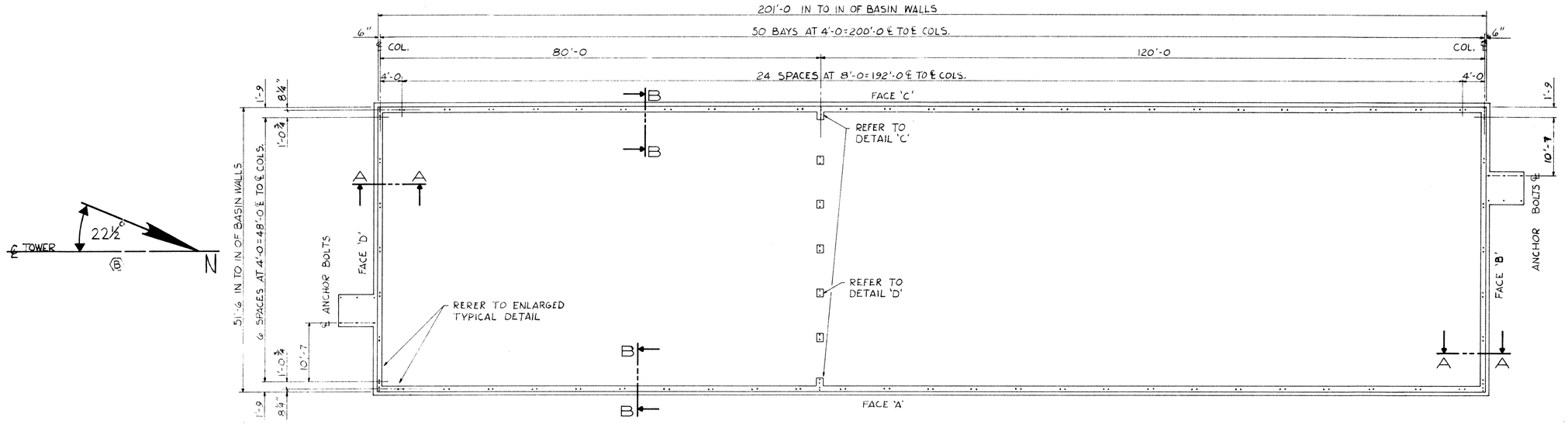
The City may require insurance covering a Bidder or subcontractor more or less than the standard requirements set forth herein depending upon the character and extent of the work to be performed by such Bidder or subcontractor.

Insurance as herein required shall be maintained in force until the City releases the Bidder of all obligations under the Contract.

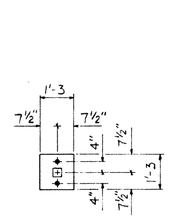
The Bidder shall provide and carry any additional insurance as may be required by special provisions of these specifications.

6. CERTIFICATE OF INSURANCE

Satisfactory certificates of insurance shall be filed with the City prior to starting any work on this Contract**. The certificates shall show the City as an additional insured on all coverage except Workers Compensation. The certificate shall state that thirty (30) days written notice shall be given to the City before any policy is cancelled (strike the "endeavor to" wording often shown on certificate forms). If the Bidder cannot have the "endeavor to" language stricken, the Bidder may elect to provide a new certificate of insurance every thirty (30) days during the contract. Bidder shall immediately notify the City if there is any reduction of coverage because of revised limits or claims paid which affect the aggregate of any policy.**

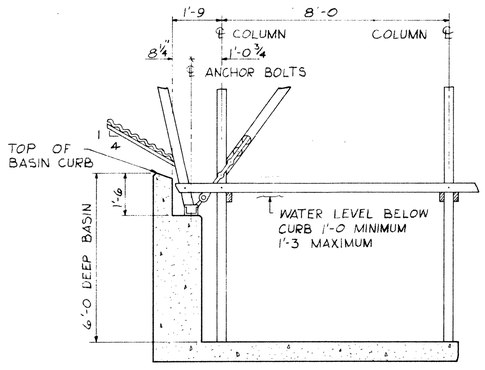


BASIN PLAN

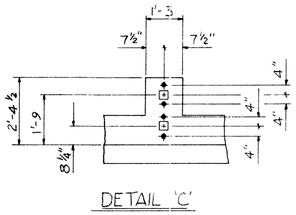


DETAIL 'D'

ALL PIERS TO BE 1'-6 BELOW TOP OF BASIN CURB.

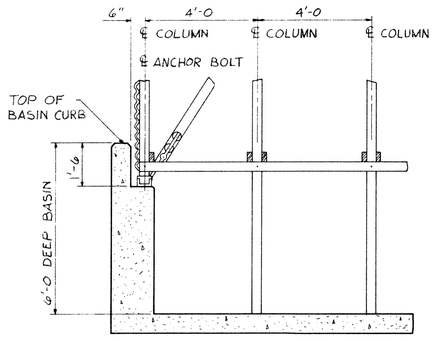


SECTION B-B

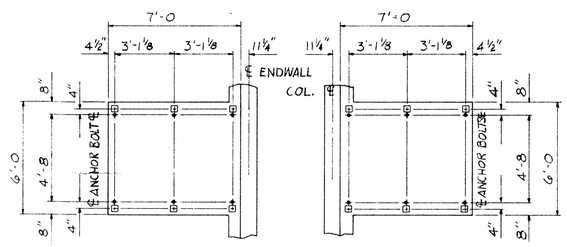


DETAIL 'C'

ALL PILASTERS TO BE 1'-6 BELOW TOP OF BASIN CURB

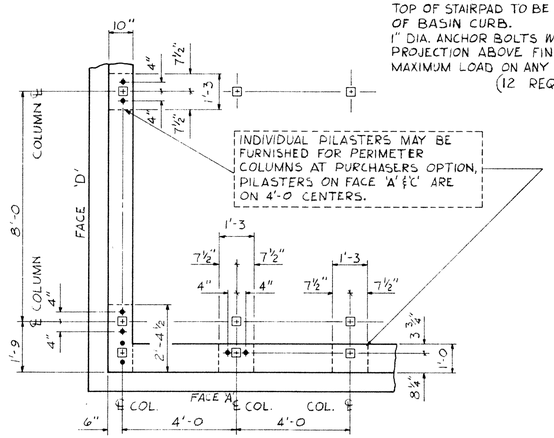


SECTION A-A



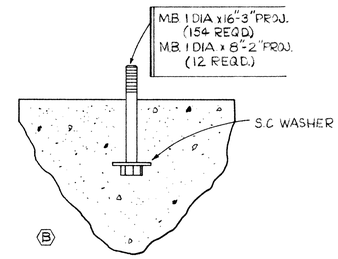
STAIRPAD DETAILS

REFER TO BASIN PLAN FOR STAIRPAD ORIENTATION. TOP OF STAIRPAD TO BE AT SAME ELEVATION AS TOP OF BASIN CURB. Ⓐ
1" DIA. ANCHOR BOLTS WITH 3" MIN. THREAD AND 2" PROJECTION ABOVE FINISHED CONCRETE. MAXIMUM LOAD ON ANY COLUMN IS 1250# (12 REQUIRED)



ENLARGED TYPICAL DETAIL

SHELF AND PILASTER DIMENSIONS ARE MINIMUM, ANCHOR BOLTS TO BE 1" DIA. WITH 4" Ⓐ THREAD AND 3" PROJECTION ABOVE FINISHED CONCRETE. (154 REQUIRED) LOCATE TO WITHIN ±⅛"



TYPICAL ANCHOR BOLT DETAIL

NOTE: ALL ANCHOR BOLTS TO BE 316SS WITH NUT & 2 S.C. WASHERS.

GENERAL NOTES

1. PURCHASER TO DESIGN, CONSTRUCT AND FURNISH FOUNDATION COMPLETE TO SUIT THE DIMENSIONS OF THIS DRAWING. BASIN DESIGNER SHOULD REFER TO SCHEMATIC VIEWS AND AVOID LOCATION OF SUMP SCREENS, PUMPS AND ADJACENT EQUIPMENT THAT WILL INTERFERE WITH SLOPING AND OVERHANGING TOWER FACES OR STAIRWAYS.
2. PURCHASER TO DESIGN, LOCATE AND FURNISH SUMP TO SUIT JOB REQUIREMENTS.
3. CONCRETE SURFACES AT TOWER ANCHORAGE MUST BE AT INSTRUMENT LEVEL TO WITHIN ±⅛" OF ELEVATION SHOWN AND TROWELED TO A SMOOTH FINISH BY PURCHASER. THIS WORK MUST BE COMPLETED BEFORE TOWER CONSTRUCTION BEGINS. INTERIOR UNANCHORED COLUMNS ARE FIELD CUT TO FIT THE BASIN FLOOR A MAXIMUM OF (6'-0) BELOW TOP OF BASIN CURB.
4. SLOPE OF BASIN FLOOR SHOULD NOT EXCEED 2%.
5. MARLEY TO FURNISH ALL ANCHOR BOLTS COMPLETE WITH NUT AND WASHER.
6. REDUCED WATER FLOW OVER A COOLING TOWER IN COLD CLIMATES CAN RESULT IN ICE FORMATION IN THE FILL. THEREFORE, HOT WATER BYPASS SYSTEMS ARE NOT INCLUDED IN TOWER DESIGN. IF THE PURCHASER'S APPLICATION REQUIRES A BYPASS SYSTEM, ITS DESIGN MUST BE REVIEWED BY THE MARLEY CO.

CITY OF GRAND ISLAND
PLATTE GENERATING STATION
UNIT NO. 1
CONTRACT NO. 77-8-34
GRAND ISLAND, NEBRASKA

LTR.	DATE	REVISION	BY	CHKD
Ⓑ	9-20-78	PER C.O. #7	DTS	PHR
Ⓐ	6-12-78	PER CWO & #4	DTS	MS

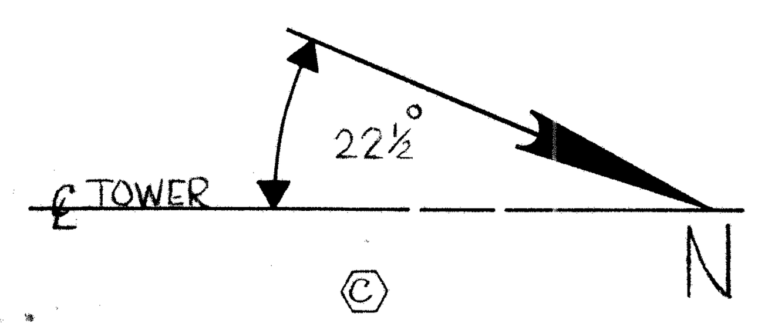
BASIN AND BASIN SECTIONS FOR A MODEL 6516-4-5 DOUBLE FLOW COOLING TOWER

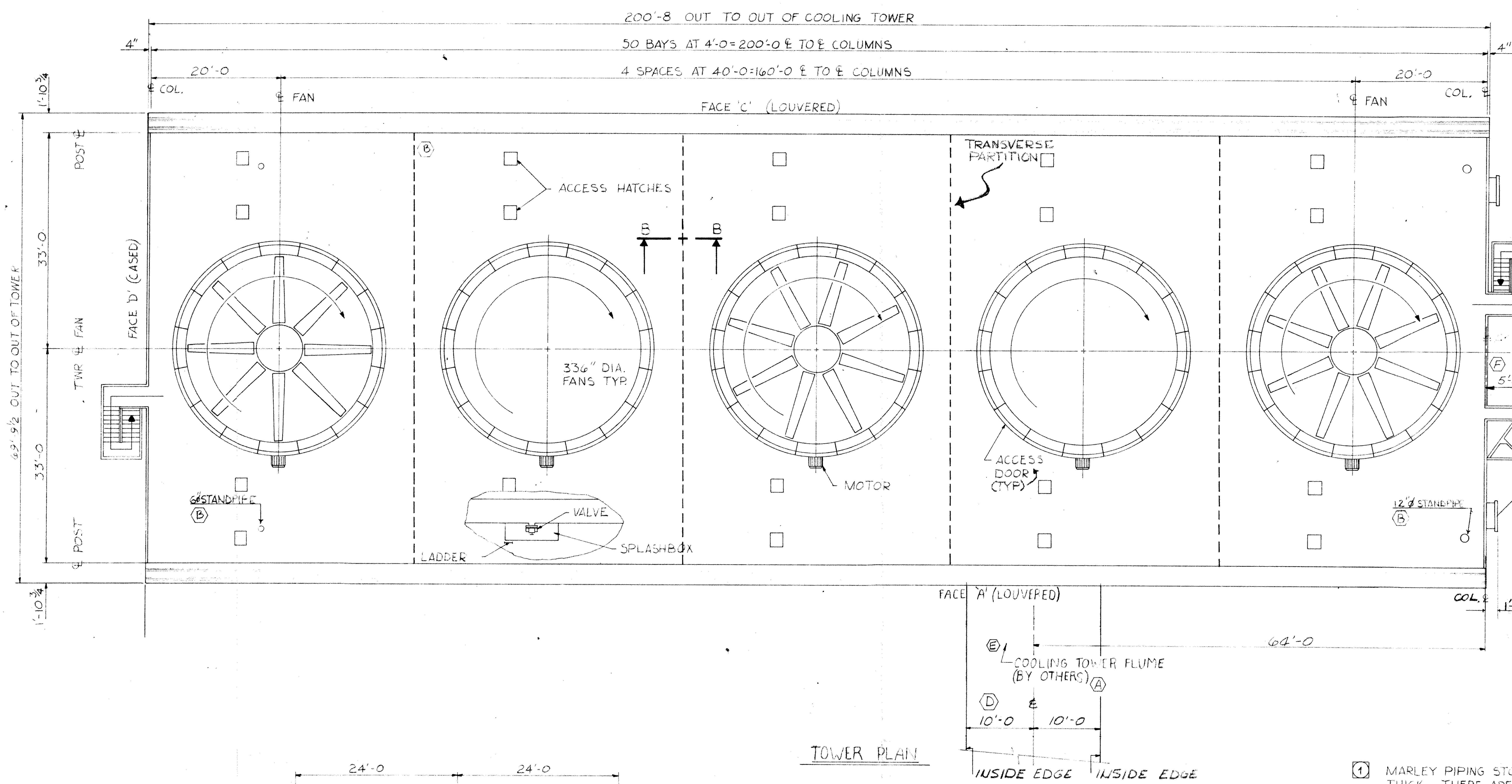
SCALE	DATE	DRAWN	CHECKED	APPROVED	M. FILE
NONE	12-8-77	G.K.L.		WES	F. FILE

ORDER NUMBER 12-117-78 | DRAWING NUMBER 78-4397 | REV B

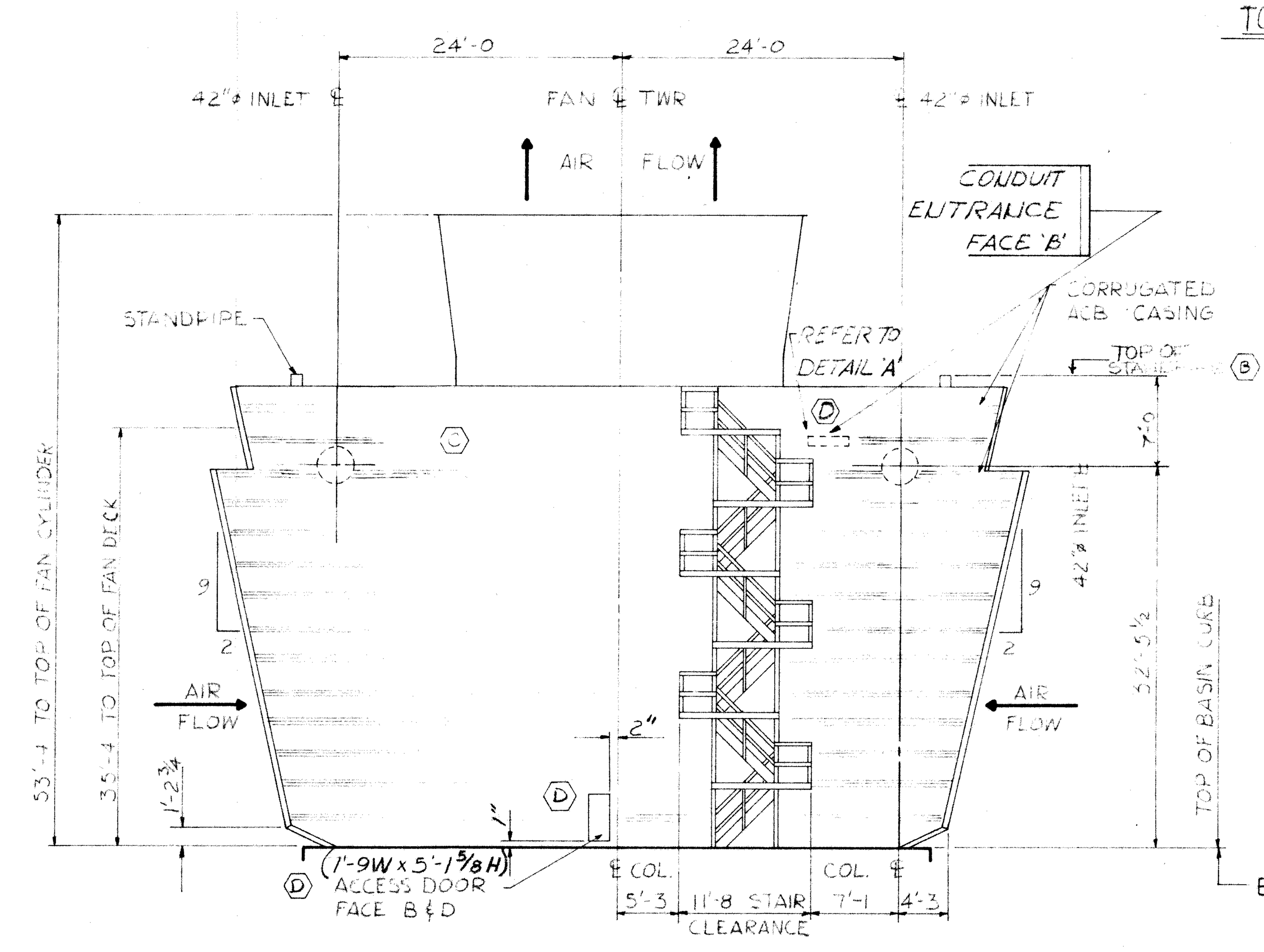
THE MARLEY COOLING TOWER CO. MARLEY
MISSION, KANSAS 66202

Drawing No.

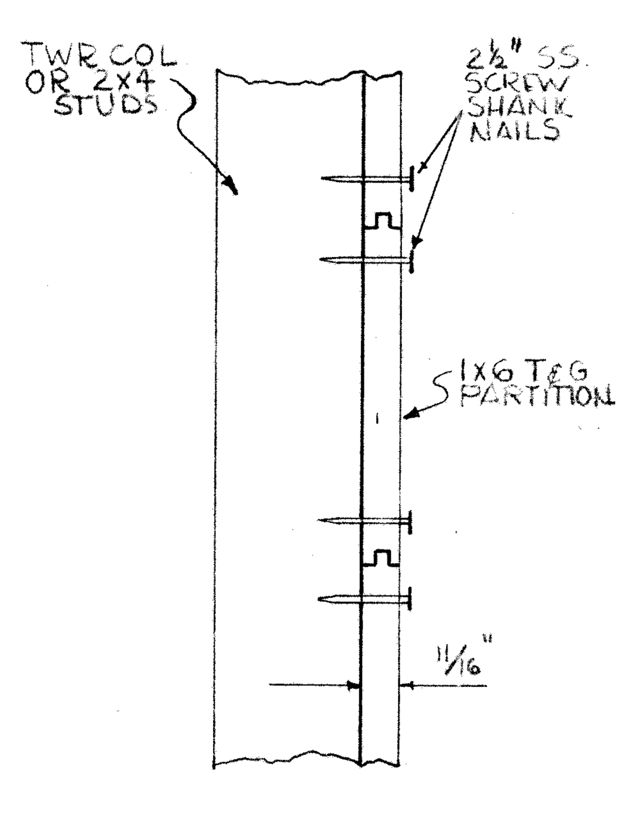




TOWER PLAN

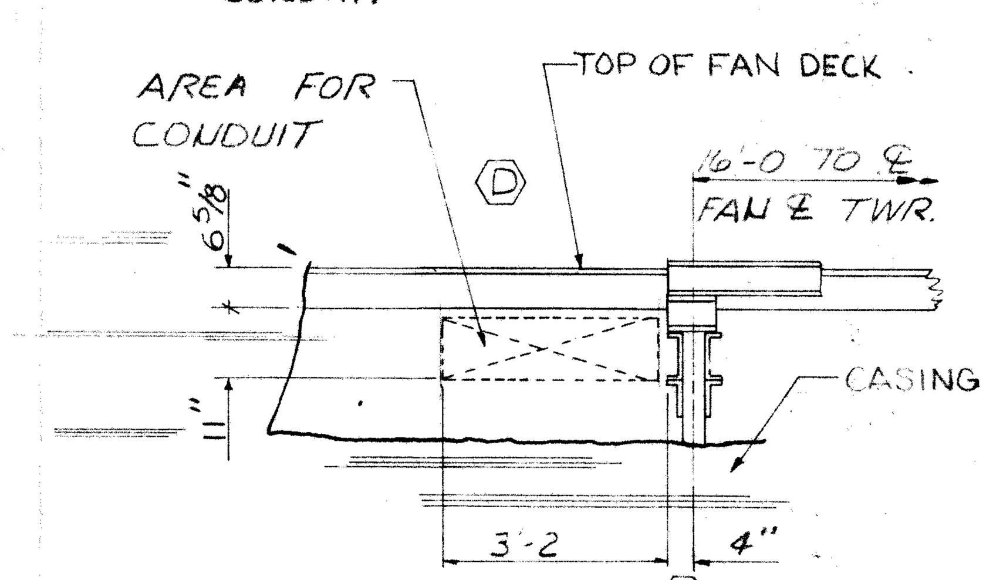


TOWER ELEVATION - FACE 'D' ④



SECTION B-B Ⓑ
(TYPICAL PARTITION WALL CONSTRUCTION)

Ⓔ CUSTOMER CONDUIT SUPPORTS MAY BE ATTACHED TO 2x6 TRANSVERSE GIRTS LOCATED ON 4'-0 CENTERS FOR HORIZONTAL RUN OF CONDUIT ℄ TO HORIZONTAL MEMBERS (BY OTHERS) ATTACHED TO 4x4 ENDWALL COLUMNS FOR SUPPORT OF VERTICAL RUN OF CONDUIT.



DETAIL 'A'
(VIEWED FROM FACE 'B')

approved for construction
BY M J Raile
Changes could result in added cost and/or delay in shipment.
MARLEY DATE 2-1-79

GENERAL NOTES

1. MARLEY PIPING STOPS AT FACE OF 42"Ø FLAT FACED FLANGE WHICH IS 2" (+½"-⅛") THICK. THERE ARE 36-1¾" DIA. BOLT HOLES ON A 49½" DIA. BOLT CIRCLE. BOLT HOLES STRADDLE CENTERLINES. PURCHASER TO FURNISH CONNECTING HARDWARE INCLUDING *S.C.W. FOR GRP FLANGE. FLANGE DRILLING CONFORMS TO CLASS 125# A.N.S.I. B16.1 SPECIFICATIONS. GASKET TO BE ⅜" THICK, FULL FACED, SOFT NEOPRENE OF SHORE DUROMETER 40-50 (BY MARLEY).
   MAXIMUM OPERATING PRESSURE AT INLET = 5 P.S.I.
   MAXIMUM START-UP PRESSURE AT INLET = 10 P.S.I.
   CAUTION: MARLEY PIPE SUPPORTS ARE DESIGNED TO SUPPORT ONLY THE WEIGHT OF PIPE AND WATER WITHIN THE LIMITS OF THE COOLING TOWER. THE PIPING DETAILER MUST PROVIDE SUPPORT FOR ALL PIPEWORK BEYOND THE LIMITS OF THE TOWER. CARE MUST BE TAKEN WHEN INSTALLING CONNECTING PIPING TO AVOID OVERLOADING OR DAMAGING THE TOWER STRUCTURE.
   *STANDARD CUT WASHER Ⓐ
2. REDUCED WATER FLOW OVER A COOLING TOWER IN COLD CLIMATES CAN RESULT IN ICE FORMATION IN THE FILL. THEREFORE, HOT WATER BYPASS SYSTEMS ARE NOT INCLUDED IN TOWER DESIGN. IF THE PURCHASER'S APPLICATION REQUIRES A BYPASS SYSTEM, ITS DESIGN MUST BE REVIEWED BY THE MARLEY CO.
3. INSTALLER NOTE: CONNECTING PIPING MUST BE ALIGNED PROPERLY AT INSTALLATION TO AVOID DAMAGING OR MOVING THE PLASTIC PIPE WHEN PULLING UP FLANGE BOLTS.
4. Ⓐ Ⓓ TOWER ELEVATION OF FACE 'B' WOULD APPEAR SIMILAR TO FACE 'D' EXCEPT PIPING WOULD BE SHOWN. ON FACE 'B' ELEVATION, DERRICK IS LOCATED ON FACE 'A' SIDE OF TOWER CENTERLINE AND ACCESS DOOR IS LOCATED ON FACE 'C' SIDE OF TOWER CENTERLINE.

CITY OF GRAND ISLAND
PLATTE GENERATING STATION
UNIT NO. 1
CONTRACT NO. 77-8-34
GRAND ISLAND, NEBRASKA

LTR	DATE	REVISION	BY	CHKD
F	3-28-80	PER CO #16 & ERR 80-945	MB	RHR
E	3-14-79	Per C.O. #11	DTS	RHR
D	1-29-79	PER C.O. #10	GKL	RHR
C	9-20-78	PER CO. # 6	DTS	RHR
B	6-9-78	PER C.O. 4		MS
A	4-4-78	PER C.O. 3 & CWO	CT	RHR

SCHEMATIC VIEWS FOR A MODEL 6516-4-5
DOUBLE FLOW COOLING TOWER

SCALE	DATE	DRAWN	CHECKED	APPROVED
	12-6-77	G K L		WES

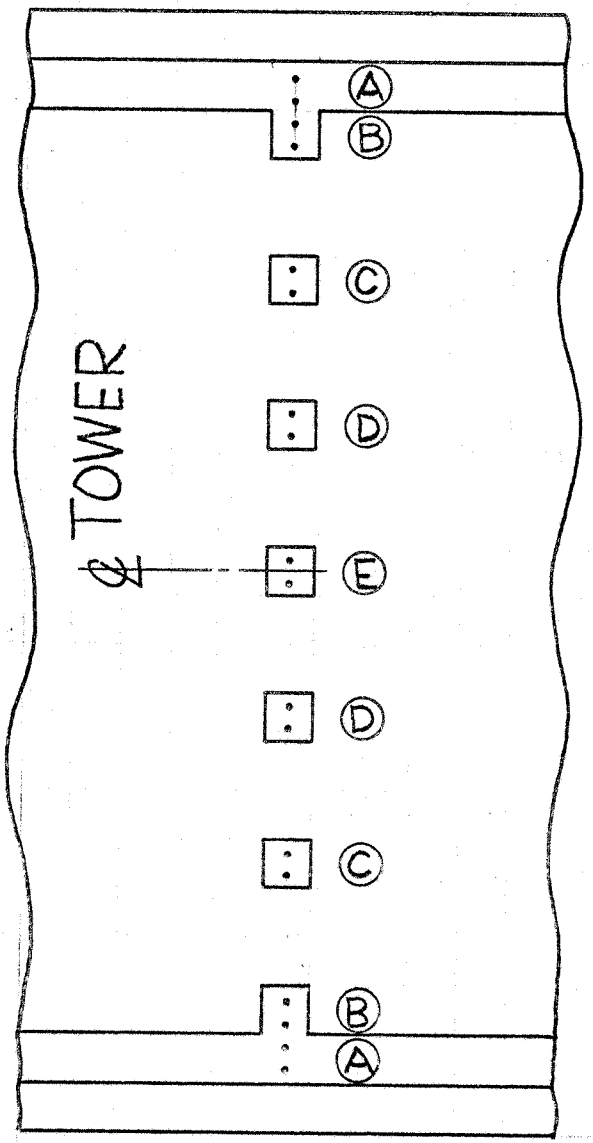
ORDER NUMBER: 12-117-78 | DRAWING NUMBER: 75-4336 | F

THE MARLEY COOLING TOWER CO.
MARLEY
MISSION, KANSAS 66202

Drawing No.

4-16-80 54.02

54-04



NOTE: REFER TO BASIN DWG. 78-4392 FOR PIER LOCATIONS.

CITY OF GRAND ISLAND
GRAND ISLAND, NEBR.

MODEL 6516-4-5
OO# 12-117-78

FACE 'A'

	PIER LOCATION				
	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
OPERATING WEIGHT	4470	5010	4890	3440	3210
MAX. WIND LOAD ~ UPLIFT OR COMPRESSION	4473	4602	4932	4932	4932
TOTAL LOAD IN POUNDS (WIND ON FACE 'B')	8943	9612	9822	8372	8142
TOTAL LOAD IN POUNDS (WIND ON FACE 'D')	-3	408	-42	-1492	-1722

NOTE:
1.) CONDUIT BOX MAY BE ROTATED IN STEPS OF 90°.
2.) APPROX. WEIGHT OF MOTOR 2000 #.

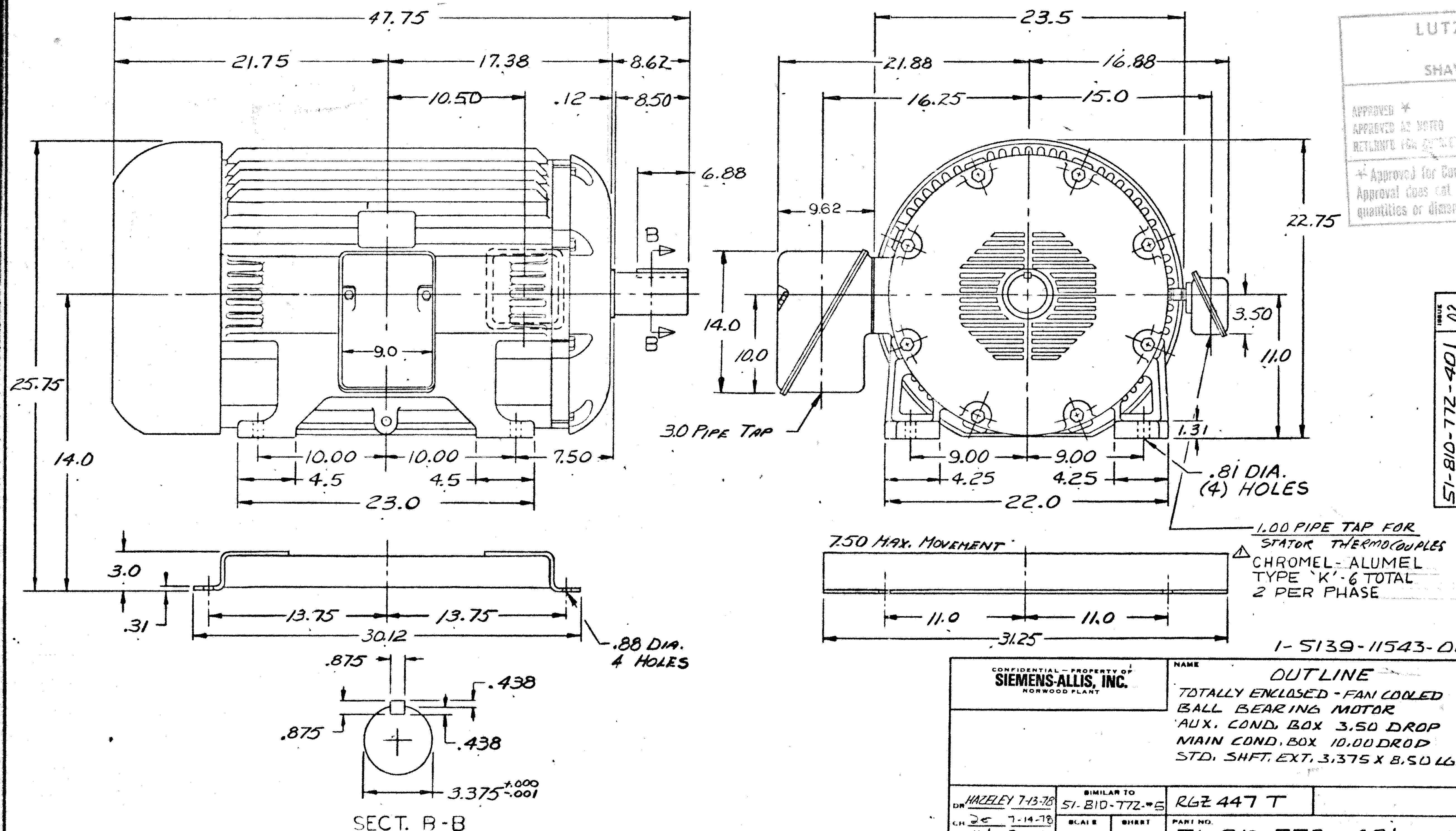
CERTIFIED PRINT		CUSTOMER INITIATED CHANGES MAY AFFECT PRICE AND DELIVERY				
CUSTOMER Marley Cooling Tower						
P.O. # CK 39717-12-117-78		S.A. S.O. # EL 1-5139-11543-1				
H.P.	R.P.M.	FRAME	TYPE	VOLTS	PH	HZ
200/50	1800/900	447T	RGZ	460	3	60
LRA = 2181/505; FLA - 230/86						
Space Heaters 240 watts/230 Volts						
City of Grand Island, NE						
Platte Generating Station Unit No. 1						
Cooling Tower Contract No. 77-8-34						

54-09

01	7-13-78
△C-1 NOTE ADDED PER CUSTOMER REQ. EST. EFF. FUT.	
02	10/4/78 C.F.H.

GRAND ISLAND 77-8

OCT 18 1978



ISSUE 02 51-810-772-401

1-5139-11543-01

CONFIDENTIAL – PROPERTY OF SIEMENS-ALLIS, INC. NORWOOD PLANT

NAME OUTLINE
TOTALLY ENCLOSED - FAN COOLED BALL BEARING MOTOR
AUX. COND. BOX 3.50 DROP
MAIN COND. BOX 10.00 DROP
STD. SHFT. EXT. 3.375 X 8.50 LG.

DR HACELEY 7-13-78	SIMILAR TO 51-810-772-5		RGZ 447 T
CH 7-14-78	SCALE —	SHEET —	PART NO. 51-810-772-401
AP 7-14-78			

MARLEY

GRAND ISLAND 77-8

THE MARLEY COOLING TOWER COMPANY
P.O. Box 2912 – Mission, Kansas 66201

NOV 19 1979

DEC 13 1979 54-13

CERTIFICATE OF WOOD TREATMENT

This is to certify that materials identified herein were pressure preservative treated at The Marley Cooling Tower Company, Stockton, California plant.

Marley order number 12-117-78 Purchaser's order number 77-8-34

Purchaser (Engineer/Architect) City of Grand Island, Nebr.

Location Grand Island, Nebr

Project Name

Ultimate User City of Grand Island, Nebr.

Location Grand Island, Nebr.

Material was treated with Marlith (CCA Type A) by the full cell process.

Material description Douglas Fir Lumber, Plywood and Redwood

Charge Number	Specified Retention	Pounds of Salt Retained	Cubic Feet of Lumber Treated	Actual Net Retention
431	.70	3194	1272	1.58
441	.50	1531	1325	.72
444	.50	1094	1155	.58
452	.50	1356	1401	.58
453	.58	1595	1249	.69
470	.55	1225	1015	.62
492	.50	1662	1325	.69
495	.50	1662	1453	.58
Stock Retreat → 500		1094	1436	.42
508	1.0	3150	1404	1.23
Stock Retreat → 515		1618	1155	.70
TOTALS		19161	14190	1.35

Date Sept 10, 1979

THE MARLEY COOLING TOWER COMPANY
Wood Treating Plant
Stockton, California

Supervisor of Inspection

QA-2113A

Anlab
ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL
1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

May 17, 1979

Date Received: 5/16/79
Date Sampled 5/15/79
Report No. 15579

Marley Cooling Tower
150 North Sinclair
Stockton, CA 95205

Attention: Mr. Howard Rinne

Sample	Retort 1		Retort 2
Lab No.	79598		
	lbs/gal		lbs/gal
$Na_2Cr_2O_7 \cdot 2H_2O$	0.337	54.2%	NO SAMPLE
$CuSO_4 \cdot 5H_2O$	0.217	34.9%	
$As_2O_5 \cdot 2H_2O$	0.068	10.9%	
Total	0.622		

ANLAB

Tom I. Ikesaki

TII/nd

Anlab
ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

May 31, 1979

Date Received 5/30/79
Date Sampled 5/30/79
Report No. 17279

Marley Cooling Tower
150 North Sinclair
Stockton, CA 95205

Attention: Mr. Howard Rinne

Sample Lab No.	Retort 1 lbs/gal		Retort 2 lbs/gal	
$Na_2Cr_2O_7 \cdot 2H_2O$	0.312	55.5%	0.306	55.2%
$CuSO_4 \cdot 5H_2O$	0.194	34.5%	0.189	34.1%
$As_2O_5 \cdot 2H_2O$	0.056	10.0%	0.059	10.6%
Total	0.562		0.554	
Density	1.03		1.03	

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TI by Moore

Tom I. Ikesaki

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ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

June 14, 1979

Date Received 6/13/79
Date Sampled 6/13/79
Report No. 19479

Marley Cooling Tower
150 North Sinclair
Stockton, CA 95205

Attention: Mr. Howard Rinne

Sample	Retort 1	Retort 2	
Lab No.	NO SAMPLE	79-717	
	lbs/gal	lbs/gal	
$Na_2Cr_2O_7 \cdot 2H_2O$		0.306	56.4%
$CuSO_4 \cdot 5H_2O$		0.178	32.8%
$As_2O_5 \cdot 2H_2O$		0.059	10.9%
Total		0.543	
Density		1.04	

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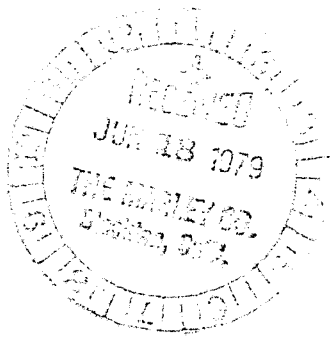
TI by Moore

Tom I. Ikesaki

TII/nd



Anlab
ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL

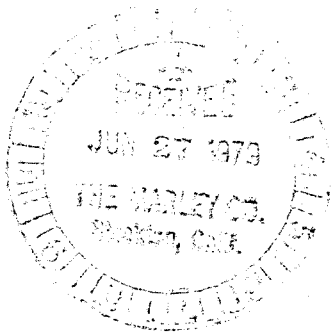
1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

June 22, 1979

Date Received: 6/20/79
Date Sampled: 6/20/79
Report # 21379

Marley Cooling Tower Co.
150 North Sinclair Ave.
Stockton, CA 95205
Attn: Howard Rinne

SAMPLE I.D. #	RETORT 1 79-761		RETORT 2 79-762	
	lb/gal	%	lb/gal	%
$Na_2Cr_2O_7 \cdot 2H_2O$	0.308	56.3	0.271	55.2
$CuSO_4 \cdot 5H_2O$	0.179	32.7	0.167	34.0
$As_2O_5 \cdot 2H_2O$	0.060	11.0	0.053	10.8
Total	0.547		0.491	
Density	1.03		1.03	



Anlab
By T. Ikesaki
T. Ikesaki, Director

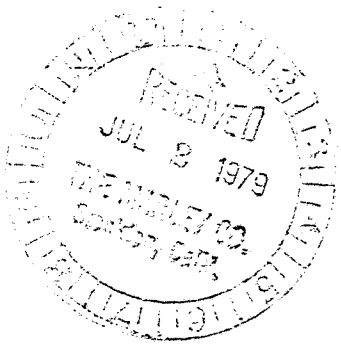
Anlab
ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

Date Received: 6/27/79
Date Sampled: 6/27/79
Report # 21879

Marley Cooling Tower Co.
150 North Sinclair Ave.
Stockton, CA 95205
Attn: Howard Rinne

SAMPLE I.D. #	RETORT 1		RETORT 2	
	lb/gal	%	lb/gal	%
$Na_2Cr_2O_7 \cdot 2H_2O$	0.315	54.3	0.274	54.0
$CuSO_4 \cdot 5H_2O$	0.200	34.5	0.176	34.7
$As_2O_5 \cdot 2H_2O$	0.065	11.2	0.057	11.2
Total	0.580		0.507	
Density, gm/cc	1.05		1.03	



Anlab
By T. Ikesaki
T. Ikesaki, Director

Anlab
ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

Date Received: 7/3/79
Date Sampled: 7/3/79
Report # 23079

Marley Cooling Tower Co.
150 North Sinclair Ave.
Stockton, CA 95205
Attn: Howard Rinne

SAMPLE	RETORT 1		RETORT 2	
I.D. #	79-861		79-862	
	lb/gal	%	lb/gal	%
$Na_2Cr_2O_7 \cdot 2H_2O$	0.324	56.5	0.275	54.6
$CuSO_4 \cdot 5H_2O$	0.187	32.6	0.173	34.3
$As_2O_5 \cdot 2H_2O$	0.062	10.8	0.056	11.1
Total	0.573		0.504	
Density	1.04		1.03	

RECEIVED
JUL 6 1979
THE MARLEY CO.
Stockton, Calif.

Anlab
By T. Ikesaki
T. Ikesaki, Director

Anlab
ANALYTICAL LABORATORY
A DIVISION OF DEWANTE & STOWELL

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

August 1, 1979

Date Received: 8/1/79
Date Sampled: 8/1/79
Report # 27879

Marley Cooling Tower Co.
150 North Sinclair Ave.
Stockton, CA 95205
Attn: Howard Rinne

SAMPLE	RETORT 1		RETORT 2	
I.D. #	79-1048		79-1049	
	lb/gal	%	lb/gal	%
$Na_2Cr_2O_7 \cdot 2H_2O$	0.281	57.5	0.280	55.9
$CuSO_4 \cdot 5H_2O$	0.147	30.1	0.161	32.1
$As_2O_5 \cdot 2H_2O$	0.061	12.5	0.060	12.0
Total, lb/gal	0.489		0.501	
Density, gm/cc	1.033		1.047	

Anlab
By _____
T. Ikesaki, Director

lmh

1.58

MARLEY

TREATMENT RECORD

(Appendix I — O.A.I. S-115B)

CHARGE NO. 431 MAY 17 1979 RETORT NO. 1 OPERATOR Lee Barnes DATE 5-11-79

PRESERVATIVE MARLITH

ITEM	% REDWOOD		% FIR		% HEMLOCK		RETENTION
LUMBER							
1/2" NET AND UNDER	____	x 1.0 +	____	x 1.5 +	____	x 1.5 =	____
OVER 1/2" NET TO 1-5/16" NET	80	x 0.75 +	[redacted]	x 0.75		=	.60
1-5/16" NET AND OVER	20	x 0.50 +	[redacted]	x 0.50		=	1.0
PLYWOOD			____	x 1.0		=	____
				SPECIFIED RETENTION THIS CHARGE			.70

	GUAGE	GALLONS	CALCULATIONS
START (A)	16-1 1/4	33819	(A–B) = 3194 GALLONS RETAINED
FINAL (B)	14-7	30625	(B–C) = 25,025 PUMP BACK (D)
LOWEST (C)	2-8	5600	34,540 – (D) = 9515 GALLONS DISPLACEMENT

9,515 GALS. DISPLACEMENT ÷ 7.48 = 1272 CU. FT. IN CHARGE

3194 GALS. RETAINED x .630 LBS. SALT PER GAL.* = 2012 TOTAL LBS. SALT ÷ 1272 CU. FT. IN CHARGE = 1.58 LBS. SALT PER CU. FT.

23 " HG INITIAL VACUUM | 138 PSI MAX. PRESSURE | 4 HRS. LENGTH PRESS. CYC. | ____ % AT ____ INCH DEPTH MOISTURE CONTENT

1272 CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = 22,006 MARLEY BOARD FEET

____ CUBIC FEET LUMBER 1/2" NET AND UNDER x 17.9 ____ MARLEY BOARD FEET

PLYWOOD THICKNESS	% OF TOTAL CHARGE	CUBIC FEET IN CHARGE	CUBIC FEET BY THICKNESS	THICKNESS FACTOR	SQ. FEET BY THICKNESS
1/4"	____ x	____ =	____ x	48.0	= ____
5/16"	____ x	____ =	____ x	38.4	= ____
3/8"	____ x	____ =	____ x	32.0	= ____
1/2"	____ x	____ =	____ x	24	= ____
5/8"	____ x	____ =	____ x	19.2	= ____
3/4"	____ x	____ =	____ x	16.0	= ____
1-1/8"	____ x	____ =	____ x	10.75	= ____

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS

20% 2X6
20% 7/8X1 1/4
60% 1X6 T&G
} Rdwd. 12-117-78

EST. CU. FT. 1300

☒ TREATED TO REFUSAL

*Includes diffusion factor

16-1 1/4 START (A) READING
4-1 1/2 TANK READING (RETORT AT .95% CAPACITY)
12-9 3/4 CHECK READING

OA-1838D WHITE COPY TO QUALITY ASSURANCE, MISSION, YELLOW TO PRICING AND ESTIMATING, MISSION, PINK AND GOLDENROD TO STOCKTON

12 AM
10 PM
8 PM
6 PM
4 PM
8:00A.M. 5-11-79 C-431 R-1

MARLEY TRE (Append)

CHARGE NO. 441 RETORT NO. 1 OPERATOR Les Brown DATE 5-8-74

PRESERVATIVE: MARLITH

ITEM	% REDWOOD		% FIR		% HEMLOCK		RETENTION
LUMBER							
1/2" NET AND UNDER		x 1.0 +		x 1.5 +		x 1.5 =	
OVER 1/2" NET TO 1-5/16" NET		x 0.75 +		x 0.75		=	
1-5/16" NET AND OVER		x 0.50 +	100	x 0.50		=	50
PLYWOOD				x 1.0		=	
				SPECIFIED RETENTION THIS CHARGE			.50

	GUAGE	GALLONS	CALCULATIONS
START (A)	17-3	36225	(A–B) = 1531 GALLONS RETAINED
FINAL (B)	16-6 1/4	34694	(B–C) = 24,631 PUMP BACK (D)
LOWEST (C)	4-9 1/2	10063	34,540 – (D) = 9,909 GALLONS DISPLACEMENT

9,909 GALS. DISPLACEMENT ÷ 7.48 = 1325 CU. FT. IN CHARGE

1531 GALS. RETAINED x .620 LBS. SALT PER GAL. = 949 TOTAL LBS. SALT ÷ 1325 CU. FT. IN CHARGE = .72 LBS. SALT PER CU. FT.

23 " HG INITIAL VACUUM | 146 PSI MAX. PRESSURE | 5 1/4 HRS. LENGTH PRESS. CYC. | % AT INCH DEPTH MOISTURE CONTENT

1325 CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = 22923 MARLEY BOARD FEET

CUBIC FEET LUMBER 1/2" NET AND UNDER x 17.9 MARLEY BOARD FEET

PLYWOOD THICKNESS	% OF TOTAL CHARGE		CUBIC FEET IN CHARGE		CUBIC FEET BY THICKNESS		THICKNESS FACTOR		SQ. FEET BY THICKNESS
1/4"		x		=		x	48.0	=	
5/16"		x		=		x	38.4	=	
3/8"		x		=		x	32.0	=	
1/2"		x		=		x	24	=	
5/8"		x		=		x	19.2	=	
3/4"		x		=		x	16.0	=	
1-1/8"		x		=		x	10.75	=	

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS.

100A. 2X4 FLR

12-11-78

EST. CU. FT. 1300

☒ TREATED TO REFUSAL

*Includes diffusion factor

17-3 START (A) READING

5-6 TANK READING (RETORT AT .95% CAPACITY)

11-9 CHECK READING

A-1898D WHITE COPY TO QUALITY ASSURANCE, MISSION, YELLOW TO PRICING AND ESTIMATING, MISSION; PINK AND GOLDENROD TO STOCKTON

MARLEY TRE
(Append

CHARGE NO. 441 RETOF

PRESERVATIVE: MARLITH

ITEM	% REDWOOD	%
LUMBER		
1/2" NET AND UNDER	____ x 1.0 =	____
OVER 1/2" NET TO 1-5/16" NET	____ x 0.75 =	____
1-5/16" NET AND OVER	____ x 0.50 =	1
PLYWOOD		____

SPEC

	GUAGE	GALLONS
START (A)	17-3	36225
FINAL (B)	16-6 1/4	34694
LOWEST (C)	4-9 1/2	10063

9.909 GALS. DISPLACEMENT ÷ 7.

1531 GALS. RETAINED x .620 LBS. SALT PER GAL.* = ____ TC

23 " HG INITIAL VACUUM

146 PSI MAX. PRESSURE

5 LENGTH

1325 CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = 22923 MARLEY BOARD FEET

7:00 AM 5-18-79 C441 R-1

PLYWOOD THICKNESS	% OF TOTAL CHARGE		CUBIC FEET IN CHARGE			
1/4"	____	x ____ =	____	x	48.0	= ____
5/16"	____	x ____ =	____	x	38.4	= ____
3/8"	____	x ____ =	____	x	32.0	= ____
1/2"	____	x ____ =	____	x	24	= ____
5/8"	____	x ____ =	____	x	19.2	= ____
3/4"	____	x ____ =	____	x	16.0	= ____
1-1/8"	____	x ____ =	____	x	10.75	= ____

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS.
100. 2X4 FLR
12-11-78

EST. CU. FT. 1300

☒ TREATED TO REFUSAL

17-3 START (A) READING
5-6 TANK READING (RETORT AT .95% CAPACITY)
11-9 CHECK READING

*Includes diffusion factor

A-1898D WHITE COPY TO QUALITY ASSURANCE, MISSION, YELLOW TO PRICING AND ESTIMATING, MISSION; PINK AND GOLDENROD TO STOCKTON

MARLEY TREATMENT RECORD

(Appendix I – O.A.I. S-115B)

CHARGE NO. 444 RETORT NO 1 OPERATOR Les Barron DATE 5-22-79

PRESERVATIVE: MARLITH

JUN 14 1979

ITEM	% REDWOOD		% FIR		% HEMLOCK		RETENTION
LUMBER							
1/2" NET AND UNDER	____	x 1.0 +	____	x 1.5 +	____	x 1.5 =	____
OVER 1/2" NET TO 1-5/16" NET	____	x 0.75 +	____	x 0.75		=	____
1-5/16" NET AND OVER	____	x 0.50 +	100	x 0.50		=	50
PLYWOOD			____	x 1.0		=	____
				SPECIFIED RETENTION THIS CHARGE			.50

	GUAGE	GALLONS	CALCULATIONS
START (A)	17-10 1/4	37494	(A–B) = 1094 GALLONS RETAINED
FINAL (B)	17-4	36400	(B–C) = 25,900 PUMP BACK (D)
LOWEST (C)	5-0	10500	34,540 – (D) = 8,640 GALLONS DISPLACEMENT

8,640 GALS. DISPLACEMENT ÷ 7.48 = 1155 CU. FT. IN CHARGE

1094 GALS. RETAINED x .610 LBS. SALT PER GAL.* = 667 TOTAL LBS. SALT ÷ 1155 CU. FT. IN CHARGE = .58 LBS. SALT PER CU.FT.

23 1/2 " HG INITIAL VACUUM | 148 PSI MAX. PRESSURE | 5 1/4 HRS. LENGTH PRESS. CYC. | % AT INCH DEPTH MOISTURE CONTENT

1155 CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = 19,982 MARLEY BOARD FEET

____ CUBIC FEET LUMBER 1/2" NET AND UNDER x 17.9 ____ MARLEY BOARD FEET

PLYWOOD THICKNESS	% OF TOTAL CHARGE		CUBIC FEET IN CHARGE		CUBIC FEET BY THICKNESS		THICKNESS FACTOR		SQ. FEET BY THICKNESS
1/4"	____	x	____	=	____	x	48.0	=	____
5/16"	____	x	____	=	____	x	38.4	=	____
3/8"	____	x	____	=	____	x	32.0	=	____
1/2"	____	x	____	=	____	x	24	=	____
5/8"	____	x	____	=	____	x	19.2	=	____
3/4"	____	x	____	=	____	x	16.0	=	____
1-1/8"	____	x	____	=	____	x	10.75	=	____

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS.

20% 3X4 12-20-77 ES-10
30% 4X4
10% 2X6 12-117-78
40% 2X4 12-510-79

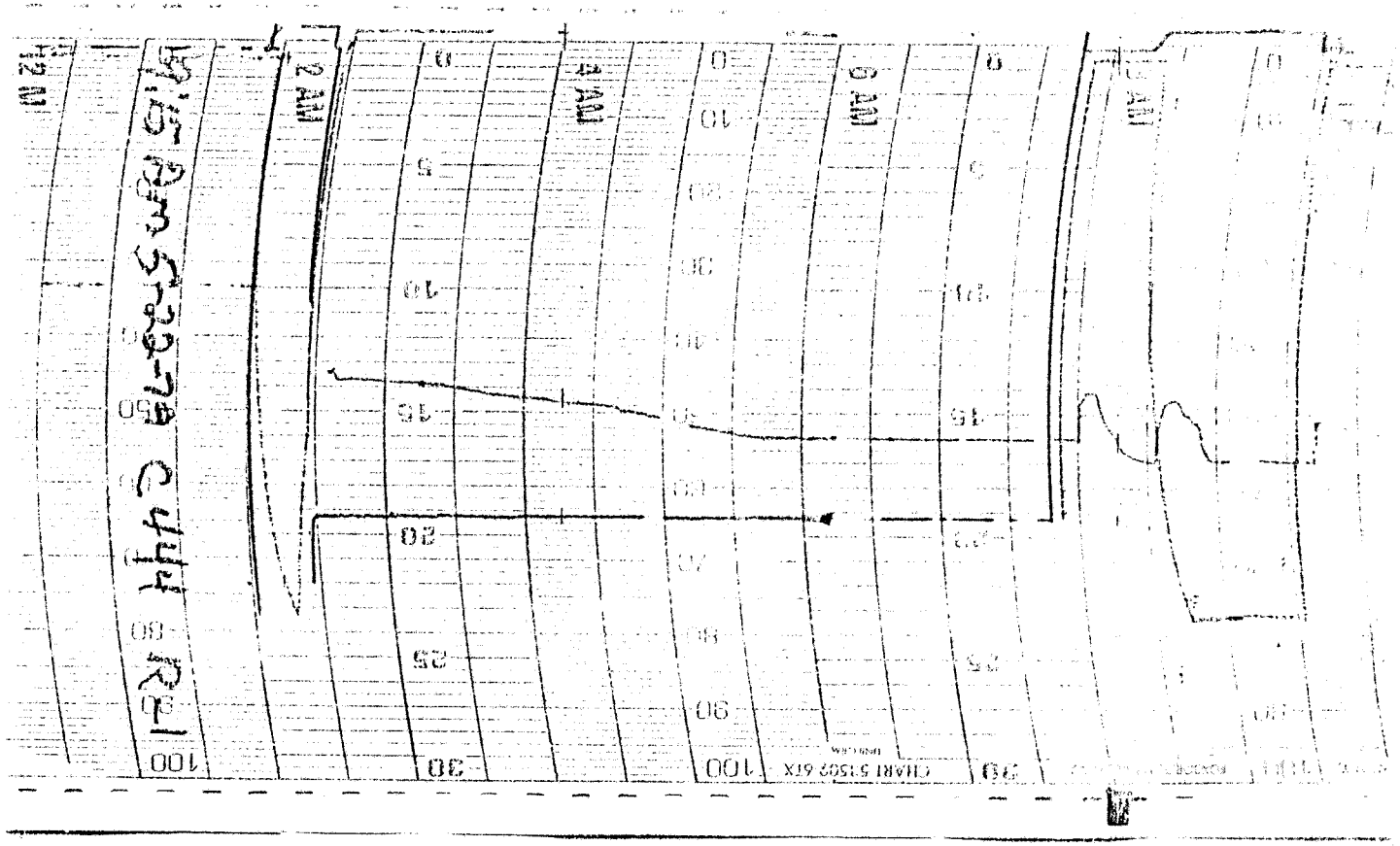
EST. CU. FT. 1150

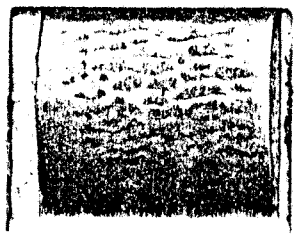
☒ TREATED TO REFUSAL

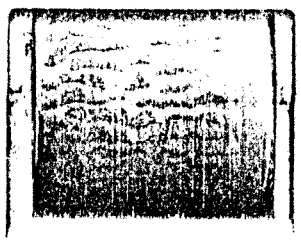
*Includes diffusion factor

17-10 1/4 START (A) READING
5-7 TANK READING (RETORT AT .95% CAPACITY)
12-3 1/4 CHECK READING

OA 1598D WHITE COPY TO QUALITY ASSURANCE, MISSION, YELLOW TO PRICING AND ESTIMATING, MISSION; PINK AND GOLDENROD TO STOCKTON







MARLEY TREATMENT RECORD

(Appendix I – O.A.I. S-1158)

CHARGE NO. 452 RETORT NO. 2 OPERATOR Les Barnes DATE 5-25-79

PRESERVATIVE: MARLITH

ITEM	% REDWOOD	% FIR	% HEMLOCK	RETENTION
LUMBER				
1/2" NET AND UNDER	____ x 1.0 +	____ x 1.5 +	____ x 1.5 =	____
OVER 1/2" NET TO 1-5/16" NET	____ x 0.75 +	____ x 0.75	=	____
1-5/16" NET AND OVER	____ x 0.50 +	100 x 0.50	=	50
PLYWOOD		____ x 1.0	=	____
		SPECIFIED RETENTION THIS CHARGE		.50

	GUAGE	GALLONS	CALCULATIONS
START (A)	16-6 1/4	34694	(A–B) = 1356 GALLONS RETAINED
FINAL (B)	15-10 1/2	33338	(B–C) = 24,063 PUMP BACK (D)
LOWEST (C)	4-5	9275	34,540 – (D) = 10,477 GALLONS DISPLACEMENT

10,477 GALS. DISPLACEMENT ÷ 7.48 = 1401 CU. FT. IN CHARGE

1356 GALS. RETAINED x .600 LBS. SALT PER GAL.* = 814 TOTAL LBS. SALT ÷ 1401 CU. FT. IN CHARGE = .58 LBS. SALT PER CU. FT.

21 "HG INITIAL VACUUM | 150 PSI MAX. PRESSURE | 6 HRS. LENGTH PRESS. CYC. | % AT INCH DEPTH MOISTURE CONTENT

1401 CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = 24,239 MARLEY BOARD FEET

____ CUBIC FEET LUMBER 1/2" NET AND UNDER x 17.9 = ____ MARLEY BOARD FEET

PLYWOOD THICKNESS	% OF TOTAL CHARGE	CUBIC FEET IN CHARGE	CUBIC FEET BY THICKNESS	THICKNESS FACTOR	SQ. FEET BY THICKNESS
1/4"	____ x	____ =	____ x	48.0	= ____
5/16"	____ x	____ =	____ x	38.4	= ____
3/8"	____ x	____ =	____ x	32.0	= ____
1/2"	____ x	____ =	____ x	24	= ____
5/8"	____ x	____ =	____ x	19.2	= ____
3/4"	____ x	____ =	____ x	16.0	= ____
1-1/8"	____ x	____ =	____ x	10.75	= ____

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS.

30% 3X6 12-117-78

0% 4X4 12-138-78

0% 2X4 12-6-79

EST. CU. FT. 1450

☒ TREATED TO REFUSAL

16-6 1/4 START (A) READING

5-4 TANK READING (RETORT AT .95% CAPACITY)

11-2 1/4 CHECK READING

*Includes diffusion factor

1-1898D WHITE COPY TO QUALITY ASSURANCE, MISSION, YELLOW TO PRICING AND ESTIMATING, MISSION, PINK AND GOLDENROD TO STOCKTON

MARLEY TREA (Appendix

CHARGE NO. 452 RETOR IC

PRESERVATIVE: MARLITH

ITEM	% REDWOOD	% F
LUMBER		
1/2" NET AND UNDER	_____ x 1.0 =	_____
OVER 1/2" NET TO 1-5/16" NET	_____ x 0.75 =	_____
1-5/16" NET AND OVER	_____ x 0.50 =	1(
PLYWOOD		_____
		SPECI

	GUAGE	GALLONS
START (A)	16-6 1/4	34694
FINAL (B)	15-10 1/2	33338
LOWEST (C)	4-5	9275

10,477 GALS. DISPLACEMENT ÷ 7.4

1356 GALS. RETAINED x .600 LBS. SALT PER GAL. = TO

21 " HG INITIAL VACUUM | 150 PSI MAX. PRESSURE | 6 LENGTH

1401 CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = 24,237 MARLEY BOARD FEET

1:30 P.M. 5-25-79 C-452 R-2

PLYWOOD THICKNESS	% OF TOTAL CHARGE		CUBIC FEET IN CHARGE			
1/4"	_____	x _____ =	_____	x	48.0	= _____
5/16"	_____	x _____ =	_____	x	38.4	= _____
3/8"	_____	x _____ =	_____	x	32.0	= _____
1/2"	_____	x _____ =	_____	x	24	= _____
5/8"	_____	x _____ =	_____	x	19.2	= _____
3/4"	_____	x _____ =	_____	x	16.0	= _____
1-1/8"	_____	x _____ =	_____	x	10.75	= _____

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS.

30% 3X6 12-117-78
0% 4X4 12-138-78
0% 2X4 12-6-79

EST. CU. FT. 1450

☒ TREATED TO REFUSAL

16-6 1/4 START (A) READING
5-4 TANK READING (RETORT AT .95% CAPACITY)
11-2 1/4 CHECK READING

*Includes diffusion factor

A-1898D WHITE COPY TO QUALITY ASSURANCE, MISSION, YELLOW TO PRICING AND ESTIMATING, MISSION; PINK AND GOLDENROD TO STOCKTON

MARLEY TREATMENT RECORD

(Appendix I – Q.A.I. S-115B)

CHARGE NO. 453 RETORT NO. 1 OPERATOR Los Barron DATE 5-29-79

PRESERVATIVE: MARLITH

ITEM	% REDWOOD	% FIR	% HEMLOCK	RETENTION
LUMBER				
1/2" NET AND UNDER	____ x 1.0 +	____ x 1.5 +	____ x 1.5 =	
OVER 1/2" NET TO 1-5/16" NET	____ x 0.75 +	30 x 0.75	=	23
1-5/16" NET AND OVER	____ x 0.50 +	70 x 0.50	=	35
PLYWOOD		____ x 1.0	=	
		SPECIFIED RETENTION THIS CHARGE		.58

	GUAGE	GALLONS	CALCULATIONS
START (A)	20-9	43575	(A–B) = 1575 GALLONS RETAINED
FINAL (B)	2-0	42000	(B–C) = 25,200 PUMP BACK (D)
LOWEST (C)	8-0	16800	34,540 – (D) = 9,340 GALLONS DISPLACEMENT

9,340 GALS. DISPLACEMENT ÷ 7.48 = 1249 CU. FT. IN CHARGE

1575 GALS. RETAINED x .550 LBS. SALT PER GAL. = 866 TOTAL LBS. SALT ÷ 1249 CU. FT. IN CHARGE = .69 LBS. SALT PER CU. FT.

2 1/2 " HG INITIAL VACUUM | 148 PSI MAX. PRESSURE | 6 HRS. LENGTH PRESS. CYC. | 21 % AT 3/8 INCH DEPTH MOISTURE CONTENT

1249 CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = 21,608 MARLEY BOARD FEET

____ CUBIC FEET LUMBER 1/2" NET AND UNDER x 17.9 ____ MARLEY BOARD FEET

PLYWOOD THICKNESS	% OF TOTAL CHARGE	CUBIC FEET IN CHARGE	CUBIC FEET BY THICKNESS	THICKNESS FACTOR	SQ. FEET BY THICKNESS
1/4"	____ x	____ =	____ x	48.0	= ____
5/16"	____ x	____ =	____ x	38.4	= ____
3/8"	____ x	____ =	____ x	32.0	= ____
1/2"	____ x	____ =	____ x	24	= ____
5/8"	____ x	____ =	____ x	19.2	= ____
3/4"	____ x	____ =	____ x	16.0	= ____
1-1/8"	____ x	____ =	____ x	10.75	= ____

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS.

20% 4X6 12-117-78
20% 12X3 & STK.
20% 4X4
20% 2X6

EST. CU. FT. 1250

☒ TREATED TO REFUSAL

21
20-9 START (A) READING
8-10 TANK READING (RETORT AT .95% CAPACITY)
11 11 CHECK READING

*Includes diffusion factor

1898D WHITE COPY TO QUALITY ASSURANCE, MISSION; YELLOW TO PRICING AND ESTIMATING, MISSION, PINK AND GOLDENROD TO STOCKTON

3 PM
2 PM
12 N
9 AM
3 AM
1:00 P.M. 5-29-79 C453 R4

L-2

MARLEY

TREATMENT RECORD

(Appendix I – O.A.I. S 115B)

CHARGE NO. 470 RETORT NO. 2 OPERATOR Lee Burnett DATE 6-11-79

PRESERVATIVE MARLITH

ITEM	% REDWOOD	% FIR	% HEMLOCK	RETENTION
LUMBER				
1/2" NET AND UNDER	____ x 1.0 +	____ x 1.5 +	____ x 1.5 =	____
OVER 1/2" NET TO 1-5/16" NET	____ x 0.75 +	20 x 0.75	=	15
1-5/16" NET AND OVER	____ x 0.50 +	80 x 0.50	=	40
PLYWOOD		____ x 1.0	=	____
		SPECIFIED RETENTION THIS CHARGE		.55

	GUAGE	GALLONS	CALCULATIONS
START (A)	20-0	42000	(A–B) = 1222 GALLONS RETAINED
FINAL (B)	19-5	40778	(B–C) = 26950 PUMP BACK (D)
LOWEST (C)	6-7	13825	34,540 – (D) = 7,590 GALLONS DISPLACEMENT

7,590 GALS. DISPLACEMENT ÷ 7.48 = 1015 CU. FT. IN CHARGE

1222 GALS. RETAINED × .515 LBS. SALT PER GAL.* = 631 TOTAL LBS. SALT ÷ 1015 CU. FT. IN CHARGE = .62 LBS. SALT PER CU. FT.

20 1/2 " HG INITIAL VACUUM | 152 PSI MAX. PRESSURE | 6 1/4 HRS. LENGTH PRESS. CYC. | ____ % AT ____ INCH DEPTH MOISTURE CONTENT

1015 CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = 17,560 MARLEY BOARD FEET

____ CUBIC FEET LUMBER 1/2" NET AND UNDER x 17.9 ____ MARLEY BOARD FEET

PLYWOOD THICKNESS	% OF TOTAL CHARGE	CUBIC FEET IN CHARGE	CUBIC FEET BY THICKNESS	THICKNESS FACTOR	SQ. FEET BY THICKNESS
1/4"	____ x	____ =	____ x	48.0	= ____
5/16"	____ x	____ =	____ x	38.4	= ____
3/8"	____ x	____ =	____ x	32.0	= ____
1/2"	____ x	____ =	____ x	24	= ____
5/8"	____ x	____ =	____ x	19.2	= ____
3/4"	____ x	____ =	____ x	16.0	= ____
1-1/8"	____ x	____ =	____ x	10.75	= ____

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS.

20% 1 1/2 X 3 12-117-78
30% 4 X 4 12-509-79
50% 2 X 4 12-522-77

EST. CU. FT. 1000

☒ TREATED TO REFUSAL

*Includes diffusion factor

20-0 START (A) READING
7-3 TANK READING (RETORT AT .95% CAPACITY)
12-9 CHECK READING

OA 1698D WHITE COPY TO QUALITY ASSURANCE, MISSION, YELLOW TO PRICING AND ESTIMATING, MISSION; PINK AND GOLDENROD TO STOCKTON

8 PM
6 PM
4 PM
2 PM
12 N
2:15 p.m. 6-11-79 C.470 R=2

MARLEY

TREATMENT RECORD

(Appendix I – O.A.I. S-1156)

CHARGE NO. 492 — 1979 — RETORT NO. 1 — OPERATOR Lee Burson — DATE 6-27-79

PRESERVATIVE JUL 5 MARLITH

ITEM	% REDWOOD	% FIR	% HEMLOCK	RETENTION
LUMBER				
1/2" NET AND UNDER	____ x 1.0 +	____ x 1.5 +	____ x 1.5 =	____
OVER 1/2" NET TO 1-5/16" NET	____ x 0.75 +	____ x 0.75	=	____
1-5/16" NET AND OVER	____ x 0.50 +	100 x 0.50	=	50
PLYWOOD		____ x 1.0	=	____
		SPECIFIED RETENTION THIS CHARGE		.50

	GUAGE	GALLONS	CALCULATIONS
START (A)	16-0 1/4	33644	(A–B) = 1663 GALLONS RETAINED
FINAL (B)	15-2 3/4	31981	(B–C) = 24,631 PUMP BACK (D)
LOWEST (C)	3-6	7350	34,540 – (D) = 9,909 GALLONS DISPLACEMENT

~~9,909~~ GALS. DISPLACEMENT ÷ 7.48 = ~~1325~~ CU. FT. IN CHARGE

1663 GALS. RETAINED x .550 LBS. SALT PER GAL.* = 915 TOTAL LBS. SALT ÷ 1325 CU. FT. IN CHARGE = .69 LBS. SALT PER CU. FT.

21½ "HG INITIAL VACUUM — 146 PSI MAX. PRESSURE — 6 1/4 HRS. LENGTH PRESS. CYC. — ____ % AT ____ INCH DEPTH MOISTURE CONTENT

1325 CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = 22,923 MARLEY BOARD FEET

____ CUBIC FEET LUMBER 1/2" NET AND UNDER x 17.9 ____ MARLEY BOARD FEET

PLYWOOD THICKNESS	% OF TOTAL CHARGE	CUBIC FEET IN CHARGE	CUBIC FEET BY THICKNESS	THICKNESS FACTOR	SQ. FEET BY THICKNESS
1/4"	____ x	____ =	____ x	48.0	= ____
5/16"	____ x	____ =	____ x	38.4	= ____
3/8"	____ x	____ =	____ x	32.0	= ____
1/2"	____ x	____ =	____ x	24	= ____
5/8"	____ x	____ =	____ x	19.2	= ____
3/4"	____ x	____ =	____ x	16.0	= ____
1-1/8"	____ x	____ =	____ x	10.75	= ____

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS

10% 2x8 12-117-78
20% 2x4 28-73047-78B
20% 4x4

EST. CU. FT. 1350

☒ TREATED TO REFUSAL

16-0 1/4 START (A) READING
4-5 TANK READING (RETORT AT .95% CAPACITY)
11-7 1/4 CHECK READING

*Includes diffusion factor

OA 1098D WHITE COPY TO QUALITY ASSURANCE, MISSION, YELLOW TO PRICING AND ESTIMATING, MISSION; PINK AND GOLDENROD TO STOCKTON

2 AM
12 M
10 PM
8 PM
4 PM
RNOOPm.6-27-79 C492 R-1

58

MARLEY TREATMENT RECORD

(Appendix I – Q.A.I. S-115B)

JUL 5 - 1979

CHARGE NO 495 RETORT NO 2 OPERATOR Les Baron DATE 6-28-79

PRESERVATIVE MARLITH

ITEM	% REDWOOD	% FIR	% HEMLOCK	RETENTION
LUMBER				
1/2" NET AND UNDER	____ x 1.0 +	____ x 1.5 +	____ x 1.5 =	____
OVER 1/2" NET TO 1-5/16" NET	____ x 0.75 +	____ x 0.75	=	____
1-5/16" NET AND OVER	____ x 0.50 +	100 x 0.50	=	50
PLYWOOD		____ x 1.0	=	____
		SPECIFIED RETENTION THIS CHARGE		.50

	GUAGE	GALLONS	CALCULATIONS
START (A)	14-11	31325	(A–B) = 1662 GALLONS RETAINED
FINAL (B)	14-1½	29663	(B–C) = 23,669 PUMP BACK (D)
LOWEST (C)	2-10¼	5994	34,540 – (D) = 10,871 GALLONS DISPLACEMENT

10,871 GALS. DISPLACEMENT ÷ 7.48 = 1453 CU. FT. IN CHARGE

1662 GALS. RETAINED x .507 LBS. SALT PER GAL.* = 843 TOTAL LBS. SALT ÷ 1453 CU. FT. IN CHARGE = .58 LBS. SALT PER CU. FT.

21 " HG INITIAL VACUUM

150 PSI MAX. PRESSURE

6¼ HRS. LENGTH PRESS. CYC.

____ % AT ____ INCH DEPTH MOISTURE CONTENT

1453 CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = 25,137 MARLEY BOARD FEET

____ CUBIC FEET LUMBER 1/2" NET AND UNDER x 17.9 ____ MARLEY BOARD FEET

PLYWOOD THICKNESS	% OF TOTAL CHARGE	CUBIC FEET IN CHARGE	CUBIC FEET BY THICKNESS	THICKNESS FACTOR	SQ. FEET BY THICKNESS
1/4"	____ x	____ =	____ x	48.0	= ____
5/16"	____ x	____ =	____ x	38.4	= ____
3/8"	____ x	____ =	____ x	32.0	= ____
1/2"	____ x	____ =	____ x	24	= ____
5/8"	____ x	____ =	____ x	19.2	= ____
3/4"	____ x	____ =	____ x	16.0	= ____
1-1/8"	____ x	____ =	____ x	10.75	= ____

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS.

20% 2x4
80% 4x4 12-117-78

EST. CU. FT. 1400

X TREATED TO REFUSAL

14-11 START (A) READING

3-6 TANK READING (RETORT AT .95% CAPACITY)

11-5 CHECK READING

*Includes diffusion factor

QA-1898D WHITE COPY TO QUALITY ASSURANCE, MISSION, YELLOW TO PRICING AND ESTIMATING, MISSION, PINK AND GOLDENROD TO STOCKTON

4 PM
2 PM
12 N
10 AM
8 AM
THE FOXBORO COMPANY
FOXBORO, MASS.
3:15 PM
C 495
6-28-79
R2

MARLEY TREATMENT RECORD

(Appendix I – Q.A.I. S-115B)

CHARGE NO. 500 RETREAT RETORT NO. 1 OPERATOR Lee Brown DATE 7-3-79

PRESERVATIVE: MARLITH

ITEM	% REDWOOD		% FIR		% HEMLOCK		RETENTION
LUMBER							
1/2" NET AND UNDER	_____	x 1.0 +	_____	x 1.5 +	_____	x 1.5 =	_____
OVER 1/2" NET TO 1-5/16" NET	_____	x 0.75 +	_____	x 0.75		=	_____
1-5/16" NET AND OVER	_____	x 0.50 +	100	x 0.50		=	_____
PLYWOOD			_____	x 1.0		=	_____
				SPECIFIED RETENTION THIS CHARGE			_____

	GUAGE	GALLONS	CALCULATIONS
START (A)	15-2¼	31894	(A–B) = 1094 GALLONS RETAINED
FINAL (B)	14-8...	30800	(B–C) = 23,800 PUMP BACK (D)
LOWEST (C)	3-4	7000	34,540 – (D) = 10,740 GALLONS DISPLACEMENT

10,740 GALS. DISPLACEMENT ÷ 7.48 = 1436 CU. FT. IN CHARGE

1094 GALS. RETAINED x .550 LBS. SALT PER GAL. = 602 TOTAL LBS. SALT ÷ 1436 CU. FT. IN CHARGE = .42 LBS. SALT PER CU. FT.

21½ "HG INITIAL VACUUM | 150 PSI MAX. PRESSURE | 4½ HRS. LENGTH PRESS. CYC. | _____ % AT _____ INCH DEPTH MOISTURE CONTENT

1436 CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = 24843 MARLEY BOARD FEET

_____ CUBIC FEET LUMBER 1/2" NET AND UNDER x 17.9 _____ MARLEY BOARD FEET

PLYWOOD THICKNESS	% OF TOTAL CHARGE		CUBIC FEET IN CHARGE		CUBIC FEET BY THICKNESS		THICKNESS FACTOR	SQ. FEET BY THICKNESS
1/4"	_____	x	_____	=	_____	x	48.0	= _____
5/16"	_____	x	_____	=	_____	x	38.4	= _____
3/8"	_____	x	_____	=	_____	x	32.0	= _____
1/2"	_____	x	_____	=	_____	x	24	= _____
5/8"	_____	x	_____	=	_____	x	19.2	= _____
3/4"	_____	x	_____	=	_____	x	16.0	= _____
1-1/8"	_____	x	_____	=	_____	x	10.75	= _____

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS.

2"x12"x3 MATERIAL PICKED FROM EST. CU. FT. 1400

4"x4" TREATED STK & RETREATED

2"x6" Job No. 12-117-79

☒ TREATED TO REFUSAL

*Includes diffusion factor

15-2¼ START (A) READING

3-10 TANK READING (RETORT AT .95% CAPACITY)

1-4¼ CHECK READING

A-1893D WHITE COPY TO QUALITY ASSURANCE, MISSION; YELLOW TO PRICING AND ESTIMATING, MISSION; PINK AND GOLDENROD TO STOCKTON

1.23

MARLEY TREATMENT RECORD

(Appendix I – Q.A.I. S-1158)

CHARGE NO. 5708 RETORT NO. 1 OPERATOR M.P. Lawson DATE 7-13-79

PRESERVATIVE: MARLITH

ITEM	% REDWOOD	% FIR	% HEMLOCK	RETENTION
LUMBER				
1/2" NET AND UNDER	____ x 1.0 +	____ x 1.5 +	____ x 1.5 =	____
OVER 1/2" NET TO 1-5/16" NET	____ x 0.75 +	____ x 0.75	=	____
1-5/16" NET AND OVER	____ x 0.50 +	____ x 0.50	=	____
PLYWOOD		100 x 1.0	=	1.0
		SPECIFIED RETENTION THIS CHARGE		1.0

	GUAGE	GALLONS	CALCULATIONS
START (A)	14-6 1/8	30472	(A–B) = 3150 GALLONS RETAINED
FINAL (B)	13-0 1/8	27322	(B–C) = 24,041 PUMP BACK (D)
LOWEST (C)	1-6 3/4	3281	34,540 – (D) = 10,499 GALLONS DISPLACEMENT

10,499 GALS. DISPLACEMENT ÷ 7.48 = 1404 CU. FT. IN CHARGE

3150 GALS. RETAINED x .550 LBS. SALT PER GAL. = 1733 TOTAL LBS. SALT ÷ 1404 CU. FT. IN CHARGE = 1.23 LBS. SALT PER CU. FT.

21 1/2 " HG INITIAL VACUUM; 62 PSI MAX. PRESSURE; 1/2 HRS. LENGTH PRESS. CYC.; ____ % AT ____ INCH DEPTH MOISTURE CONTENT

____ CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = ____ MARLEY BOARD FEET

____ CUBIC FEET LUMBER 1/2" NET AND UNDER x 17.9 = ____ MARLEY BOARD FEET

PLYWOOD THICKNESS	% OF TOTAL CHARGE	CUBIC FEET IN CHARGE	CUBIC FEET BY THICKNESS	THICKNESS FACTOR	SQ. FEET BY THICKNESS
1/4"	____	____	____	48.0	____
5/16"	____	____	____	38.4	____
3/8"	____	____	____	32.0	____
1/2"	10	1404	140	24	3360
5/8"	____	____	____	19.2	____
3/4"	20	1404	281	16.0	4496
1-1/8"	70	1404	983	10.75	10567
					18,423

*Includes diffusion factor

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS.

12-73-75 A C53
12-73-75 B C54
12-117-78 C54

EST. CU. FT. 1400

☐ TREATED TO REFUSAL

14-6 1/8 START (A) READING
3-0 7/8 TANK READING (RETORT AT .95% CAPACITY)
11-5 1/4 CHECK READING

QA-1208D WHITE COPY TO QUALITY ASSURANCE, MISSION; YELLOW TO PRICING AND ESTIMATING, MISSION; PINK AND GOLDENROD TO STOCKTON

1125

MARLEY TREAT (Appendix I-

CHARGE NO. 508 RETORT I

PRESERVATIVE MARLITH

ITEM	% REDWOOD	% FIR
LUMBER		
1/2" NET AND UNDER	____ x 1.0 =	____
OVER 1/2" NET TO 1-5/16" NET	____ x 0.75 =	____
1-5/16" NET AND OVER	____ x 0.50 =	____
PLYWOOD		10 C

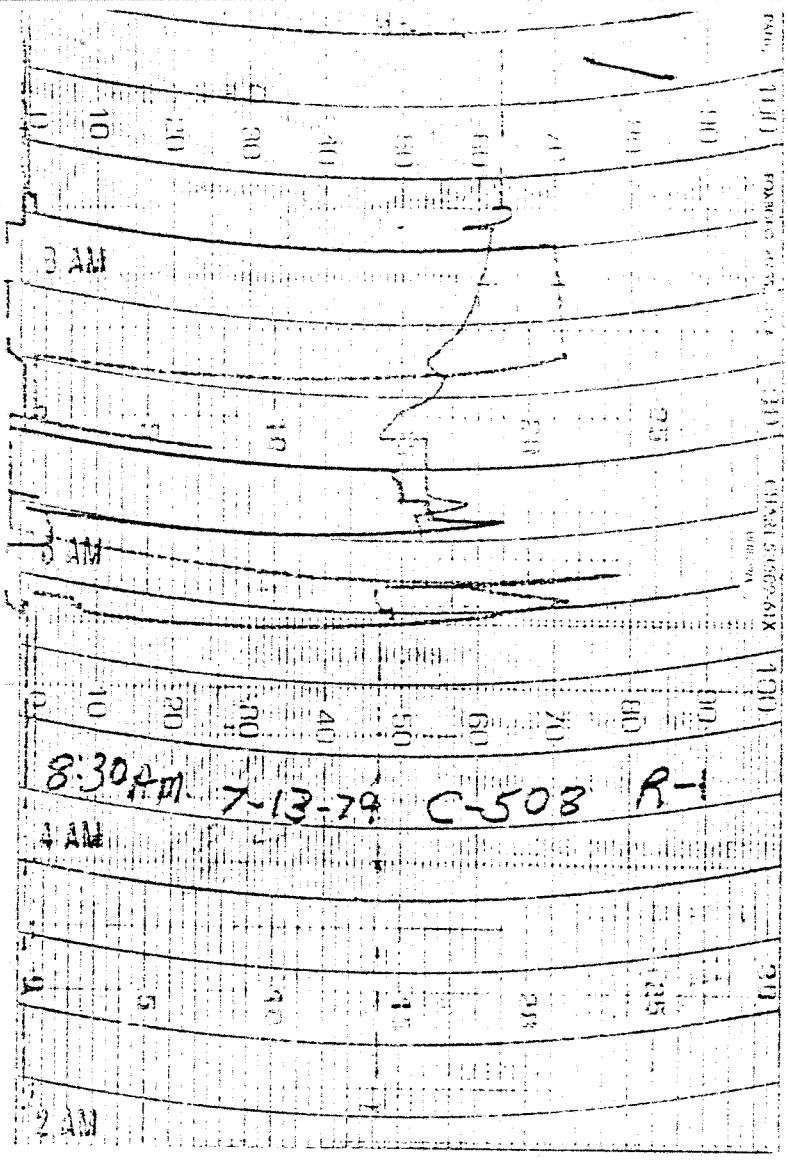
SPECIF

	GUAGE	GALLONS
START (A)	14-6 1/8	30472
FINAL (B)	13-0 1/8	27322
LOWEST (C)	1-6 3/4	3281

10,499 GALS. DISPLACEMENT ÷ 7.48

3150 GALS. RETAINED x .550 LBS. SALT PER GAL.* = 1 TOTA

21 1/2 " HG INITIAL VACUUM | 128 PSI MAX. PRESSURE | 1/2 LENGTH PF



____ CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = ____ MARLEY BOARD FEET

____ CUBIC FEET LUMBER 1/2" NET AND UNDER x 17.9 ____ MARLEY BOARD FEET

PLYWOOD THICKNESS	% OF TOTAL CHARGE		CUBIC FEET IN CHARGE		CUBIC FEET BY THICKNESS		THICKNESS FACTOR		SQ. FEET BY THICKNESS
1/4"	____	x	____	=	____	x	48.0	=	____
5/16"	____	x	____	=	____	x	38.4	=	____
3/8"	____	x	____	=	____	x	32.0	=	____
1/2"	10	x	1404	=	140	x	24	=	3360
5/8"	____	x	____	=	____	x	19.2	=	____
3/4"	20	x	1404	=	281	x	16.0	=	4496
1-1/8"	70	x	1404	=	983	x	10.75	=	10567
									18423

*Includes diffusion factor

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS.

12-73-75 A C53
12-73-75 B C54
12-117-78 C

EST. CU. FT. 1400

☐ TREATED TO REFUSAL

14-6 1/8 START (A) READING
3-0 1/8 TANK READING (RETORT AT .95% CAPACITY)
11-5 1/4 CHECK READING

A-1608D WHITE COPY TO QUALITY ASSURANCE, MISSION, YELLOW TO PRICING AND ESTIMATING, MISSION; PINK AND GOLDENROD TO STOCKTON

AUG 13 1979

MARLEY TREATMENT RECORD

(Appendix I – O.A.I. S-1158)

CHARGE NO. 515 RETREAT RETORT NO 2 OPERATOR Lee Barron DATE 8-1-79

PRESERVATIVE MARLITH

ITEM	% REDWOOD	% FIR	% HEMLOCK	RETENTION
LUMBER				
1/2" NET AND UNDER	_____ x 1.0 +	_____ x 1.5 +	_____ x 1.5 =	_____
OVER 1/2" NET TO 1-5/16" NET	_____ x 0.75 +	_____ x 0.75	=	_____
1-5/16" NET AND OVER	_____ x 0.50 +	100 x 0.50	=	.5
PLYWOOD		_____ x 1.0	=	_____
		SPECIFIED RETENTION THIS CHARGE		.5

	GUAGE	GALLONS	CALCULATIONS
START (A)	17-1 3/4	36006	(A–B) = 1618 GALLONS RETAINED
FINAL (B)	16-4 1/2	34388	(B–C) = 25,900 PUMP BACK (D)
LOWEST (C)	4-0 1/2	8488	34,540 – (D) = 8,640 GALLONS DISPLACEMENT

8640 GALS. DISPLACEMENT ÷ 7.48 = 1155 CU. FT. IN CHARGE

1618 GALS. RETAINED x .500 LBS. SALT PER GAL.* = 809 TOTAL LBS. SALT ÷ 1155 CU. FT. IN CHARGE = .70 LBS. SALT PER CU. FT.

21 " HG INITIAL VACUUM | 142 PSI MAX. PRESSURE | 4 HRS. LENGTH PRESS. CYC. | % AT INCH DEPTH MOISTURE CONTENT

809 CUBIC FEET LUMBER OVER 1/2" NET x 17.3 = 13,996 MARLEY BOARD FEET

_____ CUBIC FEET LUMBER 1/2" NET AND UNDER x 17.9 _____ MARLEY BOARD FEET

PLYWOOD THICKNESS	% OF TOTAL CHARGE	CUBIC FEET IN CHARGE	CUBIC FEET BY THICKNESS	THICKNESS FACTOR	SQ. FEET BY THICKNESS
1/4"	_____ x	_____ =	_____ x	48.0	= _____
5/16"	_____ x	_____ =	_____ x	38.4	= _____
3/8"	_____ x	_____ =	_____ x	32.0	= _____
1/2"	_____ x	_____ =	_____ x	24	= _____
5/8"	_____ x	_____ =	_____ x	19.2	= _____
3/4"	_____ x	_____ =	_____ x	16.0	= _____
1-1/8"	_____ x	_____ =	_____ x	10.75	= _____

NOTE BELOW THE LUMBER SIZES, PERCENTAGE IN CHARGE, AND CONTRACT NUMBERS.

20% 2x3 1/4 MATERIAL PICKED
20% 4x4 FROM TRTR. STK. &
20% 2x8 RETREATED
20% 2x6 12-11-78
40% 2x4

EST. CU. FT. 1100

☒ TREATED TO REFUSAL

*Includes diffusion factor

17-1 3/4 START (A) READING

4-7 TANK READING (RETORT AT .95% CAPACITY)

12-6 3/4 CHECK READING

(R-1098D WHITE COPY TO QUALITY ASSURANCE, MISSION, YELLOW TO PRICING AND ESTIMATING, MISSION, PINK AND GOLDENROD TO STOCKTON

3 PM
4 PM
2 PM
12 N
10 AM
7:30 A.M. 8-1-79 C515 R-2

FEB 1979 77-8-34

SUBMITTAL from THE MARLEY COOLING TOWER COMPANY

OUR NEW ADDRESS IS:
9401 NALL - SUITE 102
SHAWNEE MISSION, KS 66207
PHONE (913) 642-9221

KANSAS CITY SALES OFFICE.....PHONE 913/236-9400 – AREA CODE 913
P.O. Box 894, Shawnee Mission, Kansas 66201

TO: Lutz, Daily & Brain Engineers
P. O. Box 718
Shawnee Mission, Kansas 66201

ATT'N: Mr. Randall B. Snell

DATE: February 2, 1979

SUBJECT: City of Grand Island
Platte Generating Station #1
Contract 77-8-34
Marley #12-117-78

[X] ENCLOSED HEREWITH [ ] FOR APPROVAL [ ] RESUBMITTED FOR APPROVAL

[ ] SENT SEPARATELY [X] FOR REFERENCE [ ] ADD'L COPIES AS REQUESTED

NO. OF PRINTS	DRAWING NO.	DESCRIPTION
		Approval Drawing Data Sheet
1 Mylar	78-4396-D	Schematic Views drawing - Final Distribution
		Supporting Steel Arrangement drawing
1 Mylar	78-4397-C	Concrete basin drawing - Final Distribution
1 Xerox	2-4197	Derrick Installation (For Information Only)

REMARKS: One (1) Print Ea.
City of Grand Island
P. O. Box 1968 - City Hall
Grand Island, Neb. 68801
Attn: Mr. Robert J. Olson

Prints to Marley 2/9/79 ad

RECEIVED
FEB 7 1979
CITY UTILITIES DEPT.
GRAND ISLAND, NEBR.

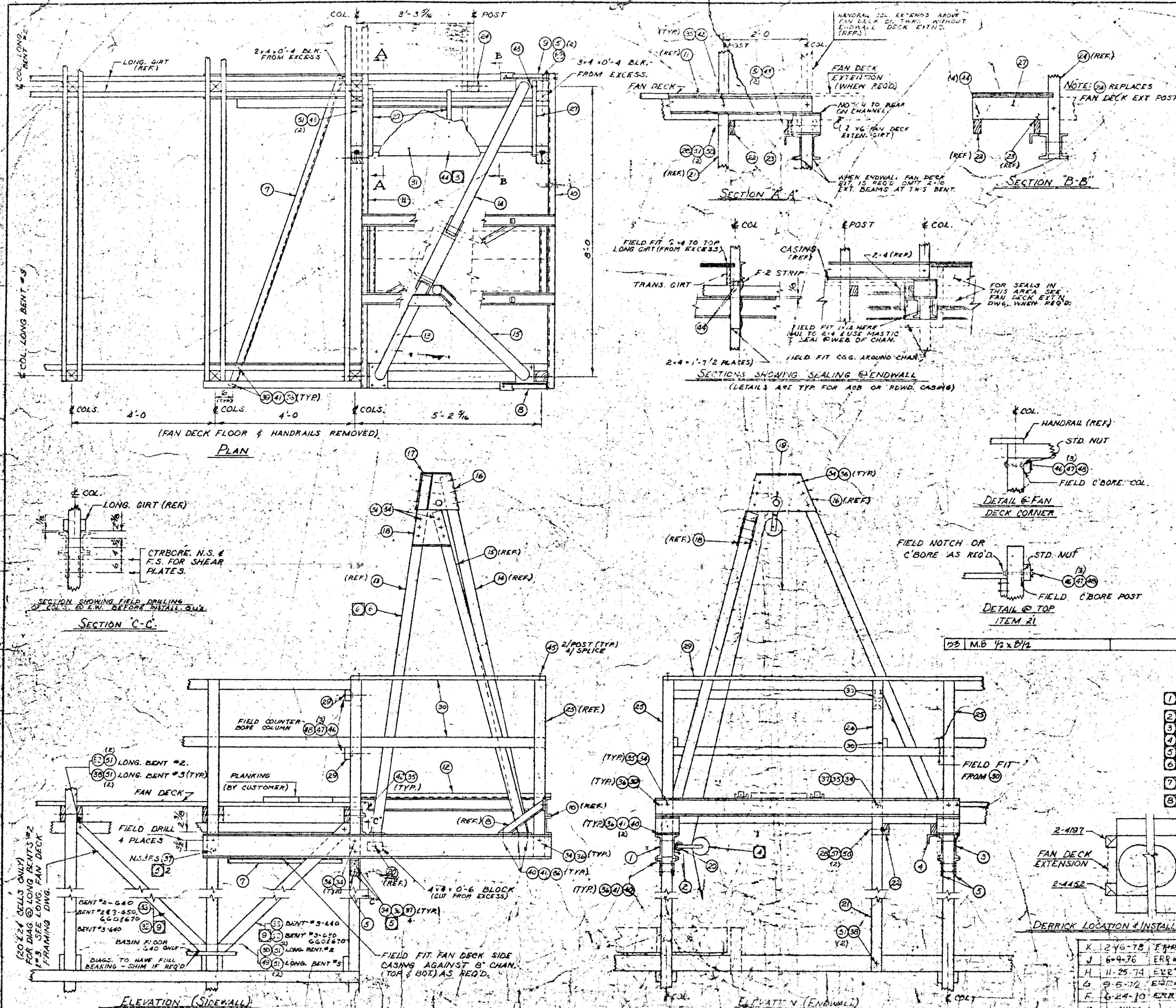
5-4-27

IMPORTANT—To insure requested _____ shipping date, please return approved drawings by _____.

[X] These drawings are certified for construction. Equipment has been released for fabrication and shipment.

[ ] Equipment is held for approval and release. Please return _____ approved copies.

THE MARLEY COOLING TOWER COMPANY
Submitted by
G. H. Harbison



ITEM NO	DESCRIPTION	DWG CODE	PART No.	[illegible]
1	SUPPORT 8⊔@11.5 × 9-9 1/2		8-4674 - 007	1
2	SUPPORT 8⊔@11.5 × 9'-9 1/2		8-4674 - 006	1
3	SUPPORT 8⊔@11.5 × 9'-9 1/2		8-3708 - 005	1
4	SUPPORT ASS'Y.		8-3708 - 004	1
5	BAR BENT 1/4 × 3 × 0'-11		8-4674 - 019	4
6	PLACARD RIGGING INSTRUCTION		8-1240 - 001	2
7	ANGLE BRACE 2×2×3/16×9'-2 1/2		8-4674 - 017	1
8	KNEEBRACE ASS'Y.		8-4674 - 010	1
9	KNEEBRACE ASS'Y.		8-4674 - 011	1
10	HORIZ. SUPPORT ASS'Y.		8-4674 - 008	1
11	HORIZ. SUPPORT ASS'Y.		8-4674 - 009	1
12	TRACK ASS'Y. ALUM.		8-2292 - 001	1
13	DERRICK LEG ASS'Y.		8-3708 - 001	1
14	DERRICK LEG ASS'Y.		8-3708 - 002	1
15	DERRICK LEG ASS'Y.		8-3708 - 003	1
16	PLATE 3/8 × 1'-0 × 2'-2 1/8		8-4674 - 013	1
17	PLATE BENT 3/8 × 1'-3 7/8 × 2'-2 1/8		8-4674 - 014	1
18	PLATE 1/4 × 1'-0 × 1'-1 7/8		8-4674 - 015	2
19	PIN 1 1/2 DIA. × 0'-6		8-4674 - 020	1
(2)	COTTER PIN 1/4 × 0'-2 1/2 E.G.			2
(2) 20	EYENUT 3/4 JOSLYN J-6122 or EQ.			1
(2)	M.B. 3/4 × 5 GALV.			1
21	POST 4 × 4 × 9'-6		8-2435 - 008	1
22	SUPPORT 3 × 4 × 5'-5 13/16		8-2435 - 010	1
23	2 × 3 3/4 NET × 6'-0			1
24	POST 4 × 4 × 4'-11		8-2435 - 003	1
25	POST 4 × 4 × 4'-11		8-2435 - 001	2
26	POST 4 × 4 × 4'-3 3/16		8-2435 - 006	1
27	STCGR. 2 × 6 × 2'-6			3
28	CSTG. STR. CERAMIC RING		8-2423 - 1	2
29	HR-KR 2 × 4 × 9'-0 EE			3
30	HR.-K.R. 2 × 4 × 6'-0 EE			7
31	PLWD. 1 1/8 × 23 15/16 × 64			1
32	DIAGONAL 3 × 4 × 6'-3 5/16		8-450 - 59	(7)
33	DIAGONAL 3 × 4 × 6'-2 13/16		8-450 - 60	(8)
(2) 34	M.B. 1/2 × 5 GALV.			29
(2) 35	WASHER S.C. 1/2 GALV.			6
(2) 36	WASHER, LOCK 1/2 GALV.			54
37	SHEAR PLATE		8-133 - 000	13
38	M.B. 1/2 × 5 1/2			3
(2) 39	M.B. 1/2 × 1 1/2 GALV.			6
(2) 40	M.B. 1/2 × 2 GALV.			22
(2) 41	WASHER MALL BEVEL 1/2 GALV.			38
(2) 42	M.B. 1/2 × 6 GALV.			3
43	M.B. 1/2 × 10 1/2			1
44	NAIL 3 SCREWSHANK			40
45	NAIL 3 1/2 SCREWSHANK			50
46	M.B. 3/8 × 6 2 1/2" MIN. THD.			4
47	WASHER S.C 3/8			12
48	NUT WING 3/8 - 16 NC - 2			4
49	M.B. 1/2 × 10			1
50	M.B. 1/2 × 7			3
51	WASHER S.C. 1/2			20
52	M.B. 1/2 × 7 1/2			1

BILL CON'T

GENERAL NOTES

(1) THIS DERRICK TO BE USED ONE END OF FAN DECK EXTENSION ONLY - SEE INSTALL. DWG. PLAN. PARTS NOT INTERCHANGEABLE.

(2) THESE ITEMS TO BE 316 S.S. ON SALT WATER CONTRACTS.

(3) NAIL PLYWD. TO SUPPORTS ON 8" CENTERS - NOTCH @ POSTS AS REQ'D.

(4) ALL SUFFICIENT HOISTING EQUIP. & PLANKING TO BE FURNISHED BY CUST.

(5) FIELD GROOVE COLUMN FOR SHEAR PLATES.

(6) INSTALL PLACARD @ EYE LEVEL ON ITEM 13 & ON ENDWALL @ BASE OF TOWER BENEATH DERRICK.

(7) NONE REQ'D. ON 20' & 24' CELLS, MODEL 640 - ONE REQ'D ON ALL OTHER MODELS, EXCEPT 28' & LARGER CELLS SERIES 650, 660 & 670 - 3 REQ'D.

(8) REQ'D. ON SERIES 640 ONLY. (1) REQ'D. 20 & 24' CELLS, (2) REQ'D. 28' & LARGER CELLS.

(9) AT BENT #3 OR #3A ONLY. DIAG'S. HEEL ON BASIN FLOOR ON MODEL 640

FOR SPIRAL TARGET NOZZLES
PER ECN #6644

FEB 09 19[illegible]
Submitted For Information Only
OSHA STDS.

REV.	DATE	REVISION		BY	CHECKED	
K	2-16-78	ERR 79-240		REF	MB	
J	6-9-76	ERR # 77-633		PB	[illegible]	
H	11-25-74	ERR # 75-160		DC	[illegible]	
G	9-5-72	ERR # 72-495		HEC	[illegible]	
F	6-24-70	ERR # [illegible]		KEC	[illegible]	

(1) DERRICK INSTALLATION (3000# CAP.)
CLASS 600 DOUBLE FLOW TOWERS
THE MARLEY COMPANY
KANSAS CITY, MISSOURI

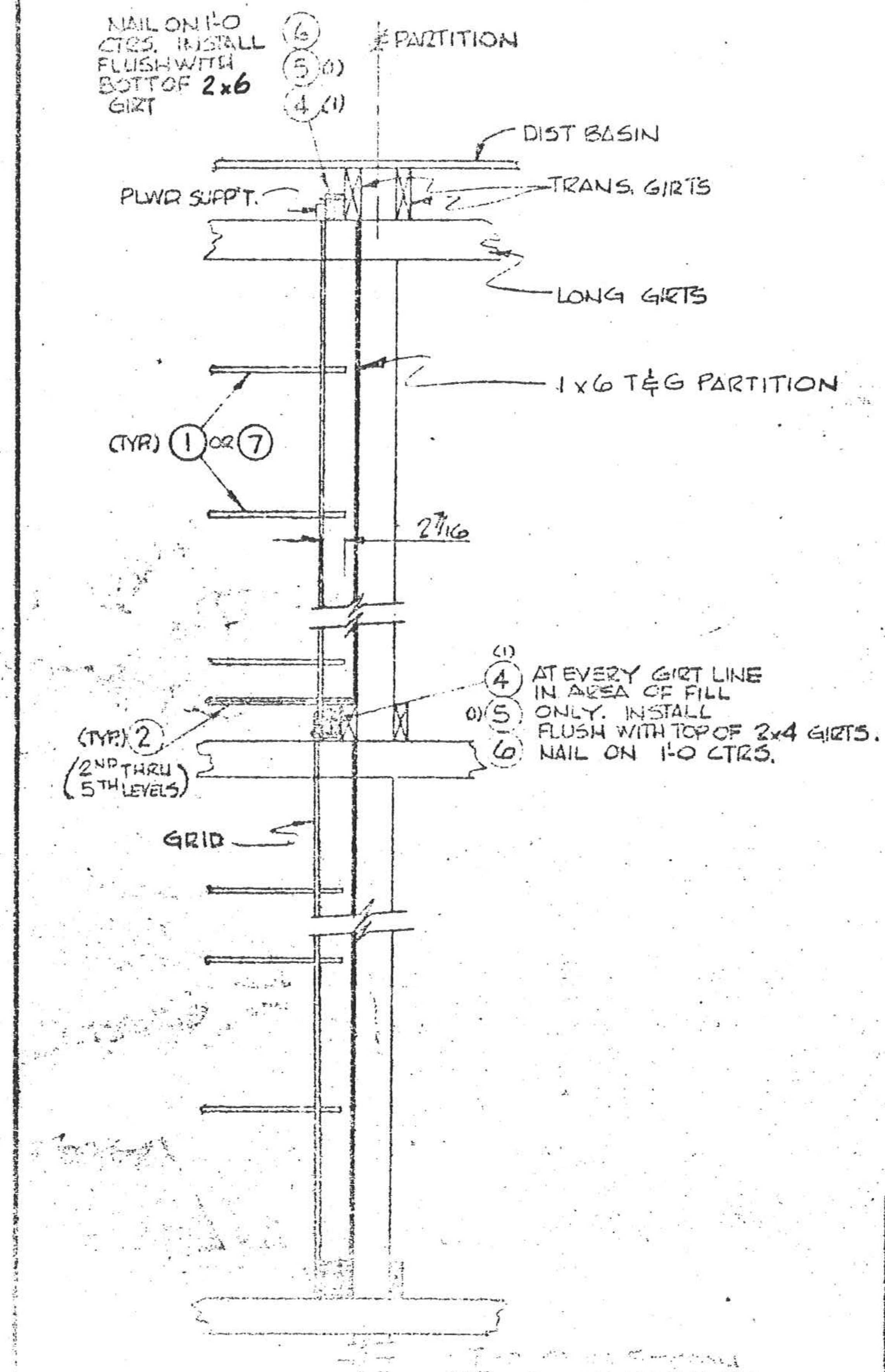
MASTER FILE NO — FOREIGN FILE YES

SCALE	DATE	DRAWN	CHECKED	APPROVED
NONE	1-13-6[illegible]	R. ROSS	[illegible]	[illegible]

Drawing No. 2-4197 Rev. K

Drawing No. 79-290

ITEM	PART NO.	DESCRIPTION	QUAN.
1.	75-2517-2	BAR, SPLASH PERF. 3'-8 P.V.C.	4424
2.	67-2484-5	GRID SUPP'T. 7/8 NET x 1 3/4 NET x 3'-5	888
3.		DELETED	—
4		2x3x12'-0	48
5.		2x3x7'-0	48
6.		NAIL 3 1/2 SCR. SHANK	912
7.		BAR, SPLASH 1 NET x 1 1/2 x 3'-8	1080



GRAND ISLAND 77-8

OFFICE COPY
CHECKED BY:
CIVIL
MECH

FEB 08 1980

GENERAL NOTES

1. DETAILS AND MATERIAL NOT NOTED SAME AS SHOWN ON FILL INSTALLATION DWG 79-4149
2. FIELD NOTCH 2x3 SPACER MEMBERS AS REQ'D TO CLEAR TWR FRAMING BOLTS.
3. USE ITEM 7 IN OUTER 2'-0 OF FILL AREA – SEE FILL INSTALLATION

(1x6 T&G PARTITION)

GRID FILL SPACER DETAILS FOR A MODEL 6516-4-5 TOWER (18'-0 A.T.)

THE MARLEY COMPANY
KANSAS CITY, MISSOURI

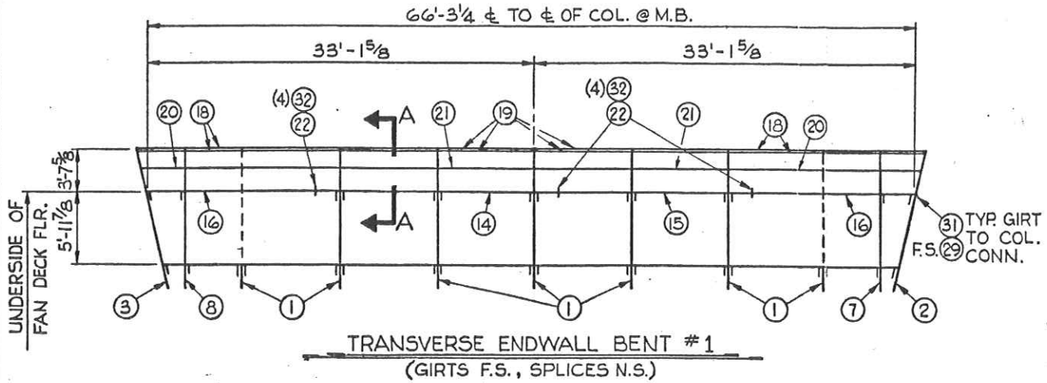
MASTER FILE NO

LTR.	DATE	REVISIONS	BY	CHECKED	C.M.

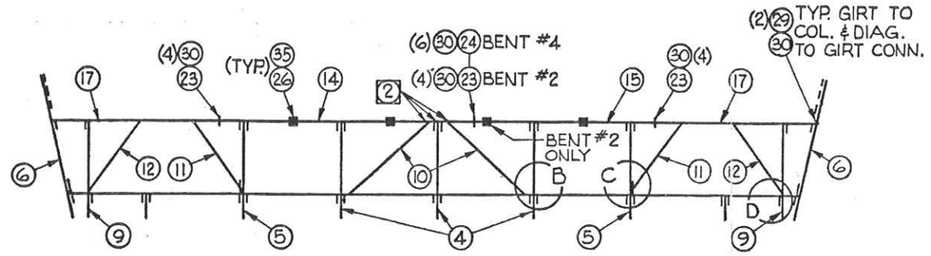
SCALE	DATE	DRAWN	ENGR.
NONE	11-8-78	THORNTON	MR

74-2280

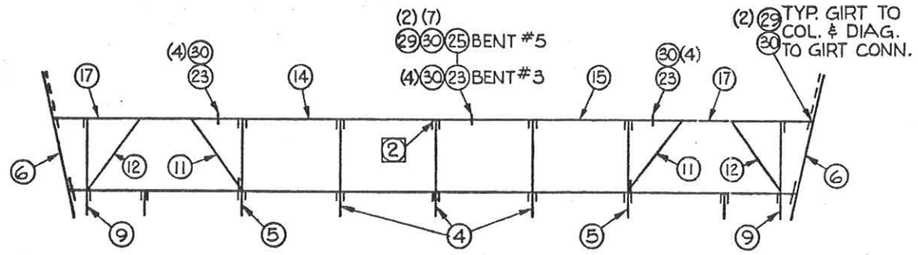
54-40



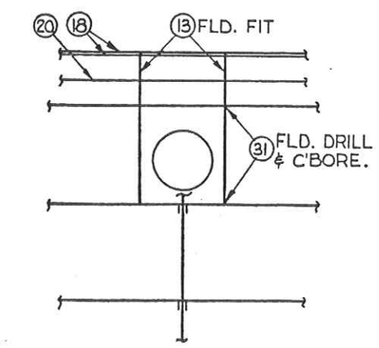
TRANSVERSE ENDWALL BENT #1
(GIRTS F.S., SPLICES N.S.)



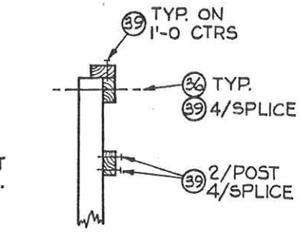
TRANSVERSE INTERIOR BENTS #2 & #4
(GIRTS N.S. & F.S.)



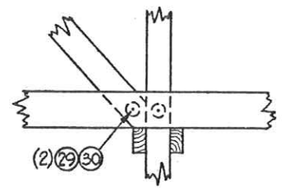
TRANSVERSE INTERIOR BENTS #3 & #5
(GIRTS N.S. & F.S.)



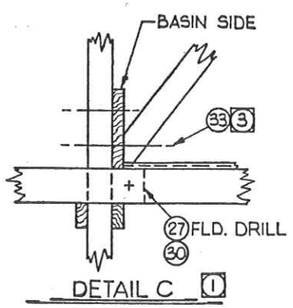
HANDRAIL SUPPORT @ INLET



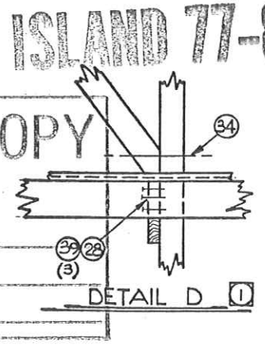
SECTION A-A



DETAIL B



DETAIL C [1]



DETAIL D [1]

ITEM	DESCRIPTION	PART NO.	QUAN.
1	COL. 4 x 4 x 18'-2⅞	8-449-101	14
2	COL. 4 x 4 x 14'-0	71-4844-2	2
3	COL. 4 x 4 x 14'-0	71-4844-3	2
4	COL. 4 x 4 x 14'-8⅝	3-4766-9	147
5	COL. 4 x 4 x 14'-8⅝	74-41744-25	98
6	COL. 4 x 4 x 14'-1½	71-4844-1	98
7	POST 4 x 4 x 15'-6	70-9924-36	2
8	POST 4 x 4 x 15'-6	70-9924-37	2
9	POST 4 x 4 x 11'-11¾	70-9924-39	98
10	DIAG. 4 x 4 x 9'-8 13/16	8-450-57	50
11	DIAG. 4 x 4 x 7'-1 13/16	5-9530-18	98
12	DIAG. 4 x 4 x 6'-11 15/16	4-474-1	98
13	4 x 4 x 10'-0		4
14	GIRT 2 x 6 x 19'-11¾	76-4479-1	100
15	GIRT 2 x 6 x 15'-11¾	76-4479-3	100
16	GIRT 2 x 6 x 15'-3½	70-9924-40	4
17	GIRT 2 x 6 x 15'-3½	79-1108-1	196
18	H.R. 2 x 4 x 18'-0 E.E.		8
19	H.R. 2 x 4 x 16'-0 E.E.		8
20	K.R. 2 x 4 x 18'-0		4
21	K.R. 2 x 4 x 16'-0		4
22	SPLICE BLK. 2 x 6 x 1'-6	8-451-9	6
23	SPLICE BLK. 4 x 6 x 1'-6	8-451-4	137
24	SUPPORT 4 x 6 x 6'-7	5-9530-24	5
25	SUPPORT 4 x 6 x 7'-7¾	5-9530-25	5
26	BLOCK 4 x 4 x 0'-3⅝	8-451-5	95
27	BLOCK 4 x 6 x 0'-6	4-474-3	98
28	BLOCK 2 x 4 x 0'-5½		98
29	CSTG. STR. CERAMIC RING	8-2423-1	1504
30	M.B. ½ x 7½		1373
31	M.B. ½ x 5½		28
32	M.B. ½ x 4		24
33	M.B. ⅜ x 10		98
34	M.B. ⅜ x 8		98
35	M.B. ⅜ x 7½		95
36	M.B. ⅜ x 6		24
37	WASHER, S.C. ½		2850
38	WASHER, S.C. ⅜		630
39	NAIL, 3½		512

GENERAL NOTES

1. [1] DIAG. MUST HAVE FULL BEARING AGAINST BASIN FLOOR & SIDE OR POST. FLD. CUT BASIN SEAL STRIP AS REQ'D.
2. [2] FOR GIRT TO COL. & DIAG. TO GIRT CONN. AT MECH. EQUIP. SUPP'TS., SEE MECH. EQUIP. INSTALL. DWG.
3. [3] REPLACES CORRESPONDING M.B. IN BASIN SIDE.
4. PLACE S.C. WASHER UNDER HEAD & NUT OF EACH M.B.
5. ALL BENTS ARE VIEWED FROM OUTSIDE OF TOWER.
6. SEE LONG. FAN DECK FRAMING DWG. FOR TRANS. FAN DECK BENT LOCATION.

5-16-79

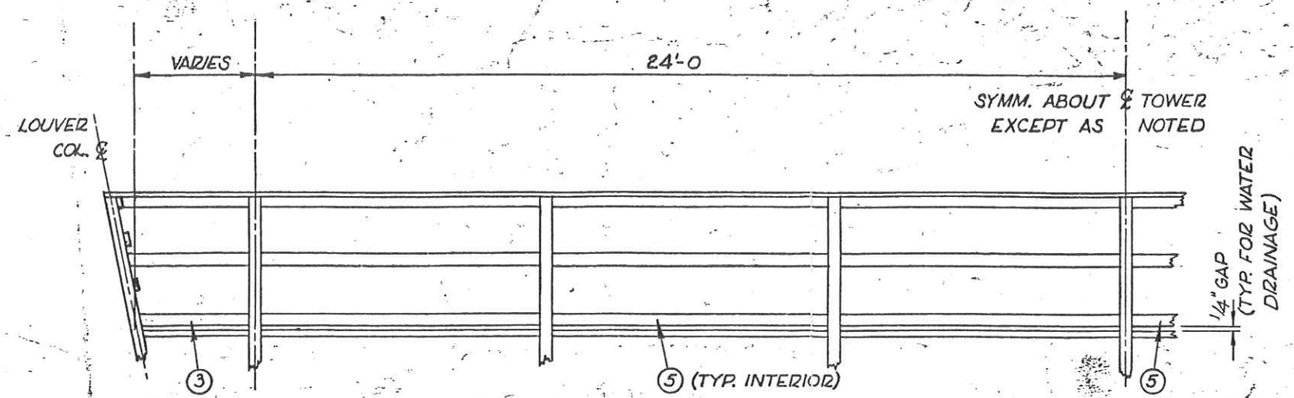
LTR.	DATE	REVISION	BY	CHKD

TRANSVERSE FAN DECK FRAMING FOR A 6516-4-05 TWR. W/ COVERED HOT WATER BASIN

SCALE	DATE	DRAWN	CHECKED	APPROVED	M. FILE NO
NONE	1-2-79	LITTLE			F. FILE NO
ORDER NUMBER		DRAWING NUMBER			REV.
12-117-78		79-3209			

THE MARLEY COOLING TOWER CO. MARLEY
MISSION, KANSAS 66202

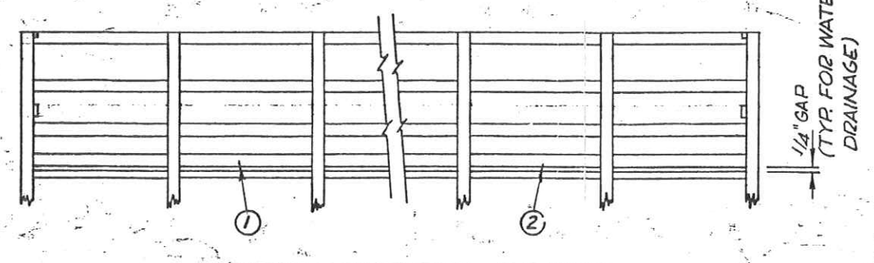
ITEM NO.	DESCRIPTION	PART NO.	QUAN.
1	2×4×A" TOEBOARD		
2	2×4×B" "		
3	2×4×C" "		
4	NAILS 3½		
5	2×4×16'-0 TOEBOARD		



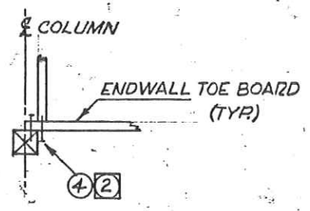
TYPICAL ENDWALL ELEVATION

CELL SIZE	A	B
20'-0	8'-0	12'-0
24'-0	12'-0	12'-0
28'-0	16'-0	12'-0
32'-0	16'-0	16'-0
36'-0	16'-0	20'-0
40-0	20'-0	20'-0
44'-0	16'-0(2)	12'-0

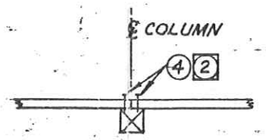
TWR. MODEL	-4	-5
	"C"	"C"
640	8'-0	10'-0
650	10'-0	12'-0
660	12'-0	14'-0
670	12'-0	14'-0



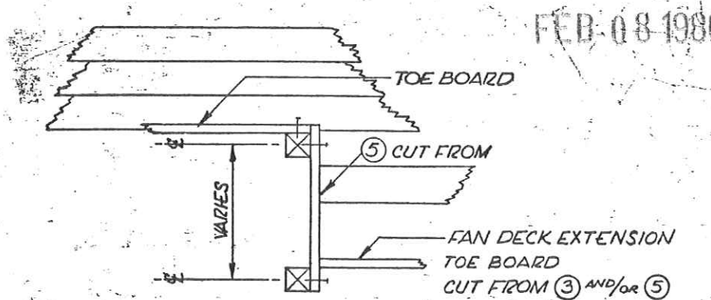
TYPICAL LONGITUDINAL ELEVATION



TYPICAL CORNER DETAIL



TYPICAL SPLICE DETAIL



TYPICAL PLAN OF TOE BOARD DETAIL @ ENDWALL FAN DECK EXTENSIONS

GENERAL NOTES

1. FIELD FIT TOE BOARDS AS REQUIRED.
2. NAIL TOE BOARDS WITH TWO NAILS PER COLUMN & FOUR NAILS PER SPLICE: (ITEM #4)
3. ALL SPLICES MUST OCCUR ON ℄ COLUMN.

54-37

LTR.	DATE	REVISIONS	BY	CHECKED	B.M.
C	8-9-78	ERR# 78-1388	BW		—
B	1-3-78	1/4"GAP W/ 5 3/8"	RCK	G.B.	—
A	6-7-76	ERR# 77-685	PB	GJ	—

FAN DECK TOEBOARD INSTALLATION FOR CLASS 600-4 & -5 TOWERS WITH COVERED H.W. BASIN

THE MARLEY COMPANY

MISSION, KANSAS 66202

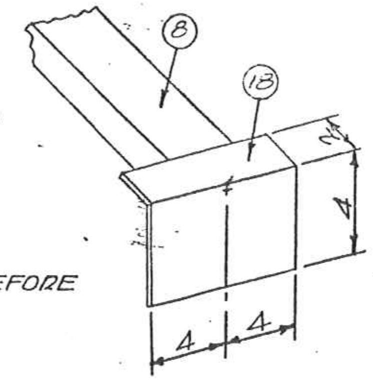
MASTER FILE NO | FOREIGN FILE NO

SCALE	DATE	DRAWN	CHECKED	APPROVED
NONE	9-7-72	J. FLOYD	RHR	LV

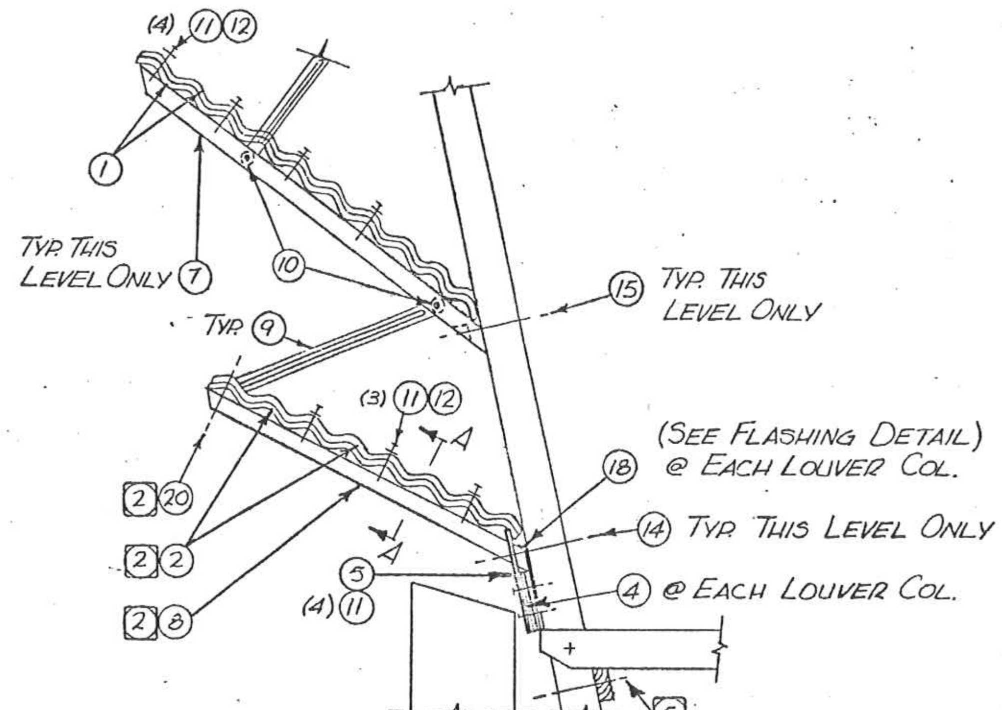
ITEM NO.	DESCRIPTION		PART NO.	TOTAL REQ'D.
1	ACB CORR. 3/8 x 42 x 4.2 x 4'-1 1/4		1-2424-3	
2	ACB CORR. 3/8 x 33 5/8 x 4.2 x 4'-1 1/4		1-2424-2	
3	BLOCK, SPACER 2 x 4 x 0'-6		8-451-103	
4	PLWD. 3/4 x 3 7/8 x 6 1/2			
5	SEAL, PLWD. 3/8 x 9 7/8 x 47 15/16		1-13-6	
6	DIAG. LOUVER 2 x 4 x 3'-9 1/8		5-4635-138	
7	DIAG. LOUVER 2 x 4 x 3'-9 1/8		5-4635-153	
8	DIAG. LOUVER 2 x 4 x 2'-11 13/16		8-451-113	
9	MOLDING PLASTIC LOUVER BAR		8-8104-2	
10	MOLDING PLASTIC LOUVER PIN		7-1188-1	
11	NAIL, 3" SCR. SHK.	S.S.		
12	W-12-S 1/8	S.S.		
13	M.B. 1/2 x 7			
14	M.B. 1/2 x 6 1/2			
15	M.B. 1/2 x 6			
16	WASH., S.C. 1/2 (2 REQ'D/M.B.)			
17	ENCLOSURE STRIP 3/4" WIDE		1-2441-7	
18	FLASHING, COPPER-16 oz. x 6 x 8		(6) 5-1697-2	
19	GUN CAULK	LBS.		
20	M.B. 1/2 x 3 1/2			

GRAND ISLAND 77-8

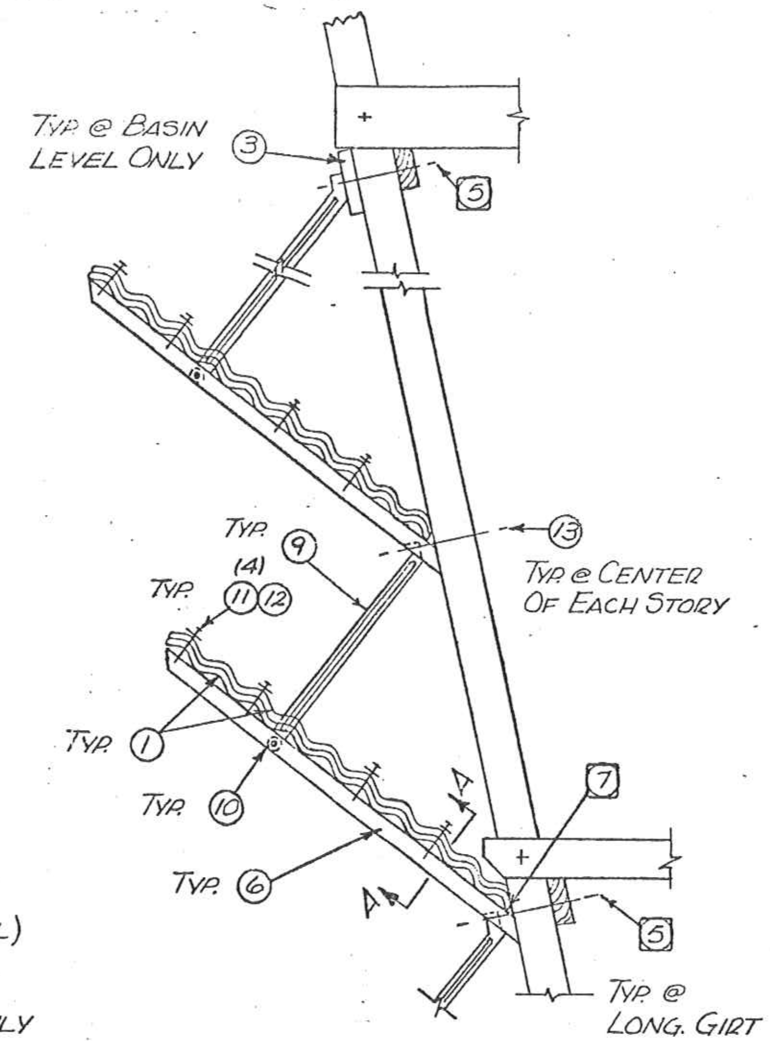
Note:
Copper Flashing Must Be Installed Before Bottom Louver Diag.



FLASHING DETAIL



TYP. DETAIL @ BOTTOM STORY



TYP. LOUVER DETAIL

(All Levels Except Bottom Story)

General Notes

1. Smooth side of ACB louver to be up.
2. Typ. @ all bottom louvers only.
3. Field drill. Use other end of louver as template. Typ. @ one endwall only. All levels.
4. Use item (17) @ each endwall. Bottom level only. See endwall louver seal dwg. for all other levels.
5. For this bolt, see long. bent dwg.
6. Flashing to be 24 GA. S.S. part 5-1697-1 when S.S. bolts are specified, see work order.
7. Field cut ACB louver neatly with minimum size notch to clear framing diagonal connector (typ.)

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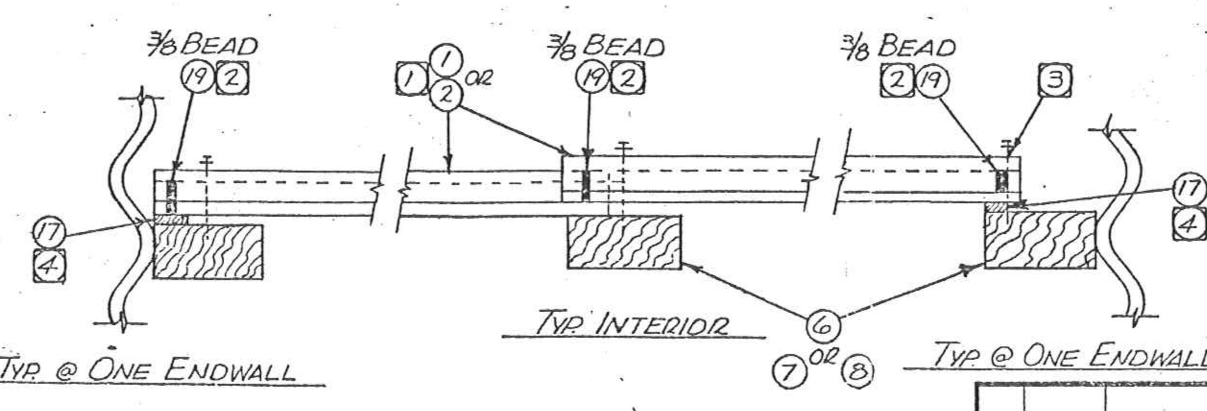
MECH ______
ELEC ______

FEB 08 1980

DO NOT USE ON CREOSOTE TREATED CONTRACTS



Typ. @ One Endwall | Typ. Interior | Typ. @ One Endwall

SECTION A-A

(2-9 Louver Slope Only)

CORRUGATED A.C.B. LOUVER ASSEMBLY
SERIES 600 -4 & -5 TOWERS

SCALE	DATE	DRAWN	CHECKED	APPROVED	M. FILE	F. FILE
NONE	11-24-70	N.E. WINNEY	RHR	L.V.	NO	NO

ORDER NUMBER | DRAWING NUMBER 71-392 | REV. G

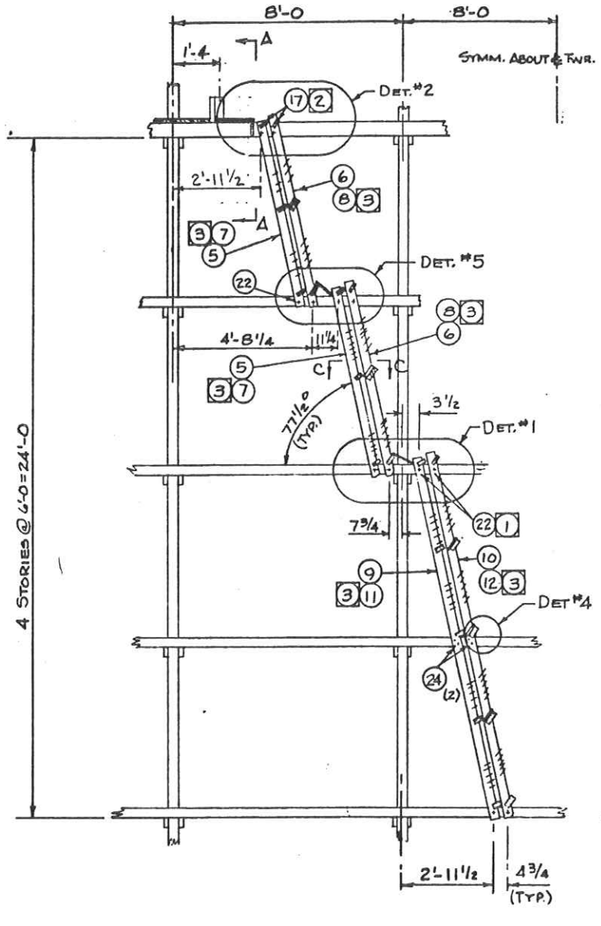
LTR.	DATE	REVISION	BY	CHKD
G	3-17-76	ERR# 76-376 (REDRAWN)	MS	CTR

THE MARLEY COOLING TOWER CO.
MISSION, KANSAS 66202

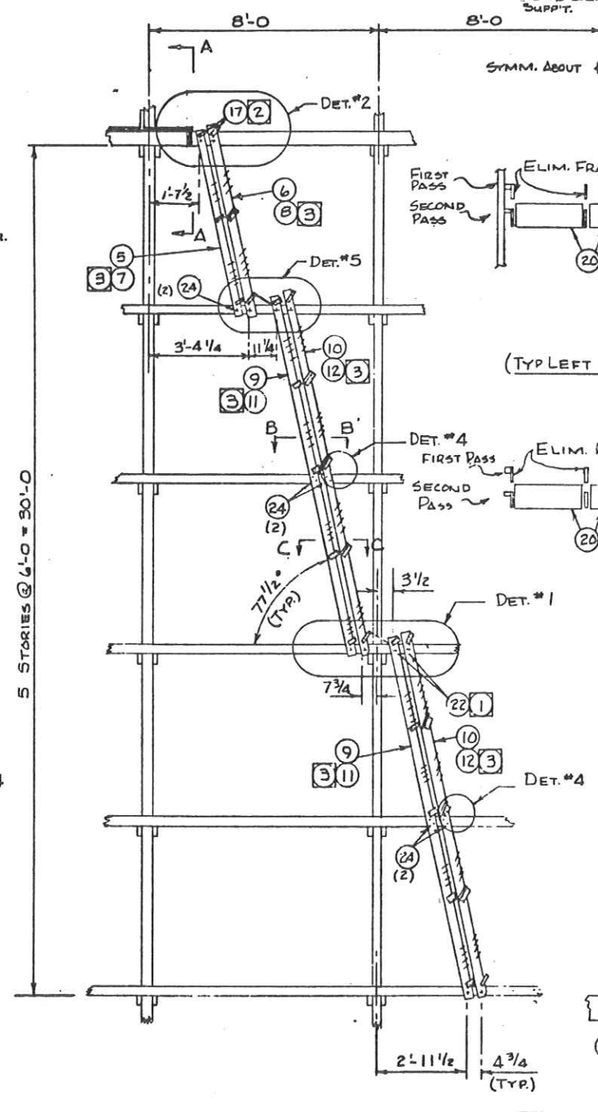
Drawing No. 71-392

54-35

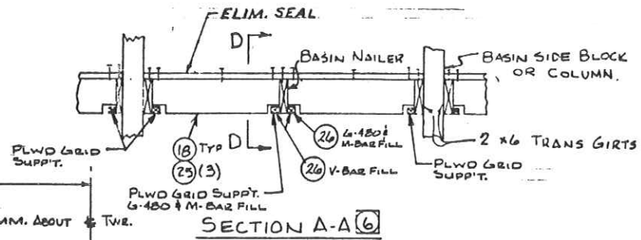
ITEM NO	DESCRIPTION	PART NUMBER	QUAN /TWR
1	PLWD. 3/8 x 5 x 14		
2	DELETED		
3	DELETED		
4	PLWD. 3/8 x 5 x 7		
5	ELIM. FRAME ASS'Y.	69-9408-2	
6		-1	
7		-4	
8		-3	
9		-6	
10		-5	
11		-8	
12		-7	
13	DELETED		
14			
15			
16	DELETED		
17	ELIM. BLADE STOP 1 1/2 x 2 3/4 NET x 3'-5 3/8	7-4132-18	
18	SEAL 1 x 6 x 1'-7 7/8	70-1796-2	
19	PLWD. 3/8 x 5 x 20 1/2		
20	PLWD. 3/8 x 5 x 14 3/4		
21	DELETED		
22	M.B. 3/8 x 4		
23	WASH., 3/8 S.C.		
24	NAIL, 3" SCREWSHANK		
25	NAIL 2		
26	PLWD., 1 1/8 x 1 1/4 x 0'-6		



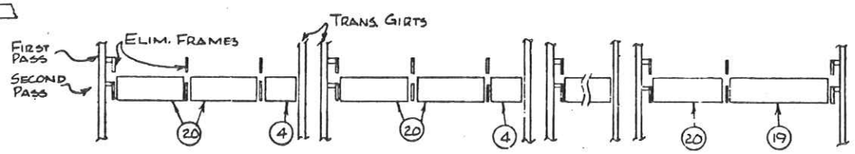
ELEVATION - SERIES 640 TOWER [5]



ELEVATION - SERIES 650 TOWER [5]



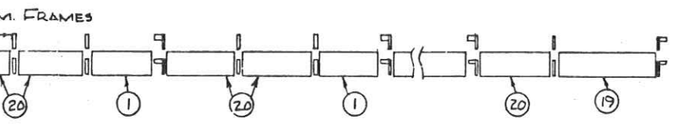
SECTION A-A [6]



SECTION B-B

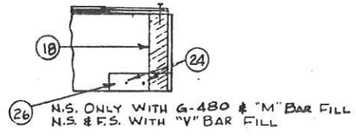
(TYP @ ALL 2 x 4 GIRT LEVELS EXCEPT 1ST & ALL OFFSETS)

(TYP LEFT ENDWALL) (TYP. INTERIOR BAY) (TYP. RIGHT ENDWALL)

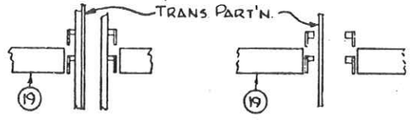


SECTION C-C

(TYP @ MIDDLE OF EACH STORY)



SECTION D-D [6]



(TYP @ 2 x 4 GIRTS) (TYP. @ MIDDLE OF STORY)

SEAL DETAILS @ THRU TRANS. PART'N. (WHEN REQ'D.)

GRAND ISLAND 77-8

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CHECKED BY:

CIVIL

MECH

GENERAL NOTES

1. TYPICAL PLYWOOD FRAME ASS'Y TO GIRT CONNECTION UNLESS NOTED.
2. TYPICAL AT THIS LEVEL ONLY.
3. USE SPECIAL FRAME ASS'Y. AT ONE ENDWALL & AT ALL THRU TRANS. PART'NS.
4. PLACE SCW (ITEM 23) UNDER HEAD & NUT OF EACH BOLT.
5. FOR NUMBERED DETAILS & TYP. INSTALLATION DETAILS, SEE ELIM. DET. DRAWING.
6. FIELD FIT SEALS AS REQ'D. @ TRANS PART'N.

54-34

(PER ECN-6644)

F	C	2-16-78	ERR # 79-239	RLF	MB	
	B	6-2-76	ERR # 77-667	PB	GW	—
	A	10-14-75	REVISED SECTION A-A	TL	[illegible]	—
	STR	DATE	REVISIONS	BY	CHECKED	APP'D

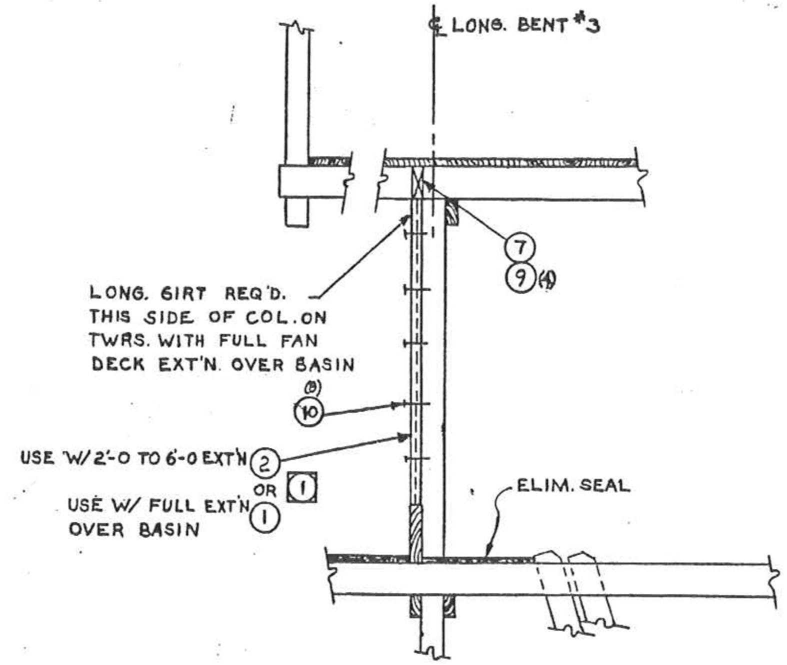
ELIMINATOR FRAME INSTALLATION FOR SERIES 640 & 650 -4 OR -5 TWR.

MASTER FILE No THE MARLEY COMPANY MISSION, KANSAS 66202 FOREIGN FILE No

SCALE	DATE	DRAWN	CHECKED	APPROVED
NONE	10-19-73	FLOYD	LLL	[illegible]

Drawing No. 69-9408-2

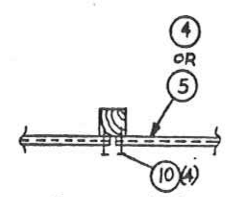
ITEM NO.	DESCRIPTION	PART NUMBER	QUAN.
1	PLYWOOD 3/4 x 46 x 48		
2	x 48 x 49 7/8		
3	x 38 1/8 x 47 3/4		
4	x 7 3/4 x 48		
5	PLYWOOD 3/4 x 11 1/4 x 48		
6	1 1/2 x 2 x 0'-8		
7	2 x 6 x 3'-5 3/8		
8	WASH., 1/4 S.C.		
9	NAIL, 3"		
10	NAIL, 2"		
11	MB. 1/4 x 2 1/2		
12	1 x 4 x 1'-3		



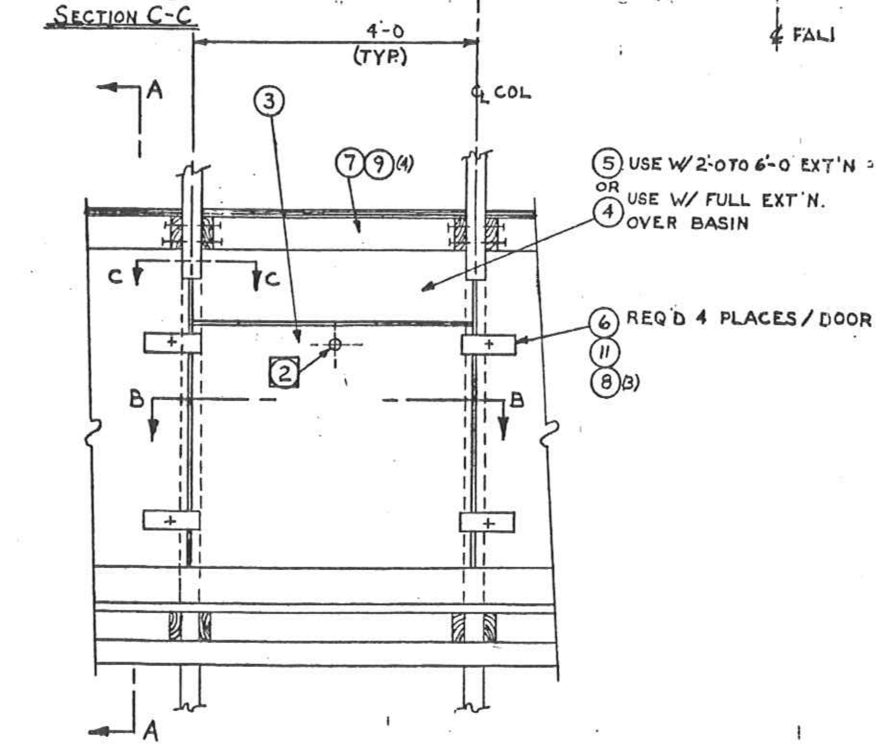
SECTION A-A

ALTERNATE LOCATION

WHEN FAN DECK LADDER IS LOCATED TO RIGHT OF FAN ℄, LOCATE ACCESS DOOR TO RIGHT OF FAN ℄. DIMENSIONS SHOWN ARE TYP.

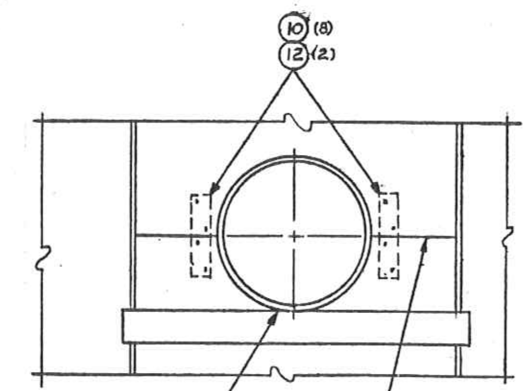


SECTION C-C



ELEVATION

ACCESS DOOR REQ'D @ SIDE OPP. MOTOR, EXCEPT ON TWRS. WITH FAN DECK EXTENDED OVER BASIN, THEN DOOR REQ'D BOTH SIDES.



TYP. DETAIL @ CROSSOVER PIPE

GRAND ISLAND 77-8

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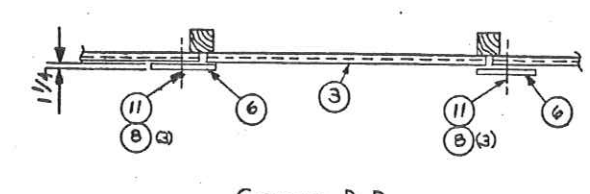
MECH ....

ELEC ....

GENERAL NOTES

1. FIELD TRIM PLWD. SHEETS IF REQ'D DUE TO ACCUMULATION OF TOLERANCES.
2. FIELD DRILL 1 1/4" DIA. HOLE AT TOP CENTER OF EACH ACCESS PANEL FOR REMOVAL.
3. INSTALL PLWD. WITH BEST SIDE OUT.



SECTION B-B

54-25

(PER ECN # 6644) (PLYWOOD)

(USE W/ SPIRAL TARGET NOZZLES ONLY) (BIG PACKAGE)

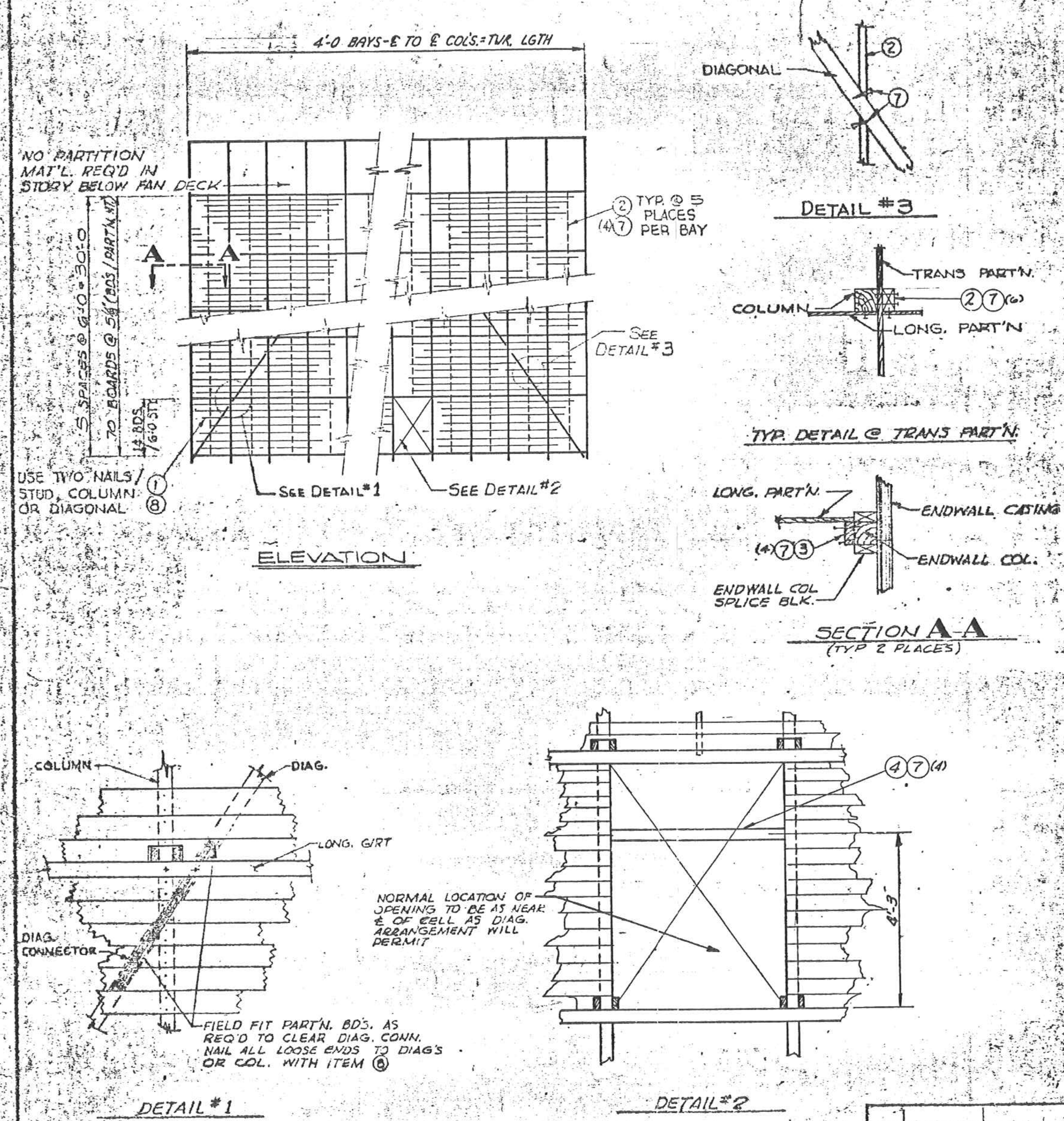
(F) D	12-16-76	ERR # 79-241	RLF	MMB
C	10-19-78	ERR # 78-1425	W	GT
B	6-2-76	ERR # 77-628	PE	GJ
A	11-10-75	ITEM 7 WAS 1 1/2 x 6 x 3'-5 3/4	GJ	

FAN DECK SIDE CASING INSTALL. MODELS 650, 660 & 670 D.F. W/ EXTENSIONS ON BOTH SIDES

SCALE	DATE	DRAWN	CHECKED	APPROVED
NONE	10-16-75	K BOESSEN	LLL	WES

M. FILE NO. / F. FILE NO. / ORDER NUMBER / DRAWING NUMBER / REV.

THE MARLEY COOLING TOWER CO. (MARLEY)



1	ROUGH	1 x 6 T&G REDWOOD	
2		2 x	
3		2 x	
4	H.R.	2 x 4 x 4'-11⅞	E.E.
5	DELETED		
6	DELETED		
7	NAILS	3½	
8	NAILS	3	

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78-3991

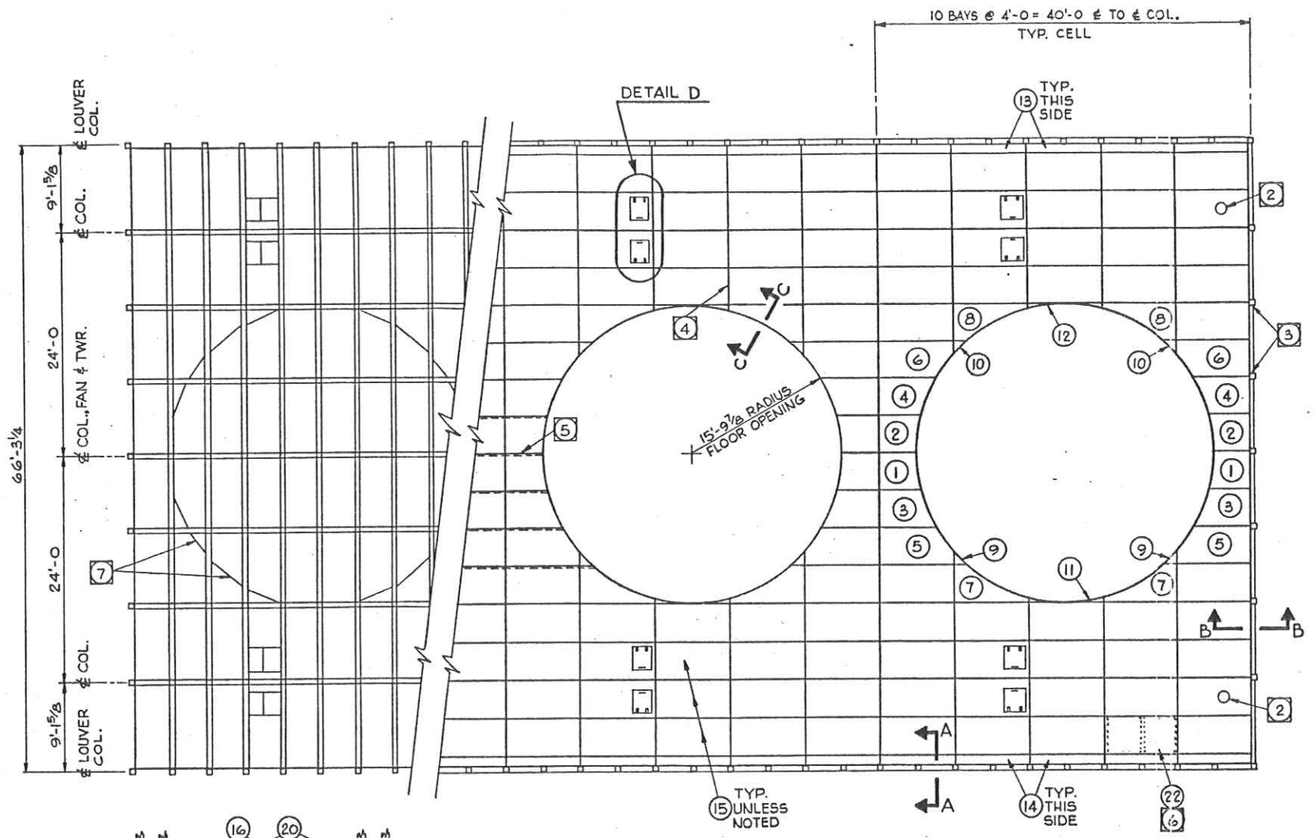
38

A	1-23-79	ERR # 79-573	DT	JF	—
LTR.	DATE	REVISIONS			

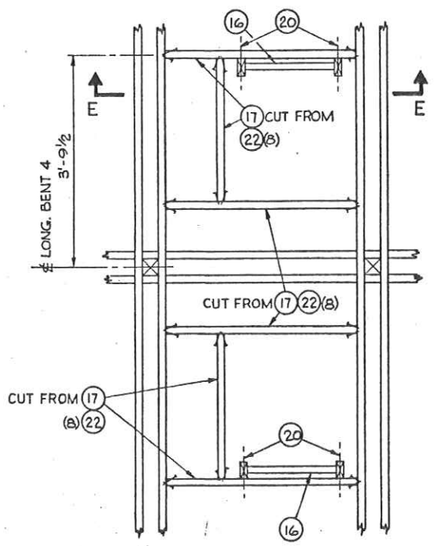
SPECIAL LONGITUDINAL PARTITION ...
CLASS 650

7-21-78 PEAK

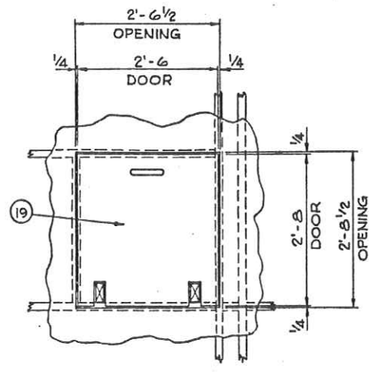
78-3991



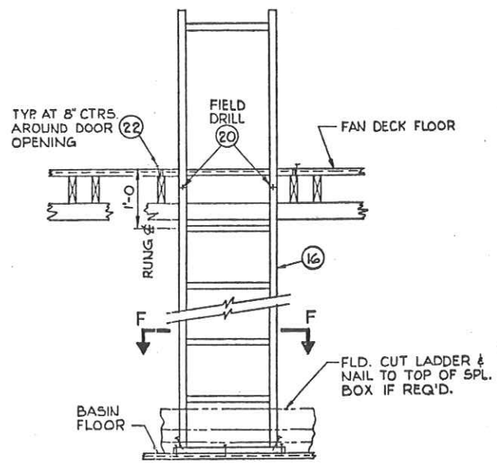
PLAN VIEW



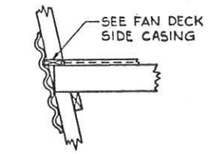
DETAIL D



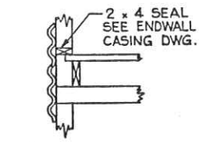
TYPICAL ACCESS DOOR INSTALL.



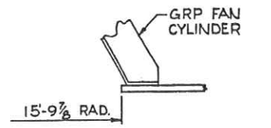
SECTION E-E



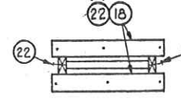
SECTION A-A



SECTION B-B



SECTION C-C



SECTION F-F

ITEM	DESCRIPTION	PART NO.	QUAN.
1	PLYWOOD T.& G. 1⅛ x 48 x 56 5/16	67-4749-1	10
2	PLYWOOD T.& G. 1⅛ x 48 x 56 5/16	67-4749-2	10
3	PLYWOOD T.& G. 1⅛ x 48 x 76 3/16	67-4749-3	10
4	PLYWOOD T.& G. 1⅛ x 48 x 76 3/16	67-4749-4	10
5	PLYWOOD T.& G. 1⅛ x 48 x 96	67-4749-5	10
6	PLYWOOD T.& G. 1⅛ x 48 x 96	67-4749-6	10
7	PLYWOOD T.& G. 1⅛ x 48 x 96	67-4749-7	10
8	PLYWOOD T.& G. 1⅛ x 48 x 96	67-4749-8	10
9	PLYWOOD T.O.E. 1⅛ x 20¼ x 20¼	67-4749-21	10
10	PLYWOOD G.O.E. 1⅛ x 20¼ x 20¼	67-4749-22	10
11	PLYWOOD T.O.E. 1⅛ x 8 5/16 x 96	67-4749-27	5
12	PLYWOOD G.O.E. 1⅛ x 8 5/16 x 96	67-4749-28	5
13	PLYWOOD T.O.E. 1⅛ x 12 x 96		25
14	PLYWOOD G.O.E. 1⅛ x 12 x 96		25
15	PLYWOOD T.& G. 1⅛ x 48 x 96		220
16	LADDER ASSEMBLY	75-1435-1	20
17	2 x 6 x 8'-0		30
18	2 x 4 x 2'-0		40
19	PLYWOOD 1⅛ x 30 x 32	75-1437-1	20
20	M.B. ⅜ x 6		40
21	WASHER S.C. ⅜		80
22	NAIL, 3"		11,300

GENERAL NOTES

1. USE ONE S.C.W. UNDER HEAD & NUT OF EACH M.B.
2. FIELD CUT CLEARANCE HOLES IN FAN DECK FOR STANDPIPES AT INLET & BULKHEAD.
3. FIELD NOTCH PLYWOOD SHEETS FOR ENDWALL COLS.
4. FAN DECK SHEETS TO BE STARTED AT FIRST JOINT ADJACENT TO FAN ℄ AND LAID LONGITUDINALLY TOWARD E.W. ℄ PART'N. BENT. IF DUE TO ACCUMULATED TOLERANCES, SHEET IS TO LONG, FIELD TRIM SHEET TO FIT AT PART'N. OR E.W. COL.
5. FAN DECK SHEETS TO BE STARTED AT ℄ FAN & LAID TRANSVERSELY TOWARD FAN DECK SIDE.
6. FAN DECK SHEETS TO BE NAILED TO TRANS. GIRTS & BRIDGING ON 8" CENTERS.
7. FOR BRIDGING DETAILS SEE DWG. 4-9113.

TOP PLAN DETAILS DETAILS FOR A 6516-4-05 D.F. TOWER WITH FULL EXTENDED FAN DECK

SCALE	DATE	DRAWN	CHECKED	APPROVED	M. FILE NO
NONE	12-6-78	LITTLE			F. FILE NO

ORDER NUMBER 12-117-78 | DRAWING NUMBER 79-4255 | REV.

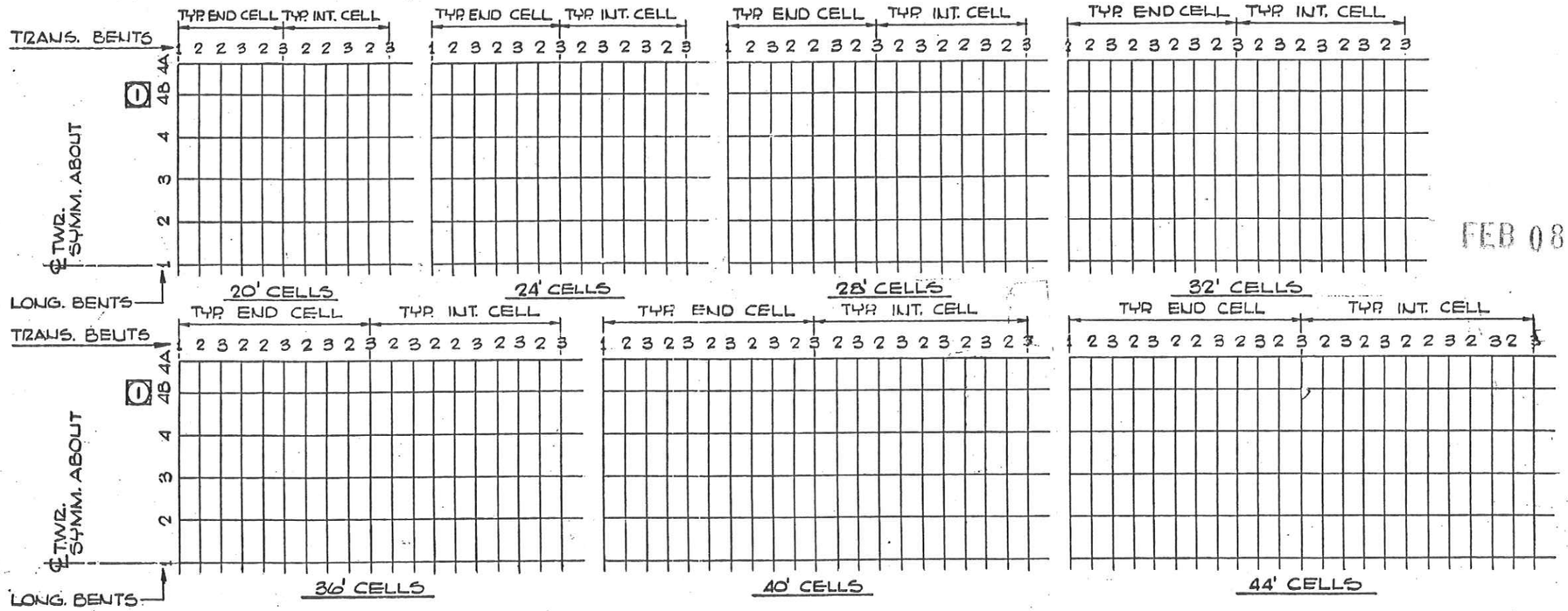
THE MARLEY COOLING TOWER CO. MARLEY
MISSION, KANSAS 66202

LTR.	DATE	REVISION	BY	CHKD.

Drawing No. 79-4255

LONGITUDINAL GIRT END ARRANGEMENT DIAGRAM

CELL SIZE \ NO. OF CELLS		2	3	4	5	6	7	8	9	10
20'-0 OR 36'-0	L.E.	10'	14'	14'	10'	10'	14'	14'	10'	10'
	R.E.	14'	14'	18'	10'	14'	14'	18'	10'	14'
24'-0 OR 40'-0	L.E.	14'	10'	14'	10'	14'	10'	14'	10'	14'
	R.E.	18'	14'	18'	14'	18'	14'	18'	14'	18'
28'-0 OR 44'-0	L.E.	10'	10'	14'	14'	10'	10'	14'	14'	10'
	R.E.	14'	10'	18'	14'	14'	10'	18'	14'	14'
32'-0	L.E.	14'	14'	14'	14'	14'	14'	14'	14'	14'
	R.E.	18'	18'	18'	18'	18'	18'	18'	18'	18'



BENT LOCATION PLANS

(FOR TRANS. & LONG. BENTS BELOW DIST. BASIN LEVEL)

GENERAL NOTES

1. BENT # 4B NOT REQ'D. ON SERIES 650-4 TWRS.
2. SEE CONCRETE BASIN DWG. FOR ORIENTATION OF ANCHORED TRANSVERSE BENTS.

LTR.	DATE	REVISIONS	BY	CHECKED	E.M.
F					
C	10-2-75	MADE FOR 650, 660 & 670 TWRS ONLY	G.J	ROT	—
B	12-20-74	REV. NO. OF BRACED BENTS MODEL 674	RC		—
A	9-13-72	REV. NO. OF BRACED BENTS MODEL 674	KEC		—

LONGITUDINAL GIRT ARRANGEMENT DIAGRAM AND BENT LOCATION PLANS FOR SERIES 650, 660, & 670 -4 & -5 D.F. TWRS.

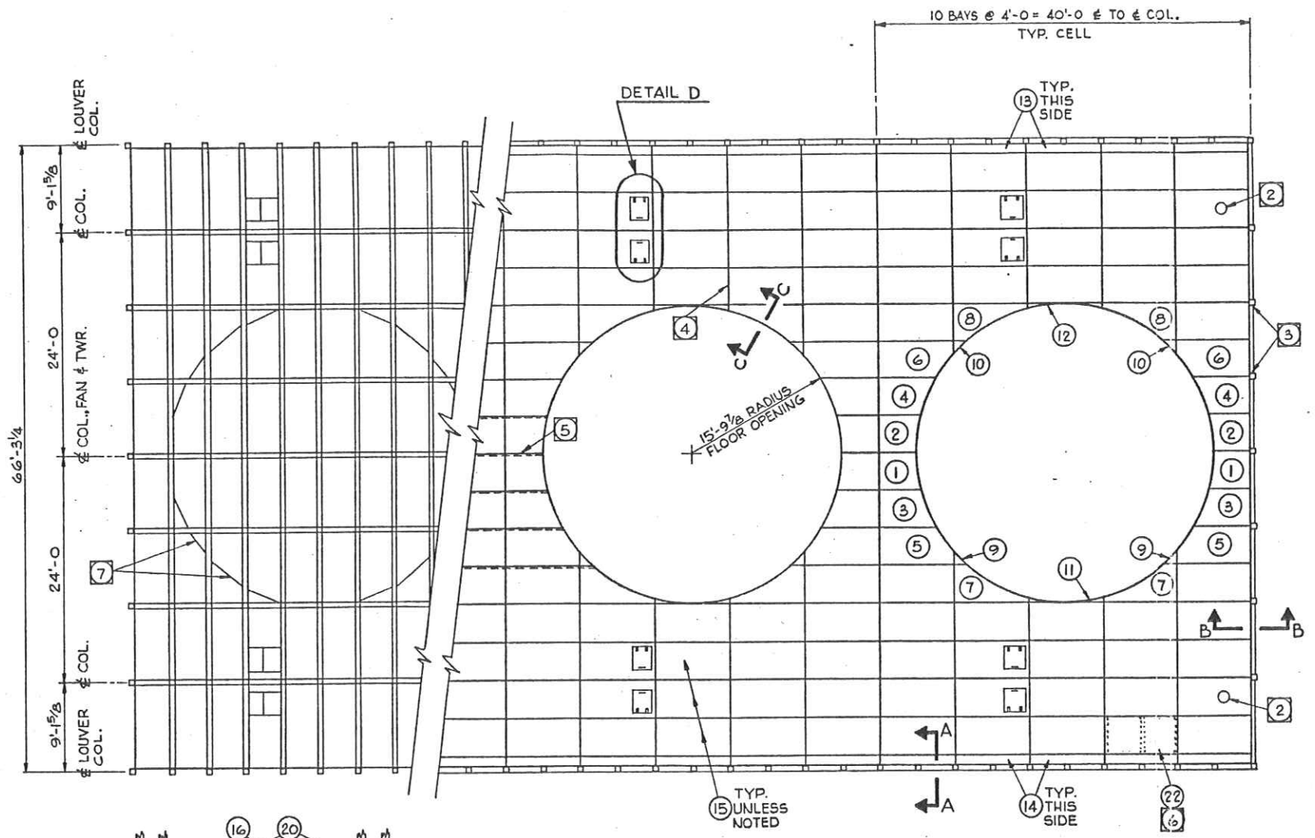
THE MARLEY COMPANY
KANSAS CITY, MISSOURI

MASTER FILE NO | FOREIGN FILE NO

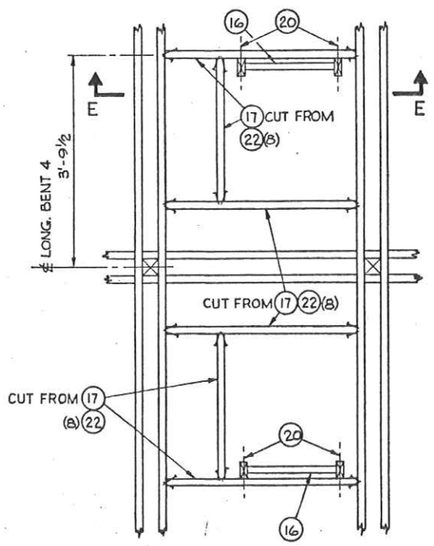
SCALE	DATE	DRAWN	CHECKED	APPROVED
NONE	3-3-71	TAVIS	MG	GV

54-18-75

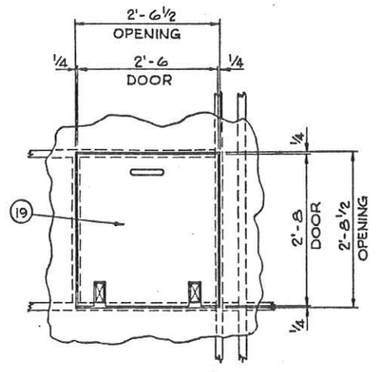
Drawing No. 71-3408



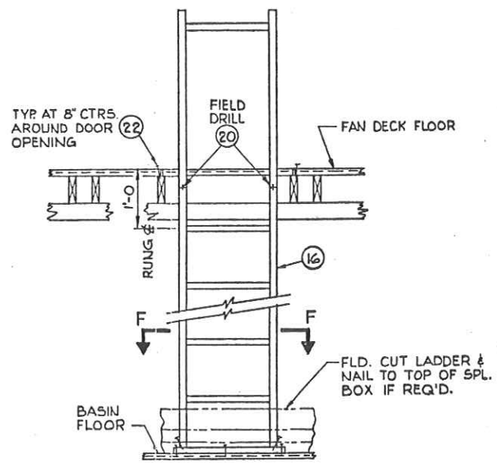
PLAN VIEW



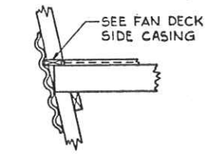
DETAIL D



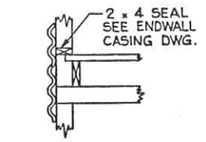
TYPICAL ACCESS DOOR INSTALL.



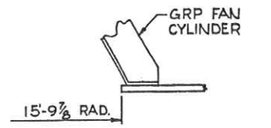
SECTION E-E



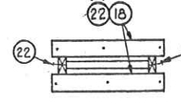
SECTION A-A



SECTION B-B



SECTION C-C



SECTION F-F

ITEM	DESCRIPTION	PART NO.	QUAN.
1	PLYWOOD T.& G. 1⅛ x 48 x 56 5/16	67-4749-1	10
2	PLYWOOD T.& G. 1⅛ x 48 x 56 5/16	67-4749-2	10
3	PLYWOOD T.& G. 1⅛ x 48 x 76 3/16	67-4749-3	10
4	PLYWOOD T.& G. 1⅛ x 48 x 76 3/16	67-4749-4	10
5	PLYWOOD T.& G. 1⅛ x 48 x 96	67-4749-5	10
6	PLYWOOD T.& G. 1⅛ x 48 x 96	67-4749-6	10
7	PLYWOOD T.& G. 1⅛ x 48 x 96	67-4749-7	10
8	PLYWOOD T.& G. 1⅛ x 48 x 96	67-4749-8	10
9	PLYWOOD T.O.E. 1⅛ x 20¼ x 20¼	67-4749-21	10
10	PLYWOOD G.O.E. 1⅛ x 20¼ x 20¼	67-4749-22	10
11	PLYWOOD T.O.E. 1⅛ x 8 5/16 x 96	67-4749-27	5
12	PLYWOOD G.O.E. 1⅛ x 8 5/16 x 96	67-4749-28	5
13	PLYWOOD T.O.E. 1⅛ x 12 x 96		25
14	PLYWOOD G.O.E. 1⅛ x 12 x 96		25
15	PLYWOOD T.& G. 1⅛ x 48 x 96		220
16	LADDER ASSEMBLY	75-1435-1	20
17	2 x 6 x 8'-0		30
18	2 x 4 x 2'-0		40
19	PLYWOOD 1⅛ x 30 x 32	75-1437-1	20
20	M.B. ⅜ x 6		40
21	WASHER S.C. ⅜		80
22	NAIL, 3"		11,300

GENERAL NOTES

1. USE ONE S.C.W. UNDER HEAD & NUT OF EACH M.B.
2. FIELD CUT CLEARANCE HOLES IN FAN DECK FOR STANDPIPES AT INLET & BULKHEAD.
3. FIELD NOTCH PLYWOOD SHEETS FOR ENDWALL COLS.
4. FAN DECK SHEETS TO BE STARTED AT FIRST JOINT ADJACENT TO FAN ℄ AND LAID LONGITUDINALLY TOWARD E.W. ℄ PART'N. BENT. IF DUE TO ACCUMULATED TOLERANCES, SHEET IS TO LONG, FIELD TRIM SHEET TO FIT AT PART'N. OR E.W. COL.
5. FAN DECK SHEETS TO BE STARTED AT ℄ FAN & LAID TRANSVERSELY TOWARD FAN DECK SIDE.
6. FAN DECK SHEETS TO BE NAILED TO TRANS. GIRTS & BRIDGING ON 8" CENTERS.
7. FOR BRIDGING DETAILS SEE DWG. 4-9113.

TOP PLAN DETAILS DETAILS FOR A 6516-4-05 D.F. TOWER WITH FULL EXTENDED FAN DECK

SCALE	DATE	DRAWN	CHECKED	APPROVED	M. FILE NO
NONE	12-6-78	LITTLE			F. FILE NO

ORDER NUMBER 12-117-78 | DRAWING NUMBER 79-4255 | REV.

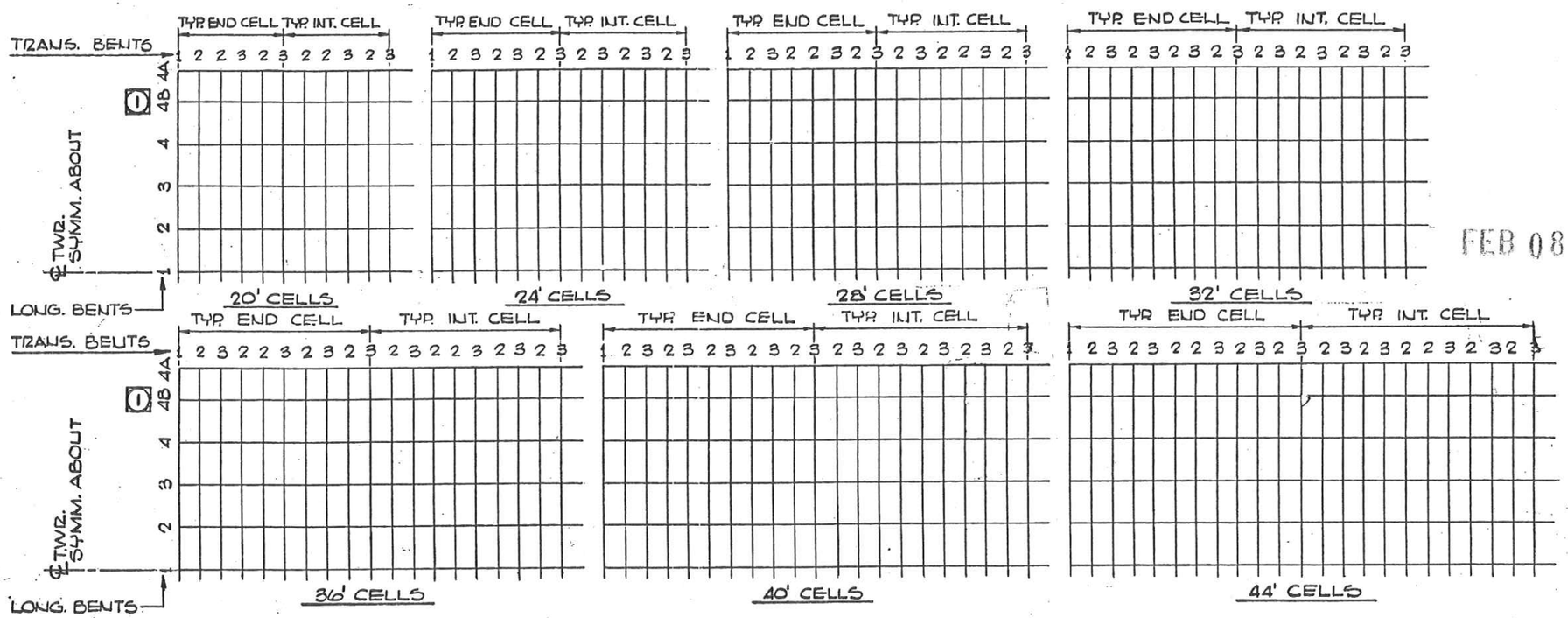
THE MARLEY COOLING TOWER CO. MARLEY
MISSION, KANSAS 66202

LTR.	DATE	REVISION	BY	CHKD.

Drawing No. 79-4255

LONGITUDINAL GIRT END ARRANGEMENT DIAGRAM

CELL SIZE \ NO. OF CELLS		2	3	4	5	6	7	8	9	10
20'-0 OR 36'-0	L.E.	10'	14'	14'	10'	10'	14'	14'	10'	10'
	R.E.	14'	14'	18'	10'	14'	14'	18'	10'	14'
24'-0 OR 40'-0	L.E.	14'	10'	14'	10'	14'	10'	14'	10'	14'
	R.E.	18'	14'	18'	14'	18'	14'	18'	14'	18'
28'-0 OR 44'-0	L.E.	10'	10'	14'	14'	10'	10'	14'	14'	10'
	R.E.	14'	10'	18'	14'	14'	10'	18'	14'	14'
32'-0	L.E.	14'	14'	14'	14'	14'	14'	14'	14'	14'
	R.E.	18'	18'	18'	18'	18'	18'	18'	18'	18'



BENT LOCATION PLANS

(FOR TRANS. & LONG. BENTS BELOW DIST. BASIN LEVEL)

GENERAL NOTES

1. BENT # 4B NOT REQ'D. ON SERIES 650-4 TWRS.
2. SEE CONCRETE BASIN DWG. FOR ORIENTATION OF ANCHORED TRANSVERSE BENTS.

LTR.	DATE	REVISIONS	BY	CHECKED	E.M.
F C	10-2-75	MADE FOR 650, 660 & 670 TWRS ONLY	G.J	ROT	—
B	12-20-74	REV. NO. OF BRACED BENTS MODEL 674	RC		—
A	9-13-72	REV. NO. OF BRACED BENTS MODEL 674	KEC		—

LONGITUDINAL GIRT ARRANGEMENT DIAGRAM AND BENT LOCATION PLANS FOR SERIES 650, 660, & 670 -4 & -5 D.F. TWRS.

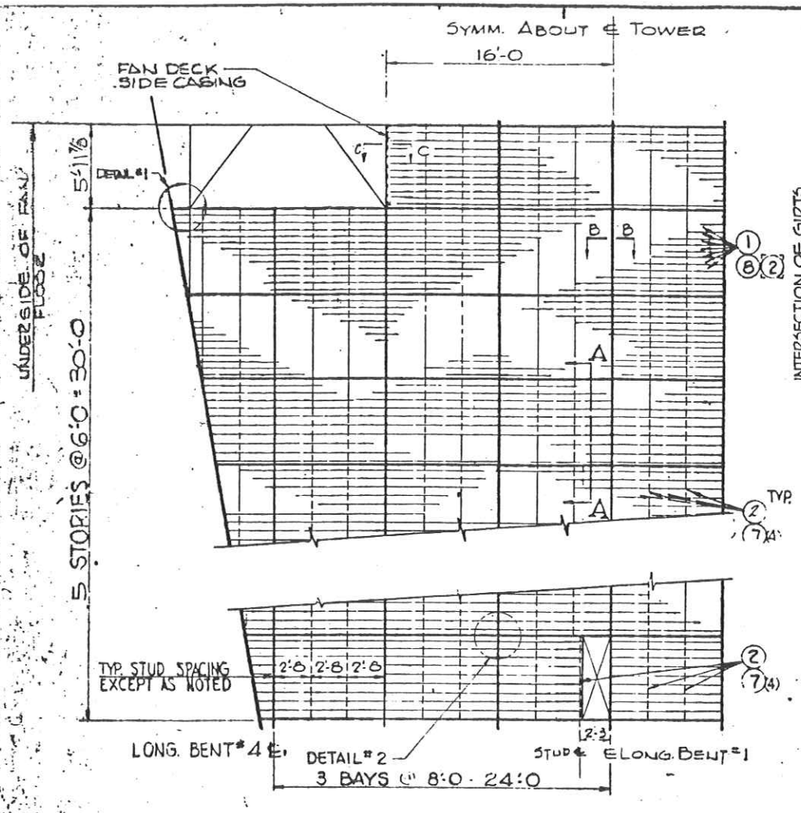
THE MARLEY COMPANY
KANSAS CITY, MISSOURI

MASTER FILE NO | FOREIGN FILE NO

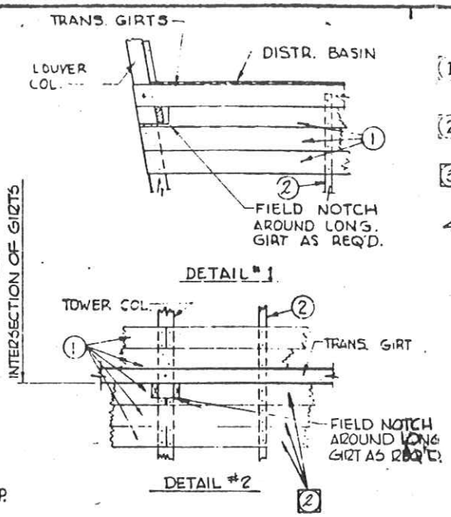
SCALE	DATE	DRAWN	CHECKED	APPROVED
NONE	3-3-71	TAVIS	MG	GV

54-18-75

Drawing No. 71-3408



TRANSVERSE PARTITION CLASS 600-4 DOUBLE FLOW TOWERS



GENERAL NOTES

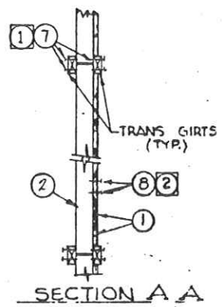
(1) NAIL EACH PARTITION STUD (ITEM (2)) TO GIRTS WITH FOUR 3½ NAILS (ITEM (7))

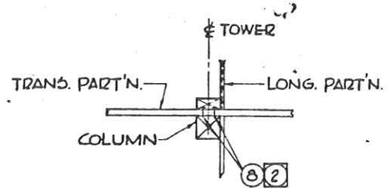
(2) USE TWO 3 NAILS (ITEM (8)) PER BOARD @ EACH COLUMN OR PARTITION STUD.

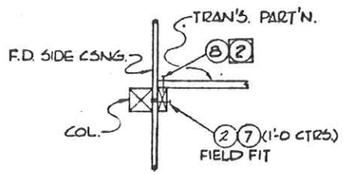
(3) DELETED

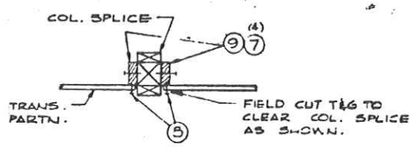
4. FOR ACCESS DOOR INSTALLATION, SEE DWG. # 7-4924 LOCATE DOOR ON ONE SIDE OF TWR ℄ ONLY. SEE SCHEMATIC FOR EXACT ORIENTATION. FIELD CUT T&G AND NAIL TO DOOR AS REQUIRED.

ITEM NO.	DESCRIPTION		PART NUMBER	QUAN./PARTN
1	RGH. 1x6x LIN. FT. T&G	REDWOOD		4402
2	STUD 2x4x 6'-0			82
3	DELETED			—
4	DELETE			—
5	DELETE			—
6	DELETE			—
7	NAILS 3½			456
8	NAILS 3			4700
9	2·4·2'-0			32





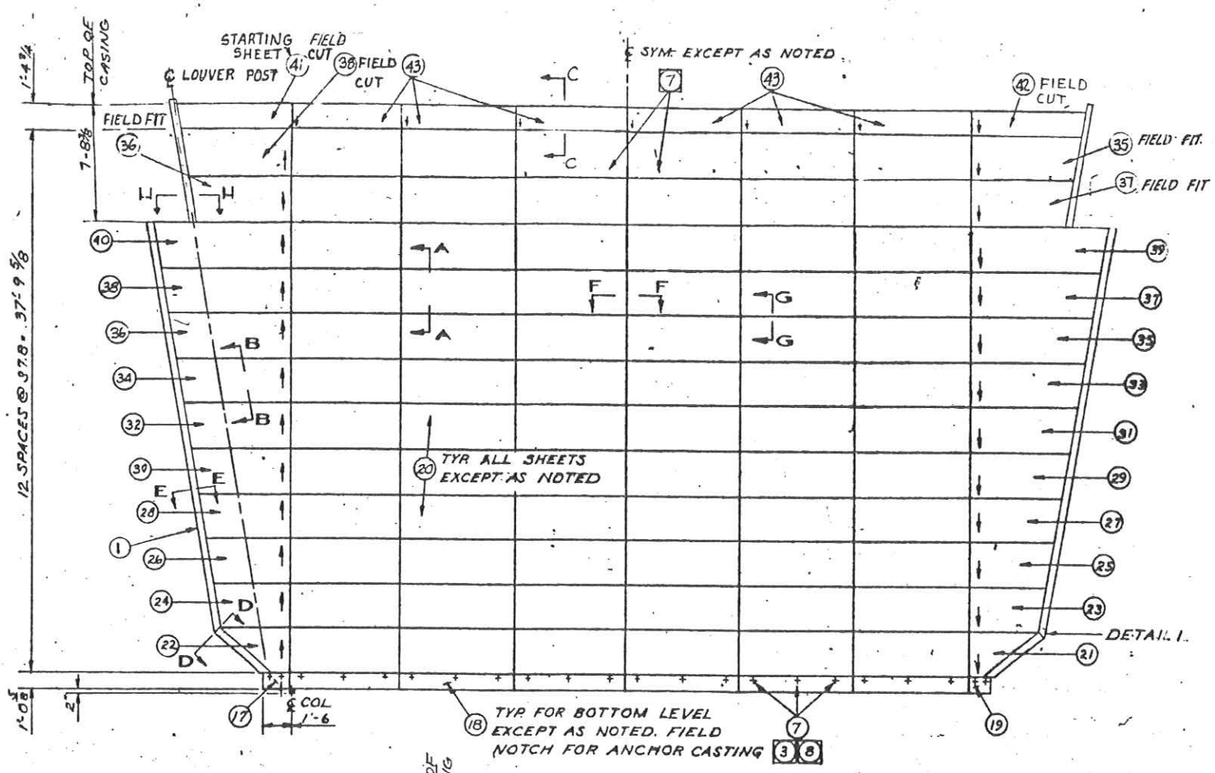




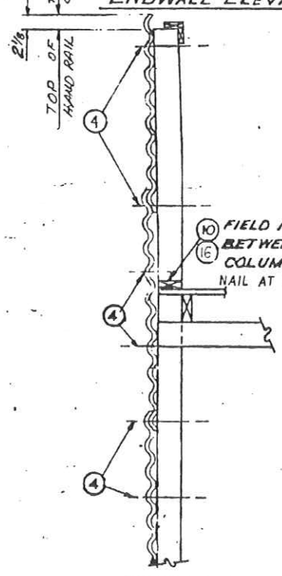
TYPICAL PLAN VIEW OF DETAIL AT COLUMN SPLICE

INC T&G TRANSVERSE PART'N. FOR A 650-4 D.F. TWR.

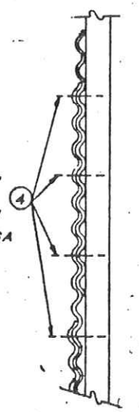
THE MARLEY COMPANY
KANSAS CITY, MISSOURI



ENDWALL ELEVATION

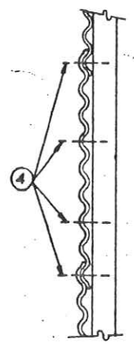


SECTION C-C



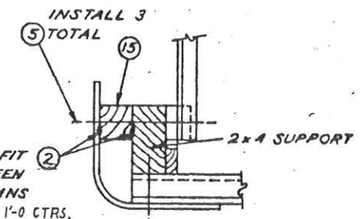
SECTION A-A

LOCATE ℄ LAP JOINT ON CREST OF 4TH & 7TH CORRUGATION.

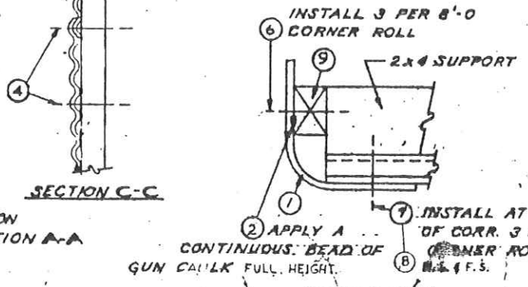


SECTION B-B

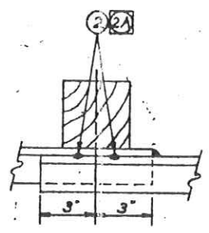
HEX SCREW INSTALLATION DETAILS SAME AS SECTION A-A



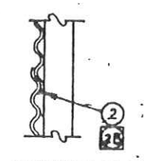
SECTION D-D



SECTION E-E



SECTION F-F



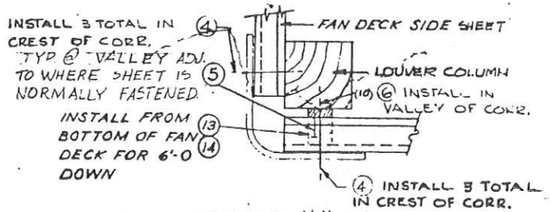
SECTION G-G

GENERAL NOTES:

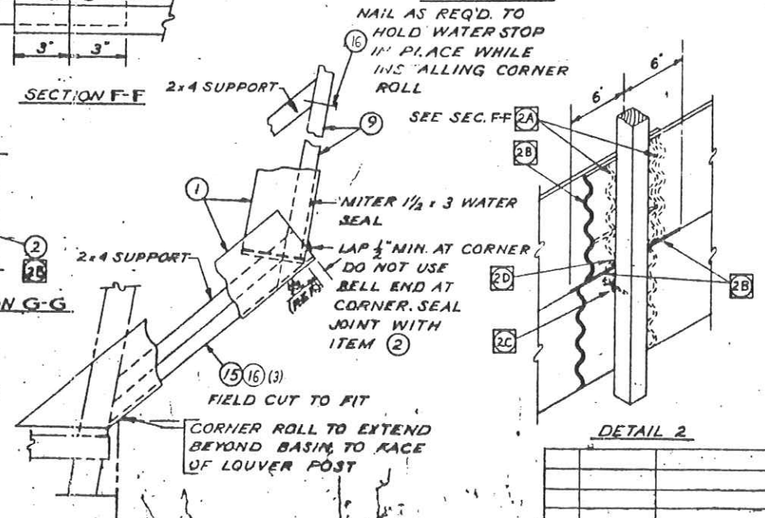
1. INSTALL SHEETS FROM UPPER LEFT HAND CORNER OF FAN DECK. ARROW INDICATED DIRECTION OF CUT CORNER (UP OR DOWN)
2. INSTALL GUN CAULK AS FOLLOWS: (SEE DETAIL #2)
   - (A) 3/8" DIAMETER BEAD (WITH GUN) TWO PLACES AT END OVERLAP JOINT. ONE EACH SIDE OF FASTNER.
   - (B) 3/8" DIAMETER BEAD AT EXPOSED EDGES OF ALL VERTICAL JOINTS AND 6" ON EACH SIDE OF COLUMN CENTERLINE AND AT EACH HORIZONTAL JOINT ON INSIDE OF CASING.
   - (C) AROUND SHANK OF HEX SCREW ON INSIDE OF CASING.
   - (D) LIBERALLY WHERE CUT CORNERS BUTT TOGETHER.
3. THESE MACHINE BOLTS TO BE INSTALLED WITH NUT ON OUTSIDE OF TOWER. USE ONE STANDARD CUT WASHER UNDER HEAD AND ONE NEOPRENE COATED WASHER UNDER NUT OF BOLT.
4. 305 S.S TYPE A INDENTED HEX HD ASSEMBLED W/.729 O.D. x 20GA. HVY. NEOP. SS. 302 WASHER.
5. DELETED.
6. DELETED
7. OMIT THESE TWO PANELS ON TOWERS WITH FAN DECK EXTENSIONS.
8. INSTALL MACHINE BOLTS PRIOR TO INSTALLATION OF UPPER ADJACENT SHEETS.
9. ON 316 SS HDW. CONTRACTS REPLACE THIS ITEM WITH ¼ LAG BOLT & ¼ WRS.

CAUTION

WATERTIGHTNESS OF THIS CASING DEPENDS ENTIRELY UPON PROPER INSTALLATION OF GUN CAULK AT TIME OF CONSTRUCTION. SEE NOTE 2.



SECTION H-H



DETAIL 2

DETAIL 1

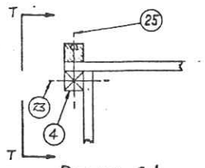
ITEM NO.	DESCRIPTION		PART NUMBER	QUANT
1	CORNER ROLL ACB 6 3/4 x 6 3/4 x 8'-0		BELL END	24
2	GUN CAULK	LBS		180
3	DELETED			—
4	HEX SCREW #14 x 4	(9)(4) S.S.		754
5	HEX SCREW #14 x 3	(9)(4) S.S.		32
6	HEX SCREW #14 x 1 1/2	(9)(4) S.S.		102
7	M.B. 1/2 x 2	S.S.		116
8	WASHER, WRS 1/4	S.S.		188
9	1½ x 3 x 8'-0			20
10	2 x 4 x 8'-0			18
11	DELETED			—
12	WASHER ¼ SC	S.S.		44
13	CLOSURE STRIP ETHAFOAM		1-2441-10	12
14	NAILS 1 1/2			24
15	1½ x 2 x 3'-0			4
16	NAILS 3			196
	THE FOLLOWING TO BE 3/8 x 4.2 ACB CORR			—
17	12 5/8 x 1'-9	TYPE B		2
18	12 5/8 x 8'-6	TYPE B		12
19	12 5/8 x 1'-9	TYPE A		2
20	42 x 8'-6	TYPE C		144
21	42 x 4'-8		71-426-16	2
22	42 x 4'-8		71-426-15	2
23	42 x 5'-4 5/8		71-426-13	2
24	42 x 5'-4 5/8		71-426-28	2
25	42 x 6'-1		71-426-12	2
26	42 x 6'-1		71-426-27	2
27	42 x 6'-9 3/8		71-426-11	2
28	42 x 6'-9 3/8		71-426-26	2
29	42 x 7'-5 3/4		71-426-10	2
30	42 x 7'-5 3/4		71-426-25	2
31	42 x 8'-2 1/8		71-426-9	2
32	42 x 8'-2 1/8		71-426-24	2
33	42 x 8'-10 1/2		71-426-8	2
34	42 x 8'-10 1/2		71-426-23	2
35	42 x 9'-6 7/8		71-426-7	4
36	42 x 9'-6 7/8		71-426-22	4
37	42 x 10'-3 1/4		71-426-6	4
38	42 x 10'-3 1/4		71-426-21	2
39	42 x 10'-11 5/8		71-426-5	2
40	42 x 10'-11 5/8		71-426-20	2
41	21 x 10'-7 3/8	TYPE A		2
42	21 x 10'-7 3/8	TYPE B		2
43	21 x 8'-6	TYPE B		12

ACB CASING TO TOP OF HAND RAIL - COVERED HOT WATER BASIN -

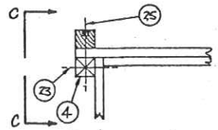
ACB-CORRUGATED ENDWALL CASING ASSEMBLY FOR SERIES 650-4 DOUBLE FLOW TOWER - 18' A.T. - (2) 3 SLOPE

THE MARLEY COMPANY

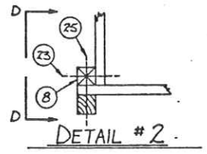
MASTER FILE NO KANSAS CITY, MISSOURI



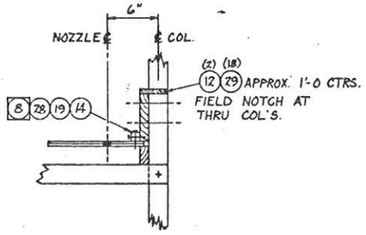
DETAIL # 1
(600-3,-0 ONLY)



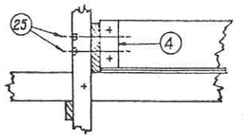
DETAIL # 1
(600-4,-5 ONLY)



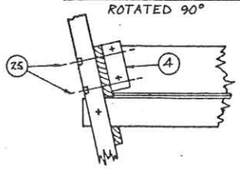
DETAIL # 2



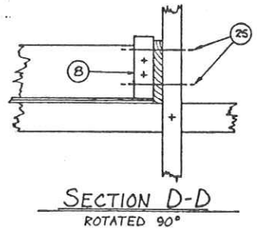
SECTION E-E



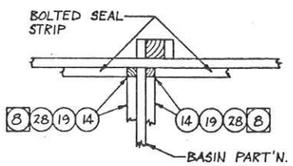
SECTION T-T
ROTATED 90°



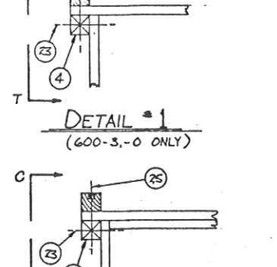
SECTION C-C
ROTATED 90°



SECTION D-D
ROTATED 90°



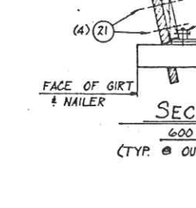
VIEW L-L



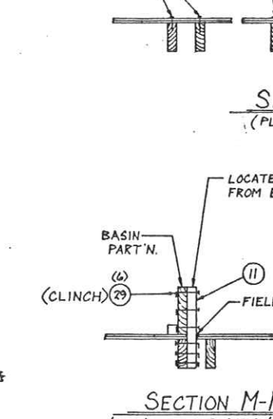
SECTION F-F
(600-4,-5 ONLY)

SECTION F-F
(600-3,-0 ONLY)

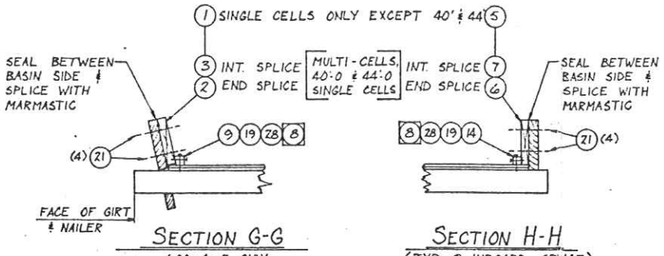
BOLTED SEAL STRIP [5] INSTALL DETAILS



SECTION P-P
(PLYWOOD BASIN ONLY WHERE COL. OR POST PASSES THRU BASIN FLOOR)

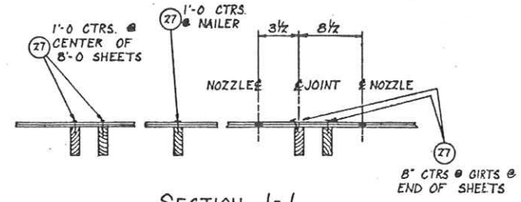


VIEW R-R

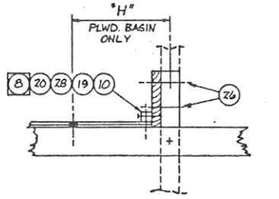


SECTION G-G
600-4,-5 ONLY
(TYP. @ OUTBOARD SPLICE)

SECTION H-H
(TYP. @ INBOARD SPLICE)
(ALL MODELS)



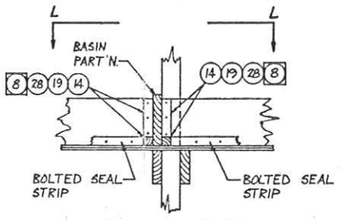
SECTION J-J
(PLYWOOD BASINS ONLY)



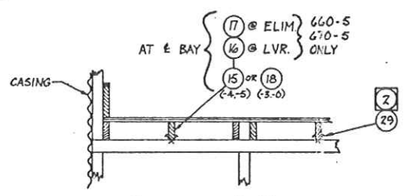
SECTION K-K

TOWER SERIES	"H"
670-4,-5	2'-3⅝
660-4,-5	
650-4,-5	9¼
640-4,-5	
670-3,-0	2'-9¼
660-3,-0	1'-9¼
650-3,-0	9¼
640-3,-0	

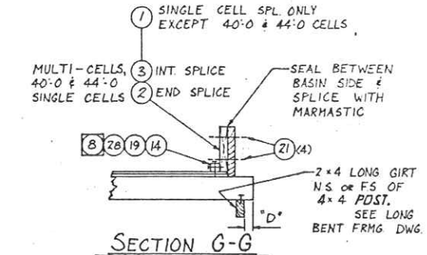
SECTION M-M
(REQ'D. TWO PLACES / PART'N.)



SECTION N-N



SECTION B-B



SECTION G-G
600-3,-0 ONLY
(TYP. @ OUTBOARD SPLICE)

ITEM	DESCRIPTION		PART NUMBER	QUAN
1	SPLICE	2 x 8⅞ NET x 1'-9¼	8-451-41	
2	SPLICE	2 x 8⅞ NET x 1'-7⅝	8-451-42	
3	SPLICE	2 x 8⅞ NET x 1'-6	8-451-43	
4	BLOCK	4 x 4 x 0'-9½	8-451-40	
5	SPLICE	2 x 10⅞ NET x 1'-9¼	72-41011-8	
6	SPLICE	2 x 10⅞ NET x 1'-7⅝	72-41011-9	
7	SPLICE	2 x 10⅞ NET x 1'-6	72-41011-10	
8	BLOCK	4 x 4 x 0'-11½	72-41011-17	
9	SEAL STRIP	½ OF 1½ x 3 x 8'-0	70-2622-4	
10	SEAL STRIP	1½ x 1½ x 8'-0	8-451-159	
11		2 x 4 x 1'-4		
12		1 x 6 x 10'-0		
13		1 x 4 x 0'-5½		
14		1½ x 1½ x LIN. FT.		
15		2 x 6 x "A"		
16		2 x 6 x "B"		
17		2 x 6 x "C"		
18		2 x 6 x "E"		
19	MARMASTIC	LBS.		
20	M.B.	⅜ x 3		
21	M.B.	⅜ x 4		
22	DELETED			—
23	M.B.	⅜ x 5½		
24	DELETED			—
25	M.B.	⅜ x 9		
26	M.B.	⅜ x 6		
27	NAILS,	2"		
28	NAILS,	2½"		
29	NAILS,	3"		
30	VULKEM	616 GUN GRADE 1/10 GAL. TUBE		
31	WASH. S.C.	⅜		

	670-5	670-4 660-4	660-5	650-5 640-5	650-4 640-4
"A"	—	19'-1	—	19'-9	17'-9
"B"	12'-10½	—	11'-6½	—	—
"C"	8'-2½	—	9'-6½	—	—

	"H" BAR FILL ONLY		G 480, MORTIS LOCK & "V" BAR FILL ONLY	
	"D"	"E"	"D"	"E"
640-0	7½	18'-9	1	18'-0
650-0	1'-4	18'-9	4¾	18'-4
660-0	6½	18'-9	1	18'-0
670-0	1'-3	18'-9	6	18'-0
640-3	7½	16'-9	1	16'-0
650-3	1'-4	16'-9	4¾	16'-4
660-3	6½	16'-9	1	16'-0
670-3	1'-3	16'-9	6	16'-0

GENERAL NOTES

1. FIELD CUT, DRILL & FIT AS REQ'D.
2. [2] TOENAIL N.S. & F.S. @ ALL LONG. GIRTS.
3. PLACE S.C. WASHER UNDER HEAD & NUT OF EACH M.B.
4. [4] BOLTED SEAL STRIP MUST BE INSTALLED BEFORE PLAIN STRIPS, FIELD FIT SEAL STRIPS @ PART'N., SPLICES & ONE ENDWALL.
5. [5] TYP. ALONG INBOARD & OUTBOARD BASIN SIDES ONLY.
6. [6] FIELD DRILL BASIN SHEETS USING SEAL STRIPS AS TEMPLATE.
7. SEE DISTRIBUTION BASIN ASS'Y. DWG. FOR ADDITIONAL DETAILS & MATERIAL.
8. [8] COAT 2 SIDES OF SEAL STRIPS WITH MARMASTIC BEFORE INSTALLING. NAIL ALTERNATELY ON 8" CTRS. TO BASIN SIDE & FLOOR.

— USE WITH FULL EXTENDED FAN DECK —

DISTRIBUTION BASIN ASSEMBLY DETAILS FOR 640, 650, 660 & 670 -4,-5 D.F. & -3,-0 D.F. F.S.F. TWR. -- PLWD. OR T. & G. FLOOR

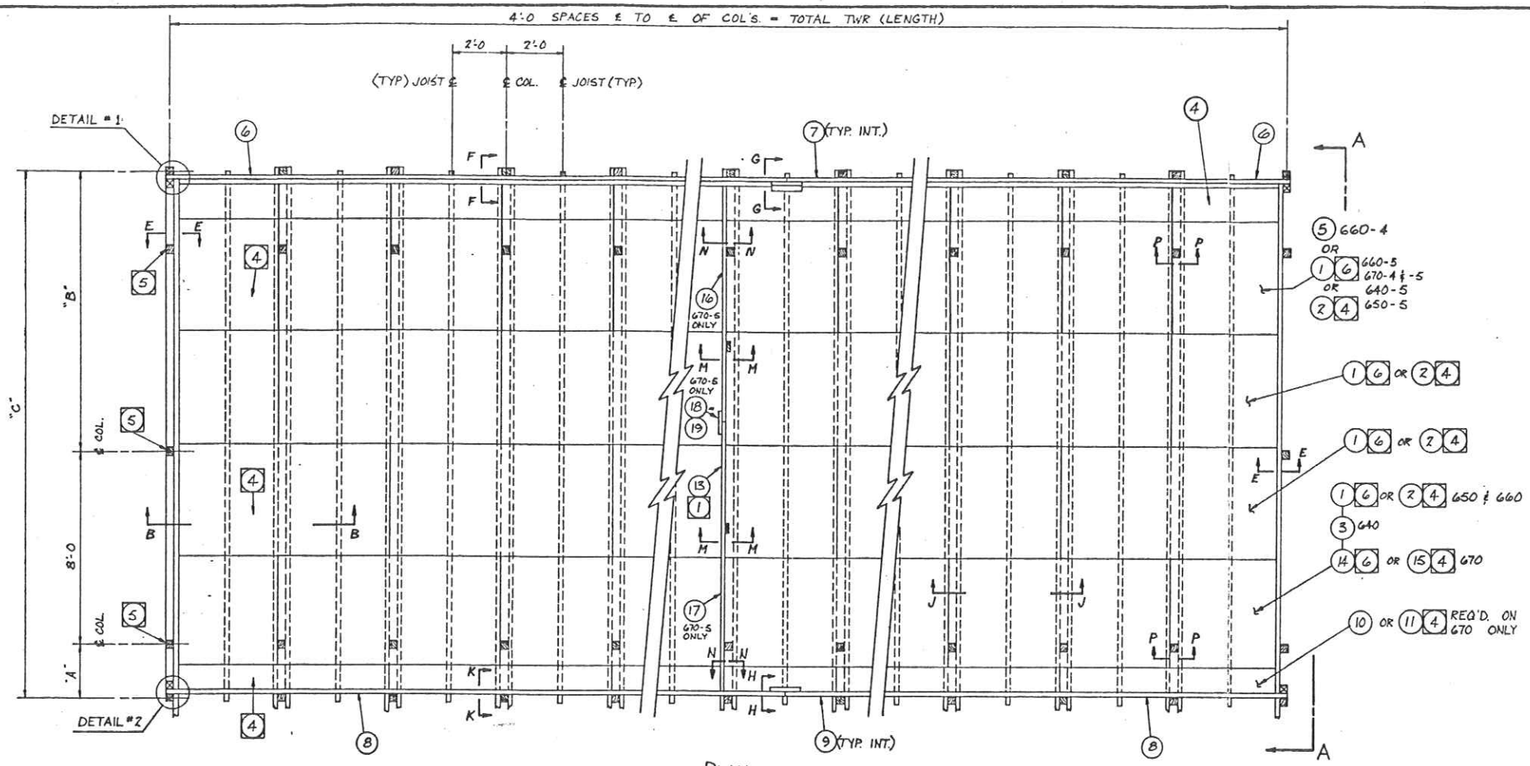
SCALE	DATE	DRAWN	CHECKED	APPROVED	M. FILE No.
NONE	1-4-78	THORNTON	AF	MGR	T. FILE No.

ORDER NUMBER — DRAWING NUMBER 79-4728 — REV.

LTR	DATE	REVISION	BY	CHKD

THE MARLEY COOLING TOWER CO. MARLEY
MISSION, KANSAS 66202

Drawing No. 79-4728



PLAN

TOWER SERIES	"A"	"B"	"C"
670-4	0	10'-6 7/8	18'-6 7/8
670-5	0	12'-6 7/8	20'-6 7/8
660-4	0	9'-2 7/8	17'-2 7/8
660-5	0	11'-2 7/8	19'-2 7/8
650-4	0	7'-10 7/8	15'-10 7/8
650-5	0	9'-10 7/8	17'-10 7/8
640-4	1'-4	6'-6 7/8	15'-10 7/8
640-5	1'-4	8'-6 7/8	17'-10 7/8

ERECTORS NOTE : INSTALL SHEET NEAREST TOWER ℄ FIRST ℄ BUTT AGAINST BASIN SIDE. LAY REMAINING SHEETS TOWARD OUTBOARD BASIN SIDE BUTTED TOGETHER. TRIM ENDS OF SHEETS, IF NECESSARY DUE TO ACCUMULATED TOLERANCES. INSTALL BASIN SHEETS WITH BURRED HOLES DOWN ℄ BEST SIDE UP. BASIN SHEETS TO BE INSTALLED SO THAT JOINTS FALL ON STAGGERED CENTERS, IF POSSIBLE. SEE NOTES [4] ℄ [6]

	660-5 670-4	640-5 650-5 660-4	640-4 650-4
"J"	20-0	18:0	16:0

"D"	"E"	"F"	"G"
-45	18:0	-44	19:11 3/4
-47	14:0	-46	15:11 3/4
-49	10:0	-48	11:11 3/4

"N"	"P"	"R"	"S"
-2	18:0	-1	19:11 3/4
-4	14:0	-3	15:11 3/4
-6	10:0	-5	11:11 3/4

ITEM No	DESCRIPTION		PART No	QUAN
1	BASIN SHEET,	5/4 x 48 x 96	69-9377	
2		3/4 x 48 x 47 15/16	69-9377-8	
3		3/4 x 48 x 47 15/16	79-4185-21	
4		3/4 x "K" x 47 15/16	"L"	
5		3/4 x 48 x 47 15/16	"M"	
6	BASIN SIDE	2 x 10 x "E"	8-451-"D"	
7		2 x 10 x "G"	8-451-"F"	
8		2 x 12 x "P"	72-41011-"N"	
9		2 x 12 x "S"	72-41011-"R"	
10	PLWD. 3/4 x 6 1/2 x 96			
11	PLWD. 3/4 x 6 1/2 x 47 15/16			
12	NOZZLE, PLASTIC		68-3738-"H"	
13	2 x 10 x "J"			
14	BASIN SHEET	3/4 x 48 x 96	74-41752-2	
15	BASIN SHEET	3/4 x 48 x 47 15/16	74-41752-4	
16	BASIN END	2 x 10 x 10'-0	71-4810-16	
17	BASIN END	2 x 10 x 12'-0	71-4810-15	
18	SPLICE BLK.	2 x 10 x 1'-6	71-4810-17	
19	M.B.	3/8 x 4		
20	M.B.	3/8 x 5 1/2		
21	WASH. S.C.	3/8		

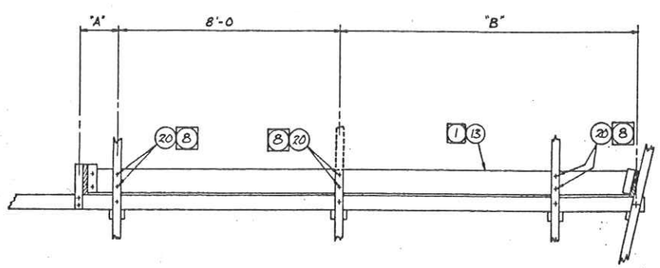
ORIF DIA.	NOZZLE PT. 68-3738-"H"	GPM MIN.	GPM MAX.
25/64	-25	1.52	1.93
27/64	-27	1.94	2.42
15/32	-30	2.43	2.88
33/64	-33	2.89	3.62
9/16	-36	3.63	4.20
39/64	-39	4.21	5.07
21/32	-42	5.08	5.69
45/64	-45	5.70	7.28
51/64	-51	7.29	9.50
15/16	-60	9.51	12.20
11/32	-66	12.21	14.80
1 1/8	-72	14.81	18.00
SEE ENGRNG.		18.01	20.24
1 5/16	-84	20.25	25.60

	650-4	640-5 650-5	660-4	660-5	670-4	670-5
"K"	40 3/4	16 3/4	8 3/4	32 3/4	18 1/4	42 1/4
"L"	79-3275-1		—			
"M"			79-3275-2			

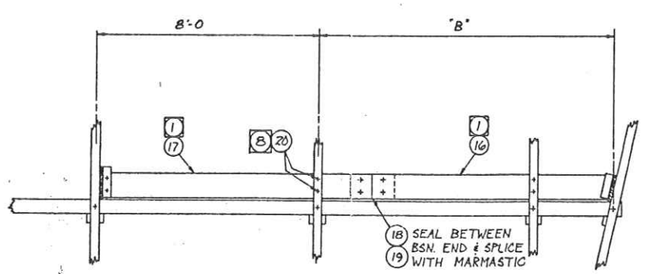
GRAND ISLAND 77-8

GENERAL NOTES

1. FIELD CUT, DRILL ℄ FIT AS REQ'D.
2. BASIN SIDE ℄ SPLICE ARRANGEMENT IS SIMILAR TO LONG. GIRT ARRANGEMENT.
3. PLACE S.C. WASHER UNDER HEAD ℄ NUT OF EACH M.B.
4. ON 20', 28', 36', ℄ 44' CELL LENGTHS, USE 3'-11 15/16 LONG BASIN SHEET @ ONE END OF TWR., ODD NO. OF CELLS ONLY.
5. FIELD NOTCH BASIN SHEET @ TWR. COL.
6. WHEN REQ'D. FIELD CUT TWO 47 15/16 SHTS. FROM ONE 8'-0 SHT. PLACE ONE @ EACH ENDWALL TO MAINTAIN STAGGERED JOINTS.
7. THIS DWG TO BE WORKED IN CONJUNCTION WITH DWG # 79-4728 SEE DWG # 79-4728 FOR ADDITIONAL DETAILS, MATERIAL ℄ SECTIONS.
8. FIELD DRILL BASIN SIDE USING COL. AS TEMPLATE.



SECTION A-A



SECTION A-A
(670-5 ONLY)

USE WITH MODEL 650-4 ℄ 660-4 ONLY
(END INLET AND THRU POST AT BENT 4B)

DISTRIBUTION BASIN ASSEMBLY FOR CLASS 600-4 ℄-5 D.F. TOWERS WITH COVERED HOT WATER BASIN (PLYWOOD FLOOR)

SCALE	DATE	DRAWN	CHECKED	APPROVED	W. FILE No.
NONE	1-4-79	THORNTON			H. FILE No.

LTR	DATE	REVISION	BY	CHKD
F	3-21-79	ERR # 79-1015	LLL	MS

ORDER NUMBER | DRAWING NUMBER 79-4729 | REV A

THE MARLEY COOLING TOWER CO. MARLEY
MISSION, KANSAS 66202

Drawing No. 79-4729