



INVITATION TO BID
CITY OF NAPLES
PURCHASING DIVISION
CITY HALL, 735 8TH STREET SOUTH
NAPLES, FL 34102
PH: 239-213-7100 FX: 239-213-7105

NOTIFICATION DATE: 03/12/15	<small>TITLE</small> RADIATORS FOR WATER PLANT GENERATORS	NUMBER: 15-033	OPENING DATE & TIME: 04/02/15 2:00 PM
PRE-BID DATE, TIME AND LOCATION: Non-mandatory Pre-Bid Meeting held March 19, 2015; 10:00 AM local time; Naples Utilities Department, 380 Riverside Circle, Naples FL, 34102			

LEGAL NAME OF PARTNERSHIP, CORPORATION OR INDIVIDUAL:	
MAILING ADDRESS:	
CITY-STATE-ZIP:	
PH:	EMAIL:
FX:	WEB ADDRESS:

<p>I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a bid for the same materials, supplies, or equipment and is in all respects fair and without collusion or fraud. I agree to abide by all conditions of this bid and certify that I am authorized to sign this bid for the bidder. In submitting a bid to the City of Naples the bidder offers and agrees that if the bid is accepted, the bidder will convey, sell, assign or transfer to the City of Naples all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the Anti-trust laws of the United States and the State of FL for price fixing relating to the particular commodities or services purchased or acquired by the City of Naples. At the City's discretion, such assignment shall be made and become effective at the time the City tenders final payment to the bidder.</p> <p style="text-align: center;">FEI/EIN Number _____</p>		
AUTHORIZED SIGNATURE	DATE	PRINTED NAME/TITLE
<small>Please initial by all that apply</small> <small>I acknowledge receipt / review of the following addendum</small> ____Addendum #1 ____Addendum #2 ____Addendum #3 ____Addendum #4		

PLEASE NOTE THE FOLLOWING:

- > **This page must be completed and returned with your bid.**
- > **Bids must be submitted in a sealed envelope, marked with bid number & closing date.**
- > **Bids received after the above closing date and time will not be accepted.**
- > **If you do not have an email address and you want a copy of the Bid Tab, please enclose a stamped, self-addressed envelope with your bid.**

GENERAL CONDITIONS

TO INSURE ACCEPTANCE OF THE BID, PLEASE FOLLOW THESE INSTRUCTIONS. ANY AND ALL SPECIAL CONDITIONS, ATTACHED HERETO, HAVE PRECEDENCE.

- 1. SEALED BID:** All bids must be submitted in a sealed envelope. The face of the envelope shall contain the bid name and bid number. Bids not submitted on attached bid form shall be rejected. All bids are subject to the conditions specified herein. Those which do not comply with these conditions are subject to rejection.
- 2. EXECUTION OF BID:** Bid must contain a manual signature of authorized representative in the proposal section. Bid must be typed or printed in ink. Use of erasable ink is not permitted. All corrections made by bidder to his bid must be initialed.
- 3. NO BID:** If not submitting a bid, respond by returning the Statement of No Bid and explain the reason in the spaces provided. Failure to respond 3 times in succession without justification shall be cause for removal of the supplier's name from the bid mailing list. NOTE: To qualify as a respondent, bidder must submit a "NO BID," and it must be received no later than the stated bid opening date and hour.
- 4. BID OPENING:** Shall be public, on the date and at the time specified on the bid form. It is the bidder's responsibility to assure that his bid is delivered at the proper time and place of the bid opening. Bids which for any reason are not so delivered will not be considered. Offers by telegram; telephone; or fax are not acceptable. Bid files may be examined during normal working hours.
- 5. WITHDRAWAL OF BIDS:** Withdrawal of a bid within sixty (60) days after the opening of bids is subject to suspension or debarment in accordance with Section 2-668 of the City Code for up to three years.
- 6. PRICES, TERMS and PAYMENT:** Firm Prices include all packing, handling, shipping charges and delivery to the destination shown herein. Bidder is encouraged to offer cash discount for prompt invoice payment. Terms of less than 20 days will not be considered.

 - A. TAXES:** The City of Naples does not pay Federal Excise and Sales taxes on direct purchases of tangible personal property. See exemption number on face of purchase order. This exemption does not apply to purchases of tangible personal property made by contractors who use the tangible personal property in the performance of contracts for the improvement of City-owned real property.
 - B. MISTAKES:** Bidders are expected to examine the specifications, delivery schedule, bid prices, extensions, and all instructions pertaining to supplies and services. Failure to do so will be at bidder's risk. In case of mistake in extension, the unit price will govern.
 - C. CONDITION AND PACKAGING:** It is understood and agreed that any item offered or shipped as a result of this bid shall be a new, current standard production model available at the time of this bid. All containers shall be suitable for storage or shipment, and all prices shall include standard commercial packaging.
 - D. SAFETY STANDARDS:** Unless otherwise stipulated in the bid, all manufactured items and fabricated assemblies shall comply with applicable requirements of Occupational Safety and Health Act and any standards there under.
 - E. UNDERWRITERS' LABORATORIES:** Unless otherwise stipulated in the bid, all manufactured items and fabricated assemblies shall carry U.L. approval and re-examination listing where such has been established.
 - F. PAYMENT:** Payment will be made by the buyer after the items awarded to a vendor have been received, inspected, and found to comply with award specifications, free of damage or defect and properly invoiced. All invoices shall bear the purchase order number. Payment for partial shipments shall not be made unless specified in the bid. Failure to follow these instructions may result in delay in processing invoices for payment. In addition, the purchase order number must appear on bills of lading, packages, cases, delivery lists and correspondence.
- 7. DELIVERY:** Unless actual date of delivery is specified (or if specified delivery cannot be met), show number of days required to make delivery after receipt of purchase order in space provided. Delivery time may become a basis for making an award (see Special Conditions). Delivery shall be within the normal working hours of the user, Monday through Friday, unless otherwise specified.

8. MANUFACTURERS' NAMES AND APPROVED EQUIVALENTS: Any manufacturers' names, trade names, brand names, information and/or catalog numbers listed in a specification are for information and not intended to limit competition. The bidder may offer any brand for which he is an authorized representative, which meets or exceeds the specification for any item(s). If bids are based on equivalent products, indicate on the bid form the manufacturer's name and number. Bidder shall submit with his proposal, cuts, sketches, and descriptive literature, and/or complete specifications. Reference to literature submitted with a previous bid will not satisfy this provision. The bidder shall also explain in detail the reason(s) why the proposed equivalent will meet the specifications and not be considered an exception thereto. Bids which do not comply with these requirements are subject to rejection. Bids lacking any written indication of intent to quote an alternate brand will be received and considered in complete compliance with the specifications as listed on the bid form.

9. INTERPRETATIONS: Any questions concerning conditions and specifications shall be directed in writing to this office for receipt no later than ten (10) days prior to the bid opening. Inquiries must reference the date of bid opening and bid number. Failure to comply with this condition will result in bidder waiving his right to dispute the bid.

10. CONFLICT OF INTEREST: All bid awards are subject to Section 2-973 Conflict of Interest, City of Naples Code of Ordinances, which states: *"No public officer or employee shall have or hold any employment or contractual relationship with any business entity or any agency which is subject to the regulation of or is doing business with the city; nor shall an officer or employee have or hold any employment or contractual relationship that will create a continuing or frequently recurring conflict between his private interests and the performance of his public duties or that would impede the full and faithful discharge of his public duties. Any member of the city council or any city officer or employee who willfully violates this section shall be guilty of malfeasance in office or position and shall forfeit his office or position. Violation of this section with the knowledge, express or implied, of the person or corporation contracting with or making a sale to the city shall render the contract or sale voidable by the city manager or the city council."*

11. AWARDS: As the best interest of the City may require, the right is reserved to make award(s) by individual item, group of items, all or none, or a combination thereof; to reject any and all bids or waive any minor irregularity or technicality in bids received.

12. ADDITIONAL QUANTITIES: For a period not exceeding ninety (90) days from the date of acceptance of this offer by the buyer, the right is reserved to acquire additional quantities up to but not exceeding those shown on bid at the prices bid in this invitation. If additional quantities are not acceptable, the bid sheets must be noted "BID IS FOR SPECIFIED QUANTITY ONLY." (THIS PARAGRAPH DOES NOT APPLY FOR A TERM CONTRACT.)

13. SERVICE AND WARRANTY: Unless otherwise specified, the bidder shall define any warranty service and replacements that will be provided during and subsequent to this contract. Bidders must explain on an attached sheet to what extent warranty and service facilities are provided.

14. SAMPLES: Samples of items, when called for, must be furnished free of expense, on or before bid opening time and date, and if not destroyed may, upon request, be returned at the bidder's expense. Each individual sample must be labeled with bidder's name, manufacturer's brand name and number, bid number and item reference. Request for return of samples shall be accompanied by instructions which include shipping authorization and name of carrier and must be received with your bid. If instructions are not received within this time, the commodities shall be disposed of by the City of Naples.

15. BID PROTEST: The city has formal bid protest procedures that are available on request.

16. INSPECTION, ACCEPTANCE AND TITLE: Inspection and acceptance will be at destination unless otherwise provided. Title and risk of loss or damage to all items shall be the responsibility of the contract supplier until accepted by the ordering agency, unless loss or damage results from negligence by the ordering

17. DISPUTES: In case of any doubt or difference of opinion as to the items to be furnished hereunder, the decision of the buyer shall be final and binding on both parties.

18. GOVERNMENTAL RESTRICTIONS: In the event any governmental restrictions may be imposed which would necessitate alteration of the material, quality, workmanship or performance of the items offered on this proposal prior to their delivery, it shall be the responsibility of the successful bidder to notify the buyer at once, indicating in his letter the specific regulation which required an alteration. The City reserves the right to accept any such alteration, including any price adjustments occasioned thereby, or to cancel the contract at no expense to the City.

19. LEGAL REQUIREMENTS: Applicable provision of all Federal, State, county and local laws, and of all ordinances, rules, and regulations shall govern development submittal and evaluation of all bids received in response hereto and shall govern any and all claims and disputes which may arise between person(s) submitting a bid response hereto and the City of Naples by and through its officers, employees and authorized representatives, or any other person, natural or otherwise; and lack of knowledge by any bidder shall not constitute a cognizable defense against the legal effect thereof.

20. PATENTS AND ROYALTIES: The bidder, without exception, shall indemnify and save harmless the City of Naples and its employees from liability of any nature or kind, including cost and expenses for or on account of any copyrighted, patented, or unpatented invention, process, or article manufactured or used in the performance of the contract, including its use by the City of Naples. If the bidder uses any design, device, or materials covered by letters, patent or copyright, it is mutually agreed and understood without exception that the bid prices shall include all royalties or cost arising from the use of such design, device, or materials in any way involved in the work.

21. ADVERTISING: In submitting a bid, bidder agrees not to use the results there from as a part of any commercial advertising.

22. ASSIGNMENT: Any Purchase Order issued pursuant to this bid invitation and the monies which may become due hereunder are not assignable except with the prior written approval of the buyer.

23. LIABILITY: The supplier shall hold and save the City of Naples, its officers, agents, and employees harmless from liability of any kind in the performance of this contract.

24. PUBLIC ENTITY CRIMES: A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.

25. DISCRIMINATION: An entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid on a contract to provide goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not award or perform work as a contractor, supplier, subcontractor, or consultant under contract with any public entity, and may not transact business with any public entity.

26. COUNTY TAXES: No proposal shall be accepted from and no contract will be awarded to any person, firm or corporation that is in arrears to the government of Collier County, Florida.

27. OFFER EXTENDED TO OTHER GOVERNMENTAL ENTITIES: The City of Naples encourages and agrees to the successful bidder/proposer extending the pricing, terms and conditions of this solicitation or resultant contract to other governmental entities at the discretion of the successful bidder/proposer.

IF THIS BID IS FOR A TERM CONTRACT, THE FOLLOWING CONDITIONS SHALL ALSO APPLY

28. ELIGIBLE USERS: All departments of the City of Naples are eligible to use this term contract. Such purchases shall be exempt from the competitive bid requirements otherwise applying to their purchases.

29. PRICE ADJUSTMENTS: Any price decrease effectuated during the contract period by reason of market change shall be passed on to City of Naples. Price increases are not acceptable.

30. CANCELLATION: All contract obligations shall prevail for at least one hundred eighty (180) days after effective date of contract. After that period, for the protection of both parties, this contract may be cancelled in whole or in part by either party by giving thirty (30) days prior written notice to the other party.

31. RENEWAL: The City of Naples reserves the option to renew the period of this contract, or any portion thereof for up to two (2) additional periods. Renewal of the contract period shall be by mutual agreement in writing.

32. ABNORMAL QUANTITIES: While it is not anticipated, should any unusual or abnormal requirements arise, the City reserves the right to solicit separate bids thereon.

33. FISCAL NON-FUNDING CLAUSE: In the event sufficient funds are not budgeted for a new fiscal period, the City shall notify the contractor of such occurrence and the contract shall terminate on the last day of the current fiscal year without penalty or expense to the City.

IF THIS BID IS FOR PERFORMING A SERVICE, THE FOLLOWING CONDITIONS SHALL ALSO APPLY

34. ALTERNATIVE BIDS: Bidders offering service delivery methods other than those permitted by the scope of work may submit a separate envelope clearly marked "ALTERNATIVE BID". Alternative bids will be deemed non-responsive and will not be considered for award. All such responses will, however, be examined prior to award. Such examination may result in cancellation of all bids received to permit rewriting the scope of work to include the alternative method, or the alternative method may be considered for future requirements of the City of Naples.

35. ANTITRUST: By entering into a contract, the contractor conveys, sells, assigns and transfers to the City of Naples all rights, titles and interest it may now have or hereafter acquire under the antitrust laws of the United States and the State of Florida that relate to the particular goods or services purchased or acquired by the City of Naples under said contract.

36. BIDDER INVESTIGATIONS: Before submitting a bid, each bidder shall make all investigations and examinations necessary to ascertain all site conditions and requirements affecting the full performance of the contract and to verify any representations made by the City of Naples upon which the bidder will rely. If the bidder receives an award as a result of its bid submission, failure to have made such investigations and examinations will in no way relieve the bidder from its obligation to comply in every detail with all provisions and requirements of the contract documents, nor will a plea of ignorance of such conditions and requirements be accepted as a basis for any claim whatsoever by the contractor for additional compensation.

37. CERTIFICATES AND LICENSES: The Contractor, at time of proposal, shall possess the correct occupational licenses, all professional licenses or other authorizations necessary to carry out and perform the work required by the City of Naples and Collier County for this project pursuant to all applicable Federal, State and Local Laws, Statutes, Ordinances, and rules and regulations of any kind.

38. CHANGE IN SCOPE OF WORK: The City of Naples may order changes in the work consisting of additions, deletions or other revisions within the general scope of the contract. No claims may be made by the contractor that the scope of the project or of the contractor's services has been changed, requiring changes to the amount of compensation to the contractor or other adjustments to the contract unless such changes or adjustments have been made by written amendment to the contract signed by the City of Naples and the contractor. If the contractor believes that any particular work is not within the scope of the project, is a material change, or will otherwise require more compensation to the contractor, the contractor must immediately notify the City in writing of this belief. If the City believes that the particular work is within the scope of the contract as written, the contractor will be ordered to and shall continue with the work as changed and at the cost stated for the work within the scope.

39. CONTRACTOR PERSONNEL: The City of Naples shall, throughout the life of the contract, have the right of reasonable rejection and approval of staff or subcontractors assigned to the work by the contractor. If the City

reasonably rejects staff or subcontractors, the contractor must provide replacement staff or subcontractors satisfactory to the City in a timely manner and at no additional cost to the City. The day-to-day supervision and control of the contractor's employees and sub-contractors is the responsibility solely of the contractor.

40. COST REIMBURSEMENT: The contractor agrees that all incidental costs, including allowances for profit and tools of the trade, must be included in the bid proposal rates. If an arrangement is made between the contractor and the City to reimburse the contractor for the cost of materials provided in the performance of the work, the contractor shall be reimbursed in the following manner: The City shall reimburse the contractor on completion and acceptance of each assigned job, only for those materials actually used in the performance of the work that is supported by invoices issued by the suppliers of the contractor describing the quantity and cost of the materials purchased. No surcharge shall be added to the supplier's invoices or included in the contractor's invoice submitted to the City that would increase the dollar amount indicated on the supplier's invoice for the materials purchased for the assigned job.

41. EXCEPTIONS: Bidders taking exception to any part or section of the solicitation shall indicate such exceptions on the bid form. Failure to indicate any exception will be interpreted as the bidder's intent to comply fully with the requirements as written. Conditional or qualified bids, unless specifically allowed, shall be subject to rejection in whole or in part.

42. FAILURE TO DELIVER: In the event of the contractor to fail to deliver services in accordance with the contract terms and conditions, the City, after due oral or written notice, may procure the services from other sources and hold the contractor responsible for any resulting purchase and administrative costs. This remedy shall be in addition to any other remedies that the City may have.

43. FAILURE TO ENFORCE: Failure by the City at any time to enforce the provisions of the contract shall not be construed as a waiver of any such provisions. Such failure to enforce shall not affect the validity of the contract or any part thereof or the right of the City to enforce any provision at any time in accordance with its terms.

44. FORCE MAJEURE: The contractor shall not be held responsible for failure to perform the duties and responsibilities imposed by the contract due to legal strikes, fires, riots, rebellions and acts of God beyond the control of the contractor, unless otherwise specified in the contract.

45. INDEPENDENT CONTRACTOR: The contractor shall be legally considered an independent contractor and neither the contractor nor its employees shall, under any circumstances, be considered servants or agents of the City of Naples and the City of Naples shall be at no time legally responsible for any negligence or any wrongdoing by the contractor, its servants or agents. The City of Naples shall not withhold from the contract payments to the contractor any federal income taxes, Social Security tax, or any other amounts for benefits to the contractor. Further, the City shall not provide to the contractor any insurance coverage or other benefits, including Workers' Compensation normally provided by the City for its employees.

46. ORAL STATEMENTS: No oral statement of any person shall modify or otherwise affect the terms, conditions or specifications stated in this contract. All modifications to the contract must be made in writing by the City of Naples.

47. QUALIFICATIONS OF BIDDERS: The bidder may be required, before the award of any contract, to show to the complete satisfaction of the City of Naples that it has the necessary facilities, ability, and financial resources to provide the service specified therein in a satisfactory manner. The bidder may also be required to give a past history and references in order to satisfy the City in regard to the bidder's qualifications. The City may make reasonable investigations deemed necessary and proper to determine the ability of the bidder to perform the work, and the bidder shall furnish to the City all information for this purpose that may be requested. The City reserves the right to reject any bid if the evidence submitted by, or investigation of, the bidder fails to satisfy the City that the bidder is properly qualified to carry out the obligations of the contract and to complete the work described therein. Evaluation of the bidder's qualifications shall include:

- > The ability, capacity, skill and financial resources to perform the work or service.
- > The ability to perform the work service promptly or within the time specified, without delay.
- > The character, integrity, reputation, judgment, experience, and efficiency of the bidder.

> The quality of performance of previous contracts or services.

48. QUALITY CONTROL: The contractor shall institute and maintain throughout the contract period a properly documented quality control program designed to ensure that the services are provided at all times and in all respects in accordance with the contract. The program shall include providing daily supervision and conducting frequent inspections of the contractor's staff and ensuring that accurate records are maintained describing the disposition of all complaints. The records so created shall be open to inspection by the City.

49. RECOVERY OF MONEY: Whenever, under the contract, any sum of money shall be recoverable from or payable by the contractor to the City, the same amount may be deducted from any sum due to the contractor under the contract or under any other contract between the contractor and the City. The rights of the City are in addition and without prejudice to any other right the City may have to claim the amount of any loss or damage suffered by the City on account of the acts or omissions of the contractor.

50. REQUIREMENTS CONTRACT: During the period of the contract, the contractor shall provide all the services described in the contract. The contractor understands and agrees that this is a requirements contract and that the City shall have no obligation to the contractor if no services are required. Any quantities that are included in the scope of work reflect the current expectations of the City for the period of the contract. The amount is only an estimate and the contractor understands and agrees that the City is under no obligation to the contractor to buy any amount of services as a result of having provided this estimate or of having any typical or measurable requirement in the past. The contractor further understands and agrees that the City may require services in excess of the estimated annual contract amount and that the quantity actually used whether in excess of, or less than, the estimated annual contract amount and that the quantity actually used shall not give rise to any claim for compensation other than the total of the unit prices in the contract for the quantity actually used.

51. TERMINATION FOR CONVENIENCE: The performance of work under the contract may be terminated by the City in whole or in part whenever the City determines that termination is in the City's best interest. Any such termination shall be effected by the delivery to the contractor of a written notice of termination of at least seven (7) days before the date of termination, specifying the extent to which performance of the work under the contract is terminated and the date upon which such termination becomes effective. After receipt of a notice of termination, except as otherwise directed, the contractor shall stop work on the date of the receipt of the notice or other date specified in the notice; place no further orders or subcontracts for materials, services or facilities except as necessary for completion of such portion of the work not terminated; terminate all vendors and subcontracts; and settle all outstanding liabilities and claims.

52. TERMINATION FOR DEFAULT: The City of Naples reserves the right to terminate the contract if the City determines that the contractor has failed to perform satisfactorily the work required, as determined by the City. In the event the City decides to terminate the contract for failure to perform satisfactorily, the City shall give to the contractor at least seven (7) days written notice before the termination takes effect. The seven-day period will begin upon the mailing of notice by the City. If the contractor fails to cure the default within the seven (7) days specified in the notice and the contract is terminated for failure to perform satisfactorily, the contractor shall be entitled to receive compensation for all reasonable, allocable and allowable contract services satisfactorily performed by the contractor up to the date of termination that were accepted by the City prior to the termination. In the event the City terminates the contract because of the default of the contractor, the contractor shall be liable for all excess costs that the City is required to expend to complete the work under contract.

53. STATE AND FEDERAL EMPLOYMENT LAWS: Contractors providing service to the City are required to comply with all state and federal employment laws. This includes, but is not limited to, laws resulting from the Immigration and Reform and Control Act of 1986, wherein all employers are required to verify the identity and employment eligibility of all employees. The Department of Homeland Security, U.S. Citizenship and Immigration Services require employees and employers to complete Form I-9 and the employer must examine evidence of identity and employment eligibility within three business days of the date employment begins. Non compliant contractors will be subject to contract sanctions, up to and including contract termination.

54. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY, AND VOLUNTARY EXCLUSION: The contractor agrees to comply with Executive Order 12549 "Debarment and

Suspension” and 2 CFR 180 “OMB Guidelines to Agencies on Government wide Debarment and Suspension.” These rules require all contractors using federal funds not be debarred or suspended from doing business with the Federal Government. This includes sub-recipients and lower tier participant for covered transactions. Signing and submitting this document certified the organization and its principals are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency, and further have not within the preceding three-year period been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction .

THE CITY OF NAPLES IS AN EQUAL OPPORTUNITY EMPLOYER

GENERAL INSURANCE REQUIREMENTS

The Contractor shall not commence work until he has obtained all the insurance required under this heading, and until such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work until all similar insurance required of the subcontractor has also been obtained and approved by the Owner.

Certificates of insurance must be issued by an authorized representative of the insurance company at the request and direction of the policyholder and must include sufficient information so as to identify the coverage and the contract for Owner's improvements for which they are issued. Certificates of insurance must be issued by a nationally recognized insurance company with a Best's Rating of no less than B+VII, satisfactory to the Owner, and duly licensed to do business in the state of said Contract.

The Contractor shall procure and maintain, during the life of this Contract, Worker's Compensation Insurance for all of his employees to be engaged in work under this Contract, and he shall require any subcontractor similarly to provide Worker's Compensation Insurance for all of the latter's employees to be engaged in such work, unless such employees are covered by the protection afforded by the Contractor's insurance. In case any employees are to be engaged in hazardous work under this Contract, and are not protected under this Worker's Compensation statute, the Contractor shall provide, and shall cause each subcontractor to provide, adequate coverage for the protection of such employees. It is acceptable to use a State-approved Worker's Compensation Self-Insurance fund.

The Contractor shall take out and maintain during the life of this Contract, Public Liability and Property Damage and shall include Contractual Liability, Personal Injury, Libel, Slander, False Arrest, Malicious Prosecution, Wrongful Entry or Eviction, Broad Form Property Damage, Products, Completed Operations and XCU Coverage to be included on an occurrence basis, and to the full extent of the Contract to protect him, the Owner, and any subcontractor performing work covered by this Contract from damages for personal injury, including accidental death, as well as from claims for property damage, which may arise from operations under this contract, whether such operations be by himself or by a subcontractor, or by anyone directly or indirectly employed by either of them. The Contractor shall also maintain automobile liability insurance including "non-owned and hired" coverage. The entire cost of this insurance shall be borne by the Contractor.

The amount of such insurance shall be no less than \$1,000,000 annual aggregate for bodily injury and property damage combined per occurrence.

The City of Naples must be named as Additional Insured on the insurance certificate and the following must also be stated on the certificate. "This coverage is primary to all other coverage the City possesses for this contract only." The City of Naples shall be named as the Certificate Holder. The Certificate Holder shall read as follows:

The City of Naples
735 Eighth Street South
Naples, Florida 34102

No City Division, Department, or individual name should appear on the Certificate.

No other format will be acceptable.

The Certificate must state the proposal number and title.

When using the "Accord"- 25 Certificate of Insurance only the most current version will be accepted.

The City of Naples requires a copy of a cancellation notice in the event the policy is cancelled. The City of Naples shall be expressly endorsed onto the policy as a cancellation notice recipient.

STATEMENT OF NO BID

If you will not be bidding on this product/service, please help us by completing and returning only this page to:

City of Naples, Purchasing Division
City Hall, 735 8th Street South
Naples, FL 34102
Fax 239-213-7105

Bid # _____ and Description: _____

We, the undersigned, decline to proposal on the above project for the following reason(s):

- ___ We are not able to respond to the Invitation to Bid by the specified deadline.
- ___ Our Company does not offer this product or service.
- ___ Our current work schedule will not permit us to perform the required services.
- ___ Specifications are incomplete or information is unclear
(Please explain below).

___ Other (Please specify below)

Company Name _____ PH _____

Name and Title of individual completing this form:

(Printed Name) (Title)

(Signature) (Date)

REFERENCES

THIS SHEET MUST BE COMPLETED AND RETURNED WITH BID

PROVIDE AT LEAST THREE REFERENCES FOR WHOM YOUR COMPANY HAS PROVIDED SAME OR SIMILAR SERVICES WITHIN THE LAST 2 YEARS.

COMPANY NAME: _____

ADDRESS: _____

TELEPHONE: _____

CONTACT PERSON: _____

CONTACT E-MAIL ADDRESS: _____

COMPANY NAME: _____

ADDRESS: _____

TELEPHONE: _____

CONTACT PERSON: _____

CONTACT E-MAIL ADDRESS: _____

COMPANY NAME: _____

ADDRESS: _____

TELEPHONE: _____

CONTACT PERSON: _____

CONTACT E-MAIL ADDRESS: _____

Submitting Vendor Name: _____

CONSTRUCTION
SPECIAL CONDITIONS

A. TERMS OF CONTRACT

The resulting contract will commence on award and be in effect until completion of the project. Substantial Completion – 120 calendar days (radiator delivery time estimated at 60 days after approved submittal). Final Completion – 150 calendar days. Services to be rendered by the CONTRACTOR shall be commenced subsequent to the execution of this Agreement upon written Notice to Proceed from the CITY for all or any designated portion of the Project must be completed by the contract dates specified within the Notice of Proceed. Should CONTRACTOR fail to complete the project within this timeframe, daily liquidated damages in an amount consistent with the current Sec. 8-10.2 Florida Department of Transportation Standard Specifications will be assessed.

B. PROHIBITION OF CONTACT

Under no circumstances should any prospective organization or individual, or anyone acting for or on behalf of a prospective organization or individual, seek to influence or gain the support of any member of the City Council, public official or City staff favorable to the interest of any prospective organization or individual. Likewise, contact with City Council, any public official or city staff against the interests of other prospective organization (s) and or individual(s) is prohibited. Any such activities will result in the exclusion of the prospective organization or individual from consideration by the City.

C. REFERENCES

Bidder must submit a minimum of three references on the form provided. Additionally, a signed and dated IRS W-9 form with EIN is required from all vendors.

D. STATEMENT OF NO BID

If you will not be bidding on this producer/service, please help us by completing and returning the Statement of No Bid.

E. BID FORMAT

The Contract, if awarded, will be awarded on the basis of material and equipment illustrated and described on the Drawings or specified in the Specification. If a substitution or an “or equal” item is proposed, Proposer must submit this information to the City of Naples Purchasing Department ten (10) days prior to the Proposal Date for evaluation as an acceptable substitution or an “or equal” item. If the substitution or the “or equal” item is accepted, the City of Naples will issue an Addendum to all Proposers listing the allowable substitution or the “or equal” item. The cost of changes in related work, additional drawings which may be required to illustrate or define the substitute or “or equal” equipment and its relationship to the other parts or portions of the Work shall be paid by the Contractor. No change will be made in the amount of time in which to complete the Work or in the liquidated damages.

F. BID SECURITY / BID BOND

It is the policy of the City of Naples to require a Bid Bond for all construction-related sealed bids estimated to be in excess of \$100,000. A bid bond or equivalent financial security in the amount of five (5) percent of the bid price shall be required and must accompany all bids. The Bid Bond is to be provided by a surety company authorized to do business in the State of Florida or otherwise supplied in a form satisfactory to the City. The bid bond must be submitted with the bid. When the invitation for bids requires a bid bond, noncompliance will result in rejection of the bid.

Note that failure or refusal of the awarded bidder to enter into a contract within twenty (20) calendar days after receipt of said contract will result in damages to the City and bid bond will be forfeited to the City as liquidated damages.

G. PROPOSAL CONSTRUCTION PERFORMANCE & PAYMENT BONDS

A Performance and Payment Bond will be required of the Awarded Proposer for any contract that is in excess of \$100,000.00 dollars and will be in an amount equal to 100 (%) percent of the price specified in the Contract.

The bond(s) shall be executed by a surety company authorized to do business in the State of Florida, or otherwise secured in a manner satisfactory to the City for the protection of all persons supplying labor and material to the contractor or its subcontractors for the performance of the work provided for in the contract.

Proof of insurance from the successful proposer is required at the time of issuance and award of a contract.

H. QUESTIONS

Questions regarding this proposer packet must be received in writing in the Purchasing Division NO LATER THAN TEN CALENDAR DAYS PRIOR TO THE PROPOSAL CLOSING DATE TO ENSURE AN ANSWER IS PROVIDED PRIOR TO CLOSING.

Direct all questions to:
Gerald "Jed" Secory, MBA / CPPO / CPM
Purchasing Manager
City of Naples, Purchasing Division
735 8th Street South
Naples, Florida 34102
PH: (239) 213-7102 FX: (239) 213-7105
jsecory@naplesgov.com

SUBMISSION CHECKLIST

Bidder should check off each of the following items as completed and submit with bid response:

CHECKLIST ELEMENTS	INCLUDED
<ul style="list-style-type: none"> • Submit one (1) original signature and one (1) copies of your original bid proposal / document AND a Windows© compatible PDF of the original document on a CD or Flash / Thumb Drive that is clearly labeled. 	<input type="checkbox"/>
<ul style="list-style-type: none"> • Include any required drawings; descriptive literature; qualifications; schedules; product compliance / exceptions; alternatives; questionnaire; references, forms, tabs, pricing/cost; and any information required of the proposer identified in the text of the bid including information for bid evaluation. 	<input type="checkbox"/>
<ul style="list-style-type: none"> • Include any delivery information. 	<input type="checkbox"/>
<ul style="list-style-type: none"> • Mandatory FORMS from this document to be included are: <u>Cover Sheet</u>, <u>References Sheet</u>, <u>Submission Checklist Sheet</u>, and <u>Bid Schedule</u>. Also included firm's currently IRS W-9 Form. 	<input type="checkbox"/>
<ul style="list-style-type: none"> • Have an authorized individual sign the appropriate pages including the <u>Cover Sheet</u> with any bid addendums initialed. Also, examples of vendor contracts used by the City can be found on the Naples Purchasing web site and should be reviewed by the vendor. 	<input type="checkbox"/>
<ul style="list-style-type: none"> • Bid proposal / document needs to be received by the OPENING DATE & TIME indicated on the Cover Sheet. The mailing envelope must be addressed to: <div style="text-align: center;"> City of Naples Purchasing Division 735 8th Street South Naples, Florida 34102 </div> 	<input type="checkbox"/>
<p style="text-align: center;">The mailing envelope should be sealed and marked with:</p> BID Number: 15-033 BID Title: RADIATORS FOR WATER PLANT GENERATORS BID Opening Date: 04/02/15	<input type="checkbox"/>

ALL COURIER DELIVERED PROPOSALS MUST HAVE THE BID NUMBER AND TITLE ON THE OUTSIDE OF THE COURIER PACKET.

Submitting Vendor Name: _____

At the discretion of the Purchasing Manager, bids or proposals with minor irregularities may be accepted and allowed to be corrected when in the best interest of the City.

City of Naples FL
Invitation to Bid
15-033 RADIATORS FOR WATER PLANT GENERATORS

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END OF SECTION

CITY OF NAPLES WATER TREATMENT PLANT
 GENERATOR RADIATOR ADDITION
 BID SCHEDULE

No.	Description	Unit	Quantity	Unit Price	Total
	BASEBID				
1	Mobilization/Demobilization	LS	1		
2	Generator Radiator Improvements	LS	1		
3	Louver Replacements	LS	1		
	BASE BID TOTAL				

Company Name _____ PH _____

Email _____

Name and Title of individual completing this schedule:

 (Printed Name)

 (Title)

WORK SUMMARY

The Project proposes improvements to the City of Naples' emergency generators at the Water Treatment Plant. This Project includes the replacement of two 8-foot by 10-foot louver and one 2-foot by 10-foot louver with hurricane rated louvers, installation of two auxiliary engine generators radiators with approximated 100 lineal feet of 4-inch stainless steel – insulated - aluminum jacketed piping, piping supports, concrete equipment pads, electrical and appurtenances.

SECTION 08 90 00
LOUVERS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. Air Movement and Control Association (AMCA): 500-L, Laboratory Methods of Testing Louvers for Rating.
 2. The Aluminum Association, Incorporated (AA): Designation System for Aluminum Finishes.
 3. ASTM International (ASTM):
 - a. A480/A480M, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
 - b. D1187, Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
 - c. E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
 4. Underwriters Laboratories, Inc. (UL): Building Materials Directory.

1.02 DESIGN REQUIREMENTS

- A. Applicable Building Code: Meet the requirements of the Florida Building Code (FBC), 2010 Edition.
- B. Structural Performance: The aluminum louver assemblies shall be designed to safely resist the positive and negative loads as required for the location and type of project designed according to the Florida Building Code.

1.03 SUBMITTALS

- A. Action Submittals:
1. Shop Drawings: Large scale details of louvers, anchorage, and relationship to adjoining construction.
 - a. Manufacturer's Literature:
 - 1) Descriptive and performance data of louvers, including standard drawings and louver-free area.

2. Product/Code Certification: Provide written verification that submitted louver assembly and installation method meet or exceed Project Design Requirements, in this section, by one, or more, of the following methods as allowed for by FBC:
 - a. Dade County Building Code Compliance Office (DCBCCO) Notice of Acceptance (NOA) or Florida Product Approval for complete louver assembly.
 - b. Rational Comparative Analysis: Testing data, calculations, and verification documents signed and sealed by a professional engineer registered in the State of Florida.
 - c. Local product approval by Authority Having Jurisdiction (AHJ).

B. Informational Submittals:

1. Factory test data.
2. Certificates of AMCA ratings.
3. Installation instructions.
4. Parts list, if applicable.
5. Maintenance procedures.

PART 2 PRODUCTS

2.01 GENERAL

- A. Water Penetration Rate: No greater than 0.02 ounce per square foot.
- B. Louvers: Rated and tested in accordance with AMCA 500-L.

2.02 FIXED STORMPROOF LOUVER (TYPE SP)

- A. Frame: Extruded aluminum channel, 0.081-inch thick, 6 inches deep, with concealed mullions.
- B. Blades: Extruded aluminum, 0.081-inch thick, 35-degree to 45-degree pitch angle.
- C. Beginning Point of Water Penetration: 1,023 fpm.
- D. Sizes:
 1. Louvers shall be sized to fit within existing concrete masonry wall openings of the following:
 - a. Two at 8 feet wide by 10 feet high.
 - b. One at 2 feet wide by 10 feet high.
 2. Field verify existing concrete masonry wall openings for correct size of louvers.

- E. Screen: Inside mounted, painted aluminum, insect mesh.
- F. Finish: AA-M1022A41, clear anodized.
- G. Manufacturers and Products:
 - I. Ruskin; Model ELF6375DXD.

2.03 ACCESSORIES

- A. Anchors and Fasteners: Stainless steel.
- B. Flashings: Match louver frame.
- C. Isolation Tape: Tremco 440, 3M EC1202, or Presstite 579.6.
- D. Isolation Paint: ASTM D1187, bituminous coating.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Check openings to ensure dimensions conform to existing wall opening.
- B. Ensure openings are free of irregularities that would interfere with installation.
- C. Do not install louvers until irregularities have been corrected.

3.02 INSTALLATION

- A. Install louvers as shown on reviewed Shop Drawings.
- B. Follow procedures in manufacturer's recommended installation instructions.
- C. Separate aluminum from other metals with isolation tape or paint.

3.03 CLEANING

- A. After erection, protect exposed portions from damage by machines, paint, lime, acid, cement, or other harmful compounds.
- B. Remove protective materials and clean with plain water, water with soap, or household detergents.

END OF SECTION

SECTION 40 05 15
PIPING SUPPORT SYSTEMS

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. ASTM International (ASTM): A525, Standard Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
2. Building Officials and Code Administrators (BOCA): Basic Building Code.
3. International Conference of Building Officials (ICBO): Uniform Building Code.
4. Manufacturers' Standardization Society (MSS):
 - a. SP 58, Pipe Hangers and Supports—Materials, Design and Manufacture.
 - b. SP 69, Pipe Hangers and Supports—Selection and Application.
 - c. SP 89, Pipe Hangers and Supports—Fabrication and Installation.
5. FBC, Florida Building Code.

1.02 DEFINITIONS

- A. Ferrous Metal: Iron, steel, stainless steel, and alloys with iron as principal component.
- B. Wetted or Submerged: Submerged, less than 1 foot above liquid surface, below top of channel wall, under cover or slab of channel or tank, or in other humid or damp locations.

1.03 SUBMITTALS

- A. Action Submittals: Shop Drawings:
1. Drawings of each piping support system to scale shown, locating each support, brace, hanger, guide, component and anchor. Identify support, hanger, guide, and anchor type by catalog number and shop drawing detail number.
 2. Revisions to support systems resulting from changes in related piping system layout or addition of flexible joints.
- B. Informational Submittals: Maintenance information on piping support system.

1.04 DESIGN REQUIREMENTS

A. General:

1. Provide piping support systems throughout facility, whether shown or not.
2. Meet requirements of MSS SP 58, MSS SP 69, and MSS SP 89.
3. Criteria for Structural Design and Selection of Pipe Support System Components.
 - a. Dead loads imposed by the weight of the pipes filled with water, within specified spans and component requirements plus any insulation.
 - b. Safety Factor: Minimum of 5 using ultimate strength of material.
 - c. Wind Pressure: In accordance with Florida Building Code or local County Code whichever is more stringent.
4. Design, size, and space support anchoring devices, including anchor bolts, inserts, and other devices used to anchor the support, to withstand the shear and pullout loads imposed by loading and spacing on each particular support.
5. No attempt has been made to show all required pipe supports in all locations, either on the Drawings or in the details. The absence of pipe supports and details on any Drawings shall not relieve the Contractor of the responsibility for designing and providing them throughout the Project at no increase in Contract cost.
6. Where piping connects to equipment it shall be supported by a pipe support and not by the equipment.
7. A pipe support or hanger shall be installed within 3 diameter lengths up through 12-inch pipe, 2 diameter lengths for 12- to 36-inch pipe, and 1 diameter length for 36-inch pipe and greater adjacent to each pipe fitting, flexible connection, flange coupling adapter, in-line device such as a valve or meter for all piping larger than 4 inch, or removable spool pieces.

B. Pipe Support Spacing:

1. As tabulated, unless indicated otherwise on the Drawings.
2. Single Rod Hanger Supported Pipe Span:

Nominal Pipe or Tubing Size	Maximum Support Spacing (ft)
	Stainless Steel Pipe
	Water Service
1/2" and smaller	6
3/4" through 1-1/4"	6
1-1/2" and 2"	6
2-1/2" and 3"	8
4"	8

3. Stanchion Pipe Support Spacing:

Nominal Pipe or Tubing Size	Maximum Support Spacing (ft)
	Stainless Steel Pipe
	Water Service
1/2" and smaller	6
3/4" through 1-1/2"	6
2" and 2-1/2"	7
3"	
4"	10

4. Hanger Rod Size:

Nominal Pipe or Tubing Size	Minimum Hanger Rod Size (in)
	Carbon Steel, Stainless Steel and Ductile Iron Pipe
	Single Rod
2" and smaller	3/8
2-1/2" through 3"	1/2
4"	5/8

C. Bracing: Provide vertical sway bracing on 10-foot (maximum) vertical centers.

D. Pipe Anchors:

1. Provide on straight runs without provisions for piping expansion.
2. Maximum Spacing: The maximum straight run of piping smaller than 4 inches not bound by anchors shall be as follows:

Pipe Type (Service Temperature)	Anchor Spacing (ft)
Stainless steel (81 - 212 degrees F)	80

3. Direction of design load shall be either perpendicular or parallel to support, or parallel to pipe, whichever produces greatest stress in anchor.

E. Metal Framing Support Systems:

1. Beams: Size such that beam stress does not exceed 25,000 psi and maximum deflection does not exceed 1/240 of span.
2. Column Members: Size in accordance with manufacturer's recommended method.

- 3. Support Loads: Include total weight of supported piping full of water, flanges, fittings, valves, and insulation, electrical conduit, as well as weight of support assembly.
- 4. Maximum Spans:
 - a. Steel and Ductile Iron Pipe, 3-Inch Diameter and Larger: 10-foot centers, unless otherwise shown.
 - b. Other Pipelines and Special Situations: May require supplementary hangers and supports.

F. Building Structural Attachments:

- a. Minimum design load for attachments shall be the following:

Pipe Size	Load (lbs)
1-1/4" and smaller	150
1-1/2" and 2"	150
2-1/2"	170
3"	210
4"	260

- b. Rating shall be based on an allowable stress of 1/5 of the minimum tensile strength of the material at service temperature. Castings shall include a casting quality factor of 0.80 of the allowable stress specified.
- c. Verify that the concrete used is of sufficient strength to hold concrete inserts at the design load rating specified.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Standard Support Components:

- 1. Anvil.
- 2. B-Line.

B. Channel Type Support and Framing Systems:

- 1. Unistrut.
- 2. Kin-Line.
- 3. Power Strut.

2.02 MATERIALS

A. Standard Pipe Support and Channel Support/Framing Systems:

1. Exposed: Factory or manufacturer hot-dip galvanized coating system.
2. Submerged Installations (Including Vaults and Pipe Trenches):
Type 304 stainless steel.

2.03 COMPONENTS

A. Standard Component Types:

1. Type Definition: Per MSS SP 58.
2. General Service (33 degrees F to 119 degrees F) and Hot Service (120 degrees F to 450 degrees F):

Item	Type (MSS SP 58)	Notes
Horizontal Pipe Attachments (Insulated)-General Service		
Clips	26	
Bands	1	2
Hanging Rollers	41, 43	2, 3
Supporting Rolls	44, 46	2, 3
Protective Shields	39, 40	
Saddles	36, 37, 38	2
Horizontal Pipe Attachments (Insulated)-Hot Service		
Bands	1	1, 2
Hanging Rollers	41, 43	2, 3
Protective Shields	39	
Supporting Rolls	44, 46	2, 3
Saddles	36, 37, 38	2
Vertical Pipe Attachments-General and Hot Service		
Riser Clamps	8, 42	
Hanger Rod Fixtures-General and Hot Service		
Turnbuckles	13, 15	
Swing Eyes	16, 17	
Clevises	14	

Item	Type (MSS SP 58)	Notes
Building Structural Attachments-General and Hot Service		
Inserts	18	
C-Clamps	19, 23	
Beam Clamps	20, 21, 25, 27, 28, 29, 30	
Welded Attachments	22, 57, 58	
Brackets	33, 34	
Notes:		
1. Use for piping 2-1/2 inch and smaller.		
2. Use rigid insulation insert under hanger.		
3. Use insulation shield.		

B. Intermediate Pipe Guides:

1. Piping 6 Inches and Smaller:
 - a. Type: Pipe clamp with oversized pipe sleeve to provide minimum 1/8-inch clearance.
 - b. Manufacturers and Products:
 - 1) Kin-Line, Inc.; Figure 417.
 - 2) Anvil Power Strut; Figure P5932.

C. Pipe Alignment Guides:

1. Type:
 - a. Piping 8 Inches and Smaller: Spider or sleeve type.
2. Manufacturers:
 - a. Flexonics.
 - b. Kin-Line.

D. Pipe Anchors:

1. Type: Anchor chair with U-bolt or bar strap.
2. Manufacturers and Products:
 - a. Anvil; Figure 198.
 - b. B-Line; Figure B3147A or B3147B.

2.04 SHOP/FACTORY FINISHING

- A. Hot-dip galvanized by the pipe support manufacturer in accordance with ASTM A525.

2.05 FASTENERS

A. Anchor Bolts:

- I. Material:
 - a. Wetted or Submerged and in Vaults and Pipe Trenches: Type 316 stainless steel.
 - b. Atmospheric Exposed: Type 304 stainless steel.

2.06 FABRICATION

- A. Shop Assembly: In accordance with MSS SP 89.

2.07 SOURCE QUALITY CONTROL

- A. Shop Tests: In accordance with MSS SP 89.

PART 3 EXECUTION

3.01 INSTALLATION

A. General:

1. Install support systems in accordance with MSS SP 69, Pipe Hangers and Supports-Selection and Application and MSS SP 89, Pipe Hangers and Supports-Fabrication and Installation, unless shown otherwise.
2. Support piping connections to equipment by pipe support and not by the equipment.
3. Support large or heavy valves, fittings, and appurtenances independently of connected piping.
4. Support no pipe from the pipe above it.
5. Support pipe at changes in direction or in elevation, adjacent to flexible joints and couplings, and where shown.
6. Do not install pipe supports and hangers in equipment access areas or bridge crane runs.
7. Brace hanging pipes against horizontal movement by both longitudinal and lateral sway bracing.
8. Install pipe anchors where required to withstand expansion thrust loads and to direct and control thermal expansion.
9. Repair mounting surfaces to original condition after attachments are made.

B. Standard Pipe Supports:

1. Horizontal Suspended Piping:
 - a. Single Pipes: Adjustable swivel-ring, splint-ring or clevis hangers.

- b. For insulated piping, furnish galvanized steel protection shields, welding insulation saddles, or precut sections of rigid insulation (with vapor barrier) at all hanger locations.
 - 2. Horizontal Piping Supported From Walls:
 - a. Single Pipes: Wall brackets or wall clips attached to wall with anchors. Clips attached to wall-mounted framing also acceptable.
 - b. Insulated piping shall have the insulation removed in the vicinity of wall brackets and piping clips to allow only direct pipe wall contact with the support system.
 - 3. Horizontal Piping Supported From Floors:
 - a. Stanchion Type:
 - 1) Pedestal type; adjustable with stanchion, saddle, and anchoring flange.
 - 2) Use yoked saddles for piping whose centerline elevation is 18 inches or greater above the floor and for all exterior installations.
 - 3) Provide neoprene waffle isolation pad under anchoring flanges, adjacent to equipment or where otherwise required to provide vibration isolation.
 - b. Floor-Mounted Channel Supports:
 - 1) Use for piping smaller than 3-inch nominal diameter running along floors and in trenches at piping elevations lower than can be accommodated using pedestal pipe supports.
 - 2) Attach channel framing to floors with anchor bolts.
 - 4. Vertical Pipe:
 - a. Support with wall brackets and base elbow or riser clamps on floor penetrations.
 - b. Insulated piping shall have the insulation removed in the vicinity of wall brackets and riser clamps, to allow only direct wall contact with the support system.
 - 5. Standard Attachments:
 - a. To Concrete Ceilings: Concrete inserts.
 - b. To Steel Beams: I-beam clamp or welded attachments.
 - c. To Concrete Walls: Concrete inserts or brackets or clip angles with anchor bolts.
 - d. Existing Walls and Ceilings: Install as specified for new construction, unless shown otherwise.

C. Intermediate and Pipe Alignment Guides:

- 1. Provide pipe alignment guides (or pipe supports that provide the same function) at all expansion joints and loops.
- 2. Guide piping on each side of an expansion joint or loop at 4 and 14 pipe diameters from each joint or loop.

3. Install intermediate guides on metal framing support systems not carrying a pipe anchor or alignment guide.

D. Accessories:

1. Vibration Isolation Pad: Install under base flange of pedestal type pipe supports adjacent to equipment, and where required to isolate vibration.
2. Dielectric Barrier:
 - a. Install between carbon steel members and copper or stainless steel pipe.
 - b. Install between stainless steel supports and nonstainless steel ferrous metal piping.

END OF SECTION

SECTION 40 27 00
PLANT PIPING-GENERAL

PART 1 GENERAL

1.1 REFERENCES

- A. The following is a list of standards which may be referenced in this section and any supplemental Data Sheets:
1. American National Standards Institute (ANSI):
 - a. B16.1, Cast Iron Pipe Flanges and Flanged Fittings.
 - b. B16.3, Malleable Iron Threaded Fittings.
 - c. B16.5, Pipe Flanges and Flanged Fittings.
 - d. B16.9, Factory-Made Wrought Steel Buttwelding Fittings.
 - e. B16.11, Forged Fittings, Socket-Welding and Threaded.
 - f. B16.21, Nonmetallic Flat Gaskets for Pipe Flanges.
 - g. B16.25, Butt Welding Ends.
 2. American Society of Mechanical Engineers (ASME):
 - a. Boiler and Pressure Vessel Code, Section VIII, Division 1, Pressure Vessels.
 - b. Boiler and Pressure Vessel Code, Section IX, Welding and Brazing Qualifications.
 - c. B31.1, Power Piping.
 - d. B31.3, Chemical Plant and Petroleum Refinery Piping.
 - e. B36.10M, Welded and Seamless Wrought Steel Pipe.
 3. American Society for Nondestructive Testing (ASNT): SNT-TC-1A, Recommended Practice for Nondestructive Testing Personnel Qualifications.
 4. American Society for Testing and Materials (ASTM):
 - a. A182/A182M Rev C, Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.
 - b. A194/A194M, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service.
 - c. A312/A312M, Standard Specification for Seamless and Welded Austenitic Stainless Steel Pipes.
 - d. A320/A320M, Standard Specification for Alloy Steel Bolting Materials for Low-Temperature Service.
 - e. A403/A403M Rev A, Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings.
 - f. A774/A774M, Standard Specification for As-Welded Wrought Austenitic Stainless Steel Fittings for General Corrosive Service at Low and Moderate Temperatures.

- g. A778 Rev A, Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products.
- h. B61, Standard Specification for Steam or Valve Bronze Castings.
- i. B62, Standard Specification for Composition Bronze or Ounce Metal Castings.
- j. D412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.
- k. D413, Standard Test Methods for Rubber Property-Adhesion to Flexible Substrate (R1993).
- 5. American Welding Society (AWS):
 - a. A5.8, Specification for Filler Metals for Brazing and Braze Welding.
 - b. QC 1, Standard for AWS Certification of Welding Inspectors.
- 6. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS): SP43, Wrought Stainless Steel Butt-Welding Fittings Including Reference to Other Corrosion Resistant Materials.

1.2 SYSTEM DESIGN REQUIREMENTS

A. General:

- 1. The Specifications and Drawings are not all inclusive of explicit piping details; provide piping in accordance with laws and regulations and intended use, including:
 - a. Power Plant Piping: ANSI/ASME B31.1 Code.
- 2. Pressure Ratings and Materials Specified: Represent minimum acceptable standards for piping systems.
- 3. Piping Systems: Suitable for the services specified and intended.

B. Support Systems: Refer to Section 40 045 15, Piping Support Systems.

1.3 DEFINITIONS

A. Submerged or Wetted:

- 1. Zone below elevation of:
 - a. Top face of channel walls and cover slabs.
 - b. Liquid surface or within 1 foot above top of maximum liquid surface in basin, tank, or other water holding structure.
 - c. Top of tank wall or under tank cover.
- 2. Exposed or Atmospherically Exposed Piping: All piping exposed to the atmosphere (not buried, submerged, or embedded). This designation includes piping that is insulated or otherwise hidden from visual inspection.

1.4 SUBMITTALS

A. Shop Drawings: Furnish the following:

1. Detail installation drawings of each piping system scale: (1/4 inch = 1 foot 0 inch, minimum) clearly identifying all items proposed for installation with reference to existing structures, piping, etc. The detail installation drawings shall also provide information identifying pipe and fitting size, pressure rating, material of construction, joint style, coatings, etc. The drawings shall also locate each support, guide, and pile support; locate all restrained joints, fittings, couplings, and other appurtenances as well as identify them by catalog number or shop drawing detail number; show anchor locations, and identify them by Shop Drawing detail number.
2. Detail installation drawings, catalog information, and complete component specifications for pipe, fittings, couplings, as well as metal framing pipe support systems, trenches, and other locations employing metal framing pipe support systems.
3. Before starting fabrication, the Contractor shall furnish the Engineer with pipe design calculations and shop drawings which shall include a laying plan identifying all restrained joints, and details of a standard pipe section, special fittings, all pipe supports, and bends. Dimensions, coatings, and other pertinent information shall be shown. The laying plan shall show the location of each pipe section and each special length, with each piece numbered or otherwise designated in sequence. All outlets and bends shall be made up into special lengths so that, when installed, they will be located as indicated. Each pipe and fitting shall be marked on the outside to indicate the class of pipe and location number of the laying plant. Pipe shall be furnished and installed in accordance with the reviewed laying plan. All marking shall be coded to the Shop Drawings. Review of the drawings and laying plan by the Engineer shall not relieve the Contractor of responsibility for complying with all requirements of the Contract Documents.
4. Detailed drawings of all proposed couplings, gaskets, unions, hangers and other supports, and joints for dissimilar metals.
5. Manufacturer's certification that supplied piping materials meet the Detail Piping Specifications.
6. Manufacturer's Certification of Compliance:
 - a. Pipe and fittings.
 - b. Welding electrodes and filler materials.
 - c. Factory applied resins and coatings.

- B. Quality Control Submittals:
 - 1. Manufacturer's Certification of Compliance.
 - 2. Laboratory Testing Equipment: Certified calibrations, manufacturer's product data, and test procedures.
 - 3. Certified welding inspection and test results.
 - 4. Manufacturer's Certification of Compliance:
 - a. Pipe and fittings.
 - b. Welding electrodes and filler materials.
 - 5. Project Welding Operator: Submit documentation of qualifications by testing agency.

1.5 QUALIFICATIONS

- A. Independent Inspection and Testing Agency:
 - 1. Ten years' experience in field of welding and welded pipe and fittings' testing required for this Project.
 - 2. Calibrated instruments and equipment, and documented standard procedures for performing specified testing.
 - 3. Certified in accordance with ASNT SNT-TC-1A for testing procedures required for this Project.
 - 4. Testing Personnel: Qualified for nondestructive test methods to be performed.
 - 5. Inspection Services: Qualified welding inspector.
- B. Welding Inspector: AWS certified, AWS QC 1 qualified, with prior inspection experience of welds specified.
- C. Welder and Welding Operator Qualifications:
 - 1. Qualified by accepted inspection and testing agency before starting Work in accordance with Section IX, Article III of the ASME Boiler and Pressure Vessel Code.
 - 2. Qualified to perform groove welds in Positions 2G and 5G for each welding process and pipe material specified.
 - 3. Qualification tests may be waived by Engineer based on evidence of prior qualification.
 - 4. Retesting: Upon Engineer's written request, retest qualified welder(s).

1.6 DELIVERY, STORAGE, AND HANDLING

- A. In accordance with Division 1, General Requirements, and:
 - 1. Flanges: Securely attach metal, hardboard, or wood protectors over entire gasket surface.

2. Threaded or Socket Welding Ends: Fit with metal, wood, or plastic plugs or caps.
3. Linings and Coatings: Prevent excessive drying.
4. Handling: Use heavy canvas or nylon slings to lift pipe and fittings. Pipe manufacturer's requirements for lift and handling shall take precedence.
5. Exterior Exposure: In accordance with manufacturer's recommendations.

PART 2 PRODUCTS

2.1 PIPING

- A. As specified on Piping Data Sheet(s) and Piping Schedule located at the end of this section as Supplement.
- B. Diameters Shown:
 1. Standardized Products: Nominal size.
 2. Fabricated Steel Piping (Except Cement-Lined): Outside diameter, ASME B36.10M-85.

2.2 JOINTS FOR EXPOSED/SUBMERGED PIPING

- A. Flanged Joints:
 1. Flanges manufactured of piping material as specified in the Detail Piping Specifications. Flat-faced flanges when mating with flat-faced flanges.
 2. Higher pressure rated flanges as required to mate with equipment when equipment flange is of higher pressure rating than required for piping.
- B. Other joint styles are listed in the Pipe Data Sheets at the end of this Section.

2.3 GASKET LUBRICANT

- A. Lubricant shall be supplied by pipe manufacturer and no substitute or "or-equal" will be allowed.

2.4 VENT AND DRAIN VALVES

- A. Pipelines 2-1/2-Inch Diameter and Larger: 3/4-inch vent, 1-inch drain, unless shown otherwise.
- B. Pipeline 2-Inch Diameter and Smaller: 1/2-inch vent, 1-inch drain, unless shown otherwise.

- C. Install vents and drains at piping system high points (vents) and low points (drains) as required by final installation configuration. Provide line size ball valves (V-300) for all vents and drains.

2.5 FABRICATION

- A. Mark Each Pipe Length on Outside:
 - 1. Size or diameter and class.
 - 2. Manufacturer's identification and pipe serial number.
 - 3. Location number on laying drawing.
 - 4. Date of manufacture.
- B. Code markings according to approved Shop Drawings.

2.6 PIPE IDENTIFICATION LABELS

- A. Pipe labels and flow direction arrows are to be used on all exposed piping. Use snap-around type label on all pipe 4 inches and smaller. On pipe greater than 4 inches, painted marking is acceptable provided painting and labeling is high quality and professionally done.
- B. Pipe Labels and Flow Direction Arrows:
 - 1. Lettering and Arrows: Black print.
 - 2. Background: OSHA safety yellow.
 - 3. Material: Manufacture from or encase in outdoor grade plastic or vinyl that will resist damage or fading from washdown, sunlight, mildly corrosive atmosphere, dirt, grease, and abrasion.
 - 4. Label, Lettering Size and Color: ANSI A13.1.
 - 5. Message: Pipe labels to carry description of "Service" or "Flowstream" listed in the Piping Schedule of Section 40 27 00, Plant Piping – General.
 - 6. Labels:
 - a. Snap-Around Type: Size for finished outside diameter of pipe and insulation.
 - b. Firmly grip pipe so labels remain fixed in vertical pipe runs.
 - 7. Manufacturers and Products:
 - a. T&B/Westline, Raiton, NJ, Model WSS Snap-Around.
 - b. Seton Name Plate Corp., New Haven, CT, Setmark Series.

PART 3 EXECUTION**3.1 EXAMINATION**

- A. Verify size, material, joint types, elevation, horizontal location, and pipe service of existing pipelines to be connected to new pipelines or new equipment.
- B. Inspect size and location of structure penetrations to verify adequacy of wall pipes, sleeves, and other openings.
- C. Welding Electrodes: Verify proper grade and type, free of moisture and dampness, and coating is undamaged.

3.2 PREPARATION

- A. Notify Engineer at least 2 weeks prior to field fabrication of pipe or fittings.
- B. Inspect pipe and fittings before installation, clean ends thoroughly, and remove foreign matter and dirt from inside.
- C. Damaged Coatings and Linings: Repair using original coating and lining materials in accordance with manufacturer's instructions.

3.3 WELDING

- A. Perform in accordance with Section IX, ASME Boiler and Pressure Vessel Code and ASME B31.1 for Pressure Piping.
- B. Weld Identification: Mark each weld with symbol identifying welder.
- C. Pipe End Preparation:
 - 1. Machine Shaping: Preferred.
 - 2. Oxygen or Arc Cutting: Smooth to touch, true, and slag removal by chipping or grinding.
 - 3. Beveled Ends for Butt Welding: ANSI B16.25.
- D. Surfaces:
 - 1. Clean and free of paint, oil, rust, scale, slag, or other material detrimental to welding.
 - 2. Clean stainless steel joints with stainless steel wire brushes or stainless steel wool prior to welding.

3. Thoroughly clean each layer of deposited weld metal, including final pass, prior to deposition of each additional layer of weld metal with a power-driven wire brush.
- E. Alignment and Spacing:
1. Align ends to be joined within existing commercial tolerances on diameters, wall thicknesses, and out-of-roundness.
 2. Root Opening of Joint: As stated in qualified welding procedure.
 3. Minimum Spacing of Circumferential Butt Welds: Minimum four times pipe wall thickness or 1 inch, whichever is greater.
- F. Climatic Conditions:
1. Do not perform welding if there is impingement of any rain, snow, sleet, or high wind on the weld area, or if the ambient temperature is below 32 degrees F.
 2. Stainless Steel and Alloy Piping: If the ambient is less than 32 degrees F, local preheating to a temperature warm to the hand is required.
- G. Tack Welds: Performed by qualified welder using same procedure as for completed weld, made with electrode similar or equivalent to electrode to be used for first weld pass, and not defective. Remove those not meeting requirements prior to commencing welding procedures.
- H. Surface Defects: Chip or grind out those affecting soundness of weld.
- I. Weld Passes: As required in welding procedure.
- J. Weld Quality: Free of cracks, incomplete penetration, weld undercutting, excessive weld reinforcement, porosity slag inclusions, and other defects in excess of limits shown in applicable piping code.

3.4 INSTALLATION-GENERAL

- A. Join pipe and fittings in accordance with manufacturer's instructions, unless otherwise shown or specified.
1. All exposed piping to be installed in a workmanship like manner with centerlines plumb and/or level to adjacent structure or piping.
- B. Remove foreign objects prior to assembly and installation.

C. Flanged Joints:

1. Install perpendicular to pipe centerline.
2. Bolt Holes: Straddle vertical centerlines, aligned with connecting equipment flanges or as shown.
3. Use torque-limiting wrenches to ensure uniform bearing and proper bolt tightness.
4. When mating piping flanges to each other or to equipment and dissimilar piping, flanges shall be centered and in contact at the faces prior to bolting. Use of bolting to align/join flanges is prohibited. Proper alignment and mating shall be demonstrated to the Owner's Representative prior to bolt assembly.

D. Couplings:

1. General:
 - a. Install in accordance with manufacturer's written instructions.
 - b. Before coupling, clean pipe holdback area of oil, scale, rust, and dirt.
 - c. Remove pipe coating if necessary to present smooth surface.
2. Locations: At all equipment connections.

3.5 INSTALLATION-EXPOSED PIPING

A. Piping Runs:

1. Parallel to building or column lines and perpendicular to floor, unless shown otherwise.
2. Piping upstream and downstream of flow measuring devices shall provide straight lengths as required for accurate flow measurement.

B. Supports: As specified in Section 40 05 15, Piping Support Systems, and as further detailed on the Drawings.

C. Group piping wherever practical at common elevations; install to conserve building space and not interfere with use of space and other work.

D. Unions or Flanges: Provide at each piping connection to equipment or instrumentation on equipment side of each block valve to facilitate installation and removal.

E. Install piping so that no load or movement in excess of that stipulated by equipment manufacturer will be imposed upon equipment connection; install to allow for contraction and expansion without stressing pipe, joints, or connected equipment.

F. Piping Clearance, Unless Otherwise Shown:

1. Over Walkway and Stairs: Minimum of 7 feet 6 inches, measured from walking surface or stair tread to lowest extremity of piping system including flanges, valve bodies or mechanisms, insulation, or hanger/support systems.
2. Between Equipment or Equipment Piping and Adjacent Piping: Minimum 3 feet 0 inches, measured from equipment extremity and extremity of piping system including flanges, valve bodies or mechanisms, insulation, or hanger/support systems.
3. From Adjacent Work: Minimum 1 inch from nearest extremity of completed piping system including flanges, valve bodies or mechanisms, insulation, or hanger/support systems.
4. Do not route piping in front of or to interfere with access ways, ladders, stairs, platforms, walkways, openings, doors, or windows.
5. Head room in front of openings, doors, and windows shall not be less than the top of the opening.
6. Do not install piping containing liquids or liquid vapors in transformer vaults or electrical equipment rooms.
7. Do not route piping over, around, in front of, in back of, or below electrical equipment including controls, panels, switches, terminals, boxes, or other similar electrical work.

3.6 BRANCH CONNECTIONS

- A. When line of lower pressure connects to a line of higher pressure, requirements of Piping Data Sheet for higher pressure rating prevails up to and including the first block valve in the line carrying the lower pressure, unless otherwise shown.
- B. Threaded Pipe Tap Connections:
 1. Welded Steel or Alloy Piping: Connect only with welded threadolet or half-coupling as specified on Piping Data Sheet.

3.7 VENTS AND DRAINS

- A. Vents and drains at high and low points in piping required for completed system may or may not be shown. Install vents and valves specified on high points and drains on low points of exposed piping. Contractor to locate and identify locations prior to installation.

3.8 CLEANING

- A. Following assembly and testing, and prior to disinfection and final acceptance, flush pipelines (except as stated below) with water at 2.5 fps minimum flushing velocity until foreign matter is removed.
- B. Contractor shall pig piping where noted in the Piping Schedule to remove sand and debris. Contractor shall also provide video survey of piping interior to confirm sand and debris removal.
- C. Blow Clean of Loose Debris: Plant process air, dry chlorine gas or liquid, and instrument air-lines with compressed air at 4,000 fpm; do not flush with water.
- D. Immediately after cleaning dry chlorine gas or liquid, service piping, dry to minus 40 degrees F dew point with dry compressed instrument air or compressed commercial grade nitrogen.
- E. If impractical to flush large diameter pipe at 2.5 fps or blow at 4,000 fpm velocity, clean in-place from inside by brushing and sweeping, then flush or blow line at lower velocity.
- F. Insert cone strainers in flushing connections to attached equipment and leave in-place until cleaning is complete.
- G. Remove accumulated debris through drains 2 inches and larger or by removing spools and valves from piping.

3.9 PIPE IDENTIFICATION LABELS

- A. Pipe Labels and Flow Indication Arrows:
 - 1. Locate at all connections to equipment, valves, or branching fittings at wall boundaries.
 - 2. At intervals along piping not greater than 18 feet on center with at least one label applied to each exposed horizontal and vertical run of pipe.
 - 3. At exposed piping not normally in view, such as above suspended ceilings and in closets and cabinets.
 - 4. Supplementary Labels: Provide to Owner those listed on Piping Schedule that do not receive arrows.
 - 5. Application: Place on pipe only after painting in vicinity is complete or as approved by Owner.
 - 6. Installation; In accordance with manufacturer's instructions.

B. Equipment Labels:

1. Locate and Install: On equipment or concrete equipment base.
2. Anchor to equipment or base for easy removal and replacement with ordinary hand tools.

3.10 PIPE IDENTIFICATION/LOCATING

- A. Provide plastic detectable marking tape in trench backfill above all buried pipelines in accordance with this section. Install marking tape on all buried lines as specified.
- B. Exposed Piping: Pipe color coding and banding shall be in accordance with the requirements of ANSI A13.1, Z15.3, and Section 10 14 00, Identifying Devices. Painting shall be as specified in Section 09 90 00, Painting and Coatings.
- C. On exposed stainless steel piping, color shall be applied 12 inches in length along pipe axis at all connections to equipment, valves, or branch fittings, at wall boundaries, and at intervals along the piping not greater than 18 feet on center, with identification labels applied to each exposed run of pipe as specified hereinafter.
- D. Mild steel pipe supports shall be painted No. 70 light gray as specified in ANSI 359-A, as manufactured by Tnemec Co., No. BJ45, or equal.
- E. Labels for Piping:
1. Identification labels shall bear the full piping system name as specified in the Piping Schedule at the end of this section. Separate flow directional arrows shall be installed with each label and include the specified field and lettering color per ANSI A13.1. Lettering height to be in conformance to ANSI A13.1. Labels are to be located at all connections to equipment valves, or branch fittings, at wall boundaries, and at intervals along the piping not greater than 18 feet on center, with at least one label applied to each exposed run of pipe. Labels shall be attached to all atmospherically exposed piping including "hidden" piping located in piping trays inside pipe chases, etc.
 2. Color Banding: Color banding to consist of 3-inch wide bands, color and number as specified in the Piping Schedule. Banding to be applied at all connections to equipment, valves, or branch fittings, at wall boundaries and at intervals along the piping not greater than 18 feet on center, with at least one band applied to each exposed run or branch run on pipe. Multiple bands shall be spaced 3 inches apart.

3.11 FIELD QUALITY CONTROL

- A. Pressure Leakage Testing: As specified in Section 40 80 01, Piping Leakage Testing.
- B. Minimum Duties of Welding Inspector:
1. Job material verification and storage.
 2. Qualification of welders.
 3. Certify conformance with approved welding procedures.
 4. Maintenance of records and preparation of reports in a timely manner.
 5. Notification to Engineer of unsatisfactory weld performance within 24 hours of weld test failure.
- C. Required Weld Examinations:
1. Perform examinations in accordance with the Piping Code for Category M fluids.
 2. Perform examinations for every pipe thickness and for each welding procedure, progressively, for all piping covered by this section.
 3. Examine at least one of each type and position of weld made by each welder or welding operator.
 4. For each weld found to be defective under the acceptance standards or limitations on imperfections contained in the applicable Piping Code, examine two additional welds made by the same welder that produced the defective weld. Such additional examinations are in addition to the minimum required above. Examine, progressively, two additional welds for each tracer examination found to be unsatisfactory.

3.12 MANUFACTURERS' SERVICES

- A. Provide manufacturer's representative at site in accordance with Division I, General Requirements.

3.13 SUPPLEMENTS

- A. The supplements listed below, following "END OF SECTION," are part of this Specification.
1. Piping Schedule.
 2. Data Sheets.

NUMBER	TITLE
-08	DS—Stainless Steel Pipe and Fittings-General Service

END OF SECTION

**CITY OF NAPLES
WATER TREATMENT PLANT
PLANT PIPING SCHEDULE**

Service/Flowstream	Legend	Pipe Size (Inches)	Piping Material	Specification Section Number	Installation	Pressure (psig)		Color Code	Remarks
						Maximum Operating	Test		
Cooling Water Supply	CWS	4	SST	40 27 00.08	EXP	15	50 H	N/A	Insulate pipe and fittings as specified in Section 40 42 13., Plant Piping Insulation
Cooling Water Return	CWR	4	SST	40 27 00.08	EXP	15	50 H	N/A	Insulate pipe and fittings as specified in Section 40 42 13., Plant Piping Insulation

SECTION 40 27 00.08 STAINLESS STEEL PIPE AND FITTINGS-GENERAL SERVICE		
Item	Size	Description
Pipe	2" & smaller 2-1/2" thru 6"	Schedule 40S: ASTM A312/A312M, Type 304 seamless, pickled and passivated. Schedule 20S: ASTM A778, "as-welded" grade, Type 304.
Joints	2" & smaller 2-1/2" thru 6"	Butt-welded or socket-welded style. Butt-welded. Flanged at valves and connections to equipment and piping accessories as shown on the Contract Drawings.
Fittings	2" & smaller 2-1/2" thru 6"	Conforming to ASTM A182, B336, and ASTM A403, B336. Pressure rating of fittings to match that of pipe. Butt-Welded: ASTM A774/A774M Grade 304 conforming to MSS SP 43, "as-welded" grade, pickled and passivated; fitting wall thickness to match adjoining pipe; long radius elbows unless shown otherwise.
Branch Connections	1/2" & larger	Tee or reducing tee in conformance with Fittings above. Butt-welding tee or reducing tee in accordance with Fittings above.
Flanges	All	Forged Stainless Steel: ASTM A182/A182M, Grade F304, ANSI B16.5 Class 150, slip-on style weld neck flange pieces. Contractor shall coordinate equipment to pipe connections. Butt Weld Stub Ends: MSS SP-43, Type "A" Schedule to match pipe; grade 304. Lap joint flanges shall be in accordance with flange spec above.

SECTION 40 27 00.08 STAINLESS STEEL PIPE AND FITTINGS-GENERAL SERVICE		
Item	Size	Description
Unions	2" & smaller	Threaded Forged: ASTM A182/A182M, Grade F304, 2,000-pound or 3,000-pound WOG, integral ground seats, AAR design meeting the requirements of ANSI B16.11, bore to match pipe. Use only at locations where disassembly of piping is required for maintenance of valves and related piping accessories.
Bolting	All	Forged Flanges: Type 304 stainless steel, ASTM A320/A320M Grade B8M hex head bolts and ASTM A194/A194M Grade 8M hex head nuts.
Gaskets	All Flanges	Flanged, Water Service: 1/8-inch thick, unless otherwise specified, homogeneous EPDM, hardness 60 (Shore A), rated to 300 degrees F, conforming to ANSI B16.21 and ASTM D1330 Steam Grade. Blind flanges shall be gasketed covering entire inside face with gasket cemented to blind flange.
Shop Fabricated Pipe/Fittings Assemblies	All	Following shop fabrication, all stainless steel material shall be pickled and passivated by complete immersion (15 minutes minimum) in a 125-degree F solution of 10 percent nitric acid and 3 percent hydrofluoric acid. Material to be rinsed in a neutralizing bath and air dried.
Thread Lubricant	2" & smaller	Teflon tape.

END OF SECTION

SECTION 40 27 01
PIPING SPECIALTIES – PLANT SERVICES

PART 1 GENERAL

1.1 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American National Standards Institute (ANSI):
 - a. B16.1, Cast Iron Pipe Flanges and Flanged Fittings.
 - b. B16.5, Pipe Flanges and Flanged Fittings.
2. American Society for Testing and Materials (ASTM):
 - a. A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - b. A276, Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes.

1.2 SUBMITTALS

A. Shop Drawings:

1. Make, model, and weight of each equipment assembly/item.
2. Complete catalog information, descriptive literature, specifications, and identification of materials of construction with reference to ASTM material designations.
3. Detailed mechanical drawings showing the equipment dimensions, size, locations of connections, and weights of associated equipment.
4. Factory finish system for each component in conformance with painting system specified.

PART 2 PRODUCTS

2.1 GENERAL

- A. Provide required piping specialty items, whether shown or not shown on the Drawings, as required by applicable codes and standard industry practice.
- B. Rubber ring joints, flexible hose joints, mechanical joints, flexible couplings, are considered flexible joints; welded pipe joints are not.

2.2 DEFINITIONS

- A. Definitions of terms used in this section related to corrosion (e.g. submerged, exposed, etc.) are provided in Section 40 05 15, Piping Support Systems.

2.3 CONNECTORS

- A. General: Type 304 stainless steel bolts, fasteners, and accessories are required for connectors intended for areas where damp conditions exist.
- B. Reinforced Flexible Coolant Hose:
 - 1. Heat and corrosion resistant silicone hose consisting of silicone tube wrapped in multiple high temperature textile piles with wrapped silicone cover.
 - 2. Rated temperature range from minus 65 to 350 degrees F.
 - 3. Hose complying with SAE J20R1 Class 1 requirements and 3:1 design factor. Minimum 45 psi burst pressure rating.
 - 4. Connect hose to adjacent ends of piping with constant torque clamps as specified in this section. Employ twin clamps to make each hose to pipe end connection.
 - 5. Manufacturer/Products:
 - a. Parker Hannifin Corp.; Series 6750 X-treme™ Hose.
 - b. Or equal.
- C. Constant Torque Clamps:
 - 1. Automatically self compensating Belleville spring design for constant torque/clamping force regardless of hose expansion/contraction.
 - 2. Extra long screw shaft engaging eight screw threads.
 - 3. Clamps fabricated with inner liner to protect hoses from damage.
 - 4. Manufactured of Type 304 stainless steel with 5/8-inch band width.
 - 5. Manufacturer/Products:
 - a. Partsmaster; Constant-Torque™.
 - b. Or equal.
- D. Flanged Coupling Adapters (Stainless Steel Pipe – Liquid Service):
 - 1. Design Features:
 - a. Body: Type 316 stainless steel.
 - b. Flanges/Followers: Type 316 stainless steel, conforming to AWWA C207.
 - c. Bolts: Type 316 stainless steel.
 - d. Gaskets: EPDM.
 - e. Thrust restraint: FCA body to be outfitted with manufacturers set screw set type retaining pins to fully restrain joint.
 - f. Manufacturers and Products:
 - 1) Dresser Industries Inc., Style 128W (Stainless Steel).
 - 2) Or equal.

2.4 EXPANSION JOINTS

A. Elastomer Bellows:

1. Type: Reinforced, molded wide-arch.
2. End Connections: Flanged, drilled 125-pound ANSI B16.1 standard, with Type 304 stainless steel retaining rings.
3. Washers: Over the retaining rings to help provide a leakproof joint under test pressure.
4. Thrust Protection: Manufacturer designed and supplied control rods, fasteners, and accessories to protect the bellows from overextension at the test pressure specified for the piping in Section 40 27 00, Piping-General.
5. Tube and Bellows Arch Lining: EPDM.
6. Rated Temperature: 250 degrees F.
7. Rated Deflection and Pressure:
 - a. Lateral Deflection: 3/4-inch minimum.
 - b. Burst Pressure: Four times the working pressure.
 - c. Compression deflection and minimum working pressure as follows:

Size (inch)	Deflection (inch)	Pressure (psig)
2-1/2 to 12	3/4	250

8. Manufacturers and Products:
 - a. Mercer Rubber Co.; Series 500.
 - b. General Rubber Corp.
 - c. Goodall Rubber Co.

2.5 INSULATING FLANGES, COUPLINGS, AND UNIONS

A. Materials:

1. In accordance with applicable piping material specified in Pipe Data Sheets. Complete assembly shall have ASME B31.1 rating equal to or higher than that of joint and pipeline.
2. Galvanically compatible with piping.
3. Resistant for intended exposure, operating temperatures, and products in pipeline.

B. Union Type, 2 Inches and Smaller:

1. Screwed or solder-joint.
2. O-ring sealed with molded and bonded insulation to body.

- C. Flange Type, 2-1/2 Inches and Larger: Flanged, complete with bolt insulators, dielectric gasket, bolts, and nuts.
- D. Flange Insulating Kits:
 - 1. Gaskets:
 - a. Full-face, Type E with O-ring seal.
 - b. Supplemented with neoprene facing on each side to accomplish seal.
 - 2. Insulating Sleeves: Full-length fiberglass reinforced epoxy (NEMA LI 1, G-10 grade).
 - 3. Insulating Washers: Fiberglass reinforced epoxy (NEMA LI 1, G-10 grade).
 - 4. Steel Washers: Type 316 stainless steel, 1/8-inch thick.
- E. Manufacturers and Products:
 - 1. Dielectric Flanges and Unions:
 - a. Pipeline Seal and Insulator, Inc., Houston, TX.
 - b. Central Plastics Co., Shawnee, OK.
 - 2. Insulating Couplings:
 - a. Dresser; STAB-39.
 - b. Baker Coupling Company, Inc.; Series 216.

2.6 FLEXIBLE HOSE, JOINTS, AND FITTINGS (MODERATELY LOW PRESSURE)

- A. For moderately low pressure applications (e.g., vent lines, etc.).
- B. Flexible Hose and Connections Shall Meet the Following Requirements:
 - 1. Flexible Hose:
 - a. Hose Material: PVC with spiral wound internal reinforcement. Smooth wall exterior and interior.
 - b. Pressure Rating: 60 psi, minimum working pressure at 68 degrees F with full vacuum pressure rating.
 - c. Service Temperature Range: 0 degree F to 150 degrees F.
 - d. Minimum Bending Radius: Not to exceed four times the pipe ID (in inches).
 - 2. Joints: Tubing shall be joined to pipe, equipment, and quick connect couplings and fittings at every location with two constant torque clamps.
 - 3. Manufacturers/Products:
 - a. Flexible Hose:
 - 1) ALSCO Ind. Products, "TIGERFLEX" (medium duty) hose.
 - 2) Or equal.

PART 3 EXECUTION

3.1 GENERAL

- A. Provide accessibility to piping specialties for control and maintenance.

3.2 PIPING FLEXIBILITY PROVISIONS

A. General:

1. Install thrust protection.
2. Install flexible couplings to facilitate piping installation, in accordance with approved shop drawings.

3.3 PIPING TRANSITION

A. Applications:

1. Provide complete closure assembly where pipes meet other pipes or structures.
2. Pressure Pipeline Closures: Plain end pieces with flexible hose connections or flange coupling adapters, unless otherwise shown.
3. Elastomer sleeves bonded to pipe ends are not acceptable.

B. Installation:

1. Flexible Transition Couplings: Install in accordance with coupling manufacturer's instructions to connect dissimilar pipe and pipes with a small difference in outside diameter.

3.4 PIPING INSTALLATION

- A. Piping Installation: Allow for thermal expansion due to differences between installation and operating temperatures.
- B. Anchors and Anchor Walls: Install as specified in Section 40 05 15, Piping Support Systems, to withstand expansion thrust loads and to direct and control thermal expansion.

3.5 FLEXIBLE PIPE CONNECTIONS TO EQUIPMENT/VALVES

- A. Tie Bolts: Tighten snug prior to applying any pressure to the system.

3.6 INSULATING FLANGES, COUPLINGS, AND UNIONS

A. Applications:

1. At locations indicated on the Drawings for connections between steel and ductile iron pipe.
2. Copper to ferrous metal piping connections.
3. Cathodically protected piping penetration to buildings and watertight structures.
4. Submerged to unsubmerged metallic piping connections.
5. Where required for electrically insulated connection.

B. Installation of Insulating Kits: Drill oversize to accommodate insulating sleeves through the bolt holes, assuming standard bolt sizes.

C. Pipe Installation:

1. Insulating joints connecting immersed piping to nonimmersed piping shall be installed above maximum water surface elevation.
2. All submerged carbon steel, ductile iron, or galvanized piping in reinforced concrete basins shall be isolated from the concrete reinforcement steel.

END OF SECTION

**SECTION 40 27 02
VALVES AND OPERATORS**

PART 1 GENERAL

1.1 REFERENCES

- A. The following is a list of standards which may be referenced in this Section:
1. American National Standards Institute (ANSI):
 - a. B16.1, Cast Iron Pipe Flanges and Flanged Fittings.
 - b. C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 2. American Society of Sanitary Engineers (ASSE): 1011, Performance Requirements for Hose Connections Vacuum Breakers.
 3. American Society for Testing and Materials (ASTM):
 - a. A276, Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes.
 - b. A351, Standard Specification for Castings, Austenitic, Austenitic-Ferric (Duplex), for Pressure-Containing Parts.
 - c. B61, Standard Specification for Steam or Valve Bronze Castings.
 - d. B62, Standard Specification for Composition Bronze or Ounce Metal Castings.
 - e. B98, Standard Specification for Copper-Silicon Alloy Rod, Bar, and Shapes.
 - f. B127, Standard Specification for Nickel-Copper Alloy (UNS N04400) Plate, Sheet, and Strip.
 - g. B139, Standard Specification for Phosphor Bronze Rod, Bar, and Shapes.
 - h. B164, Standard Specification for Nickel-Copper Alloy Rod, Bar, and Wire.
 - i. B194, Standard Specification for Copper-Beryllium Alloy Plate, Sheet, Strip, and Rolled Bar.
 - j. B584, Standard Specification for Copper Alloy Sand Castings for General Applications.

1.2 SUBMITTALS

- A. Shop Drawings:
1. Product data sheets and complete catalog information for each size, make, and model of valve with identification of valve size and type (i.e., "V" number) and proposed chemical service clearly marked on the submittal in the top right hand corner. For example, "4-inch V902, 95 percent sulfuric acid service."

2. Complete catalog information on valve and accessories, descriptive literature, specifications, including identification of materials of construction of all components with reference to ASTM Standards.
 3. Open/close and throttle actuator sizing calculations.
- B. Quality Control Submittals:
1. Tests and inspection data.
 2. Manufacturer's Certificate of Proper Installation.
 3. Operation and Maintenance Manual.

PART 2 PRODUCTS

2.1 GENERAL

- A. Valve to include operator, actuator, handwheel, chain wheel, extension stem, floor stand, worm and gear operator, operating nut, chain, wrench, and all accessories and related equipment for a complete installation. Refer to Process and Instrumentation Drawings for valves requiring limit switches, electric or pneumatic actuators, etc.
- B. Valve to be suitable for intended service and designed for long term service in severe-duty, corrosive environment. Corrosion the result of localized gases from wastewater process as well as the fluid in contact with the valve. Renewable parts not to be of a lower quality than specified and shall be designed by valve manufacturer for long term service in severe duty, corrosive environment.
- C. Valve same size as adjoining pipe.
- D. Valve ends to suit adjacent piping. Valve ends shall be suitable for use in pressure piping and shall be restrained against thrust forces for 1.5 times the piping test pressure specified in Section 40 27 00, Plant Piping-General.
- E. Size operator to operate valve for the full range of pressures anticipated and/or specified.
- F. Valve to open by turning counterclockwise.
- G. Factory mount operator, actuator, and accessories at valve manufacturer's facility.

2.2 MATERIALS

- A. Brass and bronze valve components and accessories that have surfaces in contact with water to be alloys containing less than 16 percent zinc and 2 percent aluminum.
- B. Approved alloys are of the following ASTM designations:
 - 1. B61, B62, B98 (Alloy UNS No. C65100, C65500, or C66100), B139 (Alloy UNS No. C51000), B584 (Alloy UNS No. C90300 or C94700), B164, B194, and B127.
 - 2. Stainless steel, AISI Type 316 may be substituted for bronze.

2.3 FLANGE END VALVE BOLTING

- A. Fasteners for flanged valves shall be as follows:
 - 1. Bolts, Nuts, and Washers: Type 304 stainless steel conforming to requirements of Section 05 50 00, Metal Fabrications and Castings.

2.4 FACTORY FINISHING

- A. Exterior Coatings:
 - 1. Atmospherically Exposed Valves: System No. 4 as specified in Section 09 9000, Painting and Coatings.

2.5 VALVES

- A. Gate Valves:
 - 1. Type V108 Gate Valve 2 Inches to 24 Inches:
 - a. Iron body, bronze mounted, flanged ends, solid wedge gate, nonrising bronze stem, Class 125 rated 125 psi SWP, 200 psi CWP for 2 inches through 12 inches and 100 psi SWP, 150 psi CWP for 14 inches through 24 inches.
 - b. Manufacturers and Products:
 - 1) Crane; Figure 461.
 - 2. Stockham; Figure G612.
- B. Ball Valves:
 - 1. Type V300 Ball Valve 2 Inches and Smaller for General Water and Air Service:
 - a. All bronze, end entry type, PTFE seats, Teflon packing, hand lever operator, rated 150-pound SWP, 600-pound WOG.

- b. Manufacturers and Products:
 - 1) Milwaukee; BA100, threaded end.
 - 2) Nibco; T-585-70, threaded end.
 - 3) Milwaukee; BA150, soldered ends.
 - 4) Nibco; S-858-70, soldered ends.

2.6 OPERATORS

A. Manual Operator:

- 1. General:
 - a. Operator force not to exceed 40 pounds under any operating condition, including initial breakaway. Gear reduction operator when force exceeds 40 pounds.
 - b. Operator self-locking type or equipped with self-locking device.
 - c. Position indicator on quarter-turn valves.
 - d. Worm and gear operators one-piece design worm-gears of gear bronze material. Worm hardened alloy steel with thread ground and polished. Traveling nut type operators threader steel reach rods with internally threaded bronze or ductile iron nut.
- 2. Exposed Operator:
 - a. Galvanized and painted handwheels.
 - b. Cranks on gear type operators.
 - c. Chain wheel operator with tiebacks, extension stem, floor stands, and other accessories to permit operation from normal operation level.

2.7 ACCESSORIES

- A. Tagging: 1-1/2-inch diameter heavy brass or stainless steel tag for each valve operator, bearing the valve tag number shown on the Electrically Actuated Valve Schedule.
- B. Chain Wheel and Guide:
 - 1. Handwheel direct-mount type.
 - 2. Complete with chain.
 - 3. Galvanized or cadmium-plated.
 - 4. Manufacturers and Products:
 - a. Clow Corp.; Figure F-5680.
 - b. Walworth Co.; Figure 804.
 - c. DeZurik Corp.; Series W or LWG.

PART 3 EXECUTION

3.1 INSTALLATION

A. Flange Ends:

1. Flanged valve boltholes shall straddle vertical centerline of pipe.
2. Clean flanged faces, insert gasket and bolts, and tighten nuts progressively and uniformly.

B. Valve Orientation:

1. Install operating stem vertical when valve is installed in horizontal runs of pipe having centerline elevations 4 feet 6 inches or less above finished floor, unless otherwise shown.
2. Install operating stem horizontal in horizontal runs of pipe having centerline elevations between 4 feet 6 inches and 6 feet 9 inches above finish floor, unless otherwise shown.

C. Locate valve to provide accessibility for control and maintenance. Install access doors in finished walls and plaster ceilings for valve access.

D. Chain Wheel and Guide: Install chain wheel and guide assemblies or chain lever assemblies on manually operated valves over 6 feet 9 inches above finished floor. Where chains hang in normally traveled areas, use appropriate "L" type tie-back anchors.

3.2 TESTS AND INSPECTION

A. Valve may be either tested while testing pipelines, or as a separate step.

B. Test that valves open and close smoothly with operating pressure on one side and atmospheric pressure on the other, in both directions for two-way valve and applications.

C. Count and record number of turns to open and close valve; account for any discrepancies with manufacturer's data.

3.3 MANUFACTURERS' SERVICES

- A. For each set of valves with the same "V" number contained in this section, a qualified manufacturer's representative for the equipment specified herein shall be present at the jobsite and/or classroom designated by the Owner for the minimum person-days listed for the services hereinunder, travel time excluded:
 - 1. 1/2 person-day for inspection of the installation of the assemblies, functional testing, and certification that the assemblies have been installed and tested in accordance with the manufacturer's recommendations and these Specifications. Manufacturers' Certificates of Proper Installation shall be received and acknowledged by the Engineer prior to plant startup.
 - 2. 1/2 person-day for plant startup.
- B. Startup services shall be at such times as requested by the Contractor and as approved by the Owner.
- C. Training of Owner's personnel shall be at such times as requested by the Owner.
- D. See Division 1, General Requirements.

END OF SECTION

SECTION 40 42 13
PLANT PIPING INSULATION

PART 1 GENERAL

1.1 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Society of Heating, Refrigerating and Air Conditioning Engineers Inc. (ASHRAE): 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings.
 2. ASTM International (ASTM):
 - a. B209, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - b. C552, Standard Specification for Cellular Glass Thermal Insulation.
 - c. C585, Standard Practice for Inner and Outer Diameters of Thermal Insulation for Nominal Sizes of Pipe and Tubing.
 - d. C1136, Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
 - e. C1729, Standard Specification for Aluminum Jacketing for Insulation.
 - f. E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - g. E96/E96M, Standard Test Methods for Water Vapor Transmission of Materials.
 3. International Code Council (ICC): International Energy Conservation Code (IECC).
 4. Underwriters Laboratories Inc. (UL).

1.2 SUBMITTALS

- A. Action Submittals:
1. Shop Drawings: Manufacturer's descriptive literature.
- B. Informational Submittals: Maintenance information.

PART 2 PRODUCTS

2.1 PIPE AND FITTING INSULATION

A. Type 2—Fiberglass:

1. Material: UL rated, preformed, sectional bonded fiberglass per ASTM C585 with factory applied, Kraft paper with aluminum foil vapor barrier jacket with pressure-sensitive, self-sealing lap.
2. Insulation Temperature Rating: Zero to 850 degrees F.
3. Conductivity in accordance with ASHRAE 90.1 and maximum numerical value of 0.23 Btu-in./hr-square foot degrees F at 75 degrees F.
4. Jacketing per ASTM C1136 with minimum water vapor transmission for jacket of 0.02 perm-inch per ASTM E96/E96M.
5. Joints: Matching pressure-sensitive butt strips for sealing circumferential joints.
6. Flame Spread Rating: Less than 25 per ASTM E84.
7. Smoke Developed Index: Less than 50 per ASTM E84.
8. Manufacturers and Products:
 - a. Owens Corning Fiberglass; ASJ/SSL-11.
 - b. John Manville; Micro-Lok with Jacket.

2.2 INSULATION FINISH SYSTEMS

A. Type F3—Aluminum:

1. Aluminum Roll Jacketing: For straight run piping, wrought aluminum Alloy 3003, 5005, 1100, or 3105 to ASTM B209 with H-14 temper, in accordance with ASTM C1729, minimum 0.016-inch thickness, with smooth mill finish.
2. Vapor Barrier: Provide factory applied vapor barrier, heat and pressure bonded to inner surface of aluminum jacketing.
3. Fitting Covers: Material as for aluminum roll jacketing, premolded, one or two piece covers, which includes elbows, tee/valves, end caps, mechanical line couplings, and specialty fittings.
4. Manufacturers:
 - a. RPR Products; Insul-Mate.
 - b. ITW, Pabco-Childers.

2.3 INSULATION AT PIPE HANGERS AND SUPPORTS

- A. Refer to Section 40 05 15, Piping Support System.

- B. Type 1:
1. Copper and Nonmetallic Pipe 2 Inches and Smaller and Steel Pipe 1-1/2 Inches and Smaller: Use insulation shields.
 2. Larger Sizes: Use insulation saddles or Type 3 rigid insulation insert 10 inches long.
- C. Type 2: UL rated, preformed rigid pipe insulation inserts of thickness equal to adjoining insulation, 10 inches in length, with factory applied, vinyl-coated and embossed vapor barrier jacket with self-sealing lap.
- D. Type 3: Preformed inserts equal to thickness of adjacent piping insulation

PART 3 EXECUTION

3.1 APPLICATION

A. General:

1. Insulate valve bodies, flanges, and metallic pipe couplings.
2. Do not insulate flexible pipe couplings and expansion joints.
3. Service and Insulation Thickness: Refer to table below and to Piping Schedule in Section 40 27 00, Plant Piping - General.

Service and Insulation Thickness				
Service Type	Thickness Determined By		Maximum Fluid Temperature (degrees F)	Insulation Type and Finish System
CWS-Cooling Water Supply	Pipe Sizes	Insulation Thickness	To 250 degrees F	Type 2 Insulation with Type F-3 aluminum jacket finish system
CWR-Cooling Water Return	<u>Inches</u>	<u>Inches</u>		
	1-4	1-1/2		

3.2 INSTALLATION

A. General:

1. Install in accordance with manufacturer's instructions and as specified herein.
2. Install insulation after piping system has been pressure tested and leaks corrected.
3. Apply insulation over clean finish painted and dry surfaces.
4. Do not allow insulation to cover nameplates or code inspection stamps.
5. Run insulation continuously through pipe hangers and supports, wall openings, ceiling openings, and pipe sleeves, unless otherwise shown.

6. Install removable insulation sections on devices that require access for maintenance of equipment or removal, such as unions and strainer end plates.
 7. Use insulating cements, lagging adhesives, and weatherproof mastics recommended by insulation manufacturer.
- B. Connection to Existing Piping: Cut back existing insulation to remove portion damaged by piping revisions. Install new insulation.
- C. Placement:
1. Slip insulation on pipe or tubing before assembly, when practical, to avoid longitudinal seams.
 2. Insulate valves and fittings with sleeved or cut pieces of same material.
 3. Seal and tape joints.
- D. Insulation at Hangers and Supports: Install under piping, centered at each hanger or support.
- E. Vapor Barrier:
1. Provide continuous vapor barrier at joints between rigid insulation and pipe insulation.
 2. Install vapor barrier jackets with pipe hangers and supports outside jacket.
 3. Do not use staples and screws to secure vapor sealed system components.
- F. Aluminum Jacket:
1. Use continuous friction type joint to hold jacket in place, providing positive weatherproof seal over entire length of jacket.
 2. Secure circumferential joints with preformed snap straps containing weatherproof sealant.
 3. On exterior piping, apply coating over insulation and vapor barrier to prevent damage when aluminum fitting covers are installed.
 4. Do not use screws or rivets to fasten the fitting covers.
 5. Install removable prefabricated aluminum covers on exterior flanges and unions.
 6. Caulk and seal all exterior joints to make watertight.

3.3 FIELD FINISHING

- A. Apply coating of insulating cement where needed to obtain smooth and continuous appearance.

END OF SECTION

**SECTION 40 80 01
PIPING LEAKAGE TESTING**

PART 1 GENERAL

1.1 SCOPE OF THIS SECTION

- A. The work of this section includes providing the pipe leak testing and all appurtenances.

1.2 SUBMITTALS

A. Information Submittals:

1. Testing Plan: Submit prior to testing and include at least the information that follows.
 - a. Testing dates.
 - b. Piping systems and section(s) to be tested.
 - c. Test type.
 - d. Method of isolation.
 - e. Calculation of maximum allowable leakage for piping section(s) to be tested.
2. Certifications of Calibration: Testing equipment.
3. Certified Test Report.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PREPARATION

- A. Notify Engineer in writing 5 days in advance of testing. Perform testing in presence of Engineer.
- B. Pressure Piping:
1. Install restraint as necessary to protect adjacent piping or equipment and make taps in piping prior to testing.
 2. Prior to test, remove or suitably isolate appurtenant instruments or devices that could be damaged by pressure testing.
 3. New Piping Connected to Existing Piping:
 - a. Isolate new piping with restrained spectacle flanges, blind flanges, or as acceptable to Engineer.
 - b. Test joint between new piping and existing piping by methods that do not place entire existing system under test load, as approved by Engineer.

4. Items that do Not Require Testing Include: Piping between wetwells, tank overflows to atmospheric vented drains, and tank atmospheric vents.
 5. Test Pressure: As indicated on Piping Schedule.
- C. Test section may be filled with water and allowed to stand under low pressure prior to testing.

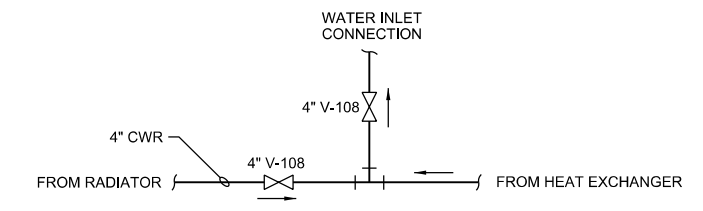
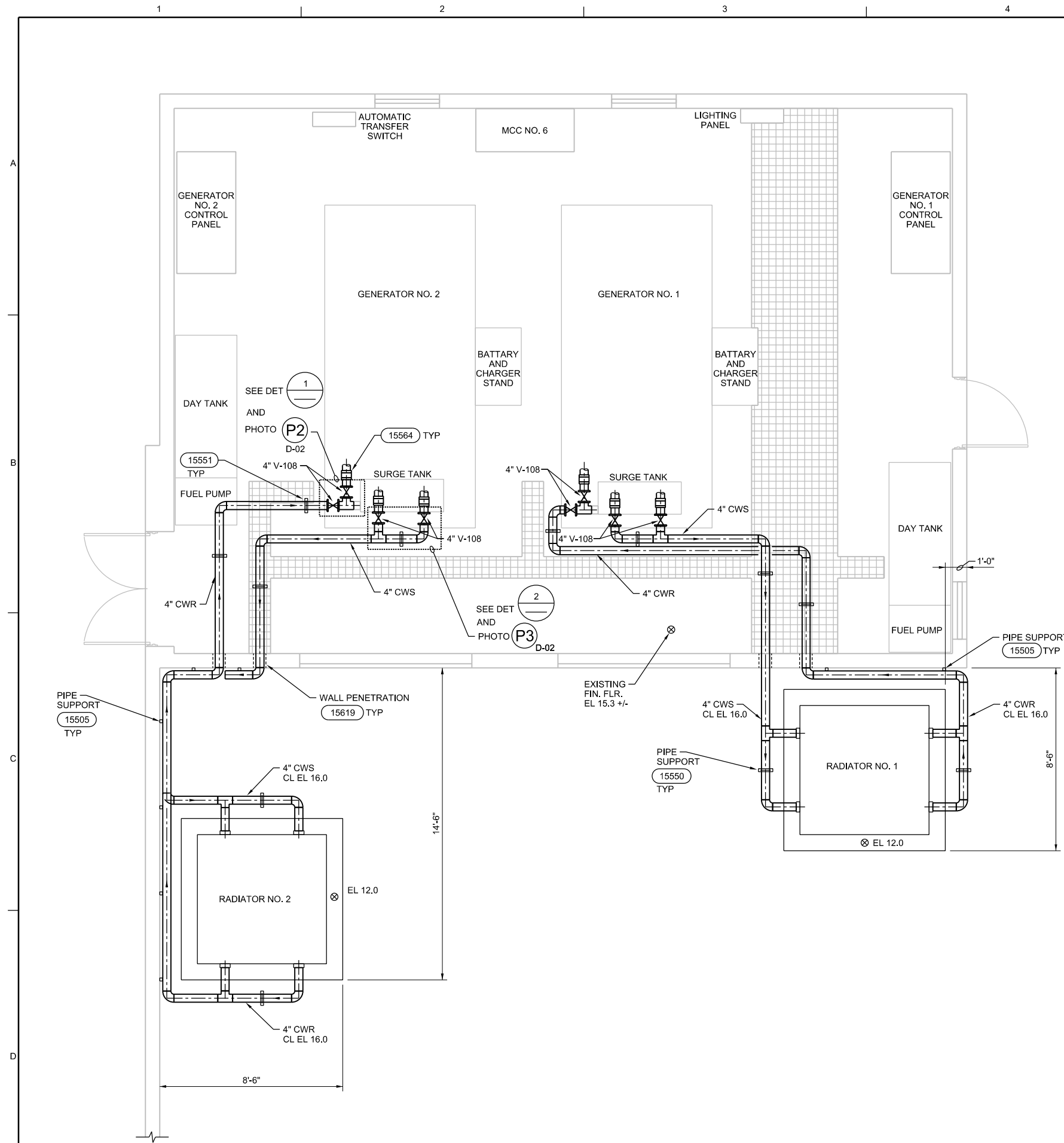
3.2 HYDROSTATIC TEST FOR PRESSURE PIPING

- A. Fluid: Potable water.
- B. Exposed Piping:
1. Perform testing on installed piping prior to application of insulation.
 2. Maximum Filling Velocity: 0.25 foot per second, applied over full area of pipe.
 3. Vent piping during filling. Open vents at high points of piping system or loosen flanges, using at least four bolts, or use equipment vents to purge air pockets.
 4. Maintain hydrostatic test pressure continuously for 2 hours, minimum, and for such additional time as necessary to conduct examinations for leakage.
 5. Examine joints and connections for leakage.
 6. Correct visible leakage and retest as specified.
 7. All of the Piping: Empty pipe of water prior to final cleaning or disinfection.

3.3 FIELD QUALITY CONTROL

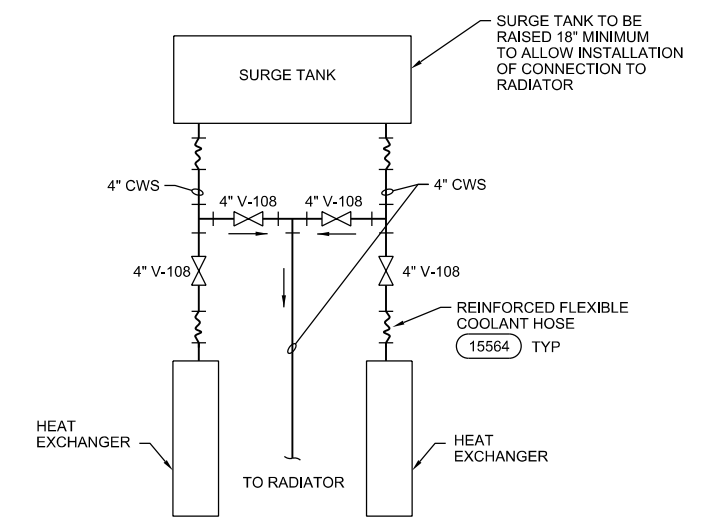
- A. Test Report Documentation:
1. Test date.
 2. Description and identification of piping tested.
 3. Test fluid.
 4. Test pressure.
 5. Remarks, Including:
 - a. Leaks (type, location).
 - b. Repair/replacement performed to remedy excessive leakage.
 6. Signed by Contractor to represent that test has been satisfactorily completed.

END OF SECTION



NOTE: CONTRACTOR TO ROUTE PIPING FROM RADIATOR.

1 CONNECTION POINT FROM RADIATOR
 NTS (TYP FOR GENERATOR NO. 1 & 2)
 D-01



NOTE: CONTRACTOR TO ROUTE PIPING TO RADIATOR.

2 CONNECTION POINT TO RADIATOR
 NTS (TYP FOR GENERATOR NO. 1 & 2)
 D-01

- NOTES:**
- CONTRACTOR TO FIELD ROUTE PIPING TO AND FROM RADIATOR.
 - CONTRACTOR TO SUPPORT NEW PIPE PER SECTION 40 05 15.
 - PIPE INSULATION PROVIDED PER SECTION 40 42 13.
 - RADIATOR TO BE YOUNG TOUCHSTONE (A WABTEC COMPANY) MODEL NO. HB24NX124115H XXXXX XXXXX R. FAN MODEL NO. 54-6-9XR-PAG-27; 54 INCH DIAMETER; 6 BLADES; 27.0 DEGREE PITCH OR EQUAL.
 - CONTRACTOR TO FIELD VERIFY ALL PIPE ROUTING AND ELEVATIONS.
 - CONTRACTOR TO REMOVE SHRUBS, GRASS AND LANDSCAPING NECESSARY TO INSTALL RADIATORS.
 - CONTRACTOR TO MODIFY SURGE TANKS SUPPORTS AS NECESSARY.

RADIATOR/GENERATOR BUILDING PLAN
 3/8"=1'-0"

CH2MHILL®

PROCESS MECHANICAL
PLANS, SECTIONS AND DIAGRAMS

3011 S.W. WILLISTON ROAD
 GAINESVILLE, FL 32608
 EB0000072 / AAC011992
 engineer's seal

GENERATOR RADIATOR ADDITION
 WATER TREATMENT PLANT
 CITY OF NAPLES
 NAPLES, FLORIDA

NO.	DATE	DR	CHK	APVD	SEAL NAME

VERIFY SCALE
 BAR IS ONE INCH ON ORIGINAL DRAWING.
 0 1"

DATE NOVEMBER 2014
 PROJ 440757
 DWG D-01
 SHEET 1 of 7

PRELIMINARY

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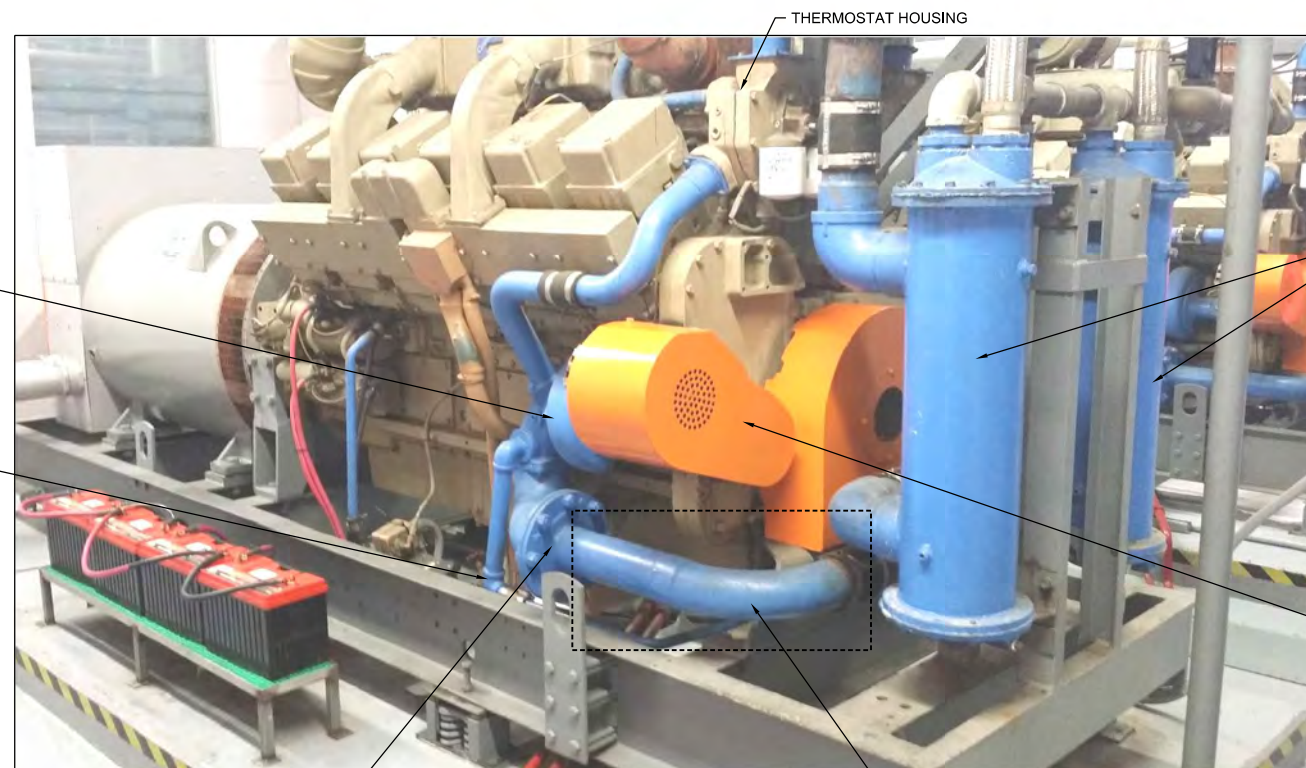


RADIATOR/GENERATOR CONNECTION - PHOTO

NTS

P1

D-01



RADIATOR/GENERATOR CONNECTION - PHOTO

NTS

P2

D-01



RADIATOR/GENERATOR CONNECTION - PHOTO

NTS

P3

D-01

NOTES:

1. SURGE TANK TO BE RAISED 18" MINIMUM TO ALLOW FOR INSTALLATION OF CONNECTIONS TO RADIATOR.
2. CONTRACTOR TO FIELD ROUTE PIPING TO AND FROM RADIATOR.

3011 S.W. WILLISTON ROAD
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EB0000072 - AAC001992
engineer's seal

GENERATOR RADIATOR ADDITION
WATER TREATMENT PLANT
CITY OF NAPLES
NAPLES, FLORIDA

CH2MHILL®

PROCESS MECHANICAL
PHOTOS

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.

DATE NOVEMBER 2014

PROJ 440757

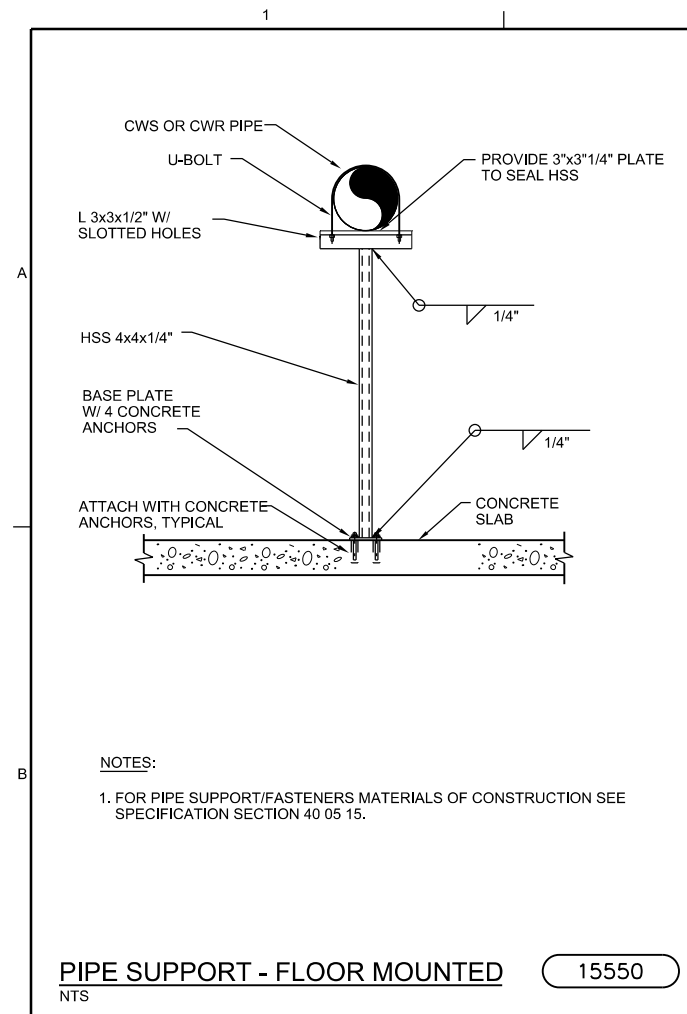
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SHEET 2 of 7

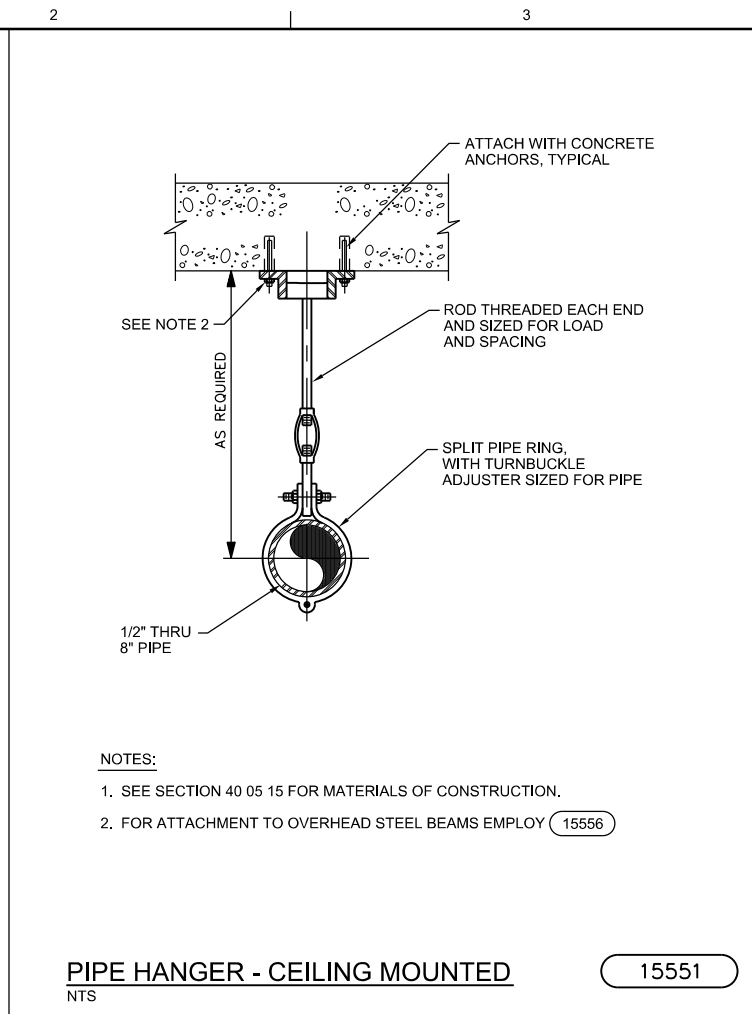
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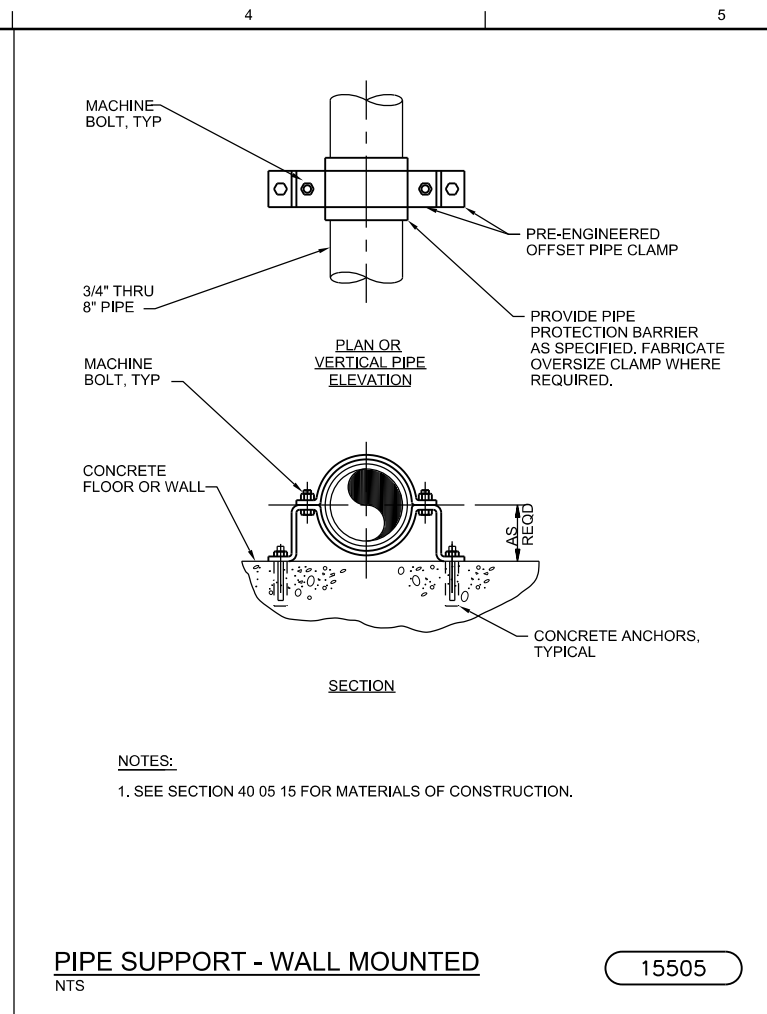
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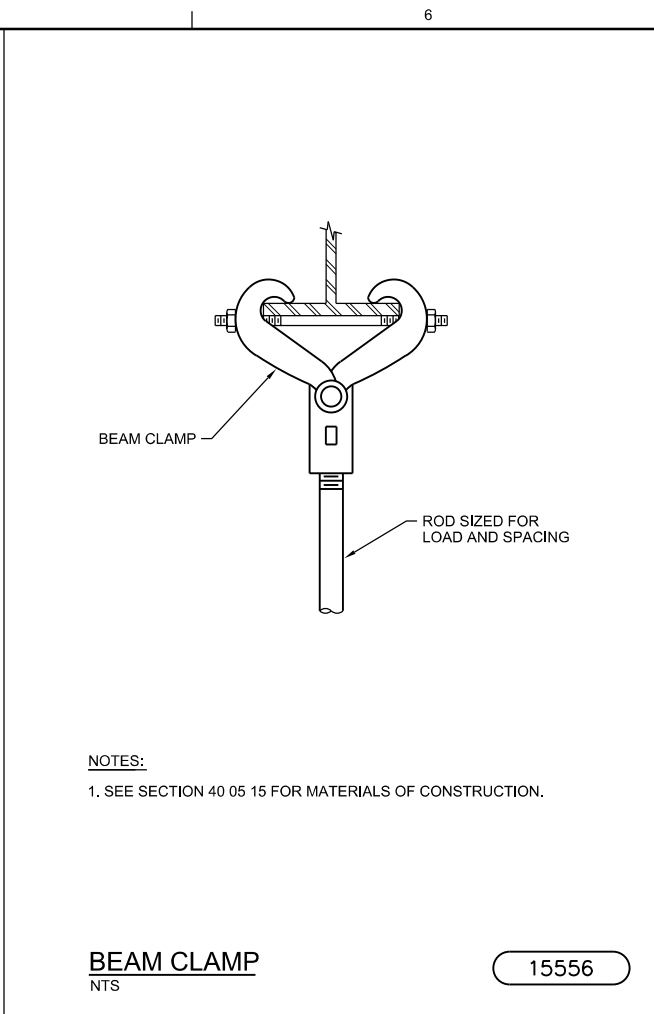
PIPE SUPPORT - FLOOR MOUNTED 15550
NTS



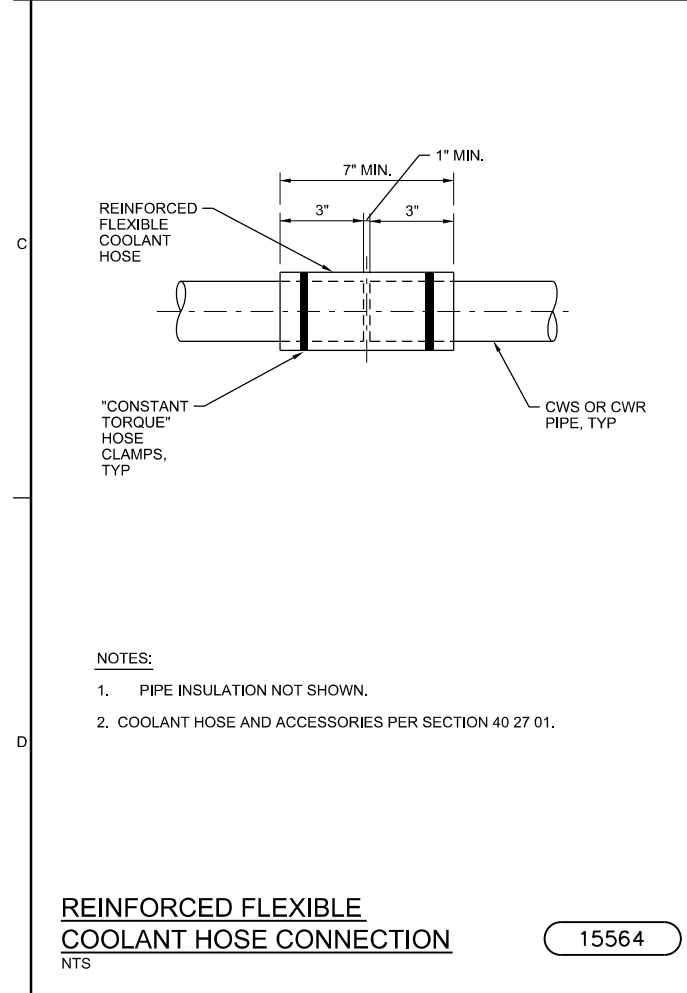
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NTS



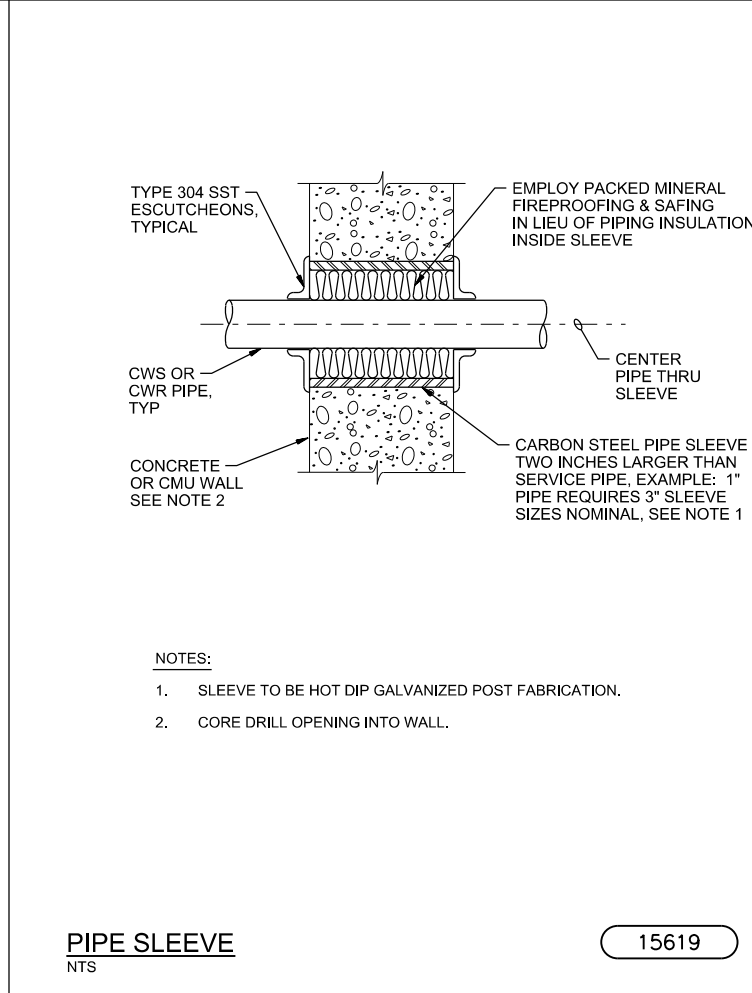
PIPE SUPPORT - WALL MOUNTED 15505
NTS



BEAM CLAMP 15556
NTS



REINFORCED FLEXIBLE COOLANT HOSE CONNECTION 15564
NTS



PIPE SLEEVE 15619
NTS

3011 S.W. WILLISTON ROAD GAINESVILLE, FL 32608 EB0000072 / AAC001992 engineer's seal		GENERATOR RADIATOR ADDITION WATER TREATMENT PLANT CITY OF NAPLES NAPLES, FLORIDA	
CH2MHILL® PROCESS MECHANICAL DETAILS		REVISION CHK APVD BY APVD SEAL/NAME	
VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"		NO. DATE DSGN DR L FINK CHECKER APVD SEAL/NAME	
DATE NOVEMBER 2014		PROJECT 440757	
DWG D-03		SHEET 3 of 7	

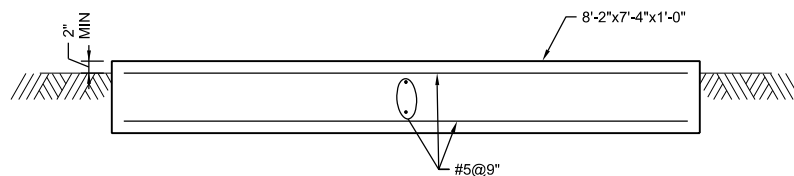
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STRUCTURAL GENERAL NOTES:

- STRUCTURAL DESIGN CRITERIA
 - APPLICABLE CODE: 2010 FLORIDA BUILDING CODE
 - WIND LOAD:
 - BASIC WIND SPEED

Vult	178 MPH
Vasd	138 MPH
 - RISK CATEGORY: III
 - EXPOSURE CATEGORY: C
- CONCRETE EQUIPMENT PAD
 - MINIMUM PAD SIZE SHOWN BASED ON EQUIPMENT CUT SHEET FOR HORIZONTAL REMOTE RADIATOR MODEL DS PROVIDED BY YOUNG TOUCHSTONE, WABTECH CORP. DISTANCE FROM CENTER OF EQUIPMENT ANCHOR BOLT TO EDGE OF CONCRETE SHALL BE 1'-0".
- FOUNDATION
 - CONCRETE EQUIPMENT PAD TO BE PLACED ON COMPACTED SUBGRADE. COMPACT SUBGRADE TO MIN 95% DRY DENSITY PER ASTM D1557. ONE COMPACTION TEST TO CONFIRM.
 - IF UNSUITABLE MATERIAL IS ENCOUNTERED, NOTIFY ENGINEER.
- CONCRETE MIX
 - CONCRETE SHALL BE IN ACCORDANCE WITH ACI 301-10.
 - MINIMUM COMPRESSIVE STRENGTH f_c SHALL BE 5,000 PSI AT 28 DAYS.
 - WATER/CEMENT RATIO SHALL NOT EXCEED 0.40.
 - CONCRETE MIXTURE SHALL BE DESIGNED FOR CONCRETE EXPOSURE CLASSES AND CATEGORIES F0S1P0C2.
 - AGGREGATE SHALL COMPLY WITH ASTM C33, CLASS DESIGNATION 4S AND NON-REACTIVE AS DETERMINED USING ONE OF THE FOLLOWING:
 - ASTM C1260
 - ASTM C1293
 - ASTM C1567
 - STRENGTH TEST:
 - ONE SPECIMEN AT 7 DAYS FOR INFORMATION.
 - TWO 6 INCH DIAMETER OR THREE 4 INCH DIAMETER TEST SPECIMENS AT AGE OF 28 DAYS FOR ACCEPTANCE.
 - PROVIDE A MINIMUM OF ONE SPARE TEST SPECIMEN PER SAMPLE.
 - PROVIDE BROOM FINISH ON EXTERIOR SLAB SURFACE. DO NOT SPRINKLE DRY CEMENT OR WATER ON SURFACE WHEN FINISHING.
 - APPLY ASTM C309 TYPE 1 OR 1-D CURING COMPOUND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CURE AND SEAL J-20 BY DAYTON SUPERIOR OR EQUAL.
 - CHAMFER EXPOSED EDGES OF CONCRETE 3/4 INCH.
- REINFORCING STEEL
 - DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60.
 - FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CRSI MSP-1 "MANUAL OF STANDARD PRACTICE".
 - CONCRETE COVER:
 - CAST AGAINST EARTH: 3 INCHES
 - OTHERWISE: 2 INCHES
 - SUPPORT REINFORCING STEEL OFF GROUND USING PRECAST CONCRETE DOBIES WITH WIRE TIES.
- EQUIPMENT ANCHORS
 - CONTRACTOR TO PROVIDE EQUIPMENT ANCHOR SYSTEM PER MANUFACTURER'S RECOMMENDATION. ANCHOR SYSTEM TO BE DESIGNED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF FLORIDA PER THE FLORIDA BUILDING CODE.



RADIATOR CONCRETE PAD DETAIL
3/4"=1'-0"

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3011 S.W. WILLISTON ROAD
GAINESVILLE, FL 32608
E80000072 / AAC001992
Clement Wilbert Anson, PE 75176

GENERATOR RADIATOR ADDITION
WATER TREATMENT PLANT
CITY OF NAPLES
NAPLES, FLORIDA

STRUCTURAL
GENERATOR RADIATORS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.

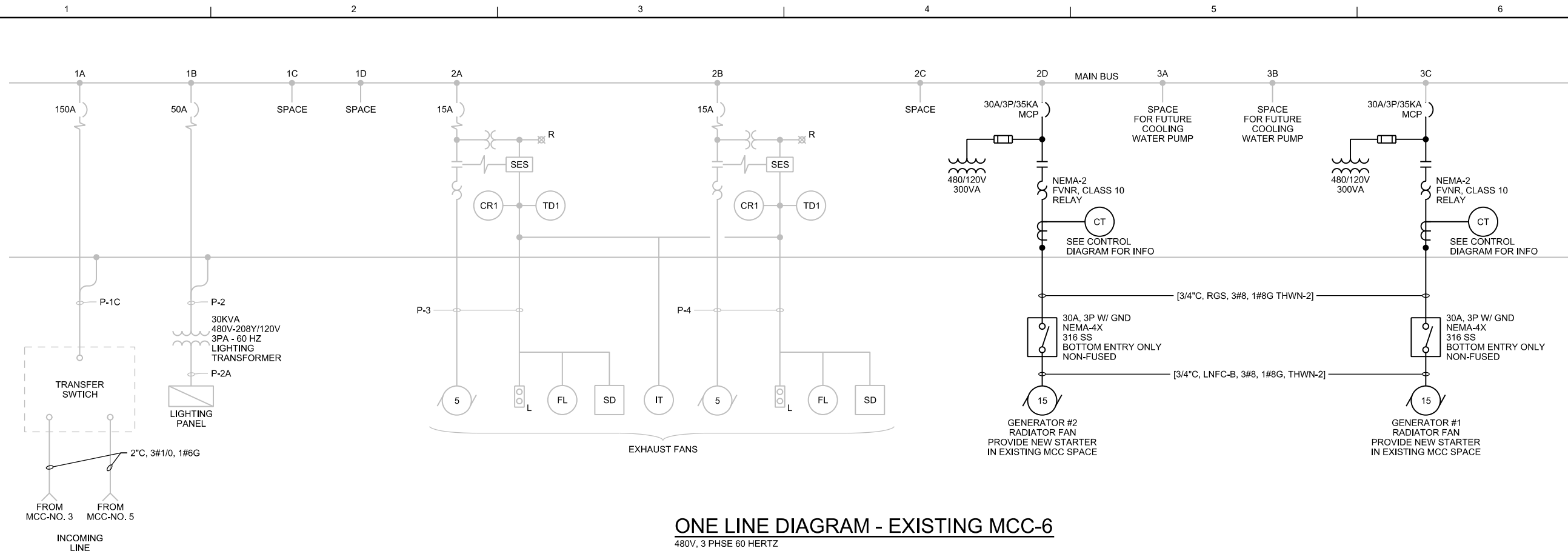
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SHEET 4 of 7

PRELIMINARY

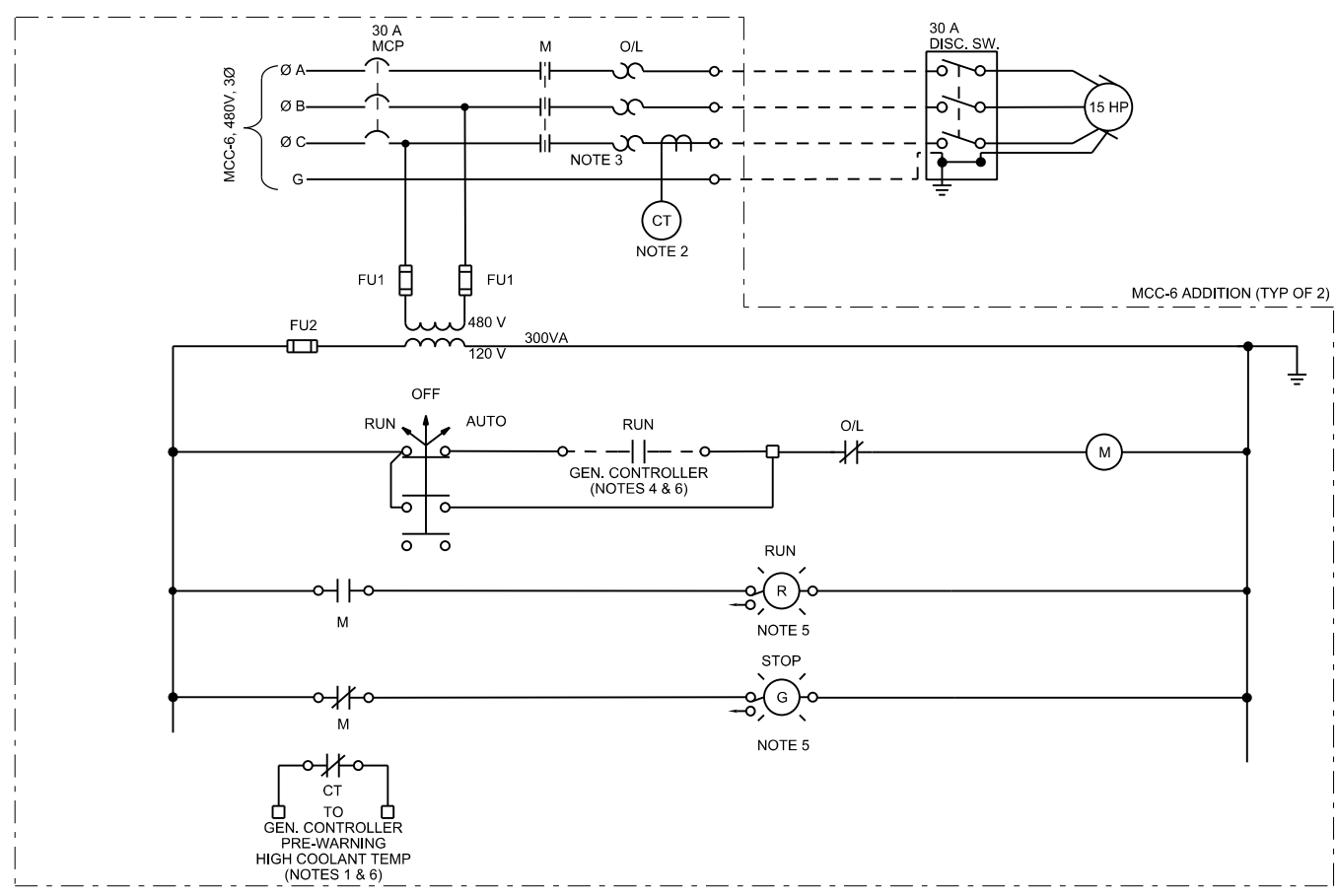
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NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
							C ANSON
							C ANSON
							D GARCIA
							J SCHOOLCRAFT



ONE LINE DIAGRAM - EXISTING MCC-6
480V, 3 PHSE 60 HERTZ



CONTROL DIAGRAM SCHEMATIC - REMOTE RADIATOR FAN

- NOTES:**
1. WIRE OUTPUT IN SERIES WITH CONTROLLER CONTACT FOR PRE-WARNING HIGH COOLANT TEMP ALARM (YELLOW LIGHT).
 2. KNG TECHNOLOGIES CAT. ASL2-NCU-FF SET TO 17 AMP OR 34% SETPOINT
 3. NEMA-2 FVNR COMBINATION MOTOR STARTER CLASS 10 RESETTABLE O/L RELAY.
 4. LOCATED ON GENERATOR CONTROLLER'S "RUN RELAYS" (K11). UTILIZE EITHER TERMINALS 7 AND 4, 8 AND 5, OR 9 AND 6 AS AVAILABLE.
 5. ALL LAMPS TO BE LED, 10,000 HR RATED, PUSH-TO-TEST.
 6. CONTROL WIRING BETWEEN MCC-6 AND GENERATOR CONTROLLER TO BE 2- #14, #14 GND THWN-2 IN 3/4 RGS CONDUIT.

CH2MHILL®
ELECTRICAL

3011 S.W. WILLISTON ROAD
GAINESVILLE, FL 32608
EB0000072 / AAC001992
engineer's seal

GENERATOR RADIATOR ADDITION
WATER TREATMENT PLANT
CITY OF NAPLES
NAPLES, FLORIDA

ONE LINE DIAGRAM AND CONTROL DIAGRAM

DATE: NOVEMBER 2014
PROJ: 440757
DWG: E-2
SHEET: 6 of 7

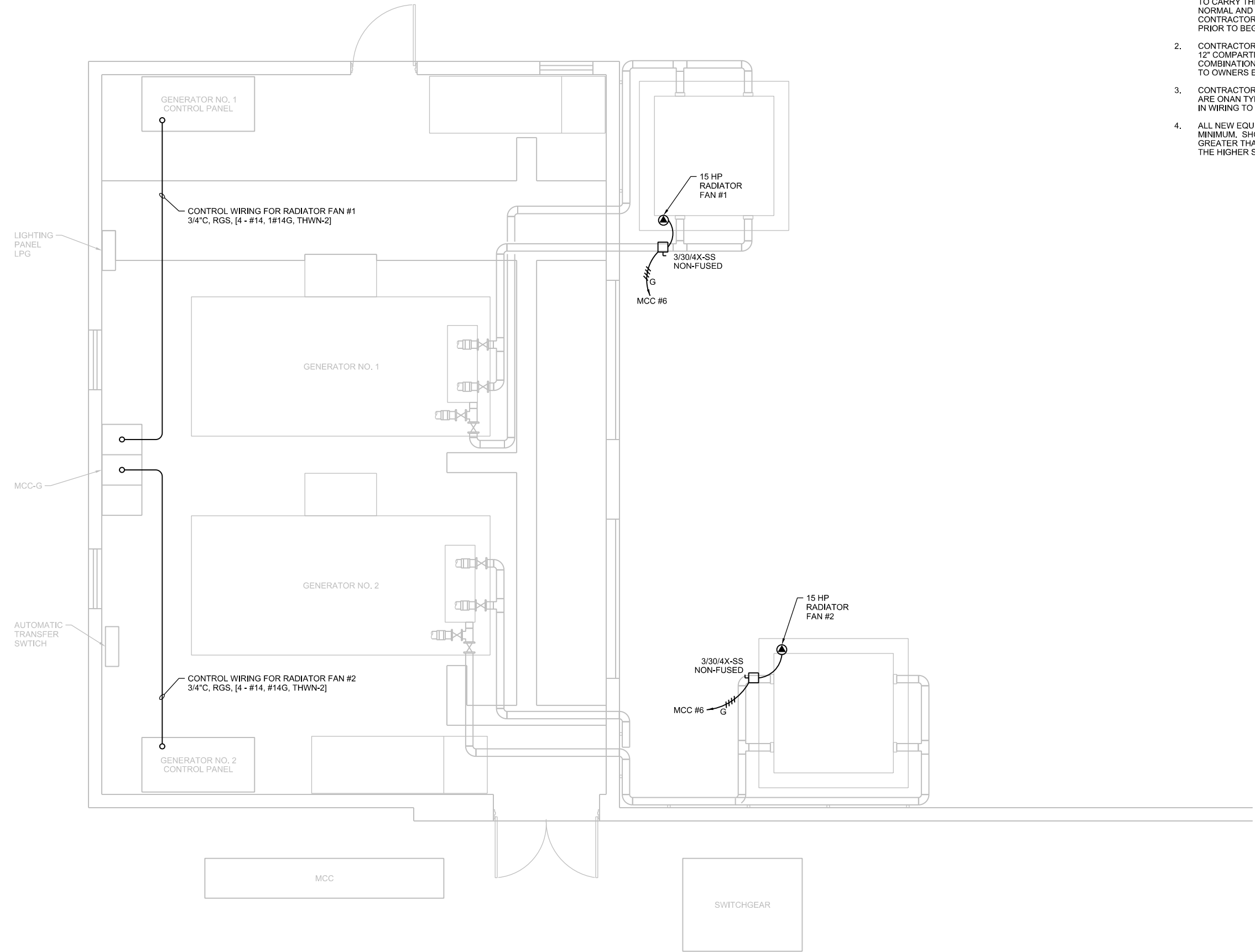
NTS
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

NO. DATE DSGN DR REVISION BY APVD

N ADAMS AL CLOUGH M GOSLOW M GOSLOW
DSGN DR CHK APVD BY APVD

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PRELIMINARY



NOTES:

1. CONTRACTOR TO VERIFY EXISTING CONTINUOUS LOADING ON MCC-6. CONFIRM THAT BOTH MCC-6 AND THE UPSTREAM DISTRIBUTION SYSTEM HAS SUFFICIENT ELECTRICAL CAPACITY TO CARRY THE TWO 15 HP RADIATOR FANS UNDER BOTH NORMAL AND ABNORMAL OPERATING CONDITIONS. CONTRACTOR TO VERIFY IN WRITING TO OWNER'S ENGINEER PRIOR TO BEGINNING WORK.
2. CONTRACTOR TO VERIFY THE AVAILABILITY OF TWO (2) SPARE 12" COMPARTMENTS IN MCC-6, EACH TO HOLD ONE NEMA-2 FVNR COMBINATION STARTER. CONTRACTOR TO VERIFY IN WRITING TO OWNERS ENGINEER PRIOR TO BEGINNING WORK.
3. CONTRACTOR TO VERIFY THAT BOTH GENERATOR CONTROLLERS ARE ONAN TYPE DETECTOR-7 UNITS. CONTRACTOR TO VERIFY IN WRITING TO OWNER'S ENGINEER PRIOR TO BEGINNING WORK.
4. ALL NEW EQUIPMENT SHALL HAVE A SCCR OF 35KA AT 480VAC, MINIMUM. SHOULD EXISTING MCC-6 HAVE A NAMEPLATE SCCR GREATER THAN 35KA, THEN ALL NEW EQUIPMENT SHALL MATCH THE HIGHER SCCR.

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GENERATOR RADIATOR ADDITION
WATER TREATMENT PLANT
CITY OF NAPLES
NAPLES, FLORIDA

CH2MHILL®
ELECTRICAL
PLAN VIEW

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	NOVEMBER 2014
PROJ	440757
DWG	E-3
SHEET	7 of 7

PRELIMINARY

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PLAN VIEW
3/8"=1'-0"

