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W23 SOURCE CONTROL WELL PLAN

ERT Document PD-722-271
June 1986

DRAFT

W23 SOURCE CONTROL WELL PLAN

Prepared for:
Reilly Tar & Chemical Corporation
Indianapolis, Indiana

ERT - A RESOURCE ENGINEERING COMPANY
696 Virginia Road, Concord, Massachusetts 01742

6668D PD-722-271

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SECTION A - Site Management Plan

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SECTION A

SITE MANAGEMENT PLAN

Source Control at W23

250-500

The Prairie du Chien-Jordan Aquifer is situated in the interval from approximately 260 to 450 feet below the ground surface. Well W23, which penetrates the Prairie du Chien-Jordan Aquifer, has been equipped with temporary packers and an eight-inch liner pending further work. Other casings in W23 include 12-inch casing from the ground surface to a depth of 65 feet and a 10-inch casing from a depth of about 90 feet to about 258 feet. When last measured, the bottom of the well extended to an approximate depth of 505 feet, although it could now be shallower due to sand entering the well (the Jordan Sandstone is poorly cemented and naturally friable in places). In order to reconstruct well W23 as a permanent recovery well in the Prairie du Chien-Jordan Aquifer, the following work items are proposed:

1) Sound well image W23 to determine the present depth to the bottom of the well.
2) If the well is deeper than 450 feet, grout the well to a depth of 450 feet to effectively seal off the lower units from the Prairie du Chien-Jordan Aquifer.
3) Place pea gravel in the well to a depth of 260 feet.
4) Remove existing eight-inch liner and packers from well W23.
5) Install six-inch inside diameter pipe within W23. The casing should extend from a depth of 260 feet to the ground surface (leaving an appropriate stickup for a well head) and be constructed of a low carbon steel.

6) Grout the annulus of the new six-inch casing.

7) Bail out pea gravel.

8) Install submersible pump in new well at an approximate depth of 100 feet. PdC are hd?

The finished well will be a 450 foot deep, six-inch inside diameter recovery well open only to the Prairie du Chien-Jordan Aquifer system. The grout will be pressure injected via a tremmie pipe and will therefore flow into pores, joints and fractures in the surrounding units. This will effectively seal off other aquifer units from the Prairie du Chien-Jordan Aquifer.

Pump Specifications and Installation

Well W23 will be pumped at a rate of 50 gallons per minute in accordance with the RAP. The total head lift that the submersible pump will be required to overcome is estimated at 65 feet. A 4-inch diameter, 3-phase, 1.5 hp submersible pump will be required to achieve the required pumping rate and total head lift. Recommended construction materials for the submersible pump and discharge pipe are as follows:

(spec curve - rating curve

- The submersible pump should be constructed of standard 304 stainless steel;
- The submersible pump's natural butanol rubber (NBR) components should be retrofitted with teflon components;
- A 2-inch national pipe thread (NPT) discharge pipe should extend from the pump outlet to the point of discharge. The discharge pipe should be constructed of low carbon galvanized steel.

The use of low carbon galvanized steel and stainless steel components as well as retrofitting the NBR components with Teflon components will increase the operational life expectancy of the system.

At the ground surface the discharge pipe should be secured at the top of the casing with a steel double or single-hole solid well seal with a gate valve installed to regulate the discharge rate. A ground water sampling valve and other necessary monitoring equipment should be connected to the discharge pipe. Construction should also permit measuring of water levels within the well through an access hole at the top of the well casing. Specific design specifications should allow for manufacture-specific requirements.

detail

Pumphouse Design and Construction

The design of the W23 pumphouse is based on providing a structure and equipment suitable for what is assumed to be a long-term operation (possibly decades) with minimal maintenance and operating requirements. The pumphouse is designed as a 7'4" by 7'4" walk-in building with plenty of room for maintenance work. The roof is provided with a removable panel to allow for access to the well by a drill rig.

The W23 pumphouse will be a solidly-built masonary structure with a concrete floor. The wall structure will be masonry block with a brick veneer (color to be specified by the City of St. Louis Park) to make a more attractive building. Insulation will be provided in the roof and walls and under the floor for energy efficiency. A concrete driveway off Louisiana Avenue is included to provide access and off-street parking for inspection and maintenance personnel. Electric heating and lighting will be provided inside the pumphouse.

Complete construction specifications and blueprints for the W23 pumphouse are presented in Appendix A. These specifications will be used in obtaining bids and contracting for the construction work. Note that the pumphouse floor grade will be established in the field so as to provide drainage away from the building. Some off-site clean fill will be required to achieve this final grading.

Piping Design and Construction

The piping design for the W23 source control well is also based on providing for long-term, low-maintenance operation. Galvanized pipe will be used from the wellhead to a point just under the pumphouse, where PVC pipe will be used for the underground run to the sanitary sewer. The discharge line

screen type

inside the pumphouse will be provided with a wellhead pressure gauge, followed by a shut-off valve, a flow controller, a sample tap, a flow indicator, a downstream pressure gauge, and a check valve.

The discharge from well W23 will be under pressure to a new sanitary sewer manhole to be built just outside the W23 pumphouse. This new manhole will discharge via an underground gravity flow line to a new manhole to be built near the W105 pumphouse. The combined flows from wells W23 and W105 will then run by gravity flow in underground PVC pipe from the new manhole at W105 to an existing sanitary sewer manhole on Walker Street.

no, PVC degrades PVC

Complete construction specifications and blueprints for the W23 discharge piping and sanitary sewer connection are also presented in Appendix A.

Operation

Pumping of the W23 source control well will begin within 5 days of completing construction, as required by RAP Section 7.1.3. The well will be pumped at a monthly average rate of 50 gpm, as specified by RAP Section 7.1.3, until a request to cease pumping is approved pursuant to RAP Section 7.1.4. The EPA and MPCA Project Leaders will be notified by certified mail of the date on which W23 construction was completed and the date on which pumping began.

The W23 source control well will be pumped continuously, except for brief shut-down periods required for maintenance and/or repair. The EPA and MPCA Project Leaders will be notified by certified mail of any shutdown lasting more than ~~two~~ 3 days (2) ~~weeks~~, with an explanation of the cause and an estimated date when pumping will be restarted. Shut-down periods for maintenance or repair are expected to be brief and infrequent because of the simple equipment involved.

The W23 source control well will be operated by the City of St. Louis Park (the City) on behalf of Reilly Tar & Chemical Corporation (Reilly) in accordance with Reilly/City Agreement (Exhibit B to the Consent Decree). The City will inspect the W23 pump operation at least twice per week. All inspections will be noted in a log book kept at the W23 wellhouse using the form shown in Figure 1. The flow indicator reading, strip chart date, time, inspector's name, and any relevant comments will be recorded in the log during each inspection.

W23 will normally be pumped at a rate of 50 gpm, but this rate will be increased slightly after shut-down periods in order to maintain a monthly average rate of 50 gpm. The monthly average rate will be calculated on a calendar month basis using the flow indicator readings in the inspection log. ? The average of successive readings will be taken as the flow rate for the period between the two readings when calculating the monthly average rate. Monthly average pumping rates

for W23 will be reported for the applicable calendar months in the progress reports required by Park K of the Consent Decree.

detail

The discharge from W23 will be monitored for Carcinogenic PAH and Other PAH quarterly during the first year of pumping and biannually thereafter, as specified by RAP Section 7.3(B). The monitoring will be performed by the City in accordance with the Reilly/City Agreement. In addition, Reilly will monitor the discharge from W23 for Carcinogenic PAH and Other PAH once during the first week of pumping. This initial monitoring is not required by the RAP, but is suggested by Reilly to aid in time-series analysis of the W23 monitoring data. Sampling and analysis for the first week monitoring will be conducted by ERT using the procedures specified in the "Quality Assurance Project Plan for Sampling and Analysis - GAC Plant Testing June-August 1986", which was prepared by ERT for the City (doc. no. P-D209-129) and approved by the U.S. EPA, MPCA and MDH Project Leaders on June 25, 1986.

It should be noted that Section 2(c) of the Reilly/City Agreement requires that the discharge from W23 will be routed to the storm sewer before the fourth anniversary of the Effective Date of the Consent Decree. This change may require pretreatment of the discharge, depending on the NPDES effluent limitations established pursuant to RAP Section 2.5. Discontinuance of the discharge to the sanitary sewer will be implemented in accordance with RAP Section 2.9.

FIGURE 1

INSPECTION LOG FOR THE W23 SOURCE CONTROL WELL

Hydrogen Chart

Date	Time	Flow Indicator Reading (gpm)	Comments	Inspector's Name

Schedule

Section 7.1.2 of the RAP specifies that construction of the W23 source control well must be completed within 60 days of receiving DNR and MWCC permits and receiving approval of this plan, whichever comes later. The 60-day period allowed should be adequate for the required construction work, provided that permits and plan approval are received expeditiously so that construction can begin well in advance of winter weather.

SECTION B

QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PLAN
FOR W23 WORK AT THE
RTCC - St. LOUIS PARK SITE

ERT Document No. QAD722-270

June 1986

Prepared for

REILLY TAR AND CHEMICAL COMPANY
INDIANAPOLIS, INDIANA

ERT - A RESOURCE ENGINEERING COMPANY
696 Virginia Road, Concord, Massachusetts 01742

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1.0 INTRODUCTION

1.1 Background

ERT and the Reilly Tar and Chemical Company (RTCC) will complete certain tasks in fulfillment of the Consent Decree and Remedial Action Plan for the St. Louis Park Site. This Quality Assurance Plan pertains to all work to be performed by ERT, RTCC and subcontractors to convert the former supply well (now a groundwater monitoring well) identified by number W23 to a source control well by replacing the existing 8-inch diameter casing with a 6-inch diameter casing, grouting, installing a pump, a well house and all necessary piping and connections to direct the pump outflow to the nearby sanitary sewer line. Further details on the work to be performed, its purpose and the methodology to be employed may be found in the Project Site Management Plan.

1.2 Quality Objectives

The purpose of this Quality Assurance Plan is to define the Quality Assurance and Quality Control provisions to be implemented to ensure that:

- The resulting source control well conforms to design specifications given in the Project Site Management Plan.
- The work is performed in an efficient manner.
- Field records generated during the course of the field work are complete and accurate.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The project organization is illustrated in Figure 2-1. The RTCC Project Manager, Mr. John Craun will oversee and coordinate all project activities. The ERT Project Manager/Field Coordinator, Mr. William Gregg, will schedule and direct all field activities and will conduct correspondence with RTCC. The Project Manager/Field Coordinator is also responsible for maintaining records of the work performed on the project and for archiving those records in the Central File upon completion of the work. The RTCC Engineering Manager, Mr. Lewis Locke will direct the engineering aspects of the work, including the installation of the sewer line connection and pump house. The Project Quality Assurance Officers are responsible for ensuring that this plan is implemented by their respective organizations, and that project data undergo technical and peer review, as necessary. The pump installation contractor will perform all work necessary to install the casing and pump and make it operational. The sewer line connection subcontractor will install piping and connection to the sewer line and will install a well house to enclose the well and pump.

3.0 QA/QC - FIELD ACTIVITIES

3.1 Training

In order to ensure that the two subcontractors doing the field work can do so in a cooperative and efficient manner, instruction and guidance will be

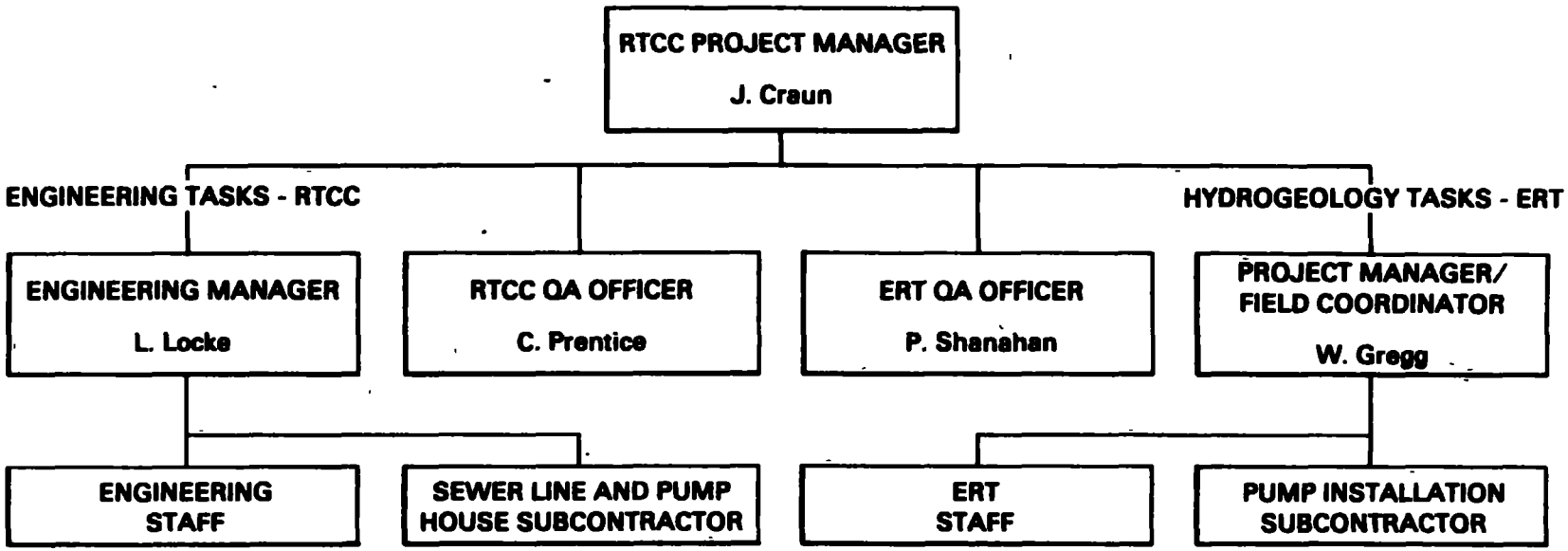

Figure 2-1 Project Organization

provided by the RTCC Project Manager and the ERT Project Manager/Field Coordinator to instill an understanding of the project objectives and plans and of the respective roles of the subcontractors.

3.2 Subcontractor Quality Control

Subcontractor quality control is that system of activities which ensures that products or services obtained from subcontractors fulfill the needs of the project. Subcontractor quality control begins with subcontractor procurement. The project policy for control of procurement is described in the ERT Quality Assurance Manual for Hazardous Waste Site Investigations, Chapter 5. The subcontractor procurement process considers:

- Bidder's qualifications in terms of personnel and physical resources, Quality Assurance program and Health and Safety program,
- Results of pre-qualification audits, if appropriate,
- Price and technical qualifications

Periodic quality control inspections of each contractor will be performed by the RTCC Engineering Manager and the ERT Project Manager/Field Coordinator to evaluate adherence to the project QA Plan and the project Health and Safety Plan. Inspection will include (as appropriate):

- Type and condition of equipment,
- Calibration procedures,
- Personnel qualifications,
- Decontamination procedures,
- Documentation.

Results of the inspection will be entered in the field notebook.

3.3 Document Control and Recordkeeping

Document Control for the W23 work serves a two-fold purpose. It is a formal system of activities that ensures that:

1) All participants in the project are promptly informed of revisions of the Quality Assurance Plan; and
2) All critical documents generated during the course of the work are accounted for during, and at the end of the project.

This QA Plan and all Standard Operating Procedure documents have the following information on each page:

- Document Number
- Page Number
- Total number of pages in document
- Revision number
- Revision date

When any of these documents are revised, the affected pages are reissued to all personnel listed as document holders with updated revision numbers and dates. Issuance of revisions is accompanied by explicit instructions as to which documents or portions of documents have become obsolete.

Control of, and accounting for documents generated during the course of the project is achieved by assigning the responsibility for document issuance and archiving. For the W23 work, the RTCC Project Manager and the ERT Project Manager/Field Coordinator have this responsibility.

Documentation for the project will either be recorded in non-erasable ink, or will be photocopied promptly upon completion, and the photocopies dated. All documents will be signed by the person completing them.

4.0 NUMERICAL ANALYSIS AND PEER REVIEW

All numerical analyses, including manual calculations, mapping, and computer modeling will be documented and subjected to quality control review in accordance with ERT SOP 2005, Numerical Analysis and Peer Review. All records of numerical analyses will be legible, reproduction-quality and complete enough to permit logical reconstruction by a qualified individual other than the originator.

5.0 AUDITS AND CORRECTIVE ACTION

ERT conducts periodic audits to assess the level of adherence to QA policies, procedures and plans.

Whenever quality deficiencies are observed that warrant immediate attention, formal corrective action request forms are issued to the project manager by the Quality Assurance Department. The QA Department retains one copy of the form when it is issued. The project manager completes the form and signs it when corrective action has been implemented, and returns the original to the QA Officer to close the loop.

The Quality Assurance Department maintains a record of all corrective action requests and reports their status to ERT management in a quarterly report.

Should an audit be conducted on the W23 activities, RTCC will be apprised of the audit findings and of any corrective action that is requested and performed.

6 Completion Approval.

SECTION C
HEALTH AND SAFETY PLAN

SAFETY PLAN

for the

Reilly Tar & Chemical Corp.
St. Louis Park Site, Well 23 Modification
(Name of Site/Facility)

Located in

St. Louis Park, Minnesota
(City) (State)

Project Number: D722-271

Division Number: 120

Date: June 5, 1986

Prepared By: Kevin Powers

Date: 6/5/86

Approved By: Peter Shanahan
for Project Manager

Date: 6/19/86

Kevin Powers
Health & Safety Manager

Date: 6/19/86

SITE DESCRIPTION

FACILITY DESCRIPTION: ACTIVE? YES _____ NO X

An 80 acre site located in St. Louis Park, Minnesota, bordering the western ~~eastern~~ edge of Minneapolis. The site was formerly occupied by a Reilly Tar and Chemical Corporation, Coal Tar Distillation and Wood Treating plant. The plant began operations in 1917 and ceased operations in 1971. The entire facility was razed and the land leveled in 1972. The site has since come to be used for various private and public projects, including a condominium development, a public park and minor commercial developments

HISTORICAL INFORMATION: From 1917 to 1972 Reilly Tar and Chemical Corporation operated a Wood Treating and Coal Tar Distillation Plant at the site. During this time both wood treating waste products and coal tar distilling waste products entered the ground. The site apparently received contaminants from process and handling operations, direct discharge of wastewater, and inadvertent discharges such as from spills, leaks and storm water runoff.

COMPOUNDS OF CONCERN: Coal tar and creosote; particularly phenols and a wide array of Polynuclear Aromatic Hydrocarbons including, but not limited to, Benzo (a) Pyrene, Benz (a) Anthracene and Quinoline.

PHYSICAL STATE OF COMPOUNDS: Not contained; contaminants in ground water and shallow soils.

SCOPE OF WORK

PROPOSED DATE(S) OF FIELD ACTIVITY: To be determined

PERSONNEL REQUIREMENTS:

NAME	RESPONSIBILITY
Bill Gregg	Coordinate Well Installation
Subcontractor	Perform Well Modification
RT&CC Engineer	Coordinate Trench Excavation and Sewer Line Connection
Subcontractor	Perform Trench Excavation and Sewer Line Connection

TRAINING REQUIREMENTS: Respirator training and respirator fit test.

PROPOSED ON-SITE ACTIVITIES: Modification of Well 23

SCOPE OF WORK: Well 23 is to be modified by removing the existing inner 8" well casing and replacing it with 6" casing penetrating to a depth of 260'. A permanent pump will be installed in the well and the pump effluent stream will be connected to the sewer system. A trench will be dug from the well to the underground sewer system to make this connection.

HAZARD EVALUATION

WASTE CHARACTERISTICS:

X	A.	TOXIC*	____	E.	SOLUBLE	____	I.	HIGHLY VOLATILE
____	B.	CORROSIVE	____	F.	INFECTIOUS	____	J.	EXPLOSIVE
____	C.	RADIOACTIVE	____	G.	FLAMMABLE	____	K.	REACTIVE
____	D.	PERSISTENT	____	H.	IGNITABLE	____	L.	INCOMPATIBLE
						____	M.	NOT APPLICABLE

*May be toxic depending upon route and nature of exposure.

TOPOGRAPHICAL HAZARDS: None known at this time

OPERATIONAL HAZARDS: Trench excavation by backhoe

NOTES OF INTEREST: The walls of trenches greater than 4 feet in depth must be adequately shored or sloped to the angle of repose. For average soil, an angle of repose of 45 is recommended. For loose or sandy soil an angle of 30 is recommended. Access to trenches greater than 4 feet in depth should be by ladders which extend to the bottom of the trench and at least 3 feet above the surface of the ground.

OVERALL HAZARD: X LOW ____ MEDIUM ____ HIGH

PERSONAL PROTECTION REQUIREMENTS

RESPIRATORY PROTECTION REQUIREMENT: LEVEL D (modified)

SPECIFICATIONS: MSA Comfo II with Type GMC-H cartridges

MODIFICATIONS: Respiratory protection required if working in a trench in which ~~liquids are~~ chemical soil/liquids are present, in the vicinity of trench excavation and contaminated well casing removal ~~and handling if VOC's are detected in the breathing zone by an HNU reading of 10 units or greater or if odors or dust becomes objectionable.~~

PROTECTIVE CLOTHING REQUIREMENT:

X WORK CLOTHES/COVERALLS (long sleeved)

X CHEMICAL PROTECTIVE CLOTHING. TYPE? - Tyvek - for personnel working in trench, or handling contaminated well casing.

___ WORK SHOES (STEEL TOE/SHANK)

X BOOTS. TYPE? Slush type

X GLOVES. TYPE? Nitrile - for handling contaminated soil or well casing.

X HARD HAT

___ FACE SHIELD

X SAFETY GLASSES/GOGGLES

MODIFICATIONS: Hard hat/safety glasses required within 25' foot radius of operating backhoe. Face shield required for personnel working in trench if liquids are present.

MONITORING REQUIREMENTS:

1) INSTRUMENT: HNU PI-101

MONITORING PROCEDURE: Monitor breathing zone during trench excavation or well casing removal and handling.

2) INSTRUMENT:

MONITORING PROCEDURE

DECONTAMINATION PROCEDURES

EQUIPMENT/SOLVENTS/SOLUTIONS: Alconox, clean water

DECONTAMINATION PROCEDURE(S):

1) ITEM(S): Gloves, boots and other equipment as necessary

PROCEDURE: Wash with alconox detergent and rinse with clean water

2) ITEM(S):

PROCEDURE:

DISPOSAL PROCEDURE: General refuse for all consumables.

SPECIAL INSTRUCTIONS:

NOTE: The above specified decontamination procedures pertain to the decontamination of personal protective equipment only. Procedures for the decontamination of sampling tools and other related equipment should be specified in the subject work plan and/or QA plan.

EMERGENCY REFERENCE

AMBULANCE: 920-2345

POLICE: 920-2345

FIRE: 920-2345

HOSPITAL: Methodist Hospital

Location: 6500 Excelsior Blvd.
St. Louis Park, Minnesota
932-5000

DIRECTIONS TO HOSPITAL: MAP INCLUDED? Yes

Directions to Methodist Hospital: From the site on Louisiana Ave., take Louisiana Ave., south to Highway 7 (approx. 0.2 mile). Go east on Highway 7 to Brunswick Avenue (approx. 0.6 mile). Turn right on Brunswick and proceed south to Excelsior Blvd. (approx. 0.8 mile). Turn right on Excelsior and proceed west past Dakota Ave. (approx. 0.2 mile). Methodist Hospital is on the north side (right) of Excelsior Blvd. immediately after Dakota Ave.

POISON CONTROL CENTER: 347-3141

NATIONAL RESPONSE CENTER: 1-800-424-8802

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o CORPORATE:

NON-RESPONSIVE

o AGENCY REPRESENTATIVE: MPCA Douglas J. Robohm 612-296-7395
EPA Daniel J. Bicknell 312-886-7341
John C. Craun

o CLIENT REPRESENTATIVE: Reilly Tar & Chemical 317-248-6426

NEAREST PHONE: Park Tavern (Bowling Alley) 3401 Louisiana Ave.

NON-RESPONSIVE

Map of St. Louis Park and Control Well Locations

8806003

SECTION D

COMMUNITY RELATIONS PLAN

Construction of the source control well at Well 23 will be undertaken pursuant to the provisions of the Consent Decree and Remedial Action Plan for the Reilly Tar & Chemical Corporation, St. Louis Park, Minnesota NPL site. All community relations programs related to the W23 source control well work will be coordinated through the following agencies:

United States	Ms. Judy Beck U.S. Environmental Protection Agency (312) 353-1325
State of Minnesota	Ms. Susan Brustman Minnesota Pollution Control Agency (612) 296-7769
City of St. Louis Park	Ms. Sharon Klumpp City of St. Louis Park (612) 924-2523

APPENDIX A

CONTRACT SPECIFICATIONS

FOR

WELL 23

PRAIRIE DU CHIEN-JORDAN AQUIFER

SOURCE CONTROL

REILLY TAR & CHEMICAL CORP.

1510 MARKET SQUARE CENTER

151 NORTH DELAWARE STREET

INDIANAPOLIS, IN 46204

PUMPING FACILITY ENGINEERING SPECIFICATIONS

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Electrical Work . . . . . Sec. 300

Painting . . . . . Sec. 400

Driveway. . . . . Sec. 500

Building. . . . . Sec. 600

Manhole and Gravity Sewer . . . . . Sec. 700

SECTION 100

SUMMARY OF WORK

101 SCOPE OF WORK

The work consists of the complete finish of the Well 23 Prairie Du Chien-Jordan Aquifer, Source Control Pump House at _____Louisiana St., St. Louis Park, MN. The work is to be completed as per this specification and Reilly Tar & Chemical Corp. drawings 861737-001 and 600.

102 OWNER RESPONSIBILITIES

The Owner will have a Representative available for field Consultation.

The Owner will furnish site elevations prior to letting the work for bids.

The Owner will furnish all required construction and permanent permits.

103 CONTRACTOR RESPONSIBILITIES

The Contractor will arrange for a temporary water supply and temporary electrical service connection during the construction period.

The Contractor shall provide project management to ensure completion of the work on schedule.

The Contractor will be responsible for base lines and bench marks for subcontractor use.

The Contractor must notify the Owner 3 days in advance of any utility tie-in or any work that will interrupt normal activity around the job site.

Coordination between the Contractor and the Subcontractors must be maintained in order to meet the schedule.

All applicable Codes and Safety Regulations will be followed by every Contractor and his workers.

The Contractor shall provide five copies of all equipment warranties, operating instructions, installation instructions, maintenance instructions and parts list for each piece of equipment installed shall be provided to the owner on completion of the work.

The Contractor shall provide temporary baricades and fencing.

The Contractor shall ensure that at the end of each working day, positive drainage shall be provided.

The Contractor shall ensure that the topsoil is removed to its entire depth, in the areas of new construction and stockpile topsoil which will be required for finish grading.

The Contractor shall see that areas that are to have topsoil removed shall first be cleared of excessive vegetation, rubbish and debris.

The Contractor shall see that stockpiled topsoil is replaced in lawn areas prior to sodding and or seeding to a minimum depth of 6 inches. Remove all stones larger than 2 inches.

The Contractor will be responsible for site restoration to near original condition.

The Contractor shall be responsible for layout of his Work, including lines and elevations. Each Subcontractor shall field verify all dimension relating to his work, as shown on the Drawings, and report any errors or discrepancies to the General Contractor before commencing work.

The Contractor is responsible for the protection of his Work from adverse weather. He shall provide, at all times, all means and methods for weather protection as necessary for the satisfactory execution and performance of his work.

104 GUARANTEES

A written one year guarantee is required to cover all installed material, equipment and labor not otherwise covered by manufacturers warranties. Exceptions to this are the roof (2 yrs) and caulking (5 yrs).

All guarantees will begin at the Owners recognized date of substantial completion.

105 TEMPORARY FACILITIES

The Contractor will furnish a project office at the site with a telephone for business use to all personnel. Toilet facilities will be provided by the Contractor.

Storage facilities are to be provided by the Contractor. Set-up location must be approved by the Owner. If the set-up location interferes with work later in the job, relocation may be required.

The Electrical Subcontractor will furnish all temporary electrical for lights and outlets at the beginning of the job. This temporary work is to be included in the Contract Bid. This work must meet the appropriate codes and regulations.

The Electrical Subcontractor is also responsible for removal of this equipment when no longer needed.

Fire extinguishers will be provided by the Contractor at required locations on the job site. Each Subcontractor is responsible for providing his own extinguishers during any cutting or welding. Certain Owner designated locations will require Owner approval before welding or cutting can be done.

Project Sign: If required, the Contractor will provide and maintain a Project Sign as approved by the City and the Owner. No other signs are allowed except as required for safety, security, or traffic control; or without the permission of the Contractor.

106 MEETINGS

Prior to Contract award, the leading Bidder will be required to attend a pre-award meeting. At this time the bid and all applicable Contract Document information will be reviewed. A preliminary schedule will be provided for Contractor input. The Contractor should also be ready to provide information on Subcontractors, Suppliers, material and equipment delivery times, personnel etc.

At any time during the job, the Owner may call a progress meeting in the St. Louis Park area. These meetings may require attendence by the Contractor, Subcontractors and Material Suppliers.

107 SHOP DRAWINGS

Shop drawings and product data must be received by the Owner with sufficient time for approval. Contractor or Supplier delay in forwarding drawings and data for approval will not be viewed as an acceptable reason for schedule extension.

Seven (7) copies of all approved drawings and data will be supplied to the Owner for further distribution.

108 CLEAN-UP — soil / water

The Contractor and each Subcontractor will be responsible for site clean-up during the job. A trash container will be supplied by the Contractor.

109 PROJECT CLOSEOUT

The Mechanical and Electrical Subcontractors must submit five (5) sets of operating and maintenance manuals to the Owner before final payment will be made. These manuals will contain the following:

- Contractor and Supplier List
- Guarantees
- Wiring and control diagrams
- Operating instructions
- Maintenance instructions
- Parts lists
- Any other information relating to supplied equipment and materials

The Contractor and all Subcontractors must submit a Contractor and Supplier List and a written guaranty.

The Contractor will be responsible for keeping a set of as-built drawings on site for updating changes. It is the responsibility of each Subcontractor to note all changes related to his work on this set.

SECTION 200

MECHANICAL WORK

201 GENERAL

This Section describes work, equipment and materials to be furnished by the Mechanical Subcontractor.

All mechanical systems are to be finished to a ready-to-operate condition. The Mechanical Contractor is responsible for completing all mechanical systems except for power wiring tie-ins.

The accompanying drawings have been drawn to scale and have some listed dimensions. Care has been taken to maintain accuracy, but it remains the Contractors responsibility to verify the scaled and listed dimensions.

The Mechanical Subcontractors Bid shall include a list describing the major types of equipment and materials to be used. After acceptance of the bid, changes to this list will not be allowed.

The Mechanical Contractor will assume all responsibility for conforming to rules and regulations of the applicable government agencies and utilties.

The plumbing installation will comply with all requirements of the Minnesota Department of Health and the Uniform Plumbing code.

The mechanical installation will comply with the Uniform Mechanical Code.

All installed work will comply with rules and recommendations of the National Fire Protection Association.

Shop drawings and operation and maintenance manuals must be supplied as described in the SUMMARY OF WORK.

202 SYSTEM TESTING

Every piping system will be flushed clean prior to pressure testing.

Testing procedures for various piping systems are as follows:

- Discharge water	- All lines pressured to 125 psi for 4 hours with no loss of pressure.
- Waste piping	- All lines pressurized with 5 psig air or ~~10' static water head~~ with no leakage for 1 hour.

203 MECHANICAL EQUIPMENT SPECIFICATIONS

Discharge Gate Valve 2" flgd (Powell Fig. 515)

Pressure Gauges (2) 0-100 psi (Ashcroft 1279 (*) 54 1/2" TA Lower 1/2 NPT 0-100 psi)

Flow Controller 2" flgd (Kates Flow Control 5FA1-1)

Sample Line Valve and Pressure Gauge Shutoff Valve (3)
1/2" NPT, ball type (Powell Fig. 4210B 1/2")

Flow Indicator 2" NPT (Universal Fluid Flow Monitor
LN-CSB150G-16-32V1.0-OWR)

Backflow Check Valve 2", spring closing (TRW
Mission Duo Check II K15 HMF 2")

204 GENERAL PIPING MATERIALS

The Mechanical Contractor is to furnish all piping, valves and accessories to complete the work as described by the Contract Documents. Substitutions may be made for specified items with approval from the owner.

The list of acceptable manufacturers is as follows:

- Gate and check valves: Nibco/Scott, Crane, Powell, Lunken, TRW Mission Heimer, Walworth, Jenkins or Stockman

- Ball valves: Wolverine Brass Works, Nibco/Scott, Hammond, Powell, Jamesbury, Metraflex or Dyna-Quip

All flange connections are to have 1/16" full face "Cranite" gaskets coated with a thread lubricant when installed.

205 GENERAL PIPING INSTALLATION

All piping must be installed and routed in a neat and orderly manner with sufficient clearances for maintenance unless otherwise indicated on the drawings.

206 GAUGES

Acceptable guage manufacturers are Ashcroft, Marsh, Trerice, Duro, Danton, Cambridge, American Air Filter or Dryer.

Typical guages shall be similar to the following:

- Ashcroft 1279

207 DISCHARGE WATER PIPING

Piping will be part low carbon steel galvanized Sch 40 with screwed and flanged fittings and part PVC Sch 40 as indicated on the drawings.

208 WASTE PIPING

Piping will be PVC SCH 40.

209 GENERAL EQUIPMENT INFORMATION

The Mechanical Subcontractor is responsible for complete purchasing and installation of all equipment other than as noted in the Drawings and Specifications. This work includes supports and all connections except power wiring to the unit.

All equipment is to be completely installed to a ready to operate state, including any lubrication, alignment and adjustments.

SECTION 300

ELECTRICAL WORK

301 GENERAL

This section describes work, equipment and materials to be furnished by the Electrical Subcontractor.

The Electrical Subcontractor will assume all responsibility for conforming to all rules and regulations of the applicable government agencies and utilities.

The Electrical Subcontractor is responsible for verification of dimensions that affect his work. Any minor deviations caused by interferences shall be considered a part of the job and the owner will not be held responsible for any reimbursement.

All electrical equipment must be U. L. approved and meet all other applicable code requirements.

All permits and inspections required for completion of electrical work are to be arranged and paid for by the Owner.

All electrical materials and equipment shown on the Contract Drawing and listed in the Specifications must be provided by the Electrical Subcontractor unless otherwise noted.

Shop Drawings and Operations and Maintenance Manuals must be supplied as described in the SUMMARY OF WORK.

302 TEMPORARY WORK

The Electrical Subcontractor must supply temporary power supply pole and outlets to allow for convenient construction use.

303 ELECTRICAL EQUIPMENT SPECIFICATIONS:

Pump 1.5 Hp, 3ph, 240V, 60Hz, 6 amps (furnished by Well Contractor)

Nema Size 0 starter (Square D class 8536, type SBW, Nema type 4 with Dual Push Button and pilot light control unit KXRG117)
One 10 amp circuit breaker disconnect in load center (Square D Q0310) 3 pole, common trip with indicator

Heater 3KW, 10,239 Btuh, 240/208 V, 60Hz, 12.5 amps (Dayton 3E039)
One 15 amp ground fault circuit interupter circuit breaker disconnect in load center (Square D Q0215GFI)2 pole, common trip with indicator

Lights 2 units each unit having 2 lamps, 120V, 6Hz, 70 watts per fixture, .65 amps per fixture (Graybar Meter Miser Wrap-Arounds GMM-8-2224)
One 15 amp ground fault circuit interupter circuit breaker disconnect in load center for both lights (Square D Q0115GFI) 1 pole with trip indicator

Switch toggle type, 120V, 15 amp (Hubbell 1201 GRY)

Duplex Outlet corrosion resistant, 3 wire grounding, 125V 20 amp (Hubbell 53CM62)
One 20 amp ground fault circuit interupter circuit breaker disconnect in load center (Square D QO120GFI) 1 pole with trip indicator

Loadcenter circuit breaker type, 3ph, 4 wire, 120/240V, 100 amp main (Square D QO424M100) flush cover (Square D QOC430LF) Equipment Ground bar kit (Square D PK15GTA)

Safety Socket Box test-bypass type, 3ph, 4 wire, 240/120V, delta, 100 amp (Square D EM71NRB)

304 GENERAL MATERIALS

The following types of material and equipment should be used

- Service equipment, panelboards, safety switches, motor starters and other general purpose control devices	- Square D
- Wiring devices	- Hubbell, A.H. & H., P. & S. G. E., Sierra, Grouse-Hinds
- Finishing plates	- Sierra
- Lighting Fixtures	- Noted on Drawings or approved equal
- Lamps	- G.E., Sylvania or Westinghouse

Conduit can be U.L. approved heavy wall rigid or EMT where not otherwise specified. All fittings must be U.L. approved and electrically conductive. Minimum conduit size is 3/4" except where noted. Flexible conduit is 1/2" minimum.

Conduit runs shall be in the block walls and under the concrete floors unless otherwise indicated.

Wire and cable for general wiring shall be rated 600 volt. Conductors size #12 through #8 AWG shall have type TW, THW or THW/THHN insulating wall unless otherwise noted. Conductors sized #6 AWG and larger shall have type THWN, THW, THHN or XHHW insulating wall unless otherwise noted. Minimum conductor size must be #12 AWG. All wire terminating in light fixtures or at equipment should be heat resisting type. Wire must be sized so that voltage drop does not exceed 3% from branch panel to last outlet. Color coding should be Phase A - Black, Phase B - Red, Phase C - Blue, Neutral - White or Grey and Ground - Green. All wire must be 98% conductability soft drawn commercially pure copper.

Toggle switches and receptacles should have a grey finish. Finishing plates must be brushed stainless steel.

305 GENERAL INSTALLATION

The Electrical Subcontractor is responsible for all power tie-ins required for installed equipment.

All equipment, switches, panels, main circuits and feeder circuits that are installed by the Electrical Subcontractor should be identified by permanent labels.

The Electrical Subcontractor is responsible for all testing required to insure a complete and secure electrical system.

All conduit shall be hidden from view unless noted on drawings or approved by Owner. No runs will be installed diagonally. Conduit ran through outside walls must be sealed with appropriate material.

Wire must not be pulled using grease or oil. Only cable pulling compounds similar to Y - ER - EASE are to be used. Any required splicing will be done using approved splicing procedures and must be approved by Owner.

All wall mounted switch and outlet boxes must be flush mounted unless otherwise noted.

Mounting height of switch and outlet boxes and devices are to be as follow:

- Receptacle outlets - 40" above floor
- Toggle switches - 48" above floor

306 HEATER

The Electrical Subcontractor is responsible to furnish, install and wire the electric heater. The heating fixture is to be hung from the wall after the wall and ceiling painting are complete. The unit specified may be replaced with an equal unit. Such a unit shall have a built in hydraulic thermostat (35° to 85°F range), totally enclosed corrosion resistant elements finned and sheathed, quiet built in fan, totally enclosed shaded pole motor with sealed bearings (54° to 67°F heat rise), automatic-reset thermal cut-out disconnects for element and motor.

307 PANEL BOARD, STARTER AND METER BOX

100 amp, 3ph, 4 wire, 240/120 volt meter box is to be supplied and installed by the Electrical Subcontractor, the unit is to be equal to Square D.

Nema Size 0 starter is to be supplied and installed by the Electrical Subcontractor. The unit is to be equal to Square D. It is to be installed after the wall and ceiling painting are complete.

100 amp 240/120 volt circuit breaker panelboard complete with main breaker and listed number of individual breakers is to be supplied and installed by the Electrical Subcontractor. The panel should be equal to Square D.

308 GROUNDING

The conduit system ground must be continuous through all new construction. All equipment must be provided with a suitable ground. Green pigtails and jumpers are to be used with outlets, switches and all flexible conduits. All conduit ground must be tested to insure correct and complete ground and approved by Owner.

309 LIGHTING

The Electrical Subcontractor is responsible to furnish, install and wire all light fixtures. Ceiling fixtures will be hung after ceiling is painted. All ceiling fixtures must be self supporting and also secured to bar joists. All fixtures must be equipped with U. L. heat resistant wiring. Fixtures should have white finish on all metal.

310 SERVICE ENTRANCE WIRING

The service entrance wire size will be #2 AWG. The service entrance conduit will be routed underground to the nearest Power Company pole or ground mounted transformer. The bury depth shall be 18 inches to the center of the conduit. A 2 inch thick by 6 inch wide concrete cover shall be poured in the trench after 6 inches of fill has been compacted over the conduit. A yellow plastic warning tape shall be laid in the trench after 6 inches of soil has been compacted over the concrete cover. The remaining fill shall then be added and compacted. If a ground mounted transformer is to be utilized for the power supply the service entrance conduit shall terminate in the terminal cabinet of the transformer. If a pole mounted transformer is to be utilized for the power supply the service entrance conduit shall extend 12 feet up the pole and have a weather head. The General Contractor will be responsible for coordinating the electrical service connection.

SECTION 400

PAINTING

401 GENERAL

The Painting Subcontractor is responsible to furnish all supplies and labor to paint all interior walls, ceiling, door (interior and exterior), gutters, downspouts, exposed roof flashing, meter box and exposed conduit.

The painting schedule will consist of two segments. All sealing, priming and finish coats will be in the first segment. After other construction is complete touch up will be done.

Care must be taken to protect all adjacent surfaces during preparation and painting. All surfaces should be prepared to paint manufacturers recommendations before painting.

402 MATERIALS AND APPLICATION

Top Coat Paint colors to be used are as follows:

- All exterior metal doors, frames and meter socket box	- Glidden Professional Colors Aluminum
- All galvanized gutters, flushing, downspouts and conduit	- Glidden Professional Colors Aluminum
- All interior walls, ceilings, doors frames and conduit	- Glidden Professional Colors White

Paint types to be used are as follows:

- Exterior Primed Surfaces	- (2) coats Glidden #592
- Exterior Galvanized Surfaces	- (2) coats Glidden Epoxy Chromate Primer #5251/5252 - (2) coats Glidden #592
- Interior Block	- (1) coat Glidden Ultra Hide Block Filler #5317 - (2) coats Glidden Glid Guard Epoxy #5250/5242
- Interior Ceiling, bar joists and conduit (all galvanized)	- (2) coats Glidden Epoxy Chromate Primer #5251/5252 - (2) coats Glidden Glid Guard Epoxy #5250/5242
- Interior Primed metal door and frame	- (1) coat Glidden Universal Fast Dry Metal Primer #5210 - (2) Coats Glidden Glid Guard Epoxy #5250/5242

SECTION 500

DRIVEWAY

501 GENERAL

The Paving Subcontractor is responsible for labor, material and installation of the drive shown on Reilly Tar & Chemical Corp. drawing number 861737-001. The driveway is to be installed to meet the specifications of the City of St. Louis Park. The Paving Subcontractor is also responsible for the pump house entry walk as shown on Reilly Tar and Chemicals Corp. drawing number 861737-600.

All concrete shall be cured for a period of not less than 7 days. During this curing period, no part of the concrete shall be permitted to become dry. Curing shall be applied and maintained to prevent loss of water from concrete for the duration of the curing period.

Fresh concrete shall be protected from heavy rains, flowing water and mechanical injury. All concrete shall be protected from the sun and drying winds.

Sidewalks and other exterior slabs except vehicular traffic areas shall receive a hair broom finish in accordance with ACI 301, Section 1104(d) with a Class B. tolerance.

Vehicular traffic areas shall receive a medium broom finish.

Exterior concrete slabs shall be cured with Sealtight WP-40 White-Pigmented Concrete Curing Compound as manufactured by W. R. Meadows Elgin, Illinois. or an equal product approved by the Owner. Application for this product shall be 300 square feet per gallon. Product shall meet specifications: ASTM C309, Type 2, Class A; AASHTO M148, Type 2, Class A; ANSI A 37.87, Type 2, Class A.

Concrete testing shall be done on a per truckload basis. Samples shall be taken per ASTM methods and tested by an independent testing laboratory. The laboratory shall be selected by the General contractor and approved by the Owner. The cost of sampling and testing shall be included in the bid price. The owner will evaluate the test results for acceptance or rejection.

SECTION 600

BUILDING

601 GENERAL

This portion of the contract includes the following:

- Foundation construction
- Masonry wall construction
- Wall, roof and floor insullation
- Concrete floor construction
- Brick veneer construction
- Bar joists and decking construction
- Roof scuttle
- Roofing, flashing, nailers, gutters and downspouts
- Door, frame, threshold, hinges, plates and handle
- Lockwork and door closer
- Caulking

All materials and labor required for complete finish are to be included.

All of the Work shall meet the requirement of all governing codes, ordinances, laws, regulations, safety orders and directives.

602 EXCAVATION AND BACKFILL

Provide all equipment, material and labor to excavate for foundations, footings, stoops, sidewalks, curbs, retaining walls and similar items, all to the lines and grades indicated herein and on the drawings.

Excavate to full depth and full width of foundations; allow ample room for forms where required. Excavation shall be held to a true line and grade. Bottom shall be level and free from loose material. Where bottom of footing is undercut, return to grade with concrete of same quality as specified for the footing of foundation.

Promptly backfill excavations as work permits, but not before walls have attained design strength. Shore walls and footings as required to prevent toppling, cracking, and misalignment.

All spaces excavated for and not occupied by structures shall be backfilled to subgrade with excavated materials from the site or bank-run gravel from off-site and thoroughly compacted in layers not to exceed 12" in depth. Backfill shall be compacted to a minimum of 95% of maximum density at optimum moisture content, as determined by Modified Proctor Test (ASTM D-1557). Backfill simultaneously on both sides of the structures.

Excess excavated material not used as backfill, but suitable for site fill, shall be used for site grading as directed by the Contractor.

Excavated material deemed unsuitable for backfilling or fill will be disposed of by the Owner.

Fill material required to complete the finish grading will be bank-run gravel for subgrade and top soil as required to meet the minimum coverage requirement of 6 inches. All additional materials for the building excavation and general site grading shall be provided by the Contractor.

Place granular drainage fill under the slab and compact. Depth of drainage fill shall be minimum 4 inches or as shown on drawings.

Earthwork density tests shall be required for each lift during construction. They shall be made by an independent testing laboratory selected by the Earwork Subcontractor and approved by the Owner. Field density tests shall be taken at locations selected with a minimum of one per 150 sq. ft. per 2' lift. All tests required to bring compaction to the required density shall be paid for by the Building Earthwork Subcontractor.

603 CONCRETE

This section includes general requirements for the concrete Subcontractor and is intended to supplement the specifications listed on the drawings.

Reinforcing bars shall conform to the requirements of ASTM A-615 "Specifications for Deformed Billet-Steel Bars for Concrete Reinforcement. The grade of steel to be as shown on drawings.

Welded wire fabric shall conform to the requirements of ASTM A-185, "Standard Specifications for Welded Steel Wire Fabric for Concrete Reinforcement".

Expansion Material shall be ASTM D1752, Type III, preformed, self-expanding strips formed of cork particles with a nonbitumen, isolable resin binder, similar to "W.R. Grace Code No. 4324."

All materials and labor required for complete finish are to be included.

All of the Work shall meet the requirement of all governing codes, ordinances, laws, regulations, safety orders and directives.

Provide Expansion Joint Material where indicated on Drawings. Install preformed, self-extending granulated cork strips full depth of joints.

Interior concrete slabs shall be cured with Clear Bond as manufactured by Guardian Chemical Company, Atlanta, Georgia or approved equal by the Owner that can be applied in one coat at the rate of 400 square feet to the gallon and shall meet ASTM C309 (Type 1), TTC-00800 (GSA-Fss), CRD-C-300 and U.S. Corps of Engineers Abrasion Test Method.

Preparation: All work shall be in accordance with ACI-614-59, "Recommended Practice for Measuring, Mixing and Placing Concrete". ACI-614-59 will be republished as ACI-304. All construction debris and extraneous matter shall be removed from within the forms. Struts, stays, bracing and blocks, servicing temporarily to hold the forms in correct shape and alignment, shall be removed. All concrete shall be place on clean damp surfaces, free from water, or upon properly consolidated fills.

Vibration: Concrete shall be consolidated by means of mechanical vibrating. Vibrators shall be inserted and removed vertically at regular intervals to insure uniform consolidation. In no case shall vibrators be used to transport concrete inside the forms. Internal vibrators shall maintain a speed of not less than 7,000 impulses per minute when in operation. At least one standby vibrator shall be on hand at all times.

Cold Weather Batching: No frozen materials or materials containing ice shall be used in cold weather. Temperatures of materials including mixing water, shall not exceed 140°. When placed in forms, the concrete shall have a temperature between 50°F. and 90°F. Work shall be in accordance with ACI-306, "Recommended Practice for Winter Concreting".

Top surface of footings shall receive a floated finish with a Class B tolerance (1/4 inch in 10 feet).

All interior floor slabs shall receive a troweled finish in accordance with ACI 301, Section 1104(c) with a Class A tolerance (1/8 inch in 10 feet).

All concrete shall be cured for a period of not less than 7 days. During this curing period, no part of the concrete shall be permitted to become dry. Curing shall be applied and maintained to prevent loss of water from concrete for the duration of the curing period.

Fresh concrete shall be protected from heavy rains, flowing water and mechanical injury. All concrete shall be protected from the sun and drying winds.

604 HARDWARE SPECIFICATIONS

Pull Handle and Plate, 3 1/2" x 14" Plate (Brookline 52A, 700 Series)

Push Plate, 3 1/2" x 14" (Brookline 52, 700 series)

Dead Bolt Lock (Best (1) 67T-6L2-DB-STK-626)

Roof Scuttle Pad Lock (Best (1) 6B-6T-72-M3-R)

Door Closer (Yale Series 50, standard door closer #54)

Door Hinges (3) Full Mortise, standard weight, wrought steel, Anti-friction ball bearing, non rising pin, flush tip, Non-Removable Pins, Satin Chrome finish (Stanley FBB179-26D-NRP)

Roof Scuttle (Bilco Type S-50)

605 MASONRY WALL CONSTRUCTION

The door opening shown on the drawing is to have a reinforced lintel. Construction materials should be 6" & 12" ASTM C90, Grade N, Type 1 hollow core block and Type S mortar.

Face brick shall be standard size (2-1/4" x 3-3/4" x 8"), grade SW, conforming to ASTM designation C216. Color and style to be specified by the Owner.

Wall reinforcing shall be truss type, 9 gauge steel wire conforming to ASTM A82, with side rods deformed. Placed as shown on drawings. Standards: Truss-Mesh (Hohmann & Barnard) - Dur-O-Wall (Dur-O-Wall Mfg. Co.) - Keywall Truss (Keystone).

Mortar joints which are to be exposed or painted shall be struck off flush with the wall surface and when the mortar is partially set, shall be firmly compacted with a round jointing tool. Mortar joints in the face of walls to be covered shall be struck off flush with the face of the wall.

The Masonry Subcontractor shall cooperate with all trades and be responsible for cutting, patching and building-in all work as required.

The door frame is to be grouted

Set and build-in flashings and counter flashings, expansion joints, frames, sleeves, lintels, and anchor inserts, furnished under other Sections, which are incidental to, or support masonry.

Anchors embedded in masonry shall be furnished and installed by the Masonry Contractor. Size and spacing will be shown on drawings.

Flashing, expansion and control joints shall be built-in to masonry and placed as the work progresses. Provide weep holes 24" o.c. at bottom of walls (floor line) and bottom of flashings.

Exterior brick and stone walls above grade shall receive silicone or stearate water-repellent, applied in accordance with manufacturer's instructions. Standards: Toch Brothers - Supertox; Sonneborn S-X Hycon; Toch Brothers Limestone Supertox; Sonneborn Hydrocide Unipel.

All permanently exposed masonry walls, including partitions shall be thoroughly cleaned down on completion, damaged surfaces repaired or replaced and mortar joints pointed to leave the work in a condition acceptable to the Owner. Cleaning and pointing shall be started at the top and worked down. Cleaning of MASONRY, except concrete block and stone, shall be done with fiber brushes using soap powder boiled in water, adding clean, sharp, fine sand to the soap and water mixture where necessary. Excess MORTAR STAINS shall be removed and the entire surfaces rinsed with clean water. Cut out defective mortar joints where necessary and fill the crevices solidly with motar and tool as specified. EXPOSED CONCRETE BLOCK to be rubbed with stone to eliminate excess mortar. Point up all surfaces and leave walls in a condition acceptable to the Owner.

No masonry work shall be permitted when the temperature is less than 32 degrees F. or below 40 degrees F. and falling, unless the following precautions are taken:

1. Below 40 degrees F. but above 32 degrees F.: Heat mortar mixing water, but not above 160 degrees F. Plastic sheets or tarpaulins shall be placed over the newly laid walls.

2. Below freezing, but above 0 degrees F.: In addition to the preceding requirements, sand shall be heated, but not scorched. The working area shall be enclosed with protective coverings and artificial heat shall be provided. When the temperature falls below 20 degrees F., all concrete masonry units shall be heated to at least 50 degrees F. at the job site by the Contractor.

3. Below 0 degrees F.: Construction shall be stopped unless the enclosure is complete and tight. Observe all preceding requirements.

   Masonry shall be protected against freezing for at least 48 hours.

   No masonry shall be laid with or on frozen materials.

606 SUPPLY AND INSTALL DOOR

Hollow metal door and frame are to be supplied and installed. Doors are to be Steelcraft Corp. or approved equal. Door and frame are to be factory primed. Frame is to be grouted. The door is to be fitted with a top cap.

The frame is to be checked for level during construction to assure it remains plumb.

Finish hardware shall be equal to the following:

- Hinges	- Hager, Stanley, McKinney
- Door closer	- Sargent & Co., Yale
- Threshold	- National Guards Products Co.
- Butts	- The Stanley Works
- Push plates & handle	- Brookline Industries Inc.

607 SUPPLY AND INSTALL LOCKWORK

The lockwork to be used is as follows:

- Door	- Best Lock Co., key lock only
- Roof Scuttle	- Best Lock Co., pad lock

All lockwork is to be satin chrome and be keyed to meet City of St. Louis Park specifications.

608 CAULKING

Provide all labor, materials, and equipment necessary for complete caulking work as shown on drawings and specified herein.

All caulking work shall be performed by an experienced, competent Caulking Contractor as per requirements herein.

Interior Caulking: same as exterior.

Exterior Caulking: shall be of a color to closely match the mortar color, 2 part polysulfide base (Thiokol) sealant material meeting requirement of American Standard Specifications for Sealing Compounds for the Building Trade, A116.1 1960 of Shore A or approved equal.

Primer: colorless by caulking manufacturer.

All materials shall be used in accordance with their manufacturer's latest printed instructions.

Caulk expansion joints, control joints, and around entire perimenter of doors and other openings and joints where caulking is otherwise indicated or obviously required on exterior of building(s).

Mix compounds which require field mixing as per manufacturer's instructions. Apply with gun especially for compound, to attain a smooth finish surface, free of wrinkles, air pockets and holes. Compress into joint with tooling rods or paddles to insure conformance of compound to even the smallest surface irregularity. Depth of joint shall be as recommended by Manufacturer of the sealant material. Pack joints required with sealant backer to bring voids to required depth before caulking.

SECTION 700

MANHOLE AND GRAVITY SEWER WORK

701 GENERAL

This Section describes work, equipment and materials to be furnished by the Sewer and Manhole Subcontractor.

All sewer systems are to be finished to a ready-to-operate condition. The Sewer and Manhole Subcontractor is responsible for completing all sewer systems except for pump discharge and floor drain connections.

The accompanying drawings have been drawn close to scale and have some listed dimensions. Care has been taken to maintain accuracy, but it remains the Contractor's responsibility to verify the scaled and listed dimensions.

The Sewer and Manhole Subcontractor bid shall include a list describing the major types of equipment and materials to be used. After acceptance of the bid, changes to this list will not be allowed.

The Sewer and Manhole Subcontractor will assume all responsibility for conforming to rules and regulations of the applicable government agencies and utilities.

The Sewer installation will comply with all requirements of the City of St. Louis Park.

The invert elevations of the sewer are to be determined by the City of St. Louis Park unless otherwise shown on the drawings.

Excavations shall meet local and state safety regulations as applicable.

Backfilling is to be done to the specifications of the City of St. Louis Park.

Elevation and layout drawings will be provided to the City by the Sewer and Manhole Subcontractor.

All construction permits will be obtained by the owner.

702 LAYING OF PIPE AND SETTING OF MANHOLES

All pipe and manholes shall be laid on undisturbed earth. If earth is disturbed or soft the loose earth should be cleared out and replaced with compacted gravel.

703 DRAINAGE AND SEWAGE CONTROL

The Subcontractor shall remove by well points, pumping, bailing, or other acceptable method any water which may accumulate or be found in the trenches or other excavations to be made. He shall take all necessary precautions to keep the trenches and other excavations entirely clear of water during construction of sewers and structures. Newly laid concrete shall be adequately protected from injury resulting from ground water or sewage or from the handling or disposal of water or sewage. No drainage ditches shall be placed within the area to be occupied by any structure except as permitted by the Contractor. Upon completion of new construction, existing sewers shall be restored or otherwise provided with adequate outlets.

The Subcontractor shall at all times have upon the job sufficient pumping equipment ready for immediate use to carry out the intent of this section.

This Subcontractor shall at no time permit effluent contaminated by raw sewage to enter any storm sewer or open ditch.

Where existing sewers or drains are encountered in this work, adequate provisions shall be made for diverting the flow in the existing sewers so that the excavation will be kept dry during the progress of the construction work. Upon the completion of the construction work, the existing sewers shall be restored or otherwise provided with an adequate outlet as directed by the Owner.

704 BACK FILLING

As soon as practicable after the pipes or conduits are constructed and inspected, the trench shall be backfilled. At the sides and top from the subgrade to a level at least one foot above the top of the pipe, selected granular material shall be deposited and carefully compacted by hand or machine tamping or water flushing in layers not to exceed six inches in depth.

In undeveloped property the backfilling shall be completed using the available excavated material, free from boulders, rock, stones, lumber, masonry, debris, or organic material. No stones over ten inches in size shall be used in the backfill. this remaining backfilling of the trench shall be carried up to limits directed by by the owner with suitable allowance for shrinkage.

Backfilling in areas beneath streets or other paved areas shall be accomplished with bank-run gravel and thoroughly compacted in layers not to exceed 8" in depth for the full depth of the trench. Backfill shall be compacted to a minimum of 90% maximum density at optimum moisture content, as determined by the Modified Proctor Test, ASTM D-1557. Subcontractor shall maintain all such areas in a condition satisfactory to the city until permanent repairs are made.

If there is not sufficient excavated material suitable to meet the requirements for backfilling material, the Subcontractor shall make up the deficiency by transporting suitable surplus material from excavations on other parts of the Work to complete the backfill. If still deficient then material shall be hauled from offsite by the Subcontractor.

All material hauled on site for fill or backfill shall be loose dry earth, sand, gravel or bank-run gravel. Aminimum of 6 inches of topsoil shall be used to cover all backfilled and filled areas.

Wherever gas mains, water mains, sewers, etc. cross the sewer trench, 3000 psi design strength concrete shall be used for backfill beneath them. This backfill shall extend from the bottom of the trench up to spring line of the pipe crossing the trench. A rough wooden form shall be used to hold the concrete in place. The thickness of the backfill shall be 6 inches greater than the diameter of the crossing pipe. Concrete so required shall be considered as an addition to the Work.

705 DISPOSAL OF UNSUITABLE MATERIAL

Excavated material shall be used in backfilling around sewers and other structures unless determined by the Owner to be unsuitable. Unsuitable material will be disposed of by the Owner.

706 ROADWAY REPAIR

This work shall include the replacement of all roadway surface damaged or removed due to the construction of the sewers and appurtenant structures. All such work shall be done in accordance with the specifications of the City of St. Louis Park. No permanent road surface repair shall be made until the backfill in the trench and around manholes has settled and the city has given their approval to make such repairs. The maintenance of temporary road surfaces during the peirod of settlement is specified hereinbefore under 704 BACKFILLING. All repairs shall be same type and at least equal to existing pavements. Edges of existing pavement parallel to trench shall be cut to a neat line prior to making a repair.

All the work necessary to make repairs to road surfaces will be included in the bid for sewer construction.

707 WATER TESTS OF SEWER

The entire sewer shall be tested for leakage of water as a measure of infiltration under service as specified herein. Such tests shall be made under the supervision of th Owner and a representative of the local governing agency and subject to their approval.

Storm Water: No storm water, run-off water, downspouts, footing drains (permimeter drains) or sub soil drainage, shall be discharged into any sewer intended for sanitary sewage or industrial waste.

Leakage Limits: Sanitary sewers shall have an infiltration not to exceed 50 gal. per inch diameter per 1000 lineal feet per day.

Sanitary sewers constructed in dry trenches void of sufficient water to effectively test for infiltration shall be suject to an exfiltration test permitting 1.5 times the gallonage of an infiltration test.

Successive sections of complete sewer, each including not less than one manhole structure, shall be tightly bulkheaded at each end, filled with water, checked for leakage and pumped out, so that the entire sewer, including all structures constructed under this Contract shall be tested and rendered acceptable in accordance with the standards and procedures as hereafter stated. Any section found to have leakage in excess of that permitted shall be repaired and retested until leakage is within the limits specified.

Test Procedure: Exfiltration test procedure of each section shall be as follows:

1. Bulkhead: Bulkhead each end of section, tightly and securely, including at least one manhole structure between the bulkheads.

2. Fill: Fill section of sewer with water to a level not lower than a point four (4) feet above the top of the sewer pipe, and not lower than four(4) feet above existing ground water level at the section. Water for test purposes may be pumped from streams or taken from municipal water supply at the option and expense of the Subcontractor.

3. Maintain Water Level: At the elevation determined above for the period of twenty-four (24) hours by measured addition of water, and accurate record of the amount of water in gallons required to maintain the constant level as stated above, shall be kept by the Subcontractor and made available to the Owner.

Pump Out: Pump out all water from the sewer at the end of the test and discharge same into the nearest stream. When a stream is not reasonably available for such discharge, water may be disposed of in the vicinity as directed by the Owner.

Repair: Repair to the satisfaction of the Owner and the city any section of sewer found to permit leakage beyond the limits set forth herein and retest. No portion of the sewer which fails to meet these test requirements will be accepted.

708 MANHOLES

Manholes and special structures shall be constructed at all points indicated on the drawings or as otherwise directed by the Owner. All manholes shall be constructed in accordance with the details given by the city and or these specifications with the more strict specification controlling the work. All concrete shall be 300 psi design strength or as otherwise indicated on drawings. Manholes shall be built with stub connections in the walls for future elevation as directe by the city. All such openings shall be closed with brickwork bulkheads.

Manhole steps shall be steel or cast iron. Steel manhole steps shall be fabricated of 3/4 inch diameter steel bars, cut and bent to shape conforming to the detail shown on the drawings. They shall be hot galvanized after bending. Cast iron manhole steps shall be similar and equal to Clow F-3650 manufactured by James B. Clow and Sons, Chicago, Illinois.

Steps shall be placed 12 inches apart in the walls of the manholes and project out from the wall a uniform distance.

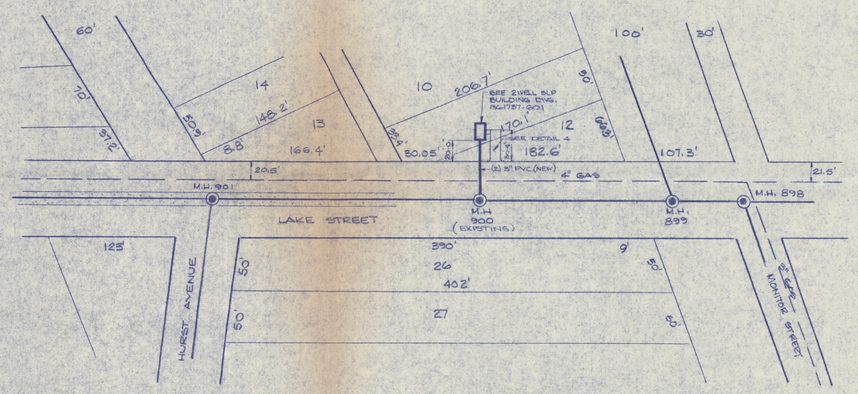
Cast iron frames and covers shall be furnished and placed on each manjole by the Subcontractor. The castings shall meet the requirements of ASTM Specification A-48. They shall be similar and equal to "Neenah R-1772C" unless otherwise specified by the city. Cover and seating ring shall be machined to insure an even, uniform bearing all around. Castings shall be set flush with ground or pavement surface and shall be securely cemented in place. In gravel streets, covers shall be set four inches below the surface.

All surface of concrete channels shall be screeded and floated to a smooth, uniform surface and troweled to a hard finish.

Where shown on the drawings, new sewers will be connected into existing manholes. In such cases, new channels shall be constructed using same type concrete as specified for manholes and special structures.

709 PIPING MATERIALS

The piping will be PVC to meet the city's specifications.

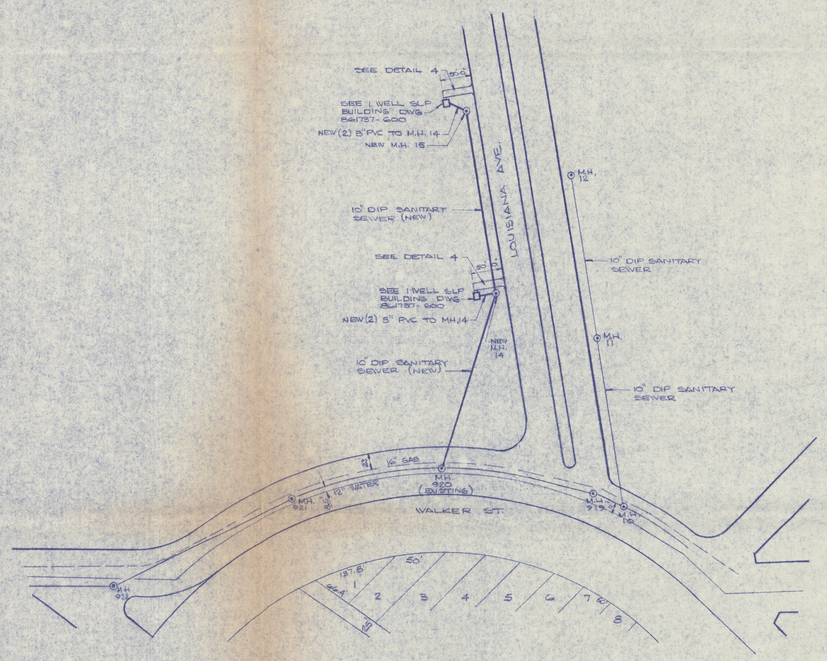


NORTH

DETAIL 1
LAKE STREET 2 WELL SLP BLDG
SCALE: 1" = 60'

NORTH

DETAIL 2
W. 37TH. ST. 1 WELL SLP BLDG
SCALE: 1" = 60'

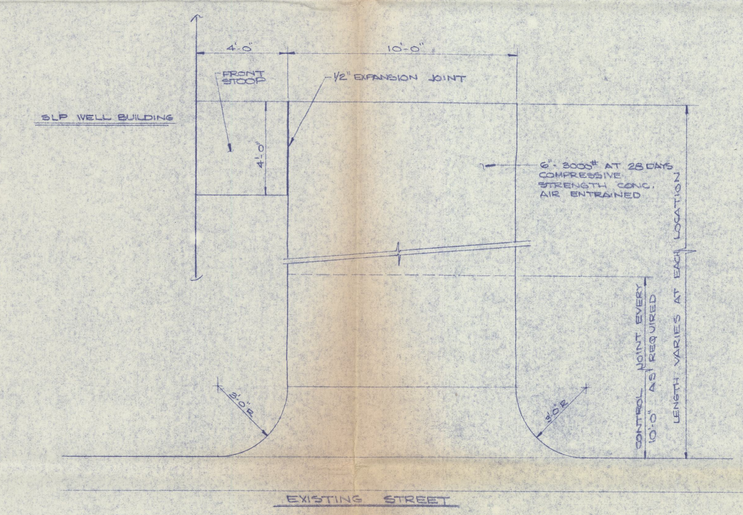


NORTH

DETAIL 3
LOUISIANA AVE 1 WELL SLP BLDG'S.
(2 REQ'D)
SCALE: 1" = 100'

NOTES:

1. LOCATIONS FOR WELL HOUSES ARE APPROXIMATE



DETAIL 4
DRIVEWAYS (4 REQ'D)
SCALE: 1/8" = 1'-0"

PRELIMINARY
NOT TO BE USED
FOR CONSTRUCTION
REILLY TAR & CHEMICAL CORP.

JUL 22 1986

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.

Date July 22, 1986 Reg. No. 017565 0

PHOTOSTAT	DATE:
MICRO FILM	DATE:

REVISIONS

NO.	DATE	BY	DESCRIPTION	CHK'D	APP'D

REVISIONS

NO.	DATE	BY	DESCRIPTION	CHK'D	APP'D

REVISIONS

NO.	DATE	BY	DESCRIPTION	CHK'D	APP'D
I	7/7/86	AK	ADDED DETAIL 4 & CALLED OUT NEW LINES & M.H.S		

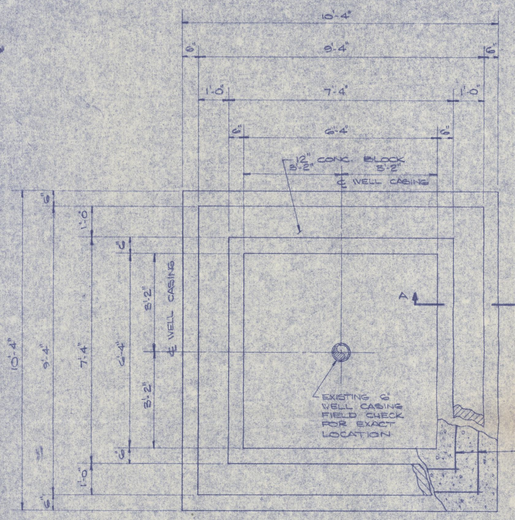
REFERENCE DRAWINGS

DRAWING NUMBER	DESCRIPTION

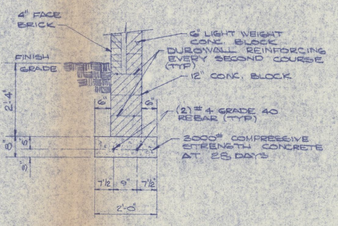
REILLY TAR & CHEMICAL CORPORATION
INDIANAPOLIS INDIANA

ST. LOUIS PARK WELL LOCATIONS

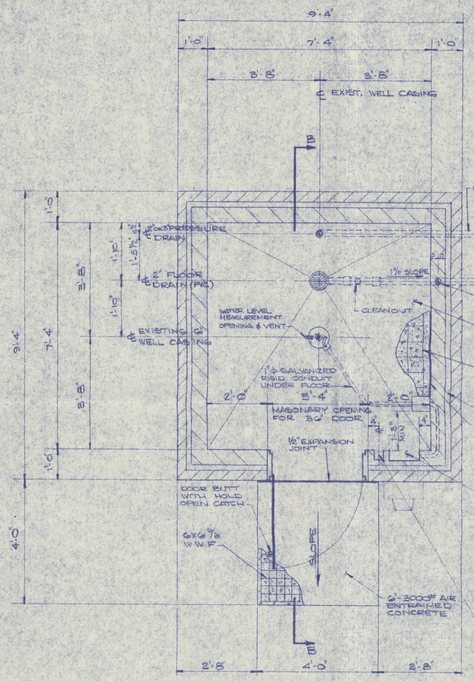
DRAWN BY	DATE	CHECKED BY	DATE	PLANT	REVISION
AK	6/27/86	[illegible]	6/27/86	ST. LOUIS PARK, MINN.	I
SCALE		APPROVED BY	DATE	DRAWING NUMBER	
INDICATED		[illegible]	6/27/86	861757-001	



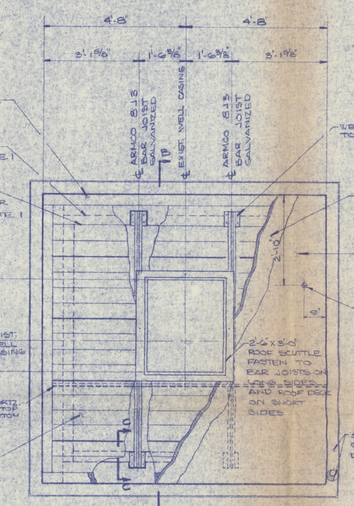
DETAIL 1
FOUNDATION PLAN
SCALE: 1/2"=1'-0"



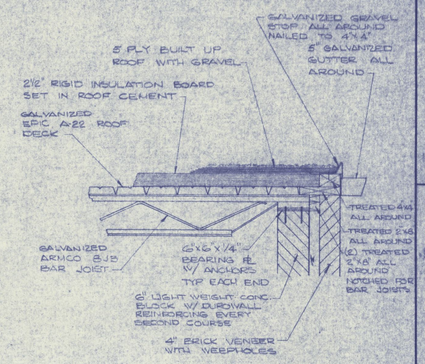
SEC. A-A
FOUNDATION SECTION
SCALE: 1/2"=1'-0"



DETAIL 2
FLOOR PLAN
SCALE: 1/2"=1'-0"

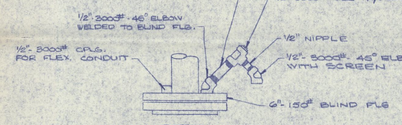


DETAIL 3
ROOF PLAN
SCALE: 1/2"=1'-0"



SEC. C-C
ROOF SECTION
SCALE: 1"=1'-0"

WELL COMPONENT SCHEDULE					
WELL	DISCHARGE SIZE	① FOWELL GATE VALVE FIG/SIZE	② KATES FLOW CONTROLLER / SIZE	③ UNIVERSAL FLUID FLOW MONITOR / SIZE	④ TRY MISSION DUO-CHECK II / SIZE
W 10S SC	2" (REDUCE TO 1½")	500 / 1½" NPT	4FAI-1 / 1½" NPT	MN-CSB 5SG-12-S2 V1.0-0 WR/1½" NPT. INCREASE TO 2" AFTER MONITOR	K15 HMF/2"
W 23 SC	2"	515/2 FLGD	5 FAI-1/2" FLGD	LN-CS B1SOG-16-S2V1.0-0WR/2" NPT	K15 HMF/2"
D-P6C	2"	515/2 FLGD	5FAI-1/2" FLGD	LN-CSB 1SOG-16-S2 V1.0-0WR/2" NPT	K15HMF/2"

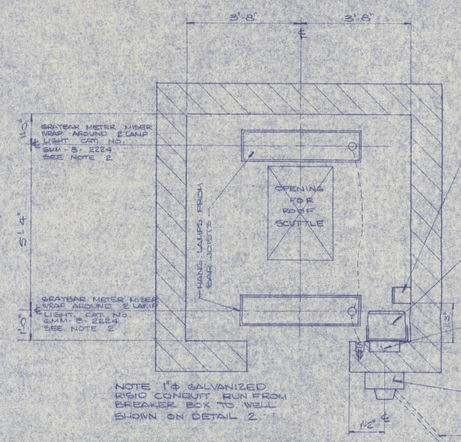


DETAIL D
VENT DETAIL (BREQ'D)
SCALE: 1½"=1'-0"

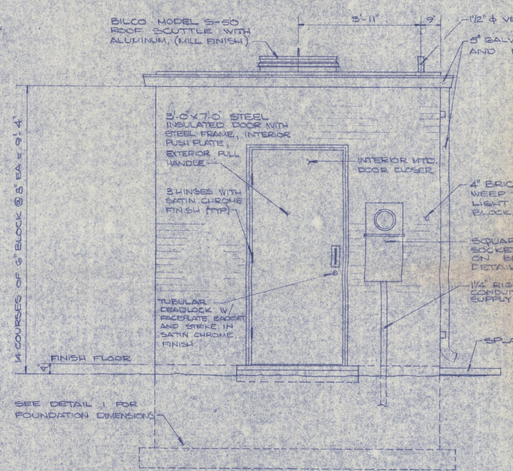
NOTES

1. TREATED 4x4 MUST BE CUT DOWN FOR A TOTAL THICKNESS OF 5½" TO MATCH INSULATION THICKNESS. (2) TREATED 2x8 MUST BE CUT DOWN FOR A TOTAL THICKNESS OF 5½" TO MATCH BAR JOIST BEARING END THICKNESS.

2. 3/4" RIGID CONDUIT IN WALL TO BOXES ABOVE EACH LIGHT AND BOX BEHIND HEATER, THEN FLEX CONDUIT TO LIGHTS AND HEATER

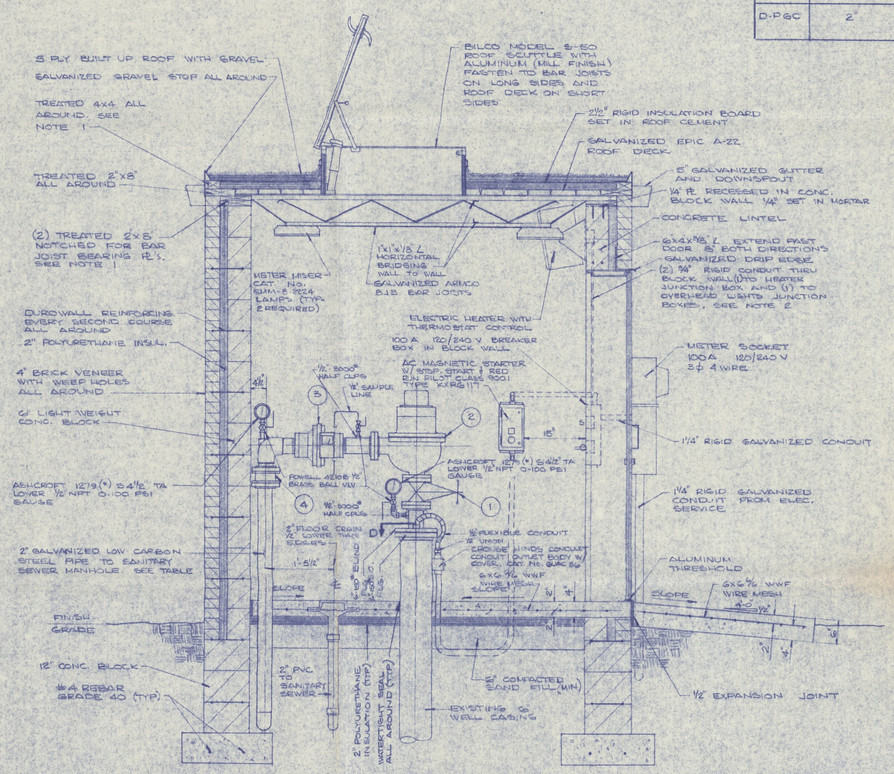


DETAIL 4
ELECTRICAL PLAN
SCALE: 1/2"=1'-0"



DETAIL 5
FRONT ELEVATION
SCALE: 1/2"=1'-0"

NOTE: ALL SIDES SIMILAR



DETAIL 6
SEC. B-B
SCALE: 3/4"=1'-0"

PRELIMINARY
NOT TO BE USED
FOR CONSTRUCTION
REILLY TAR & CHEMICAL CORP.

JUL 22 1986

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.

Date July 22, 1986 Reg. No. 017565.0

PHOTOSTAT	DATE:
MICRO FILM	DATE:

REVISIONS																							
NO.	DATE	BY	DESCRIPTION	CHK'D	APP'D	NO.	DATE	BY	DESCRIPTION	CHK'D	APP'D	NO.	DATE	BY	DESCRIPTION	CHK'D	APP'D	DRAWING NUMBER	DESCRIPTION

REILLY TAR & CHEMICAL CORPORATION
INDIANAPOLIS INDIANA

1 WELL SLP BUILDING – 3 REQUIRED

DRAWN BY	DATE	CHECKED BY	DATE	PLANT	REVISION
A.K.	6/18/86	[illegible]	7/22/86	St. Louis Park, Minn.	
SCALE		APPROVED BY	DATE	DRAWING NUMBER	
INDICATED		[illegible]	7/22/86	861737.000	