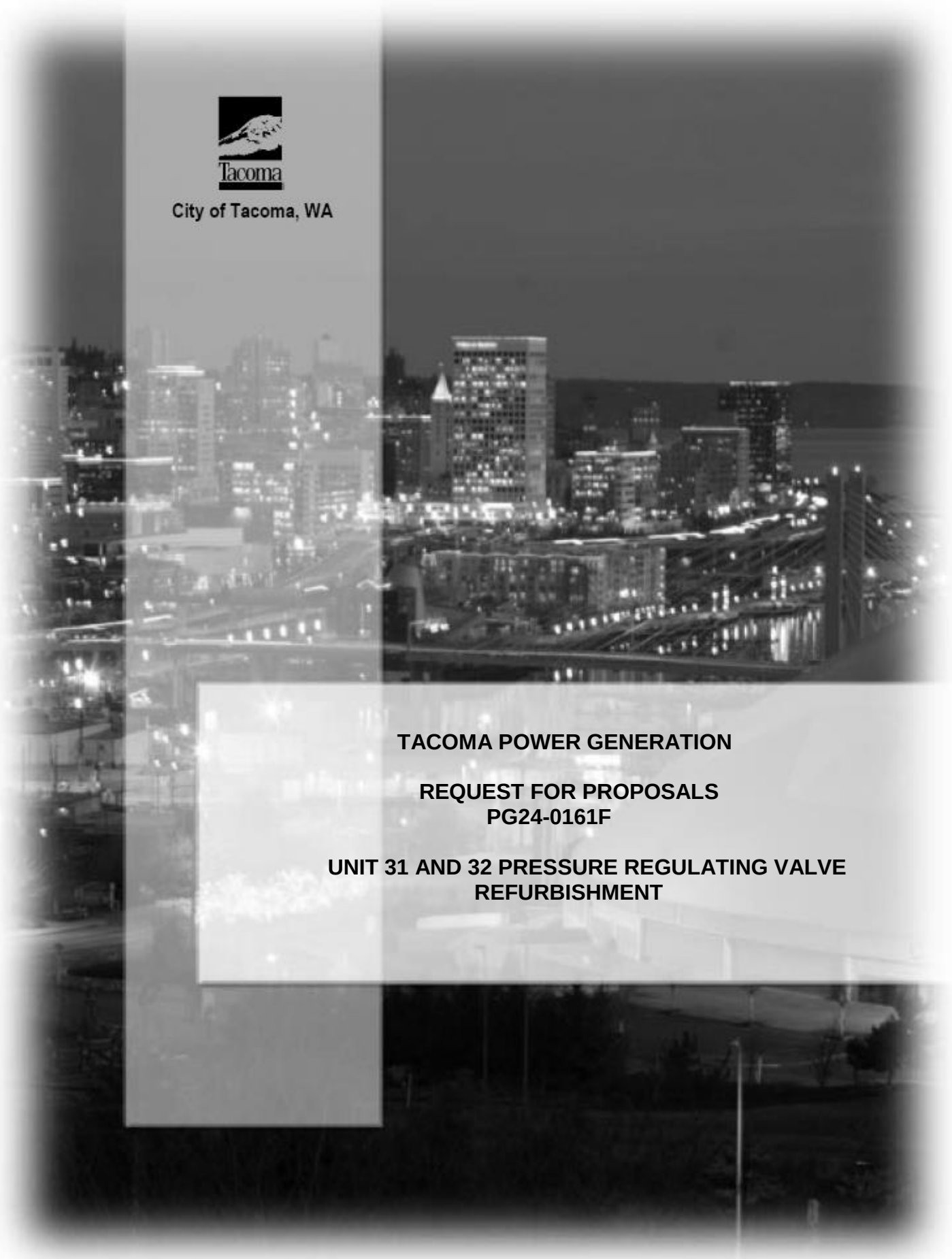

City of Tacoma, WA

TACOMA POWER GENERATION

REQUEST FOR PROPOSALS
PG24-0161F

UNIT 31 AND 32 PRESSURE REGULATING VALVE REFURBISHMENT

City of Tacoma
Power Generation Engineering

REQUEST FOR PROPOSALS PG24-0161F
Unit 31 and 32 Pressure Regulating Valve Refurbishment

Submittal Deadline: 11:00 a.m., Pacific Time, Tuesday January 14, 2025

Submittals must be received by the City's Procurement and Payables Division prior to 11:00 a.m. Pacific Time. For electronic submittals, the City of Tacoma will designate the time of receipt recorded by our email, sendbid@cityoftacoma.org, as the official time of receipt. This clock will be used as the official time of receipt of all parts of electronic bid submittals. Late submittals will be returned unopened and rejected as non-responsive.

Submittal Delivery: Sealed submittals will be received as follows:

By Email: sendbid@cityoftacoma.org Maximum file size: 35 MB. Multiple emails may be sent for each submittal.

Bid Opening: Submittals must be received by the City's Procurement and Payables Division prior to 11:00 a.m. Pacific Time. Sealed submittals in response to a RFB will be opened Tuesday's at 11:15 a.m. by a purchasing representative and read aloud during a public bid opening held at the Tacoma Public Utilities Administrative Building North, 3628 S. 35th Street, Tacoma, WA 98409, conference room M-1, located on the main floor. They will also be held virtually Tuesday's at 11:15 a.m. Attend via this link or call 1 (253) 215 8782. Submittals in response to an RFP, RFQ or RFI will be recorded as received. As soon as possible, after 1:00 PM, on the day of submittal deadline, preliminary results will be posted to www.TacomaPurchasing.org.

Solicitation Documents: An electronic copy of the complete solicitation documents may be viewed and obtained by accessing the City of Tacoma Purchasing website at www.TacomaPurchasing.org.

- Register for the Bid Holders List to receive notices of addenda, questions and answers and related updates.
- Click here to see a list of vendors registered for this solicitation.

Pre-Proposal Meeting: A pre-proposal meeting will not be held.

Project Scope: This project involves the dismantling, inspecting, and refurbishing of the Units 31 and 32 Scroll Case Pressure Regulating Valve (PRV) at Cushman Powerhouse #2, owned and operated by Tacoma Power. The work will occur during the Unit 31 and 32 overhaul outage, requiring close coordination with the City and on-site contractors to align schedules, manage logistics, and ensure efficient use of plant resources. The successful completion of this project is critical to the ongoing operation and reliability of the Cushman #2 Powerhouse.

Estimate: $1,100,000

Paid Sick Leave: The City of Tacoma requires all employers to provide paid sick leave as set forth in Title 18 of the Tacoma Municipal Code and in accordance with State of Washington law.

Americans with Disabilities Act (ADA Information: The City of Tacoma, in accordance with Section 504 of the Rehabilitation Act (Section 504) and the Americans with Disabilities Act (ADA), commits to nondiscrimination on the basis of disability, in all of its programs and activities. Specification materials can be made available in an alternate format by emailing the contact listed below in the *Additional Information* section.

Title VI Information:
"The City of Tacoma" in accordance with provisions of Title VI of the Civil Rights Act of 1964, (78 Stat. 252, 42 U.S.C. sections 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises

will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin in consideration of award.

Additional Information: Requests for information regarding the specifications may be obtained by contacting Ryan Foster, Senior Buyer by email to rFoster1@cityoftacoma.org.

Protest Policy: City of Tacoma protest policy, located at www.tacomapurchasing.org, specifies procedures for protests submitted prior to and after submittal deadline.

Meeting sites are accessible to persons with disabilities. Reasonable accommodations for persons with disabilities can be arranged with 48 hours advance notice by calling 253-502-8468.

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SUBMITTAL CHECK LIST

This checklist identifies items to be included with your submittal. Any submittal received without these required items may be deemed non-responsive and not be considered for award.

Submittals must be received by the City of Tacoma Purchasing Division by the date and time specified in the Request for Proposal page.

The following items make up your submittal package:	
One electronic copy of your complete submittal package	
Signature Page (Appendix B)	
Price Proposal Form (Appendix B)	
Record of Prior Contracts (Appendix B)	
List of Equipment Form (Appendix B)	
Content to Be Submitted (Section 9)	
After award, the following documents will be executed:	
Services Contract (Appendix C)	
Certificate of Insurance and related endorsements (Appendix C)	

1. BACKGROUND

This specification includes shipping, shop dismantling, inspection, refurbishment, shop reassembly, and return shipping of the Units 31 & 32 Scroll Case Pressure Regulating Valves (PRVs) located at Cushman #2 Powerhouse. The Cushman #2 Powerhouse is Owned and Operated by Tacoma Power.

To learn more about the City of Tacoma, visit www.cityoftacoma.org.

The City anticipates awarding one Contract.

Submittals submitted and/or the selected Consultant(s) may be used for projects of similar type and scope at the sole discretion of the City for up to one year.

2. MINIMUM REQUIREMENTS

The bidder shall have at least seven (7) years experience of delivering projects of similar scope and complexity.

3. CONTRACT TERM

The Contract will be for a three (3) year period. The City reserves the right to cancel the contract for any reason, by written notice, as stipulated in the contract.

4. CALENDAR OF EVENTS

This is a tentative schedule only and may be altered at the sole discretion of the City.

Contract may be issued after Public Utility Board and/or City Council approval.

The anticipated schedule of events concerning this RFP is as follows:

Publish and issue RFP:	**12/9/2024**
Pre-Submittal Questions:	**12/16/2024**
Response to Questions:	**12/20/2024**
Submittal Due Date:	**1/14/2025**
Submittal Evaluated:	**January 2025**
Award Recommendation:	**January 2025**
Public Utility Board/City Council Approval:	**February 2025**

5. INQUIRIES

5.1 Questions should be submitted to Ryan Foster via email to rfoster1@cityoftacoma.org. Subject line to read:

PG24-0161F – Unit 31 and 32 Pressure Regulating Valve Refurbishment – *VENDOR NAME*

5.2 Questions are due by 3 pm on the date included in the *Calendar of Events* section.

5.3 Questions marked confidential will not be answered or included.

5.4 The City reserves the discretion to group similar questions to provide a single answer or not to respond when the requested information is confidential.

5.5 The answers are not typically considered an addendum.

5.6 The City will not be responsible for unsuccessful submittal of questions.

5.7 Written answers to questions will be posted along side the specifications at www.tacomapurchasing.org

6. PRE-PROPOSAL MEETING

6.1 No pre-proposal meeting will be held; however, questions and request for clarifications of the specifications may be submitted as stated in the inquiries section.

7. DISCLAIMER

The City is not liable for any costs incurred by the Respondent for the preparation of materials or a submittal submitted in response to this RFP, for conducting any presentations to the City, or any other activities related to responding to this RFP, or to any subsequent requirements of the contract negotiation process.

8. EVALUATION CRITERIA

A Selection Advisory Committee (SAC) will review and evaluate submittals. The relative weight of each scoring criteria is indicated in the table below.

Criteria	**Max Points**
Qualifications/Experience of Firm	**10**
Approach and Schedule	**20**
Examples of Projects	**10**
Client References	**10**
Cost	**40**
Qualifications / Experience of Key Personnel	**5**
Equity in Contracting	**5**
Total	**100**

After the evaluation, the SAC may conduct interviews of the most qualified Respondents before final selection.

8.1 The SAC may select one or more respondent to provide the services required.

8.2 The City reserves the right to visit facilities of selected Respondents for the purpose of shop inspection and witnessing any and all work performed under this contract.

8.3 The SAC may use references to clarify information in the submittals and interviews, if conducted, which may affect the rating. The City reserves the right to contact references other than those included in the submittal.

8.4 A significant deficiency in any one criteria is grounds for rejection of the submittal as a whole.

9. CONTENT TO BE SUBMITTED

Proposals should formatted as 8 ½" x 11". A "page" is defined as one single-side of a document that has written text or graphics. The font should be Times New Roman or Arial with font size no smaller than 11 and the margins shall be 0.75" or greater. Submittals should be limited to a maximum of 10 pages, double-sided, or 20 pages total, excluding any required forms or resumes. All pages that exceed the specified page limit will not be part of the evaluation.

A full and complete response to each of the "CONTENT TO BE SUBMITTED" items is expected in a single location; do not cross reference to another section in your submittal.

Information that is confidential must be clearly marked and provide an index identifying the affected page number(s) and locations(s) of such identified materials. See Section 1 of the Standard Terms and Conditions – Solicitation 1.06 for Public Disclosure : Proprietary or Confidential Information.

Respondents are to provide complete and detailed responses to all items below. Submittals that are incomplete or conditioned in any way that contain alternatives or items not called for in this RFP, or not in conformity with law, may be rejected as being non-responsive. The City will not accept any submittal containing a substantial deviation from the requirements outlined in this RFP.

Submittals should present information in a straightforward and concise manner, while ensuring complete and detailed descriptions of the respondent's/team's abilities to meet the requirement of this RFP. Emphasis will be on completeness of content. The written submittals should be prepared in the sequential order as outlined below.

The City reserves the right to request clarification of any aspect of a firm's submittal, or request additional information that might be required to properly evaluate the submittal. A firm's failure to respond to such a request may result in rejection of the firm's submittal. Firms are required to provide responses to any request clarification within two (2) business days.

Requests for clarification or additional information shall be made at the sole discretion of the City. The City's retention of this right shall no way diminish a Proposer's responsibility to submit a submittal that is current, clear, complete and accurate.

In addition to the items listed in the Checklist, the bidders shall submit with their bid package the following information. This information will be used for evaluation purposes.

9.1 Qualifications/Experience of Firm – 10

Describe your company's ability to provide the service.

9.2 Approach and Schedule – 20

A summary of the including procedures and equipment to be employed in the refurbishment of major components, any special techniques to be incorporated, and contingency plans if problems occur with the proposed techniques or if primary equipment fails.

A proposed list of items to be subcontracted, the proposed subcontractor for each item, and addresses of all shops involved in refurbishment activities.

A proposed detailed project schedule, in Gantt chart format, providing the major milestones, testing, and witness hold points and overall project completion.

Provide a transportation plan for transport of the equipment to and from the City.

Alternate approach if any proposed including identification of work to be pursued to a time-and-materials basis with rationale and proposed alternatives for the specified refurbishment actions with explanation as to how they improve value to the City.

9.3 Examples of Projects – 10 points

A description of at least three (3) completed comparable projects of similar scope, complexity, and overall cost completed by company and proposed technical advisor including scope of Contractor’s work, status of the contract, lessons learned, and client contact information (name/ email/ phone number) for each.

9.4 Client References – 10 points

Provide three client references able to verify the firm’s overall expertise for this type of work. The references must have worked with the firm within the last year. Provide complete information such as name of company, contact person, address, phone number, and email address.

9.5 Cost – 40 points

Complete the Price Proposal form and include Contractor’s rate sheet for all trades involved in the refurbishment.

9.6 Qualifications / Experience of Key Personnel – 5 points

List key personnel that will handle the project. The personnel listed must be committed to this project for the expected term of the agreement. Include a brief bio or resume outlining the experience of the key personnel that will be involved.

Name and resume of technical advisor. Technical advisor shall have a minimum of seven (7) documented years experience in relevant hydro design, refurbishment, and/or construction.

9.7 Equity in Contracting – 5 points

Is your firm, or the firm you are partnering with, certified with Washington State for any of the below categories. Confirmation of any of the below certifications will result in all points for this category.

☐ Combination Business Enterprise (CBE)

☐ Disadvantaged Business Enterprise (DBE)

☐ Minority Business Enterprise (MBE)

☐ Minority/Women Business Enterprise (MWBE)

☐ Small Business Enterprise (SBE)

☐ Socially and Economically Disadvantaged Business Enterprise (SEDBE)

☐ Women Business Enterprise (WBE)

10. INTERVIEWS / ORAL PRESENTATIONS

An invitation to interview may be extended to Respondents based on SAC review of the written submittals. The SAC reserves the right to adjust scoring based on additional information and/or clarifications provided during interviews. The SAC may determine additional scoring criteria for the interviews following evaluation of written submittals.

The City reserves all rights to begin contract negotiations without conducting interviews.

Respondents must be available to interview within three business days notice.

If interviews are conducted, the SAC will schedule the interviews with the contact person provided in the SOQs. Additional interview information will be provided at the time of invitation. At this time, it is anticipated that the main objective of the interview will be for the SAC to meet the project manager and key personnel that will have direct involvement with the project and hear about their relevant experience and expertise. The City does not intend to meet with firm officials unless they are to be directly involved with the project.

Following interviews, submittals will be rescored using the same criteria as in Section 10 above.

11. RESPONSIVENESS

Respondents agree their submittal is valid until a contract(s) has been executed.

All submittals will be reviewed by the City to determine compliance with the requirements and instructions specified in this RFP. The Respondent is specifically notified that failure to comply with any part of this RFP may result in rejection of the submittal as non-responsive. The City reserves the right, in its sole discretion, to waive irregularities deemed immaterial.

The final selection, if any, will be that submittal which, after review of submissions and potential interviews, in the sole judgement of the City, best meets the requirements set forth in this RFP.

12. ACCEPTANCE / REJECTION OF SUBMITTALS

Respondents are advised that the City reserves the right to cancel award of this Contract at any time before execution of the Contract by both parties if cancellation is deemed to be in the City's best interest. In submitting a Submittal, Respondents agree that the City is not liable for any costs or damages for the cancellation of an award.

The City reserves the right and holds at its discretion the following rights and options:

- To waive any or all informalities
- To award one or more contracts
- To not award a contract
- To issue subsequent solicitation

13. CONTRACT OBLIGATION

Awardee shall be required to comply with 2 CFR part 25, and obtain a unique entity identifier and/or be registered in the federal System for Award Management as appropriate.

The selected Respondent(s) will be expected to execute a contract with the City. As part of the negotiation process, Respondents may propose amendments to the contract, but the City, at its sole option, will decide whether to open discussion on each proposed amendment and determine the final contract to be used. At a minimum, any contract will incorporate the terms and conditions contained herein. The Submittal contents of the successful Respondent may become contractual obligations if a contract ensues.

14. STANDARD TERMS AND CONDITIONS

City of Tacoma Standard Terms and Conditions apply.

15. INSURANCE REQUIREMENTS

Successful proposer will provide proof of and maintain the insurance coverage in the amounts and in the manner specified in the City of Tacoma Insurance Requirements contained in this solicitation.Please see Appendix C.

16. PARTNERSHIPS

The City will allow firms to partner in order to respond to this RFP. Respondents may team under a Prime Respondent's submittal in order to provide responses to all sections in a single submission; however, each Respondent's participation must be clearly delineated by section. The Prime Respondent will be considered the responding vendor and the responsible party at contract award. All contract negotiations will be conducted only with the Prime Respondent. All contract payments will be made only to the Prime Respondent. Any agreements between the

Prime Respondent and other companies will not be a part of the agreement between the City and the Prime Respondent. The City reserves the right to select more than one Prime Respondent.

17. COMMITMENT OF FIRM KEY PERSONNEL

The Respondent agrees that key personnel identified in its submittal or during contract negotiations as committed to this project will, in fact, be the key personnel to perform during the life of this contract. Should key personnel become unavailable for any reason, the selected Respondent shall provide suitable replacement personnel, subject to the approval of the City. Substantial organizational or personnel changes within the agency are expected to be communicated immediately. Failure to do so could result in cancellation of the Contract.

18. AWARD

After the Respondent(s) is selected by the SAC and prior to award, all other Respondents will be notified via email by the Purchasing Division.

Once a finalist (or finalists) has been selected by the Selection Advisory Committee, contract negotiations with that finalist will begin, and if a contract is successfully negotiated, it will, if required, be submitted for final approval by the Public Utility Board and/or City Council.

19. ENVIRONMENTALLY PREFERABLE PROCUREMENT

In accordance with the City's Sustainable Procurement Policy and Climate Action Plan, it is the policy of the City of Tacoma to encourage the use of products or services that help to minimize the environmental and human health impacts of City Operations. Respondents are encouraged to incorporate environmentally preferable products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. This comparison may consider raw materials acquisition, products, manufacturing, packaging, distribution reuse, operation, maintenance or disposal of the product or service.

The City of Tacoma encourages the use of sustainability practices and desires any awarded contractor(s) to assist in efforts to address such factors when feasible for:

- Durability, reusability, or refillable;
- Pollutant releases, especially persistent bioaccumulative toxins (PBTs), low volatile organic compounds (VOCs), and air quality and stormwater impacts;
- Toxicity of products used;
- Greenhouse gas emissions, including transportation of products and services, and embodied carbon
- Recycled content;
- Energy and water resource efficiency;

20. PROPRIETARY OR CONFIDENTIAL INFORMATION

The Washington State Public Disclosure Act (RCW 42.56 et seq.) requires public agencies in Washington make public records available for inspection and copying unless they fall within the specified exemptions contained in the Act, or are otherwise privileged. Documents submitted under this RFP shall be considered public records and, with limited exceptions, will be made available for inspection and copying by the public.

Information that is confidential or proprietary must be clearly marked. Further, an index must be provided indicating the affected page number(s) and location(s) of all such identified material. Information not included in said index will not be reviewed for confidentiality or as proprietary before release.

21. ADDENDUMS

In the event it becomes necessary to revise any part of this RFP, an addendum will be posted alongside specifications at www.tacomapurchasing.org. Failure to acknowledge addendum(s) on the required Signature Page may result in a submittal being deemed non-responsive by the City.

22. LEAP REQUIREMENTS

This project has no LEAP requirements, however, the City of Tacoma is committed to equality in employment for WA-State approved Apprentices, City of Tacoma residents, residents of local economically distressed areas, youth, veterans, minorities, and women. Please contact the LEAP Office for assistance in locating qualified employees. Visit the LEAP website for more information.

23. EQUITY IN CONTRACTING

This project has no EIC requirements, however, the City of Tacoma is committed to encouraging firms certified through the Washington State Office of Minority and Women's Business Enterprise to participate in City contracting opportunities. See **TMC 1.07 Equity in Contracting Policy** at the City's Equity in Contracting Program website.

APPENDIX A

Division 1 Special Provisions

Technical Specifications

Drawings

MASTER SPECIFICATION

SPECIFICATION NO. PG24-24-0161F

These Special and Technical Specifications
have been prepared under the direction of a
licensed Professional Engineer, registered
in the State of Washington

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DIVISION 1 - SPECIAL PROVISIONS

SECTION 01010 - SUMMARY OF WORK

1.1 PROJECT DESCRIPTION

This specification includes shipping, shop dismantling, inspection, refurbishment, shop reassembly, and return shipping of the Units 31 and 32 Scroll Case Pressure Regulating Valves (PRVs) located at Cushman #2 Powerhouse. The Cushman #2 Powerhouse is Owned and Operated by Tacoma Power. The project will be performed during the Unit Overhaul Outages for Units 31 and 32, respectively, and will require coordination with the City and other on-site contractors for schedule, use of plant resources and logistics.In all cases, the City's contract is with one (1) general Contractor and it is the general Contractor's responsibility to ensure all work required to provide a complete and operational facility is included in their bid. When possible, the City has attempted to reference work which should be coordinated with various trades, but it is the Contractor's responsibility to coordinate and schedule the work of all subcontractors, trades, and suppliers to assure the proper and timely prosecution and completion of all items of work.

1.2 PROJECT LOCATION

This project is located at the Cushman Powerhouse #2, 21451 N. Highway 101, Shelton, WA, 98584, and as shown on Tacoma Power Drawing No. B21044. The project is located in Mason County, Washington.

1.3 COMMENCEMENT, PROSECUTION AND COMPLETION

The Contractor shall begin the work to be performed in the contract within ten (10) calendar days after the date of notification to commence work. Notification to commence work may either be by letter or, if no letter is issued, by agreement at the project kickoff meeting (or if no letter is issued, by the date the contract is executed by the City).

Unless otherwise agreed upon between the City and the Contractor, the Contractor shall be required to complete all work for each PRV and return the equipment to site within one hundred and eight **(108) calendar days** after the requested date of transport from the project site, inclusive of shipping time. If the Contractor fails to complete all work and return the equipment to the project site within **one hundred and eight (108) calendar days**, the City will assess liquidated damages in accordance with Standard Terms and Conditions. The amount of liquidated damages set forth is hereby set to $5000 per day.

Anticipated dates for transport of the PRVs from the project site will be March to April 2025 for Unit 32 and March to April 2026 for Unit 31.

The Contractor shall begin purchasing material required for all work to be performed in the contract within thirty (30) calendar days after the date of notification to commence work. All material necessary to complete the job shall be staged and inspected by a City engineer before any work will be started. Schedule submitted shall include time necessary for obtaining material, with consideration and provisions to complete work before the completion date.

1.4 SPECIFICATION FORMAT

This specification is written and formatted for use with Public Works specifications and is numbered to be consistent with other specifications, including the Construction Specifications Institute (CSI) format, as modified by the City. It is not intended to indicate what work is to be accomplished by various subcontractors on the project. In all cases, the City's contract is with one (1) general Contractor and it is the general Contractor's responsibility to ensure all work required to provide a complete and operational facility is included in their bid.

The numbering system in the Special Provisions Section reflects standard provisions written by the City and assigned constant numbers. Thus, gaps will appear when specific sections are not used.

1.5 QUALIFICATION OF CONTRACTORS

A. QUALIFIED CONTRACTORS

Only Contractors with management, employees, and staff experienced in the type of work required by this specification, and with a record of successful completion of projects of similar scope, complexity, and overall cost will be considered. The bidder must complete the Contractor's Record of Prior Contracts form attached to this specification at the time of submitting their bid. The City will be the sole judge of the bidder's ability to meet the requirements of this paragraph. Bidders past work will be judged in the complexity of the job, time of completion, organization, and other factors that may indicate the abilities of the Contractor.

B. QUALIFIED TECHNICAL ADVISOR

The Contractor shall employ a competent technical advisor as referenced in Section 01040 – Project Coordination, Paragraph 1.8 – Technical Advisor.

1.6 SPECIFICATIONS AND DRAWINGS

The following drawings, attached to these specifications, are made a part of the contract:

Drawings for Reference – Units 31 and 32

Drawing No.	Sheet No.	Title
B21017	1	SHIFTING RING
B21019	1	54" DISCHARGE ELBOW
B21031	1	VALVE SEAT CASING AND BASE
B21033	1	CYLINDER HEAD
B21034	1	BELL CRANK LEVER
B21035	1	DASH POT CYLINDER
B21038	1	REGULATING DIAGRAM
B21039	1	12 INCH DASH POT PISTON
B21040	1	REGULATING CONNECTIONS
B21041	1	VALVE BODY FOR 7 INCH REGULATING VALVE
B21043	1	CROSS SECTION OF 37.5 HP UNIT

B21044	1	PLAN VIEW OF 37.5 HP UNIT
B21045	1	ASSEMBLY OF PRESSURE REGULATOR
B21050	1	GUIDE RING
B21055	1	VALVE SEAT RINGS
B21056	1	49 INCH CYLINDER
B21064	1	YOKE AND LINING
B21070	1	DETAILS 7 INCH REG VALVE
B21072	1	7 INCH DIA REGULATING VALVE
B21087	1	DISCHARGE PIPE FOR PRESSURE REGULATOR
B21088	1	PIPING CONNECTION BETWEEN PRESS REG + TURBINE DRAFT TUBE
B21092	1	PRESSURE REGULATOR DISCHARGE
B21097	1	POWER HOUSE ARRANGEMENT – PLATE 1
B21098	1	POWER HOUSE ARRANGEMENT – PLATE 2
B21099	1	STRAINERS & PIPING
B21100	1	CONNECTION BETWEEN SHIFTING RING &PRESSURE REGULATOR
B21104	1	ANVIL PLATE AND SIDE PLATE FOR PRESSURE REGUALTOR DISCHARGE
B21105	1	DRAIN PIPINGS
B21106	1	PRESSURE REGULATOR PLATFORM
B21578	1	FLANGED BUSHING
B21585	1	PISTON GLAND AND BUSHINGS

1.7 WORK BY CITY

Reference Section 01040, Paragraph 1.5, Division of Work, for Work Done by City.

1.8 PRICE ESCALATION/DE-ESCALATION CLAUSE

The City intends this contract to be a three (3) year contract for 2025-2027 with an option to renew for one (1) additional one (1) year renewal options in the case that the outage window(s) for one or both units shift. The price guarantee shall be for an initial period of three (3) years with the price increases for option years as stated herein.

If the contract is extended, effective January 1, 2028, the price for each job, except minus cost plus material and force account, will be increased by an amount equal to 90-percent of the increase in the U.S. Bureau of Labor Statistics' Producer Price Index (PPI) by industry: Machine Shops. All proposal items except material plus force account will be increased based on the percentage difference between rates published in January 2025 as compared to the rates published for January 2028 (or most recent).

END OF SECTION

SECTION 01025 - MEASUREMENT AND PAYMENT

1.1 ADMINISTRATION

A. AUTHORITY

The project manager in coordination with the Contractor shall make all measurements and determine all quantities and amounts of work done for progress payments under the contract.

The project manager's determination of progress payments shall be conclusive. The City will not pay for material not under City control.

In case work is suspended, nearly suspended, or in case only unimportant progress is being made, the project manager may, at their discretion, make progress estimates at longer intervals than once a month.

Invoices shall be emailed to the attention of:

Tacoma Power
Generation Engineering
3628 South 35th Street
Tacoma, Washington 98409
n-tromay@cityoftacoma.org

NOTE: All questions regarding contract status or payments should be directed to the project engineer.

B. UNIT QUANTITIES SPECIFIED

Quantities indicated in the proposal are for bidding and contract purposes only. Quantities and measurements supplied or placed in the work and verified by the engineer and Contractor determine payment.

Adjustments to contract prices due to changes in quantity shall be in accordance with the latest edition of the Standard Specifications, unless otherwise modified by this specification.

The City reserves the right to delete any bid item from the contract by notifying the Contractor in writing of its intent. In the event of deleted work, the Contractor's sole compensation shall be the money due the Contractor for materials that had been purchased and obtained by the Contractor prior to the deletion of the work.

C. CONTRACT PRICE

The lump sum and unit bid prices shall be full and complete compensation for the contract work stated, together with all appurtenances incidental thereto, including materials, equipment, tools, labor, and all the costs to the Contractor for completing the contract in accordance with the plans, specifications, and instructions of the engineer.

All work not specifically described or mentioned in these specifications but required to be constructed to achieve complete and operable systems, structures or amenities shall be considered incidental items of work, not separately compensable, and its price included in items of work specified in the specifications.

D. NON-PAYMENT FOR REJECTED OR SURPLUS PRODUCTS

Payment will not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable
2. Products determined as unacceptable before or after placement

3. Products not completely unloaded from the transporting vehicle
4. Products placed beyond the lines and levels of the required work
5. Products remaining on hand after completion of the work
6. Loading, hauling and disposing of rejected products

E. WORK INCIDENTAL TO BID ITEMS

The following list indicates work which shall be considered incidental to the appropriate bid item as listed in the proposal:

1. Coordination meetings with site teams and other contractors
2. Shop visits and inspections by City or City's representative

1.2 PROGRESS PAYMENTS

1. Progress payment for the work shall be made as follows –

   Proposal Item 1 and 2 –

   10% upon receipt of PRV at machine shop

   60% upon completion of refurbishment and acceptance of refurbishment by the City prior to shipping of the PRV and parts/ materials to Site

   25% upon receipt and inspection of PRV and parts/ materials at Site

   5% upon completion of City's installation and testing of PRV and receipt of final drawings, and documentation form the Contractor.

   For optional bid items, 100% payment for completed portion of the work once work is received and accepted by the City.

   Any additional costs when approved by the City will be paid to the Contractor per the progress payment schedule laid out for Items 1 and 2.

1.3 FORCE ACCOUNT WORK

In certain circumstances, the Contractor may be required to perform additional work. Where the work to be performed is determined to be extra and not attributed to the Contractor's negligence, carelessness, or failure to install permanent controls, it shall be paid in accordance with the unit contract price or by force account.

Such additional work not covered by contract items will be paid for on a force account basis in accordance with Section 1-09.6 of the Standard Specifications or as a negotiated change order with lump sum or unit price items. For the purpose of providing a common proposal for all bidders and for that purpose only, the City has estimated the potential cost of force account work and has entered the amount in the bid proposal to become a part of the total bid by the Contractor. However, there is no guarantee that there will be any force account work.

See Section 01040 – Project Coordination, Paragraph 1.6 for details regarding contract changes.

1.4 NON-PAYMENT FOR REJECTED OR SURPLUS PRODUCTS OR WORK

Payment will not be made for work rejected by the City. Products or work not meeting contract requirements shall be replaced by the Contractor at no expense to the City, regardless of the impact to work, schedule or cost.

1.5 AS-BUILTS

The final retained portion of this contract shall not be released for any reasons until complete redline “AS-BUILT” plans are received and approved by the engineer. Redline “AS-BUILT” plans shall have all necessary information including make/model numbers, dimensions, and layout information necessary to properly draft changes in AutoCAD.

END OF SECTION

SECTION 01040 - PROJECT COORDINATION

1.1 PROJECT MANAGER

All management for this project with whom the Contractor shall coordinate all their activities will be Mr. Thomas Romay at n-tromay@cityoftacoma.org once the notice to commence work is issued. Any changes to these specifications or plans shall be approved by the project manager prior to commencing any work.

1.2 MEETINGS

A. PROJECT KICKOFF MEETING

Following award of the contract, the project manager will notify the selected bidder of the time and date of the project kickoff meeting to be held at the project location.

Minutes of the project kickoff meeting will be sent to the Contractor and all meeting attendees. Recipients of the project kickoff meeting minutes will be required to direct any comments or changes to these minutes to the project manager within seven (7) calendar days from the date of receipt. If no changes or comments are received within the seven (7) calendar days, the meeting minutes will be kept by the project manager and become part of the project file.

B. WEEKLY MEETINGS

The project manager will schedule weekly videoconference meetings or meetings prior to each major phase or section of work; during shop inspection and refurbishment activities; prior to installing major pieces of equipment as identified by the project manager; and on an as-needed basis. Attendance of the Contractor, technical advisor, and major subcontractors is required at all such meetings. The project manager will notify the Contractor of all required meetings during the project kickoff meeting. Agenda will follow the same format as the project kickoff meeting for applicable items.

Minutes of the weekly meeting will be sent to the Contractor and all meeting attendees. Recipients will be required to direct any comments or changes to these minutes to the engineer within seven (7) calendar days from the date of receipt. If no changes or comments are received within the seven (7) calendar days, the meeting minutes will be kept by the project manager and become part of the project file.

C. COORDINATION MEETINGS WITH OTHER CONTRACTORS

While this project is underway there will be other major general contractors and City crews performing work on other projects in the vicinity of this project.

Work on these projects may require:

1. Mobilizing and using cranes
2. Loading and unloading of materials for these projects
3. Disruptions to the work areas adjacent to this project and other activities
4. Periods when PRV location cannot be accessed.
5. Open holes/ falling hazards where equipment is being removed.

As such, coordination meetings may be required throughout the project which must be coordinated among the City and all affected contractors.

These meetings will be at the discretion of the project manager and attended by the Contractor and/or technical advisor.

1.3 PERMITS

The Contractor shall apply for, obtain and pay for all other required permits to transport the equipment from the site to the Contractor's facility/ facilities and back to City's location.

1.4 COORDINATION WITH OTHERS

A. SCHEDULE AND COORDINATION OF WORK

The Contractor shall coordinate scheduling, submittals, and all work specified herein to assure efficient and orderly sequence of the installation of interdependent construction elements with provisions for accommodating items installed later.

B. COORDINATION WITH THE UNIT OVERHAUL CONTRACTOR

The Contractor shall attend all regular update and daily coordination meetings regarding the refurbishment of Units 31 and 32 while any Contractor employees are onsite. Contractor may request from the City the ability to attend regular update meetings remotely and forgo daily coordination meetings where reasonable. Contractor shall resume attendance of update meetings at least 1 week prior to returning to site.

1.5 DIVISION OF WORK

A. MATERIAL FURNISHED AND INSTALLED BY CONTRACTOR

The Contractor shall furnish and pay for all necessary materials (except City-furnished) and shall provide all labor, tools, equipment and technical advisor, and perform all work incidental to the completion of the project as contemplated by this contract in accordance with the plans, specifications, and instructions of the engineer.

Requests for use of alternate materials shall be submitted prior to bid opening in accordance with Section 01300, Paragraph 1.3 – "Or Equal" Clause or Substitutions.

B. CITY-FURNISHED MATERIAL INSTALLED BY CONTRACTOR

All material received by the Contractor shall become their responsibility and the Contractor shall be liable for any materials lost or damaged after receipt. For materials that are being shipped/ transported by the Contractor under this Contract, loading of the equipment on the transport vehicle will be considered receipt of material by the Contractor.

The City does not intend to provide any materials other than the equipment which is currently in service. There is no installation by Contractor that is part of this Contract.

C. WORK TO BE DONE BY CITY

The City will provide all materials and perform all work to:

1. Disconnect all supply and drain piping, air admission piping, grease tubing, and instrumentation. Retain until reassembly and replace where necessary.
2. Disconnect the PRV linkages from the operating ring, cross head guide, and bell crank lever by removing the connecting pins.
3. Disconnect relay rods and levers.
4. Remove dashpot oil and note oil quantity and quality. Send an oil sample for analysis.

5. Disconnect the pilot valve from the PRV and the PRV from its connection points at the interface to the scroll case and embedded discharge cone. The PRV shall be minimally dismantled by City at site in order to avoid impacts to the rest of the site work for Units 31 and 32 due to limited crane availability and powerhouse space. Inspect, measure, and retain dowels and fastening hardware removed during site dismantle. Replace hardware which is not suitable for reuse.
6. Remove platforms and walkways required for removal of the PRV. Operate the powerhouse crane to lift the PRV and associated components onto and off of the Contractor provided shipping flatbed. City will provide cribbing for pressure regulator. Contractor shall review cribbing provided by City and shall provide required dunnage and protection. At a minimum, equipment shall be covered with tarp to protect against rain and road debris.
7. Reconnect the PRV to its connection points at the interface to the scroll case and embedded discharge cone and the pilot valve to the PRV. Provide new flange hardware and gaskets and seals at these three interfaces and at pilot valve supply and drain connections.
8. Fill dashpot cylinder with new oil.
9. Reconnect relay rods and levers.
10. Reconnect the new PRV linkages to the new operating ring, existing cross head guide, and existing bell crank lever by inserting the connecting pin. Reinstall platforms and walkways.
11. Reconnect all supply and drain piping, greasing tubing, and instrumentation. Provide, wire, and integrate new instrumentation into the Plant Control System.
12. Provide all tooling, dunnage, scaffolding, man-lifts, or other equipment required for site dismantle and reassembly of the PRV plus loading and unloading of the PRV at site.
13. Provide all labor required for touch-up painting, including painting of flange hardware.

The Contractor shall notify the project manager at a minimum of four (4) calendar days prior to needing any work performed by the City.

Items noted N.I.C. (not in contract) on the drawings will be furnished and installed by the City before or concurrently with the work of this contract and are not included in this contract.

The Contractor shall be responsible for coordinating and scheduling the work to be performed by the City so that it coincides with their work.

1.6 CONTRACT CHANGES

The City has developed four (4) forms to facilitate and track communications with the contractor. These are the **Request for Information (RFI), Engineering Change Directive (ECD), Proposal Request (PR),** and **Change Order Proposal (COP)**. These forms are included at the end of this Section.

The **Request for Information (RFI)** shall be used by the contractor whenever written direction on conflicts in plans, insufficient or not constructable detail is shown, or any other issue which should be documented arises. The City may also use the form to inquire on contractor's methods, schedule or other issues not warranting more formal letter correspondence. The contractor shall maintain the numbering system and, as such, any issued by the City will be unnumbered until delivered to the contractor.

The **Engineering Change Directive (ECD)** shall be used by the City to transmit new or revised drawings, issue additions or modifications to the contract or furnish any other direction which should be documented. Directives are effective immediately. Should the contractor believe that such Directive should result in either a change in cost or time for the project, they shall notify the engineer prior to commencing such work and, if possible, submit a **Change Order Proposal** prior to the start of such work, but in no case, more than seven (7) calendar days from receipt of said Directive.

The **Proposal Request (PR)** shall be used by the City to request pricing on a possible change in plans or additional work. The PR may also be used to request credits for deletion or changes in scope of work. The contractor shall respond to such requests with a **Change Order Proposal** within seven (7) calendar days from receipt of said Request unless more time has been agreed to. Requests are numbered by the City.

The **Change Order Proposal (COP)** shall be used by the contractor to respond to City issued Proposal Requests, Engineering Change Directives or when the contractor believes that changed conditions or omitted, but necessary, work items exist. The COP may be used for requested changes in cost or time of the contract. COPs shall be numbered by the contractor, and, in the case of revision or resubmission of the same basic COP, the number shall be hyphenated with the letter “B”, “C”, etc.

In the event the City does not receive a **Change Order Proposal** from the contractor within seven (7) calendar days of the contractor’s receipt of a Directive from the City, the contractor shall have no claim for extra cost or time or impacts attributable to the work required by the Directive. (Directives are numbered and dated by the City.) Once the City and the contractor have established a price for the changes required by the Directive or any other request by the City for a change in the work, and a **Change Order Proposal** issues reflecting the agreed upon price, it is agreed and understood that the price reflected by the **Change Order Proposal** shall include all direct costs, indirect costs, and the contractor’s estimate of impacts to its work, including but not limited to delay impacts, and shall represent a full and final settlement of all issues pertaining to the work required by the Directive, and work performed by the contractor up to the date of the **Change Order Proposal**.

1.7 PROGRESS SCHEDULES

A. FORMAT

The contractor shall prepare schedules as a horizontal bar chart with separate bar for each major portion of work or operation, identifying the first work day of each week and include holidays.

B. CONTENT

This schedule shall be activity-oriented showing as nearly as can be determined the starting and completion dates of each event. The schedule shall show the shipping, shop dismantling, inspection, refurbishment, shop assembly, and return shipping, at a minimum.

Show complete sequence of project, by activity, with dates for beginning and completion of each element of refurbishment.

Identify each task by the appropriate proposal bid item number (if applicable) and subcontractor responsible.

C. SEQUENCE SCHEDULING

It shall be the Contractor’s responsibility to properly phase in all work specified herein including all work done by subcontractors.

Progress schedules are required to be coordinated with the City when changes occur and updated at least monthly, Acceptance or approval of the progress schedule does not release the contractor from the responsibility to provide the necessary resources to meet the schedule.

D. SUBMITTALS

The contractor shall submit initial schedules at the project kickoff meeting or at a minimum of within fourteen (14) calendar days after the contract award, whichever is sooner. After review, if changes are required by the engineer, resubmit required revised data within ten (14) calendar days.

The Contractor shall use the attached Submittal Transmittal form (electronic version is available from the project manager) for all submittals.

Within fourteen (14) calendar days following the kickoff meeting, the Contractor and the project manager will reach an agreement on any and all adjustments and all modifications to the submitted schedule which are warranted. The schedule, thus modified, will become part of the contract.

The failure of the Contractor to submit a schedule(s), or the inability of the Contractor and the City to reach an agreement as to modifications to a schedule, shall not excuse the Contractor's obligation to perform the work required by the specifications in the number of calendar days required by the specification.

1.8 TECHNICAL ADVISOR

The Contractor shall employ a competent technical advisor who shall be present at the PRV construction site at all times that the Contractor or any subcontractor is at the project site.

It will be the technical advisor's responsibility to have a set of plans and specifications on the project site during the progress of the work. The technical advisor shall mark or record on the plans all changes made during disassembly and reassembly. Such redline "AS-BUILT" plans shall be available to the engineer at all times and shall be delivered to the engineer upon completion of the work as summarized in Section 01025, 1.6 – AS-BUILTS.

The technical advisor initially assigned to the project by the Contractor shall remain technical advisor for the duration of the contract, unless otherwise approved by the project manager. If the technical advisor is replaced, an additional project meeting with the City shall be held to ensure continuity of services provided by the technical advisor. Any work stoppage will be at the Contractor's expense. The completion date shall remain unchanged, regardless of any work stoppage.

END OF SECTION

TACOMA POWER
TACOMA PUBLIC UTILITIES

CHANGE ORDER PROPOSAL (COP)

(This form shall be used by the contractor to respond to City issued Proposal Requests, Engineering Change Directives or when the contractor believes that changed conditions or omitted, but necessary, work items exist. The COP may be used for requested changes in cost or time of the contract.)

COP No.: ☐ *(Contractor Assigns)*

REF. Doc.: ☐ *(Initiating a RFI, ECD or PR)*

Date: _____

Project Title: _____

Specification No.: _____ Contract No.: _____

Contractor:

Owner:
Tacoma Power/Generation
3628 South 35th Street
Tacoma, WA 98409

Title: _____

☐ Architectural ☐ Civil ☐ Structural ☐ Mechanical ☐ Electrical ☐ Other

Scope of Change:

Initiated By: _____ Representing: _____
(Name) *(Company)*

Cost/Credit: _____ Time Extension Request: _____

Attachment Type: _____
(Supporting Documentation)

This change order proposal shall include ALL labor, material, equipment, subcontractor costs, mark-ups including overhead, profit, any other direct and/or indirect costs, and any requests for additional time associated with the change in the scope of work.

City's Response:

Action: ☐ Approved ☐ Unapproved ☐ Revise and Resubmit *(Select only one)*

*Prior to any extra work the contractor shall submit a written **Change Order Proposal** (COP). See Section 01040, Contract Changes, of the specification for this Contract.*

Response By: _____ Attachment Type: _____
(Name) *(Supporting Documentation)*

Representing: _____ Response Date: _____
(Company) *(Date)*

Cc:

TACOMA POWER
TACOMA PUBLIC UTILITIES

ENGINEERING CHANGE DIRECTIVE (ECD)

(This form shall be used by the City to transmit new or revised drawings, issue additions or modifications to the contract or furnish any other direction which should be documented.)

ECD No.: ☐ *(City Assigns)*

Date: _____

Project Title: _____

Specification No.: _____ Contract No.: _____

Contractor:

Owner:
Tacoma Power/Generation
3628 South 35th Street
Tacoma, WA 98409

Title: _____

☐ Architectural ☐ Civil ☐ Structural ☐ Mechanical ☐ Electrical ☐ Other

You are hereby directed to make the following modification(s) in the Scope of Work in this Contract:

This document becomes effective upon receipt by the Contractor, with signature of an approved City representative. The Contractor shall then commence with modifications(s) listed above.

Attachment Type: _____ *(Supporting Documentation)*

Initiated By: _____ *(Name)*

Representing: _____ *(Company)*

Contractor's Response:

This ECD: ☐ Will Not ☐ May ☐ Will *(select one box only) result in a claim by the Contractor.*

*Prior to any extra work the contractor shall submit a written **Change Order Proposal** (COP). See Section 01040, Contract Changes, of the specification for this Contract.*

Attachment Type: _____ *(Supporting Documentation)*

Response By: _____ *(Name)*

Response Date: _____ *(Date)*

Representing: _____ *(Company)*

Cc:

TACOMA POWER
TACOMA PUBLIC UTILITIES

REQUEST FOR INFORMATION (RFI)

(This form shall be used by the contractor whenever written direction on conflicts in plans, insufficient or unconstructable detail is shown, or any other issue which should be documented arises; or by the City when additional clarification is required.)

RFI No.: ☐ *(Contractor Assigns)*

Date: _____

Project Title: _____

Specification No.: _____ Contract No.: _____

Contractor:

Owner:
Tacoma Power/Generation
3628 South 35th Street
Tacoma, WA 98409

Subject: _____

☐ Architectural ☐ Civil ☐ Structural ☐ Mechanical ☐ Electrical ☐ Other

Requested Information:

Attachment Type: _____ Initiated By: _____
(Supporting Documentation) *(Name)*

Response Required: _____ Representing: _____
(Date) *(Company)*

Response:

Attachment Type: _____ Response By: _____
(Supporting Documentation) *(Name)*

Representing: _____
(Company)

*Prior to any extra work the contractor shall submit a written **Change Order Proposal** (COP). See Section 01040, Contract Changes, of the specification for this Contract.*

Response Date: _____
(Date)

City Approval:

The owner (Tacoma Power) reviewed the foregoing request and finds the response to be in order.

Project Engineer: _____ Response Date: _____
(Name) *(Date)*

Cc:

TACOMA POWER
TACOMA PUBLIC UTILITIES

PROPOSAL REQUEST (PR)

(This form shall be used by the City to request pricing on a possible change in plans or additional work. The PR may also be used to request credits for deletion or changes in scope of work.)

PR No.: ☐ *(City Assigns)*

Date: _____

Project Title: _____

Specification No.: _____ Contract No.: _____

Contractor:

Owner:
Tacoma Power/Generation
3628 South 35th Street
Tacoma, WA 98409

Subject: _____

☐ Architectural ☐ Civil ☐ Structural ☐ Mechanical ☐ Electrical ☐ Other

Scope of Request:

Attachment Type: _____
(Supporting Documentation)

This is not a change order or a notice to proceed with the described work. *Prior to any extra work the contractor shall submit a written* ***Change Order Proposal*** *(COP). See Section 01040, Contract Changes, of the specification for this Contract.*

Initiated By: _____ Representing: _____
(Name) *(Company)*

Cc:

TACOMA POWER
TACOMA PUBLIC UTILITIES

CONTRACTOR SUBMITTAL TRANSMITTAL

Submittal No.: ☐ *(Contractor Assigns)*

Date: _____

Project Title: _____

Specification No.: _____ Contract No.: _____

Contractor:

Owner:
Tacoma Power/Generation
3628 South 35th Street
Tacoma, WA 98409

Subject: _____

☐ Architectural ☐ Civil ☐ Structural ☐ Mechanical ☐ Electrical ☐ Other

Sending the Following Item(s):

☐ Submittals ☐ Product/Data ☐ Samples ☐ Plans ☐ Shop Drawings ☐ Copies
☐ Specifications ☐ Contract ☐ Other: _____

Copies	Section	Description of Product/Data	Manufacturer

Transmitted as:

☐ For Approval ☐ For Your Use ☐ Per Your Request ☐ For Review and Comment
☐ Other: _____

Remarks:

For Use by Architect/Engineer:

☐ No Exception Taken ☐ Make Corrections Noted ☐ Revise and Resubmit ☐ Rejected (See Response)

Corrections or comments made on the shop drawings during this review do not relieve Contractor from compliance with the requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all other contractors and agencies performing his work in a safe and satisfactory manner.

Response Date: _____ Response By: _____
(Date) *(Name*

SECTION 01300 - SUBMITTALS AND SHOP DRAWINGS

1.1 SUBMITTALS FOLLOWING AWARD

A. COST UPDATING

Provide a breakdown of the contract sum in sufficient detail to facilitate continued evaluation of applications for payment and progress reports. Coordinate with the progress payment schedule outlines in Section 01025.

B. SCHEDULE UPDATING

Update and resubmit the Schedule of Values prior to the next application for payment or when change orders or engineering change directives result in a change in the contract sum as directed by the engineer.

1.2 SUBMITTALS AND SHOP DRAWINGS DURING CONSTRUCTION

Submittals and shop drawings submitted to the City as specified herein are intended to show compliance with the contract documents. Signatures, corrections or comments made on submittals do not relieve the Contractor from compliance with requirements of the drawings and specifications. Neither does acceptance or approval of submittals by signature add to or delete from any contract requirements resulting from these specifications regardless of the wording of the submittals. Submittals will not be reviewed or approved when the term “By Others” is used. Submittals are reviewed or approved for general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processed and techniques of construction, coordinating their work with that of other contractors and agencies, and performing their work in a safe and satisfactory manner. Piecemealing of submittals will not be accepted.

A. SUBMITTALS PROCEDURES

1. Submittal Requirements: Submit as specified under individual sections. Submittals not requested will not be recognized or processed.
2. Transmittal Form: Accompany each submittal with transmittal letter, in triplicate. Transmittal form will be supplied by the engineer.
3. Submittal Numbering: Sequentially number transmittal forms in order submitted. Add alphabetic suffix to original submittal number of re-submittals.
4. Submittal Identification: Include project, contractor, subcontractor or supplier, pertinent drawing and detail number, specification section number, manufacturer, fabrication, product, material, and, as appropriate
5. Contractor’s Certification: Apply contractor’s stamp, signed or initialed, certifying that review, verification or products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the contract documents.
6. Contractor shall review submittals for adequate installation interface for all work prior to submitting them to the City.
7. Schedule of Submittals: Deliver to engineer, promptly, to meet critical path, and lead times as required to expedite the project.
8. Turn-Around Time: Allow from time of receipt fourteen (14) calendar days for each submittal and each re-submittal to be reviewed by the engineer.

9. Critical Issues: Prior to submittal, communicate with engineer reason for critical issue. Upon approval, allow fourteen (14) calendar days turn-around time from time of receipt by engineer.
10. Coordination and Consolidation of Submittals: Submit related items, sections or trades under one (1) submittal package for each unit of work or system where possible.
11. Deviations on Submittals: Identify deviations, including products and systems, not conforming with contract documents.
12. Product and System Limitations: Indicate conditions which may be detrimental to successful performance or completion of work.
13. Substitutions to Specified Items: Submit for approval in accordance with Section 1.3 "Or Equal" Clause or Substitution. Do not indicate or otherwise imply substitutions to specified items, except as approved.
14. Job Site Office Records: Maintain one (1) copy of every submittal, regardless of status, along with a current submittal log. Ensure that the most current, architect, and engineer stamped shop drawings and product data are distributed and subsequently used in connection with the work.
15. Re-Submittal Requirements: Revise initial submittal as directed and re-submit. Following procedures specified for the initial submittal. Make any corrections or changes in the submittals required by the engineer. Revise and make any further re-submittals until no exceptions are taken. Identify changes on re-submittal made since previous submittal.
16. Other Pertinent Submittals: Provide templates, inserts, and as applicable in timely fashion to other trades.

B. SCHEDULE OF SUBMITTALS

1. Within fourteen (14) calendar days of notice to proceed, prepare schedule of submittals for shop drawings, product data, samples, and as specified for each section. Update as requested by engineer.
2. List submittals sequentially by project manual table of contents section numbers and titles.
3. Show submittal preparation time, field measurements and verification time, date submitted to engineer, date due back from engineer, item order dates, and delivery dates.
4. Identify individual delivery, long lead times, and critical ordering deadlines. Include ordering dates for each item including individual parts of major submittals.
5. Indicate specified time allocated for review, turn around and distribution.
6. Identify decision dates for selection of colors and finishes not scheduled or otherwise approved.
7. Within fourteen (14) calendar days after notice to proceed, and in accordance with the conditions of the contract, submit list of major products proposed for use with name of manufacturer, tradesman, and model number of each product such that consideration it taken for the project milestones and deadlines.
8. For products specified only by reference standards, give manufacturer, tradesman, model or catalog designation and reference standards.

C. SHOP DRAWINGS

1. Number and Format: Submit drawings digitally both in native format and pdf format.
2. Submittal Procedure: Submit for engineer's review in accordance with submittal procedures specified in this section. After approved drawings are return, the Contractor shall reproduce and distribute copies to subcontractors and other entities, as applicable. Maintain one (1) copy of each shop drawing for project record documents to be delivered to the engineer at project completion.
3. Maximum Sheet Size: 24-inches by 36-inches or other allowable sizes of 8-1/2-inches by 11-inches or 11-inches by 17-inches.
4. Identification: Reference shop drawing details same as reference on contract documents, including sheet and detail descriptions, schedules and room numbers. Indicate by whom materials, products, work, and installations are supplied, performed or installed. Do not use the expression "by others".
5. Presentation: Hand drafted or computer generated, delineated to present information in a clear and thorough manner. Freehand drawings not approved. CAD drawings.
6. Variations from Contract Documents due to Standard Shop Practices: Make transmittal outlining variation.
7. Engineer Changes to Submittals which affect Contract Sum or Contract Time: Do not distribute to being work related to submittal. Notify engineer immediately.

D. PRODUCT DATA

1. Number of Copies: Submit digitally in pdf format.
2. Submittal Procedures: Submit for engineer review in accordance with submittal procedures specified in this section. After review, distribute to subcontractors and other applicable entities. Maintain one (1) copy for project record documents to be delivered to engineer at project completion.
3. Identification: Mark each copy to identify specific products, models, options, tolerances, dimensions, and other pertinent data.
4. Manufacturer's Standard Data: Modify drawings and diagrams to delete inapplicable information. Supplement to provide pertinent information unique to project.

E. ELECTRONIC FILES OF MANUALS:

1. Electronic manuals must be submitted in .PDF and compatible with the latest version of Adobe Professional.
2. Manuals should be scanned at 300 DPI.
3. Color originals should be scanned to color images if possible.
4. All .PDF files should be scanned at using Optical Character Recognition (OCR)
5. A manual must be submitted as a single .PDF file; addendums and attachments (may or may not include drawings) should not be submitted separately, or in different file formats.
6. Manuals that consist of multiple volumes should be submitted as individual files.
7. Manuals comprised of several sections or chapters should be bookmarked by the vendor.

8. If a vendor wished to include security settings (so that their documents are “read-only”), that is acceptable provided that Tacoma Power can view and print from the file.

F. SAMPLES

1. Quantity or Number: Submit one (1) each to be retained by engineer, except as otherwise specified by individual specification sections. Submit additional as required by Contractor for distribution.
2. Submittal Procedure: Submit for engineer’s review in accordance with submittal procedures specified in this section. After review, distribute to applicable entities.
3. Size and Completeness: As specified by individual sections. When not specified, submit samples of sufficient size and completeness to clearly illustrate product.
4. Identification: Label each sample with project title and complete product identification, including manufacturer, model number, descriptive name, supplier, and as applicable to sample identification.
5. Functional Characteristics: Include parts, attachments, and components as applicable. Coordinate with interfacing work.
6. Aesthetic Characteristics: As required for selection of colors, finishes, patterns, and as required or requested to finalize selection process. Furnish full range of manufacturer’s custom and standard selections. Where selection is specified, submit as required to show conformance to contract documents.

H. DESIGN DETAILS

All design details shall be submitted to the City by the Contractor during the design phase for review and approval prior to commencing any refurbishment activities. During this phase, the Contractor shall be required to submit plans, calculations, and all required materials. .

I. MANUFACTURER INSTRUCTIONS AND CERTIFICATES

Number: Submit one (1) copy of both the manufacturer instructions and certificates.

Content: Include manufacturer’s printed instructions for delivery, storage, preparation, assembly, installation, start-up, adjusting, and finishing as specified for individual specification sections. Include special procedures, project conditions, and environmental criteria required for application or installation.

1.3 "OR EQUAL" CLAUSE OR SUBSTITUTIONS

A. GENERAL

When the engineer approves a substitution, it is with the understanding that the Contractor guarantees the substituted article to be equal to, or better than, the article specified. The engineer will judge the suitability, reliability, and service availability of a proposed substitute. To be considered by the engineer, the request for substitution shall be accompanied with complete physical and technical data, manufacturer's catalogue data, photographs, samples, and the address of the nearest authorized service representative, as applicable.

The decision of the engineer on "OR EQUALS" shall be final.

The requirements of Standard Terms and Conditions 1.36 - Approved equals when alternates are allowed.

B. PRIOR TO BID OPENING

Substitution approvals will be considered prior to the bid opening if the bidder submits their request for substitution not less than fourteen (14) calendar days prior to the date set for bid opening. All substitution requests shall be submitted using the “Substitution Request Form” included in the bid packet and shall be sent to the individual as noted at the top of the form. Substitution requests not received by the named individual will not be evaluated and not allowed as a substitution prior to bidding. Submit all requests and product data in triplicate.

An addendum listing such approvals may/will be issued prior to bidding.

Bidders who do not receive prior written approvals of "OR EQUAL" by five (5) calendar days prior to bid submittal must base their bids on the items specified.

C. AFTER BID OPENING

Proposed substitution and deviation requests shall be reviewed during the time of submittal review.

Substitution and deviation requests will be received and considered only when one or more of following conditions are satisfied:

1. The specified product or method of construction cannot be provided within the contract period and the Contractor submittal is submitted within time frame allowed.
2. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
3. The specified product or method of construction cannot be provided in a manner that is compatible with other materials.
4. A substantial advantage is offered to the Owner, in terms of cost, time, or other considerations of merit.
5. The product as specified includes the statement, “or equal” and one of the above conditions governs
6. The engineer’s decision on all substitution or deviation requests shall be final.

END OF SECTION

SECTION 01600 - MATERIAL AND EQUIPMENT

1.1 QUALITY OF WORKMANSHIP AND MATERIAL

A. WORKMANSHIP

The contractor shall employ only competent, skillful persons to do the work.

B. MATERIALS

Materials shall be delivered to the project site in the manufacturer's original containers, bundles or packages unopened with the seals unbroken and the labels intact. Each type of material shall be of the same make and quality throughout. Manufactured articles, materials and equipment shall be installed in accordance with each manufacturer's written directions, unless otherwise specified.

All materials and equipment to be provided under this contract shall conform to the latest edition of the applicable codes, but in no case shall be contrary to the laws of the State of Washington and/or Federal Government.

The equipment supplied shall meet appropriate ANSI, OSHA, WISHA, and all Federal, state, and local standards for the type of equipment provided for its intended use.

Deliver, store and handle products according to manufacturer’s written instructions, using means and methods that will prevent damage, deterioration, and loss, including theft.

1. Schedule delivery to minimize long-term storage and to prevent overcrowding construction spaces.
2. Deliver with labels and written instructions for handling, storing, protecting, and installing.
3. Inspect products at time of delivery for compliance with the contract documents and to ensure items are undamaged and properly protected.
4. Store heavy items in a manner that will not endanger supporting construction.
5. Store products subject to damage on platforms or pallets, under cover in a weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required.

1.2 SALVAGEABLE AND NONSALVAGEABLE MATERIAL

A. SALVAGE TO TACOMA PUBLIC UTILITIES

Contractor shall carefully remove in a manner to prevent damage to all materials and equipment specified or indicated to be salvaged and reused or to remain property of the City. The contractor shall store and protect salvaged items specified or indicated to be reused in the work.

Any items damaged in removal, storage or handling through carelessness or improper procedures shall be replaced by the contractor in kind or with new items.

All materials considered salvageable by the engineer's representative shall be accumulated and tightly packaged in a container suitable for the type of materials being salvaged. Salvaged materials not reused on this job shall be returned to the Cushman No. 2 Office at 21451 North Highway 101, Shelton, WA 98584, between the hours of 7:00 A.M. and 5:00 P.M., Monday through Friday.

B. PROPERTY OF CONTRACTOR

Demolition, not indicated for salvage, becomes property of contractor. All costs to dispose of non-salvageable materials shipped to the Contractor shall be the Contractor's responsibility.

The contractor may, if approved by the City, furnish and install new items in lieu of those specified or indicated to be salvaged and reused, in which case such removed items will become the contractor's property. Existing materials and equipment removed by the contractor shall not be reused in the work except where so specified or indicated.

END OF SECTION

SECTION 01700 - CONTRACT CLOSEOUT

1.1 DOCUMENTS REQUIRED UPON COMPLETION OF WORK

A. CLOSE OUT PROCEDURES

The contractor shall notify the engineer in writing when identified tasks are complete and ready for inspection. The engineer will make the inspection, forward the results of same to the contractor, who shall promptly correct any deficiencies noted.

The contractor shall notify the engineer in writing when all punch list deficiencies have been completed. The engineer will promptly set a time for final inspection, at which time the engineer and the contractor shall jointly inspect the work. The contractor will promptly correct any deficiencies noted.

B. FINAL DOCUMENTATION

Upon completion of the work and before final payment is made, the contractor shall deliver to the engineer CAD (for drawings) and PDF versions of, in addition to such other items specified in these specifications, the following documents:

1. "AS-BUILT" Drawings

   "AS-BUILT" drawings and specifications of new or revised existing work, shown in red ink, provided by the contractor, and subcontractors, including all addendums, change orders, deviations, changes, elevations, and dimensions of their work from the construction documents, updated during the construction.

   NOTE: The final payment for this contract will not be released until “AS-BUILT” drawings are received and approved by the engineer.

2. Quality Manuals

   Two (2) electronic manuals (.pdf) with quality documentation related to the shop (and, if applicable) field scope of project. The manuals shall include the following items at a minimum.

   a. Before and after photos.

   b. As-found inspection reports

   c. Materials test reports

   d. As-left inspection reports

   e. Coating reports

3. All Guarantees and/or Agreements

   a. All guarantees, warranties, and/or agreements for such equipment and materials as carry such guarantees.

END OF SECTION

TECHNICAL PROVISIONS

PART 1 GENERAL

1.1 DESCRIPTION

Each of the two Unit Scroll Case Pressure Regulating Valves (PRV) is a 54" inlet, 66" outlet relief valve. It is directly connected to and forms a portion of the respective Unit, 30 MVA, vertical Francis turbine unit at Cushman Powerhouse #2.

The PRV consists of a pilot controlled 49" piston that, when depressurized, lowers a 45" disk away from its seat to discharge water from the scroll case, thereby alleviating overpressure during rapid closure of the turbine's wicket gates. The inputs to the pilot valve and piston are the operating ring position, rate of closure through the connecting rods, and penstock pressure through piping supplied from immediately upstream of the Turbine Inlet Valve.

1.2 EXISTING UNIT INFORMATION

The following data is provided for general information purposes only.

OEM	Allis Chalmers
Manufacture Year	1930
New Turbine Runner Date	1995 (U32), 1996 (U31)
New Turbine Runner Supplier	Voith Hydro
Rated Power	42,837 HP
Maximum Gross Head	484 feet
Maximum Net Head	485 feet
Rated Net Head (OEM)	440 feet
Rated Net Head (New Runners)	455 feet
Minimum Net Head	415 feet
Maximum Tailwater (High Tide)	10.55 feet msl
Minimum Tailwater (Low Tide)	-2.05 feet msl
Runner Centerline Elevation	12.55 feet msl
PRV Embedded Foundation Elevation	4.34 feet msl
PRV Inlet Centerline Elevation	12.55 feet msl
Turbine Synchronous Speed	300 rpm
Turbine Maximum Runaway Speed	575 rpm
Turbine Rotation Direction (viewed from above)	CW

1.3 BACKGROUND

The PRVs were originally designed and manufactured by Allis-Chalmers Manufacturing Co. of Milwaukee Wisconsin in 1929. They are original components of the Unit 31 and 32 turbines and were constructed in 1930.

City completed seat repairs in 1949, discovering revealed issues with the casting and a certain amount of lead contained within the ring. The ring was brazed and machined but issues with the brazing resulted in slight dimensional differences from the drawing.

City completed timing adjustments of the valves in 1992.

City last replaced the main valve seats on Unit 31's PRV in 2004. The age of the seats on Unit 32's PRVs is unknown.

City last completed maintenance on Unit 31's pilot valve in 2017. City last completed maintenance on Unit 32's pilot valve in 1993.

The PRVs are periodically inspected. These visual inspections have identified silt and sediment in the main valve piston chambers, leakage past the packing gland on the main valve piston, leakage from the seals between the discharge elbow and the main piston shaft, wirecutting on Unit 32's main valve seat, and leakage from Unit 32's pilot valve – but have not raised any immediate functional concerns.

Testing conducted in 2017 at the time of commissioning for governor controls replacement indicated that the valve was successful in preventing penstock overpressure during load rejections.

City conducted its most recent inspection of Unit 32's PRV in March 2024. During this inspection, the valve plunger did not drop as expected under its own weight, indicating fouling of the main piston assembly or binding in the piston or shaft. Leakage past the packing gland was observed with full penstock pressure applied to the main valve piston; despite the seating force obtaining by applying this pressure to the piston, there were measurable gaps between the disc and stationary seat rings. The valve plunger did not move under full pressure.

PART 2 DISMANTLE AND REASSEMBLY SITE WORK

2.1 GENERAL

A. City will self-perform site dismantle and site reassembly work.

B. Contractor shall attend daily coordination and safety meetings with the Project Team for generator unit refurbishment for any period during which they are on site and work for both projects coincides.

2.2 OPTIONAL BID ITEM

Provide a procedure for

pre-dismantle measurements,

site dismantle,

site reassembly

Provide technical advisor to advise City staff at Cushman #2 powerhouse during site dismantle (assume 4 business days) and reassembly (assume 4 business days) work. Provide technical advisor's hourly rate for site support and resume as part of the Contractor's proposal.

PART 3 TRANSPORTATION

3.1 TRANSPORTING

A. Contractor shall be responsible for transportation of the PRV from the powerhouse to a refurbishment facility and back to the powerhouse.

B. All logistics and permits required for transportation of the PRV shall be the responsibility of the Contractor.

C. The Contractor shall submit a transportation plan to the City with the proposal for approval and coordination with other powerhouse project constraints.

D. Contractor shall adequately prepare equipment, especially machined surfaces, for shipment, weather, and storage at the job site.

PART 4 PARTS TO BE PROCURED PRIOR TO OUTAGE

4.1 DESCRIPTION

A. Contractor shall include in their proposal the procurement of the following items known to require replacement. Unless otherwise stated parts shall be replaced in kind with original dimensions and materials. Where a modern equivalent material is proposed, City approval shall be obtained before procurement.

B. Contractor shall procure quantities sufficient for one unit. If parts and material are used for the first unit, contractor shall replenish material for the second unit. Parts and material not required for refurbishment of either unit shall be turned over the City.

4.2 MAIN VALVE STATIONARY SEAT RING

A. Purchase and machine material for the Stationary Seat Ring (Item 1, dwg B2-1055) in advance of receipt of the PRV. Machine this part with sufficient overmaterial to accommodate wear or past refurbishment of the Valve Seat Casing.

4.3 MAIN VALVE DISC SEAT RING

A. Purchase and machine material for the Disc Seat Ring (Item 2, dwg B2-1055) in advance of receipt of the PRV. Machine this part with sufficient overmaterial to accommodate wear or past refurbishment of the Main Valve Disc.Optional: The new main valve disc seat ring shall be replaced with Nitronic 60

4.4 MAIN VALVE SLEEVES AND BUSHINGS

A. Purchase and machine material for the main valve bushings in advance of receipt of the PRV. Machine these parts with sufficient overmaterial to accommodate wear or past refurbishment of the main valve. Bushings included are as follows:

1. Upper bushing (Item 4, dwg B2-1585) in Cylinder Head for Dashpot Cylinder. See also dwgs B2-1033 and B2-1033.
2. Lower bushing (Item 4, dwg B2-1585) in Cylinder Head for Dashpot Cylinder. See also dwgs B2-1033 and B2-1033.
3. Bushing (Item 2, dwg B2-1585) in 49” Cylinder for Main Piston Assembly. See also dwg B2-1056.
4. Sleeve (item 3 dwg B2-1585) for Main Piston Shaft. Drawing (dwg 837-532) for Main Piston is unavailable. See dwg B2-1332 for sister unit (Unit 33 at Cushman #2) for reference only; this does not necessarily reflect the design or dimensions of the components for Units 31 and 33.
5. Flanged bushing (Item 2, dwg B2-1050; Item 20, dwg B2-1578) in Valve Seat Ring/Guide Ring for Spindle Extension.

6. Sleeve for Spindle Extension. No drawings are available. Alternatively, Contractor may propose to reduce outside diameter of sleeved Spindle Extension and reduce the inside diameter of the corresponding flanged bushing to preserve the design clearances.

4.4 DASHPOT PISTON

A. Purchase and machine the following components of the dashpot piston in advance of receipt of the PRV:
   1. Piston rings (Item 10, dwg B2-1039) for Dashpot Piston.
   2. Adjustment springs (Items 8 and 9, dwg B2-1039) for bypass valves.

4.5 PILOT VALVE

A. Purchase the following items to be replaced on the pilot valve shall be in advance of receipt of the PRV. Items may require overmaterial to be final machined upon inspection of existing pilot valve.
   1. Valve bushing (Item 4, dwg B2-1041).
   2. Valve seat bushing (Item 3, dwg B2-1041).
   3. Valve tip (Item 2, B2-1070).
   4. Modern substitute for cup leather seal (Item 17, dwg B2-1041) and/or packing disks (Items 8 and 9, dwg B2-1041)in pilot valve cover for pilot stem . Provide recommendation to City engineer for approval.
   5. Bushings (Items 5 and 6, dwg B2-1041) in pilot valve cover for pilot stem.

4.6 EXTERNAL BUSHINGS

A. Purchase and machine material for the external bushings in advance of receipt of the PRV. Machine these parts with sufficient overmaterial to accommodate wear or past refurbishment of the main valve. Bronze bushings to be included are as follows:
   1. Bushings (Item 3, dwg B2-1064) in links for integral yoke pins. Quantity 4.
   2. Bushing block (Item 2, B2-1034) in Bell Crank Lever for linkage connecting pin.
   3. Bushing in linkage head (Item 4, B2-1100) for connection to the cross head. Quantity 2. Drawing (dwg 867-151) for solid head is unavailable.

B. Purchase and machine material to convert the bushing connecting the linkage to the shift ring to greaseless, self-lubricating type. Bushing material shall be Orkot TXMM. Bushing shall be purchased oversized and machined to account for potential wear or past machining of bushing housing bores. Greaseless, self-lubricating bushings to be included are as follows:
   1. Bushing in linkage head (Item 5, B2-1100) for connection to the shift ring. Drawing (dwg 867-151) for solid head is unavailable.

PART 5 INSPECTION AND REFURBISHMENT IN SHOP

5.1 DESCRIPTION

A. Shop refurbishment shall constitute the majority of the work to be completed by Contractor. The PRV shall be fully dismantled to expose all sliding and wearing parts for inspection. After cleaning, all parts shall be documented with inspection reports to be submitted to the City. Contractor shall note all relevant dimensions of each component, deficiencies, and recommendations for repair, replacement, or leaving in the as-found condition. The following sections provide additional requirements for specific parts of the PRV.

5.2 GENERAL

A. Blast clean and perform lead abatement on components with existing coatings prior to performing work on these components. Protect threaded holes and machined surfaces. Apply protective coatings in accordance with Section 09901, Shop Coatings, prior to reassembly. Protect threaded holes and machined surfaces during blasting and painting.

B. Replace all fasteners sized 2 inches in diameter in smaller in kind. City will furnish flange hardware and gaskets and seals connecting the pilot valve to the PRV and the PRV to the scroll case and embedded discharge cone.

C. Inspectors shall be certified as Level II examiners per ASNT SNT-TC-1A.

D. Contractor shall include all machining operations required to reestablish OEM tolerances and facilitate alignment in the base scope and base bid.

E. The City does not anticipate any weld repairs. If necessary, the Contractor shall provide a report and recommendations to the City project manager for approval prior to starting work on any component and conduct necessary weld repairs on a time-and-materials (T&M) basis.

5.3 ACTIONS PRIOR TO DISASSEMBLY

A. The pilot valve adjustment handwheel (item 29a) shall remain locked (item 20a) until such time as the current position of the handwheel can be properly documented. Measure and record the as-found position of the handwheel, length of the assembled spring casing, and clearance in the spring casing due to spring compression prior to disassembly.

B. Measure and record the as-found lengths and number of exposed threads of adjustable links, rods, and assemblies in the regulating connections prior to disassembly.

C. Measure and record the as-found lengths and number of exposed threads of all adjustable rods and linkages between shift ring and bell crank lever prior to disassembly.

D. Measure and record the as-found condition of all dashpot piston adjustments prior to disassembly, including but not limited to the dashpot needle adjustment, the position of the nut above the dashpot piston relative to the dashpot piston shaft, and the details of both bypass valves.

E. Assess contact between stationary and disc seat rings using Prussian blue prior to disassembly to determine whether to replace or refurbish these parts. Contact surface shall be approximately 1/16” wide per dwg B2-1055.

F. Match mark components prior to disassembly. Note the upstream side on each component relative to the spiral case inlet flange. Match mark the top components or flanges.

G. Submit records to the City in a report prior to any valve disassembly.

5.4 DISCHARGE ELBOW

A. Clean and inspect flange faces and holes. Document and replace seals between discharge elbow and valve seat casing, between discharge elbow and main piston cylinder, and between body and manhole cover.

B. Inspect and document diameter and surface finish of the bore for the main piston assembly, the concentricity of the upper and lower register fits and the bore for the main piston assembly, and the perpendicularity of the bore for the main piston assembly to the lower flange face.

C. Clean holes and ports of all grease and debris. Replace all plugs and reinstall all grease fittings.

D. Inspect the discharge elbow for cavitation, corrosion, and cracking over 100% of exposed interior and exterior surfaces.

E. Replace seals (Item 5, dwg B2-1019; Item 8, dwg B2-1579) at lower end of bore for 18” diameter section of main piston. Propose a modern alternative to the original cup leather.

5.5 VALVE SEAT CASING

A. Clean and inspect flange faces and holes. Document and replace gaskets at the splits. Document and replace seals between valve seat casing and valve base ring.

B. Inspect and document diameter of the bushing in the guide vane, circularity of the stationary seat, parallelism of the flange faces, and concentricity of the upper and lower register fits with the stationary seat and the bushing in the guide vane.

C. Inspect and document the profile of the existing stationary disc seat to identify any modifications from the original design.

D. Clean holes and ports of all grease and debris.

E. Inspect and document any cavitation, corrosion, and cracking over 100% of exposed interior and exterior surfaces on the valve seat casing and guide ring.

F. If repairs are required for cavitation and/or corrosion damage on the guide vanes, ensure that repair methods do not change shape, fit, or alignment of the component.

G. Remove existing stationary seat ring and install stationary disc seat ring.

H. Remove and replace existing bronze bushing in guide ring, if necessary.

I. Remove and replace small diameter piping and check valves.

5.6 VALVE BASE RING

A. Clean and inspect flange faces and holes. Document and replace gaskets at the splits.

B. Inspect and document any cavitation, corrosion, and cracking over 100% of exposed interior and exterior surfaces on the valve base ring.

C. Inspect and document diameter and circularity of the component.

5.7 CYLINDER FOR MAIN PISTON

A. Clean and inspect flange faces and holes. Document and replace seals between cylinder and cylinder head.

B. Inspect and document any corrosion and cracking over 100% of exposed interior and exterior surfaces on the cylinder.

C. Inspect and document diameters of the bronze bushing, bushing perpendicularity to the lower flange, bushing surface finish, parallelism of the flange faces, and concentricity of the lower register fit with the bore.

D. Remove and replace existing bronze bushing, if necessary, and reestablish original diameter, circularity, and surface finish.

5.8 CYLINDER HEAD

A. Clean and inspect flange faces and holes.

B. Inspect and document diameters of the bronze bushings for the dashpot cylinder, concentricity of the two bushings for the dashpot cylinder with the lower register fit, perpendicularity of the bushing bores to the lower flange, diameters and surface finishes of the bores for the pivots on the bell crank lever, concentricity of the bores for the pivots on the bell crank lever, diameter of the bronze bushing for the relay rod, and off-center distance of the bushing for the relay rod.

C. Clean holes and ports of all grease and debris. Clean the annular space around the dashpot cylinder and between the bushings.

D. Remove and replace bronze bushings for the dashpot cylinder, if necessary.

E. Remove and replace bronze bushing for the relay rod, if necessary.

5.9 MAIN PISTON ASSEMBLY

A. Inspect and document diameters and runouts of the sleeve and packing seat, perpendicularity of the assembled retaining ring, condition of the female threads for the spindle and feedback rod, surface finish of the sleeve on the main piston, off-center distance of the relay rod, and condition of female threads for the relay rod.

B. Reverse-engineer and provide as-found drawings for the main piston, packing gland, and retaining ring assembly.

C. Inspect and document any corrosion and cracking on the piston.

D. Remove and replace existing sleeve on the main piston, if necessary, and reestablish original diameter and surface finish.

F. Clean spring (Item 6, dwg B2-1035) and stud (Item 7, dwg B2-1035) between the dashpot cylinder and main piston assembly and test spring compression to confirm that it matches drawing specifications.

G. Replace packing for main piston.

H. Check retaining ring assembly for deformation.

I. Replace fasteners for packing gland and retaining ring assembly.

5.10 SPINDLE AND SPINDLE EXTENSION

A. Inspect and document any cracking or other defects in transition areas on the spindle.

B. Inspect and document diameters and runouts of the spindle and spindle extension, perpendicularity of the shoulders for valve disc and main piston assembly, condition of the male and female threads, and surface finish of the existing sleeve on the spindle extension.

C. Reverse-engineer and provide as-found drawings for the spindle and spindle extension.

D. Remove and replace existing sleeve on the spindle extension, if necessary, and reestablish original diameter and surface finish.

5.11 VALVE DISC AND COLLAR ASSEMBLY

A. Inspect and document the profile of the existing valve disc seat to identify any modifications from the original design.

B. Remove existing disc seat ring.

C. Inspect and document any cavitation, corrosion, and cracking on the valve disc.

D. Inspect and document diameters and runouts of the installation interface for the disc seat ring, diameter of the spindle bore, and the perpendicularity of the top and bottom surfaces to the spindle bore.

E. Reverse-engineer and provide as-found drawings for the main valve disc and the collar assembly between the valve disc and spindle extension.

F. Install new disc seat ring.

5.12 DASHPOT CYLINDER AND COVER

A. Inspect and document diameters and cylindricity of the interior and exterior of the dashpot cylinder and surface finish of the exterior of the dashpot cylinder. Inspect and document diameter and concentricity of the assembled cylinder cover.

B. Perform hydrostatic test on the joint between dashpot cylinder and cylinder bottom for 30 minutes at 650 psi to ensure that joint is oil tight.

5.13 DASHPOT PISTON

A. Measure and record the as-found condition of all dashpot piston adjustments prior to disassembly, including but not limited to the dashpot needle adjustment, the position of the nut above the dashpot piston relative to the dashpot piston shaft, and the details of both bypass valves.

B. Inspect and document diameter and straightness of dashpot piston shaft; diameter of dashpot piston; diameter and condition of piston rings; and concentricity of piston shaft, piston, and piston rings.

C. Clean and measure all ports and threads. Submit results in a report to the City and note any deviation from drawings.

D. Reassemble dashpot piston with new springs. Confirm spring compression and submit results in a report to the City. Reassemble with needle assembly in the as-found position.

E. Clean up scratches on outside diameter of piston and edges of piston ring grooves. Replace three piston rings.

5.14 YOKE

A. Inspect and document diameters and surface finishes of the integral pins.

B. Clean holes and ports of all grease and debris.

5.15 LINKS AND PINS BETWEEN YOKE AND BELL CRANK LEVER

A. Inspect and document diameters and center-to-center distances of the bushings and diameters and surface finishes of the pins connecting the bell crank lever.

B. Clean holes and ports of all grease and debris.

C. Remove and replace existing bronze bushings, if necessary, and reestablish original dimensions.

5.16 BELL CRANK LEVER

A. Inspect and document diameters and surface finishes of center pivots, diameter of bronze bushing, and distance from center pivots to bronze bushing.

B. Remove and replace bronze bushing, if necessary.

C. Clean holes and ports of all grease and debris. Replace grease piping.

5.17 LINKAGE AND PINS BETWEEN CROSSHEAD AND BELL CRANK LEVER

A. Measure and record the as-found lengths and number of exposed threads of the linkage prior to disassembly.

B. Inspect and document diameters and surface finishes of pins and diameter of bronze bushing.

C. Clean holes and ports of all grease and debris.

D. Remove and replace existing bronze bushing connecting the linkage to the crosshead, if necessary.

5.18 LINKAGE AND PINS BETWEEN SHIFT RING AND CROSSHEAD

A. Measure and record the as-found lengths and number of exposed threads of the linkage prior to disassembly.

B. Inspect and document diameters and surface finishes of pins and diameters of bronze bushings.

C. Clean holes and ports of all grease cand debris.

D. Verify that the existing pin connecting the linkage to the shift ring is constructed of stainless steel and finish to 16 Ra microinches or better. Pin shall be stainless upon reassembly. Furnish new, stainless-steel pin if required.

E. Remove existing bronze bushing connecting the linkage to the shift ring and replace with Orkot TXMM self-lubricating bushing. Running clearance shall be as recommended by bushing supplier. Clean and plug all grease ports originally used for lubrication of this bushing.

F. Remove and replace existing bronze bushing connecting the linkage to the crosshead, if necessary.

5.19 REGULATING CONNECTIONS

A. The pilot valve adjustment handwheel shall remain locked until such time as the current position of the handwheel can be properly documented. Measure and record the as-found position of the handwheel, length of the assembled spring casing, and clearance in the spring casing due to spring compression prior to disassembly.

B. Measure and record the as-found lengths and number of exposed threads of adjustable links, rods, and assemblies in the regulating connections prior to disassembly.

C. Inspect and document diameters and surface finishes of pins and diameters of bushings and bores. Inspect and document diameter, surface finish, straightness, and condition of external threads of relay rod (Item 1, B2-1040).

D. Measure and record spring connection between Items 14 and 26 on dwg B2-1040 and reference to drawing requirements (“This dist = 16 ½ inches when spring is compressed to about 400#” per dwg B2-1040).

E. Disassemble the spring assembly (Items 21, 22, 23, 24, 25, 29, dwg B2-1040) and inspect for damage and wear. Test spring compression and confirm that it matches drawing specifications.

F. Remove the tee handle air cock (Item 3, dwg B2-1040) and confirm it to be functional. Flush the internal bore of the relay rod (Item 1, dwg B2-1040) confirm it to be free of obstruction.

G. Remove and replace existing bushings and pins in the regulating connections, if necessary.

H. Scribe mark “X” on rod (Item 14, B2-1040) above spring casing, if not already present, such that mark is flush with the top of the spring casing when the top of the cylindrical head rests against the underside of the spring casing.

I. Scribe mark “Y” on pilot stem (Item 4, B2-1070), if not already present, such that mark is flush with top of pilot valve cover when pilot piston is seated.

5.20 PILOT VALVE

A. Prior to disassembly of the pilot valve, measure and record clear dimension between pilot piston and valve seat bushing with pilot piston in the “down” position (5/8” per dwg B2-1072) and allowable movement of the pilot piston in the vertical position (11/16” per dwg B2-1072).

B. Inspect and document diameter and surface finish of pilot stem, diameters and concentricity of valve tip and pilot piston, diameters and concentricity of valve bushing and valve seat bushing, and diameters and concentricity of bushings in pilot valve cover. Inspect female threads for 1-inch drain pipe for integrity. Submit recommendations for refurbishment to the City in the form of a report.

C. Clean holes and ports of all grease and debris.

D. Replace perforated screen (Item 8, dwg B2-1070) and piston orifice (Item 5, dwg B2-1070).

E. Replace valve seat (Item 5, dwg B2-1070) for pilot stem. Lap pilot stem together with valve seat and assess contact between components using Prussian blue.

F. Carefully measure stack-up height prior to lapping valve tip (Item 2, B2-1070) together with valve seat bushing (Item 3, B2-1041). Increase number or thickness of adjusting shims (Item 7, B2-1070) if required to reestablish original dimensions.

G. Replace studs, nuts, and washers (Items 9-11, dwg B2-1070) holding valve tip to pilot piston. Provide lock washers.

H. Replace packing (Item 18, dwg B2-1041) and seal for pilot stem (Item 17, dwg B2-1041; Item 009,). Propose a modern alternative to the original cup leather seal.C.

5.21 SHOP REASSEMBLY OF PRV

A. Prior to reassembly of complete valve, assemble stationary components, including valve seat casing with guide ring and stationary seat, discharge elbow, piston cylinder, and cylinder head, to verify alignment. Align and dowel all components.

B. Ensure corresponding alignment between moving components, including piston assembly, spindle, valve disc and disc seat, and spindle extension. Perform runout checks on assembled components.

C. Reassemble the PRV in the vertical position in the shop prior to shipping back to site. Test stroke the PRV using an overhead crane to slowly lift and lower the main valve and verify that it moves smoothly and drops under its own weight in the absence of any downward force. Assess contact between stationary and disc seat rings using Prussian blue during reassembly; contact surface shall be approximately 1/16” wide per dwg B2-1055.

D. In lieu of the test stroke with overhead crane required by Article C above, Contractor may temporarily connect a pressurized-water supply to the discharge elbow at the flanged connection for the pilot valve while the valve is in the vertical position in the shop. Pressurize the main piston assembly to a pressure not to exceed 200 psi and verify that the main valve moves slowly and drops under its own weight in the absence of any downward force.

PART 6 COMMISSIONING

6.1 GENERAL

City will conduct tests for general acceptance after the equipment is installed and prior to release for operation. Tests will ensure an appropriate pressure rise in the penstock is achieved during reasonably probable wicket gate operation (i.e., normal shut down, full load rejection, reasonable probable wicket gate close time maladjustment, etc.). Tests shall include mechanical adjustment checks, subsystem testing, dry testing, offline wet testing, online load run testing, and load rejection testing.

A. Contractor may provide a witness for these tests.
B. Contractor shall attend daily coordination and safety meetings with the Project Team for generator unit refurbishment for any period during which they are on site and work both project coincides.

6.2 OPTIONAL BID ITEM

A. In conjunction with the procedure specified in Part 2, provide a commissioning plan one month in advance of scheduled commissioning for the PRV.
B. Provide technical advisor to advise City staff at Cushman #2 Powerhouse during commissioning work. Provide technical advisor's hourly rate for site support and resume as part of the Contractor's proposal.

PART 7 SPECIAL DRAWINGS

7.1 GENERAL

A. Contractor shall adhere to Section 01300 for the creation of drawings, in addition to any stipulations listed above.

7.2 AS-FOUND DRAWINGS

A. All items inspected for which drawing details are not currently available shall be measured by Contractor and a drawing of the as-found design submitted to the City including all details required to replace the item in a timely manner. This includes the following:

1. Main Valve Piston (see B2-1332 for similar equipment from a sister unit)
2. Packing Gland for Main Valve Piston
3. Retaining Ring Assembly (above Main Valve Piston)
4. Valve Spindle
5. Main Valve Disc
6. Collar Assembly (between Main Valve Disc and Spindle Extension)
7. Valve Spindle Extension
8. Solid Head – R.H. Thread (between Linkage and Shift Ring)
9. Solid Head – L.H. Thread (between Linkages and Cross Head)

10. Forked Head (between Linkage and Bell Crank Lever)

11. Pin for Solid Head – R.H. Thread

12. Pin for Forked Head

7.3 REMANUFACTURED ITEMS

All items manufactured by the Contractor for the project shall be measured by Contractor and a drawing of the as-found design submitted to the City including all details required to replace the item in a timely manner. This includes the following:

1. Valve Seat Rings
2. Pins
3. Bushings
4. Sleeves

END OF SECTION

SECTION 09901 - SHOP COATINGS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This specification defines the methods of surface preparation, coating application, and inspection of shop-applied coatings on rehabilitated and new equipment components.

1.2 WORK INCLUDED

A. Surface preparation, including complete removal of existing coatings, surface preparation, application of coating materials on the carbon steel, cast iron, and non-machined surfaces of the PRV components.
B. If test shows that lead is present in the original coatings, precautions shall be taken to prevent exposure to workers and the environment. Procedures for removal and handling of removed coating waste shall comply with all applicable federal, state, and local standards and regulations. Bidder's pricing shall assume all existing paint at jobsite and on existing equipment contains lead.
C. Providing and operating environmental control equipment to maintain the conditions required for all aspects of surface preparation, material application, curing and inspection.
D. Complying with all necessary safety provisions required by federal, state, and local laws that govern this type of work.
E. Protecting exposed machined surfaces of the PRV components against corrosion during return shipping and prior to site reinstallation.

1.3 WORK NOT INCLUDED

A. Stainless steel, galvanized steel, and bronze and composite wear surfaces.
B. All machined surfaces, male and female threads, and other surfaces identified by the Engineer.
C. Uncoated cast iron surfaces exposed to water shall not be coated.

1.4 CODES AND STANDARDS

A. The Contractor shall ensure the quality of items and services to meet the requirements of this Specification, the applicable codes and standards, and other procurement documents. If the requirements of this Specification differ from the Contractor's normal procedures, the requirements of this Specification shall govern. B. The work shall conform to the latest revision of the following standards in effect at the contract award date:

1. American Society for Testing and Materials (ASTM)
    a. ASTM E337, Standard Test Method for Measuring Humidity with a Psychrometer
2. Society for Protective Coatings (SSPC)
    a. SSPC-PA 1, Shop, Field and Maintenance Painting
    b. SSPC-SP 1, Solvent Cleaning
    c. SSPC-SP 6, Commercial Blast Cleaning
    d. SSPC-SP 10, Near-White Blast Cleaning

PART 2 PRODUCTS

2.1 MATERIALS & SYSTEMS

A. The materials for the coating systems to be applied shall be furnished by the following manufacturers:

Manufacturer	Coating Product	Total Dry Film Thickness	Application
Sherwin Williams	Macropoxy HS 95	18 mils min.	submerged metal surfaces
Sherwin Williams	MIL-DTL-24441/19C Type III + MIL-DTL-24441D Type III	12-18 mils	metal surfaces exposed to water
International	Interseal 670HS	12-16 mils	metal surfaces exposed to atmosphere

B. No coating material substitutions are allowed without approval of Engineer.
C. Finish coat color shall be matched to existing topcoat color. Final color selection shall be approved by City prior to application.
D. Thinners and cleaners shall only be used as recommended by the coating manufacturer.
E. Coating materials shall be supplied in pre-measured units and mixed in full unit kit.

2.2 MATERIAL STORAGE

A. Materials shall be in manufacturer's original unopened containers without any notable damage to the container or to the air-tight seal. Each container shall be clearly identified with the manufacturer's name, product designation, batch number, date of manufacture, and shelf life expiration date.
B. Materials shall be protected from moisture, direct sunlight, and temperatures below 40°F or above 100°F.
C. Material containers shall not be opened except for immediate use.
D. Materials that do not have at least 5 months of shelf life remaining when received at the jobsite shall not be accepted without prior written permission from City.

PART 3 EXECUTION

3.1 ENVIRONMENTAL CONDITIONS

A. No surface preparation or coating application shall be performed when the environmental conditions do not meet the requirements specified by the coating manufacturer. The coatings shall be allowed to dry prior to topcoat and shall be put in service in accordance with the topcoat time and curing time recommended by the coating manufacturers.

3.2 SURFACE PREPARATION

A. The surface shall be cleaned of oil, grease, rust, stains, corrosion products, loose paint, and other contamination. Foreign matter shall be removed from the surfaces by solvent, steam, or detergent cleaning in accordance with SSPC-SP1, Solvent Cleaning. Repaired areas shall have anchor profiles sufficient for coatings applied.
B. Existing coating on the surface should be removed and steel surface should be blasted cleaned in accordance with SSPC-SP10, Near-White Blast Cleaning for immersion surfaces and SSPC-SP6 Commercial Blast Cleaning for non-immersion surfaces. Surfaces that are not to be coated shall be protected from damage from preparation activities and from coating application or overspray.
C. Primer coat shall be applied to exposed metal surface before rust blooms begin to form.
D. Openings shall be sealed to exclude foreign material during shipment and before installation.

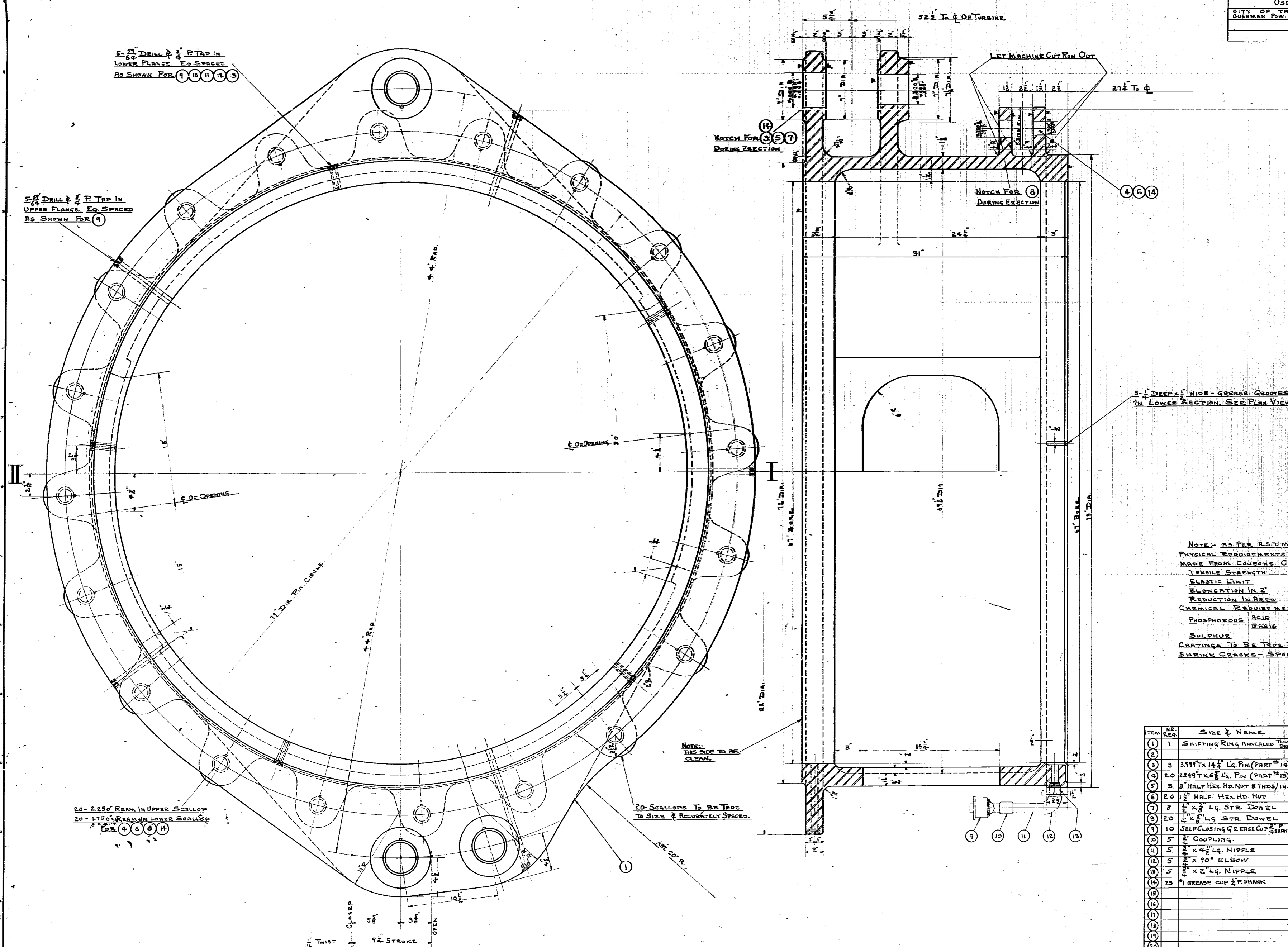
3.3 APPLICATION

A. Coating application shall conform to the requirements of SSPC-PA1 (Shop, Field, and Maintenance Coating of Metals), the manufacturer's published instructions and requirements, and as specified herein.
B. Each component shall be mixed separately prior to the mixing of the combined materials. Only complete, pre-measured units shall be mixed.
C. The coating materials shall not be applied when there is moisture on the surface or if moisture is likely to be deposited from subsequent condensation.
D. The coating shall be applied using the size and type of application equipment recommended by the coating manufacturer appropriate for the size and configuration of the job.
E. The PRV components shall be coated with coating systems specified in Part 2. Each coat will be applied to the dry film thickness listed in Part 2 or as recommended by the coating manufacturers in accordance with their product data sheets.
F. The minimum and maximum drying time between coats shall be as recommended by the coating manufacturers and shall be strictly observed.
G. After application of the final coat, the surface temperature of the substrate shall be maintained and the coating cured in accordance with coating manufacturers' recommendation.
H. After final inspection and acceptance of the completed coating repair work on the PRV components, tools and equipment shall be removed and personnel restricted from re-entering those areas until the full cure of applied coatings is reached.
I. Clean-up and removal of all waste materials generated under this work is the responsibility of the Contractor, and these materials must be disposed as required by applicable regulations.

3.4 INSPECTION

A. Visual and dry film thickness inspections shall be performed by the Contractor, with City having access to inspect any processes, in accordance with an approved inspection plan. The inspection records shall be reviewed and accepted by City.
B. Any defects disclosed by inspection shall be re-inspected after correction.
C. The temperature, dew point, and relative humidity in the work area shall be determined with a sling psychrometer in accordance with ASTM E-337 or other procedures permitted by City and this information shall be recorded.
D. Coatings shall not be applied if the substrate temperature and relative humidity fall outside the specified limits. The coatings shall be visually inspected for defects. Runs, sags, pinholes, blisters and lack of adhesion shall be removed and repaired. All defects shall be repaired before curing.
E. Contractor shall supply one quart of each color for touch-up or enough to repair all damage to the finish coat paint in the field.

END OF SECTION



Used For		Nº.	Ord. Nº	
City of Tacoma, Wash. Cushman Pow. Plant #2	7-3-29 Edw. B	2	28-9756	Omit (9)(14)

Item	Operation	Tool No
	Reamer Bar + Pilot	88671
	Cutter Bar	88672
	Rough + Fin. Cutter.	38189

Note:- As Per A.S.T.M. A-27-24 Class B Medium
Physical Requirements Of Std. Navy Test Bars
Made From Coupons Cast With Main Casting–

Tensile Strength		70,000 #□"
Elastic Limit		45% Tensile Strength
Elongation In 2"		20%
Reduction In Area		30%

Chemical Requirements

Phosphorous	Acid	Not Over 0.06%
	Basic	Not Over 0.05%
Sulphur		Not Over 0.06%

Castings To Be True To Pattern – Free From Shrink Cracks – Spongy Spots – Blowholes.

Item	Nº. Req.	Size & Name	Mat.	Patt. Nº	Drg. Nº	Stock	Weight Rgh.	Weight Fin.
(1)	1	Shifting Ring-Annealed Test Bar	C.S. See Spec.	2WT 14795-2			7000#	
(2)								
(3)	3	3.999"T x 14 1/4" Lg. Pin. (Part #14)	S.S.E.		864-308			
(4)	20	2.249"T x 6 5/8" Lg. Pin (Part #13)	S.S.E.		864-308			
(5)	3	3" Half Hex. Hd. Nut 8 Thds/In.	S.S.C.		S-5382			
(6)	20	1 1/2" Half Hex. Hd. Nut	S.S.C.		S-5382	3559		
(7)	3	1/2" x 7/8" Lg. Str. Dowel	S.S.G.		S-5030	1018		
(8)	20	1/4" x 5/8" Lg. Str. Dowel	S.S.G.		S-5030	1017		
(9)	10	Self Closing Grease Cup 3/4" P. Shank	BR.		S-5263	4374		
(10)	5	3/4" Coupling.	M.I.		S-5078	1767		
(11)	5	3/4" x 4 1/2" Lg. Nipple	W.I.		S-5079	1516		
(12)	5	3/4" x 90° Elbow	M.I.		S-5078	1680		
(13)	5	3/4" x 2" Lg. Nipple	W.I.		S-5079	2170		
(14)	23	#1 Grease Cup 1/4" P. Shank	BR		S-5263	3378		
(15)								
(16)								
(17)								
(18)								
(19)								
(20)								

1 July-3-29 Edw. B.

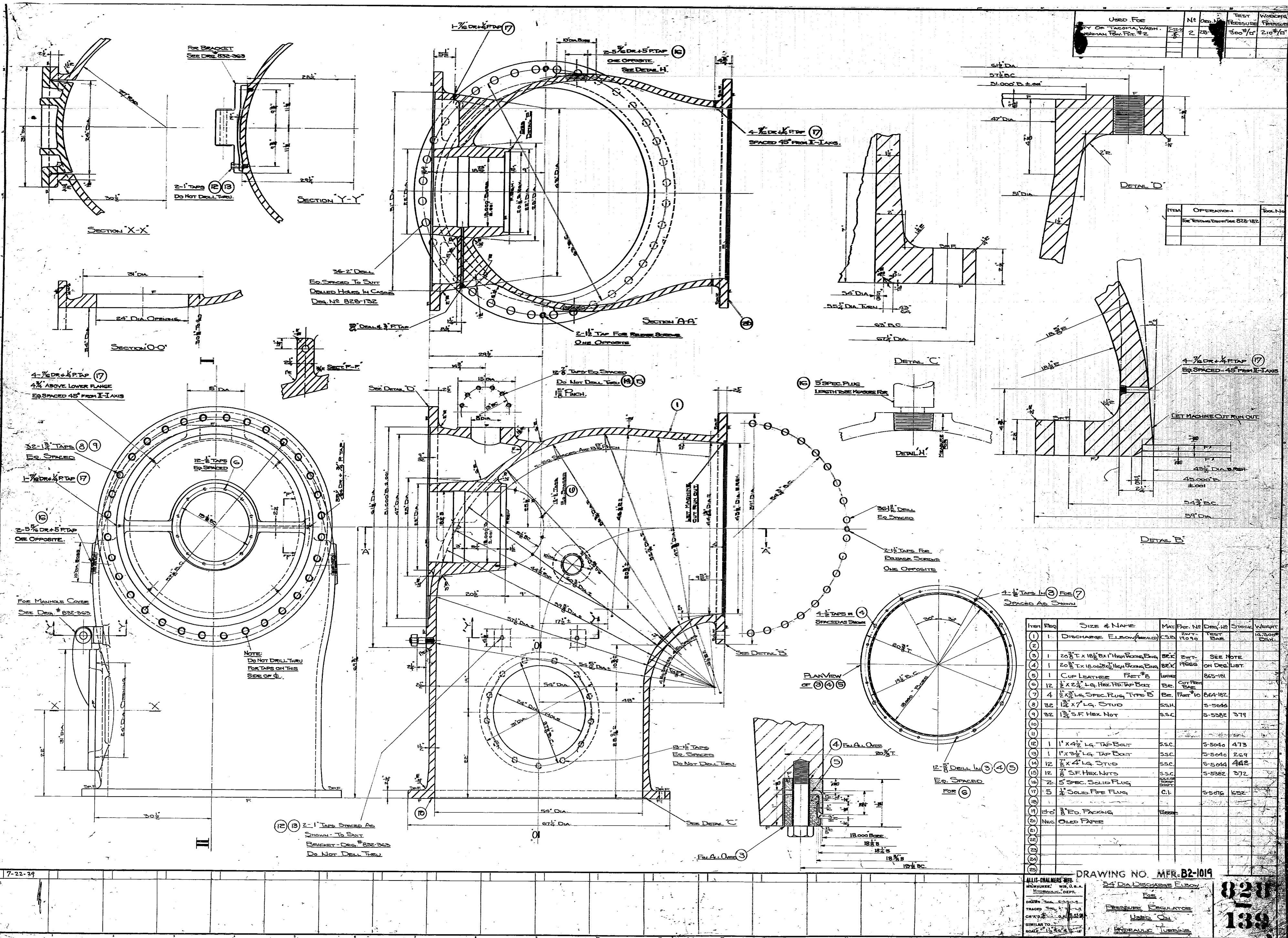
DRAWING NO. MFR-B2-1017

ALLIS-CHALMERS MFG. Co.
MILWAUKEE, WIS. U.S.A.
Hydraulic Dept.

Drawn 812-107
Traced C.K.J. 6/26/29
Ch'k'd Edw. B. O.K. 7-5-29
Similar To 824-170
Scale 3" = 12"

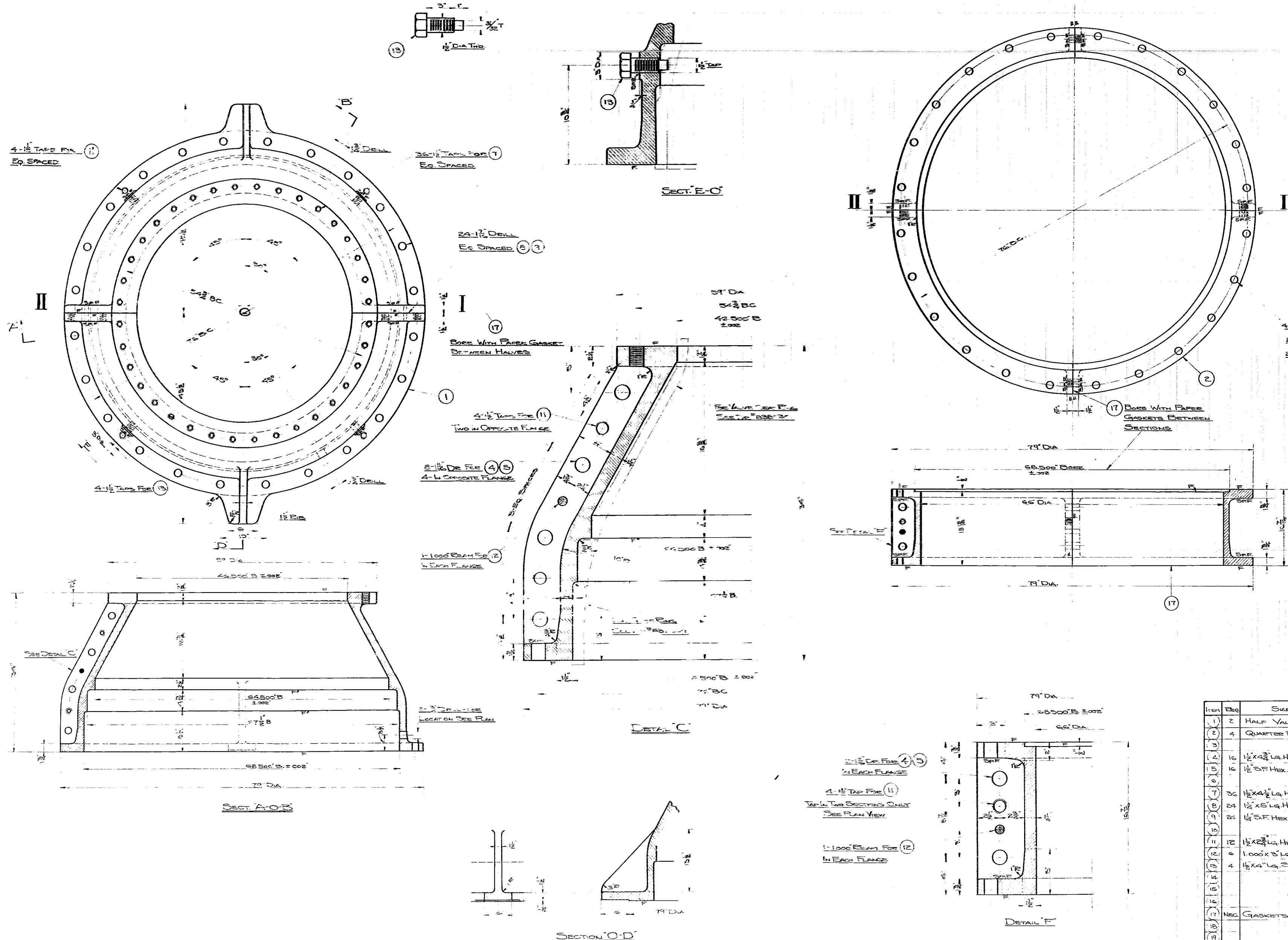
Shifting Ring
Used On
Hydraulic Turbine

828 – 137



Item	Req	Size & Name	Mat.	Patt. No	Drg. No	Stock	Weight
1	1	Discharge Elbow (Annealed)	C.S.B.	2WT-19090	Test Bar		14,300# Rgh.
2							
3	1	$20\frac{3}{8}$" T. x $18\frac{1}{8}$" B. x 1" High Packing Ring	BR.K	2WT-19666	See Note on Drg. List		
4	1	$20\frac{3}{8}$" T. x 18.000" B. x $\frac{7}{16}$" High Packing Ring	BR.K				
5	1	Cup Leather Part #8	Leather		865-181		
6	12	$\frac{1}{2}$" x $2\frac{1}{4}$" Lg. Hex. Hd. Tap Bolt	Br.	Cut From Bar			
7	4	$\frac{1}{2}$" x $\frac{3}{4}$" Lg. Spec. Plug Type "B"	Br.	Part #10	864-182		
8	32	$1\frac{3}{4}$" x 7" Lg. Stud	S.S.H.		S-5044		
9	32	$1\frac{3}{4}$" S.F. Hex Nut	S.S.C.		S-5382	379	
10							
11							
12	1	1" x $4\frac{1}{2}$" Lg. Tap Bolt	S.S.C.		S-5040	473	
13	1	1" x $3\frac{1}{2}$" Lg. Tap Bolt	S.S.C.		S-5040	269	
14	12	$\frac{7}{8}$" x 4" Lg. Stud	S.S.C.		S-5044	442	
15	12	$\frac{7}{8}$" S.F. Hex. Nuts	S.S.C.		S-5382	372	
16	2	5" Spec. Solid Plug	S.S.C. or Scrap Shaft				
17	5	$\frac{1}{4}$" Solid Pipe Plug	C.I.		S-5076	652	
18							
19	15'-0"	$\frac{3}{8}$" Rd. Packing	Rubber				
20	Nec.	Oiled Paper					
21							
22							
23							
24							
25							

Used For		№	Order №
City of Tacoma, Wash. Cushman Pow. Plt. #2		2	284777



Item	Req.	Size & Name	Mat.	Patt. №	Drg. №	Stock	Weight
1	2	Half Valve Seat Casing	C.I.B.	2WT-19623			2950# Ea. Rgh.
2	4	Quarter Base Ring	C.I.B.	2WT-19624			820# Ea. Rgh.
3							
4	16	1½"x4¾" Lg. Hex. Hd. Tap Bolt	S.S.C.		S-5040		
5	16	1½" S.F. Hex. Nuts	S.S.C.		S-5382	377	
6							
7	36	1½"x4½" Lg. Hex. Hd. Tap Bolt	S.S.C.		S-5040	322	
8	24	1¼"x5" Lg. Hex. Hd. Tap Bolt	S.S.C.		S-5040	303	
9	24	1¼" S.F. Hex. Nuts	S.S.C.		S-5382	375	
10							
11	12	1½"x2¾" Lg. Hex. Hd. Tap Bolt	S.S.C.	Thread All Way	S-5040		
12	6	1.000"x3" Lg. Stl. Dowel	S.S.G.		S-5030		
13	4	1½"x4" Lg. Spec. Bolt	S.S.C.	Machine As Shown	S-5040	321	
14							
15							
16							
17	Nec.	Gaskets	Oiled Paper				
18							
19							
20							

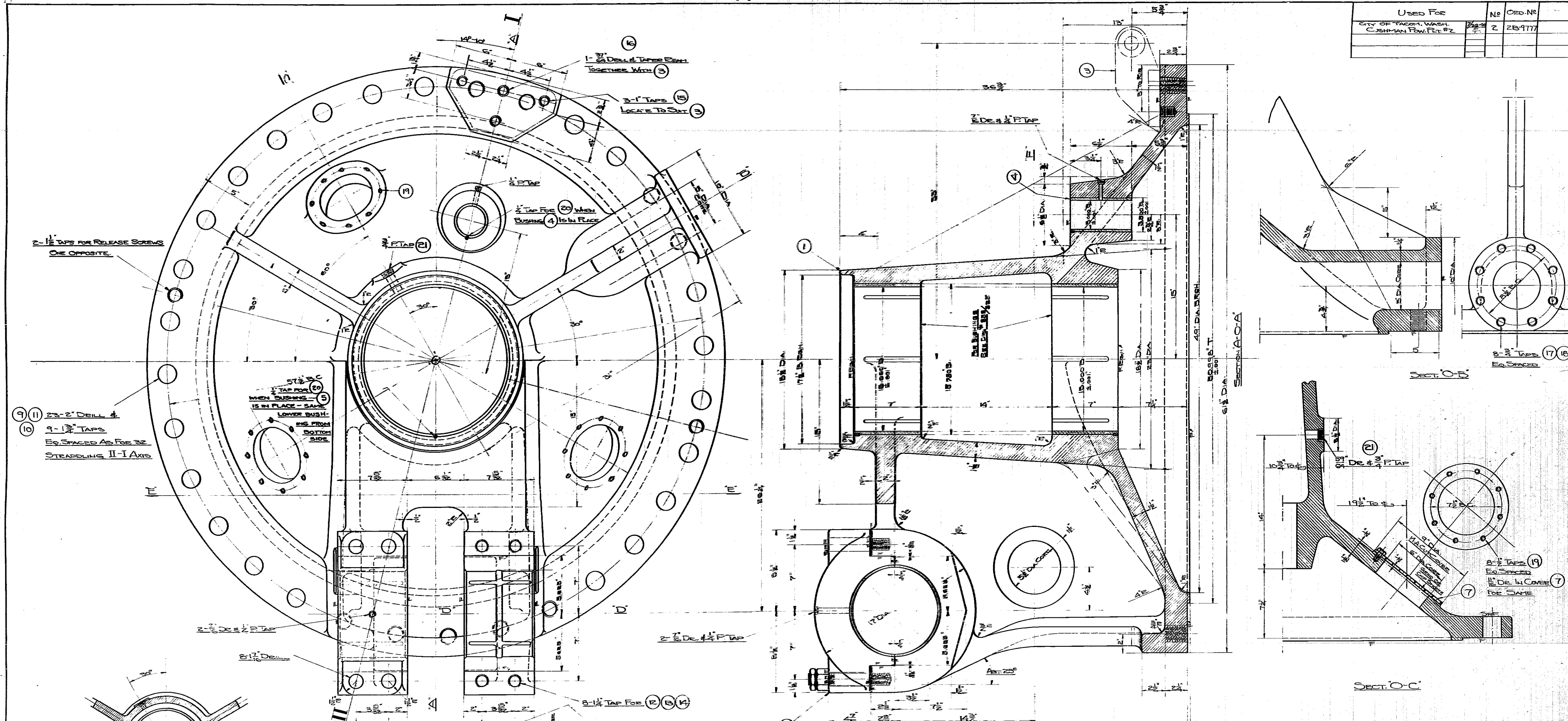
DRAWING NO. MFR-B2-1031

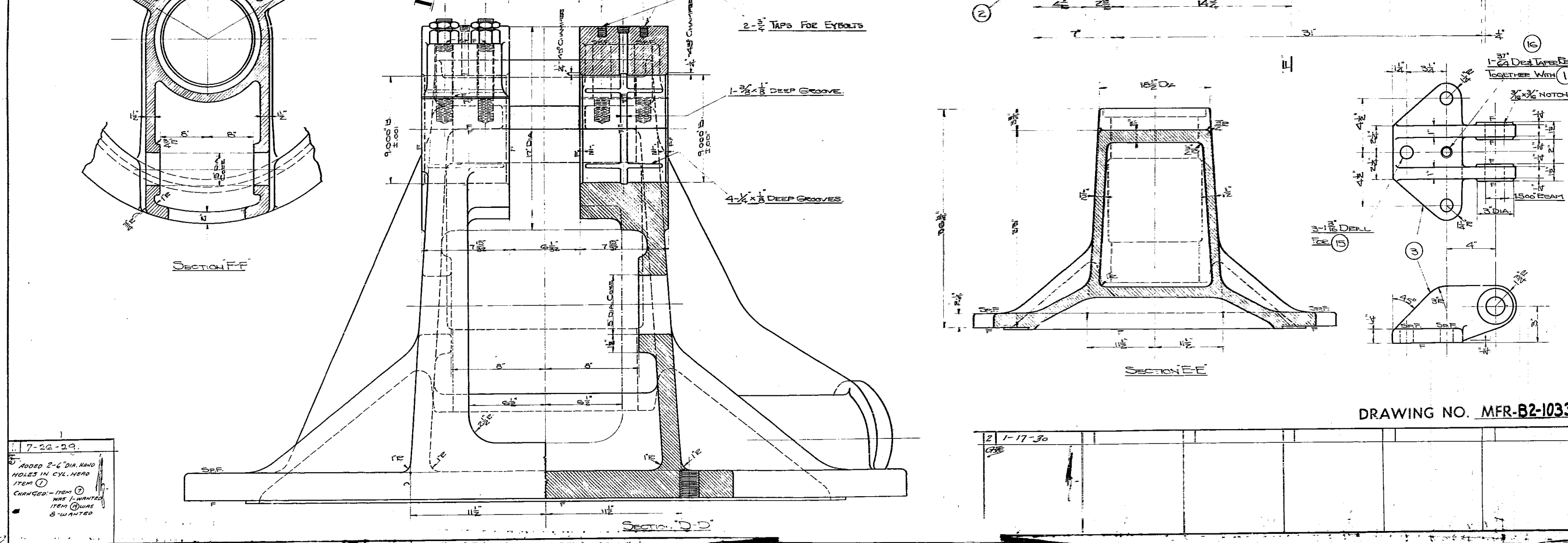
1. 7-22-29

ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS. U.S.A.
HYD. DEPT.
Drawn SJG.
Traced 7-16-29
Ch'k'd 7-22-29
Similar to
Scale 1½" & 3" = 12"

Valve Seat Casing & Base for Pressure Regulator Used on Hydraulic Turbine

828 - 177





Used For		No	Ord. No
City of Tacoma, Wash. Cushman Pow. Plt. #2		2	2B-9777

Item	Req	Size & Name	Mat.	Patt. No	Drg. No	Stock	Weight
1	1	Cylinder Head	H.T.C.I.	ZWT-19644			4500#
2	2	Bearing Caps (Annealed)	C.S.B	ZWT-19645			200# Each
3	1	Bracket	C.I.C.	ZWT-19646			
4	1	Bushing - 6½" Lg. Part #90	Br.E.	STD.47	865-87	4866	
5							
6							
7	3	¼" Thk. x 9" Dia. M.A. Cut Cover	Br.C.				
8							
9	23	1¾" x 6½" Lg. Tap Bolt	S.S.C.		S-5040		
10	9	1¾" x 4½" Lg. Tap Bolt	S.S.C.		S-5040		
11	23	1¾" S.F. Hex. Nuts	S.S.C.		S-5382	379	
12	8	1¼" x 8½" Lg. Studs	S.S.H.		S-5044		
13	8	1¼" S.F. Hex. Nuts	S.S.C.		S-5382	375	
14	8	1¼" S.F. Hex. Half Nuts	S.S.C.		S-5382	1453	
15	3	1" x 2¾" Lg. Hex. Hd. Tap Bolt	S.S.C.		S-5040	266	
16		#2 x 4" Lg. Taper Dowel Style B	S.S.G.		S-5073	615	
17	8	¾" x 3" Lg. Stud	S.S.C.		S-5044	434	
18	8	¾" S.F. Hex. Nut	S.S.C.		S-5382	371	
19	24	½" x 1" Lg. Hex. Hd. Cap Screw	S.S.C.		S-5503	3637	
20	3	¼" x ½" Lg. Threaded Rod	S.S.C.		S-5594	3909	
21	1	¼" x ¾" Red. Bushing	C.I.		S-5112	1840	
22							
23							
24							
25							
26							

DRAWING NO. MFR-B2-1033

1 7-22-29. Added 2-6" Dia. Hand holes in Cyl. Head Item 1. Changed - Item 9 was 1-wanted, Item 11 was 8-wanted

2 1-17-30

Allis-Chalmers Mfg. Co.
Milwaukee Wis. U.S.A.
Hydraulic Dept.

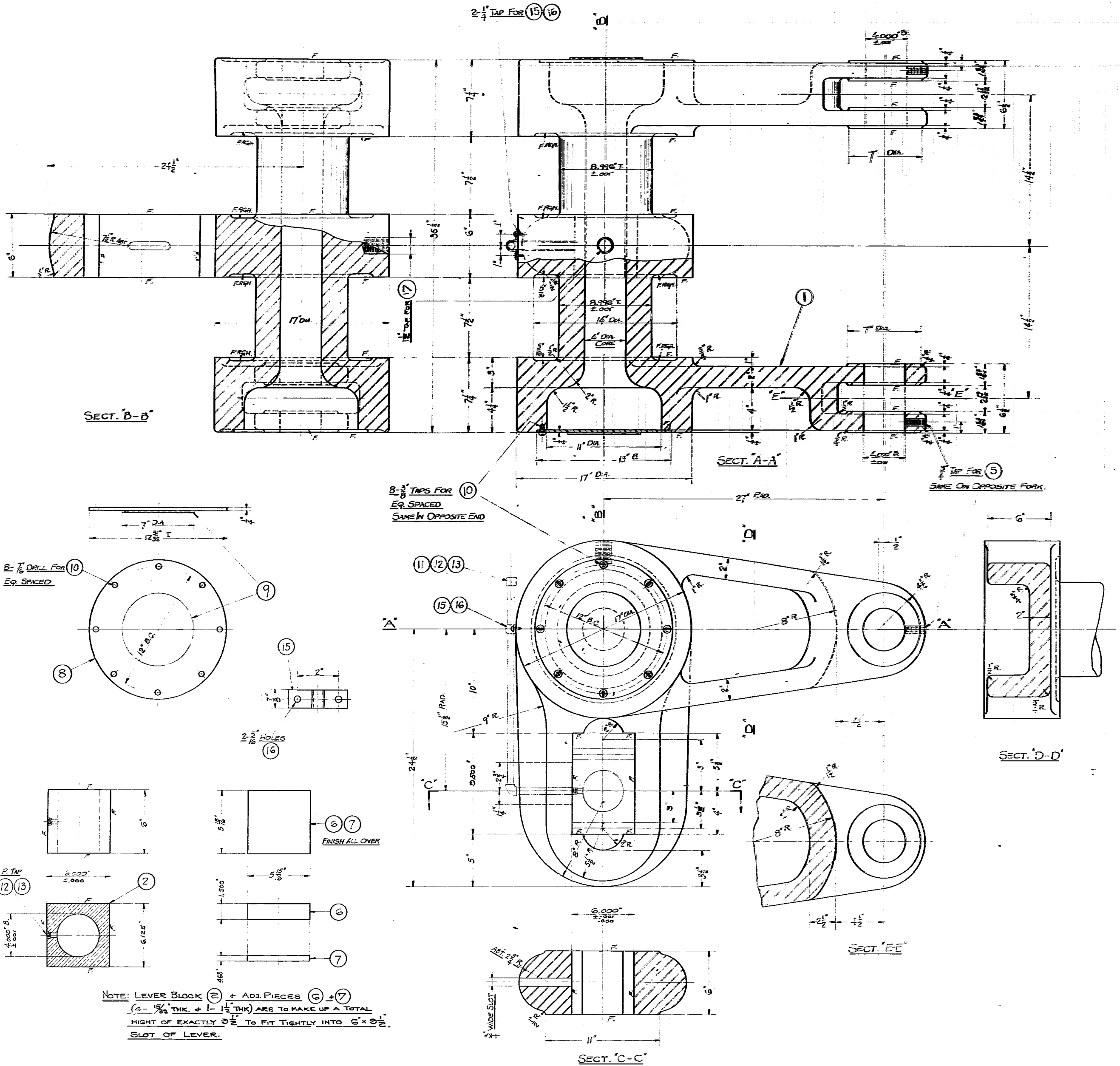
Traced Sig. Scale 1½"-3"-6" = 1'

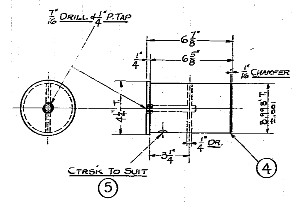
Cylinder Head For Pressure Regulator

Used On Hydraulic Turbine

828
189

Used For		No.	Ord. No.
Tacoma City Washington Cushman Power Plant #2	7-22-29	2	28-9777





Note: Lever Block (2) + Adj. Pieces (6) + (7) (4 - 15/32" Thk. & 1 - 1 1/2" Thk.) are to make up a total hight of exactly 9 1/2" to fit tightly into 6" x 9 1/2" slot of lever.

Specification:-
Cast Steel Castings As Per A.S.T.M.A-27-24 Class "B" Medium
Physical Requirements Of Navy Test Bars Made From Cupons Cast With Main Castings.

Tensile Strength 70,000#/□"
Elastic Limit 45% Ten S
Elongation In 2" 20%
Reduction Of Area 30%

Chemical Requirements
Phosphorous { Acid-Not Over 0.06% / Basic-Not Over 0.05%
Sulphur - Not Over 0.06%

Castings To Be True To Pattern Free From Shrink Cracks, Spongy Spots And Blow Holes.

Item	No.	Size & Name	Mat.	Patt. No.	Drg. No.	Stock	Weight
1	1	Bell Crank Lever (Annealed)	C.S. Spec	2WT-19647	Test Bar		2400#
2	1	Lever Block	Br. "E"	2WT-19648			
3							
4	2	4 1/4" T x 6 7/8" Lg. Pin	S.S. "E"				
5	2	3/4" x 2 3/4" Lg. Sq. Hd. Cup Pt. Set Screw	S.S.C.		S-5055	5561	
6	1	5 15/16" x 5 15/16" x 1.500" Adj. Piece	S.S.C.				
7	4	5 15/16" x 5 15/16" x .468" Adj. Piece	S.S.C.				
8	2	1/4" Thk x 12 31/32" T. Cover	B.P.C.	Cut From Scrap			
9	2	Bearing End Cap Name Plate	Br.		S-5721	5220	
10	16	3/8" x 3/4" Lg. Rd. Hd. Mach. Screw	S.S.G.		S-5046	593	
11	1	1/4" x 26" Lg. Std. Pipe	W.I.	Cut To Suit			
12	1	1/4" - 90° Elbow	M.I.		S-5078	1677	
13	1	1/4" Std. Coupling	M.I.		S-5078	1764	
14		—					
15	1	1/16" Thk x 7/8" x 5" Lg. Strip	Band Iron	Bend To Suit 1/4" Pipe	S-5783		
16	2	1/4" x 3/8" Lg. Rd. Hd. Mach. Screw	S.S.G.		S-5046	1164	
17	1	1 1/2" x 3 1/2" Lg. Eye Bolt	S.S.C.		S-5243	2731	
18							
19							
20							

Drawing No. MFR-B2-1034

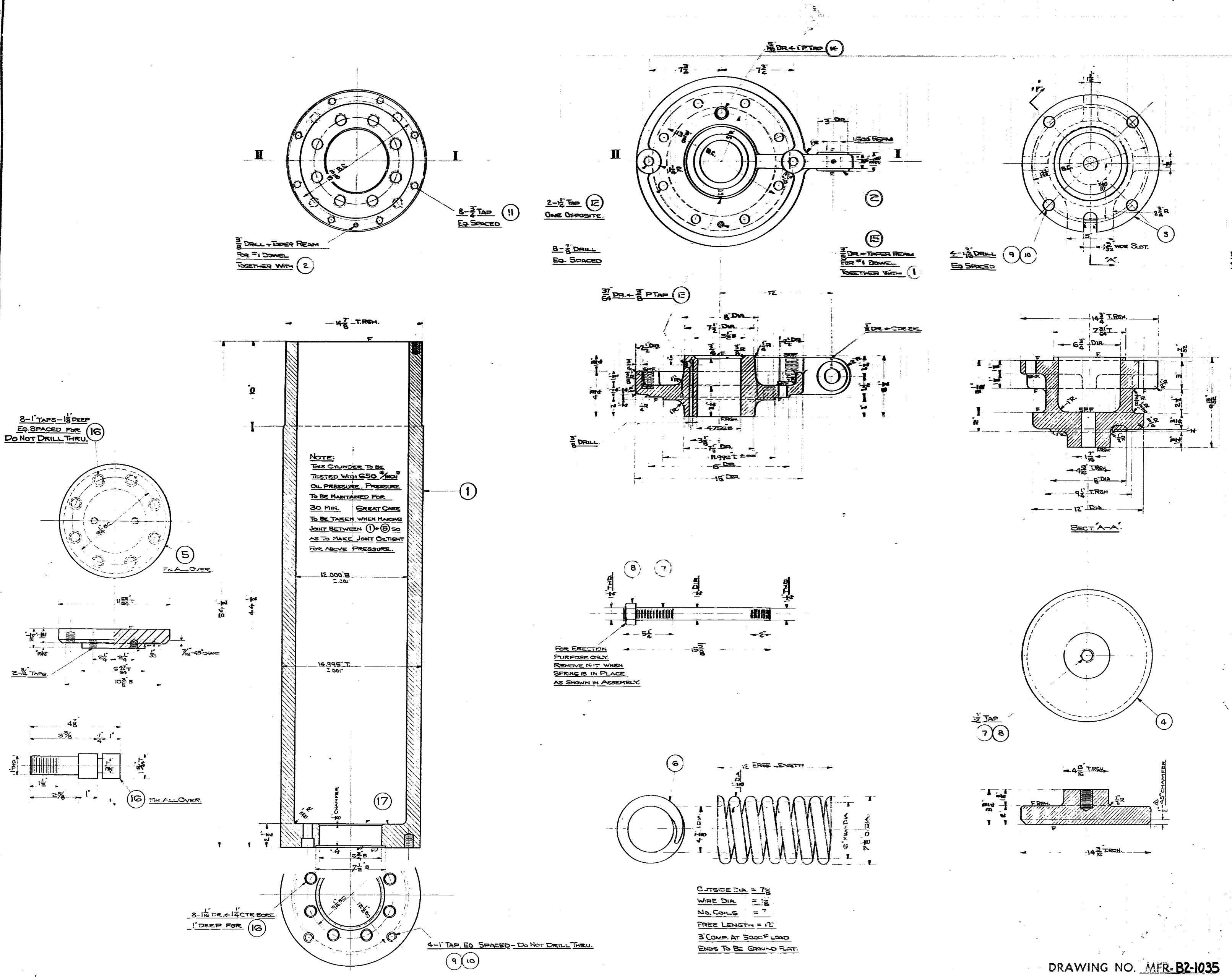
1 7-22-29 Changed:- Thickness of Items (6) & (7) To Decimal Dim. Dim. Were 1 1/2" & 15/32" After
2 2-3-30

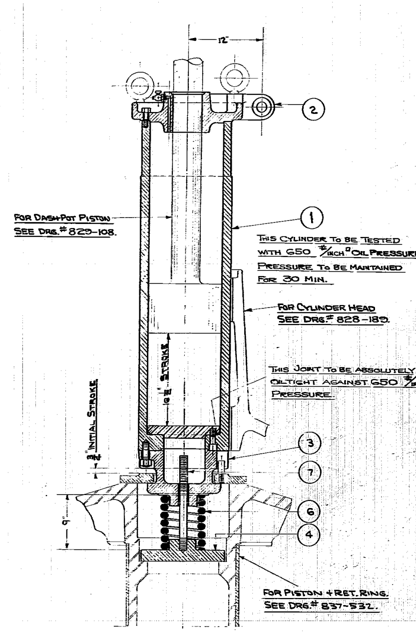
Allis-Chalmers Mfg. Co.
Milwaukee, Wis. U.S.A.
Hydraulic Dept.
Drawn
Traced
Ch'k'd
Similar To
Scale 3" = 1'

Bell Crank Lever
For
Pressure Regulator
Used On
Hydraulic Turbine

828 — 190

Used For		No.	Ord. No.
City of Tacoma Wash. Cushman Pow. Plt. #2.		2	28-9777





Item	Req.	Size & Name	Mat	Patt. No	Drg. No	Stock	Weight
1	1	Dash Pot Cylinder	H.T.C.I.	2WT. 19649			1600#
2	1	Dash Pot Cylinder Cover	C.I.B.	2WT. 19650			
3	1	Spring Retainer	C.I.B.	2WT. 19651			
4	1	Spring Supporting Washer	C.I.B.	2WT. 19652			
5	1	11 63/64" T x 2 1/4" Thk. Cyl. Bottom.	BR.E	Use 2 1/2" Stock			
6	1	1 1/8" W.D. x 4 7/8" I.D. x 12" Lg. Spring	Spring Steel	Copy Spec.			
7	1	1 1/4" Dia. x 15 5/8" Lg. Stud	BR.	Cut From Bar			
8	1	1 1/4" S.F. Hex. Nut	S.S.C.	For Assembling Purpose Only.	S-5382	375	
9	4	1" x 4 1/4" Lg. Studs	S.S.C.		S-5044	450	
10	4	1" S.F. Hex. Nuts	BR.		S-5060	722	
11	8	3/4" x 2 1/4" Lg. Hex. Hd. Tap Bolts	S.S.C.		S-5040	234	
12	2	1 1/4" x 2" Lg. Eye Bolt.	S.S.C.	Cut Stock Bolt To Suit	S-5243	3913	
13	1	3/8 Tee Handle Air Cock	BR.		S-5099	1823	
14	1	1" Solid Pipe Plug	C.I.		S-5076	1656	
15	1	#1 x 4" Lg. Taper Dowel Style B	S.S.G.		S-5073	3577	
16	8	1" Thd. x 1 15/64" T x 4 7/8" Lg. Spec. Fil. Hd. Scr.	S.S.C.	Cut From Bar			
17	1	11 1/4" O.D. x 7 1/4" I.D. x 1/64" Thk. Packing.	Endura				
18							
19							
20							

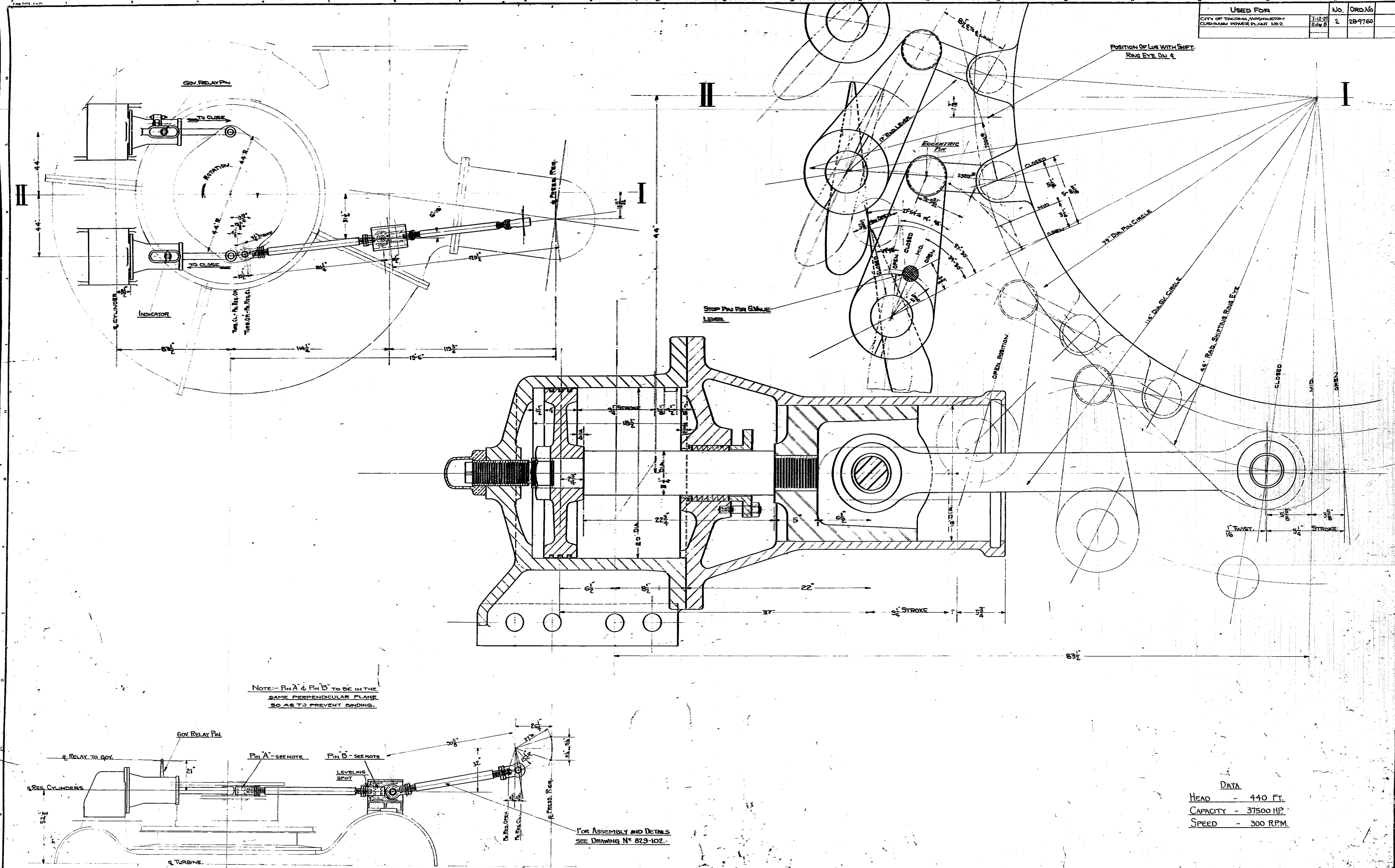
DRAWING NO. MFR-B2-1035

1 7-22-29 — 2 11-6-29
△ (16-8) Added 1/2"-45° Chamfer

ALLIS-CHALMERS MFG. CO.
Milwaukee, Wis. U.S.A.
Hydr. Dept.
Drawn S.B.
Traced Bill 7-15-29
Ch'k'd S. O.K. 7-22-29
Similar To
Scale 3" - 1 1/2" — 12"

DASH POT CYLINDER & DETAILS FOR PRESSURE REGULATOR USED ON HYDRAULIC TURBINE

828 — 191



Note:- Pin "A" & Pin "B" to be in the same perpendicular plane so as to prevent binding.

For Assembly and Details see Drawing Nº 829-102.

Data

Head	440 Ft.
Capacity	37500 H.P.
Speed	300 R.P.M.

Used For		No.	Ord. No.
City of Tacoma, Washington Cushman Power Plant No. 2	7-12-29 Edw. B.	2	28-9760

City of Tacoma, Washington
Cushman Power Plant #2

DRAWING NO. MFR-B2-1038

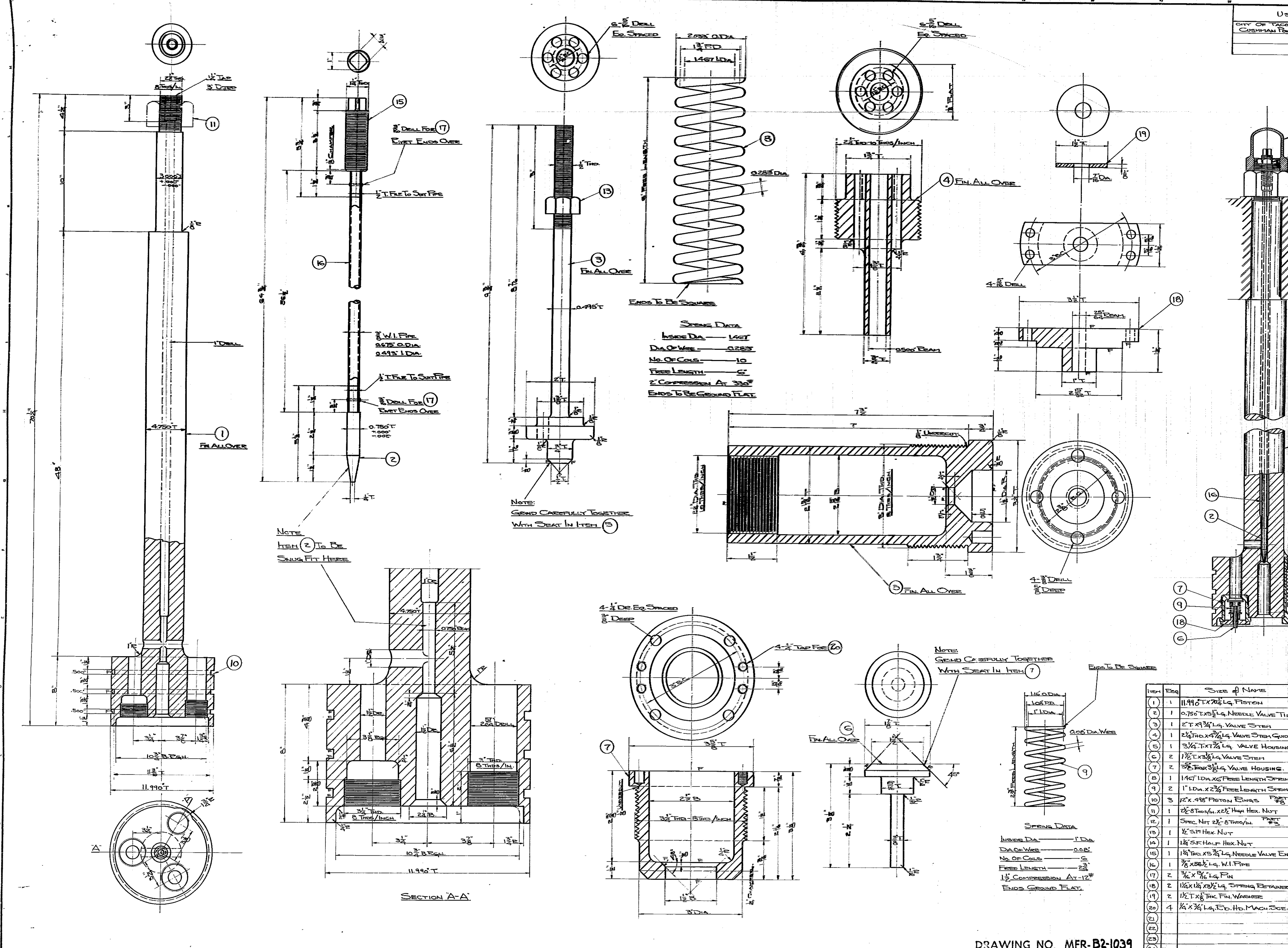
1 July-12-29

Allis-Chalmers Mfg. Co.
Milwaukee, Wis., U.S.A.

Regulating Diagram
Used On
Hydraulic Turbine

828
200

Used For		№	Ord. №
City Of Tacoma, Wash. Cushman Pow. Pct. #2.	7-25-29 / 5	2	28-9777



Item	Operation	Tool No
	2¼"-10 Thd R.H. Ring Gauge	6160
	" " " " Tap "	17921
	" " " " Plug "	6160
	3"-8 Thd R.H. Tap Gauge	DT-29-B
	" " " " Plug "	49249
	" " " " Ring "	MGE-24-B
	3¼"-8 Thd. R.H. Ring Gauge	47209
	" " " " Tap "	43763
	" " " " Plug "	47208
	2½"-8 Thd R.H. Tap Gauge	5584
	" " " " Plug "	5584
	" " " " Ring "	5584

Item	Req	Size & Name	Mat	Patt. №	Drg. №	Stock	Weight
1	1	11.990" T. x 70¼" Lg. Piston	F.S.B.				
2	1	0.750" T. x 5½" Lg. Needle Valve Tip	S.S.C.	Bar Stock			
3	1	2" T. x 9¾" Lg. Valve Stem	S.S.C.	" "			
4	1	2¼" Thd. x 4¾" Lg. Valve Stem Guide	S.S.E.	" "			
5	1	3¼" T. x 7¾" Lg. Valve Housing	S.S.E.	" "			
6	2	1⅞" T. x 3⅛" Lg. Valve Stem	S.S.E.	" "			
7	2	3⅝" Thd. x 3⅛" Lg. Valve Housing.	S.S.C.	" "			
8	1	1.467" I.Dia. x 6" Free Length Spring	Spring Steel	Copy Spec.			
9	2	1" I.Dia. x 2¾" Free Length Spring	Spring Steel	Copy Spec.			
10	3	12" x .498" Piston Rings Part #8	C.I.		867-13	Order From The Piston Ring Co. Muskegon Mich.	
11	1	2½"-8 Thds/in. x 2½" High Hex. Nut	S.S.C.	Cut From 3⅞" Hex. Bar Stock			
12	1	Spec. Nut 2½"-8 Thds/in. Part #3	C.I.C.	2WT-12868-Z	866-136		
13	1	½" S.F. Hex. Nut	S.S.C.	For Erect. Purposes	5-5382	369	
14	1	1¼" S.F. Half Hex. Nut	S.S.C.		5-5382	1453	
15	1	1¼" Thd. x 5¾" Lg. Needle Valve End	S.S.C.	Bar Stock			
16	1	⅜" x 56½" Lg. W.I. Pipe	W.I.				
17	2	3/16" x 13/16" Lg. Pin	S.S.C.				
18	2	1¼" x 1¼" x 3½" Lg. Spring Retainer	S.S.C.	Bar Stock			
19	2	1½" T. x ⅛" Thk. Fin. Washer	S.S.C.				
20	4	¼" x ¾" Lg. Rd. Hd. Mach. Scr.	S.S.G.		5-5046	576	
21							
22							
23							
24							

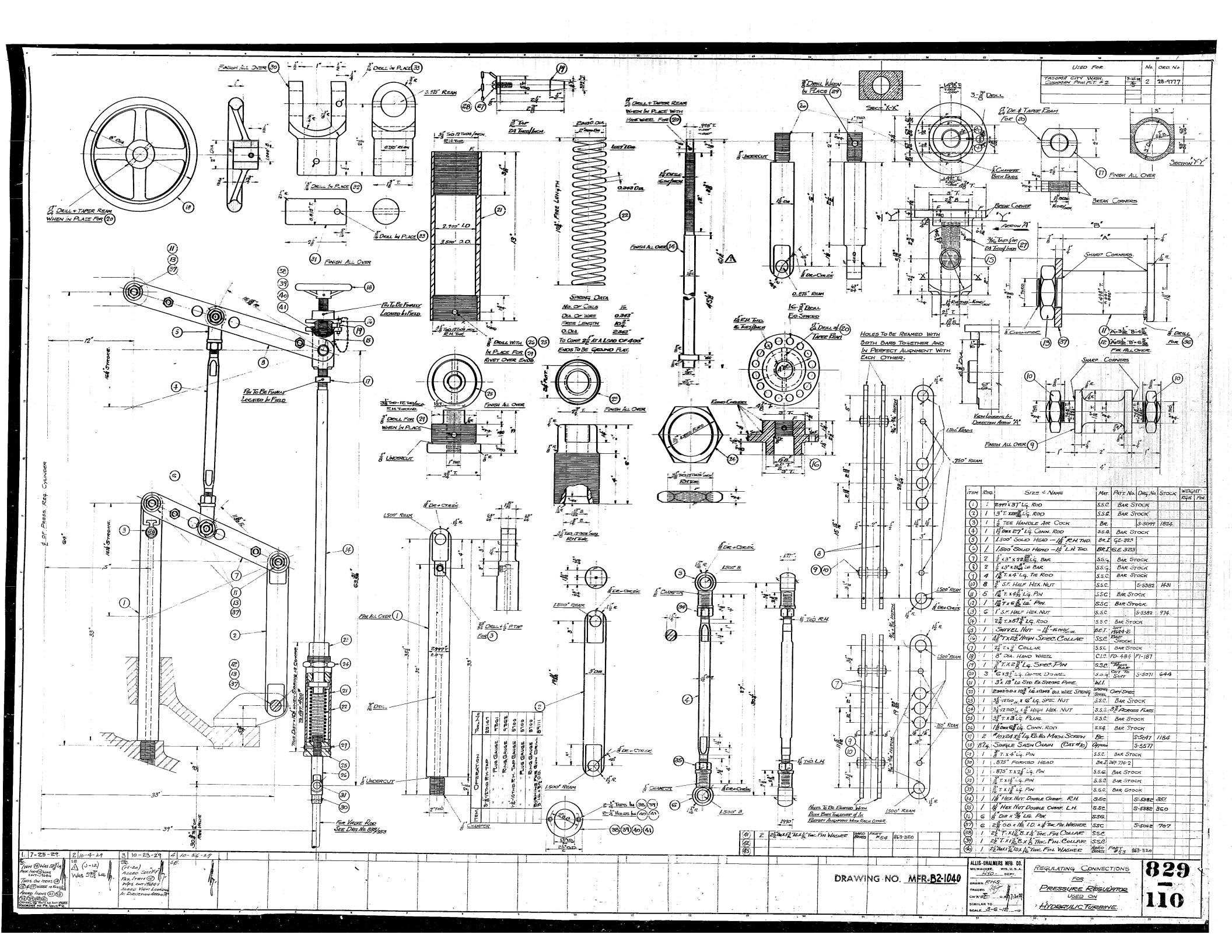
DRAWING NO. MFR-B2-1039

1 | 7-25-29

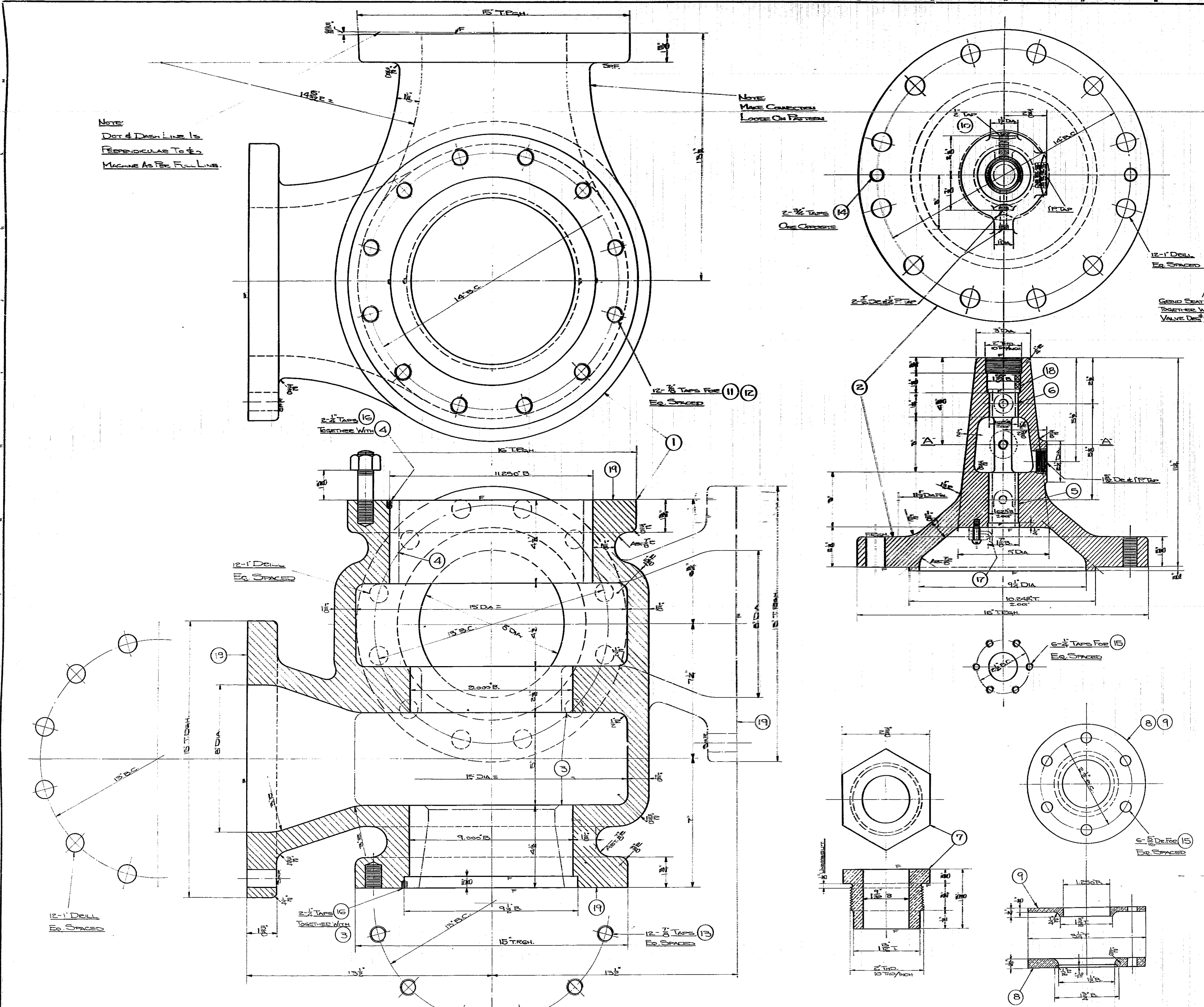
ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS. U.S.A.
Hydraulic DEPT.
DRAWN RHS.
TRACED
CH'K'D. O.K. 7-30-29
SIMILAR TO
SCALE 3"&1½"=1'

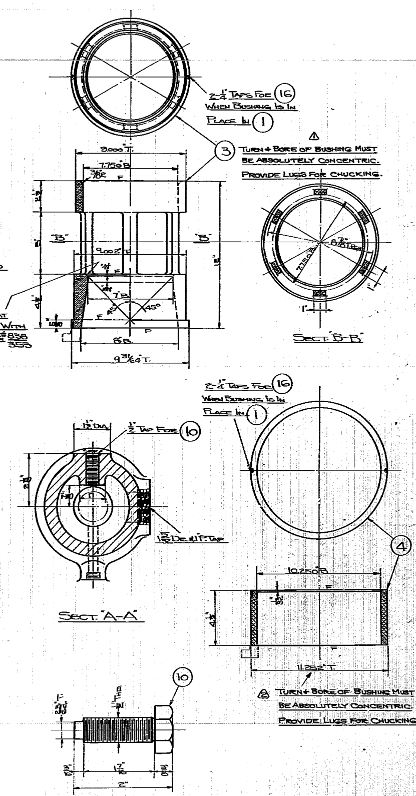
12" Dash Pot Piston & Details For Pressure Regulator Used On Hydraulic Turbine

829 — 108


USED FOR
No.
ORD No
TACOMA CITY WASH. CUSHMAN POWER PLT. #2
7-12-28
2
28-9777
DRAWING NO. MFR-B2-1040
ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS. U.S.A.
REGULATING CONNECTIONS FOR PRESSURE REGULATOR USED ON HYDRAULIC TURBINE
829-110

Used For		№	Ord. №	Test Pressure	Working Pressure	
City Of Tacoma - Cushman #2 Dev.	8/16-29	2	28-9777	300#/□"	210#/□"	





Item	Req.	Size & Name	Mat.	Patt. №	Dsg. №	Stock	Weight
1	1	Valve Body	C.I.B.	2WT-19675			
2	1	Valve Cover	C.I.B.	2WT-19676			
3	1	Valve Seat Bushing	Br.H.	2WT-19677-1			
4	1	Valve Bushing	Br.H.	2WT-19678-1			
5	1	1.250" Bushing - 3" Lg. Part #21	Br.E.	Std. #13	865-310	4832	
6	1	1.250" Bushing - 1 1/2" Lg. Part #22	Br.E.	Std. #13	865-310	4832	
7	1	2 3/8" Hex. x 1 5/8" Lg. Gland	Br.	Cut From 2 3/8" Hex Bar Stock			
8	1	3 1/4" T. x 1/4" Thk. Packing Disc	Br.	Cut From 1/4" Plate			
9	1	3 1/4" T. x 1/4" Thk. Packing Disc	Br.	Cut From 1/4" Plate			
10	1	1/2" x 2" Lg. Special Bolt	S.S.G.	Cut From Bar			
11	12	7/8" x 4" Lg. Stud	S.S.C.		S-5040	442	
12	12	7/8" S.F. Hex. Nut	S.S.C.		S-5382	373	
13	12	7/8" x 2 3/4" Lg. Hex. Hd. Tap Bolt	S.S.C.		S-5040	250	
14	2	3/4" x 2 1/4" Lg. Hex. Hd. Tap Bolt	S.S.C.	Thread All Way	S-5040	233	
15	6	1/4" x 1" Lg. Rd. Hd. Mach. Screw	Br.		S-5047	609	
16	4	1/4" x 3/8" Lg. Headless Screw	S.S.G.		S-5594	3909	
17	1	Cup Leather Part #9	Leather		865-181		
18	18"	1/4" Sq. Packing	Flax				
19	Nec	Gaskets	Oiled Paper				
20							
21							
22							
23							
24							
25							
26							
27							
28							

1 | 2 8-16-29

3 (E-20) Added Note.
2 (F-18) Added Note.
Patt. No. For (3) Was 2WT-19677
Patt. No. For (4) Was 2WT-19678

DRAWING NO. MFR-B2-1041

ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS., U.S.A.
HYDRAULIC DEPT.

DRAWN ______
TRACED Sig. 8-17-29
CH'K'D ______ O.K. 8-17-29
SIMILAR TO ______
SCALE 3"-6"-12"-12"

Valve Body
For
7" Dia. Reg. Valve
For
Pressure Regulator
Used On
Hydraulic Turbine

829 — 122

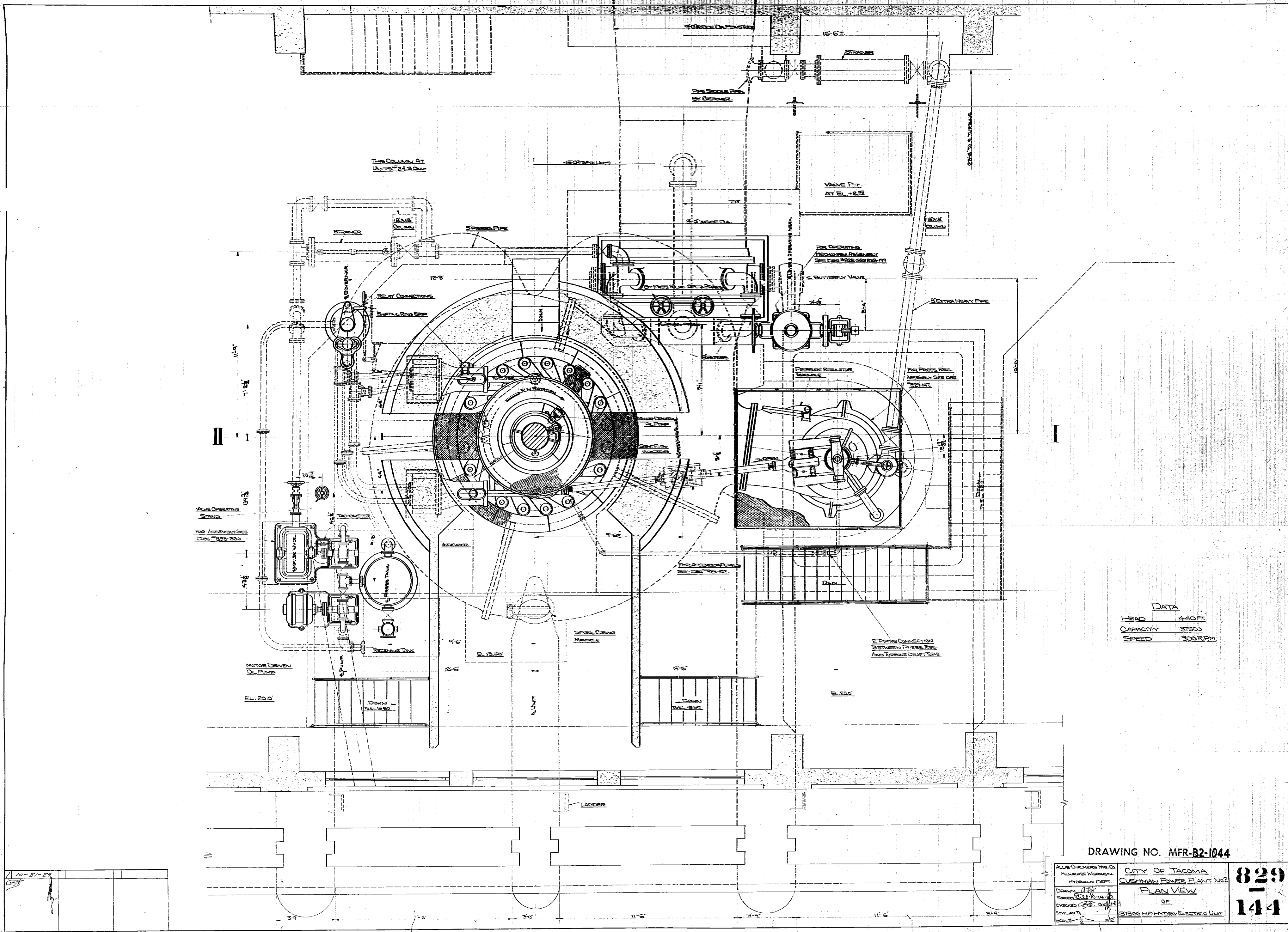
DRAWING NO. MFR-B2-1043

ALLIS-CHALMERS MFG. CO. MILWAUKEE, WIS., U.S.A.	829-143
DESIGN	
DRAWN	
TRACED	
CHECKED	
SIMILAR TO	
SCALE	

CITY OF TACOMA
CUSHMAN POWER PLANT #2
ASSEMBLY CROSS SECTION
OF
31,500 H.P. HYDRO-ELECTRIC UNIT

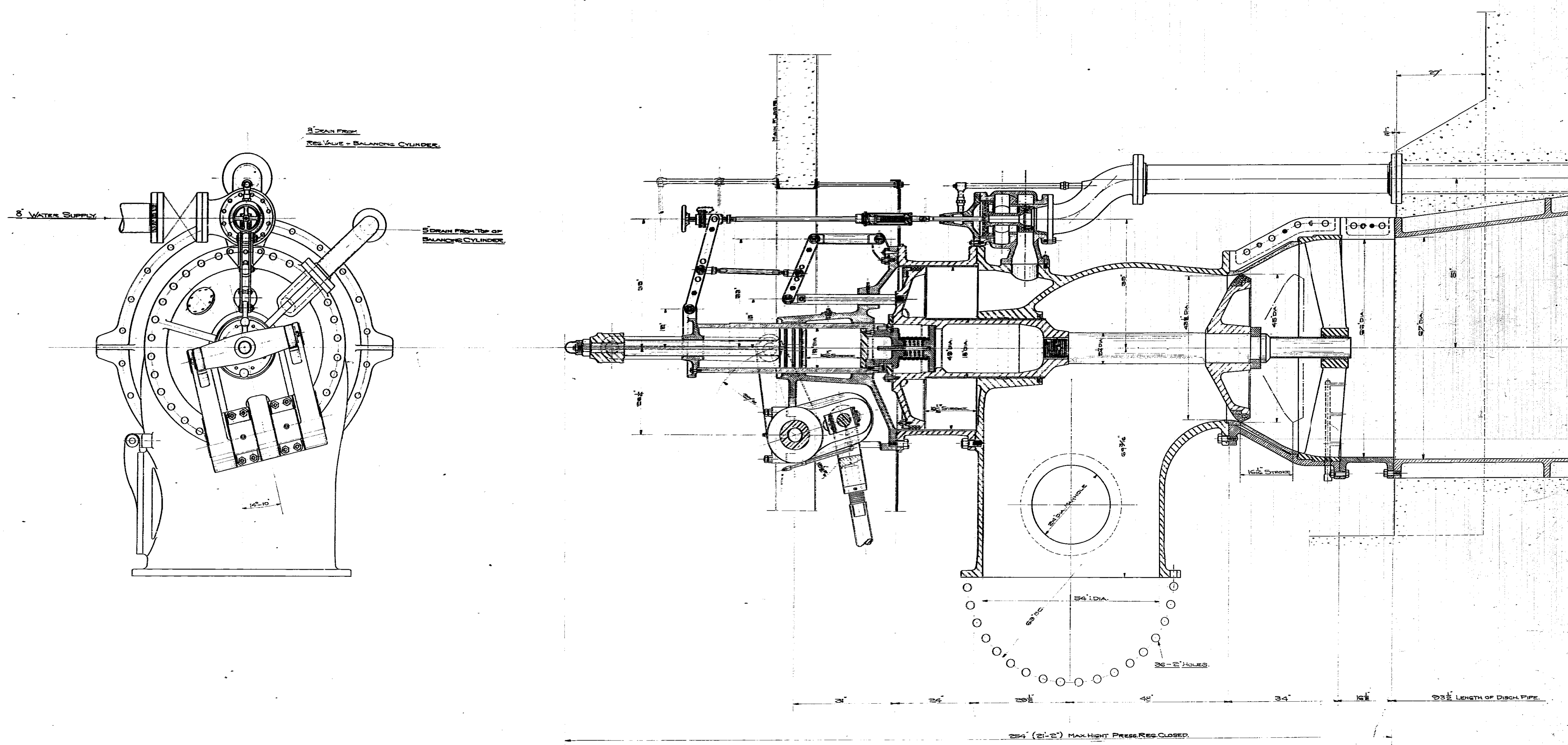
DATA

HEAD	440 FT.
CAPACITY	37,500 H.P.
SPEED	300 R.P.M.


DATA
HEAD 440 FT.
CAPACITY 37500
SPEED 300 R.P.M.
DRAWING NO. MFR-B2-1044
ALLIS-CHALMERS MFG. CO.
MILWAUKEE WISCONSIN.
HYDRAULIC DEPT.
CITY OF TACOMA
CUSHMAN POWER PLANT No 2
PLAN VIEW
OF
37500 H.P. HYDRO-ELECTRIC UNIT
829
144
STRAINER
PIPE SADDLE FURN. BY CUSTOMER
VALVE PIT AT EL. +2.5
THIS COLUMN AT UNITS No 2 & 3 ONLY
5" PRESS. PIPE
RELAY CONNECTIONS
SHIFTING RING STOP
GOVERNOR
BUTTERFLY VALVE
8" EXTRA HEAVY PIPE
FOR OPERATING MECHANISM ASSEMBLY
PRESSURE REGULATOR MANHOLE
FOR PRESS. REG. ASSEMBLY
VALVE OPERATING STAND
TACHOMETER
PRESS. TANK
RECEIVING TANK
MOTOR DRIVEN OIL PUMP
EL. 20.0'
EL. 13.50'
EL. 20.0'
INDICATOR
SPIRAL CASING MANHOLE
2" PIPING CONNECTION BETWEEN PRESS. REG. AND TURBINE DRAFT TUBE
DOWN
DOWN TO EL. 13.50'
LADDER
UNIT
I
II

ITEM	OPERATION	TOOL NO
	1 TEST HEAD 63" B.C. 36 HOLES (3½" THICK BELL TYPE)	
	1 TEST HEAD 57½" B.C. 32 HOLES (2⅜" THICK BELL TYPE)	
	1 TEST HEAD 54¾" B.C. 36 HOLES (2¼" THICK BELL TYPE)	
	49" CYLINDER ON DWG. 838-302 AND 54" DISCHARGE ELBOW ON DWG. 828-139 ARE TO BE ASSEMBLED FOR THIS TEST. TEST TO 300# PE SQ. IN.	

USED FOR		NO	ORD. NO
CITY OF TACOMA, WASH. CUSHMAN PLT #2	10/24/29	2	28-9777



DRAWING NO. MFR-B2-1045

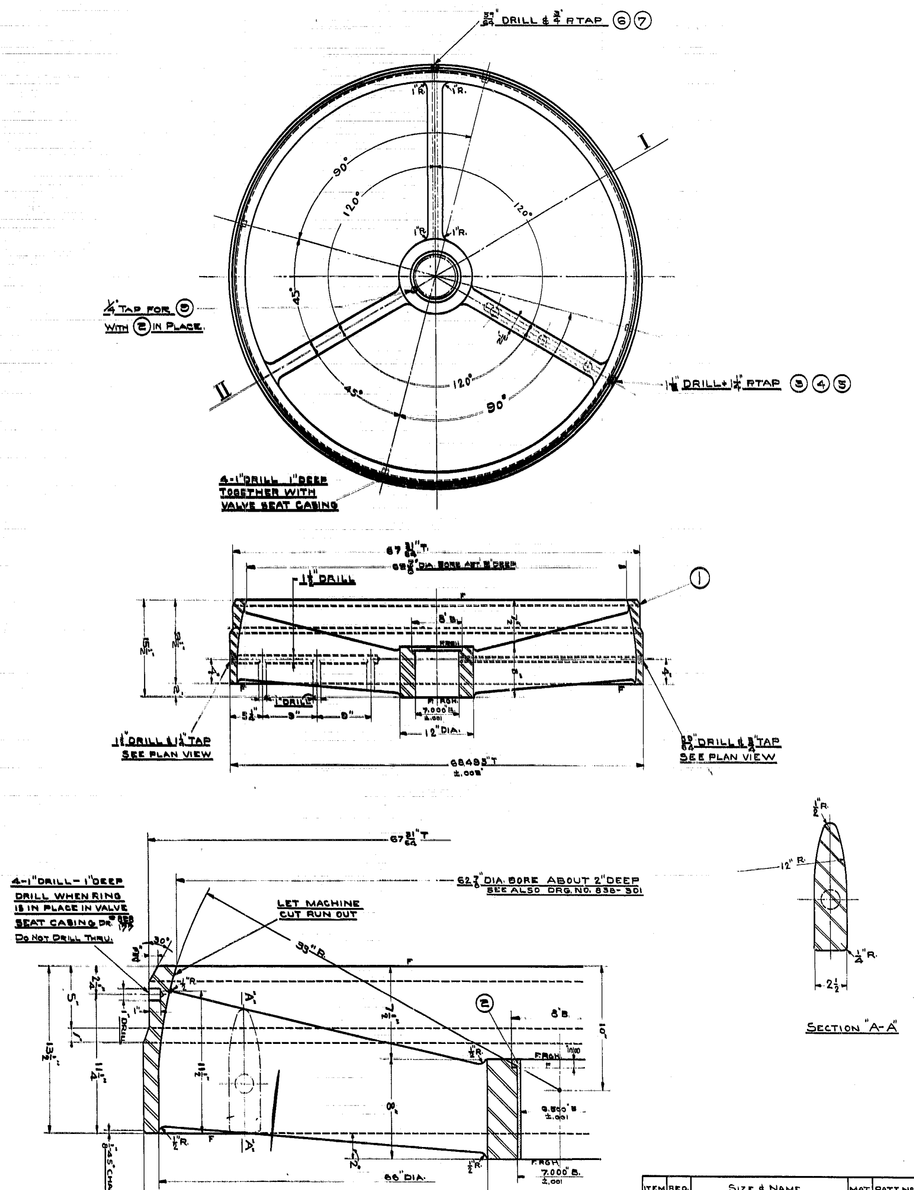
1 10-24-29

ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS. U.S.A.
HYDRAULIC DEPT.

ASSEMBLY OF PRESSURE REGULATOR USED ON HYDRAULIC TURBINE

829 - 147

DRAWING NO. MFR-B2-1050



ITEM	REQ.	SIZE & NAME	MAT.	PATT No	DRG. No	STOCK	WEIGHT
(1)	1	GUIDE RING (ANNEALED)	C.S. SEE SPEC.	2 WT-19093	TEST BAR		2700#
(2)	1	FLANGED BUSHING - PART #20	BRZ.	STD. 62	865-310	4881	
(3)	1	1 1/4" x 6" LG. STD. PIPE	W.I.				
(4)	1	1 1/4" STD. COUPLING.	M.I.		S-5078	1769	
(5)	1	1 1/4" SQ. HD. STEAM COCK	BR.		S-5099	1794	
(6)	1	3/4" x 6" LG. STD. PIPE	W.I.				
(7)	1	3/4" x 1/4" REDUCER	M.I.	CRANE #51 - PAGE 711.			
(8)							
(9)	1	1/4" x 3/8" THREADED ROD	SSC		S-5594	3909	
(10)							

1 7-22-29

ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS., U. S. A.
HYDRAULIC DEPT.

DRAWN S.B.
TRACED J.R. 6-26-29
CHECKED ... 7-22-29
SIMILAR TO ...
SCALE 1 1/2" & 3" ... 12"

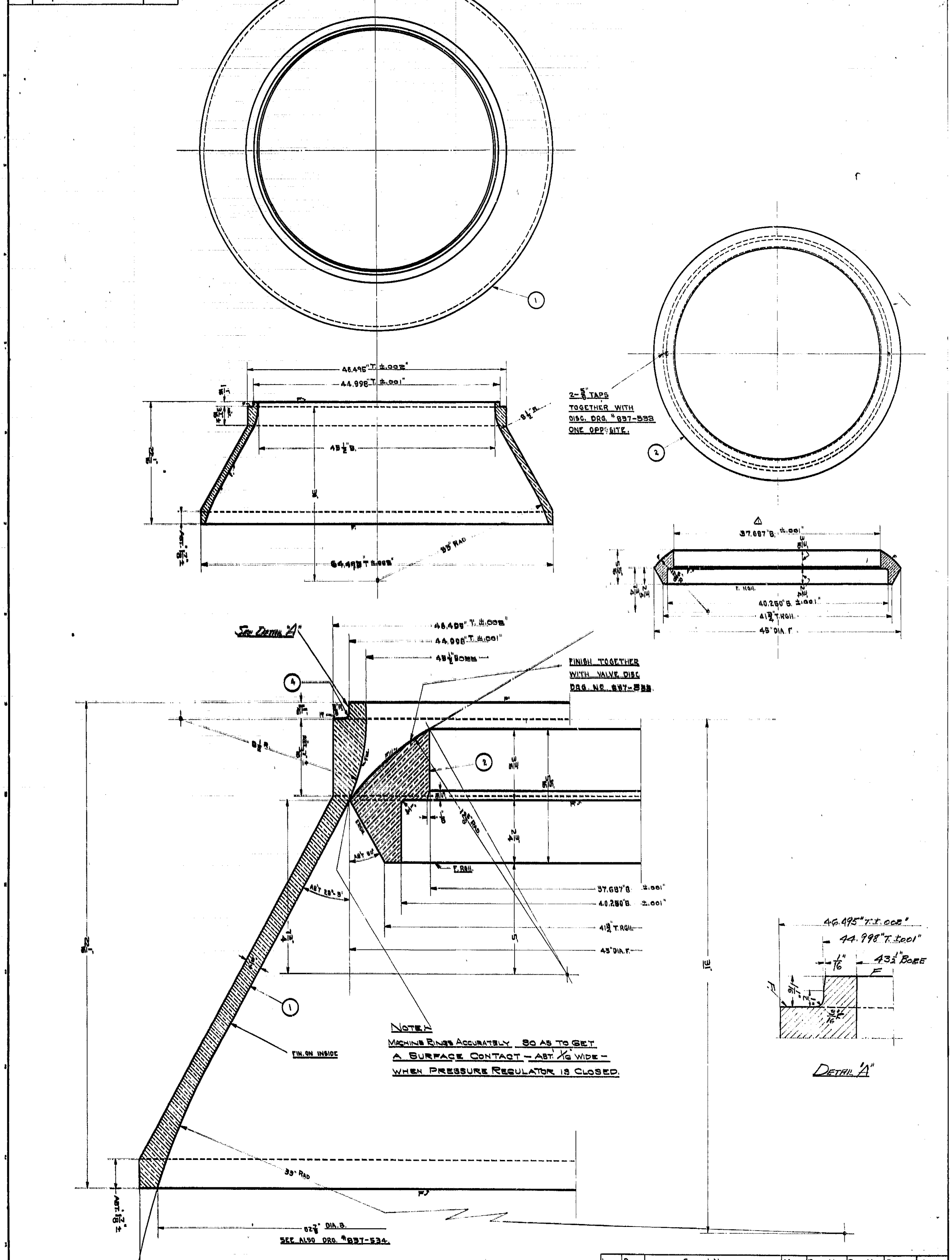
GUIDE RING
FOR
PRESSURE REGULATOR
USED ON
HYDRAULIC TURBINE

837 – 534

DRAWING NO. MFR-B2-1055

ITEM	OPERATION	TOOL NO.
	12$\frac{5}{8}$" RADIUS TEMPLATE	88684
	33" & 8$\frac{1}{2}$" RADIUS TEMPLATE	88811

USED FOR		NO.	ORD. NO.	
CITY OF TACOMA, WASH. CUSHMAN PWR. PLT. #2.	7-22-29	2	28-9777	



ITEM	REQ.	SIZE & NAME	MAT.	PATT. NO.	DRG. NO.	STOCK	WEIGHT
1	1	VALVE SEAT RING	BR. "E"	2 WT-19621			1880#
2	1	VALVE SEAT RING	BR. "E"	2 WT-19622			590#
3							
4	12'-6"	$\frac{3}{8}$" RD. PACKING	RUBBER				
5							
6							

1. 7-22-29.	2 7-29-29.	3 8-23-29
Δ (7-I) Dim. was 27.687" B	ADDED DETAIL "A"	

ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS., U. S. A.
HYD. DEPT.

DRAWN J.R.B. 6-11-29
TRACED R.G.L. 6-18-29
CHECKED 7-22-29
SIMILAR TO
SCALE 1$\frac{1}{2}$" & 6" = 1'-0"

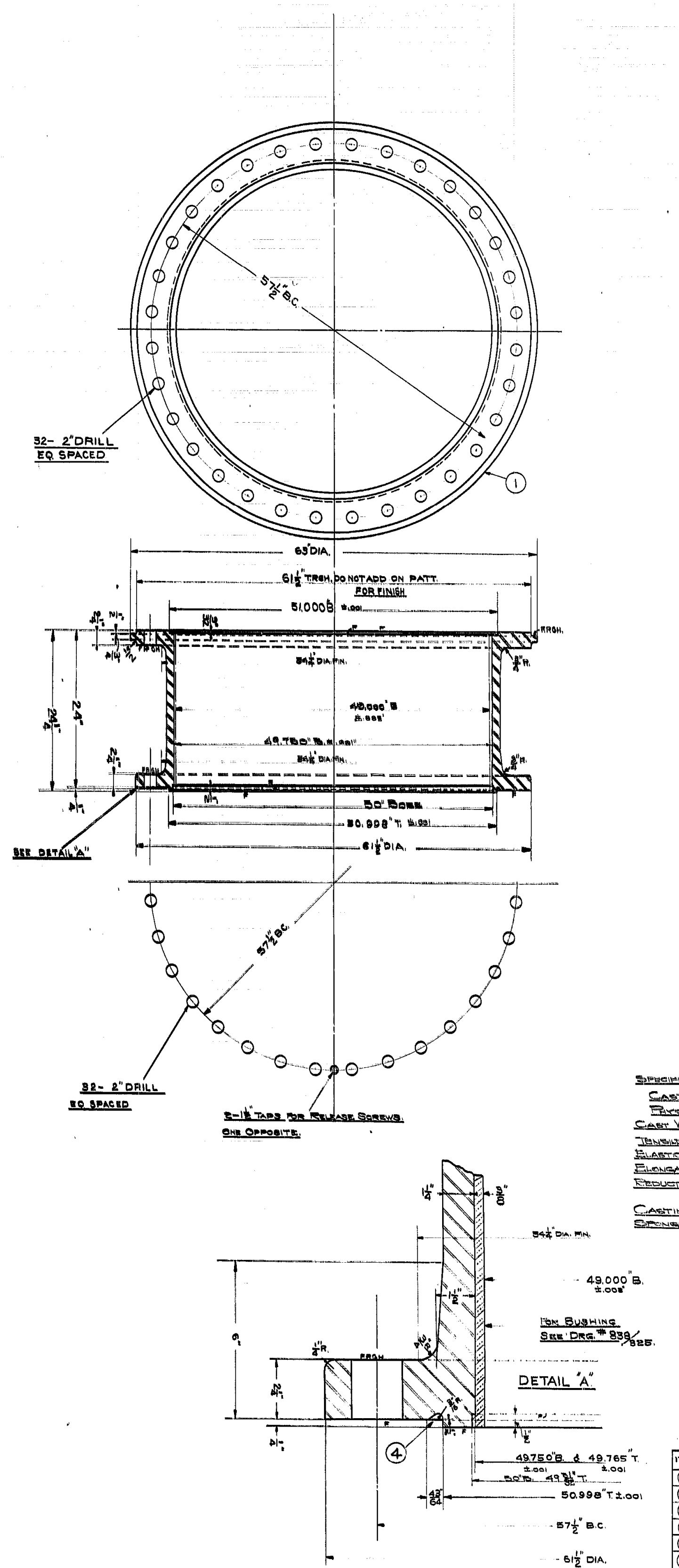
VALVE SEAT RINGS
FOR
PRESSURE REGULATOR
USED ON
HYDRAULIC TURBINE

838
—
301

DRAWING NO. MFR-B2-1056

Form E-80A 2-22-00

WORKING PRESSURE	TEST PRESSURE	USED FOR		NO.	ORD. NO.
210 #/IN.	300 #/IN.	CITY OF TACOMA WASH. CUSHMAN POWER PLT. # 2	7/26-29	2	28-9777



SPECIFICATION:-

CAST STEEL CASTINGS AS PER A.S.T.M. A.-27-24 CLASS "B" MEDIUM
PHYSICAL REQUIREMENTS OF NAVY TEST BARS MADE FROM CUPOUNS CAST WITH MAIN CASTING.

TENSILE STRENGTH — 70,000 #/□"
ELASTIC LIMIT — 45% TEN. STR.
ELONGATION IN 2" — 20%
REDUCTION OF AREA — 30%

CHEMICAL REQUIREMENTS
PHOSPHORUS { ACID - NOT OVER 0.06% ; BASIC - NOT OVER 0.05% }
SULPHUR - NOT OVER 0.06%

CASTINGS TO BE TRUE TO PATTERN, FREE FROM SHRINK CRACKS, SPONGY SPOTS, & BLOW HOLES.

ITEM	OPERATION	TOOL NO.
	FOR TEST HEAD & ARR. SEE MD. ON DWG. 829-147	

ITEM	NO. REQ.	SIZE AND NAME	MAT.	PATT. NO.	DRG. NO.	STOCK	WEIGHT
1	1	CYLINDER (ANNEALED)	C.S. SEE SPEC.	2WT-19625	TEST BAR		3800 #
2							
3							
4	14'-0"	⅜" RD. PACKING	RUBBER				
5							
6							
7							
8							

1 7/26-29

ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS., U. S. A.
HYDRAULIC DEPT.

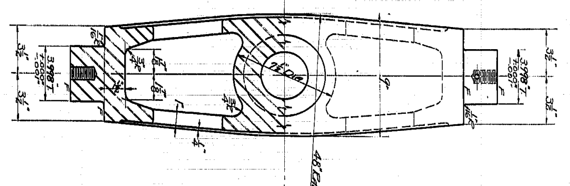
DRAWN S.B.
TRACED A.E.G. 6-2
CHECKED ... O. K. ...
SIMILAR TO ...
SCALE 1½" = 6" -12"

49" CYLINDER
FOR
PRESSURE REGULATOR
USED ON
HYDRAULIC TURBINE

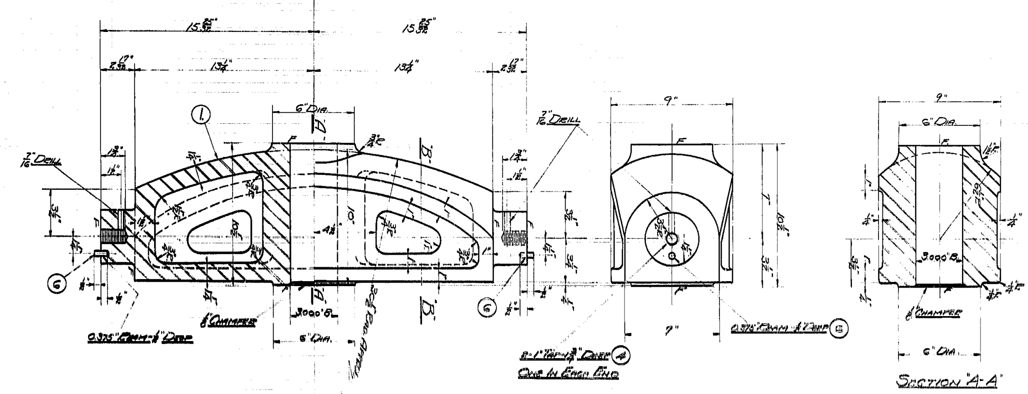
838
—
302

DRAWING NO. MFR-B2-1064

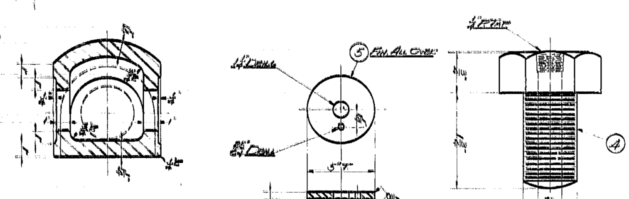
Used For		Nº	Ord. Nº	
City of Tacoma, Wash. Cushman Pow. Plt. #2	7-22-29	2	28-9777	



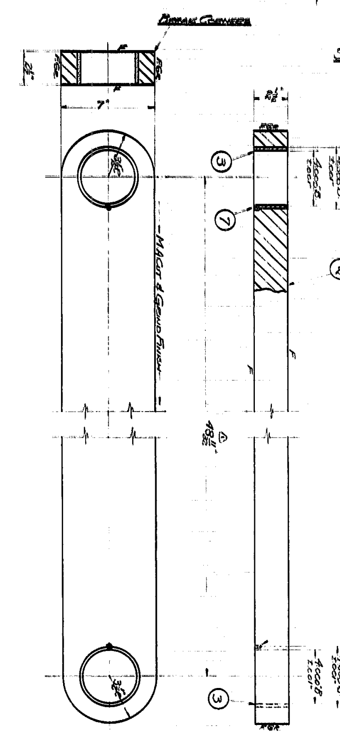
Note To Foundry –
This Casting Is In A Conspicuous Part Of The Power House, And Is To Be Smooth And Neat Appearing.



Section "A-A"



Section "B-B"



Note:
These Links To Be M.A. Cut From Plate And Edges To Be Finish Grind. Sides To Be Finished.
Links To Be Neat Appearing.

2-¼ Tap For (7) With Bushing In Place One For Each Bushing

Specification:
Cast Steel Castings As Per A.S.T.M.A.-87-24 Class "B" Medium
Physical Requirements Of Navy Test Bars Made From Cupons Cast With Main Castings.

Tensile Strength	70,000#/□"
Elastic Limit	45% Ten. S.
Elongation In 2"	20%
Reduction Of Area	30%

Chemical Requirements
Phosphorous { Acid - Not Over 0.06% / Basic - Not Over 0.05%
Sulphur - Not Over 0.06%

Castings To Be True To Pattern, Free From Shrink Cracks, Spongy Spots, & Blow Holes.

Item	Req.	Size & Name	Mat.	Patt. No.	Drg. Nº	Stock	Weight Rgh.	Weight Fin.
1	1	Yoke (Annealed)	CS See Spec	RWT 19656	Test Bar			400#
2	2	2½"x7"x55 11/32" Lg. Links	BPL	Cut 2 Links Fr. 1 - 2¾"x15" x 58" Lg. Plate				
3	4	Bushing - 2¼" Lg. Part #75	Br.E	Std. 52	866-73	4871		
4	2	1"x1¾" Lg. Hex. Hd. Tap Bolt	S.S.C.		5-5040	263		
5	2	½"x5"T x1¼" I. Dia. Washer	Br.C.	Use 1½" Scrap Plate				
6	2	⅜"T x 1" Lg. Str. Dowel	S.S.G.		5-5030			
7	1	¼"x12" Lg. Grub Screw	S.S.G.		5-5594	3909		
8								
9								
10								
11								
12								
13								
14								
15								

1	7-22-29	2	7-28-29
(13-C) Dim. was 47 3/8; 1-E-(13) was 54 ⅞" Lg. and cut from 57" Lg. plate.		8-	

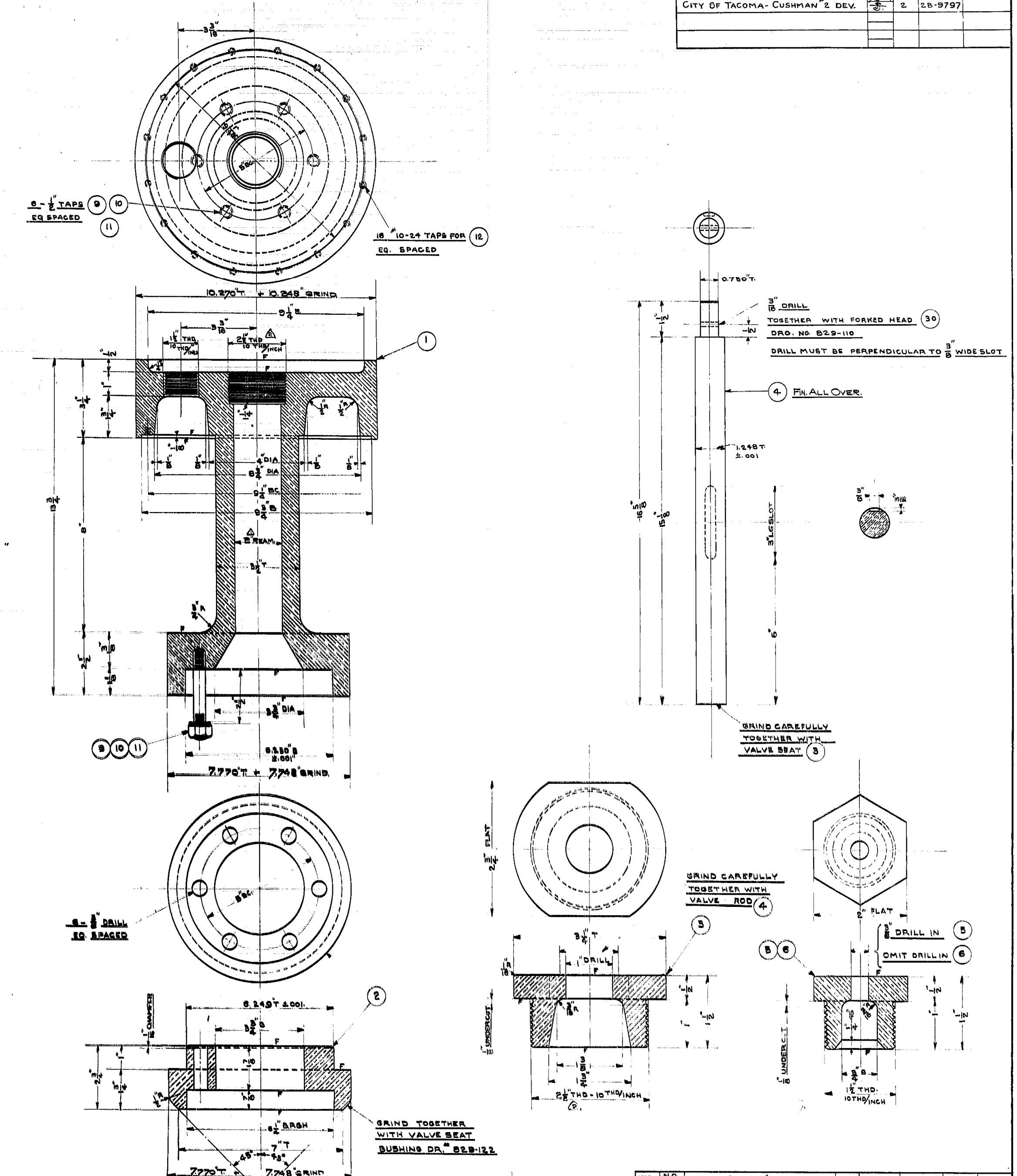
Allis-Chalmers Mfg. Co.
Milwaukee, Wis., U.S.A.
Hyd. Dept.
Drawn RHS
Traced
Checked 7-22-29
Similar to
Scale

Yoke And Links For Pressure Regulator Used On Hydraulic Turbine

838 - 327

DRAWING NO. MFR-B2-1070

USED FOR		NO.	ORD. NO.
CITY OF TACOMA - CUSHMAN #2 DEV.		2	28-9797



ITEM	NO. REQ.	SIZE & NAME	MAT.	PATT No.	DRG. NO.	STOCK	WEIGHT
1	1	VALVE	BRH.	2WT 19679-1			
2	1	VALVE TIP	BRH.	2WT 19680			
3	1	VALVE SEAT	BRH.	2WT 19681-1			
4	1	1.248"T. X 15 5/8" LG VALVE ROD	MUNTZ METAL	CUT FROM BAR			
5	1	2" HEX X 1 1/2" LG DIAPHRAGM	BR.	CUT FROM BAR	WITH 3/8" DRILL		
6	1	2" HEX X 1 1/2" LG DIAPHRAGM	BR.	CUT FROM BAR	WITHOUT DRILL		
7	3	7 23/32" T. X 6.250 B X 1/8" THK SHIM	BR.	MAKE FROM STOCK			
8	1	9 11/16" T X 8 17/32" B. X 1/8" THK. SCREEN	BR.	MAKE FROM STOCK	PUNCH AS SHOWN		
9	6	1/2" X 3 3/4" LG' STUDS	S.S.C.		S-5044	799	
10	6	1/2" SF. HEX NUTS	BR.		S-5060	719	
11	6	1/2" STD' LOCK WASHER	ST.		S-5389	4208	
12	16	#10-24 X 3/8" LG RD. HD. MACH SCREW	S.S.G.		S5046	1171	
13							
14							
15							
16							
17							
18							
19							
20							

1	2 8-16-29.	3 8-23-29
△(C-6) DIM. WAS 2" DIA. PATT. NO. FOR (1) WAS 2WT-19679	△(C-4)(F-12) DIM. WAS 2" THD. 10 THDS/INCH ITEM (3) PATT. NO. WAS 2WT 19681	

ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS., U. S. A.
HYDR. DEPT.

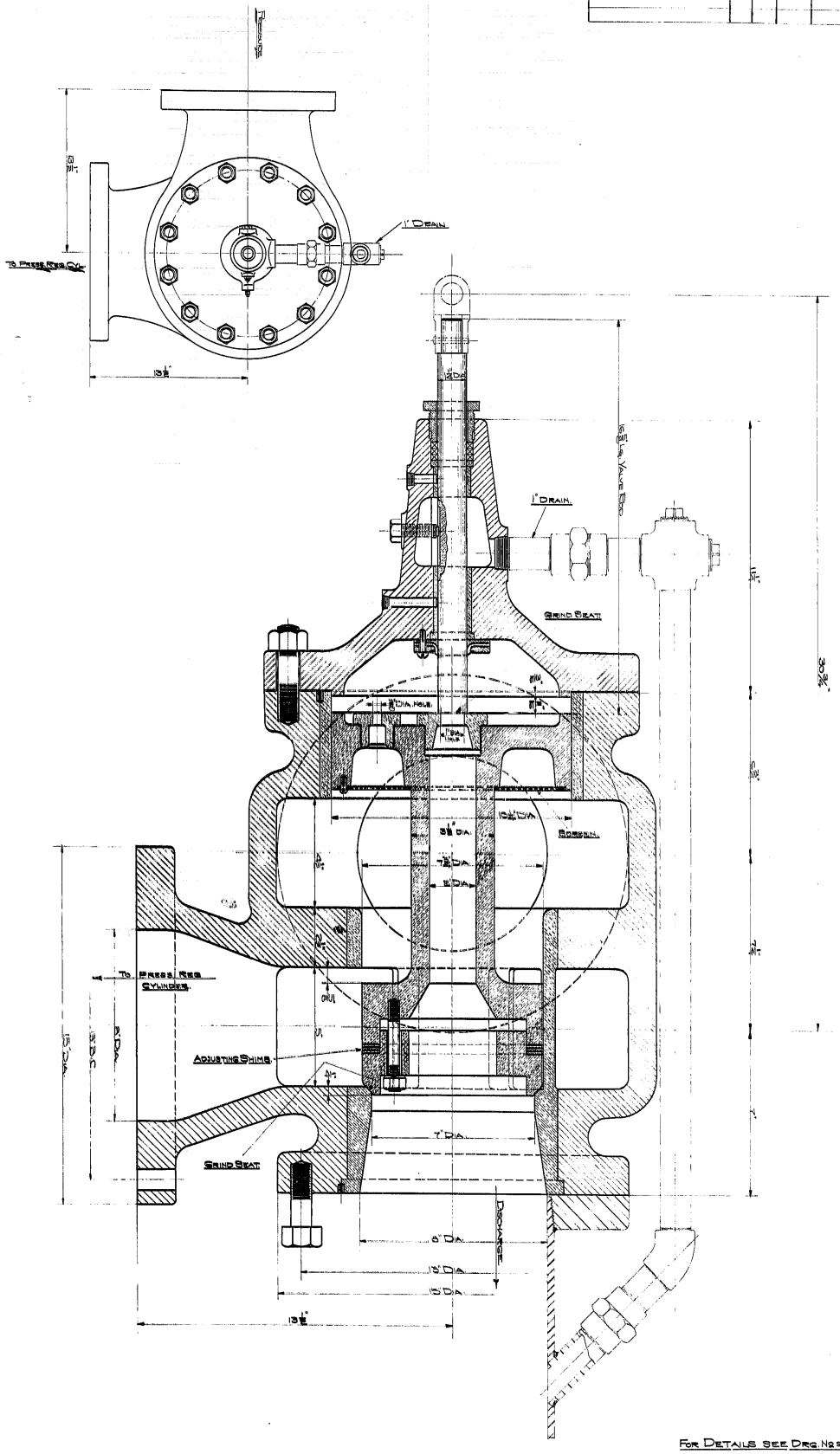
DRAWN S.
TRACED T.M. 8-18-24
CHECKED 8-17-24
SIMILAR TO
SCALE 12"

DETAILS FOR 7" REG. VALVE FOR PRESSURE REGULATOR USED ON HYDRAULIC TURBINE

838 - 353

DRAWING NO. MFR-B2-1072

Used For	No	Ord. No	Working Pressure	Test Pressure	
City of Tacoma-Cushman #2	2	28477	210#/□"	300#/□"	



For Details See Drg. Nos 829/122 + 838/353.

8-16-29.

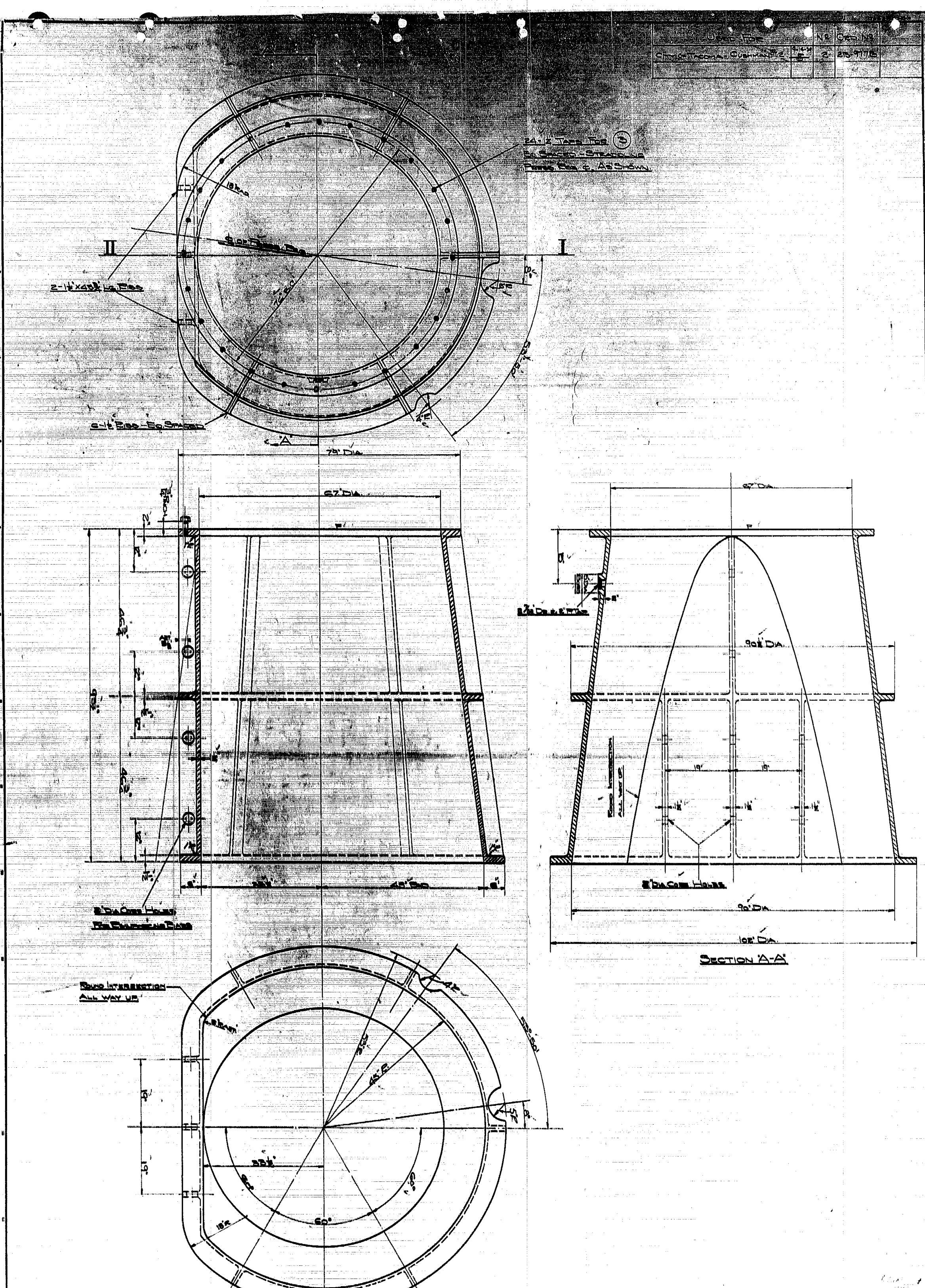
ALLIS-CHALMERS MFG. CO. MILWAUKEE, WIS., U.S.A. HYD DEPT.

DRAWN
TRACED
CHECKED
SIMILAR TO
SCALE 1" = 1'-0"

1" Dia. Regulating Valve For Pressure Regulator Used On Hydraulic Turbine

838 — 361

DRAWING NO. MFR-B2-1087



Item	Req	Size & Name	Mat.	Patt. No.	Drg. No.	Stock	Weight
1	1	Discharge Pipe	C.I.B.	Ewt- 19698			Actual 10980#
2							
3	24	1 1/4" x 3 3/4" Lg Tap Bolts.	S.S.C.		S-5040	298	
4							
5							
6							

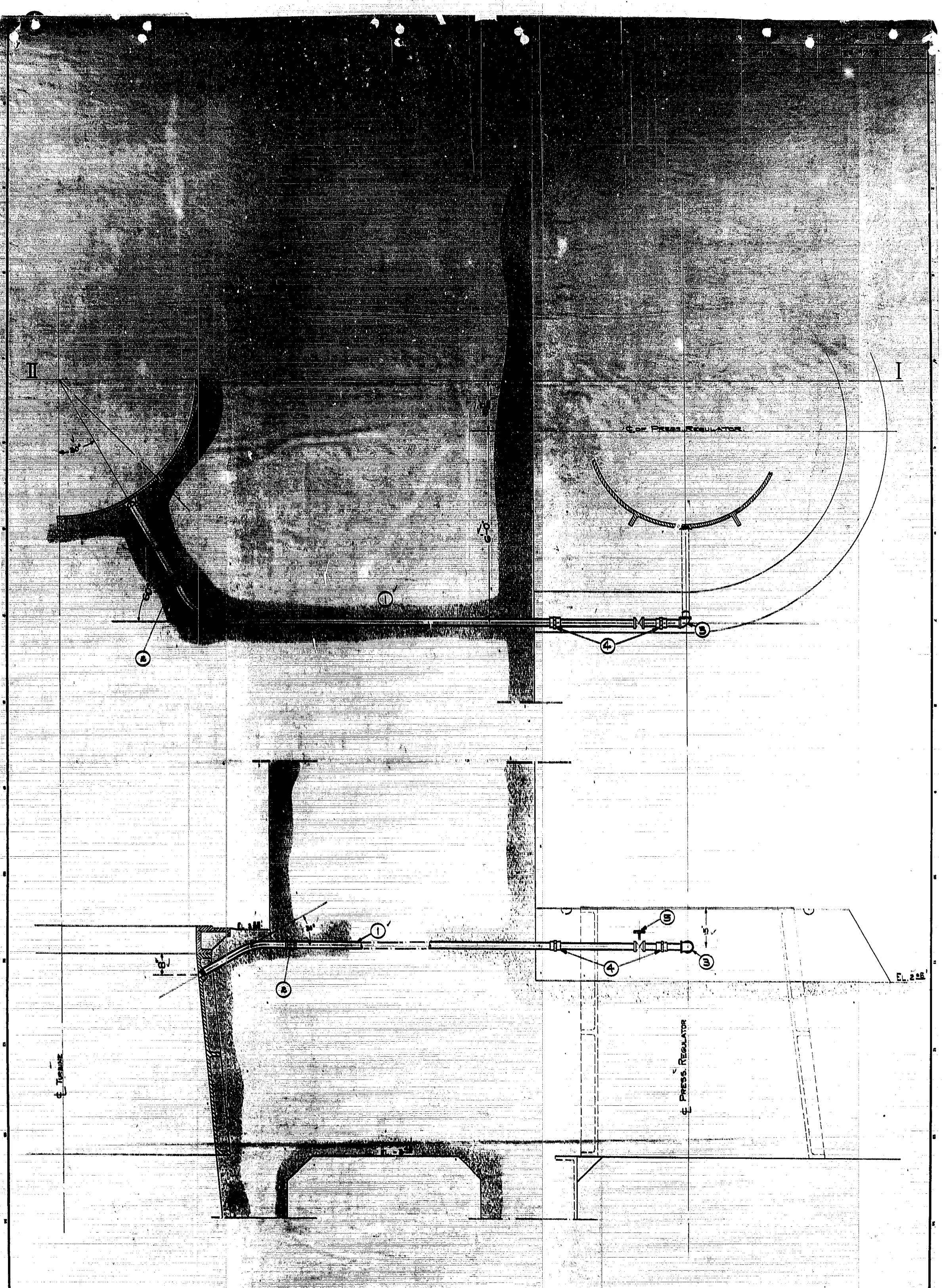
ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS., U. S. A.
HYD. DEPT.

DRAWN
TRACED
CHECKED O. K. 9-14-24
SIMILAR TO
SCALE 1" = 5'

DISCHARGE PIPE
FOR
PRESSURE REGULATOR
USED ON
HYDRAULIC TURBINE

838
—
372

DRAWING NO. MFR. B2-1088



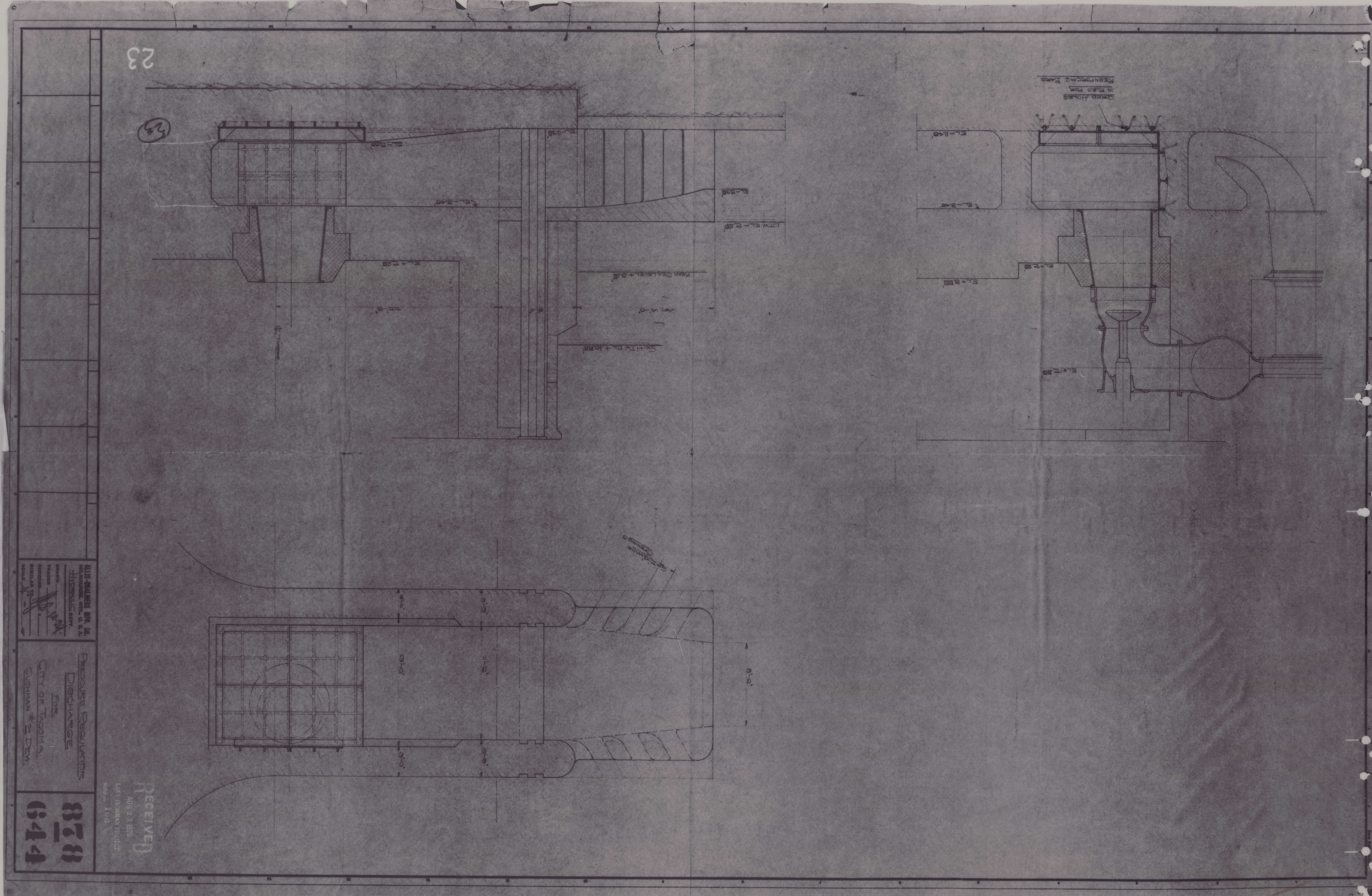
ITEM	No. REQ.	SIZE & NAME	MAT.	PATT. No.	DRG. No.	STOCK	WEIGHT RGH.	WEIGHT FIN.
1	1	2" X 24'-0 Lg. Brass Pipe (Iron Pipe Size.)	BR.	Cut Length to Suit.	S-5136			
2	1	2" Coupling.	BR.	Crane Cat. # 51 Page 77				
3	1	2" - 90° ELBOW	C.I.		S-5072	1619		
4	2	2" - STD. UNION	M.I.		S-5076	1738		
5	1	2" - STD. DOUB. DISC. GATE VALVE	BR.	Crane Cat. # 51 Page 42.				

ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS., U. S. A.
HYDRAULIC DEPT.

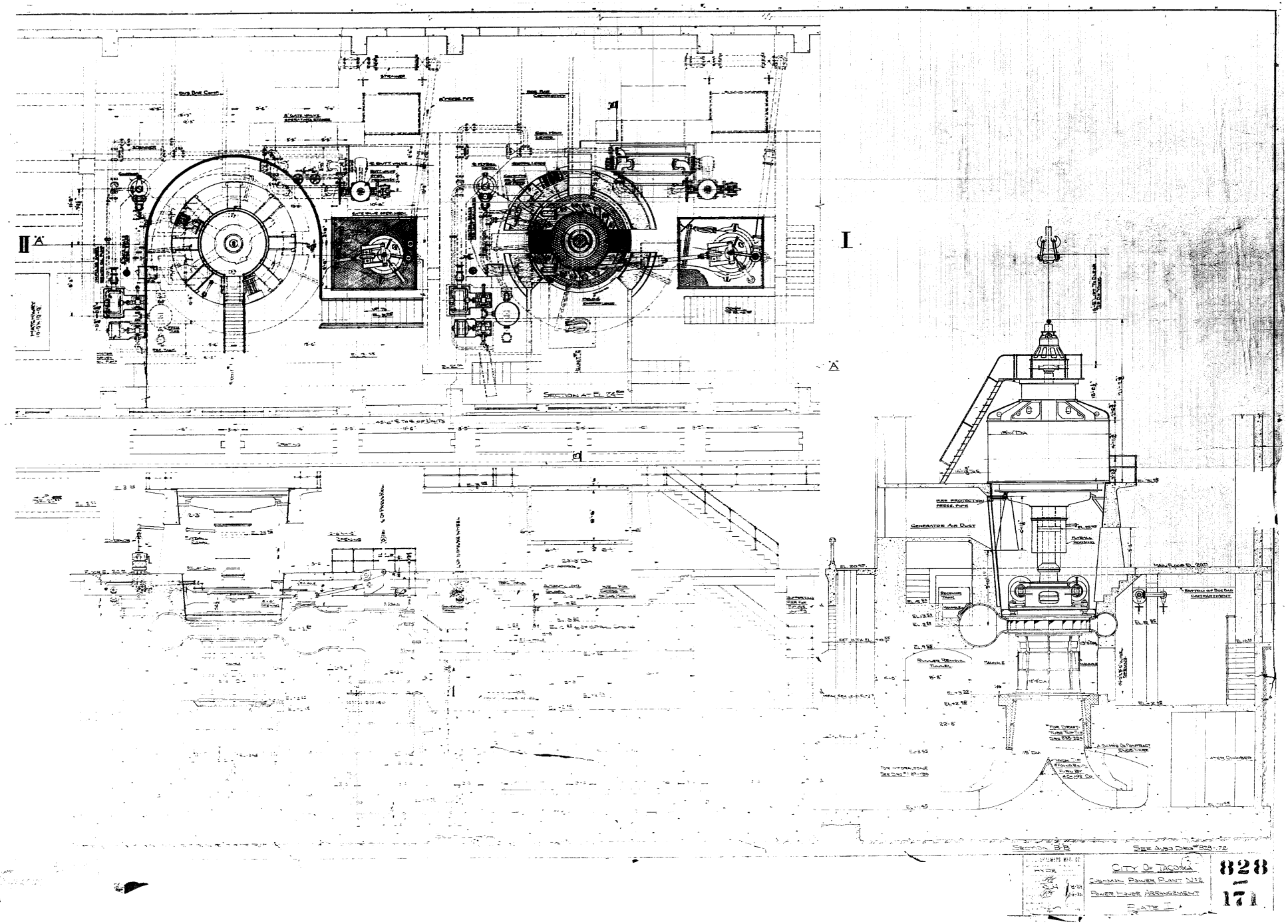
DRAWN
TRACED A.J.H. 9-16-20
CHECKED
SIMILAR TO
SCALE

Piping Connection Between Press. Reg. + Turbine Draft-Tube Used on Hydraulic Turbine.

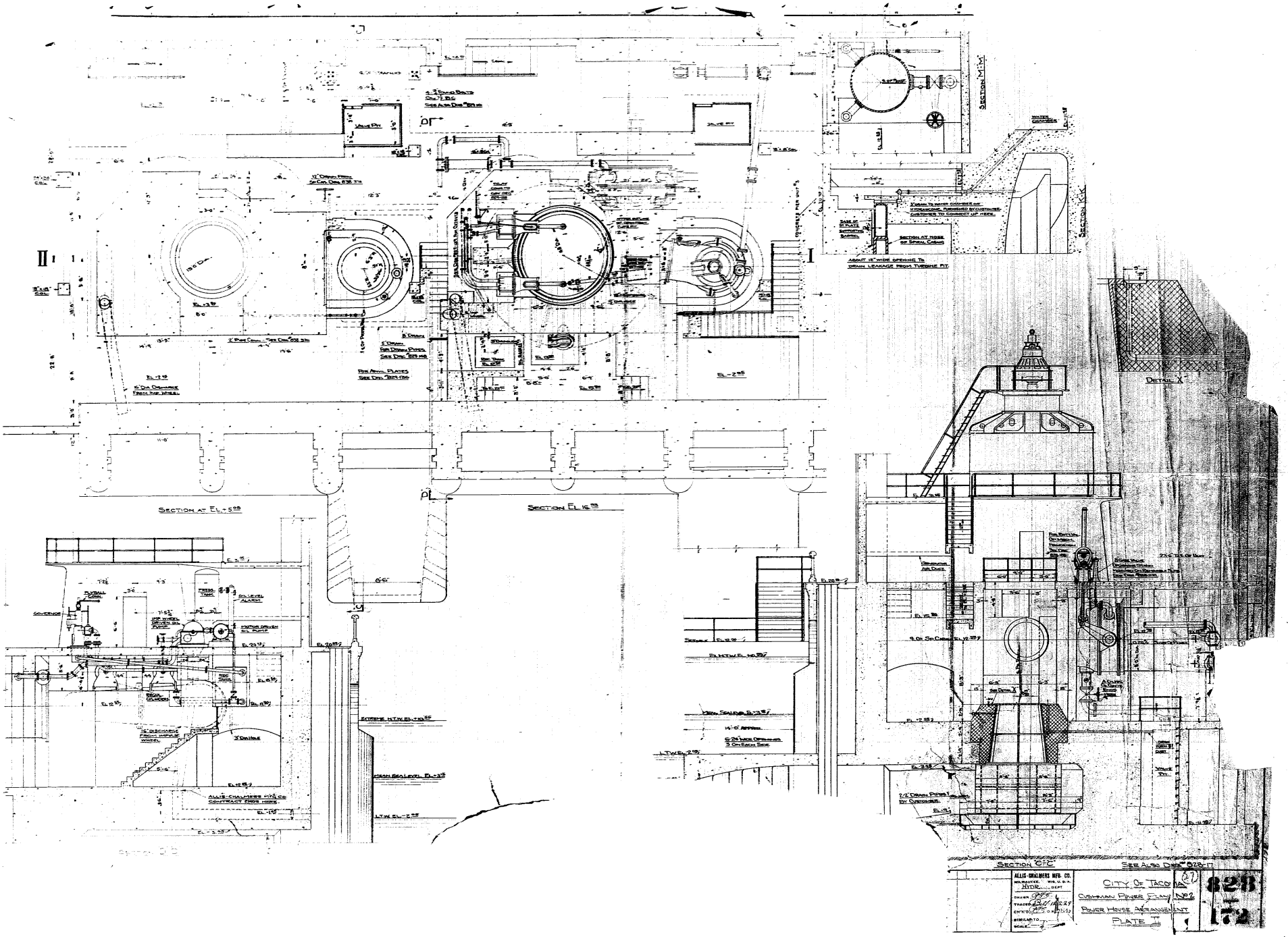
838 — 374



DRAWING NO. MFR-B2-1092

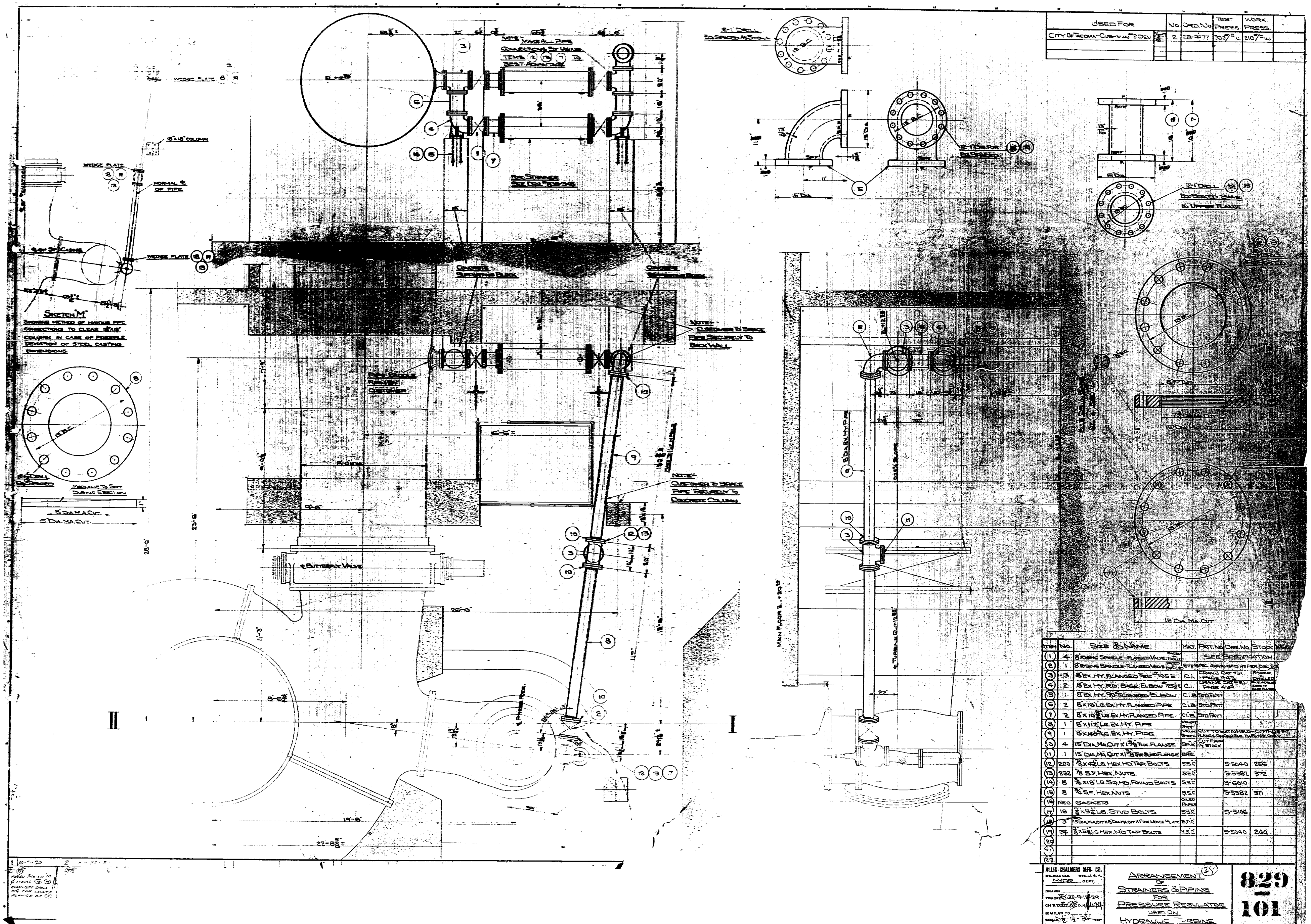


DRAWING NO. MFR-B2-1097



DRAWING NO. MER-B2-1098

Used For	No	Ord. No	Test Press.	Work Press.
City of Tacoma-Cushman No 2 Dev.	2	28-9977	300#/□"	210#/□"



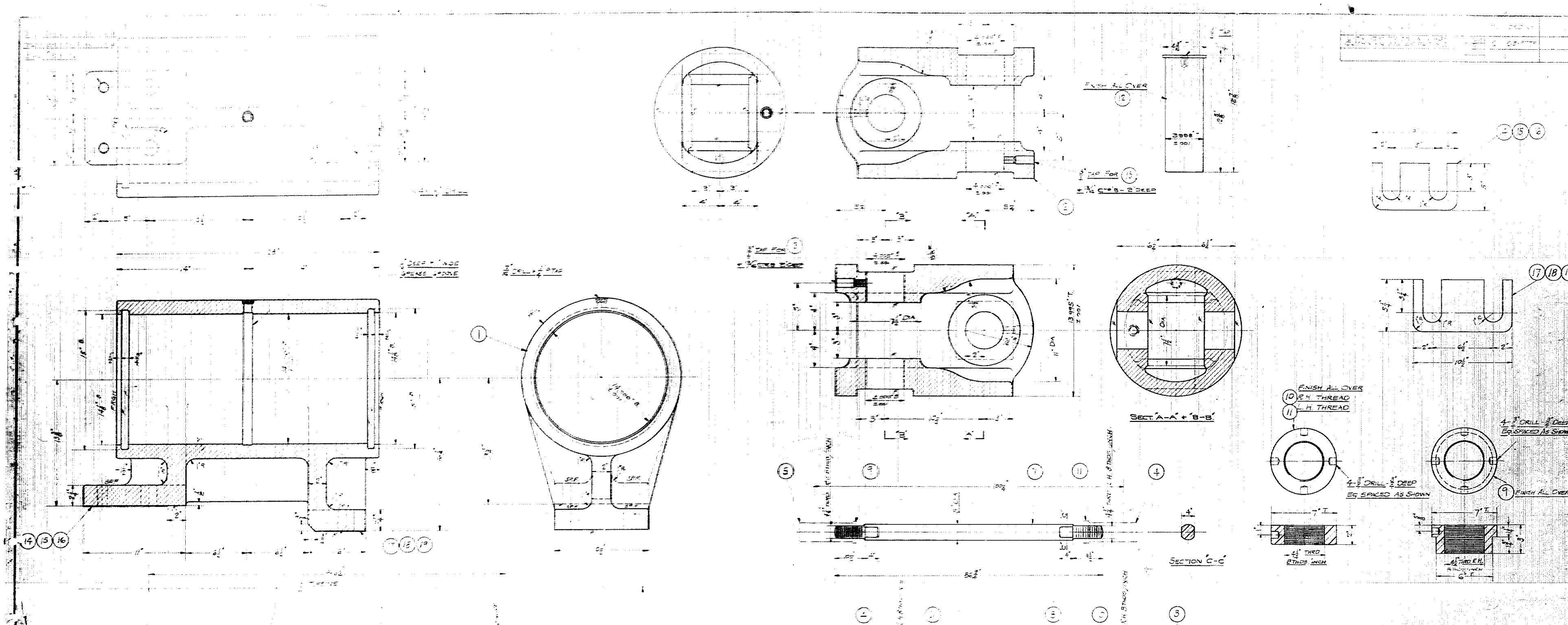
Item	No.	Size & Name	Mat.	Patt. No	Drg. No	Stock	Weight
1	4	8" Rising Spindle-Flanged Valve, Faced & Drilled	See Specification				
2	1	8" Rising Spindle-Flanged Valve, Faced & Drilled	See Spec. Arranged as per Drg.				
3	3	8" Ex. Hy. Flanged Tee #105 E	C.I.	Crane Cat #51 Page 443		Faced & Drilled	
4	2	8" Ex. Hy. Rd. Base Elbow #125½ E	C.I.	Crane Cat #51 Page 439		Faced & Drilled except base flange	
5	1	8" Ex. Hy. 90° Flanged Elbow	C.I.B.	Std. Patt.			
6	2	8"x16" Lg. Ex. Hy. Flanged Pipe	C.I.B.	Std. Patt.			
7	2	8"x10⅝" Lg. Ex. Hy. Flanged Pipe	C.I.B.	Std. Patt.			
8	1	8"x117" Lg. Ex. Hy. Pipe	Wrought Steel				
9	1	8"x140" Lg. Ex. Hy. Pipe	Wrought Steel	Cut to suit in field—Cut thread fit flange on one end in shop only			
10	4	15" Dia. Ma. Cut x 1⅜" Thk. Flange	B.P.E.	Cut from 1½" stock			
11	1	15" Dia. Ma. Cut x 1⅜" Thk. Blind Flange	B.P.E.	"			
12	200	⅞"x4½" Lg. Hex. Hd. Tap Bolts	S.S.C.		S-5040	256	
13	232	⅞" S.F. Hex. Nuts.	S.S.C.		S-5382	372	
14	8	¾"x18" Lg. Sq. Hd. Found. Bolts	S.S.C.		S-6010		
15	8	¾" S.F. Hex. Nuts	S.S.C.		S-5382	371	
16	Nec.	Gaskets	Oiled Paper				
17	16	⅞"x5¼" Lg. Stud Bolts	S.S.C.		S-5106		
18	3	15" Dia. Ma. Cut x 8" Dia. Ma. Cut x 1" Thk. Wedge Plate	B.P.C.				
19	34	⅞"x5½" Lg. Hex. Hd. Tap Bolts	S.S.C.		S-5040	260	
20							
21							
22							

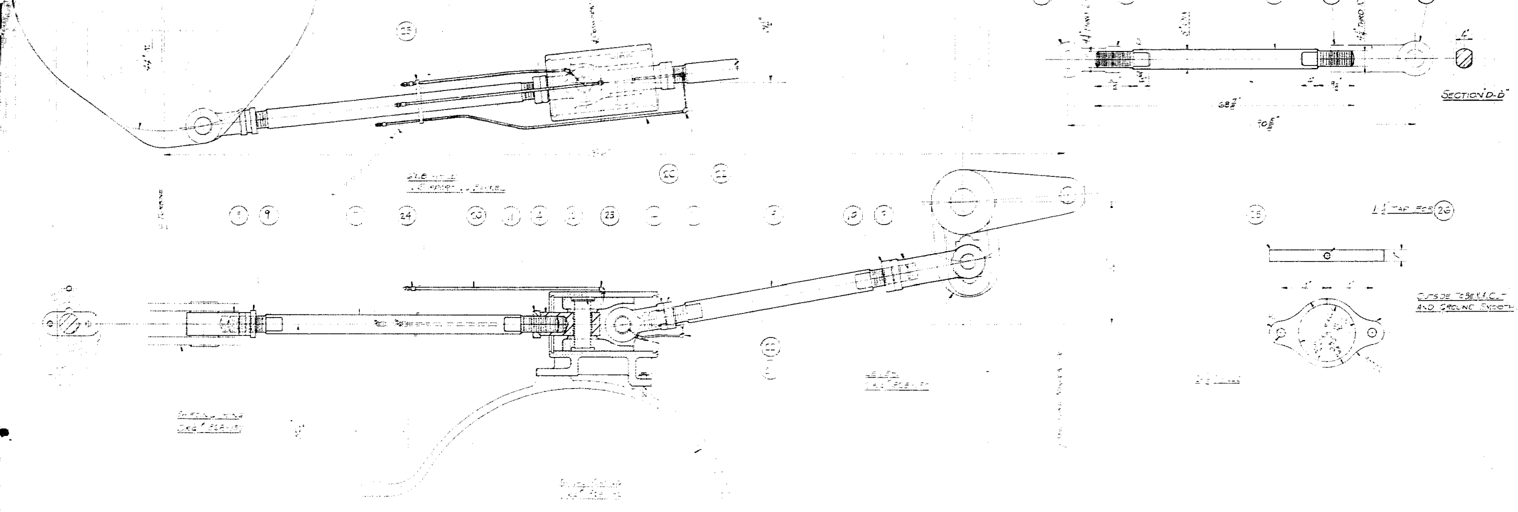
ALLIS-CHALMERS MFG. CO.
Milwaukee, Wis. U.S.A.
Hydr. Dept.
Drawn
Traced B.U. 9-12-29
Ch'k'd ... O.K. ...
Similar to
Scale ½"-1½"-3" = 12"

Arrangement of Strainers & Piping for Pressure Regulator used on Hydraulic Turbine (28)

829 — 101

Drawing No. MFR B2-1099





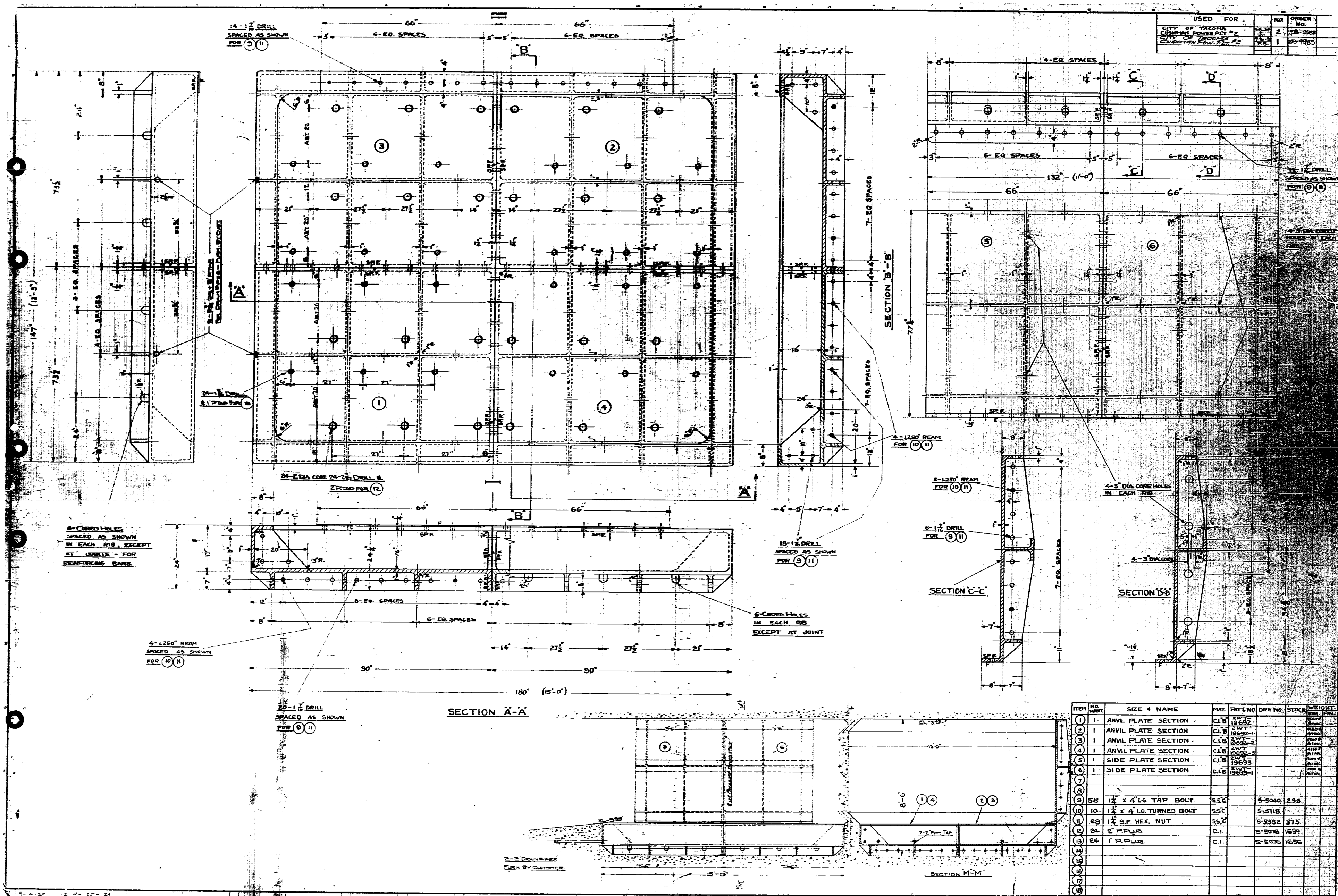
Item	No. Want	Size & Name	Mat.	Patt. No.	Drg. No.	Stock	Weight Rgh.	Weight Fin.
1	1	Cross Head Guide	C.I.B.	2WT-19657			1100#	
2	1	Cross Head	H.T.21	2WT-19658				
3	1	Forked Head - All Items	C.S.B.	2WT-19659	867-162			
4	2	Solid Head - L.H. Thd. (All Items)	C.S.B.	2WT-19643	867-151			
5	1	Solid Head - R.H. Thd. (All Items)	C.S.B.	2WT-19643	867-151	Omit ¼" P. Tap		
6								
7	1	5" Dia. x 86¾" Lg. Rod	S.S.F.	Bar Stock				
8		5" Dia. x 68⅞" Lg. Rod	S.S.F.	Bar Stock				
9	1	3" x 7" T. Spec. Nut (4½" R.H. Thrd.)	S.S.C.	Make From Bar				
10		2" x 7" T. Spec. Nut 4½" R.H. Thrd.	S.S.C.	Make From Bar				
11	2	2" x 7" T. Spec. Nut (4½" L.H. Thrd.)	S.S.C.	Make From Bar				
12	2	4 3/16" T. x 12⅞" Lg. Pin	S.S.E.	Bar Stock				
13	2	½" x 3½" Lg. Sq. Hd. Cup Pt. Set Screw	S.S.C.		S-5055	3820		
14	4	5" x 9" x 1/32 Thk. Shim	Common Sheet Metal		S-5300			
15	2	5" x 9" x 1/16 Thk. Shim	"		"			
16	2	5" x 9" x ⅛ Thk. Shim	"		"			
17	2	5¼ x 10½ x 1/32 Thk. Shim	"		"			
18		5¼ x 10½ x 1/16 Thk. Shim	"		"			
19		5¼ x 10½ x ⅛ Thk. Shim	"		"			
20		½" Std. Pipe	W.I.	Cut & Bend To Suit				
21	2	½" - 45° Street Elbow	M.	Crane Cat. #51 Page 517				
22	2	½" - 90° Elbow	M.		S-5076	1677		
23		½" - 90° Street Elbow	M.		S-5076	1722		
24	3	½" Coupling	M.		S-5078	1744		
25	1	Pipe Holder M.A. Cut		Make From 1" x 7" x 11" Lg. Plate				
26	1	½" x ¾" Lg. Sq. Hd. Cup Pt. Set Screw	S.S.C.		S-5055	1254		
27	2	#4 x 6¾" Lg. Taper Dowel Style 2	S.S.S.		S-5073	624		
28								
29								
30								

ALLIS CHALMERS MFG. CO.
MILWAUKEE, U.S.A.
DEPT.
DRAWN
TRACED
CH'K'D
SIMILAR TO
SCALE

CONNECTIONS BETWEEN
SHIFTING RAG & PRESS. REG.

829 - 102

DRAWING NO. MFR-B2-1100



USED FOR		NO.	ORDER NO.
CITY OF TACOMA CUSHMAN POWER PLT #2		2	28-9985
CITY OF TACOMA CUSHMAN POW. PLT. #2	F.S.	1	28-9985

ITEM	NO. WANT.	SIZE & NAME	MAT.	PATT. NO.	DRG NO.	STOCK	WEIGHT RGH.	WEIGHT FIN.
1	1	ANVIL PLATE SECTION	C.I.B	2WT-19692			4660# Actual	
2	1	ANVIL PLATE SECTION	C.I.B	2WT-19692-1			4660# Actual	
3	1	ANVIL PLATE SECTION	C.I.B	2WT-19692-2			4660# Actual	
4	1	ANVIL PLATE SECTION	C.I.B	2WT-19692-3			4660# Actual	
5	1	SIDE PLATE SECTION	C.I.B	2WT-19693			3000# Actual	
6	1	SIDE PLATE SECTION	C.I.B	2WT-19693-1			3000# Actual	
7								
8								
9	58	1 1/4" x 4" LG. TAP BOLT	S.S.C.		S-5040	299		
10	10	1 1/4" x 4" LG. TURNED BOLT	S.S.C.		S-5118			
11	68	1 1/4" S.F. HEX. NUT	S.S.C.		S-5382	375		
12	24	2" P.PLUG	C.I.		S-5076	1659		
13	24	1" P.PLUG.	C.I.		S-5076	1656		
14								
15								
16								
17								
18								

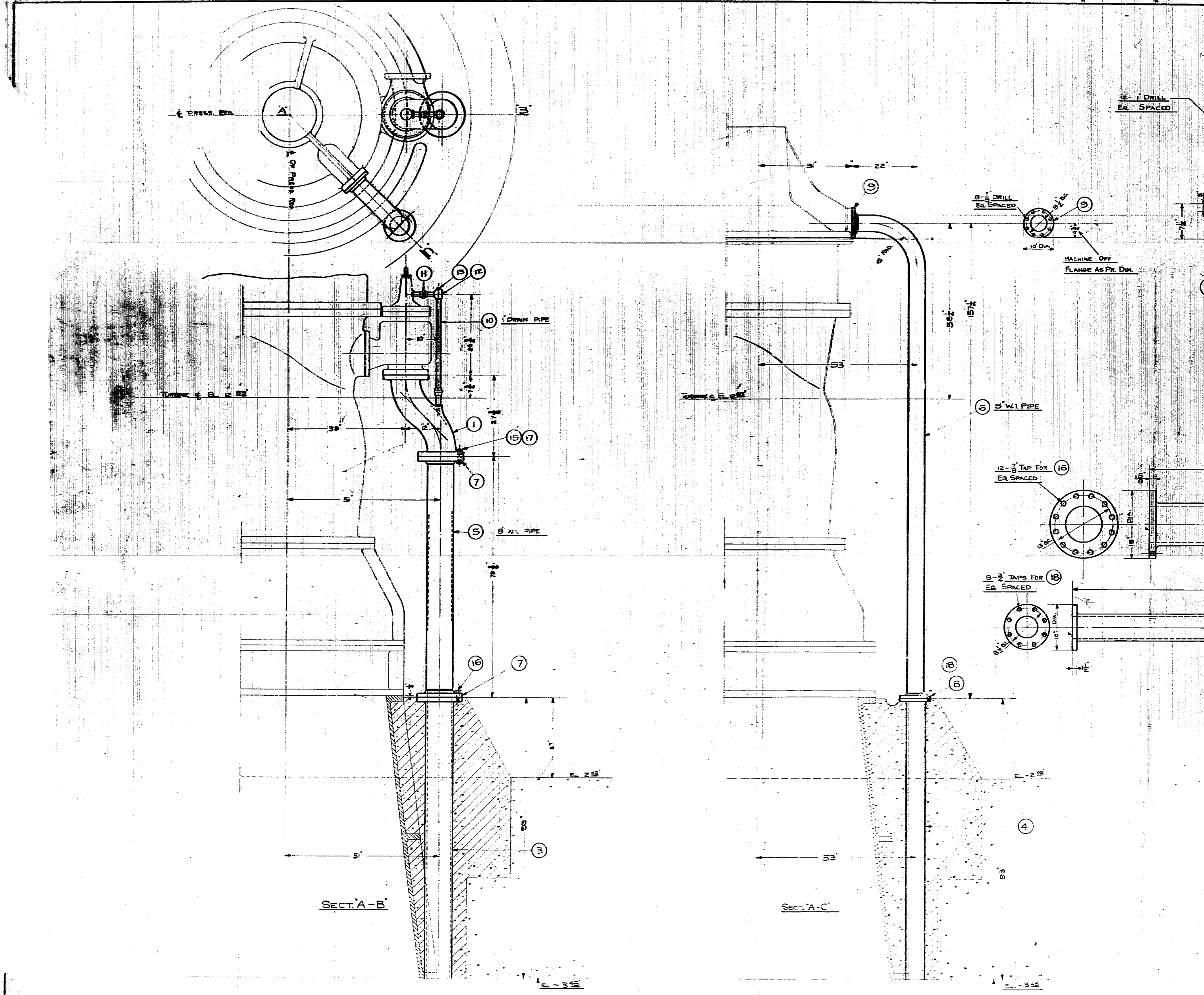
ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS. U.S.A.
HYD. DEPT.
DRAWN J.F.K.
TRACED W.A.K. 3-9-29
CH'K'D ... O.K.
SCALE 1/2" = 1'

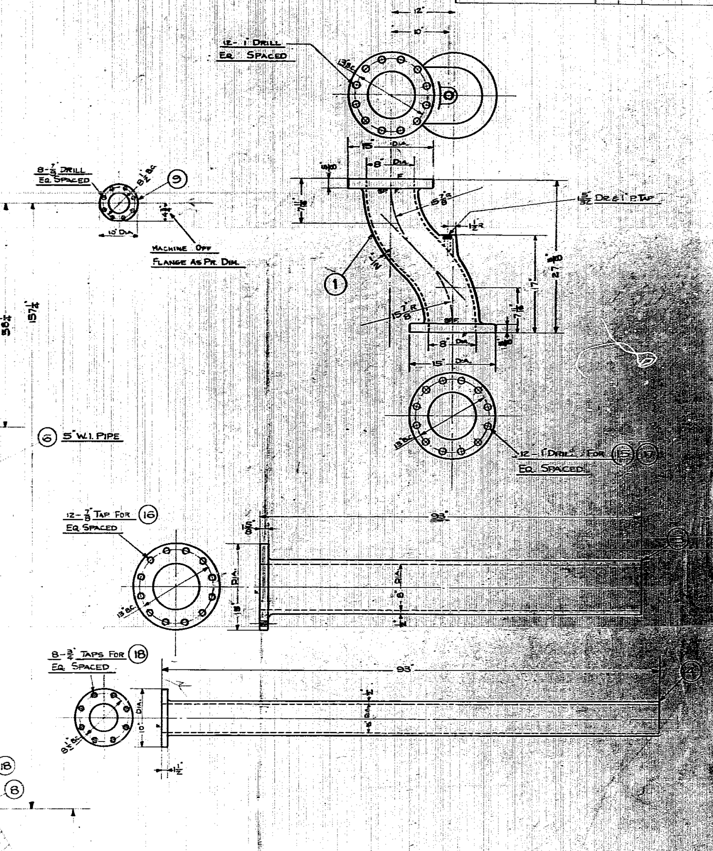
ANVIL PLATE & SIDE PLATE
FOR
PRESSURE REGULATOR DISCHARGE
USED ON
HYDRAULIC TURBINE

829
136

DRAWING NO MFR-B2-1104

Used For	No.	Ord No.
City of Tacoma Cushman #2 Dev.	2	283778





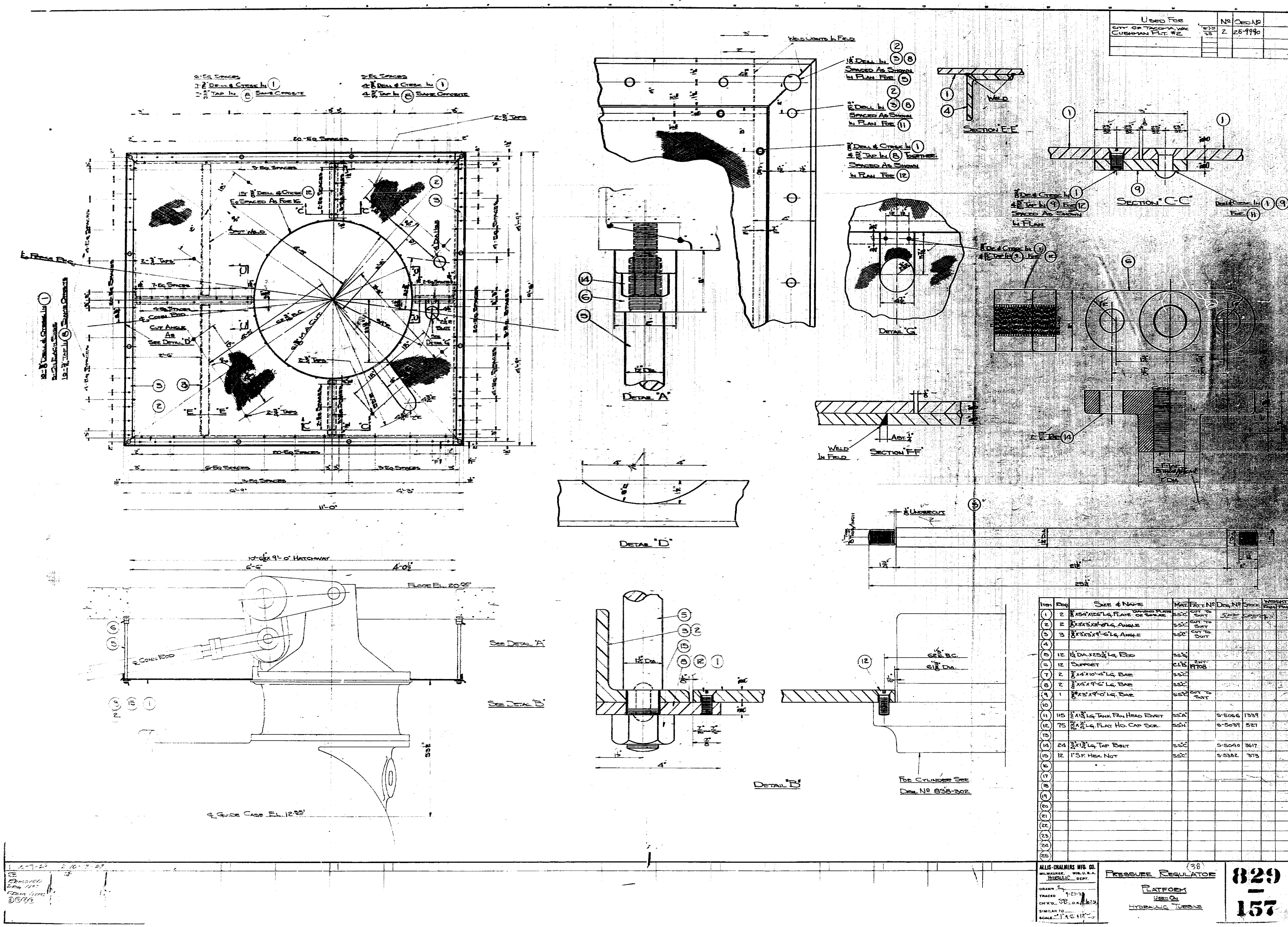
Item	No.	Size & Name	Mat.	Patt. No.	Drg. No.	Stock	Weight
1	1	8" Dia x 27 3/8" Lg. S-Bend	C.I.B.	2WT-19702			
2							
3	1	8" Dia. x 93" Lg. Pipe	C.I.B.	Std. Patt.			
4	1	5" Dia. x 93" Lg. Pipe	C.I.B.	Std. Patt.			
5	1	8" Dia. x 82" Lg. Std. Pipe Thread Ends	W.I.				
6	1	5" Dia. x 190" Lg. Std. Pipe	W.I.	Bend and thread as shown			
7	2	8 x 15" Dia. Ex. Hy. Flange	C.I.	Crane Cat. #51 #151E Page 474		Face & Drill	
8	1	5" x 10" Dia. Std. Flange	C.I.D.		S-5194	4449	
9	1	5" x 10" Dia. Std. Flange Cut off as shown	C.I.D.		S-5194	4449	
10	1	1" x 48" Lg. Std Pipe	W.I.	Cut to suit			
11	2	1" Std. Unions	M.I.		S-5076	1735	
12	1	1" Std. Tee	M.I.		S-5076	1717	
13	1	1" Sq. Hd. Pipe Plug	C.I.		S-5076	1656	
14							
15	12	7/8 x 4 1/2 Lg. Tap Bolts	S.S.C.		S-5040	257	
16	12	7/8" x 3" Lg. Tap Bolts	S.S.C.		S-5040	251	
17	12	7/8" Sf. Hex. Nuts	S.S.C.		S-5382	372	
18	8	3/4 x 2 1/4 Lg. Tap Bolt	S.S.C.		S-5040	234	
19	Nec.	Packing	Oiled Paper				

Allis-Chalmers Mfg. Co.
Milwaukee, Wis. U.S.A.
Hydr. Dept.
Drawn
Traced A.J.K. - 9 - 2 - 29
Ch'k'd
O.K.
Similar to
Scale 1" = 12"

Drain Pipings (33)
For
Pressure Regulator
Used On
Hydraulic Turbine

829 — 148

Drawing No. MFR B2-1105



Item	Req.	Size & Name	Mat.	Patt. No.	Dwg. No.	Stock	Weight Rgh.	Weight Fin.
1	2	3/8" x 54" x 126" Lg. Plate, Diamond Plate or Similar	S.S."C"	Cut to Suit	See Spec.			
2	2	3/8" x 3" x 3" x 11'-0" Lg. Angle	S.S."C"	Cut to Suit				
3	3	3/8" x 3" x 3" x 9'-6" Lg. Angle	S.S."C"	Cut to Suit				
4								
5	12	1 1/4" Dia. x 25 3/4" Lg. Rod	S.S."G"					
6	12	Support	C.I."B"	2 WT-19708				
7	2	3/8" x 4" x 10'-4" Lg. Bar	S.S."C"					
8	2	3/8" x 4" x 9'-6" Lg. Bar	S.S."C"					
9	1	3/8" x 3" x 9'-0" Lg. Bar	S.S."C"	Cut to Suit				
10								
11	115	1/2" x 1 3/4" Lg. Tank Pan Head Rivet	S.S."A"		S-5066	1339		
12	75	5/16" x 3/4" Lg. Flat Hd. Cap Scr.	S.S."H"		S-5039	527		
13								
14	24	3/4" x 1 3/4" Lg. Tap Bolt	S.S."C"		S-5040	3617		
15	12	1" S.F. Hex Nut	S.S."C"		S-5382	373		
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								

ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS. U.S.A.
HYDRAULIC DEPT.
DRAWN Sy.
TRACED 9-27-29
CH'K'D. SB. O.K.
SIMILAR TO
SCALE 1" & 6" = 1'-0"

PRESSURE REGULATOR (38)

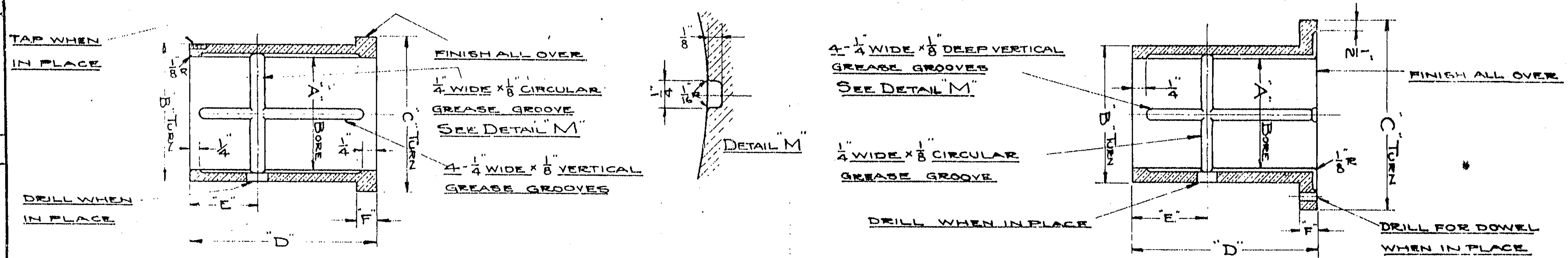
PLATFORM

USED ON

HYDRAULIC TURBINE

829 — 157

DRAWING NO. MFR-B2-1106



PART No.	"A"	"B"	"C"	"D"	"E"	"F"	PATT. No.	TOOL No.	FINAL DIM. OF "A"	FINAL DIM. OF "B"	MAT.	DATE & SIGN
1	1 23/32"	2 1/32"	2 7/16"	1 11/16"	-	3/16"	SE-13025-1		1.753"	2.002"	BR."E"	2-12-25 R.H.S.
2	6.000"	6.503"	7 15/32"	6 7/8"	2 1/4"	3/8"	~~2WT-2125-4~~	6" REAMER 14968	–	–	BR."E"	3-19-25
3	2 15/32"	3 1/32"	3 15/32"	2 7/8"	OMIT GREASE GROOVES	1/4"	~~2WT-3213-6~~		2.506"	2.503"	BR."E"	4-7-25 Edw.B.
4	1.252" +.001"	1.628" -.001"	1 23/32"	3 1/2"	OMIT GREASE GROOVES	1/4"	STD. #13		–	–	BR."E"	3-3-26 Edw.B.
5	4.000"	4.502"	4 63/64"	3 1/2"	OMIT GREASE GROOVES	3/8"	~~2WT-1152-13~~		–	–	BR."E"	4-23-26 J.F.K.
6	2 31/32"	3 17/32"	4"	3 5/16"	1 1/2"	0.500"	PATTERN DESTROYED		–	–	BR."E"	5-24-26 J.F.K.
7	2 31/32"	3 17/32"	4 7/16"	4 1/4"	1 1/2"	1/4"	PATTERN DESTROYED		–	–	BR."E"	5-24-26 J.F.K.
8	4 31/32"	5 17/32"	6 15/32"	6"	2"	1/2"	2WT-16130-5	OMIT VERT. GROOVES	5.010" +.001" -.000"	5.503" +.001 -.001	BR."E"	7-14-26
9	7 15/64"	8 1/32"	8 23/32"	9"	4 1/2"	1/2"	~~2WT-15660-1~~	OMIT VERT. GROOVES	7.262" +.001" -.000"	8.003" ±.001"	BR."E"	10-15-26
10	2 7/32"	2 25/32"	3 7/32"	2 7/8"	OMIT GREASE GROOVES	1/4"	~~2WT-490-4~~	Destroyed	2.256"	2.753"	BR."E"	5-6-26 J.F.K.
11	7.130" ±.001"	7.878" ±.001"	8 19/32"	14 3/4"	OMIT CIRCULAR GROOVES	3/4"	2WT-16352-2	VERT. GREASE GROOVES TO RUN THRU ON END OPPOSITE FLANGE	–	–	BR."E"	6-16-27 Edw.B.
12	1.502" ±.001"	1.878" ±.001"	2 7/32"	5"	2 5/8"	[illegible]	PATTERN DESTROYED	OMIT GREASE GROOVES	–	–	BR."E"	7-27-27 Edw.B.
13	8.500" +.000" -.001"	9.000" +.000" -.001"	9 63/64"	7"	4 5/8"	3/8"	2WT-15079-1		–	–	BR."E"	4-6-28 C.G.G.
14	2 9/16"	3 3/8"	PATTERN DESTROYED				2WT-6590-3	CUT GREASE GROOVE 3/16" DEEP	2.625" +.000" -.001"	3.315" +.000" -.001"	BR."E"	8-4-28
15	2 1/2"	3 3/8"	3 43/64"	2 1/2"	5/8"	1/2"	~~2WT-6590-3~~	CUT GREASE GROOVES 3/16" DEEP	2.625" +.000" -.001"	3.315" +.000" -.001"	BR."E"	8-4-28
16	4.490" ±.002"	5.003" +.001" -.000"	5 11/16"	5"	1 7/16"	3/8"	2WT-3541-8		4.500" +.002" -.000"	5.003" +.001" -.000"	BR."E"	4-9-29
17	4.490" ±.002"	5 1/16"	5 11/16"	5"	1 7/16"	3/8"	2WT-3541-8		4.600" +.002" -.000"	5.003" +.001" -.000"	BR."E"	5-28-29
18	1.252" ±.001"	1.752" +.001" -.000"	1 15/16"	1 1/2"	OMIT GREASE GROOVES	3/8"	STD. #13		–	–	BR."E"	6-29-29
19	4 31/32"	5 17/32"	6 7/32"	4 7/8"	2 1/4"	3/8"	2WT-16130-8	CUT GREASE GROOVES	5.008" +.001" -.000"	5.003" ±.001"	BR."E"	7-1-29 Edw.B.
20	6.600" ±.001"	7.002" ±.001"	7 15/16"	8"	6"	5/8"	STD. #62	OMIT GREASE GROOVES	–	–	BR."E"	7-10-29
21	1.250" ±.001"	1.626" ±.001"	1 27/32"	3"	1 1/2"	1/4"	STD. #13	OMIT VERT. GROOVES	–	–	BR."E"	8-7-29
22	1.250" ±.001"	1.626" ±.001"	1 27/32"	1 1/2"	5/8"	1/4"	STD. #13	OMIT VERT. GROOVES	–	–	BR."E"	8-7-29
23	4 31/32"	5 17/32"	6 15/32"	4 7/8"	2 1/4"	3/8"	2WT-16130-9	OMIT GREASE GROOVES	5.010" +.001" -.000"	5.503" ±.001"	BR."E"	12-11-29 C.G.G.
48	2 31/32"	3 17/32"	4 1/8"	3 3/8"	PATTERN DESTROYED		~~2WT-7…~~	OMIT GREASE GROOVES	3.008" +.001" -.000	3.503" ±.001"	BR."E"	8-11-30 C.G.G.

PART No.	"A"	"B"	"C"	"D"	"E"	"F"	PATT. No.	TOOL No.	REMARKS	MAT.	DATE & SIGN
24	6.000"	6.503"	9"	4 7/8"	2 3/4"	0.375"	~~2WT-2125-6~~	6" REAMER 14968		BR."E"	3-19-25
25	3 15/32"	4 1/32"	5"	3 5/8"	2 1/4"	0.375"	~~2WT-4388-5~~			BR."E"	1-12-26 R.H.S.
26	4 31/32"	5 17/32"	8 1/2"	4"	2 1/2"	0.500"	2WT-16130-4		FINAL DIM. A=5.010" +.001" -.000" B=5.503" ±.001"	BR."E"	7-14-26
27	7 15/64"	8 1/32"	12"	6"	2 1/2"	0.500"	2WT-15661-1 KEEP		FINAL DIM. A=7.262" +.000" -.000" B=8.003" ±.001"	BR."E"	10-15-26
28	3 31/32"	4 17/32"	7"	3 5/8"	2 1/4"	0.375"	~~2WT-7152-17~~		FINAL DIM. A=4.008" +.001" -.000" B=4.503" ±.001"	BR."E"	7-26-27
29	5 31/32"	6 17/32"	9"	4 7/8"	3"	0.375"	~~2WT-2125-6~~	6" REAMER 14968	FINAL DIM. A=6.010" +.001" -.000" B=6.503" ±.001"	BR."E"	3-28-28 Edw.B.
30	2.753"	3.252"	5 1/4"	3 1/2"	-	1/2"	~~2WT-8867-9~~		OMIT GREASE GROOVES	BR."E"	7-30-28 W.H.R.
31	4 31/32"	5 17/32"	8"	4 3/8"	1 1/4"	0.375"	2WT-16130-7		FINAL DIM. A=5.008" +.001" -.000" B=5.503" ±.001"	BR."E"	7-1-29 Edw.B.
32	4 31/32"	5 17/32"	7 1/2"	2 1/8"	7/8"	0.375"	2WT-19730		FINAL DIM. A=5.010" +.001" -.000" B=5.503" ±.001"	BR."E"	12-11-29 C.G.G.
33	2 31/32"	3 17/32"	5"	2 7/8"	1 3/4"	0.375"	~~2WT-2286-11~~ PATTERN DESTROYED		FINAL DIM A=3.008" +.001" -.000" B=3.503" ±.001"	BR."E"	8-11-30 C.G.G.
34	3.375"	4 1/32"	4 5/8"	3 1/2"	1 1/4"	0.500"	~~2WT-8509-17~~		FIN. DIM "B"=4.002" MACH. DURING ERECTION.	BR."E"	9/4-30 J.F.K.
35	1.250" +.001" -.000"	1.628"	2 1/4"	2 3/16"	—	5/16"	2WT-20009	CUT GREASE GROOVE 3/32" DEEP		BR."E"	12-18-30 S.B.B.
36	4.875" +.001" -.000"	5.503" +.000" -.001"	7 1/2"	5"	3 3/4"	1/2"	~~2WT-20038~~			BR."E"	1-15-31 Edw.B.
37	1.755" +.001" -.000"	2.252"	2 1/2"	1 11/16"	1 3/16"	1/8"	STD. #35	CUT GREASE GROOVE 3/32" DEEP		BR."E"	3-17-31 S.B.B.
38	2 15/64"	2 49/64"	4"	1 7/8"	3/4"	0.375	2WT-20080		FINAL DIM. "A"=2.258" +.002" -.000" "B"=2.752" ±.001"	BR."E"	10/6-31 J.F.K.
39	4.500" +.001" -.000"	5.253" +.000" -.001"	6 1/2"	9 1/2"	—	1/2"	TE-2372-1			BR."E"	10/28-31 J.F.K.
40	2.468" +.001" -.000"	3.003" +.000" -.001"	3 1/2"	3 1/8"	—	1/4"	2WT-~~19920~~			BR."E"	10/28-31 J.F.K.
41	3.753" +.001" -.000"	4.503" +.000" -.001"	4 31/32"	2 1/8"	—	3/8"	2WT-~~19770~~			BR."E"	10/28-31 J.F.K.
42	1.250" +.001" -.000"	1.498" +.000" -.001"	1 23/32"	1 1/2"	—	1/4"	STD. #14			BR."E"	10/28-31 J.F.K.
43	1.125" +.001" -.000"	1.500" +.000" -.001"	2 1/2"	2.062"	9/16"	.250"	———	OMIT GREASE GROOVES		S.A.E. 1045	10/28-31 J.F.K.
44	1.004" +.002" -.000"	1.253" +.000" -.001"	1 7/16"	1 3/8"	—	1/4"	STD #5	OMIT GREASE GROOVES		BR."E"	7-29-32 Edw.B.
45	2.469" +.001" -.000"	3.003" +.000" -.001"	3 1/2"	3 1/8"	—	1/4"	~~2WT-19920~~	OMIT GREASE GROOVES		BR. SEE SPEC.	2-28-36 Edw.B.
46	3.757" +.001" -.000"	4.503" +.000" -.001"	4 31/32"	2 1/8"	—	3/8"	~~2WT-19776~~	OMIT GREASE GROOVES		BR. SEE SPEC.	2-28-36 Edw.B.
47	1.252" +.001" -.000"	1.502" +.000" -.001"	1 23/32"	1 1/2"	—	1/4"	STD #14	OMIT GREASE GROOVES		BR. SEE SPEC.	3-5-35 Edw.B.

1	2-13-25	R.H.S. Patt. # Ows. was 2WT-4473-3
2	4-6-25	E.H.S. Grease grooves, parts no. 9 were omitted
3	4-28-25	Edw.B. Patt. Item ⑧ was 2WT-4588-3
4	2-2-26	R.H.S. Part 4 Dim. "C" was 3 1/32", Patt. # was 2WT-3284
5	6-24-26	J.F.K. Dim. "D" Part 6 was 3 1/2"
6	7-30-26	Grease grooves were omitted
7	11-14-30	C.G.G.

FOR ADDITIONAL BUSHINGS SEE 868/278

FLANGED BUSHING

USED ON HYDRAULIC TURBINE

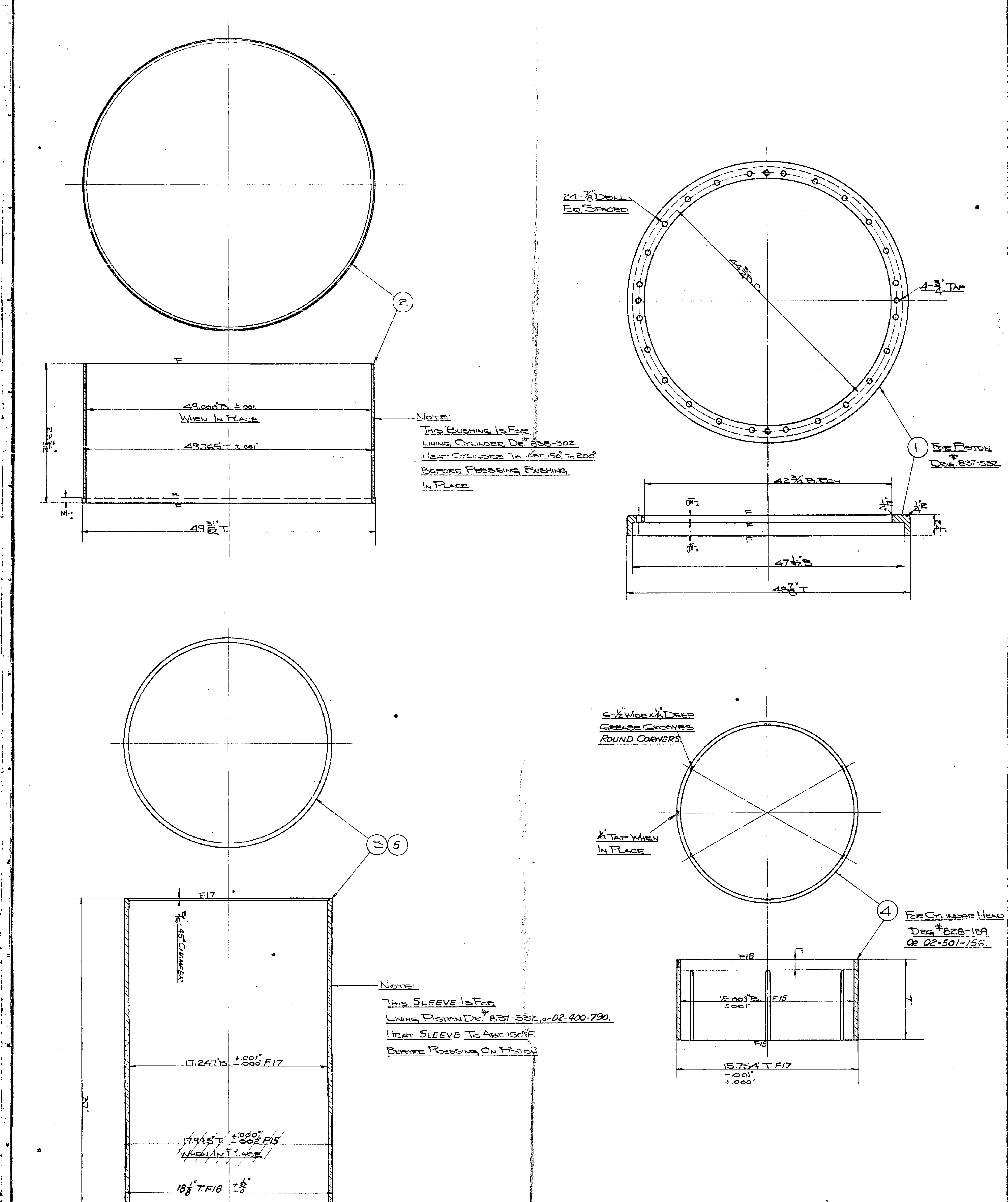
ALLIS-CHALMERS MFG. CO.
MILWAUKEE, WIS., U.S.A.

DRAWN 863-333
TRACED CRUD
CHECKED R.H.S.
SIMILAR TO
SCALE N.T.S.

863 333

B2-1578

Used For		Nº	Ord. Nº
City of Tacoma-Cushman #2	8/4-29	2	28-9777
City of Tacoma Cushman #2 Powerhouse - Unit #3	8R40 KWK	—	2-0202-15193



Note "A":- Material for sleeve item ⑤ is composed of the following: Copper 88%, Tin 6½%, Lead 1½%, Zinc 4%.

Item	Req.	Size & Name	Mat.	Patt. Nº	Drg. Nº or "Q" No.	Mark No.	Weight Rgh. Fin.
1	1	Piston Gland	C.I.B	2WT-19685	PATTERN DESTROYED		
2	1	49" Cylinder Bushing	BR'E	2WT-19686	PATTERN DESTROYED		
3	1	Sleeve - 37" Lg.	BR'E	2WT-19687		003	480#
4	1	Bushing - 7" Lg.	BR'E	2WT-19688		004	40#
5	1	Sleeve - 37" Lg.	See Note "A"		Cent. Casting	005	480#
6							
7							
8							

1	8/16-29	02	Dec. 31, 1950	03	Feb. 16, 1951
	Spec & Fin. Marks Revised To Comply With Latest A-C Standards. It ③ Was 2 Reg. Changed Effective On Ord. 2-0202-15193 It ③ Was Called Bushing		KWK Added Item ⑤ & Note "A".		KWK

Allis-Chalmers Mfg. Co.
Milwaukee, Wis., U.S.A.
Hyd. Dept.
Drawn
Traced
Checked 3-17-29
Similar To

Piston Gland & Bushings For Pressure Regulator

Used On

02 838 — 325

B2-1585

APPENDIX B

Signature Page

Price Proposal Form

Record of Prior Contracts

List of Equipment Form

SIGNATURE PAGE

CITY OF TACOMA
TACOMA POWER GENERATION

All submittals must be in ink or typewritten, executed by a duly authorized officer or representative of the bidding/proposing entity, and received and time stamped as directed in the **Request for Proposal page near the beginning of the specification**. If the bidder/proposer is a subsidiary or doing business on behalf of another entity, so state, and provide the firm name under which business is hereby transacted.

REQUEST FOR PROPOSAL SPECIFICATION NO. PG24-0161F
UNIT 31 AND 32 PRESSURE REGULATING VALVE REFURBISHMENT

The undersigned bidder/proposer hereby agrees to execute the proposed contract and furnish all materials, labor, tools, equipment and all other facilities and services in accordance with these specifications.

The bidder/proposer agrees, by submitting a bid/proposal under these specifications, that in the event any litigation should arise concerning the submission of bids/proposals or the award of contract under this specification, Request for Bids, Request for Proposals or Request for Qualifications, the venue of such action or litigation shall be in the Superior Court of the State of Washington, in and for the County of Pierce.

Non-Collusion Declaration

The undersigned bidder/proposer hereby certifies under penalty of perjury that this bid/proposal is genuine and not a sham or collusive bid/proposal, or made in the interests or on behalf of any person or entity not herein named; and that said bidder/proposer has not directly or indirectly induced or solicited any contractor or supplier on the above work to put in a sham bid/proposal or any person or entity to refrain from submitting a bid/proposal; and that said bidder/proposer has not, in any manner, sought by collusion to secure to itself an advantage over any other contractor(s) or person(s).

_____
Bidder/Proposer's Registered Name

_____
Address

_____
City, State, Zip

_____
Authorized Signatory E-Mail Address

_____
E.I.No. / Federal Social Security Number Used on Quarterly Federal Tax Return, U.S. Treasury Dept. Form 941

_____
E-Mail Address for Communications

_____
Signature of Person Authorized to Enter into Contracts for Bidder/Proposer — Date

_____
Printed Name and Title

_____
(Area Code) Telephone Number / Fax Number

_____
State Business License Number
in WA, also known as UBI (Unified Business Identifier) Number

_____
State Contractor's License Number
(See Ch. 18.27, R.C.W.)

Addendum acknowledgement #1_____ #2_____ #3_____ #4_____ #5_____

THIS PAGE MUST BE SIGNED AND RETURNED WITH SUBMITTAL.

_____
Name of Bidder

PROPOSAL

	BID UNIT	QUANTITY	UNIT COST	TOTAL COST
ITEM 1				
Unit 32 (1st Unit) PRV refurbishment	Lump Sum	1	$_____	$_____
ITEM 2				
Unit 31 (2nd Unit) PRV refurbishment	Lump Sum	1	$_____	$_____
OPTIONAL BID ITEMS				
Procedure development for pre dismantle measurement, site disassembly oversight (4 days), site reassembly oversight (4 days), and commissioning plan.	Lump Sum	1	$_____	$_____
Spare pilot valve	Lump Sum	1	$_____	$_____
Technical advisor on site hourly rate***	Hourly	-	$_____ / hour	NA
Shop Welder	Hourly	-	$_____ / hour	NA
ITEM 3				
*Force Account	Lump Sum	1	$ 200,000.00	$ 200,000.00

*Bidders shall include the $ 200,000.00 figure as part of their overall bid.

TOTAL ITEMS 1 - 3 $_____

**Sales Tax @ _____ $_____

TOTAL AMOUNT $_____

*** Provide separate rate sheet for all trade that the bidder proposes to use for completion of work.

RECORD OF PRIOR CONTRACTS

NAME _____ **ADDRESS**_____

Type of Work _____ **Specification No.** _____

Beginning Date	Completion Date	Contract With	Contact Person Phone #	Amount of Contract

Remarks: _____

Name of Bidder

LIST OF EQUIPMENT

Following is a list to be filled in by the bidder, showing equipment definitely available for use on the proposed work as required. (Give quantity, description, size or capacity, condition and present location of each item of equipment.)

APPENDIX C

Sample Contract

City of Tacoma Insurance Requirements

SERVICES CONTRACT

Click here for the Contract Questionnaire Popup Quick Reference

Start Questionnaire | Finalize Document

THIS CONTRACT, made and entered into effective as of the ____ day of _____, 20__ (EFFECTIVE DATE) by and between the CITY OF TACOMA, a municipal corporation of the State of Washington (hereinafter referred to as the "CITY"), and **[INSERT legal name of Supplier exactly as it appears in Ariba]**, (hereinafter referred to as "CONTRACTOR");

In consideration of the mutual promises and obligations hereinafter set forth, the Parties hereto agree as follows:

1. **Scope of Services/Work**

   The CONTRACTOR agrees to diligently and completely perform the services and/or deliverables consisting of [INSERT A BRIEF DESCRIPTION OF THE WORK TO BE PERFORMED] as is described in Exhibit XXXXX [A, B, ETC., if needed] attached hereto and incorporated herein.

2. **Order of Precedence**

   To the extent there is any discrepancy or conflict between and/or amongst the terms of this Contract and Exhibit(s) _____, the controlling terms for this Contract will be interpreted in the following order of precedence, with the first listed being the most controlling, and the last listed being the least controlling: Contract, Exhibit ___, Exhibit _____. [INSERT EXHIBIT REFERENCES IN ORDER OF WHICH IS MOST CONTROLLING]

3. **Changes to Scope of Work**

   The CITY shall have the right to make changes within the general scope of services and/or deliverables upon execution in writing of a change order or amendment hereto. If the changes will result in additional work effort by CONTRACTOR, the CITY will agree to reasonably compensate the CONTRACTOR for such additional effort up to the maximum amount specified herein or as otherwise provided by City Code.

4. **On Call Contracts**

   If the services and deliverables performed under this Contract are on an on call or as assigned basis, service and deliverables may be assigned by Task Authorization or Statements of Work, are subject to Section 9, and cannot augment any other work that the CONTRACTOR is doing for the CITY on another Contract. Actual compensation will depend upon the actual purchases made by the City during the life of this Contract and will be paid at the rates set in Exhibit A

5. **Term**

All services shall be satisfactorily completed on or before [INSERT CONTRACT TERMINATION DATE] and this Contract shall expire on said date unless mutually extended by a written and executed Amendment to this Contract.

6. Renewals

At CITY's sole option, the Term of this Contract may be renewed for additional [INSERT THE RENEWAL PERIOD - 1 YEAR, ETC] periods, not to exceed [INSERT THE MAXIMUM NUMBER OF RENEWAL PERIODS]. CITY will provide written notice of its intent to exercise any renewal options at least 30 days prior to the then existing Term and a written Amendment to this Contract will be mutually executed.

7. Delay

Neither party shall be considered to be in default in the performance of this Contract to the extent such performance is prevented or delayed by any cause which is beyond the reasonable control of the affected party and, in such event, the time for performance shall be extended for a period equal to any time lost as a result thereof. In the event CONTRACTOR is unable to proceed due to a delay solely attributable to CITY, CONTRACTOR shall advise CITY of such delay in writing as soon as is practicable.

8. Compensation

The CITY shall compensate the CONTRACTOR for the services and deliverables performed under this Contract [in accordance with OR on the basis of] [INSERT DESCRIPTION OF COMPENSATION ARRANGEMENTS – REFERENCE EXHIBIT, TIME AND MATERIALS, LUMP SUM ETC.]

9. Not to Exceed Amount

The total price to be paid by CITY for CONTRACTOR'S full and complete performance of the Scope of Work hereunder shall not exceed $ [INSERT TOTAL AMOUNT OF CONTRACT] plus applicable taxes without a written and executed Amendment to this Contract. Said price shall be the total compensation for CONTRACTOR'S performance hereunder including, but not limited to, all work, deliverables, materials, supplies, equipment, subcontractor's fees, and all reimbursable travel and miscellaneous or incidental expenses to be incurred by CONTRACTOR.
In the event the CONTRACTOR incurs cost in excess of the sum authorized for service under this Contract, the CONTRACTOR shall pay such excess from its own funds, and the CITY shall not be required to pay any part of such excess, and the CONTRACTOR shall have no claim against the CITY on account thereof.

10. Payment

CONTRACTOR shall submit XXXXXXXX {monthly, weekly, annual, Contract milestone, etc.} invoices for services completed and/or deliverables furnished during the invoice period. Upon CITY'S request, CONTRACTOR shall submit necessary and appropriate documentation, as determined by the CITY, for all invoiced services and deliverables.

Payment shall be made through the CITY'S ordinary payment process, and shall be considered timely if made within 30 days of receipt of a properly completed invoice. All payments shall be subject to adjustment for any amounts, upon audit or otherwise, determined to have been improperly invoiced. The CITY may withhold payment to the CONTRACTOR for any services or deliverables not performed as required hereunder until such time as the CONTRACTOR modifies such services or deliverables to the satisfaction of the CITY.

11. Payment Method

The City's preferred method of payment is by ePayables (Payment Plus), followed by credit card (aka procurement card), then Electronic Funds Transfer (EFT) by Automated Clearing House (ACH), then check or other cash equivalent. CONTRACTOR may be required to have the capability of accepting the City's ePayables or credit card methods of payment. The City of Tacoma will not accept price changes or pay additional fees when ePayables (Payment Plus) or credit card is used. The City, in its sole discretion, will determine the method of payment for this Contract.

12. Independent Contractor Status

The services and deliverables shall be furnished by the CONTRACTOR as an independent Contractor, and nothing herein contained shall be construed to create an employer and employee relationship. The CONTRACTOR shall provide at its sole expense all materials, office space, and other necessities to perform its duties under this Contract, unless stated otherwise in this Contract. No payroll or employment taxes of any kind shall be withheld or paid by the CITY with respect to payments to CONTRACTOR. The payroll or employment taxes that are the subject of this paragraph include, but are not limited to, FICA, FUTA, federal income tax, state personal income tax, state disability insurance tax and state unemployment insurance tax. By reason of CONTRACTOR's status as an independent Contractor hereunder, no workers' compensation insurance has been or will be obtained by the CITY on account of CONTRACTOR. CONTRACTOR may be required to provide the CITY proof of payment of these said taxes and benefits. If the CITY is assessed or deemed liable in any manner for those charges or taxes, the CONTRACTOR agrees to hold the CITY harmless from those costs, including attorney's fees.

13. Services Warranty

The CONTRACTOR warrants that all services performed pursuant to this Contract shall be generally suitable for the use to which CITY intends to use said services and deliverables as expressed in the Scope of Work. In the performance of services under this Contract, the CONTRACTOR and its employees further agree to exercise the degree of skill and care required by customarily accepted good practices and procedures followed by professionals or service providers rendering the same or similar type of service. All obligations and services of the CONTRACTOR hereunder shall be performed diligently and completely according to such professional standards.

Unless a higher standard or longer periods of warranty coverage for product deliverables provided under this Contract is provided herein, CONTRACTOR agrees to correct any defect or failure of deliverables supplied under this Contract which occurs

within one year from _____[FILL IN APPROPRIATE TIME FRAME, E.G. GO LIVE, FIRST USE, ETC]. During said warranty period, all of the costs (including shipping, dismantling and reinstallation) of repairs or corrections is the responsibility of the CONTRACTOR. If CONTRACTOR is not the manufacturer of the item of equipment, CONTRACTOR agrees to be responsible for this warranty and shall not be relieved by a lesser manufacturer's guarantee. This Contract warranty period shall be suspended from the time a significant defect is first documented by the CITY until repair or replacement by CONTRACTOR and acceptance by the CITY. In the event less than ninety (90) days remain on the warranty period (after recalculating), the warranty period shall be extended to allow for at least ninety (90) days from the date of repair or replacement and acceptance by the CITY.

14. Reliance on CITY Provided Data or Information

If the CONTRACTOR intends to rely on information or data supplied by the CITY, other CITY contractors or other generally reputable sources without independent verification, such intent shall be brought to the attention of the CITY.

15. Contract Administration

[INSERT NAME TITLE AND DEPARTMENT OF CONTRACT ADMINISTRATOR] for the CITY shall have primary responsibility for contract administration and approval of services to be performed by the CONTRACTOR, and shall coordinate all communications between the CONTRACTOR and the CITY.

16. Specific Personnel

If before, during, or after the execution of this Contract, CONTRACTOR represents to the CITY that certain personnel would or will be responsible for performing services and deliverables under this Contract, then the CONTRACTOR is obligated to ensure that said personnel perform said Contract services to the maximum extent permitted by law. This Contract provision shall only be waived by written authorization by the CITY, and on a case-by-case basis.

17. Right to Audit

During the Term of this Contract, and for six (6) years thereafter, the CITY shall have the right to inspect and audit during normal business hours all pertinent books and records of the CONTRACTOR and/or any sub-contractor or agent of CONTRACTOR that performed services or furnished deliverables in connection with or related to the Scope of Work hereunder as reasonably needed by CITY to assess performance, compliance and quality assurance under this Contract or in satisfaction of City's public disclosure obligations, as applicable.

CONTRACTOR shall, upon three (3) business days of receipt of written request for such inspection and audit from CITY, provide the CITY with, or permit CITY to make, a copy of any work-related books, accounts, records and documents, in whole or in part, as specified in such request. Said inspection and audit shall occur in Pierce County, Washington or such other reasonable location as the CITY selects. The CITY shall bear the cost of any inspection audit requested hereunder, provided, that if an inspection

audit in accordance with the foregoing provisions discloses overpricing or overcharges (of any nature) by the CONTRACTOR to the CITY in excess of one percent (1%) of the total contract billings, in addition to making adjustments for the overcharges, the reasonable actual cost of the CITY's audit shall be reimbursed to CITY by CONTRACTOR. Any adjustments or payments that must be made as a result of any audit and inspection hereunder shall be made no later than 90 days from presentation of CITY's findings to CONTRACTOR.

CONTRACTOR shall ensure that the foregoing inspection, audit and copying rights of the CITY are a condition of any subcontract, agreement or other arrangement under which any other person or entity is permitted to perform the Scope of Work under this Contract.

18. Records Retention

The CONTRACTOR shall establish and maintain records in accordance with requirements prescribed by the CITY, with respect to all matters related to the performance of this Contract. Except as otherwise authorized by the CITY, the CONTRACTOR shall retain such records for a period of _____[INSERT THE TIME THE RECORDS SHOULD BE KEPT. MOST COMMON IS 6 YEARS] years after receipt of the final payment under this Contract or termination of this Contract.

If CONTRACTOR retains any City records or data hosted in a Cloud Service. CITY shall have the ability to access its records hosted in a Cloud Service at any time during the Term of this Contract. CITY may export and retrieve its records during the Term of the Contract and, no later than 30 days from the termination of this Contract, CONTRACTOR shall export CITY records to City's custody and control.

19. Notices

Except for routine operational communications, which may be delivered personally or transmitted by electronic mail all notices required hereunder shall be in writing and shall be deemed to have been duly given if delivered personally or mailed first-class mail, postage prepaid, to the parties at the following addresses:

CITY:	CONTRACTOR:
Name:	Name:
Title:	Title:
Address:	Address:
Telephone No.:	Telephone No.:
E-mail:	E-mail:

20. Termination

Except as otherwise provided herein, the CITY may terminate this Contract at any time, with or without cause, by giving ten (10) business days written notice to CONTRACTOR.

In the event of termination, all finished and unfinished work prepared by the CONTRACTOR pursuant to this Contract shall be provided to the CITY. In the event CITY terminates this Contract due to the CITY's own reasons and without cause due to the CONTRACTOR's actions or omissions, the CITY shall pay the CONTRACTOR the amount due for actual work and services necessarily performed under this Contract up to the effective date of termination, not to exceed the total compensation set forth herein. Termination of this Contract by CITY shall not constitute a waiver of any claims or remaining rights the CITY may have against CONTRACTOR relative to performance hereunder.

21. Suspension

The CITY may suspend this Contract, at its sole discretion, upon seven (7) business days' written notice to the CONTRACTOR. Such notice shall indicate the anticipated period of suspension. Any reimbursement for expenses incurred due to the suspension shall be limited to the CONTRACTOR'S reasonable expenses and shall be subject to verification. The CONTRACTOR shall resume performance of services under this Contract without delay when the suspension period ends. Suspension of this Contract by CITY shall not constitute a waiver of any claims or remaining rights the CITY may have against CONTRACTOR relative to performance hereunder.

22. Taxes

Unless stated otherwise in Exhibit A, CONTRACTOR is responsible for the payment of all charges and taxes applicable to the services performed under this Contract, and CONTRACTOR agrees to comply with all applicable laws regarding the reporting of income, maintenance of records, and all other requirements and obligations imposed pursuant to applicable law. If the CITY is assessed, made liable, or responsible in any manner for such charges or taxes, the CONTRACTOR holds CITY harmless from such costs, including attorney's fees.

If CONTRACTOR fails to pay any taxes, assessments, penalties, or fees imposed by any governmental body, including by Tacoma City ordinance, and including by a court of law, CITY will deduct and withhold or pay over to the appropriate governmental body those unpaid amounts upon demand by the governmental body. Any such payments shall be deducted from the CONTRACTOR's total compensation.

23. Licenses and Permits

The CONTRACTOR, at its expense, shall obtain and keep in force any and all necessary licenses and permits. The CONTRACTOR shall obtain a business license as required by Tacoma Municipal Code Subtitle 6B.20 and shall pay business and occupation taxes as required by Tacoma Municipal Code Subtitle 6A.30. If applicable, CONTRACTOR must have a Washington state business license.

24. Indemnification

CONTRACTOR shall indemnify, defend, and hold harmless the CITY, its officials, officers, agents, employees, and volunteers, from any and all claims, demands, damages, lawsuits, liabilities, losses, liens, expenses and costs arising out of the subject

matter of this Contract; provided that this provision shall not apply to the extent that damage or injury results from the sole negligence of the CITY, or its officers, agents, or employees. This indemnification shall extend to and include attorneys' fees and the cost of establishing the right of indemnification hereunder in favor of the CITY. This indemnification shall survive the termination of this Contract.

It is expressly agreed that with respect to design professional services performed by CONTRACTOR herein, CONTRACTOR's duty of indemnification, including the duty and cost to defend, against liability for damages arising out of such services or out of bodily injury to persons or damage to property shall, as provided in RCW 4.24.115 apply only to the extent of CONTRACTOR's negligence.

CONTRACTOR hereby warrants and represents CONTRACTOR is owner of any products, solutions or deliverables provided and licensed under this Contract or otherwise has the right to grant to CITY the licensed rights under this Contract, without violating the rights of any third party worldwide. CONTRACTOR shall, at its expense, defend, indemnify and hold harmless CITY and its employees, officers, directors, contractors, agents and volunteers from any claim or action against CITY which is based on a claim against CITY for infringement of a patent, copyright, trademark, or other propriety right or appropriation of a trade secret.

25. Title 51 Waiver

CONTRACTOR specifically assumes potential liability for actions brought by the CONTRACTOR'S own employees against the CITY and, solely for the purpose of this indemnification and defense, the CONTRACTOR specifically waives any immunity under the state industrial insurance law, Title 51 RCW. THE CONTRACTOR RECOGNIZES THAT THIS WAIVER WAS THE SUBJECT OF MUTUAL NEGOTIATION.

26. Insurance

During the course and performance of the services herein specified, CONTRACTOR will maintain the insurance coverage in the amounts and in the manner specified in the City of Tacoma Insurance Requirements as is applicable to the services and deliverables provided under this Contract. The City of Tacoma Insurance Requirements documents are fully incorporated herein by reference.

Failure by City to identify a deficiency in the insurance documentation provided by Contractor or failure of City to demand verification of coverage or compliance by Contractor with these insurance requirements shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

27. Nondiscrimination

The CONTRACTOR agrees to take all steps necessary to comply with all federal, state, and City laws and policies regarding non-discrimination and equal employment opportunities. The CONTRACTOR shall not discriminate in any employment action because of race, religion, creed, color, national origin or ancestry, sex, gender identity, sexual orientation, age, marital status, familial status, veteran or military status, the

presence of any sensory, mental or physical disability or the use of a trained dog guide or service animal by a disabled person. In the event of non-compliance by the CONTRACTOR with any of the non-discrimination provisions of this Contract, the CITY shall be deemed to have cause to terminate this Contract, in whole or in part.

28. Conflict of Interest

No officer, employee, or agent of the CITY, nor any member of the immediate family of any such officer, employee, or agent as defined by City ordinance, shall have any personal financial interest, direct or indirect, in this Contract, either in fact or in appearance. The CONTRACTOR shall comply with all federal, state, and City conflict of interest laws, statutes, and regulations. The CONTRACTOR represents that the CONTRACTOR presently has no interest and shall not acquire any interest, direct or indirect, in the program to which this Contract pertains which would conflict in any manner or degree with the performance of the CONTRACTOR'S services and obligations hereunder. The CONTRACTOR further covenants that, in performance of this Contract, no person having any such interest shall be employed. The CONTRACTOR also agrees that its violation of the CITY'S Code of Ethics contained in Chapter 1.46 of the Tacoma Municipal Code shall constitute a breach of this Contract subjecting the Contract to termination.

29. City ownership of Work/Rights in Data and Publications

To the extent CONTRACTOR creates any Work subject to the protections of the Copyright Act (Title 17 U.S.C) in its performance of this Contract, CONTRACTOR agrees to the following: The Work has been specially ordered and commissioned by CITY. CONTRACTOR agrees that the Work is a "work made for hire" for copyright purposes, with all copyrights in the Work owned by CITY. To the extent that the Work does not qualify as a work made for hire under applicable law, and to the extent that the Work includes material subject to copyright, CONTRACTOR hereby assigns to CITY, its successors and assigns, all right, title and interest in and to the Work, including but not limited to, all patent, trade secret, and other proprietary rights and all rights, title and interest in and to any inventions and designs embodied in the Work or developed during the course of CONTRACTOR'S creation of the Work. CONTRACTOR shall execute and deliver such instruments and take such other action as may be required and requested by CITY to carry out the assignment made pursuant to this section. Any documents, magnetically or optically encoded media, or other materials created by CONTRACTOR pursuant to this Contract shall be owned by CITY and subject to the terms of this sub-section. To the maximum extent permitted by law, CONTRACTOR waives all moral rights in the Work. The rights granted hereby to CITY shall survive the expiration or termination of this Contract. CONTRACTOR shall be solely responsible for obtaining releases for the performance, display, recreation, or use of copyrighted materials.

30. Public Disclosure

This Contract and documents provided to the CITY by CONTRACTOR hereunder are deemed public records subject to disclosure under the Washington State Public Records Act, Chapter 42.56 RCW (Public Records Act). Thus, the CITY may be required, upon request, to disclose this Contract and documents related to it unless an exemption under the Public Records Act or other laws applies. In the event CITY receives a request for

such disclosure, determines in its legal judgment that no applicable exemption to disclosure applies, and CONTRACTOR has complied with the requirements herein to mark all content considered to be confidential or proprietary, CITY agrees to provide CONTRACTOR ten (10) days written notice of impending release. Should legal action thereafter be initiated by CONTRACTOR to enjoin or otherwise prevent such release, all expense of any such litigation shall be borne by CONTRACTOR, including any damages, attorneys fees or costs awarded by reason of having opposed disclosure. CITY shall not be liable for any release where notice was provided and CONTRACTOR took no action to oppose the release of information. Notice of any proposed release of information pursuant to Chapter 42.56 RCW, shall be provided to CONTRACTOR according to the “Notices” provision herein.

31. Confidential or Proprietary Records Must be Marked

If CONTRACTOR provides the CITY with records that CONTRACTOR considers confidential or proprietary, CONTRACTOR must mark all applicable pages of said record(s) as “Confidential” or “Proprietary.” If CONTRACTOR fails to so mark record(s), then (1) the CITY, upon request, may release said record(s) without the need to satisfy the notice requirements above; and (2) the CONTRACTOR expressly waives its right to allege any kind of civil action or claim against the CITY pertaining to the release of said record(s).

32. Duty of Confidentiality

CONTRACTOR acknowledges that unauthorized disclosure of information or documentation concerning the Scope of Work hereunder may cause substantial economic loss or harm to the CITY.

Except for disclosure of information and documents to CONTRACTOR's employees, agents, or subcontractors who have a substantial need to know such information in connection with CONTRACTOR's performance of obligations under this Contract, the CONTRACTOR shall not without prior written authorization by the CITY allow the release, dissemination, distribution, sharing, or other publication or disclosure of information or documentation obtained, discovered, shared or produced pursuant to this Contract.

CONTRACTOR shall inform its employees, agents, and subcontractors of the confidentiality obligations under this Contract and instruct them so as to ensure such obligations are met. If so requested by the CITY, the CONTRACTOR further agrees to require all such individuals and entities performing services pursuant to this Contract to execute a Confidentiality and Non-Disclosure Agreement in a form acceptable to CITY.

This Section shall survive for six (6) years after the termination or expiration of this Contract.

CITY is required to provide notice of the Red Flags Rules published by the Federal Trade Commission in Title 16 Code of Federal Regulations, Part 681 ("Rules") to all entities that receive confidential or otherwise protected personal information of CITY's customers. Terms in quotations in this Section refer to defined terms contained in the "Rules." CONTRACTOR is, as to "Covered Accounts" of CITY for which CONTRACTOR

performs activities under the Contract, a "Service Provider." "Service Provider" will perform in accordance with its reasonable policies and procedures designed to detect, prevent, and mitigate the risk of identity theft and will promptly report to CITY any specific "Red Flag" incidents detected as to "Covered Accounts" of CITY and upon request by CITY will respond to or reasonably assist CITY in responding reported "Red Flags." This Section shall survive for six (6) years after the termination or expiration of this Contract.

33. Approval for Release of Information Related to Contract

If requested by CITY, CONTRACTOR shall not release any information or documentation concerning the work under this Contract or any part thereof for marketing, advertising, or other commercial activities or publication including, but not limited to, news releases or professional articles without CITY's prior written approval. CONTRACTOR may submit at any time for review and approval a generic abstract describing the component parts of the completed Scope of Services ("Project Abstract"). After receiving written approval of the Project Abstract from the CITY, the CONTRACTOR may make minor insignificant changes to the Project Abstract and use all or parts of the Project Abstract in proposals.

This Section shall survive for six (6) years after the termination or expiration of this Contract.

34. Dispute Resolution

In the event of a dispute pertaining to this Contract, the parties agree to attempt to negotiate in good faith an acceptable resolution. If a resolution cannot be negotiated, then the parties agree to submit the dispute to voluntary non-binding mediation before pursuing other remedies. This provision does not limit the CITY'S right to terminate authorized by this Contract.

35. Miscellaneous Provisions

Governing Law and Venue

Washington law shall govern the interpretation of this Contract. Pierce County shall be the venue of any mediation, arbitration, or litigation arising out of this Contract.

Assignment

The CONTRACTOR shall not assign, subcontract, delegate, or transfer any obligation, interest or claim to or under this Contract or for any of the compensation due hereunder without the prior written consent of the CITY.

No Third Party Beneficiaries

This Contract shall be for the sole benefit of the parties hereto, and nothing contained herein shall create a contractual relationship with, or create a cause of action in favor of, a third party against either party hereto.

Waiver

A waiver or failure by either party to enforce any provision of this Contract shall not be construed as a continuing waiver of such provisions, nor shall the same constitute a waiver of any other provision of this Contract.

Severability and Survival

If any term, condition or provision of this Contract is declared void or unenforceable or limited in its application or effect, such event shall not affect any other provisions hereof and all other provisions shall remain fully enforceable. The provisions of this Contract, which by their sense and context are reasonably intended to survive the completion, expiration or cancellation of this Contract, shall survive termination of this Contract.

Entire Agreement

This Contract and the attached Exhibits, as modified herein, contain the entire agreement between the parties as to the services to be rendered hereunder. All previous and contemporaneous agreements, representations or promises and conditions relating to the subject matter of this Contract are superseded hereby. The Parties hereto mutually acknowledge, understand and agree that the terms and conditions set forth herein shall control and prevail over any conflicting terms and conditions stated in any attachments hereto.

Modification

No modification or amendment of this Agreement shall be effective unless set forth in a written and executed Amendment to this Contract.

Direct Solicitation and Negotiation

For service contracts valued $25,000 or less the City signature authorizes waiver of competitive solicitation by “Direct Solicitation and Negotiation” of professional and personal services in accordance with Tacoma Municipal Code 1.06.256 and the Purchasing Policy Manual.

IN WITNESS WHEREOF, the Parties hereto have accepted and executed this Contract, as of the Effective Date stated above, which shall be Effective Date for bonding purposes as applicable. The undersigned Contractor representative, by signature below, represents and warrants they are duly authorized to execute this legally binding Contract for and on behalf of Contractor.

CITY OF TACOMA:	CONTRACTOR:
By:	By:

(City of Tacoma use only - blank lines are intentional)

Director of Finance: _____

City Attorney (approved as to form): _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

CITY OF TACOMA
INSURANCE REQUIREMENTS FOR CONTRACTS

This Insurance Requirements shall serve as an attachment and/or exhibit form to the Contract. The Agency entering a Contract with City of Tacoma, whether designated as a Supplier, Contractor, Vendor, Proposer, Bidder, Respondent, Seller, Merchant, Service Provider, or otherwise referred to as "Contractor".

1. GENERAL REQUIREMENTS

The following General Requirements apply to Contractor and to Subcontractor(s) performing services and/or activities pursuant to the terms of this Contract. Contractor acknowledges and agrees to the following insurance requirements:

1.1. Contractor shall not begin work under the Contract until the required insurance has been obtained and approved by the City of Tacoma.

1.2. Contractor shall keep in force during the entire term of the Contract, at no expense to the City of Tacoma, the insurance coverage and limits of liability listed below and for Thirty (30) calendar days after completion of all work required by the Contract, unless otherwise provided herein.

1.3. Liability insurance policies, except for Professional Liability and Workers' Compensation, shall:

- 1.3.1. Name the City of Tacoma and its officers, elected officials, employees, and agents as **additional insured**
- 1.3.2. Be considered primary and non-contributory for all claims with any insurance or self-insurance or limits of liability maintained by the City of Tacoma
- 1.3.3. Contain a "Waiver of Subrogation" clause in favor of City of Tacoma
- 1.3.4. Include a "Separation of Insureds" clause that applies coverage separately to each insured and additional insured
- 1.3.5. Name the "City of Tacoma" on certificates of insurance and endorsements and not a specific person or department
- 1.3.6. Be for both ongoing and completed operations using Insurance Services Office (ISO) form CG 20 10 04 13 and CG 20 37 04 13 or the equivalent
- 1.3.7. Be satisfied by a single primary limit or by a combination of a primary policy and a separate excess umbrella

1.4. A notation of coverage enhancements on the Certificate of Insurance shall not satisfy these requirements below. Verification of coverage shall include:

- 1.4.1. An ACORD certificate or equivalent
- 1.4.2. Copies of requested endorsements

1.5. Contractor shall provide to City of Tacoma Procurement & Payable Division, prior to the execution of the Contract, Certificate(s) of Insurance and endorsements from the insurer certifying the coverage of all insurance required herein. Contract or Permit number and the City of Tacoma Department must be shown on the Certificate of Insurance.

1.6. A renewal Certificate of Insurance shall be provided electronically prior to coverage

expiration via email sent annually to coi@cityoftacoma.org.

1.7. Contractor shall send a notice of cancellation or non-renewal of this required insurance within Thirty (30) calendar days to coi@cityoftacoma.org.

1.8. "Claims-Made" coverages, except for pollution coverage, shall be maintained for a minimum of three years following the expiration or earlier termination of the Contract. Pollution coverage shall be maintained for six years following the expiration of the Contract. The retroactive date shall be prior to or coincident with the effective date of the Contract.

1.9. Each insurance policy must be written by companies licensed or authorized (or issued as surplus line by Washington surplus line broker) in the State of Washington pursuant to RCW 48 with an (A-) VII or higher in the A.M. Best key rating guide.

1.10. Contractor shall not allow any insurance to be cancelled, voided, suspended, or reduced in coverage/limits, or lapse during any term of this Contract. Otherwise, it shall constitute a material breach of the Contract.

1.11. Contractor shall be responsible for the payment of all premiums, deductibles and self-insured retentions, and shall indemnify and hold the City of Tacoma harmless to the extent such a deductible or self-insured retained limit may apply to the City of Tacoma as an additional insured. Any deductible or self-insured retained limits in excess of Twenty Five Thousand Dollars ($25,000) must be disclosed and approved by City of Tacoma Risk Manager and shown on the Certificate of Insurance.

1.12. City of Tacoma reserves the right to review insurance requirements during any term of the Contract and to require that Contractor make reasonable adjustments when the scope of services changes.

1.13. All costs for insurance are included in the initial Contract and no additional payment will be made by City of Tacoma to Contractor.

1.14. Insurance coverages specified in this Contract are not intended and will not be interpreted to limit the responsibility or liability of Contractor or Subcontractor(s).

1.15. Failure by City of Tacoma to identify a deficiency in the insurance documentation or to verify coverage or compliance by Contractor with these insurance requirements shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

1.16. If Contractor is a government agency or self-insured for any of the above insurance requirements, Contractor shall be liable for any self-insured retention or deductible portion of any claim for which insurance is required. A certification of self-insurance shall be attached and incorporated by reference and shall constitute compliance with this Section.

2. SUBCONTRACTORS

It is Contractor's responsibility to ensure that each subcontractor obtain and maintain adequate liability insurance coverage that applies to the service provided. Contractor shall provide evidence of such insurance upon City of Tacoma's request. Failure of any subcontractor to comply with insurance requirements does not limit Contractor's liability or responsibility.

3. REQUIRED INSURANCE AND LIMITS

The insurance policies shall provide the minimum coverages and limits set forth below. Providing coverage in these stated minimum limits shall not be construed to relieve Contractor from liability in excess of such limits.

3.1 Commercial General Liability Insurance

Contractor shall maintain Commercial General Liability Insurance policy with limits not less than One Million Dollars ($1,000,000) each occurrence and Two Million Dollars ($2,000,000) annual aggregate. This policy shall be written on ISO form CG 00 01 04 13 or its equivalent and shall include product liability especially when a Contract is solely for purchasing supplies. It includes Products and Completed Operations for three years following the completion of work related to performing construction services. It shall be endorsed to include: A per project aggregate policy limit (using ISO form CG 25 03 05 09 or equivalent endorsement)

3.2 Commercial (Business) Automobile Liability Insurance

Contractor shall maintain Commercial Automobile Liability policy with limits not less than One Million Dollars ($1,000,000) each accident for bodily injury and property damage and bodily injury and property damage coverage for owned (if any), non-owned, hired, or leased vehicles. Commercial Automobile Liability Insurance shall be written using ISO form CA 00 01 or equivalent. Contractor must also maintain MCS 90 and CA 99 48 endorsements or equivalent if "Pollutants" are to be transported unless in-transit Pollution coverage is covered under required Contractor's Pollution Liability Insurance.

3.3 Workers' Compensation

Contractor shall comply with Workers' Compensation coverage as required by the Industrial Insurance laws of the State of Washington, as well as any other similar coverage required for this work by applicable federal laws of other states. Contractor must comply with their domicile State Industrial Insurance laws if it is outside the State of Washington.

3.4 Employers' Liability Insurance

Contractor shall maintain Employers' Liability coverage with limits not less than One Million Dollars ($1,000,000) each employee, One Million Dollars ($1,000,000) each accident, and One Million Dollars ($1,000,000) policy limit.

3.5 Professional Liability Insurance or Errors and Omissions

For contracts with professional licensing, design, or engineering services. Contractor and/or its subcontractor shall maintain Professional Liability or Errors and Omissions with limits of One Million Dollars ($1,000,000) per claim and Two Million Dollars ($2,000,000) in the aggregate covering acts, errors and omissions arising out of the professional services under this Contract. Contractor shall maintain this coverage for Two Million Dollars ($2,000,000) if the policy limit includes the payment of claims or defense costs, from the policy limit. If the scope of such design-related professional services includes work related to pollution conditions, the Professional Liability policy shall include Pollution Liability coverage.

3.6 Excess or Umbrella Liability Insurance

Contractor shall provide Excess or Umbrella Liability Insurance with limits not less than Three Million Dollars ($3,000,000) per occurrence and in the aggregate. This coverage shall apply, at a minimum, in excess of primary underlying Commercial General Liability, Employer's Liability, Pollution Liability, Marine General Liability, Protection and Indemnity, and Automobile Liability if required herein.

3.7 Other Insurance

Other insurance may be deemed appropriate to cover risks and exposures related to the scope of work or changes to the scope of work required by City of Tacoma. The costs of such necessary and appropriate Insurance coverage shall be borne by Contractor.