GENERAL REQUIREMENTS

The 2010 Standard Specifications for Road, Bridge, and Municipal Construction as adopted by the Washington State Department of Transportation hereinafter referred to as the "Standard Specifications", shall hereby become part of this contract.

A copy of the Standard Specifications is on file in the Office of the Department of Municipal Services, Moses Lake, Washington, where they may be examined and consulted by any interested party.

Copies of the Standard Specifications are available for purchase from The Washington State Department of Transportation, Olympia, Washington.

The Special Provisions that follow (sections 1 to 9) amend the Standard Specifications mentioned above and describe work that is not covered in the Standard Specifications. The work on this contract shall be performed in accordance with these Special Provisions and the Standard Specifications insofar as applicable.

The City Council of the City of Moses Lake reserves the right to reject any or all bids or waive any or all irregularities if such action is in the best interest of the City.

All payments to the Contractor for the work required by these Plans and Specifications shall be as specified by the unit prices as bid in the proposal. If an item of work is called for, but is not specifically identified in a bid item, the cost for that work shall be included in other unit prices. These contract documents require a complete, fully operational, finished product; all costs for this shall be included in the contractor's bid.

PROJECT DESCRIPTION

This project includes construction of a removable pumphouse and a main well house building with electrical, control, and telemetry systems; and providing and installing a new bowl assembly, line shaft, column pipe, discharge head and support, and a 200 hp motor at the Well 31 site. The project will also include installing a new bowl assembly, line shaft, column pipe, discharge head and support, construction of a removable pumphouse, modifications of the existing electrical and telemetry system to accommodate the new pump, and a 125 hp motor at the Well 19 site.

CONTRACT DRAWINGS

The following plans and drawings are incorporated in and made a part of this contract. The plans and drawings are intended to show the scope of the work and provide detail as to construction method and contract limits. If details for particular work are not covered in the plans and listed drawings below, the current City of Moses Lake Community Standard details shall prevail.

Description	Sheet No.	File No.
Vicinity Map	1	B-444
Well 31 Site Plan	2	B-444
Well 31Pumphouse Details	3	B-444
Well 31 Piping Details	4	B-444
Well 31 Electrical Details	5	B-444
Well 19 Piping Details	6	B-444
Construction Details	7	B-444

SPECIAL PROVISIONS

DIVISION 1 GENERAL REQUIREMENTS

1-01 DEFINITIONS AND TERMS

1-01.3 DEFINITIONS

The section is supplemented with the following:

All references in the Standard Specifications to the terms "State", "Department of Transportation", "Washington State Transportation Commission", "Commission", "Secretary of Transportation", "Secretary", "Headquarters", and "State Treasurer" shall be revised to read "Contracting Agency".

All references to "State Materials Laboratory" shall be revised to read "Contracting Agency designated location".

The venue of all causes of action arising from the contract shall be in the Superior Court of the county where the Contracting Agency's headquarters is located.

Additive

A supplemental unit of work or group of bid items, identified separately in the proposal, which may, at the discretion of the Contracting Agency, be awarded in addition to the base bid.

Alternate

One of two or more units of work or groups of bid items, identified separately in the proposal, from which the Contracting Agency may make a choice between different methods or material of construction for performing the same work.

Attorney

The attorney duly authorized to act for the City in matters pertaining to law.

City Council

The duly elected or appointed Council of the City of Moses Lake, Washington.

Contract Time

The period of time established by the terms and conditions of the contract within which the work must be physically completed.

Dates

Bid Opening Date

The date on which the Contracting Agency publicly opens and reads the bids.

Award Date

The date of the formal decision of the Contracting Agency to accept the lowest responsible and responsive bidder for the work.

Contract Execution Date

The date the Contracting Agency officially binds the agency to the contract.

Notice to Proceed Date

The date stated in the Notice to Proceed on which the contract time begins.

Final Acceptance Date:

The date the City Council accepts the completed contract and items of work shown in the final estimate.

May

A permissive condition. Shall be at the discretion of the Engineer.

Notice of Award

The written notice from the Contracting Agency to the successful bidder signifying the Contracting Agency's acceptance of the bid.

Notice to Proceed

The written notice from the Contracting Agency or Engineer to the Contractor authorizing and directing the Contractor to proceed with the work and establishing the date on which the contract time begins.

Shall

A mandatory condition. Where certain requirements in the design or application of the device are described with the "shall" stipulation, it is mandatory when an installation is made that these requirements be met.

Should

An advisory condition. Where the word "should" is used, it is considered to be advisable usage, recommended but not mandatory.

Traffic

Both vehicular and non-vehicular users, such as pedestrians, bicyclists, wheelchairs, and equestrian.

Unworkable Days

An unworkable day is defined as a partial or whole day the Engineer declares to be unworkable because of weather, conditions caused by the weather, or such other conditions beyond the control of the Contractor that prevent satisfactory and timely performance of the work; and such performance, if not hindered, would have otherwise progressed toward physical completion of the work.

The section is revised by replacing the existing completion date definitions with the following:

Completion Dates

"Substantial Completion Date" is the day the Engineer determines the Contracting Agency has full and unrestricted use and benefit of the facilities, both from the operational and safety standpoint, all bid items are 100 percent complete and only minor incidental work, replacement of temporary substitute facilities, plant establishment periods, or correction/repair remains for the physical completion of the total contract.

"Physical Completion Date" is the day all of the work is physically completed on the project, including all punch list items. All documentation, required by the contract and required by law, does not necessarily need to be furnished by the Contractor by this date.

"Completion Date" is the day all the work specified in the contract is completed and all the obligations of the Contractor under the contract are fulfilled by the Contractor. All documentation required by the contract and by law must be furnished by the Contractor before establishment of this date. Included in this documentation will be Affidavits of Wages Paid and verification of payment of Workmen's Compensation Insurance premiums, among other items.

1-02 BID PROCEDURES AND CONDITIONS

SECTION 1-02.1 IS REPLACED WITH THE FOLLOWING:

1-02.1 QUALIFICATIONS OF BIDDERS

Bidders shall be qualified by experience, financing, equipment, and organization to do the work called for in the Contract Documents. The Contracting Agency reserves the right to take whatever action it deems necessary to ascertain the ability of the bidder to perform the work satisfactorily. This action may include a prequalification procedure prior to the bidder being furnished a proposal form on any contract, or a pre-award survey of the bidder's qualifications prior to award.

The bidder shall submit at the time of bid opening on standard forms furnished by the owner as part of the bid proposal, the following:

1. Qualifications of the Bidder.
2. Equipment list, including percentage of the time major equipment items will be on the job site.
3. General Superintendent's Resume - Resume of the individual who will be directly responsible for the work.

For this project bidders will not be pre-qualified prior to bid opening.

The City will determine qualified bidders and decide whether or not to proceed with a pre-award survey following review of the Contractors' bid package and other pertinent information gathered by the City.

1-02.2 PLANS & SPECIFICATIONS

The section is replaced with the following:

Information as to where Bid Documents can be obtained or reviewed will be found in the Call for Bids (Advertisement for Bids) for the work.

After award of the contract, plans and specifications will be issued to the Contractor as detailed in the Special Provisions.

Bidders may obtain complete plan and specification sets at the Municipal Services Department, City of Moses Lake, 321 South Balsam, (P.O. Box 1579) by paying a **non-refundable** fee as specified in The Notice to Contractors.

If the Owner should so require, evidence of legal authority to sign shall accompany the proposal or be on file with the Owner.

1-02.5 PROPOSAL FORMS

The section is replaced with the following:

At the request of a bidder, the Contracting Agency will provide a proposal form for any project on which the bidder is eligible to bid.

The proposal form will identify the project and its location and describe the work. It will also list estimated quantities, units of measurement, the items of work, and the materials to be furnished at the unit bid prices. The bidder shall complete spaces on the proposal form that call for, but are not limited to, unit prices; extensions; summations; the total bid amount; signatures; date; and, where applicable, retail sales taxes and acknowledgment of addenda; the bidder's name, address, telephone number, and signature; the bidder's D/M/WBE commitment, if applicable; a State of Washington Contractor's Registration Number; and a Business License Number, if applicable. Bids shall be completed by typing or shall be printed in ink by hand, preferably in black ink. The required certifications are included as part of the proposal form.

The Contracting Agency reserves the right to arrange the proposal forms with alternates and additives, if such be to the advantage of the Contracting Agency. The bidder shall bid on all alternates and additives set forth in the proposal forms unless otherwise specified in the Special Provisions.

Any correction to a bid made by interlineation, alteration, or erasure, shall be initialed by the signer of the bid. The bidder shall make no stipulation on the Bid Form, nor qualify the bid in any manner.

A bid by a corporation shall be executed in the corporate name, by the president or a vice president (or other corporate officer accompanied by evidence of authority to sign).

A bid by a partnership shall be executed in the partnership name, and signed by a partner. A copy of the partnership agreement shall be submitted with the Bid Form if any D/M/WBE requirements are to be satisfied through such an agreement.

A bid by a joint venture shall be executed in the joint venture name and signed by a member of the joint venture. A copy of the joint venture agreement shall be submitted with the Bid Form if any D/M/WBE requirements are to be satisfied through such an agreement.

1-02.7 BID DEPOSIT

The section is supplemented with the following:

On federally funded projects, the Contractor's surety company name must also appear on the United States Treasury Department's list of authorized sureties, Circular 570 as amended.

Bid bonds shall contain the following:

1. Contracting Agency-assigned number for the project;
2. Name of the project;
3. The Contracting Agency named as obligee;
4. The amount of the bid bond stated either as a dollar figure or as a percentage which represents five percent of the maximum bid amount that could be awarded;
5. Signature of the bidder's officer empowered to sign official statements. The signature of the person authorized to submit the bid should agree with the signature on the bond, and the title of the person must accompany the said signature;
6. The signature of the surety's officer empowered to sign the bond and the power of attorney.

If so stated in the Contract Provisions, bidder must use the bond form included in the Contract Provisions.

1-02.9 DELIVERY OF PROPOSAL

The section is replaced with the following:

The proposal shall be submitted at the time and place specified in the Notice to Contractors. The proposal, together with the Bid Bond and other required documentation as listed on the Proposer's Checklist shall be submitted and enclosed in a sealed envelope marked with the Owner's and Bidder's names and addresses. The name of the project for which the bid is submitted shall also be clearly written, printed, or typed on the outside of the envelope.

If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope. The Bidder shall assume full responsibility for the timely delivery at the location designated in the Notice to Contractors for receipt of Bids. A Bid submitted or delivered after the time fixed for receipt of Bids will not be accepted.

The official time for bid openings shall be per the official clock in the Engineering Secretarial office of the Moses Lake City Hall. The Bidders shall be responsible for synchronizing their watches with this clock prior to bid opening.

Bids which are received by fax will not be accepted.

1-02.13 IRREGULAR PROPOSALS

The section is revised by replacing item a in paragraph 1 with the following:

a. The bidder is not pre-qualified when so required;

The section is supplemented with the following:

1. j. The bidder has not purchased a complete set of plans and specifications from the City.

1-02.14 DISQUALIFICATION OF BIDDERS

The section is replaced with the following:

A bidder may be deemed not responsible and the proposal rejected if:

1. More than one proposal is submitted for the same project from a bidder under the same or different names;
2. Evidence of collusion exists with any other bidder or potential bidder. Participants in collusion will be restricted from submitting further bids;
3. The bidder, in the opinion of the Contracting Agency, is not qualified for the work or to the full extent of the bid, or to the extent that the bid exceeds the authorized prequalification amount as may have been determined by a prequalification of the bidder;
4. An unsatisfactory performance record exists based on past or current Contracting Agency work or for work done for others, as judged from the standpoint of conduct of the work; workmanship; progress; affirmative action; equal employment opportunity practices; or Disadvantaged Business Enterprise, Minority Business Enterprise, or Women's Business Enterprise utilization;
5. There is uncompleted work (Contracting Agency or otherwise) which might hinder or prevent the prompt completion of the work bid upon;
6. The bidder failed to settle bills for labor or materials on past or current contracts;
7. The bidder has failed to complete a written public contract or has been convicted of a crime arising from a previous public contract;
8. The bidder is unable, financially or otherwise, to perform the work;
9. A bidder is not authorized to do business in the State of Washington (not registered in accordance with RCW 18.27);
10. There are any other reasons deemed proper by the Contracting Agency.

1-02.15 PRE-AWARD INFORMATION

The section is supplemented with the following:

7. Obtain, and furnish a copy of, a business license to do business in the city or county where the work is located.
8. A copy of State of Washington Contractor's Registration.

1-03 AWARD AND EXECUTION OF CONTRACT

1-03.1 CONSIDERATION OF BIDS

The section is revised by replacing the last sentence of paragraph 1 with the following:

The total of extensions, corrected where necessary, including sales taxes where applicable and such additives and/or alternates as selected by the Contracting Agency, will be used by the Contracting Agency for award purposes and to fix the Awarded Contract Price amount and the amount of the contract bond.

1-03.2 AWARD OF CONTRACT

The section is replaced with the following:

Contract award will be based upon the lowest responsible bid, as determined by the City Council. In addition to price the City Council will consider past project experiences with the Contractor as well as experiences of other project owners, engineers, and architects. Contract award or bid rejection shall occur within 60 calendar days after the bid opening. If the lowest responsible bidder and the City agree, this deadline may be extended. If they cannot agree on an extension by the 60 calendar day deadline, the City reserves the right to award the contract to the next lowest responsible bidder that agrees to extend this deadline. The City will notify the successful bidder of the contract award in writing.

1-03.3 EXECUTION OF CONTRACT

The section is revised by placing the following sentence before the first paragraph:

The City will forward 3 copies of the contract to the Contractor within 5 working days after Award of the Contract by the City Council.

The section is revised by replacing the first sentence of paragraph 1 with the following:

Within 10 calendar days after the award date, or such other time frame identified in the Special Provisions, the successful bidder shall return the signed Contracting Agency-prepared contract, insurance certification as required by Section 1-07.18, and a satisfactory bond as required by law and Section 1-03.4.

The section is also revised by replacing the last paragraph with the following:

If the bidder experiences circumstances beyond their control that prevents return of the contract documents within 10 calendar days after the award date, the Contracting Agency may grant up to a maximum of 20 additional calendar days for return of the documents, provided the Contracting Agency deems the circumstances warrant it. However, contract working days shall begin as specified in Section 1-08.4.

1-03.4 CONTRACT BOND

The section is supplemented by adding the following to the first paragraph:

5. Be accompanied by a power of attorney for the Surety's officer empowered to sign the bond.
6. Be signed by an officer of the Contractor empowered to sign official statements (sole proprietor or partner). If the Contractor is a corporation, the bond must be signed by the president or vice-president, unless accompanied by written proof of the authority of the individual signing the bond to bind the corporation (i.e., corporate resolution, power of attorney or a letter to such effect by the president or vice-president).
7. Insure against defects appearing or developing in the material or workmanship provided or performed under this contract for one full year following the acceptance of this project by the City Council.

1-03.5 FAILURE TO EXECUTE CONTRACT

The section is replaced with the following:

If the successful bidder fails to sign and return the contract, or to furnish satisfactory bond and insurance within 10 calendar days from the date of award, or refuses, in writing, to enter into the contract, the successful bidder's Bid Bond shall be forfeited. The City may then award the contract to the second lowest responsible bidder. If the second lowest responsible bidder fails to enter into the contract or furnish satisfactory bond and insurance within ten calendar days after award has been made to the second bidder, the second bidder's Bid Bond shall also be forfeited. The contract may be awarded successively in a like manner to the remaining lowest responsible bidders until the contract and bond are executed and insurance furnished by a responsible bidder or the remaining proposals are rejected.

1-04 SCOPE OF THE WORK

1-04.2 COORDINATION OF CONTRACT DOCUMENTS, PLANS, SPECIAL PROVISIONS, SPECIFICATIONS, AND ADDENDA

This section is supplemented by adding the following:

If a bidder or a Contractor notes a discrepancy or a short coming in the bid documents, plans, or other contract documents, he/she shall bring this to the Engineer's attention immediately.

THE FOLLOWING SECTION (1-04.12) IS ADDED:

1-04.12 WASTE SITES

Waste sites shall be provided by the Contractor. Waste sites shall be operated in such a manner as to meet all laws, ordinances and the safety and health requirements of the State, County, and local political subdivision. Sites, operations, or results of such operations, which create a definite nuisance problem, or which result in damage to public or private properties shall not be permitted.

Copies of permits for borrow and waste sites, reclamation plans for pits, and grading plans for any borrow or waste (fill) sites of more than 40 cubic yards shall be furnished to the Owner by the Contractor.

THE FOLLOWING SECTION (1-04.13) IS ADDED:

1-04.13 USE OF PRIVATE PROPERTY

The Contractor shall obtain permission from the property owner before using any private property for any purpose related to the contract. Upon vacating the property and prior to physical completion, the Contractor shall furnish the Engineer with a release from all damages, signed and dated by the property owner.

1-05 CONTROL OF WORK

1-05.4 CONFORMITY WITH AND DEVIATIONS FROM PLANS AND STAKES

THE FOLLOWING SECTION (1-05.4(1)) IS ADDED:

1-05.4(1) ROADWAY AND UTILITY SURVEYS

The Engineer will set the following construction stakes and marks establishing lines, slopes, and grade:

1. For street construction - Offset stakes 2 feet behind sidewalk or bike path to top of curb elevation at a maximum of 50 foot intervals, and a minimum of 25 foot intervals.
2. For sewer construction - Offset stakes to pipe centerline and invert at changes in grade or alignment or at a minimum of 50 foot intervals.
3. For water main construction - Offset stakes to centerline and top of pipe at 100 foot intervals and at changes in alignment.
4. For structures, a minimum of two offset stakes for location and elevation.
5. Finish grade for paving in curb streets, one row of blue tops at crown line at 50 foot intervals.
6. Finish grade for paving uncurbed streets, three rows of blue tops (one at crown and one at each edge of pavement).
7. Subgrade for curbed streets - No stakes will be set. Contractor will be responsible for setting subgrade from offset cut and fill stakes or curb offset stakes if he/she requires them.
8. Subgrade for graveled streets - One row of red tops along centerline at 100 foot intervals.

The Contractor shall be responsible for setting all other control necessary to complete the work.

THE FOLLOWING SECTION (1-05.4(2)) IS ADDED:

1-05.4(2) BRIDGE AND STRUCTURE SURVEYS

For all structural work such as bridges and retaining walls, the Contractor shall retain as a part of Contractor's organization an experienced team of surveyors.

The Contractor shall provide all surveys required to complete the structure, except the following primary survey control which will be provided by the Engineer:

Centerline or offsets to centerline of the structure.
Stations of abutments and pier centerlines.
A sufficient number of bench marks for levels to enable the Contractor to set grades at reasonably short distances.
Monuments and control points as shown in the Plans.

The Contractor shall establish all secondary survey controls, both horizontal and vertical, as necessary to assure proper placement of all project elements based on the primary control points provided by the Engineer. Survey work shall be within the following tolerances:

Stationing	+.01 foot
Alignment	+.01 foot (between successive points)
Superstructure Elevations	+.01 foot (from plan elevations)
Substructure Elevations	+.05 foot (from plan elevations)

During the progress of the work, the Contractor shall make available to the Engineer all field books including survey information, footing elevations, cross sections and quantities.

The Contractor shall be fully responsible for the close coordination of field locations and measurements with appropriate dimensions of structural members being fabricated.

THE FOLLOWING SECTION (1-05.4(3)) IS ADDED:

1-05.4(3) GENERAL

The Engineer will provide construction stakes and marks establishing lines, slopes, and grades as stipulated in Section 1-05.4(1) and 1-05.4(2). The Contractor shall assume full responsibility for detailed dimensions, elevations, and excavation slopes measured from these Engineer- furnished stakes and marks.

The Contractor shall provide a work site which has been prepared to permit construction staking to proceed in a safe and orderly manner. The Contractor shall keep the Engineer informed of staking requirements and provide at least two working days notice to allow the Engineer adequate time for setting stakes.

Stakes, marks, and other reference points, including existing monumentation, set by Contracting Agency forces shall be carefully preserved by the Contractor. The Contractor will be charged a minimum of $25.00 each for the costs of replacing stakes, markers and monumentation that were not to be disturbed but were destroyed or damaged by the Contractor's operations. This charge will be deducted from monies due or to become due to the Contractor.

Any claim by the Contractor for extra compensation by reason of alterations or reconstruction work allegedly due to error in the Engineer's line and grade, will not be allowed unless the original control points set by the Engineer still exist, or unless other consecutive points set on line or grade still exist and can be used to determine the cause of any problems. Any variation shall, upon discovery, be reported to the Engineer. In the absence of such report the Contractor shall be liable for any error in alignment or grade.

1-05.7 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK

The section is supplemented with the following:

If the Contractor fails to remedy defective or unauthorized work within the time specified in a written notice from the Engineer, or fails to perform any part of the work required by the Contract Documents, the Engineer may correct and remedy such work as may be identified in the written notice, with Contracting Agency forces or by such other means as the Contracting Agency may deem necessary.

If the Contractor fails to comply with a written order to remedy what the Engineer determines to be an emergency situation, the Engineer may have the defective and unauthorized work corrected immediately, have the rejected work removed and replaced, or have work the Contractor refuses to perform completed by using Contracting Agency or other forces. An emergency situation is any situation when, in the opinion of the Engineer, a delay in its remedy could be potentially unsafe, or might cause serious risk of loss or damage to the public.

Direct or indirect costs incurred by the Contracting Agency attributable to correcting and remedying defective or unauthorized work, or work the Contractor failed or refused to perform, shall be paid by the Contractor. Payment will be deducted by the Engineer from monies due, or to become due,

the Contractor. Such direct and indirect costs shall include in particular, but without limitation, compensation for additional professional services required, and costs for repair and replacement of work of others destroyed or damaged by correction, removal, or replacement of the Contractor's unauthorized work.

No adjustment in contract time or compensation will be allowed because of the delay in the performance of the work attributable to the exercise of the Contracting Agency's rights provided by this Section.

The rights exercised under the provisions of this section shall not diminish the Contracting Agency's right to pursue any other avenue for additional remedy or damages with respect to the Contractor's failure to perform the work as required.

1-05.10 GUARANTEES

The section is supplemented with the following:

If within one year after the date of Final Acceptance of the work by the City Council, defective material or workmanship is discovered, the Contractor shall promptly, upon written request by the Engineer, return and either correct or replace the defective work. If weather or other factors prohibit corrections from being made within one year after final acceptance, the Contractor's bond shall stay in full force and effect until the corrections have been made and accepted by the City.

1-05.11 FINAL INSPECTION

The section is replaced with the following:

1-05.11(1) SUBSTANTIAL COMPLETION DATE

When the Contractor considers the work to be substantially complete, the Contractor shall so notify the Engineer and request the Engineer establish the Substantial Completion Date. The Contractor's request shall list the specific items of work that remain to be completed in order to reach physical completion. The Engineer will schedule an inspection of the work with the Contractor to determine the status of completion. The Engineer may also establish the Substantial Completion Date unilaterally.

After the Engineer determines that all bid items are 100% complete, the Engineer, by written notice to the Contractor, will set the substantial completion date. If, after this inspection the Engineer does not consider the work substantially complete and ready for its intended use, the Engineer will, by written notice, so notify the Contractor giving the reasons therefor.

Upon receipt of written notice concurring in or denying substantial completion, whichever is applicable, the Contractor shall pursue vigorously, diligently and without unauthorized interruption, the work necessary to reach Substantial and Physical Completion. The Contractor shall provide the Engineer with a revised schedule indicating when the Contractor expects to reach substantial and physical completion of the work.

The above process shall be repeated until the Engineer establishes the Substantial Completion Date and the Contractor considers the work physically complete and ready for final inspection.

1-05.11(2) FINAL INSPECTION AND PHYSICAL COMPLETION DATE

When the Contractor considers the work physically complete and ready for final inspection, the Contractor by written notice, shall request the Engineer to schedule a final inspection. The Engineer will set a date for final inspection. The Engineer and the Contractor will then make a final inspection and the Engineer will notify the Contractor in writing of all particulars in which the final inspection reveals the work incomplete or unacceptable. The Contractor shall immediately take such corrective measures as are necessary to remedy the listed deficiencies. Corrective work shall be pursued vigorously, diligently, and without interruption until physical completion of the listed deficiencies. This process will continue until the Engineer is satisfied the listed deficiencies have been corrected.

If action to correct the listed deficiencies is not initiated within 7 days after receipt of the written notice listing the deficiencies, the Engineer may, upon written notice to the Contractor, take whatever steps are necessary to correct those deficiencies pursuant to Section 1-05.7.

The Contractor will not be allowed an extension of contract time because of a delay in the performance of the work attributable to the exercise of the Engineer's right hereunder.

Upon correction of all deficiencies, the Engineer will notify the Contractor and the Contracting Agency, in writing, of the date upon which the work was considered physically complete. That date shall constitute the Physical Completion Date of the contract, but shall not imply acceptance of the work or that all the obligations of the Contractor under the contract have been fulfilled.

1-05.11(3) OPERATIONAL TESTING

It is the intent of the Contracting Agency to have at the Physical Completion Date a complete and operable system. Therefore when the work involves the installation of machinery or other mechanical equipment; street lighting, electrical distribution or signal systems; irrigation systems; buildings; or other similar work it may be desirable for the Engineer to have the Contractor operate and test the work for a period of time after final inspection but prior to the physical completion date. Whenever items of work are listed in the Contract Provisions for operational testing they shall be fully tested under operating conditions for the time period specified to ensure their acceptability prior to the Physical Completion Date. During and following the test period, the Contractor shall correct any items of workmanship, materials, or equipment which prove faulty, or that are not in first class operating condition. Equipment, electrical controls, meters, or other devices and equipment to be tested during this period shall be tested under the observation of the Engineer, so that the Engineer may determine their suitability for the purpose for which they were installed. The Physical Completion Date cannot be established until testing and corrections have been completed to the satisfaction of the Engineer.

The costs for power, gas, labor, material, supplies, and everything else needed to successfully complete operational testing, shall be included in the unit contract prices related to the system being tested, unless specifically set forth otherwise in the proposal.

Operational and test periods, when required by the Engineer, shall not affect a manufacturer's guaranties or warranties furnished under the terms of the contract.

1-05.13 SUPERINTENDENTS, LABOR, AND EQUIPMENT OF CONTRACTOR

The section is revised by replacing sentence 1 of paragraph 2 with the following:

Either the Contractor or the duly appointed Superintendent shall remain on site whenever work is underway.

The section is supplemented by adding the following to paragraph 2:

The Superintendent shall be an employee of the Contractor and shall not be a subcontractor or representative of a subcontractor. The Superintendent shall be designated by the Contractor and shall be present at the Preconstruction Meeting. The Engineer shall be notified in writing, by the Contractor, if a different Superintendent is designated during the span of the project. Before any work resumes with a new Superintendent, a meeting shall take place between the Contractor, the new Superintendent, the Project Engineer, and the Project Inspector. However, working days will continue to be charged during this time.

The section is revised by replacing the last paragraph with the following:

Whenever the Contracting Agency evaluates the Contractor's qualifications pursuant to Section 1-02.1, the Contracting Agency will take these performance reports into account.

THE FOLLOWING SECTION (1-05.16) IS ADDED:

1-05.16 WATER AND POWER

The Contractor shall make necessary arrangements, and shall bear the costs for power and water necessary for the performance of the work, unless the contract includes power and water as a pay item, or unless provided for otherwise in the Special Provisions.

THE FOLLOWING SECTION (1-05.17) IS ADDED:

1-05.17 ORAL AGREEMENTS

No oral agreement or conversation with any officer, agent, or employee of the Contracting Agency, either before or after execution of the contract, shall affect or modify any of the terms or obligations contained in any of the documents comprising the contract. Such oral agreement or conversation shall be considered as unofficial information and in no way binding upon the Contracting Agency, unless subsequently put in writing and signed by the Contracting Agency.

1-06 CONTROL OF MATERIAL

1-06.2 ACCEPTANCE OF MATERIALS

1-06.2(1) SAMPLES AND TESTS FOR ACCEPTANCE

The section is supplemented with the following:

A.W.W.A. - American Water Works Association. The effective date of the AWWA Specifications is on the first day of the second month after publication in the American Water Works Journal. The AWWA Specifications and Revisions thus in effect at the time of the call for bids shall apply whenever referenced in these specifications. Copies of the AWWA Specifications may be obtained from American Water Works Association, Inc., Customer Service, 6666 Quincy Avenue, Denver, Colorado, 80235.

Any testing done for this contract by the City will be done for the City's use. Despite what may be written in the WSDOT Specifications or the APWA Modifications to those Specifications, no minimum or maximum number of tests will be required of the City, and no limitations are placed on the City for reporting the test results or the form for providing this information to the Contractor. Any test results received will be passed along to the Contractor as requested, and as available. However, the City is not required to provide any test for any work to the Contractor or any other entity by any given time. The City subcontracts much of this testing and cannot guarantee when the results will be received, nor the accuracy of the results.

As an example, this applies to the asphalt sampling as covered in Division 5 of the WSDOT Specifications and these Special Provisions. Any asphalt testing done by the City may be reported to the Contractor when the results are known, but the City may take 48 hours or longer to report the results. There shall be no repercussions on the City if this occurs. The Contractor is responsible for knowing his product and equipment, and to do the work in accordance with the Contract requirements. The City has every intention of determining compliance and informing the Contractor of their results as soon as possible, but failure to test, to report, or using different methods does not in any way relieve the Contractor of his responsibility to perform the work in accordance with the Contract.

1-07 LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC

1-07.1 LAWS TO BE OBSERVED

The section is supplemented with the following:

In cases of conflict between different safety regulations, the more stringent regulation shall apply.

The Washington State Department of Labor and Industries shall be the sole and paramount administrative agency responsible for the administration of the provisions of the Washington Industrial Safety and Health Act of 1973 (WISHA).

The Contractor shall maintain at the project site office, or other well known place at the project site, all articles necessary for providing first aid to the injured. The Contractor shall establish, publish, and make known to all employees, procedures for ensuring immediate removal to a hospital, or doctor's care, persons, including employees, who may have been injured on the project site. Employees should not be permitted to work on the project site before the Contractor has established and made known procedures for removal of injured persons to a hospital or a doctor's care.

The Contractor shall have sole responsibility for the safety, efficiency, and adequacy of the Contractor's plant, appliances, and methods, and for any damage or injury resulting from their failure, or improper maintenance, use, or operation. The Contractor shall be solely and completely responsible for the conditions of the project site, including safety for all persons and property in the performance of the work. This requirement shall apply continuously, and not be limited to normal working hours. The required or implied duty of the Engineer to conduct construction review of the Contractor's performance does not, and shall not, be intended to include review and adequacy of the Contractor's safety measures in, on, or near the project site.

Section 1-07.2 and all of its sub-sections are replaced with the following:

1-07.2 STATE TAXES

1-07.2(1) GENERAL

The Washington State Department of Revenue has issued special rules on the State sales tax. Sections 1-07.2(1) through 1-07.2(4) are meant to clarify those rules. The Contractor should contact the Washington State Department of Revenue for answers to questions in this area. The Contracting Agency will not adjust its payment if the Contractor bases a bid on a misunderstood tax liability.

The Contractor shall include all Contractor-paid taxes in the unit bid prices or other contract amounts. In some cases, however, state retail sales tax will not be included.

Section 1-07.2(3) describes this exception.

The Contracting Agency will pay the retained percentage only if the Contractor has obtained from the Washington State Department of Revenue a certificate showing that all contract-related taxes have been paid (RCW 60.28.050). The Contracting Agency may deduct from its payments to the Contractor any amount the Contractor may owe the Washington State Department of Revenue, whether the amount owed relates to this contract or not. Any amount so deducted will be paid into the proper State fund.

The Contractor agrees to pay and report all sales taxes for this project under Code Number 1309, City of Moses Lake.

1-07.2(2) STATE SALES TAX - RULE 171

WAC 458-20-171, and its related rules, apply to building, repairing, or improving streets, roads, etc., which are owned by a municipal corporation, or political subdivision of the state, or by the United States, and which are used primarily for foot or vehicular traffic. This includes storm or combined sewer systems within and included as a part of the street or road drainage system and power lines when such are part of the roadway lighting system. For work performed in such cases, the Contractor shall include Washington State Retail Sales Taxes in the various unit bid item prices, or other contract amounts, including those that the Contractor pays on the purchase of the materials, equipment, or supplies used or consumed in doing the work.

1-07.2(3) STATE SALES TAX - RULE 170

WAC 458-20-170, and its related rules, apply to the constructing and repairing of new or existing buildings, or other structures, upon real property. This includes, but is not limited to, the construction of streets, roads, highways, etc., owned by the state of Washington; water mains and their appurtenances; sanitary sewers and sewage disposal systems unless such sewers and disposal systems are within, and a part of, a street or road drainage system; telephone, telegraph, electrical power distribution lines, or other conduits or lines in or above streets or roads, unless such power lines become a part of a street or road lighting system; and installing or attaching of any article of tangible personal property in or to real property, whether or not such personal property becomes a part of the realty by virtue of installation.

For work performed in such cases, the Contractor shall collect from the Contracting Agency, retail sales tax on the full contract price. The Contracting Agency will automatically add this sales tax to each payment to the Contractor. For this reason, the Contractor shall not include the retail sales tax in the unit bid item prices, or in any other contract amount subject to Rule 170, with the following exception.

Exception: The Contracting Agency will not add in sales tax for a payment the Contractor or a subcontractor makes on the purchase or rental of tools, machinery, equipment, or consumable

supplies not integrated into the project. Such sales taxes shall be included in the unit bid item prices or in any other contract amount.

1-07.2(4) SERVICES

The Contractor shall not collect retail sales tax from the Contracting Agency on any contract wholly for professional or other services (as defined in Washington State Department of Revenue Rules 138 and 244).

1-07.5 ENVIRONMENTAL REGULATIONS

1-07.5(4) AIR QUALITY

The section is revised by replacing paragraph 1 with the following:

The Contractor shall comply with the regulations of the local air pollution control authorities and/or with the regulations of the Department of Ecology, whichever are more stringent.

THE FOLLOWING SECTION (1-07.5) IS ADDED:

1-07.5(5) LIABILITY

The Contractor shall be liable for the payment of all fines and penalties resulting from failure to comply with the Federal, State, and local control regulations.

1-07.7 LOAD LIMITS

1-07.7(1) GENERAL

The section is revised by replacing paragraph 1 with the following:

While moving equipment or materials on any public street, road, or highway, the Contractor and its subcontractors, agents, or suppliers shall adhere to Chapter 46.44 of the Motor Vehicle Laws of the State of Washington and local laws that control traffic or limit loads. The contract neither exempts the Contractor, its subcontractors, agents, or suppliers from such laws, nor license overloads. At the Engineer's request, the Contractor shall furnish to the Engineer a listing of all haul vehicles to be used in the work. The list shall include vehicle owner, license number, tare weight, and maximum legal load for vehicle and trailer, if any. Payment shall not be made for any delivered material which is in excess of the legal weight for the delivery vehicle or combination.

1-07.13 CONTRACTOR'S RESPONSIBILITY FOR WORK

1-07.13(2) RELIEF OF RESPONSIBILITY FOR COMPLETED WORK

The section is replaced with the following:

The Contractor shall be responsible for maintaining and protecting all portions of the work until physical completion has been established for the project.

1-07.13(4) REPAIR OF DAMAGE

The section is replaced with the following:

The Contractor shall promptly repair all damage to either temporary or permanent work as directed by the Engineer. For damage qualifying for relief under Sections 1-07.13(1), 1-07.13(2), or 1-07.13(3), payment will be made in accordance with Section 1-04.4. Payment will be limited to repair of damaged work only. No payment will be made for delay or disruption to the work.

The Engineer may elect to accomplish repair by Contracting Agency forces or other means and deduct costs for such repairs from payments due the Contractor.

1-07.14 RESPONSIBILITY FOR DAMAGE

The section is supplemented with the following:

The Contractor recognizes that he/she is waiving immunity under Industrial Insurance Law, Title 51 RCW. This indemnification extends to the officials, officers, and employees of the City of Moses Lake and also includes attorneys' fees and the cost of establishing the right to indemnification hereunder in favor of the City of Moses Lake.

The Contractor shall provide the City a copy of their Washington State Dept. of Labor & Industries Industrial Insurance Certificate of Coverage. In addition, the Contractor warrants that he/she and all subcontractors shall pay all Industrial Insurance premiums due on this project. Proof that these payments have been made in full shall be provided to the City prior to the acceptance of the project by the City Council.

1-07.16 PROTECTION AND RESTORATION OF PROPERTY

1-07.16(1) PRIVATE/PUBLIC PROPERTY

The section is supplemented with the following:

When trenching is required within a planting strip, the Contractor shall protect the existing curb, gutter, and sidewalk from damage; utilizing, if necessary, timber pads of sufficient thickness, or other means as approved by the Engineer, to protect existing improvements. If the Engineer so requests, the Contractor shall demonstrate the method or procedure the Contractor will follow in protecting existing improvements before proceeding with trenching in a planting strip. Any damage to existing improvements shall be repaired promptly at the Contractor's expense.

Damaged sidewalk and driveway entrances in the Paver District shall be replaced with concrete pavers. Paver District boundaries are as shown in the *Community Street and Utility Standards*.

1-07.17 UTILITIES AND SIMILAR FACILITIES

The section is supplemented with the following:

No additional compensation shall be made to the Contractor for loss of time due to the removal or relocation of any utility or other facility; the Contractor shall consider such costs to be incidental to the other items of the contract.

The Contractor shall call the Washington Utilities Coordinating Council (800-424-5555), for field location, not less than two and not more than ten working days prior to any excavation, and cooperate with these agencies in the protection and relocation of the various underground installations. These agencies will give assistance in the location of the various utilities, but such assistance shall not relieve the Contractor from the responsibility for damage incurred, except as provided by State law.

1-07.18 PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE

The section is deleted and replaced with the following:

1-07.18(1) GENERAL REQUIREMENTS

The Contractor shall obtain and keep in force during the term of the contract and until 30 days after the physical completion date, unless otherwise indicated below, the following insurance with insurance companies or through sources approved by the State Insurance Commissioner pursuant to Title 48 RCW.

The insurance provided must be with an insurance company with a rating of A-: VII or higher in the A.M. Best's Key Rating Guide, which is licensed to do business in the state of Washington (or issued as a surplus line by a Washington Surplus lines broker). The Contracting Agency reserves the right to approve the security of the insurance provided, the company, terms and coverage, and the Certificate of Insurance.

If any policy is written on a claims made form, the retroactive date shall be prior to or coincident with the effective date of this contract. The policy shall state that coverage is claims made, and state the retroactive date. Claims made form coverage shall be maintained by the Contractor for a minimum of three years following the expiration or earlier termination of this contract, and the Contractor shall annually provide the Contracting Agency with proof of renewal. If renewal of the claims made form of coverage becomes unavailable, or economically prohibitive, the Contractor shall purchase an extended reporting period ("tail") or execute another form of guarantee acceptable to the Contracting Agency to assure financial responsibility for liability for services performed.

The policies of insurance shall contain a "cross liability" endorsement substantially as follows:

> The inclusion of more than one insured under this policy shall not affect the rights of any insured as respects any claim, suit, or judgment made or brought by or for any other insured or by or for any employee of any other insured. This policy shall protect each insured in the same manner as though a separate policy had been issued to each, except that nothing herein shall operate to increase the company's liability beyond the amount or amounts for which the company would have been liable had only one insured been named.

The policies of insurance for general, automobile, and pollution policies shall be specifically endorsed to name the Contracting Agency and its officers, elected officials, employees, agents and volunteers, and any other entity specifically required by the Contract Provisions, as additional insured(s).

In addition, Contractor's insurance shall be primary as respects the Contracting Agency, and any other insurance maintained by the Contracting Agency shall be excess and not contributing insurance with the Contractor's insurance.

The Contracting Agency shall be given at least 45 days prior written notice of any cancellation, reduction in coverage, or other material change in any insurance policy.

Insurance shall provide coverage to the Contractor, all subcontractors, and the Contracting Agency. The coverage shall protect against claims for personal injuries, including accidental death, as well as claims for property damages which may arise from any act or omission of the Contractor or the subcontractor, or by anyone directly or indirectly employed by either of them.

Contractor hereby assumes all risk of damage to its property, or injury to its officers, directors, agents, contractors, or invitees, in or about the Property from any cause, and hereby waives all claims against the Contracting Agency. The Contractor further waives, with respect to the Contracting Agency only, its immunity under RCW Title 51, Industrial Insurance.

Upon request, the Contractor shall forward to the Contracting Agency the original policy, or endorsement obtained, to a Contractor's policy currently in force.

The Contractor shall not begin work under the contract until the required insurance has been obtained and approved by the Contracting Agency.

Failure on the part of the Contractor to maintain the insurance as required shall constitute a material breach of contract upon which the Contracting Agency may, after giving five working days notice to the Contractor to correct the breach, immediately terminate the contract or, at its discretion, procure or renew such insurance and pay any and all premiums in connection therewith, with any sums so expended to be repaid to the Contracting Agency on demand, or at the sole discretion of the Contracting Agency, offset against funds due the Contractor from the Contracting Agency.

All costs for insurance shall be incidental to and included in the unit contract prices of the contract and no additional payment will be made.

1-07.18(2) COVERAGES AND LIMITS

The insurance shall provide the minimum coverages and limits set forth below. Providing coverage in these stated minimum limits shall not be construed to relieve the Contractor from liability in excess of such limits. All deductibles must be disclosed and are subject to approval by the Contracting Agency. The cost of any claim payments falling within the deductible shall be the responsibility of the Contractor.

1. A policy of Commercial General Liability Insurance, written on an insurance industry standard occurrence form: (CG 00 01) or equivalent, including all the usual coverage known as:

   Per project aggregate endorsement (CG2503)
   Premises/Operations Liability
   Products/Completed Operations - for a period of one year following final acceptance of the work.
   Personal/Advertising Injury
   Contractual Liability
   Independent Contractors Liability
   Stop Gap or Employers Contingent Liability
   Explosion, Collapse, or Underground (XCU), (as applicable)*
   Liquor Liability/Host Liquor Liability (as applicable)*
   Fire Damage Legal
   Blasting (as applicable)*

*These coverage are only required when the Contractor's work under this agreement includes exposures to which these specified coverage respond.

If the contract requires working over water, the following additional coverages are required, if so stated in the Contract Provisions:

a. Watercraft, owned and non-owned
b. U.S. Harborworkers'/Longshoremen and Jones Act

If any structures are involved in the contract, the Contractor shall provide property insurance under an "All Risk Builder's Risk" form in an amount equal to the value of the structure. The structure shall have All Risk Builders Risk Insurance inclusive of earthquake and flood subject to customary industry deductibles.

Other additional coverages that may be required will be listed in the Contract Provisions.

Such policy(ies) must provide the following minimum limits:

Bodily Injury and Property Damage

$1,000,000 General Aggregate
$1,000,000 Products & Completed Operations Aggregate
$1,000,000 Personal & Advertising Injury
$1,000,000 Each Occurrence
$50,000 Fire Damage

Stop Gap Employers Liability

$1,000,000 Each Accident
$1,000,000 Disease - Policy Limit
$1,000,000 Disease - Each Employee

2. Commercial Automobile Liability: as specified by Insurance Services Office, form number CA 0001, Symbol 1 (any auto), with an MCS 90 endorsement and a CA 9948 endorsement attached if "pollutants" as defined in exclusion 11 of the commercial auto policy are to be transported. Such policy(ies) must provide the following minimum limit:

Bodily Injury and Property Damage

$1,000,000 combined single limit

3. Excess or Umbrella Liability

$0 per occurrence and aggregate

4. A Pollution Liability policy, required if so stated in the Contract Provisions, providing coverage for claims involving remediation, disposal, or other handling of pollutants arising out of: (1) Contractor's operations related to this project; (2) transportation of hazardous materials to or from any site related to this project, including, but not limited to, the project site and any other site, including those owned by the Contractor or for which the Contractor is responsible; and (3) remediation, abatement, repair, maintenance or other work with lead-based paint or materials containing asbestos.

Such Pollution Liability policy shall provide the following minimum coverage for Bodily Injury and Property Damage:

$1,000,000 per occurrence

5. Professional Liability: Required if design services are a part of the work, to cover damages resulting from professional errors and omissions. Such policy must provide the following minimum coverage:

   $1,000,000 per claim and annual aggregate.

6. A policy of Worker's Compensation, as required by the Industrial Insurance Laws of the State of Washington. As respects Workers' Compensation insurance in the state of Washington, Contractor shall secure its liability for industrial injury to its employees in accordance with the provisions of RCW Title 51. If Contractor is qualified as a self-insurer in accordance with RCW 51.14, Contractor shall so certify by letter signed by a corporate officer indicating that it is a qualified self insured, and setting forth the limits of any policy of excess insurance covering its employees.

Maximum deductible coverage shall be $5,000 for all policies except Professional Liability which shall be a maximum of $10,000.

1-07.18(3) SUBCONTRACTORS

Contractor shall include all subcontractors as insureds under its policies or shall furnish separate evidence of insurance as stated above for each subcontractor. All coverage for subcontractors shall be subject to all the requirements stated herein and applicable to their profession.

1-07.18(4) EVIDENCE OF INSURANCE

When the Contractor delivers the executed contract for the work to the Contracting Agency it shall be accompanied by a Certificate(s) of Insurance and endorsements for each policy of insurance meeting the requirements set forth above. The certificate must conform to the following requirements:

An ACORD certificate Form 25-S, showing the insuring company, policy effective dates, limits of liability and the Schedule of Forms and Endorsements.

A copy of the endorsement naming the Contracting Agency and any other entities required by the Contract Provisions as Additional Insured(s), showing the policy number, and signed by an authorized representative of the insurance company on Form CG2010 (ISO) or equivalent.

The certificate(s) shall not contain the following or similar wording regarding cancellation notification to the Contracting Agency: "Failure to mail such notice shall impose no obligation or liability of any kind upon the company."

1-07.18(5) SELF-INSURANCE

Should Contractor be self-insured for any liability coverage, a letter from the Corporate Risk Manager, or appropriate Finance Officer, is acceptable-stipulating if actuarially funded and fund limits; plus any excess declaration pages to meet the contract requirements. Further, this letter shall advise how Contractor would protect and defend the Contracting Agency as an Additional Insured in their Self-Insured layer, and include claims-handling directions in the event of a claim.

1-07.23 PUBLIC CONVENIENCE AND SAFETY

1-07.23(1) CONSTRUCTION UNDER TRAFFIC

The section is supplemented with the following:

Emergency traffic such as police, fire, and disaster units shall be provided access at all times. The City Police, County Sheriff, and City and County Fire Departments shall be notified by the Contractor prior to any street closure and immediately upon reopening the street. In addition, the Contractor shall coordinate his/her activities with the school district, post office, all disposal firms and other services which may be operating in the project area. The Contractor shall be liable for any damages which may result from failure to provide reasonable notice, access, or coordination.

When construction operations are such that debris from the work is deposited on the streets, the Contractor shall remove on a daily basis, as a minimum, any deposits or debris which have accumulated on the roadway surface. Should daily removal be insufficient to keep the streets clean, the Contractor shall perform removal operations on a more frequent basis. If the Engineer determines that a more frequent cleaning is impractical or if the Contractor fails to keep the streets free from deposits and debris resulting from the work, the Contractor shall, upon order of the Engineer, provide facilities for and remove all clay or other deposits from the tires or between wheels before trucks or other equipment will be allowed to travel over paved streets. Should the Contractor fail or refuse to clean the streets, trucks, or equipment in question, the Engineer may order the work suspended at the Contractor's risk until compliance with the Contractor's obligation is assured; or the Engineer may order the streets in question cleaned by others. Working days shall continue to be charged to the contract. Such costs incurred by the Owner in achieving compliance with these contract requirements, including cleaning of the streets, shall be deducted from monies due or to become due to the Contractor on monthly estimates. The Contractor shall have no claim for delay, extension of contract time, or additional cost should the Engineer choose to suspend the Contractor's work until compliance is achieved.

THE FOLLOWING SECTION (1-07.23(1)A) IS ADDED:

1-07.23(1)A EXISTING TRAFFIC CONTROL AND STREET NAME SIGNS

Existing traffic control and street name signs which interfere with construction shall be relocated or removed by the Contractor and temporarily stored in a safe place. "Stop", "Yield", and "One-Way" signs shall be removed or relocated only upon approval of the Engineer. Existing signs shall not be removed until the Contractor has provided temporary measures sufficient to safeguard and direct traffic after the existing signs have been removed. Except as otherwise provided in the contract documents, preservation and maintenance of traffic control and street name signs shall be the sole responsibility of the Contractor. All temporary signs shall be in compliance with Section 1-10.3(3) of these specifications.

As work progresses and permits, temporarily relocated or removed traffic and street name signs shall be reset in their permanent location by the Contractor. Signs and other traffic control devices damaged or lost by the Contractor, shall be replaced or repaired by the Contractor at no cost to the Owner. The option of whether a sign shall be repaired or be replaced by the Contractor belongs to the Engineer; and such decision shall be final and binding on the Contractor.

THE FOLLOWING SECTION (1-07.23(1)B) IS ADDED:

1-07.23(1)B MAINTAINING ACCESS

The Contractor shall maintain access to residential and commercial property adjacent to the project. In no case will access to residential property be blocked or interrupted for more than 8 consecutive hours. Access to commercial property shall not be blocked or interrupted for more than 4 consecutive hours. The Contractor shall provide alternate access routes if the work requires blocking streets or driveways longer than the hours specified herein. The proposed alternate routes shall be approved by the Engineer and built by the Contractor at no additional expense to the City.

The Contractor shall provide a notice 24 hours in advance to all property owners whose parking will be restricted. The notice shall indicate where they may park and the name and phone number of the Engineer and Contractor.

1-07.23(2) CONSTRUCTION AND MAINTENANCE OF DETOURS

The section is revised by replacing paragraph 2 with the following:

The cost to cover construction, maintenance, and removal of all detours shown on the plans, or as proposed by the Contractor and approved by the Engineer, shall be included in the unit prices of the bid items in the proposal.

The section is supplemented with the following:

All detours within the limits of the project, required or necessitated by the work, shall be the responsibility of the Contractor. This work includes, but is not limited to, side street crossings, temporary bridges, freshly placed concrete, utilization of one or more lanes of the construction area for maintenance of through traffic, and related traffic control. Plans for such detours shall be in accordance with the requirements of Section 1-10. Surfacing and paving of all detours shall be consistent with the requirements of traffic as determined by the Engineer.

1-07.24 RIGHTS OF WAY

The section is replaced with the following:

Street right of way lines, limits of easements, and limits of construction permits are indicated in the Plans. The Contractor's construction activities shall be confined within these limits, unless arrangements for use of private property are made.

Generally, the Contracting Agency will have obtained, prior to bid opening, all rights of way and easements, both permanent and temporary, necessary for carrying out the work. Exceptions to this are noted in the Bid Documents or will be brought to the Contractor's attention by a duly issued Addendum.

Whenever any of the work is accomplished on or through property other than public right of way, the Contractor shall meet and fulfill all covenants and stipulations of any easement agreement obtained by the Contracting Agency from the owner of the private property. Copies of the easement agreements may be included in the Contract Provisions or made available to the Contractor as soon as practical after they have been obtained by the Engineer.

Whenever easements or rights of entry have not been acquired prior to advertising, these areas are so noted in the Plans. The Contractor shall not proceed with any portion of the work in areas where right of way, easements or rights of entry have not been acquired until the Engineer certifies to the

Contractor that the right of way or easement is available or that the right of entry has been received. If the Contractor is delayed due to acts of omission on the part of the Contracting Agency in obtaining easements, rights of entry or right of way, the Contractor will be entitled to an extension of time. The Contractor agrees that such delay shall not be a breach of contract.

Each property owner shall be given 48 hours notice prior to entry by the Contractor. This includes entry onto easements and private property where private improvements must be adjusted.

The Contractor shall be responsible for providing, without expense or liability to the Contracting Agency, any additional land and access thereto that the Contractor may desire for temporary construction facilities, storage of materials, or other Contractor needs. However, before using any private property, whether adjoining the work or not, the Contractor shall file with the Engineer a written permission of the private property owner, and, upon vacating the premises, a written release from the property owner of each property disturbed or otherwise interfered with by reasons of construction pursued under this contract. The statement shall be signed by the private property owner, or proper authority acting for the owner of the private property affected, stating that permission has been granted to use the property and all necessary permits have been obtained or, in the case of a release, that the restoration of the property has been satisfactorily accomplished. The statement shall include the parcel number, address, and date of signature. Written releases must be filed with the Engineer before the Completion Date will be established.

THE FOLLOWING SECTION (1-07.28) IS ADDED:

1-07.28 CONTRACTOR'S RESPONSIBILITY FOR SAFETY

The Contractor is solely responsible for the safety of all workers at the work site, no matter by whom they may be employed. Such responsibility shall include compliance with all local, State, and Federal safety laws, rules and regulations that are applicable to the site of all work to be performed by the Contractor, or any subcontractor, under this contract. The Contractor is not relieved of this responsibility by actions of the Owner in the inspection of work in progress, including trench safety progress, to insure contract compliance. The Owner's inspectors that might be assigned to perform inspections in connection with this contract are not safety inspectors. If the Contractor is uncertain as to the application of any safety rule or regulation, the Contractor is responsible for obtaining an opinion or inspection from the appropriate regulatory agency.

The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours.

The Contractor has been afforded an opportunity to inspect the work site. The Contractor enters into this contract being aware of the work site's present condition. The Contractor shall indemnify and hold the Owner harmless from any and all claims arising from the condition of the work site or on account of a claim of unsafe conditions maintained at the work site during the term of this contract.

1-08 PROSECUTION AND PROGRESS

*Section 1-08 is supplemented by adding the following**:***

1-08.0 PRELIMINARY MATTERS

1-08.0(1) PRECONSTRUCTION CONFERENCE

Prior to the Contractor beginning the work, a preconstruction conference will be held between the Contractor, the Engineer and such other interested parties as may be invited. The purpose of the preconstruction conference will be:

1. To review the initial progress schedule;
2. To establish a working understanding among the various parties associated or affected by the work;
3. To establish and review procedures for progress payment, notifications, approvals, submittals, etc.;
4. To establish normal working hours for the work;
5. To review safety standards and traffic control; and
6. To discuss such other related items as may be pertinent to the work.

The Contractor shall prepare and submit at the preconstruction meeting the following:

1. A breakdown of all lump sum items;
2. A preliminary schedule of working drawing submittals; and
3. A list of material sources for approval if applicable.

1-08.0(2) HOURS OF WORK

Except in the case of emergency or unless otherwise stated in the Special Provisions or approved by the Contracting Agency, the normal straight time working hours for the contract shall be any consecutive 8-hour period between 7:00 a.m. and 6:00 p.m. of a working day with a maximum 1-hour lunch break and a 5-day work week. The normal straight time 8-hour working period for the contract shall be established at the preconstruction conference or prior to the Contractor commencing the work.

If a Contractor desires to perform work on holidays, Saturdays, Sundays, or before 7:00 a.m. or after 6:00 p.m. on any day, the Contractor shall apply in writing to the Engineer for permission to work such times. Permission to work longer than an 8-hour period between 7:00 a.m. and 6:00 p.m. is not required. Such requests shall be submitted to the Engineer no later than noon on the working day prior to the day for which the Contractor is requesting permission to work.

Permission to work between the hours of 10:00 p.m. and 7:00 a.m. during weekdays and between the hours of 10:00 p.m. and 9:00 a.m. on weekends or holidays may also be subject to noise control requirements. Approval to continue work during these hours may be revoked at any time the Contractor exceeds the Contracting Agency's noise control regulations or complaints are received from the public or adjoining property owners regarding the noise from the Contractor's operations. The Contractor shall have no claim for damages or delays should such permission be revoked for these reasons.

Permission to work Saturdays, Sundays, holidays or other than the agreed upon normal straight time working hours Monday through Friday may be given subject to certain other conditions set forth by the Contracting Agency or Engineer. These conditions may include but are not limited to: requiring the Engineer or such assistants as the Engineer may deem necessary to be present during the work; requiring the Contractor to reimburse the Contracting Agency for the costs in excess of straight-time costs for Contracting Agency employees who worked during such times, on non Federal aid projects; considering the work performed on Saturdays and holidays as working days with regards to the contract time; and considering multiple work shifts as multiple working days with respect to contract time even though the multiple shifts occur in a single 24-hour period. Assistants may include, but are not limited to, survey crews; personnel from the Contracting Agency's material

testing lab; inspectors; and other Contracting Agency employees when in the opinion of the Engineer, such work necessitates their presence.

1-08.0(3) REIMBURSEMENT FOR OVERTIME WORK OF CONTRACTING AGENCY EMPLOYEES (NON FEDERAL AID PROJECTS ONLY)

Where the Contractor elects to work on a Saturday, Sunday, or holiday, or longer than an 8-hour work shift on a regular working day, as defined in the Standard Specifications, such work shall be considered as overtime work. On all such overtime work an inspector will be present, and a survey crew may be required at the discretion of the Engineer. The Contractor's payments from the Contracting Agency shall be reduced by a flat rate of $30.00 per hour for each hour any employee of the Contracting Agency is required to work overtime on the project.

The Contractor by these specifications does hereby authorize the Engineer to deduct such costs from the amount due or to become due to the Contractor.

1-08.1 SUBCONTRACTING

The section is revised by replacing sentence 1 of paragraph 1 with the following:

Work performed by the Contractor's organization shall amount to not less than the percentage specified in the bid proposal.

The section is supplemented by adding the following to paragraph 1:

For the purpose of determining the percentage of work to be subcontracted, the following items on this contract are designated as specialty items and may be subtracted from the awarded contract price before computing percentage by the Prime Contractor:

None

The section is revised by replacing sentence 2 and 3 of paragraph 8 with the following:

This certification shall be submitted to the Engineer, on the form provided by the Engineer, on the date cited in the Special Provisions, or 20 calendar days after physical completion of the contract, whichever comes first.

1-08.4 PROSECUTION OF WORK

The section is replaced with the following:

Written notice to proceed will be given after the contract has been executed by the Contracting Agency and the performance bond and all required insurance paperwork has been filed with and approved by the Contracting Agency. The Contractor shall not commence work under the contract until written authorization to proceed has been given by the Engineer.

Please note that the City Attorney will review the contract for signature once the complete set of contract paperwork has been submitted. This review will occur on the Tuesday following the submittal of the contract and insurance paperwork. Preliminary review by city staff will be done as soon as possible but may require two business days. The bidder is expected to determine the time needed for insurance and bonding companies to provide the required documents prior to bidding.

The last working day of the contract shall be calculated based on the bid award date plus twenty calendar days plus the working days in the contract. Whether paperwork has been completed by the Contractor or not, the working days shall begin twenty calendar days after the award date.

Contract working days shall start twenty calendar days after the date of the bid award. After receiving the Notice to Proceed letter the Contractor may physically start the work. **Note:** If Contractor is issued a Notice to Proceed by the Engineer prior to the twentieth calendar day, he/she may start early and those days shall not be charged as working days. The Contractor shall prosecute the work vigorously and continually to completion except when it is physically impossible to do so because of weather conditions or other unavoidable handicaps. The necessity of discontinuing and resuming work on any portion of the contract shall be determined by the Engineer.

No voluntary shutdowns or slowing of operations by the Contractor are allowed without prior approval of the Engineer; and such approval shall not relieve the Contractor from the contractual obligation to complete the contract work within the prescribed contract time.

The Contractor shall diligently pursue the work to the physical completion date within the time specified in the contract.

1-08.5 TIME FOR COMPLETION

The section is revised by replacing sentence 2 and 3 of paragraph 1 with the following:

Every day is a "working day" unless it is a Saturday, a Sunday, a day on which the contract specifically suspends work, or one of these holidays: January 1, the third Monday of February, Memorial Day, July 4, Labor Day, November 11, Thanksgiving Day, the day after Thanksgiving, and Christmas Day.

The section is revised by replacing paragraph 3 with the following:

Each successive working day, beginning twenty days after the bid has been awarded (Contract Start Date) and ending with the Physical Completion Date, shall be charged to the Contract Time as it occurs except a day or part of a day which is designated as an unworkable or non-working day by the Engineer.

The section is supplemented by adding the following to item 2 in the last paragraph:

e. Property owner releases per Section 1-07.24

The section is supplemented with the following:

If the Contractor elects to work 10 hours a day and 4 days a week (a 4-10 schedule) and the fifth day of the week in which a 4-10 shift is worked would ordinarily be charged as a working day then the fifth day of that week will be charged as a working day whether or not the Contractor works on that day.

1-08.7 MAINTENANCE DURING SUSPENSION

The section is revised by replacing paragraph 2 with the following:

At no expense to the Contracting Agency, the Contractor shall provide through the construction area a safe, smooth, and unobstructed roadway, sidewalk, and path for public use during suspension (as required in Section 1-07.23 or the Special Provision). This may include a temporary road or detour.

1-08.9 LIQUIDATED DAMAGES

All but the last two paragraphs of this section shall be replaced with the following:

Time is of the essence in this contract. Any late completion will inconvenience the public. In order to adjust for late completion, the following "Late Completion" Assessments shall be deducted from the payments made to the Contractor (or paid by the Contractor) for every working day of delay.

$$LCA = \frac{0.15 \times (Cost)}{Time}$$

Where: LCA = late completion assessment for public inconvenience (rounded to the nearest dollar). Charged for every working day of delay.

Cost = Original Contract Amount;

Time = Original time for physical completion in the contract.

The last two paragraphs of this section shall remain, the only change being that "liquidated damages" shall be replaced with "late completion assessment" wherever it occurs.

1-08.10 TERMINATION OF CONTRACT

1-08.10(1) TERMINATION FOR DEFAULT

The section is supplemented by adding the following to paragraph 1:

8. If the Contractor fails to provide or maintain adequate insurance as required by the contract. Insurance canceled or terminated during the contract shall cause a stop work order by the Owner until adequate insurance is obtained by the Contractor or until the contract is terminated. Working days shall continue to be charged during such an order.

1-09 MEASUREMENT AND PAYMENT

1-09.2 WEIGHING EQUIPMENT

1-09.2(1) GENERAL REQUIREMENTS FOR WEIGHING EQUIPMENT

The section is revised by replacing the last paragraph with the following:

The vehicle operator shall deliver the original ticket, in legible condition, to the City's inspector at the material delivery point. If an inspector for the City is not at the delivery site, the Contractor shall notify the Engineer immediately so that an inspector can be sent out. **No payment shall be made for materials which are delivered without an accompanying ticket which meets the requirements of the specifications. All tickets shall be provided by the Contractor to the inspector at the time and place that the material is delivered. Materials shall not be paid for if the tickets are not provided at the time of delivery. The material delivery point is defined as the location where the material is incorporated into the permanent work.**

Each weight or load ticket shall be numbered serially.

1-09.8 PAYMENT FOR MATERIAL ON HAND

The section is replaced with the following:

No separate payment shall be made for materials on hand.

1-09.9 PAYMENTS

The section is revised by replacing paragraph 3 with the following:

Progress estimates for progress payments will be based upon the quantities shown in the City Inspector's quantity book as of the first day of each month. The Contractor shall have 5 working days after receiving the pay estimate to disagree with these quantities. If the Contractor does not disagree within this time limit, the Engineer will assume the Contractor is in agreement and the progress payment shall be paid accordingly. The Contractor shall provide an invoice at the beginning of each month based on the Engineer's progress estimate prior to payment being processed.

The value of the progress estimate will be the sum of the following:

1. Unit Price Items in the Bid Form - the approximate quantity of acceptable units of work completed multiplied by the unit price.
2. Lump Sum Items in the Bid Form - the estimated percentage complete multiplied by the Bid Forms amount for each Lump Sum Item, or per the schedule of values for that item.
3. Change Orders - entitlement for approved extra cost or completed extra work as determined by the Engineer.

Progress payments will be made in accordance with the progress estimate less:

4. Retainage per Section 1-09.9(1);
5. The amount of Progress Payments previously made; and
6. Funds withheld by the Contracting Agency for disbursement in accordance with the Contract Documents.

Progress payments for work performed shall not be evidence of acceptable performance or an admission by the Contracting Agency that any work has been satisfactorily completed.

Payments will be made by warrants, issued by the Contracting Agency's fiscal officer, against the appropriate fund source for the project. Payments received on account of work performed by a subcontractor are subject to the provisions of RCW 39.04.250.

1-09.11 DISPUTES AND CLAIMS

1-09.11(3) TIME LIMITATION AND JURISDICTION

The section is supplemented with the following:

If the Contractor is an out-of-state resident, he/she shall designate an agent in Washington State upon whom process may be served before commencing work either under permit or bond.

1-09.13 CLAIMS RESOLUTION

1-09.13(3) CLAIMS $250,000 OR LESS

1-09.13(3)A ADMINISTRATION OF ARBITRATION

The section is revised by replacing sentence 1 of paragraph 3 with the following:

The Contracting Agency and the Contractor mutually agree to be bound by the decision of the arbitrator, and judgement upon the award rendered by the arbitrator may be entered in the Superior Court of the County in which Contracting Agency's headquarters are located.

DIVISION 2 EARTHWORK

2-02 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

2-02.3 CONSTRUCTION REQUIREMENTS

The section is supplemented with the following:

The removal of street improvements shall be conducted in such a manner as not to injure utilities and any portion of the improvement that is to remain in place. The Contractor shall be responsible for damage to improvements or utilities caused by careless removal.

2-02.3(3) REMOVAL OF PAVEMENT, SIDEWALKS, CURBS, AND GUTTERS

The section is replaced with the following:

Pavement, sidewalks, curbs, and gutters shall be removed as shown on the plans and as directed by the Engineer. Sidewalk aprons and private walks on street grading and paving projects shall be removed to the extent necessary to provide for construction of pavement, sidewalks, curbs, and gutters. After the curbs and pavement have been constructed, the Contractor will be required to remove any additional sidewalk required to provide proper connections and grades, as determined by the Engineer.

Pavement, sidewalk, and curb removed shall be disposed of at an approved waste site.

2-02.4 MEASUREMENT

The section is replaced with the following:

Measurement for "Remove Asphalt" shall be per square yard to the nearest 0.5 square yard.

Measurement for "Sawcut Asphalt or Concrete" shall be measured per linear foot. Measurement shall be along the lines shown on the Plans or as directed by the Engineer.

2-02.5 PAYMENT

The section is replaced with the following:

Payment will be made for the following items as included in the bid proposal:

"Remove Asphalt" per square yard.
"Sawcut Asphalt or Concrete" per linear foot.

The unit contract price for the above items shall be full compensation for labor and equipment required to remove and dispose of the above items as required by these specifications and as directed by the Engineer.

All items not included in the bid proposal shall be considered incidental to other items listed on the bid proposal.

2-03 ROADWAY EXCAVATION AND EMBANKMENT

2-03.3(14) EMBANKMENT CONSTRUCTION

2-03.3(14)D COMPACTION AND MOISTURE CONTROL TESTS

The section is replaced with the following:

Maximum density and optimum moisture for materials with more than 35 percent retained on the No. 4 sieve shall be determined by WSDOT Test Method No. 606.

Maximum density and optimum moisture for materials with 35 percent or less retained on the No. 4 sieve shall be determined by WSDOT Test Method No. 609, with the following exceptions:

1. 10 pound hammer shall be used.
2. 18-inch drop shall be used.
3. 5 lifts per test

These changes convert Test Method No. 609 to the Modified Proctor Test.

The Contractor shall provide all necessary excavation, vibratory compaction equipment, and labor to facilitate taking compaction tests. The City will provide the test equipment and operator. The Contractor shall provide all necessary test pits and additional work as directed by the Engineer. The Contractor shall provide the Engineer 24 hour notice prior to compacting to allow scheduling of testing of the compaction. Any references to compaction results shall be in accordance with Modified Proctor densities.

In the event more than 20 percent of the compaction tests fail, the Contractor shall reimburse the City for the percentage of failed tests over the above mentioned 20 percent. These tests shall cost $25.00 each ($40.00 if after normal working hours,) and these costs shall be deducted from the monthly estimate. All work required under this section shall be incidental to the bid items "Roadway Excavation" and "Roadway Embankment" as bid in the bid proposal.

THE FOLLOWING SECTIONS (2-03.3(19)) ARE ADDED:

2-03.3(19) PROTECTION OF EXISTING IMPROVEMENTS

2-03.3(19)A GENERAL

Utilities of record will be shown on the construction plans insofar as it is possible to do so. Failure of the Owner to show the existence of subsurface objects or installations on the plans shall not relieve the Contractor from his/her responsibility to call for utility locates, to make independent checks on the ground, nor relieve him/her from all liability for damages resulting from the work.

It shall be the responsibility of the Contractor to give proper notification to the agencies that have utilities in place and to cooperate with these agencies in the protection and relocation of the various underground installations. These agencies will give assistance in the location of the various utilities, but this shall not relieve the Contractor from responsibility for any damage incurred, except as provided by State law.

The Contractor shall protect and preserve existing manholes, water meters, catch basins, and other items lying within the right-of-way.

Trenching or other excavation that undermines curbs, sidewalks, driveways, footings or any other structures shall be backfilled with controlled density fill. Trenching or other excavation within the roadway of any City street less than 24 inches in width shall require controlled density fill. Excess material from this excavation shall be removed to an approved site per Section 2-01.2.

Controlled density fill shall meet the requirements as stated in Section 2-09.3(1)E.

2-03.3(19)C DAMAGED WATER MAINS AND APPURTENANCES

Any damage to water valves, hydrants, valve boxes and other surface appurtenances which results from the Contractor's operation shall be the responsibility of the Contractor to repair or replace.

2-03.3(19)D PRIVATE UTILITIES

Utilities other than those owned and operated by Owner are in streets pursuant to franchises or to rights claimed under the laws of the U.S.A. or the State of Washington; therefore, the respective utility agencies are responsible for all modifications and relocations of their facilities. The Contractor shall coordinate his/her work with that of the affected agencies and shall protect them from damage.

The Contractor shall be liable for all damages to private utilities resulting from his/her operations and shall hold the City harmless.

2-07 WATERING

2-07.3 CONSTRUCTION REQUIREMENTS

The section is supplemented with the following:

The Engineer may direct the Contractor to apply water for dust control at any time.

THE FOLLOWING SECTION (2-07.3(A)) IS ADDED:

2-07.3(A) CITY WATER SOURCE

The Contractor shall secure permission from and comply with all requirements of the City before obtaining water from a City water source. The Contractor shall measure all water obtained from the City with a City approved hydrant meter. The Contractor may provide his own meter subject to City Water Department approval, or rent one from the City Water Department The Contractor shall be responsible for the hydrant meter rental rate and water charges. Current water meter rental rates and water charges may be obtained by contacting the City of Moses Lake, Municipal Services Department, Maintenance Division, at 11789 Road 4 NE. The Contractor shall be responsible for protecting the City hydrant meter and associated apparatus from damage, loss, or theft until all items are returned to the possession of the water utility.

The Contractor shall furnish all connectors, wrenches, valves and small tools that may be necessary to meet the requirements of the City. The Contractor shall use hydrant wrenches to open and close hydrants.

When using the valve, the Contractor shall make certain that the hydrant valve is completely open or shut. An approved auxiliary valve shall be provided on the outlet line for control purposes. Fire hydrant valves shall be closed slowly to prevent surging of the system.

When use of the hydrant is complete, the Contractor shall notify the City to read the meter and so the hydrant may be inspected for possible damage. Any damage resulting from the use of the hydrant by the Contractor, including theft of City equipment, shall be repaired or replaced by the City, and the cost thereof shall be withheld from the final payment to the Contractor.

THE FOLLOWING SECTION (2-07.3(B)) IS ADDED:

2-07.3(B) NON-CITY WATER SOURCE

Water from a source other than from a fire hydrant shall be measured by a meter supplied by the Contractor and approved by the Engineer.

2-07.5 PAYMENT

The section is replaced with the following:

"Water", per M Gallon.

The unit contract price per M Gallon for "Water" shall be full pay for all labor, city water charges, materials, tools, and equipment required to furnish, haul, and apply one thousand gallons of water for compaction and dust control as required by these specifications and as directed by the Engineer.

2-09 STRUCTURE EXCAVATION

2-09.3 CONSTRUCTION REQUIREMENTS

2-09.3(1)D DISPOSAL OF EXCAVATED MATERIAL

The section is revised by replacing paragraph 2 with the following.

All costs for disposing of excavated material shall be included in the bid items included in the proposal.

2-09.3(4) CONSTRUCTION REQUIREMENTS, STRUCTURE EXCAVATION, CLASS B

The section is revised by replacing paragraph 3 with the following:

If workers enter any trench or other excavation 4 feet or more in depth, then the Contractor shall provide trench safety systems meeting the requirements of the Washington Industrial Safety and Health Act, Chapter 49.17 RCW and WAC 296-155. Trench safety systems may include shoring, extra trench excavation, or other methods acceptable to the Department of Labor and Industries. The Contractor alone shall be responsible for worker safety and the City assumes no responsibility.

2-09.4 MEASUREMENT

The section is replaced with the following:

No specific unit of measurement shall apply to the lump sum item of shoring or extra excavation Class A.

Shoring or extra excavation Class B shall be measured by the square foot as follows:

Where a pipe trench is excavated to a depth of four feet or more and shoring or other trench safety method in conformance with WISHA requirements is used or the earth faces of the trench are excavated to the maximum allowable slope, such trench safety systems will be measured by the square foot along one vertical plane, along the centerline of the trench, including structures. Measurement will be made from the invert of the pipe to the top of the surface of the ground where the work begins.

Gravel backfill shall not be measured as part of this section.

2-09.5 PAYMENT

The section is replaced with the following:

Payment will be made for each of the following bid items when included in the bid proposal:

"Shoring or Extra Excavation Class B", per square foot.

The unit contract price per square foot for "Shoring or Extra Excavation Class B" shall be full pay for the construction and removal of shoring or providing a trench box and extra excavation, backfill, and other work required to provide trench safety meeting all local, State, and Federal safety standards.

Excavation, compaction, and dewatering for structures shall be considered incidental to the structure bid item in the proposal. Excavation, compaction, pipe bedding, controlled density backfill, and dewatering for pipe and culverts shall be considered incidental to the unit prices for pipe and culvert as bid in the proposal.

2-11 TRIMMING AND CLEANUP

2-11.1 DESCRIPTION

The section is replaced with the following:

This work consists of neatly finishing construction areas to the lines, grades, and cross sections shown on the Plans and as directed by the Engineer. The work shall include trimming and cleaning the entire area.

2-11.3 CONSTRUCTION REQUIREMENTS

The section is replaced with the following:

The area shall be smoothed and finished to the required cross section and grade by means of a grading machine insofar as it is possible to do so without damaging existing improvements. Machine dressing shall be supplemented by hand work to meet requirements outlined herein or as directed by the Engineer.

Upon completion of cleaning and dressing the project shall appear uniform in all respects. All graded areas shall be true to line and grade as shown on the typical sections and as required by the Engineer.

Irregularities in the slopes shall be removed and slopes dressed neatly so as to present a uniformly sloped surface.

All windrows of earth shall be removed entirely. Trash of all kinds resulting from clearing and grubbing or grading operations shall be removed and not placed in areas adjacent to the project. Where machine operations have broken down brush and trees beyond the limits of the project, the Contractor shall remove and dispose of this material at his/her own expense.

The drywell shall be cleaned of all debris which is the result of the Contractor's operations.

DIVISION 5 SURFACE TREATMENTS AND PAVEMENTS

5-04 HOT MIX ASPHALT

5-04.3 CONSTRUCTION REQUIREMENTS

5-04.3(9) SPREADING AND FINISHING

The section is revised by replacing sentence 3 of paragraph 1 with the following:

The nominal compacted depth of any layer of any course shall not exceed 2.5 inches in depth.

The section is supplemented with the following:

Asphaltic emulsion paint binder shall be applied to all vertical surfaces of existing pavement, curbs, gutters, and construction joints against which additional material is to be placed, to a pavement to be resurfaced and to other surfaces designated by the Engineer.

THE FOLLOWING SECTIONS (5-06) ARE ADDED:

5-06 HOT MIX ASPHALT PATCHING

5-06.1 DESCRIPTION

The work shall consist of the removal of asphalt, or concrete pavement, placing CSTC, application of tack coat, and patching of asphalt concrete pavement in accordance with the details shown in the plans, and these specifications, and in conformity to the lines and grades shown in the plans or as directed by the Engineer.

5-06.2 MATERIALS

Materials shall meet the requirements of the following sections:

Hot Mix Asphalt	5-04
Crushed Surfacing	9-03.9(3)

Hot mix asphalt used for pavement patching may be Class ½-inch asphalt with performance grade 64-22 asphalt binder.

5-06.3 CONSTRUCTION REQUIREMENTS

5-06.3(1) GENERAL

Pavement patching shall be scheduled to accommodate the demands of traffic. All pavement removal shall be patched within 10 calendar days of the removal of the original asphalt.

Sawcutting shall be performed as shown on the plans or as directed by the Engineer. Existing Asphalt Concrete which becomes damaged during the patching process or due to the Contractor's procedures shall be removed and replaced by the Contractor at no expense to the City.

Asphaltic emulsion paint binder shall be evenly applied to all vertical surfaces of existing pavement, curbs, gutters, construction joints, and improvements against which additional material is to be placed. This asphalt emulsion paint binder shall also be applied to existing horizontal concrete surfaces which will be overlaid with hot mix asphalt. Asphaltic emulsion paint binder shall be applied within 1 hour of the application of hot mix asphalt. The Contractor shall notify the Engineer twenty-four hours prior to application of asphalt emulsion paint binder so that it may be inspected by the Engineer before it is concealed by hot mix asphalt.

5-06.3(2) GRADE TOLERANCE

Grade tolerance for the surface to receive hot mix asphalt shall be plus 0.02 feet or minus 0.04 feet. The Contractor shall give the Engineer notice when placement of crushed surface top course has

been completed. The Contractor shall not proceed with paving until the crushed surfacing finished grade has been measured and approved by the Engineer. Any areas not conforming to the above tolerance shall be corrected by the Contractor and re-measured and approved by the Engineer prior to proceeding with the work.

5-06.3(3) SPREADING AND FINISHING

Hot mix asphalt patches with total depths exceeding 2.5 inches shall require at least 2 paving applications at depths as determined by the Engineer. Hot mix asphalt shall be placed to the required thickness and compacted in accordance with Section 5-04.3(10).

The Contractor shall use a paving machine for all patching in excess of 8 feet wide.

5-06.3(4) TRAFFIC CONTROL

Proper signs, barricades, lights, and other warning devices shall be maintained 24 hours a day until the patch is completed and ready for traffic.

5-06.3(5) TEMPORARY PATCHES

Temporary patches, consisting of cold plant mix, asphalt, or concrete, shall be placed by the Contractor within eight calendar days if permanent patches cannot be constructed within eight calendar days following excavation. Physical completion will not be declared until all temporary patches have been replaced by permanent patches by the Contractor.

5-06.3(5)A TEMPORARY PATCHES - COLD PLANT MIX ASPHALT

1. The temporary patch shall be a minimum of 0.2 feet thick.
2. The temporary patch shall match the existing grade.
3. The temporary patch shall be removed and replaced with permanent patches in accordance with plans and specifications prior to the following May 15th.
4. When the temporary patch is replaced, the patch shall be expanded an additional 12 inches around the exterior perimeter and sawcut prior to the placement of CSTC and/or HMA.

5-06.3(5)B TEMPORARY PATCHES - CONCRETE

1. The cement concrete shall be class 3000.
2. The temporary patch shall be a minimum of 6 inches in depth.
3. The temporary patch shall match the existing grade.
4. Steel plates shall be placed over the patch area and traffic restored within 2 hours of the placement of the concrete. The steel plates shall be removed when the concrete has set up a minimum of 1500 psi.
5. The temporary concrete patch shall be removed and replaced with permanent patches in accordance with plans and specifications prior to the following May 15th.
6. When the temporary patch is replaced, the patch area shall be expanded an additional 12 inches around the exterior perimeter and sawcut prior to the placement of CSTC and/or HMA.

5-06.4 MEASUREMENT

Hot mix asphalt patching will be measured by the square yard to the lines shown on the Plans or as directed by the Engineer. Patching in excess of lines shown on the Plans or as directed by the Engineer will not be measured.

Cold mix placed for temporary patches will not be measured.

Crushed surfacing top course placed in preparation for hot mix asphalt patching will not be measured.

No additional measurement shall be made for asphalt patch beyond the original limits due to temporary patches being placed.

5-06.5 PAYMENT

Payment will be made for the following Bid Item:

"HMA Patch Cl. __ PG _____", per square yard.

The unit contract price per square yard for "HMA Patch Cl. __ PG _____ " shall be full compensation for all labor, materials and equipment necessary or incidental to the installation of the patch including but not limited to the removal of asphalt or concrete, excavation, temporary patches, crushed surfacing top course, tack, compaction and hot mix asphalt.

No payment shall be made for temporary patches and no payment shall be made for patches in excess of the original limits due to temporary patches being placed.

The project shall not be declared substantially complete until all temporary patches have been replaced with permanent patches.

DIVISION 6 STRUCTURES

6-02 CONCRETE STRUCTURES

6-02.3 CONSTRUCTION REQUIREMENTS

6-02.3(2)B COMMERCIAL CONCRETE

The section is replaced with the following:

Commercial class concrete shall not be used on City projects.

6-02.3(4)C CONSISTENCY

The section is revised by replacing Item 3 with the following:

3. 4 inches for non-vibrated concrete. (Includes class 4000 P)

6-11 REMOVABLE PUMPHOUSE AND MAIN STRUCTURES

6-11.1 DESCRIPTION

The main structure shall consist of insulated concrete block walls, and insulated gable roof, concrete foundation and a concrete slab floor. The exterior door to the piping room shall be a 6-foot steel, double door with a steel frame.

The concrete floor in the main building shall be painted. The Engineer shall approve the paint and color before the Contractor applies the material.

Two outlets as shown on the plans shall only be energized when the 200 horsepower motor is running or if the H-O-A switch in the electrical room is in the hand position. The Contractor shall coordinate with the Engineer to determine the location of the two outlets.

6-11.2 MATERIALS

For the materials of the concrete slab floor refer to section 6-02.2.

Concrete	6-02
Floor Drain	9-05.15(2)
Rebar	9-07
Blocks	9-12
Interior Sheathing	9-46
Fiberglass Reinforced Plastic Panels	9-47
Commercial Steel Doors and Frames	9-48
Locksets	9-49

Removable Structure

Submit a design similar to the structures at Wells 7, 9, 10, 14, 17, 18, and 23 or a 10' x 10' prefabricated structure with adequate height for the motor, approved color, blockout for pipe, specified lock, and all electrical and vent items shown in plans. The blockout shall allow for the building to be removed without having to disassemble the wall or piping.

6-11.3 CONSTRUCTION REQUIREMENTS

All structures described in this section shall be built in compliance with the International Building Code as adopted by the City of Moses Lake.

Insulation in the ceiling shall be fiberglass batt.

Inside sheathing shall be as follows:

Piping room (lower 4 feet)	1/2" cement board
Piping room (upper 6 feet), electrical room, and ceiling	5/8" gypsum sheathing

All interior surfaces shall be painted white (with an exterior type semigloss paint), and fastened on with 1" wood screws.

Exterior roof decking shall be 7/16" OSB. The roof shall be prefinished metal that coordinates with the exterior walls. The soffit shall be covered outside with continuous venting aluminum. Exterior walls, except for the gabled ends, shall be tan, split-faced CMU block as approved by the Engineer. The gabled ends may be concrete block matching the walls or prefinished metal as approved by the Engineer.

The doors shall be 18 guage steel and have stainless steel doorknobs on the interior and exterior. The lock shall be capable of being keyed with a Best, 6-pin interchangeable core for the project. The City shall supply and install the construction cores for the project and replace the cores upon project acceptance.

The main building shall have two 480 volt heaters that are sufficient to maintain the temperature above 40 degrees F.

The floor shall have a grade that slopes to the drains.

6-11.3(1) CONCRETE SLAB FLOOR

A class 3000 concrete slab containing fibermesh will be constructed for the pumphouse floor. The slab will be built in accordance with the materials and specifications of section 6-02. The floor will be protected from freezing during the one week curing time. Curing compound shall be sprayed over the surface within two hours of the completion of steel trowel finishing of the floor, unless directed otherwise by the Engineer. The minimum floor depth is 6 inches and shall be sloped as shown in the plans or as directed by the Engineer.

All concrete block outs in the floor shall be filled and surfaced to match the adjacent floor and seams filled with mastic to facilitate future removal.

6-11.3(2) REMOVABLE PUMPHOUSE STRUCTURE

This section includes all structural work at the wellhead.

A concrete slab shall be placed as shown on the plans. The slab will not be placed until all conduits are installed, and approved by the Engineer. The floor shall be 6-inches thick with a 12-inch by 12-inch thickened edge.

The discharge head support shall meet the pump manufacturers recommendations as to strength and materials. The support shall include a gasketed, air and water tight seal at the top of the well casing. The well casing shall be vented by a well vent style screened cap on the sounding pipe with the open end downward facing..

The removable wellhead structure is intended to facilitate maintenance of the pump, well, and motor and is a design - build structure in these specifications so that the pump installer has the opportunity to incorporate his ideas and experience into the design. If the Contractor chooses to build the structure, plans must be submitted prior to construction. The removable building shall have steel siding and painted plywood interior finish.

The structure must perform as a heated ventilated structure and meet the minimum requirements of the International Building Code for local conditions. The contractor must demonstrate that the structure can be removed and reinstalled by a two man crew in four hours or less. The only non-hand held tools allowed for this removal and reinstallation shall be a crane. The structure must have sufficient structural integrity to withstand the removal and re-installation process without forming gaps or cracks greater than 3/16 of an inch in width or two inches in length. Lifting required to remove the structure must be no more than that available to the rigs used to lift the pump and motor.

6-11.3(2) FIBERGLASS REINFORCED PLASTIC PANEL

The Contractor shall install a fiberglass plastic panel over the finished cement board in the piping room in accordance with the manufacturers recommendation. This panel will protect the walls from spray that might result from the piping systems and from occasional wash downs. The panels shall cover the lower four feet of the wall in the piping room.

6-11.4 MEASUREMENT

Measurement for "Removable Pumphouse and Main Structures" shall be per lump sum, and shall include all materials, and labor required to complete the main structure as shown on the structural plans and to purchase or design and build the removable pumphouse structure shown as submitted and approved.

Note: The electrical and plumbing plans and specifications include items of work that require blockouts or wall or floor penetrations -- this contract specifies a complete working unit; therefore, these structures shall not be considered more than 90 percent complete until the electrical and plumbing systems and all other items are complete and working.

6-11.5 PAYMENT

"Removable Pumphouse and Main Structures", per lump sum.

Payment for "Removable Pumphouse and Main Structures" shall be per lump sum shall be full compensation for all labor, materials, and equipment necessary to provide the complete buildings shown in the plans and as submitted, including at a minimum the framing, roofing, block, rebar, doors, doorknobs, vents, fans, ventilation cutouts, insulation, painting, fiberglass reinforced plastic panels, concrete slab floor and footings, floor grading, excavation, compaction, drains, drain lines, drain tiles, and ceiling.

Payment includes all labor and materials to make a complete working unit of the structures. This includes the removable pumphouse structure, discharge head support, casing seal, insulation, concrete slab and footings, excavation, and compaction. Payment includes all design costs, and costs related to demonstrating the structures' performance.

“Removable Pumphouse at Well #19", per lump sum.

Payment for "Removable Pumphouse at Well #19" shall be per lump sum shall be full compensation for all labor, materials, and equipment necessary to provide the complete building shown in the plans and as submitted, including at a minimum the framing, roofing, doors, doorknobs, vents, fans, ventilation cutouts, painting, concrete slab floor, floor grading, excavation, compaction, drain, drain line, drain tile, and interior sheeting.

Payment includes all labor and materials to make a complete working unit of the structure. This includes the removable pumphouse structure, discharge head support, casing seal, concrete slab, excavation, and compaction. Payment includes all design costs, and costs related to demonstrating the structures' performance.

DIVISION 7 DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS AND CONDUITS

7-04 STORM SEWERS

7-04.2 MATERIALS

The section is replaced with the following:

Materials shall meet the requirements of the following sections:

Polyvinyl Chloride (PVC) Pipe	9-05.12(1)

PVC pipe for storm pipe installed under sidewalks may be installed at depths of 24 inches and greater, provided that no portion of the PVC pipe is installed withing the street (defined at face of curb).

7-04.4 MEASUREMENT

The section is revised by replacing paragraph 2 with the following:

Storm sewer pipe shall be measured to the nearest 0.5 feet.

7-04.5 PAYMENT

The section is replaced with the following:

"PVC Storm Sewer Pipe __ Inch Diameter", per linear foot.

The unit contract price per linear foot for "PVC Storm Sewer Pipe __ Inch Diameter" shall be full compensation for all labor, material, excavation, dewatering, pipe bedding, compaction, testing, and equipment required for the installation of the pipe as required.

Payment for storm sewer pipe testing shall constitute 10 percent of the unit contract price per linear foot for the size and kind of storm sewer pipe. This amount shall be withheld until the pipe passes the acceptance test.

Shoring or extra excavation shall be paid in accordance with Section 2-09.5.

7-05 MANHOLES, INLETS, CATCH BASINS, AND DRYWELLS

7-05.2 MATERIALS

The section is supplemented with the following:

Construction Geotextile	9-33

Metal castings shall be as shown on the appropriate construction detail.

7-05.3 CONSTRUCTION REQUIREMENTS

The section is supplemented with the following:

The construction fabric for the drywell shall be stored in a dry place off the ground. Rolls shall be placed straight in piles. Under no circumstances, either during storage or placement, shall the material be exposed to sunlight for more than a total of 40 hours.

The surface to be covered by the fabric shall be excavated to a smooth, uniform condition free from excessive ruts, potholes and protruding objects such as rocks or sticks. The fabric shall be placed loosely as a liner for the ditch to avoid placing the fabric in tension upon backfilling. The fabric shall be placed with overlaps of 1 foot minimum. The fabric shall be covered with the material designated in the plans or as directed by the Engineer. Equipment shall not be operated directly on the fabric.

Should the fabric be punctured or the overlaps disturbed, the backfill around the damaged or displaced area shall be removed and the area repaired to the satisfaction of the Engineer at no additional cost to the Owner.

The excavation for drywells shall be sufficient to allow 2 feet of gravel backfill for drains, to be placed around and below the drywell. Prior to placing the drywell base the gravel backfill below the base shall be compacted.

7-05.4 MEASUREMENT

The section is replaced with the following:

Drywells shall be measured per each.

7-05.5 PAYMENT

The section is replaced with the following:

Payment will be made for the following bid items that are included in the proposal:

"Drywell, Type _" per each.

The unit contract price per each for "Drywell, Type _" shall be full compensation for all labor, material, and equipment necessary to install a drywell in accordance with the plans and specifications and as directed by the Engineer. This work shall include, but not be limited to excavation, construction fabric, gravel backfill, connection to storm sewer, backfilling, compaction, and the frame and cover.

7-08 GENERAL PIPE INSTALLATION REQUIREMENTS

7-08.3 CONSTRUCTION REQUIREMENTS

7-08.3(1) EXCAVATION AND PREPARATION OF TRENCH

7-08.3(1)C BEDDING THE PIPE

The section is supplemented with the following:

Pipe bedding shall be installed as shown on the Trenching and Bedding Detail. Pipe bedding shall conform to Section 9-03.12 (3) or Section 9-03.22 for pipes installed above ground water. Pipe bedding shall conform to Section 9-03.12(4) for pipes installed in ground water.

7-08.3(2) LAYING PIPE

7-08.3(2)A SURVEY LINE AND GRADE

The section is revised by replacing sentence 1 of paragraph 2 with the following:

If the Contractor uses string line to grade ditch or lay pipe, he/she shall set batter boards every 25 feet where grade is less than 1 percent and at 50 foot intervals on grades 1 percent and greater.

7-08.3(2)G JOINTING OF DISSIMILAR PIPE

The section is supplemented with the following:

Where ductile iron sewer pipe is to be connected to PVC pipe, the connection shall be made with a Fernco Flexible coupling with stainless steel clamp bands or Engineer approved equal.

7-08.3(3) BACKFILLING

The section is revised by replacing sentence 3 and 4 of paragraph 4 with the following:

When pipe is being placed in paved and non-paved areas, backfill above the pipe zone shall be placed in horizontal layers not more than 6 inches thick and shall be compacted to at least 95 percent maximum density.

THE FOLLOWING SECTION (7-08.3(5)) IS ADDED:

7-08.3(5) MARKING TAPE

Marking Tape shall be installed over all culverts, storm sewers, and sanitary sewer mains. The tape shall be placed approximately 2 feet above the top of the pipe over the entire length of the pipe. Marking tape shall be a minimum of 3 inches wide, marked sewer, and green in color.

7-09 WATER MAINS

7-09.2 MATERIALS

The section is revised by deleting the following materials:

Steel Pipe (6 inches and over)	9-30.1(4)A

Fittings for Steel Pipe (6 inches and over)	9-30.2(4)A
Steel Pipe (4 inches and under)	9-30.1(4)B
Fittings for Steel Pipe (4 inches and under)	9-30.2(4)B

7-09.3 CONSTRUCTION REQUIREMENTS

7-09.3(5) GRADE AND ALIGNMENT

The section is revised by replacing sentence 1 of paragraph 3 with the following:

The depth of trenching for water mains shall provide a minimum cover of 42 inches over the top of the pipe unless otherwise shown on the plans or approved by the Engineer.

7-09.3(9) BEDDING THE PIPE

The section is revised by replacing sentence 1 and 2 with the following:

Pipe bedding shall be installed as shown on the Trenching and Bedding Detail. Pipe bedding shall conform to Section 9-03.12(3) or Section 9-03.22 for pipes installed above ground water. Pipe bedding shall conform to Section 9-03.12(4) for pipes installed in ground water.

7-09.3(10) BACKFILLING TRENCHES

The section is supplemented with the following:

Pipe bedding is required for all water pipe. Bedding shall be placed as shown on the Trenching and Bedding Detail.

7-09.3(17) LAYING DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT

The section is replaced with the following:

The Contractor shall lay all ductile iron pipe, valves, and fittings with a polyethylene encasement installed in accordance with AWWA C105.

7-09.3(19) CONNECTIONS

7-09.3(19)A CONNECTIONS TO EXISTING MAINS

The section is revised by replacing paragraph 1 and 2 with the following:

Method 1 - Isolation

Water mains being constructed shall not be connected to existing water mains in use until the newly constructed main has passed the hydrostatic pressure test and a satisfactory bacteriological report has been received by the Engineer. An approved backflow prevention assembly must be used on the supplying water line when filling the new water main during disinfection and flushing.

Method 2 - Lockout

Water mains being constructed may be connected to existing water mains in use prior to satisfactorily passing a bacteriological test provided the following conditions are met;

1. All materials used in the connection shall be disinfected. The interiors of all pipe and fittings (particularly couplings and sleeves) shall be swabbed or sprayed with 1-percent hypochlorite solution before they are installed.

2. A new valve shall be used to separate the new main from the main in use.

3. The valve shall be operated only by a Water Division employee and shall have a lockout installed on the valve to assure no unauthorized person operates the valve.

4. The valve will be opened by a Water Division employee for filling and flushing of the new main.

5. The new main shall be vented to atmosphere whenever the valve is open. These procedures are to prevent any backflow from the new main due to back pressure or back siphonage.

If an unsatisfactory bacteriological test report is obtained, the valve shall remain closed and the new main shall be disinfected by injection of a chlorine solution at a location near the valve.

Connections and taps to existing water mains shall be made by the City unless otherwise provided in the special provisions. The Contractor shall contact the City Water Supervisor at least 48 hours prior to making the connection or tap. Prior to excavation, the Contractor shall submit to the City a list of materials including, fittings, valves, tapping tees, and other items shown on the plans or required to connect to the existing water main. The Contractor shall furnish all labor (with the exception of the actual connection or tap), equipment, materials, excavation, backfill, and compaction, required to connect to the existing main.

When the work requires an interruption of service the affected customers shall be notified in advance. The superintendent of the utility, Engineer, and Contractor shall mutually agree upon a date and time for the work to be performed. The schedule will allow ample time for the Contractor to assemble labor and materials, and for the Water Division to notify all affected customers.

7-09.3(23) HYDROSTATIC PRESSURE TEST

The section is supplemented with the following:

A successful pressure test must be performed within 30 days of a satisfactory bacteriological sample or an additional satisfactory bacteriological sample must be taken.

7-09.3(23)A TESTING EXTENSIONS FROM EXISTING MAINS

The section is deleted.

7-09.3(23)B TESTING SECTION WITH HYDRANTS INSTALLED

The section is deleted.

7-09.3(23)C TESTING HYDRANTS INSTALLED ON EXISTING MAINS

The section is deleted.

7-09.3(24) DISINFECTION OF WATER MAINS

The section is supplemented with the following:

When a pressure test fails, and any portion of the piping system must be taken apart or replaced, re-chlorination shall be required.

If a section of pipe has not passed a pressure test within 30 days of a satisfactory bacteriological sample then the line shall be flushed and re-sampled before a pressure test can be performed.

If a section of pipe is required to be retested the Contractor shall pay the additional costs to refill, reflush, and resample the section. The costs are as follows:

Water Sample - purity	$70 per each
Refilling and Reflushing main (each time)	$16 per 100 feet

These costs shall be deducted from monies owed to the Contractor.

THE FOLLOWING SECTION (7-09.3(25)) IS ADDED:

7-09.3(25) TRACER WIRE

A solid copper tracer wire shall be taped to the top of all PVC water pipe installed. The wire installation shall conform to the details shown in the plans.

7-09.4 MEASUREMENT

The section is supplemented with the following:

Connection to existing water mains shall be measured individually.

Tracer wire will not be measured. Payment for tracer wire shall be considered incidental to water pipe.

7-09.5 PAYMENT

The section is supplemented with the following:

"Connect to Existing ____", per each.

The unit contract price per each for "Connect to Existing ____" shall be full pay for all material, labor, equipment, excavation, and other work required to connect the water main to the existing system in accordance with the plans and specifications and as directed by the Engineer.

7-16 PUMPING AND PLUMBING SYSTEMS

7-16.1 DESCRIPTION

The work shall consist of supplying and installing a pump, pump control valve, check valve, flexible expansion joint, related plumbing, gate valve, piping, pipe supports, eye wash, and other materials and equipment used in pumping systems in accordance with the plans, these specifications, and as directed by the Engineer.

7-16.2 MATERIALS

Materials shall meet the requirements of the following sections:

Water Distribution Materials	9-30
Pipe	9-30.1
Flexible Expansion Joint	9-30.1(3)
Fittings	9-30.2
Valves	9-30.3
Gate Valves	9-30.3(1)
Check Valve	9-30.3(10)
Solenoid Valve(norm. open)	9-30.3(11)
Pump Control Valve	9-30.3(12)
Copper Tubing	9-30.6(3)A
Pump	9-36
Electric Pump Motor	9-36.1
Discharge Head	9-36.2
Column Pipe	9-36.3
Line Shaft	9-36.4
Cone Strainer	9-36.5
Starter	9-37
Flowmeter	9-38
Pipe Supports	9-39
Eye Wash	9-40
Link Seals	9-50

Equipment or devices fabricated in the field shall be equal in every respect to manufactured items used for the same purpose. Where cutting, drilling, grinding, etc., is done to galvanized or painted metal, it shall be regalvanized or painted to match original finish.

7-16.3 CONSTRUCTION REQUIREMENTS

7-16.3(1) PUMP, MOTOR, AND COLUMN ASSEMBLY

The intent of this contract is for the Contractor to provide and install materials at the well site.

Well 31 - a new set of pump bowls; a 200 horsepower motor; 450 feet of line shaft, column pipe, airline, and transducer pipe; bearings; spiders; and a discharge head and support.

Well 19 - a new set of pump bowls; a 125 horsepower motor; 350 feet of line shaft, column pipe, airline, and transducer pipe; bearings; spiders; and a discharge head and support.

Any equivalent equipment from manufacturers other than those allowed in the specifications must be approved by the City five days before bid opening or wait until after the bid award.

The Contractor shall submit a listing of similar units which are in use in this area, so that the City may check past performance records of the proposed installation. A history of faulty performance or poor service will be reason to reject the submittal of that manufacturer or dealer.

The Contractor shall furnish a list of dealers and/or service shops within a 200 mile radius of Moses Lake. All materials shall be new and of current production and design.

Each proposal shall contain enough information for the City to reach a conclusion as to whether the pumps meet the specifications of Section 9-36.

The Contractor shall disinfect the well in accordance with the AWWA Standard A100-97. After a minimum of 24 hours the Contractor shall pump all of the chlorinated water into the drywell and the City shall collect a sample and pay for a bacteriological test. If the sample fails the Contractor shall be responsible for all costs associated with rechlorinating and resampling the well.

7-16.3(2) PLUMBING HARDWARE AND LABOR

The scope of this bid item shall be as shown on the plans and called for in the specifications including, but not limited to these major items:

A. Provide and install all the pipes, fittings, and equipment indicated on the plans.

B. Connect pressure transducers(plumbing connections only).

C. Provide and install a pre-lubrication system including a gate valve and normally open solenoid valve. The system starts on a time delay and lubricates the pump before pump start up.

D. Provide a 10 inch by 1 inch saddle to be placed on the 10 inch ductile iron water main just before it enters the floor in the piping room. The Water Department will do the live tap and connect this to their chlorination system after the Contractor completes the pressure test on the water main.

E. Paint all above ground piping light grey as directed by the Engineer. The color shall be approved by the Engineer.

All work for plumbing and fittings within the structures shall be bid as a lump sum item and shall include all necessary labor, equipment and materials to complete the work.

All ductile iron and galvanized pipe penetrations through concrete walls, floors, and roofs shall be sleeved with schedule 80 PVC and sealed (except for those penetrations that have been specified differently on the plans).

7-16.3(2)A ELECTRIC SOLENOID VALVE

Provide and install a normally open, electric solenoid valve on the 3/4-inch pre-lubrication system. This work will involve making a complete working unit from tapping into the top of the discharge head, providing and installing 3/4-inch type K copper pipe and brass fittings from the water main to the discharge head, brass gate valve, and tap into the 10-inch ductile iron water line.

7-16.3(2)B CHECK VALVE

This work shall consist of installing a 10 inch Cla-Val model 501 wafer check valve at the site as shown in the Plans and as directed by the Engineer.

7-16.3(2)D AIR LINE

A 1/4-inch polyethelene air line and a 1 1/4-inch black iron sleeve shall be installed for the purpose of determining water level. The air line shall be installed complete with an air gage and tire valve to facilitate the measurements. The bottom of the sleeve shall be firmly attached at one foot above the top of the pump bowls. The installation shall allow the airline to be replaced without having to remove the pump assembly.

7-16.3(3) PUMP CONTROL VALVE

This valve shall be a 4 inch Cla-Val model 61-07 pump control valve. This valve shall have adjustable closing and opening rates and a limit switch on the valve stem that breaks the pump motor circuit when the valve is fully open.

7-16.3(4) FLOWMETER

This work shall consist of providing and installing a 10-inch, digital flowmeter at the location shown in the plans and as directed by the Engineer.

7-16.3(5) OPERATION AND MAINTENANCE MANUALS

Provide submittals for all materials and equipment that is intended to be installed to the Engineer as soon as practicable after the notice of award, but prior to ordering, for review and approval. Five copies of every submittal is required, two copies will be returned to the Contractor stamped either approved or rejected.

Operation and maintenance manuals shall be supplied to the Engineer before substantial completion of the project.

7-16.4 MEASUREMENT

"Vertical Turbine Pump, Well __" per each.
"Line Shaft, __ Inch Diam." per linear foot.
"Column Pipe, __ Inch Diam.," per linear foot.
"Plumbing, Hardware, and Labor," per lump sum.
"Install Pump Assembly, Well __ " per lump sum.

7-16.5 PAYMENT

Payment will be made for the following bid items that are included in the bid proposal:

"Vertical Turbine Pump, Well __" per lump sum.

Payment for "Vertical Turbine Pump" per lump sum includes all labor and material costs for acquiring the new pump, transporting it to the wellhead, and providing the City with an Operations and Maintenance manual.

"Line Shaft, __ Inch Diam." per linear foot.

Payment for "Line Shaft" per linear foot shall be full compensation for all labor and material costs for acquiring the new line shaft, spiders, and bearings, and transporting them to the well site. Each section of line shaft shall be interchangeable with any other section and meet all requirements of the AWWA Standards.

"Column Pipe, __ Inch Diam.," per linear foot.

Payment for "Column Pipe, __ Inch Diam." per linear foot shall be full compensation for all labor and material costs for acquiring the new column pipe, and transporting it to the wellhead. Each section of column pipe shall be interchangeable with any other section and meet all requirements of the AWWA Standards.

"Plumbing Hardware and Labor," per lump sum.

Payment for "Plumbing Hardware and Labor," per lump sum shall be full compensation for providing the fittings, solenoid valves and pre-lube system, copper pipe, eye wash, pressure gauge, hose bib, discharge head and support, flexible expansion joint, link seals, flowmeter, 10 inch check valve, 4-inch gate valve, 4-inch pump control valve, painting, and ductile iron pipe needed to make a complete working system of the plumbing from the 10 inch column pipe to the 10-inch PVC water main, 90 degree elbow under the main structure, and including the discharge line to the 10-inch PVC drain pipe outside of the main structure, and the labor and materials required to make a complete working unit.

"Install Pump Assembly, Well __" per lump sum.

Payment for "Install Pump Assembly, Well __" per lump sum, shall consist of providing all fittings, cone strainer, airline and sleeve (1-1/4 inch diameter), transducer pipe (minimum 1-1/4 inch diameter), installation of the 1-1/4 inch pipes and air line from the bowl assembly through the discharge head, installation of the bowl assembly, pump column, lubrication system, and discharge head, connecting the pump column to the discharge head, and disinfecting the well.

DIVISION 8 MISCELLANEOUS CONSTRUCTION

8-12 CHAIN LINK FENCE AND WIRE FENCE

8-12.1 DESCRIPTION

The section is supplemented with the following:

A 6 inch deep by 12 inch wide concrete mow strip shall be installed underneath all chain link fence per the construction details.

8-12.3 CONSTRUCTION REQUIREMENTS

8-12.3(1) CHAIN LINK FENCE AND GATES

8-12.3(1)F CONCRETE MOW STRIP

The following section is added:

A concrete mow strip shall be installed underneath all of the fencing. The mow strip shall be 12 inches wide and 6 inches deep. The contractor shall keep a 1.5 inch gap from the bottom of the fence and the top of the concrete mow strip. The concrete mow strip shall have a light broom finish.

8-12.4 MEASUREMENT

The section is supplemented with the following:

Concrete mow strip shall not be measured and is considered incidental to Chain Link Fence construction.

8-14 CEMENT CONCRETE SIDEWALKS

8-14.1 DESCRIPTION

The section is replaced with the following:

The work shall consist of constructing cement concrete sidewalks, driveways, and pads in accordance with these specifications and in conformity with the lines, grades, thicknesses, and typical cross-sections shown in the plans or as established by the Engineer.

8-14.2 MATERIALS

The section is revised by replacing paragraph 2 with the following:

The concrete used for driveways shall be Class 3000 concrete conforming to the requirements of Section 6-02.

8-14.3 CONSTRUCTION REQUIREMENTS

8-14.3(3) PLACING AND FINISHING CONCRETE

The section is supplemented with the following:

Isolation (expansion) joints and contraction joints shall be located to create 6-foot panels. Joints shall be edged with a 1/2-inch radius edger and the sidewalk edges shall be edged with a 1/2-inch radius edger. Depending on the type, the sidewalk shall be divided into panels by scoring a minimum of 1/2" deep as shown on the plans or as directed by the Engineer.

8-14.3(4) CURING

The section is supplemented with the following:

The Contractor may use clear pigment curing compound as an alternative to moist burlap or quilted blankets. Clear pigment shall be applied in accordance with the procedures outlined in Section 5-05.3(13)B. The curing agent shall be applied immediately after brushing and shall be maintained for a period of 5 days.

8-14.4 MEASUREMENT

The section is replaced with the following:

Measurement for cement concrete driveway and sidewalk shall be by the square yard for the surface of concrete placed.

Concrete shall be measured to the nearest 0.5 square yard.

Maintenance rock or CSTC placed in preparation for sidewalks and driveways shall not be measured.

The concrete pad for the proposed and existing drywells shall be measure as concrete driveway.

8-14.5 PAYMENT

The section is replaced with the following:

Payment will be made for the following bid items when included in the Proposal:

"Cement Concrete Sidewalk", per square yard.
"Cement Concrete Driveway", per square yard.

The unit contract price per square yard for "Cement Concrete Sidewalk," and "Cement Concrete Driveway," shall be full compensation for all labor, materials, and equipment required to excavate and compact subgrade, place and grade maintenance rock, place and set forms and all other work required to construct the sidewalk or driveway in accordance with the plans and specifications and as directed by the Engineer.

8-20 ILLUMINATION, TRAFFIC SIGNAL SYSTEMS, AND ELECTRICAL

8-20.1 DESCRIPTION

The section is supplemented with the following:

SCOPE

WELL 31

Provide the electrical design, labor, materials, and equipment necessary to furnish, install, and place into operation the power, lighting, instrumentation, control, alarm, telemetry, and associated electrical systems of this Contract. Connect motors, instrumentation, controls, meters, or any other electrical device installed or provided as part of the project. Mark and identify circuits,

equipment/enclosures with wire numbers, nameplates, and warning signs. Test, adjust, and calibrate equipment and start-up all electrical equipment, instrumentation equipment, and its associated mechanical attachments as necessary to place the project into operation.

The Contractor shall provide a radio modem, radio transmitter, antenna, antenna cable, and battery and power supply for the radio.

The Contractor shall submit a design for the electrical work for review and approval. He shall not order equipment or begin work until written approval has been received from the Engineer.

WELL19

Provide the electrical design, labor, material, and equipment necessary to furnish, install, and place into operation the power, instrumentation, control, alarm, telemetry, and associated electrical systems of this Contract. Connect motors, instrumentation, controls, meters, or any other electrical device provided and installed as part of this project, or is existing in the wellhouse and is necessary for the function of the system. Mark and identify circuits, equipment/enclosures with wire numbers, nameplates, and warning signs. Test, adjust, and calibrate equipment and start-up all electrical equipment, instrumentation equipment, and its associated mechanical attachments as necessary to place the project into operation.

The Contractor shall submit a design for the electrical work for review and approval. He shall not order equipment or begin work until written approval has been received from the Engineer.

8-20.2 MATERIALS

The section is supplemented with the following:

SECTION	**MATERIAL**
9-29.1	Conduit
9-29.1(1)	Fittings
9-29.3	Conductors, Cable
9-29.9	Ballast, Transformers
9-29.31	Enclosures
9-29.32	Panelboards
9-29.33	Control Panels
9-29.34	Metering, Protection, & Control Devices
9-29.35	Duplex Receptacles
9-29.36	Toggle Switches
9-29.38	Unit Heaters
9-29.39	Thermostats
9-29.40	Fans
9-44.	Telemetry System
9-44.1	General
9-44.2	Testing
9-44.3	Media
9-44.4	Function
9-44.5	Materials
9-44.6	Radio Transmitter
9-44.8	Antenna and Cable
9-44.9	Power Supply
9-44.10	Battery
9-45	Analog Instrumentation
9-45.2	Panel Indicators
9-45.3	Pressure to Current (P\I) Transmitter

9-45.4 Pressure to Current (Immersed) (P/I) Transmitter
9-45.5 Power Transducer

8-20.2 (1) EQUIPMENT LIST AND DRAWINGS

The section is supplemented with the following:

MANUALS FOR SHOP DRAWINGS, OPERATING AND MAINTENANCE

Submit to the Engineer for review, as soon as practicable after the date of award and before ordering or commencement of installation or fabrication of any materials or equipment, manuals containing detailed drawings, diagrams and instructions for fabricating, constructing, installing, operating and maintaining the material and equipment proposed for installation in the electrical work. Five copies of every submittal is required, two copies will be returned to the Contractor stamped either approved or rejected.

The manuals shall be supplied to the Engineer for review and approval before any electrical equipment is ordered or fabricated for the project. No material for electrical work shall be ordered or fabricated before the Contractor has received approved submittals. The required test results may be delayed but shall be provided at the time of substantial completion of the project. Record drawings of the work shall be provided upon completion of the work and shall be folded and punched for insertion into the manual after they are reviewed by the Engineer. Allow 10 working days for engineering review of any and all submittals.

Manuals for the electrical system shall consist of 3-post, expandable metal hinge binders labelled with the job name and the Contractor's name with tab dividers for each major type of equipment. Three manuals are required.

Provide manufacturer's installation, operation, maintenance, and service information, shop drawings, etc., for each panel, and equipment item furnished under the electrical work. Assemble and index each section listing the contents individually on the tab divider for that section. Compile a spare parts lists and a supplier's index for each section and assemble in the section provided. Assemble records of all tests, measurements, and calibration settings made for each device.

8-20.3 CONSTRUCTION REQUIREMENTS

8-20.3(1) GENERAL

The section is supplemented with the following:

Install the equipment and materials in a neat and workmanlike manner employing people skilled in the particular trade and in accordance with the manufacturer's instructions and industry standards. Maintain adequate supervision of the work by a person in charge at the site during any time that work under this division is in process or when necessary for coordination with other work.

Do the work in a systematic manner and coordinate with other trades on the job. Check work under this division for interference with work under other divisions and cooperate in locating equipment to avoid all such interferences. No extras will be allowed because of moving work required to avoid interference with work under other divisions of this contract. Organize this work to harmonize with the work of other trades so that all work may proceed as expeditiously as possible. Coordinate the installation of built-in work, attaching items to buildings and cutting and patching with other trades.

The general arrangement of panelboards, outlets, and other equipment, as shown on the plans, is only a suggestion for the approximate locations. Where conflicts occur in locating the work, verify

the location of conduit, fixtures, panels, control devices, etc., with the Owner. Where minor changes in location are required because of structural conditions or for the convenience of the Contractor, such changes shall be made without additional expense to the Owner. Attention of the Contractor is directed to the coordination required between the equipment installers and himself. Verify the location of all meters, valves, limit switches, etc. with installers prior to final conduit installation, etc. and make all necessary adjustments in the routing, without cost to the Owner. The Contractor shall be responsible for the accurate location of switches, outlets, etc., with respect to doors, partitions, cabinets, and the finished work of others. Verify dimensions and locations with the mechanical, and instrumentation drawings and trades before installing the work.

8-20.3(5) CONDUIT

The section is supplemented with the following:

All conduit on this project will be part of the lump sum electrical bid excluding the 4-inch electrical conduit running from the PUD pole to the transformer.

Terminated conduit ends shall be threaded and capped.

Rigid steel conduit shall be used for all work except as noted herein.

Rigid plastic conduit may be used for circuits run underground with a transition to rigid steel PVC coated at stub-up locations and at entrances to buildings or other locations where the raceway changes from buried to encased in concrete or exposed conditions.

Electrical metallic tubing (EMT) may be used in areas which are indoors, above the exterior grade, dry, and concealed in the building construction. EMT is not permitted in any of the following: "wet" areas, outdoors, below grade, embedded in concrete, where exposed to the process.

Flexible conduit shall be provided for connections to motors, generators, transformers, valves, etc., which are subject to vibration in normal service. Runs shall be kept as short as practical (less than 18 inches) and shall not be used in place of elbows, offsets, or fittings to attach to fixed equipment. Flexible conduit shall not be strapped to structures or other equipment.

Circuits shall run in individual raceways unless specific combinations in one raceway are shown. Raceways shall not be ganged into wireways, pull boxes, junction boxes, etc., without specific approval.

Raceway shall run concealed unless shown otherwise on the drawings. Raceway shall be installed as follows:

It shall be installed in lines parallel or perpendicular to the building or structural members lines. Raceway shall be run plumb or level within 1/16 inch in each foot, even if ceiling or structure is not level. The installation shall not result in cross-overs or offsets that can be avoided by installing the raceway in a different sequence or a uniform line. Parallel runs shall be symmetrical.

Raceway in "wet" areas shall have clamp backs or other appropriate spacers to hold them a minimum of 1/2 inch off the surface. Horizontal runs on the roof surface shall be blocked at every five (5) feet to hold them a minimum of two (2) inches above roof surface.

Conduit connections to motors or other equipment shall be supported independently of the motor or equipment. Runs shall drop or rise vertically to the nearest practicable point of connection to the unit. Vertical drops shall be run to the floor and fastened with a floor flange. Unsupported drops are not permitted. Horizontal runs on the floor or on equipment are not permitted. Drop or rise at the appropriate closest location.

Wherever practical, route conduit with adjacent ductwork or piping and support on common racks. Base required strength of racks, hangers, and anchors on combined weights of conduit and piping.

Penetrations of exposed conduit through building surfaces shall be as follows:

Through exposed and exterior walls; sleeve with PVC pipe, caulk with fiberglass, seal with silicone sealant and cover with an escutcheon at the wall.

Through free slabs, provide a cast iron or, above-grade only, Schedule 40 black pipe sleeve with retaining ring or washer. Sleeves shall be set flush with forms or edges of slab. Pack around conduit with fiberglass and seal with silicone sealant. For penetrations below exterior grade, provide an O-Z Gedney sealing fitting on the interior of the building wall threaded onto the sleeve.

Through masonry or fabricated walls, provide a PVC sleeve with a least 1/4" greater ID than conduit OD, set flush with walls, pack with fiberglass and seal with silicone sealant and cover with escutcheon plate.

Sleeve roof opening where non-concrete roof construction occurs.

Conduit connections to enclosures shall be made at the nearest practicable point of entry to the enclosure area where the devices are located to which the circuits contained in the conduit will connect.

Direct buried rigid plastic or rigid steel conduit shall be installed where underground runs are shown. Rigid steel conduit, underground or encased in concrete, shall have a half lapped wrap of Scotchrap No. 51 plastic tape, a coat of Koppers Bitumastic No. 505, a factory PVC coating (20 mils minimum thickness), or an Engineer approved equal.

The trench for underground raceway runs shall be as straight as practical. Changes in direction and/or grade shall be of sufficient length to allow a gradual change (3-foot radius minimum). The trench shall be graded true and free from stones or soft spots. Three inches of fine sand shall be placed in the trench bottom and tamped into place. Provide pre-formed plastic spacers on 5-foot intervals between conduits in the same run. Bends in 2-inch and larger raceway shall have a minimum radius of three feet. Slight offsets may be made with 5° couplings. After the raceway is placed in the trench, native earth backfill passing a No. 8 sieve, free of stones shall be placed in the trench bottom and tamped around the sides of the conduit. Do not tamp on top of the conduit until the final backfill is placed to finish the grade. Each concealed below-grade conduit shall be cleaned with a non-metallic mandrel not more than 1/4 inch smaller than the inside diameter of the raceway, followed by a wire brush and a swab.

Install raceway as a complete, continuous system without wires, mechanically secure and connected to all metal boxes, fittings, and equipment. Blank off all unused openings, using factory-made knockout seals. Keep conduits clean and dry until conductors are installed using caps, bushings, and "penny" or other suitable means. Install a No. 12 TW pull wire or nylon cord in each empty conduit, leaving at least eight inches slack at each end. Close each end left exposed.

Conduit shall connect to equipment as follows:

Provide double lock nuts and insulating bushings at all boxes and cabinets. Bushings shall be grounding type where connecting to concentric or eccentric knockouts. In "wet" areas, lock nuts shall be sealing type or Myers hubs shall be used. Conduits shall connect to the enclosure at the location of the gutter into which the conductors they contain will be routed. Conduits to motors and/or mechanical equipment shall be stubbed up or routed directly to the connection and located as close as possible to equipment terminals.

Where conduits are stubbed up into enclosures and similar equipment, do not extend the conduit, including end fittings, more than three inches above the bottom of the enclosure. Stubs shall be of uniform height (plus or minus 1/8 inch) and aligned within plus or minus 1/4 inch. Stub-ups shall be located directly under the section gutter into which the conductors they contain are to be routed. Conduits shall be terminated by insulating and bonding grounding bushings to the ground bus of the equipment.

Conduit couplings, fittings, and boxes where threaded male to female connections are made shall be waterproofed and rust-proofed by application of a water tight, conductive thread compound. Clean threads of cutting oil before applying thread compound and making up joint.

8-20.3(7) "AS BUILT" PLANS

The section is supplemented with the following:

RECORDS

Maintain on the job at all times a separate set of record drawings showing changes from the original work, routing of hidden raceways, actual fixture and equipment locations, equipment sizes and dimensions and building outline changes. At the end of the project, forward to the Engineer a complete set of drawings marked in red pencil in a manner equal to the Contract Drawings, indicating all changes made on the job.

Record voltage, current, ohmmeter and ground resistance test measurements made on the electrical work, the trip units, fuses, and overload relay elements installed in the equipment and the setting of all pressure, flow, level, etc. control devices. These records shall be given to the Engineer to obtain substantial completion for the project.

8-20.3(8) WIRING

The section is supplemented with the following:

Insulated wire and cable shall be installed in raceway systems after the system is complete. Damage due to missing bushings, burrs on conduit ends, etc. shall be cause to require removal and replacement of conductors. Damaged ends shall be considered sufficient indication of damaged insulation to require replacement. Cable lubricants, pulling sleeves, pull boxes, etc. shall be Ideal Yellow 77 or equal. Pulls shall be by hand using cable grips or wrapping extra conductor around to form an eye. Cable ends shall be cut off after pulling and all compound cleaned from conductors before terminating.

Service, feeder, and motor branch circuits shall be continuous without splices from equipment terminal to equipment terminal or motor lead. Instrumentation and control circuits shall be continuous except for termination on terminal strips in control panels. Branch circuits may be spliced at taps.

Unless otherwise shown on the drawings or specified, leave at least six inches of free conductor at each connected outlet (outlet connected to equipment or device) and nine inches of free conductors at each unconnected outlet. Tape free ends of conductors and coil neatly in outlet box.

Color code conductors as follows:

Basic color coding:

Phase	480Y/277 Volts	120/240 Volts
A	Brown	Black
B	Orange	Red
C	Yellow	
Neutral	Grey	White
Ground	Green	Green

For three-wire, 120/240 volt single phase circuits, use black and red with white neutral.

Connect all circuit conductors of the same color to the same phase throughout the installation.

Do not use white or green color for any conductor not intended for neutral or grounding purposes. This limitation applies to power, lighting, and control wiring, except smaller gauge (No. 18 or less), low voltage control circuits.

Use wire with the insulation of required color for conductors No. 8 AWG or smaller. For wire larger than No. 8 AWG and other types of wire of any size, which may not be available in specified colors, use self-adhesive, wrap-around cloth type markers of solid colors to color code the conductors.

Wire markers shall be used to mark each conductor at all accessible locations such as panelboards, junction boxes, pull boxes, auxiliary gutters, outlets, switches, and control centers.

Viewing all equipment from the front, make connections so phase color sequence is in the same order as that for panelboards, etc.

Control wiring must be of colors different from power wiring or be supplied with a trace of color in addition to the basic color of the insulation. In general, use same color throughout a given system for any signal or control wires performing the same function. The Contractor shall submit the control wiring color coding scheme he proposes for the Engineer's review.

Install wire neatly in all enclosures. Bend or form wires in neat runs from conduits to terminals. Arrange wires so that they may be grouped by conduit or by function in the enclosure. Install cable ties and straps to support and bundle wiring in enclosures. Arrange wires to allow wire tags and numbers to be easily read without bending or flexing wiring.

Terminate service and feeder circuits with compression indent barrel connectors with one or two hole spade lug ends. Terminate control wiring with indent, insulated spade connectors made especially for the wire size and terminal size on which they are installed and crimped with an approved plier or tool for the connector.

Service, feeder, and motor branch circuits shall be run in individual conduit. Where several circuits follow a common route, pull boxes or fittings shall be staggered, or if shown grouped in one box, each feeder shall be individually fireproofed. At each connection, except at motors, tag for phase rotation; at motors, tag for winding lead numbers. Make all phase rotation changes for motor direction changes at the motor to maintain correct color phase sequence in equipment.

General use branch circuits and lighting branch circuits shall be installed as follows:

In each enclosure or box where more than one ungrounded conductor is spliced or connected, tag for panelboard identification and pole number. Mark junction boxes concealed above ceilings with circuit identification using indelible marking pens on the cover.

Single phase branch circuits may be shown with separate home runs on the drawings. These home runs may be combined with a common neutral as permitted by code and when they are on adjacent poles of a panelboard. No more than three ungrounded conductors shall be permitted in one branch circuit conduit, unless otherwise shown.

8-20.3(9) BONDING, GROUNDING

Thermit welding of ground mats shall be done with Burndy, Thermoweld, or Cadweld molds and charges. Clean all varnish, oxide, scale, concrete, etc. from conductors before firing joints.

Service and feeder circuits shall have a green insulated grounding conductor installed with each set of phase conductors. The grounding conductor shall be bonded full size to the equipment which the circuit connects and to the raceway if it is metallic.

Make the grounding conductor connections to motors ten (10) horsepower and above or circuits 20 amperes and above, by solderless terminal and a 5/16 inch minimum bolt tapped to the motor frame or equipment housing. Ground connections to smaller motors or equipment may be made by fastening the terminal to a connection box.

Equipment grounding connections shall be checked by the Contractor in the presence of the Engineer with a Biddle ground ohmmeter at each panelboard, enclosure, switchboard, or other distribution equipment. Resistance in excess of 5 ohms to ground shall be reason to reject the continuity of the ground system and require replacement.

8-20.3(10) SERVICE

Grant County PUD will be providing service to the well site. The Contractor shall coordinate work to facilitate the installation of these utilities.

The Contractor shall install conduit as shown on the plans or as directed by the utility.

8-20.3(11) FIELD TEST

The section is supplemented with the following:

TESTS, OPERATIONS AND TRAINING INSTRUCTION

The Department of Labor and Industries shall perform a rough and final electrical inspection at the well site. The Contractor shall coordinate with the Department of Labor and Industries for the electrical inspections.

Test electrical equipment before it is energized and placed in service.

Make any specific tests required by the manufacturer's installation instructions or electrical standards (i.e., NEMA, IEEE) for the class of equipment.

Distribution equipment test load readings shall be taken after all loads are connected. These shall give the maximum reading for each phase and neutral obtained with all lighting, motors, etc., connected to the panels in service.

Test the resistance of the grounding electrodes in the presence of the Owner's representative. The measurement shall be done with a ground ohmmeter or the IEEE Standard No. 550, Paragraph 3.42 method. Testing shall be performed during normal dry weather conditions with at least five non-rain

days elapsing prior to the test. Measured resistance of the electrode exceeding 3 ohms shall require supplemental electrode additions until electrode resistance is less than 3 ohms.

Ground paths shall be tested for continuity by applying a low voltage source of d-c current, capable of furnishing up to 100 amps, between all electrical distribution/motor control equipment ground bars or buses and the ground grid at the service or source. The grounding path must conduct 100 amps at a resistance of 0.010 ohms or less as calculated from the current and voltage difference between equipment locations.

Check fuses with an ohmmeter; Ring out wiring and busing; Check operation of control and safety interlocks; Check grounding of PTs, CTs, lightning arresters, and surge capacitors; Check control connections at terminal blocks, relays, meters, switches, etc.

Megger bus work, switches, breakers, and circuits phase-to-phase and phase-to-ground disconnecting and reconnecting equipment which cannot be meggered as required. The minimum acceptable steady-state value is 50 megohms. Ambient temperature and humidity during testing shall be recorded.

Test wire and cable installation, when complete and 72 hours prior to energization of the system. Check for continuity, visual damage, marking, proper phase sequence before performing insulation testing.

Test motor driven equipment motors before energization. Insulation test shall consist of megohmeter check phase-to-ground, per IEEE Standard 43 or manufacturer's recommendations.

Load test each motor of motor driven equipment showing the following:

Nameplate Ratings (horsepower), (speed), (voltage), (phase), (ampere rating of motor at full load).

Measured Load

Amperes Lines 1-2-3.

Load test pump motors, noting the operating conditions at the time of the test. Motor test data will show suction and discharge conditions (pressure) where such conditions affect load.

Overload heaters shall be checked and the size on each phase shall be noted at this time on the test sheet.

Check every power distribution connection in the electrical equipment with an infra-red pyrometer under load and report results in writing.

Report all test results in writing. Where tests disclose problem areas, retest after the defect has been corrected. Assemble records of all tests, measurements, and settings made for each system in a binder as stated herein before.

Demonstrate to the Owner that the electrical installation is working by operating all electrical systems and equipment.

Operate the electrical systems until acceptance of the work. Instruct Owner's employees in the correct operation of all electrical and control systems.

The Contractor shall furnish to the Owner at the time the project is accepted, any special tools, calibration equipment, and testing apparatus specified or furnished by the equipment manufacturer for the proper adjustment and maintenance of the electrical equipment provided.

8-20.3(15) EQUIPMENT

Install manufactured equipment in accordance with manufacturers installation instructions. Perform tests outlined in this Specification and as recommended by the equipment manufacturer. A written report of these tests and any repairs resulting from them shall be sent to the Engineer.

The Contractor shall be responsible for the painted finish specified for individual equipment. Where deemed necessary by the Engineer, damaged finishes of equipment furnished by the Contractor shall be retouched or repainted without additional cost to the Owner.

Install self-supporting equipment in a level and plumb manner, shimming with full width stainless steel shims, as necessary. Units shall be bolted to the floor with 3/8" stainless steel expansion anchors and bolts or welded to embedded steel channels. Floor or pad shall be level within plus or minus 1/8 inch in a square yard before installing equipment. Grout or caulk enclosure to floor or pad. Conduits entering from above or at the sides shall be bushed. Conduits entering from below shall have grounded insulating bushings bonded to the ground bus or pad.

Protect enclosed electrical equipment such as switchboards, panelboards, control stations, starters, enclosures, etc. during construction from moisture, dust, abrasion, or other damage or disfigurement, using plastic sheeting, draft paper, space heaters, or other appropriate means. Field repair of material or equipment made defective by improper storage is not acceptable.

Wall-mounted enclosures such as those for enclosed switches, starters, circuit breakers, transformers, etc. shall be mounted level and plumb to within 1/8" overall. Enclosures shall be fastened with a minimum of three screws or bolts. Switches, starters, etc. shall be mounted 4'6" to centerline of handle on walls or 3'6" when strut supported at motors, etc. In wet locations, provide neoprene or polyethylene 1/2 inch spacers behind equipment enclosures and connect all raceways to enclosure from below.

Provide pedestals or stanchions for devices or equipment not wall or ceiling mounted or self supporting. Pedestals or stanchions shall be constructed of structural steel hot-dipped galvanized after fabrication or of structural stainless steel or structural aluminum or fiber glass reinforced plastic. "Strut" systems are not permitted.

Enclosures, including motor starters, safety switches, and control stations shall be provided with permanently attached identification plates giving the panel designation and panel circuit number from which the motor is fed. The plates shall be laminated phenolic with engraved legend, white letters with black background. Letters 3/8 inch high.

Vacuum equipment clean after installation; remove metal cuttings with a magnet or suitable means before assembling equipment; wipe insulating supports, bushings, etc. with a clean lint-free cloth; clean debris, shavings, etc. from breakers, bus, switches, relays, etc. before start-up.

The following shall be done as a minimum before energizing equipment:

Remove bracing, packing materials, tape on movable parts, etc. as necessary. Check for damage to enclosure, cracked porcelain, chipped bushings, etc.

Assemble all shipping splits. Tighten all bus splices to the recommended torques. Clean splice plates with Stoddard's Solvent before assembling. Check factory connections for proper torque.

Tighten all structural connections, barriers, racking mechanisms, etc.; check alignment of plug-in devices with stationary parts; check operating mechanism for binding, lubrication, etc.

Check continuity and phase uniformity from unit to unit and for all control or metering circuits.

Operate switches in the test and disconnected positions.

Transformers shall be mounted with vibration isolators on trapeze hangers or pads.

Panelboards shall be installed in such a manner as to leave access to the box, building chases, knockouts, etc. for future circuit additions. Place conduit in the rear line of knockouts, where possible. Wiring to neutral and grounding blocks shall be installed on the bottom or furthest back row first. Wiring shall leave the blocks accessible for future neutral or grounding connections.

Knockouts shall be removed only where conduit or cable entrances are made to the box. If knockouts are incorrectly removed or worked out of position, they shall be plugged with snap-in steel seals. Where concentric knockouts are used, a grounding bushing shall be installed on any connector or conduit entering through such knockouts.

Knockouts for breaker positions shall not be removed unless a breaker is to be installed. Where twistouts or knockouts are removed, provide a circuit breaker (1 pole, 20 ampere) to fill the position even if not called for on the panel schedule, circuit, etc.

Panelboard directories shall be neatly typewritten in the same sequence as the panelboard stamping. A copy shall be sent to the Engineer for his records. Record drawings shall reflect the actual size and pole position of all breakers, switches, or fuses installed.

Grounding bars, pads, or buses shall be bonded to the enclosure and sized to accommodate the grounding conductors shown on the drawings. Neutrals shall be insulated, but bondable.

8-20.3(18) BOXES, WIRING DEVICES, CONTROL STATIONS, etc.

Symbols on the plans show approximate locations and care shall be taken to locate device as follows:

Lighting switches.

48-inches above floor on the strike side of the door within one (1) foot of the opening, unless otherwise noted.

Receptacle Convenience Outlets

- On walls, 48 inches above floor.

Fixture Outlets

- Center in spaces or on quarter points, etc.

Coordinate box locations with building surfaces and finishes to avoid bridging wainscots, joints, finish changes, etc.

Boxes in finished areas shall be installed to present a symmetrical, neat appearance, centered in masonry courses, tile courses, moldings, etc.

Install devices as follow:

Lighting switches ..... "Off" down.
Receptacles ..... ground down on walls.
Control Stations ..... "Stop" on bottom.

Install boxes and cabinets (enclosures) as follows:

Boxes and cabinets in finished areas shall be recessed in the wall, floor, and ceiling surfaces.

Boxes and enclosures in wet areas shall be mounted on channel iron stanchions or set with spacers on walls.

Boxes and enclosures installed in "wet" areas shall have all conduit connections from below. Conduit shall be arranged to drain moisture away from boxes and suitable Crouse-Hinds EYD drains shall be installed in the bottom of each box.

Boxes and cabinets with concentric knockouts shall have bonding jumpers and grounding bushings installed on conduit terminations.

Where devices are grouped, provide gang boxes of one-piece construction.

Boxes in wet areas shall be attached using external ears, feet, or clamps. Drilling or punching enclosure to mount through inside of box or enclosure is not permitted.

Install plates on flush-mounted devices so that all four edges are in continuous contact with finished wall surface without the use of mats or similar devices. Plaster fillings will not be permitted. Install plates with an alignment tolerance of 1/16 inch to plumb.

8-20.3(19) LIGHTING FIXTURES

Provide lighting fixtures of the correct physical size and type to properly suit the installation requirements of each area. Review the building drawings for details of ceiling construction and finish and install lighting fixtures suitable for the particular type in each area.

Spacing for all fixtures as shown on the drawings must be maintained and shall not be arbitrarily changed because of ceiling pattern, etc.

Provide two fixture hangers and attachments (stem, chain, or fastener) for surface or pendant fluorescent fixtures (in addition to raceway connections) at the quarter points except for fixtures over 8 feet or in a continuous row.

Surface or pendant fixtures shall be secured to ceiling structural system, roof structure, or slabs with an attachment device such as lag screw, lag bolt, toggle bolt, cinch anchor, or stud to support the fixture plus 100 pounds at each support. Nails or similar fasteners are not approved for lighting fixture support.

Contractor shall not install fixture lens or diffuser enclosures on fixtures where possible until general construction work is complete, including painting. Glass and plastic enclosures shall be handled with white canvas gloves. Dirty enclosures shall be removed, washed, and rinsed as recommended by fixture manufacturer.

Fixtures with slow starting lamps shall be repaired or replaced; stained or watermarked lens on diffusers shall be replaced; correct light leaks of recessed or enclosed fixtures. Correct any defects in control or operation found at this time.

8-20.3(20) ANCHORS, SUPPORTS AND ATTACHMENTS

Install attachments to structures or building surfaces in a manner which does not damage the structure or surface. Trim all excess length of studs, rods or bolts.

Provide stainless steel or nylon fasteners in all outdoor, wet, below grade or any location exposed to the process. Support each raceway or device independently. Racking of conduit runs shall be permitted only with special permission of the Engineer. Provide cap nuts on all unprotected ends of threaded devices. Provide double jam nuts or lock plus cap nuts on all fixtures or equipment hangers.

8-20.3(21) HEATERS

Install heaters where shown on the drawings. Adjust mounting height, louver angle, and heater direction to give maximum coverage of area.

All heaters in the main building shall be 480 volt, three phase units. The heater in the removeable building shall be a 240 volt, single phase unit. All heaters shall have their own built-in thermostat.

The heaters and fans/louvers shall be installed on separate circuits.

Connect controls for heaters as recommended by the manufacturer.

8-20.3(22) VENTILATING CONTROLS

Install thermostats for the fans on the wall at a minimum height of 5 feet above the floor. Units shall be mounted on junction boxes suitable for the area of installation. Adjust to temperatures given by the Engineer. The thermostats shall operate both the fans and louvers in the building.

8-20.3(23) RADIO ANTENNA

The radio antenna shall be mounted near the peak on the North wall as shown in the plans and as directed by the Engineer.

8-20.3(24) LOW TEMPERATURE ALARM

The low temperature alarm system shall consist of a thermostat that detects if the temperature in the main building gets down to a certain setting. The thermostat shall be located in the piping area and shall light up the indicator on the control panel and send an alarm through the telemetry.

8-20.3(25) ANALOG INSTRUMENTATION

The analog instrumentation shall consist of measuring the flow, well level, power consumption, and system pressure and sending that information to the control panel and telemetry system.

8-20.3(26) TELEMETRY

The telemetry system shall consist of a new PLC system. The system shall receive information from various sources at the well site and relay that information by the way of radio to the Water Division's shop. The telemetry system shall send the following information and alarms:

Power Fail	Phase Fail	Well Flow
Pump Run	Low Air Temp.	System Pressure
Motor Overload	Chlorine Pump Run	Well Level
Motor Overtemp	Power Consumption	Control Valve Closed

The Water Division shall also have the capability to start and stop the pump from the shop through the telemetry.

The Contractor shall make all changes to the Water Division's computer to add the additional well site to the existing display on their shop computer.

Well 31's RTU design shall be consistent with the existing units installed throughout the system. Detailed drawings of existing sites are available from the City upon request.

8-20.4 MEASUREMENT

The section is supplemented with the following:

"Electrical, Well __", shall be measured per lump sum.
"Telemetry, Well __", shall be measured per lump sum.
"Analog Instrumentation", shall be measured per lump sum.
"PVC Conduit Pipe __ Inch Diameter", shall be measured per linear foot.

8-20.5 PAYMENT

The section is supplemented with the following:

"Electrical, Well __", per lump sum.

The unit contract price per lump sum for "Electrical", shall be full compensation for all electrical design, labor, materials, and equipment required to design, provide, and install the complete power and pump control equipment, a reduced voltage starter, enclosures, coordinate and connect electrical service, conductors, metering protection and control devices, surge protection, phase fail relays, ventilation, switches, conduits, heaters, lights, receptacles, thermostat, conduit and fittings, operation and maintenance manuals, and other miscellaneous equipment, specials, and hardware required to furnish and install the electrical system as shown on the plans, in accordance with the specifications, and as directed by the Engineer to make a complete working system. The Contractor shall submit a design for review and approval prior to ordering materials and starting work.

"Telemetry, Well __", per lump sum.

The unit contract price per lump sum for "Telemetry" shall be full compensation for all labor, materials, and equipment required to design, provide, and install a complete operational PLC system that is compatible with the City's existing system. A ten percent payment shall be made upon approval of shop drawings, the lump sum shall be increased to eighty percent complete when all hardware items are in place with the system operating to the satisfaction of the Water Department, and the final twenty percent of this item shall be paid upon receipt of completed record drawings.

"Analog Instrumentation", per lump sum.

The unit contract price per lump sum for "Analog Instrumentation," shall be full compensation for all labor, materials, and equipment required to provide and design the complete analog instrumentation systems for measuring and displaying the well flow, well level, system pressure, and power consumption as shown on the plans, in accordance with the specifications, and as directed by the Engineer.

DIVISION 9 MATERIALS

The Division is supplemented by including the following prior to Section 9-00.

Submittals for all materials used on this project shall be approved by the Municipal Services Department prior to installation of the item.

9-03 AGGREGATES

9-03.12 GRAVEL BACKFILL

9-03.12(3) GRAVEL BACKFILL FOR PIPE ZONE BEDDING

The section is revised by deleting the third paragraph.

THE FOLLOWING SECTION (9-03.22) IS ADDED.

9-03.22 SAND PIPE BEDDING

Blow sand, free of rocks larger than 1/4 inch in diameter and organic material, may be used for pipe bedding.

9-03.23 POLYMERIC FIBER REINFORCEMENT

The polymeric fiber reinforcement shall be Fibermesh or an Engineer approved equal.

9-08 WELL 31 PAINT

The paint for the main building floors shall be recommended for applying to concrete surfaces. The paint shall be self-priming or a compatible primer shall be used. The paint shall be Tnemec, Sherwin-Williams, Columbia Paint, or Engineer approved equal.

The paint for the piping shall be recommended for applying to cast/ductile iron surfaces. The paint shall be self-priming or a compatible primer shall be used. The paint shall be Tnemec, Sherwin-Williams, Columbia Paint, or Engineer approved equal.

The paint for the interior walls shall be recommended for applying to exterior surfaces. The paint shall be self-priming or a compatible primer shall be used. The paint shall be Tnemec, Sherwin-Williams, Columbia Paint, or Engineer approved equal.

9-12 MASONRY UNITS

9-12.1 CONCRETE BLOCKS

The section is supplemented with the following:

Concrete block for the main structure shall be split-face CMU of a color to be approved by the Engineer. The top row of blocks shall be flat faced on both sides.

9-29 ILLUMINATION, SIGNALS, AND ELECTRICAL

9-29.1 CONDUIT

The section is revised to read as follows:

Conduit raceways shall be galvanized rigid steel. Rigid steel conduit shall be hot-dipped galvanized or sherardized steel conduit meeting ANSI C80.1. Couplings shall be unsplit, NPT threaded steel cylinders with galvanizing equal to the conduit. Use approved split or union type couplings only where permitted by the Engineer. Threadless couplings are not permitted. Nipples shall be factory made through 8-inch length. Running threads are not permitted. Intermediate steel conduit is not permitted.

For flexible connections in areas where rigid steel conduit is used, provide liquid-tight flexible metal conduit. It shall be flexible galvanized steel convolutions covered by a liquid tight PVC layer with the manufacturer's marking at 3-foot or less intervals.

Connectors shall be UL approved for grounding and employ a ferrule which covers the end of the conduit inside and out. Conduit shall be Electri-Flex Type LA or American Sealtite, Type UA or approved equal.

Raceway supports shall be as follows:

The Contractor shall submit detailed drawings of placement, insert dimensions, etc. for the Engineer's approval.

Supports in "wet" areas shall be stainless steel or aluminum structural shoes and cast hardware. "Strut" systems for support or attachment of conduit are not permitted. FRP supports such as Aickkenstrut may be used where the Contractor submits load calculations demonstrating their suitability for the load.

Plastic or wire conduit clamps, nail-in clips and/or metal tape are not permitted.

9-29.1(1) FITTINGS

Fittings shall be galvanized, cast iron alloy with threaded hubs, neoprene gasket and galvanized casts iron alloy cover. Miscellaneous fittings shall be as follows:

Escutcheons shall be equal to Beaton & Cadwell 3A, Grabler or Fee & Mason.

Clamp backs shall be galvanized cast iron alloy, one-hole style.

Locknuts shall be extra-heavy, hot-dip galvanized steel through 2 inches thick size and hot-dip galvanized malleable iron above that size.

Bushings shall be hot-dip galvanized iron with insulating thermo setting collar. Provide grounding connector on bushing where terminating at enclosures.

Seals shall be provided in conduit runs to prevent the passage of gases through the conduit where runs exit or enter from outdoor areas. Seals shall be EYA or EYS type; sealant shall be clear or

colorless RTV silicone or equal. Seals shall also be provided for all raceways entering "Hazardous" areas. Sealing compound shall have appropriate fiber backer.

Use cord grip bushing Kellem's or equal stainless steel mesh weave grip devices for hanging cords.

9-29.3 CONDUCTORS, CABLE

The section is revised to read as follows:

Power wiring for service, feeder, and motor circuits shall be Class B stranded copper conductor with Type THHN-THWN insulation. Solid copper conductors, THW or THWN insulated, may be used in 120 volt lighting and receptacle circuit in sizes No. 10 and No. 12 AWG. Other sizes shall be Class B stranded copper conductor, USE or XHHW insulated.

Minimum conductor size for all power wiring shall be No. 12 AWG.

Control wiring shall be Class C stranded copper conductor with Type MTW or XHHW insulation. Minimum conductor size shall be No. 14 AWG.

Multi-conductor control cables shall be XHHW insulated, Class B stranded conductors in overall PVC jacket. Color coding shall be per IPCEA Method No. 1.

Cords shall be stranded copper conductor Type SO with green insulated grounding conductor.

Low voltage instrument wire shall be multi-conductor cable with overall neoprene or PVC jacket. Individual conductors shall be polyethylene/nylon insulated. Unshielded instrument cable shall be equal to Alpha Wire Company No. 1899 and 1899/3 or equal, Belden or NEC. Shielded instrument wire shall be equal to Alpha Wire Company No. 2258 and No. 2258/3 or equal, Belden or NEC.

Grounding clamps shall be equal to T&B 3900 UB Series.

Grounding wire and cable shall be solid copper for No. 4 and smaller diameter; stranded copper in the larger sizes.

Ground rods shall be copper-clad steel, 3/4 inch round, 10-feet long.

Connectors for splicing copper conductors shall be; "Scotchlok" insulated spring connectors for No. 18 through No. 6 AWG solid conductors; insulated, solid-barrel, crimp type connectors for No. 18 through No. 6 AWG stranded conductors; compression splicing sleeves installed by high-pressure compression tools for No. 4 and larger size stranded conductors.

Motor connectors shall be insulated, solid-barrel, crimp type, ring tongue terminals bolted together and taped to insulation thickness of conductors.

Connectors for terminating copper conductors shall be insulated, solid-barrel, crimp type, spade tongue terminal for No. 18 through No. 10 AWG and compression, solid-barrel, one or two hole lugs installed by high-pressure compression tools for No. 8 and larger size.

The insulating materials for splices shall be "Scotchfill" or equal for filling bolted or irregular areas before taping with Scotch No. 88, 33 plus or equal 7 mil vinyl plastic tape.

9-29.9 BALLAST, TRANSFORMERS

The section is revised to read as follows:

Lighting transformers shall be UL listed, two winding, dry-type transformers. They shall be Class "H" insulated but the maximum temperature rise under full load shall not exceed 115 degrees C. rise above ambient.

Transformers shall be equipped with two 5% FCBN taps on the primary winding.

Submit shop drawings for the unit for the Engineer's review. Shop drawings shall show enclosure size and type, weight, openings, and mounting methods, the complete nameplate information for the unit including SO or S/N number and actual impedance.

Transformers shall be manufactured by one of the following:

Cutler-Hammer, General Electric, Square D Company, Westinghouse.

9-29.31 ENCLOSURES

Equipment Enclosures shall be NEMA 12 in dry, indoor locations and NEMA 3R or NEMA 4 in "wet" or outdoor locations.

Enclosures shall be factory Underwriters Laboratory labelled enclosures fabricated of stretcher levelled steel welded into a rigid self-supporting structure.

Enclosures shall be painted white hard finish enamel inside and gray electrical hard finish enamel on the exterior.

Enclosures shall have nameplates attached to the enclosures. Nameplates shall be 1" x 4" with 3/8' letters except where smaller sizes are necessary for smaller enclosures. Nameplates shall be Lamacoid or equal plastic laminate or engraved metal plate. Lettering shall be white; background shall be black. No abbreviations are permitted unless approved by the Engineer. Inscription shall be subject to the Engineer's approval.

Individual device enclosures for circuit breakers shall have external handles marked to indicate "OFF" and "ON" positions. The handle shall be lockable in the "OFF" position. These operating handles shall be interlocked with the enclosure door to prevent: Opening the door with the device "ON". Closing the device with the door open. The interlock shall be screwdriver defeatable.

9-29.32 PANELBOARDS

Panelboard equipment shall consist of wall mounted circuit breaker type equipment meeting NEMA Standard PB-1-1990 and UL Standard 67.

Panelboard shall be vertical main breaker or main lugs only type.

Breakers shall bolt to the bus. Busing shall be copper.

Panelboards shall be complete with insulated but bondable neutral bars, grounding bars and directory card and holder. Each panelboard shall have a 1"x 4" engraved Lamacoid nameplate on the enclosure.

Panelboards shall be equipped with doors with keyed, lockable tumbler lock/catch.

Locks shall be keyed alike. Provide three keys for each panelboard lock. Keys shall be removable in the locked and unlocked position.

Provide shop drawings for the Engineer's review showing ratings, enclosure type, size, finish, and details; wiring or busing diagram of interior; and bill of materials for all components and nameplate listing.

Panelboards shall be manufactured by one of the following and shall be the type noted for the manufacturer in each voltage class:

	Voltage	
Manufacturer	**240V or less**	**480 V**
Cutler-Hammer	PB	PH
General Electric	AQ	AE
Siemens-ITE	CDP-7	CDP-7
Square D Comp.	NQOD	NEHB

9-29.33 CONTROL PANELS

Control panel construction shall, in general, meet JIC EMP-1-1967 standards and applicable NEMA and IEEE standards. The panels shall be constructed in accordance with the standards of a nationally recognized testing laboratory.

The entire assembled panel shall be meggered and tested to be free from unintentional grounds and shorts. All controllers, circuits and interlocks shall be rung out and tested to assure that they function correctly before the panel is shipped. Revise all drawings upon completion of the work to show "as shipped" condition of the panel.

After completion of shop assembly and testing, panels shall be enclosed in heavy-duty polyethylene envelopes or secured sheeting to provide complete protection from dust and moisture. Dehumidifiers shall be placed inside the polyethylene covering. The equipment shall then be skid-mounted for final transport. Shipping weight shall be shown on shipping tags, together with instructions for unloading, transporting, storing, and handling on job site.

Panels shall be arranged as shown on the panel elevations on the Drawings. Submit panel layouts with dimensions to the Engineer for review before fabrication. Panel wiring shall follow the elementary wiring diagrams shown on the Drawings.

Control panel enclosures shall be factory U/L labeled enclosures fabricated of stretcher leveled steel welded into a rigid, self supporting structure. Enclosures shall be NEMA 12.

Components mounted in the interior shall be fastened to an interior subpanel using machine screws plus adhesive to insure vibration-free attachment.

Panel wiring shall comply with ANSI C1-1975 National Electrical Code. Wiring duct shall be provided for wiring within the panel enclosure including all field wiring. Wiring within the panel shall be labeled with wire numbers and run in wiring duct neatly tied and bundled with tie wraps or similar materials.

Line voltage (120 volt or higher) wiring in panels shall be Class C stranded copper conductor with Type MTW or SIS insulation. Color coding of insulation shall be black for power, white for 120V neutrals, red for controls which derive their source from the control power transformer or source

within the panel, yellow for controls which derive their source external to the panel, green for 120V grounding conductors.

Instrumentation wiring for DC analog circuits shall be stranded #18 AWG, minimum size copper conductor with conductor insulation of thermoplastic with foil or stranded wire shielding and overall gray PVC jacket.

Wiring which is an internal part of a device and is not connected to external terminal blocks may be wired using the manufacturer's standard wire designations. Wire which connects to external circuits, to terminal blocks, or other devices which are connected to external circuits shall be identified by the numbers shown on the elementary wiring diagrams. Every wire termination, including all jumpers, shall be identified with wire markers. Wire markers shall be installed over wire terminators or directly adjacent to them. Markers shall be arranged to permit reading of identification.

Wire markers shall consist of yellow, slip-on elastic sleeves sized to tightly grip the wire insulation and marked in block printing with the letters or numbers to identify the circuit.

Panel wiring terminating on device or terminal block screw terminals shall be terminated using slip-on spade tongue insulated crimp (compression) terminators.

Terminal blocks shall be provided for the termination of power and control wiring. Where multiple terminal blocks are shown for a given wire number, additional blocks shall be provided and jumpered as necessary to provide terminal spaces for each individual outgoing wire. Terminal strips shall be mounted on a flat steel channel or strut which raises them to the level of the adjacent wire gutters (2 inch to 3 inch above subplate). The numbers shall correspond to those shown on the elementary wiring diagram. Provide space for a minimum of 10 percent additional control wiring terminal blocks on each side.

Terminal blocks shall be one-piece phenolic with flat base for mounting directly on the plate (no channel) and shall have brass screws with straps suitable for No. 12 AWG wire. They shall be Buchanan or General Electric.

Nameplates shall be rigid phenolic plastic laminate with engraved lettering or engraved metal plate with filled lettering. Background shall be black, lettering shall be white. Nameplates shall be attached to the sheet metal structure by a thin coat of adhesive and sheet metal screws. Adhesive and screw application shall be made in a manner to avoid buckling or distorting nameplates due to use of excessive adhesive or over tightening of screws. Abbreviations are not permitted unless approved by the Engineer or specifically shown on the nameplates, schedules, or drawings.

Nameplates shall be installed plumb and parallel to the lines of doors or structure to which they are attached. A nameplate shall be provided for each panel. It shall be 2"x 10" minimum size with 1/2 inch minimum engraved letters. The engraving shall be as shown on the drawings for the identification of each panel.

Nameplates shall be provided for all relays, timers, transformers, fuses, terminal block, switches mounted internally, and other components which are mounted to the internal mounting panel. These nameplates shall be sized to the scale of the device to which they refer. The engraving shall be as shown for the device on the elementary wiring diagrams.

9-29.34 METERING, PROTECTION AND CONTROL DEVICES

Devices used throughout the project shall be manufactured by a single manufacturer for each type of device.

Provide shop drawings for the Engineer's review for units which are individually mounted. Drawings shall show enclosure outline dimensions and type, voltage and current ratings of device, wiring diagrams of power and control wiring, fusing and overload information and a listing of nameplate and legend plate information. The Contractor shall submit a list of fuse and overload types and their manufacturers to be used on this project for review. Time-current curves for all fuses and overloads shall be submitted to the Engineer for his use. Contractor shall also list the fuses and overloads used on the project by size and quantity; furnish three copies to the Engineer.

Circuit breakers shall meet NEMA Standard AB-1-1993. They shall be molded case, thermal-magnetic trip, trip-free with non-interchangeable, non-adjustable trip unless noted as insulated case breakers.

Magnetic motor starters shall meet NEMA Standard ICS-1-1993. Starter sizes shall be as stated by NEMA, no half or third sizes are allowed. Starters shall be 600 volt rated, three-pole with 120 volt coils. Minimum size shall be NEMA 1. Provide one "NO" auxiliary contact plus two field convertible "NO/NC" auxiliary contacts on each starter. Provide means of mounting up to two additional auxiliary contacts on each starter.

They shall be complete with three overload units of the melting alloy type. The overload units shall be manual reset type and an external reset mechanism shall be provided in the starter enclosure. Provide isolated NO auxiliary contact on overload relays for each starter.

Miscellaneous protection and control devices shall be as follows:

Fuses: Power fuses, Class RK-5 silver element. Control fuses, Bussman FNQ or equal.

Voltage Relays: Diversified Electronics.

Current transformers shall be 1 percent accuracy at burden and lead length as installed. G.E., Midwest, or Westinghouse.

Pilot devices (control units and stations): Allen-Bradley, Cutler-Hammer, General Electric, Square D, Westinghouse, or Rundel; heavy duty, oil-tight type per NEMA ICS-1-1970.

Legend plates shall be provided for all front-mounted control devices, including pilot lights, selector switches, and pushbuttons.

Legend plates shall be engraved with the nomenclature shown on the control wiring diagrams or with standard engraving such as "stop-start"; "hand-off-auto", etc. where none is shown on the drawings.

Control relays shall be electromechanical machine tool, heavy duty type per NEMA Standard with 120 VAC coils and double break contacts rated B-300 by NEMA Standards unless shown otherwise on the drawings. They shall be Allen Bradley 700N, General Electric CR 120, Square D Class 8501 Type G, or equal. Timing relays shall be Allen-Bradley Series 700-H. All relays shall be equipped with surge suppressors.

Running time meters shall be Red Lion Signal six digit non-reset.

Annunciator indicators shall be multi-window engraved display units equal to RIS Model 3100, SCAM, Ronan, or Edwards. Annunciators shall be complete with follower relays with dry contact output and critical bus/non-critical bus alarm output. Sequencing shall be jumper selectable per input or card to ISA standard sequences.

Lightning arresters shall be provided at each control power supply point and to external devices. They shall be General Electric Company Catalog No. 9L15ECA001, 9LECB001, 9LECC001 or equal.

Provide spare fuses, pilot devices and relays as follows:

Original Installation	Spares
3 or less	Same Quantity
4 to 10	3
10 or more	3 plus 10 percent

9-29.35 DUPLEX RECEPTACLES

Duplex receptacles shall be heavy-duty per NEMA WD-1, with staked screw line, neutral and grounding terminals for connection and provisions for split bus operation. They shall be NEMA 5-15R or 5-20R type Arrow-Hart 5739, Bryant or Hubbell 5362 (white), P&S CRB5362I, Sierra, or equal.

Receptacle covers shall be equipped with gasketed, screw cover device covers. Switch covers shall be equipped with push rod or rocker type sealed operators. Device covers in laboratory shall be stainless steel.

Outdoor switch and receptacle covers shall be weatherproof with spring-hinged cover.

9-29.36 TOGGLE SWITCHES

Toggle switches shall be 25 or 20 amp, 120-277 volts AC only, heavy-duty per NEMA WD-1 with staked screw terminals for line and grounding connection, ivory in color, with silver contacts, flush mounting, Arrow-Hart 1991 Series, Bryant 4901 Series, Hubbell 1221 Series, P & S 20ACI Series, or Sierra 5021 Series.

9-29.38 UNIT HEATERS

Provide 480 volt, three phase unit heaters of the size shown on the drawings. Heaters shall be fan forced air units with resistance heating elements. They shall be complete with heater and fan contactors, thermal safety cut-out for overheating, adjustable air louvers to direct air flow, mounting brackets with pivotal mounting for heater, dynamically balanced fan with heat throw of 15 feet up to 3 kW and 32 feet above (maximum RPM 1550), enclosed and guarded motor and fan, enamel steel housing and louvers with removable sides and terminal compartment, internally overload-protected fan motor, and plate fan heating element, low-watt density, full area of air flow, with 5-year warranty. The heaters shall include an optional thermostat as provided by the manufacturer.

9-29.39 THERMOSTATS

Heating and ventilating thermostats shall be equipped with helical sensing elements enclosed in a vented corrosion resistant steel enclosure. Elements shall operate a set of 120 volt rated SPDT contacts. Temperature range shall be adjustable from 35 degrees to 100 degrees F. with fixed 2 degree F. differential for heating and 70 degree to 140 degree F. with fixed 2 degree F. differential for cooling. Adjustment screw and temperature setting indicator shall be accessible without opening the enclosure. Thermostats shall be Honeywell, Johnson, Powers, or equal. Thermostats for the heaters shall be provided by the heater manufacturer. The louvers and fans shall operate on a separate thermostat from the heaters.

9-29.40 FANS

Supply fan for the Well building shall be Dayton model 1HLB5 with two model 4C561 motorized dampers or Engineer approved equal. The fan for the removable pumphouse shall move a minimum of 6000 CFM.

The shutter mount exhaust fan for the electrical room shall be a Dayton model 1HLA2 with shutter or Engineer approved equal. The fan shall move a minimum of 800 cfm.

9-30 WATER DISTRIBUTION MATERIALS

9-30.1 PIPE

9-30.1(3) FLEXIBLE EXPANSION JOINT

The flexible expansion joint shall be a Rubber Spheres Ultra-Sphere model U302, rated at 225 psi or Engineer approved equal.

9-30.3 VALVES

9-30.3(1) GATE VALVES (3 Inches to 12 Inches)

The section is replaced with the following:

Gate valves shall be non-rising stem, resilient wedge conforming to AWWA C515. The wedge shall be cast iron completely encapsulated with urethane rubber. Urethane sealing rubber shall be permanently bonded to the cast iron wedge to meet ASTM test for rubber metal bond ASTM D429.

THE FOLLOWING SECTION (9-30.3(10)) IS ADDED.

9-30.3(10) CHECK VALVE

The 10-inch check valve shall be a Cla-Val model 501 wafer swing check valve or Engineer approved equal.

9-30.3(11) SOLENOID VALVE (normally open)

The pre-lubrication system shall include one 3/4-inch normally open 115 VAC electrically operated solenoid valve.

9-30.3(12) PUMP CONTROL VALVE

The 4-inch pump control valve on the discharge line shall be a Cla-Val model 61-07 or approved equal.

9-36 PUMP

Each pump must meet the following criteria:

1. AWWA E101 Standard for Line Shaft Vertical Turbine Pumps.
2. State Sanitary Codes.
3. Designed for pumping potable water.
4. Will work without modifications in the designed installation shown.
5. The impeller type is specified.
6. The pump is water lubricated.
7. The pump column sections are to be joined by threaded coupling.

Vertical Turbine Pump shall be one of the following sets of bowls or an Engineer approved equal.

WELL 31

Manufacturer	Pump Size and Type	Number of Stages
Flowserve	12SKM	12
Flowserve	12EMM	10
Goulds	12RJMC	11

The Contractor may use one of these bowl assemblies or an Engineer approved equal. The impellers shall be trimmed to use as close to 200 horsepower as possible without going into the service factor. The Contractor shall submit the bowl assembly and impeller trim to the Engineer for review.

WELL 19

Manufacturer	Pump Size and Type	Number of Stages
Flowserve	12EMM	7
Goulds	12RJLC	8

The Contractor may use one of these bowl assemblies or an Engineer approved equal. The impellers shall be trimmed to use as close to 125 horsepower as possible without going into the service factor. The Contractor shall submit the bowl assembly and impeller trim to the Engineer for review.

9-36.1 ELECTRIC PUMP MOTOR

The 200 and 125 horsepower motors shall have class F windings and class B temperature rise, for three phase, 60 cycle, 480 volt current and be manufactured by U.S., G.E., Westinghouse, or Engineer approved equal. The motors shall be of adequate capacity to operate the pumping unit continuously under the head specified with a temperature rise not greater than 40 degrees C above the ambient air, with a 1.15 service factor. The motor shall meet or exceed all applicable state, federal, AWWA E101, ANSI C50.10, and NEMA standards. The motors shall be of the proper size to drive the pumps continuously over the complete head capacity range without the load exceeding

the service factor. The bearings shall be of such size that the average life rating is no less than five (5) years continuous operation. The thrust bearings shall be extra heavy with a thrust rating of 175 percent of the standard thrust bearings. Motor construction shall be cast iron frame and end bells with copper windings.

The motors shall be the product of a well and favorably known manufacturer and shall be vertical hollow shaft, squirrel cage 200 and 125 hp induction type. The speed shall be no greater than 1800 rpm. The motors shall have incorporated a non-reverse ratchet to prevent rotation of the motor in a reverse direction, thus preventing high-speed back spin and excessive surging of the well. The motors shall have a minimum of 93 percent efficiency at full load.

The connection between the motor and the pump shaft shall be through a non-reverse coupling in the motor head, to protect the line shaft bearing from running without lubricant when the power is interrupted. A thrust bearing of ample capacity to carry the weight of all rotating parts plus the hydraulic thrust shall be incorporated into the motor as an integral part.

Provide embedded winding over temperature sensing system with output relay to stop motor when temperature exceeds the rated value of the motor insulation. System shall be Texas Instruments or an approved equal.

The motor shall be compatible with a reduced voltage starter.

9-36.2 DISCHARGE HEAD

The new 10 inch by 10 inch discharge heads shall be supplied and installed by the Contractor. The discharge heads shall conform to AWWA E101 and have penetrations for the air line and sleeve, transducer pipe, and pre-lubrication line.

9-36.3 COLUMN PIPE

The 10 inch column pipe shall comply with AWWA E101. The column shall be furnished in interchangeable ten foot sections. Threads shall be lathe or dye cut to insure that the jointed sections form a perfectly straight column. The sections shall be jointed by threaded sleeve-type couplings so that the ends of the pipe sections will be solidly butted together.

9-36.4 LINE SHAFT

The line shaft shall comply with section E101 of the AWWA Standards and be properly sized to handle 200 horsepower at Well 31 and 125 horsepower at Well 19 , 1760 rpm, and the calculated pump thrust.

9-36.5 CONE STRAINER

The cone strainer shall be stainless steel and comply with section E101 of the AWWA Standards. The cone strainer shall have a net inlet area equal to at least four times the suction pipe area.

9-37 REDUCED VOLTAGE STARTER

The reduced voltage starter shall be a Benshaw or Engineer approved equal. The starter shall have a bypass contactor that closes and prevents current from going through the SCR's after the motor is up to full speed.

9-38 FLOWMETER

The meter shall be the propeller type and shall be furnished with flanged tube, Standard 150 lb. ASA, and shall be 150 psi working pressure (must be able to withstand a 225 psi pressure test). The meter shall be McCrometer/Water Specialties Model ML 04-D, or approved equal, and shall be for electric transmission for remote recording. The meter tube shall be furnished with three straightening vanes directly upstream of the meter-head assembly. The meter-head shall be connected to the tube by means of a flanged connection. The meter tube shall have uniform inside diameter not less than the nominal size of the meter required. The meter head shall be furnished with conical-shaped 3-blade propeller, mounted transversely in the center of the meter tube. The meter head shall be designed to handle thrust at the front of the propeller support assembly.

Provide a McCrometer/Water Specialties model ML04-D indicator/totalizer/ transmitter with digital indicator model TR-28-1 for rate of flow, six digit totalizer (1000 gallons per unit), test hand for flow testing and with 4-20mA isolated flow rate output signal. The output signal shall be 4-20mA scaled over 0-2000 gallons per minute.

9-39 PIPE SUPPORTS

All pipe supports shall be Standon Pipe Supports or Engineer approved equals. The supports shall be adjustable, connect to the pipe flanges, and the bases shall be secured to the concrete floors.

9-40 EYEWASH

The wall mounted eyewash shall be a Haws model 7260BT as supplied by Oxarc, Inc. or an Engineer approved equal.

9-44 TELEMETRY EQUIPMENT

9-44.1 MATERIALS

Ambient conditions

Electrical service to the computer will be 120 V, single phase, 3-wire grounded circuit, 60 Hertz.

The equipment will be located as indicated on the Drawings. The equipment shall operate in a room ambient of 62° - 80° F. Intake air for equipment cooling will be room air.

The system shall operate without failure due to local RFI from motors and other equipment such as SCR controllers, etc., in adjacent rooms.

9-44.2 PROGRAMMABLE LOGIC CONTROLLER (PLC)

The programmable logic controller (PLC) system shall be an Allen-Bradley MicroLogix 1500 system and it shall be programmed to control the on-site functions of the control panel..

The system shall consist of the following components:

Base Unit	Model 1764-24AWA
Processor	Model 1764-LRP

Units consist of solid state electronic devices on a print circuit board equipped with a power supply suitable for 120 volt AC input and with screw terminal block connections for signals in and out.

The telemetry system shall send the following information and alarms:

Power Fail	Phase Fail	Well Flow
Pump Run	Low Air Temp.	System Pressure
Motor Overload	Chlorine Pump Run	Well Level
Motor Overtemp	Power Consumption	Control Valve Closed

The Water Division shall also have the capability to start and stop the pump from the shop through the telemetry.

The Contractor shall make all changes to the Water Division's computer to add the additional well site to their existing display.

Well 31's telemetry capabilities shall be consistent with the existing units installed throughout the system. Detailed drawings of existing sites are available from the City upon request.

Initial programming shall include:

A. Alarms file for each remote location. Alarms are reported to the CRT with a user selectable option to report to the printer.

B. Logic for alarm reporting at Well 31 if: (1) a pump start signal is sent and no flow occurs and/or the control valve does not close after a preset time period; (2) flow occurs for longer than a preset time period after the control valve opens.

9-44.3 MEDIA

The system shall communicate via radio. Any filtering, buffering, or line conditioning necessary to install the equipment in place on the utility circuits shall be provided by the Contractor. The Contractor shall be responsible for checking that his equipment is suitable for application on this system prior to bidding.

9-44.4 FUNCTION

Data Acquisition. The system shall be capable of sensing, recording, and reporting all external signals connected to it. The system shall monitor values of discrete and analog inputs and record values or events that the operator may designate as an alarm condition. The operating parameters, alarms and status inputs shall be monitored and be transmitted over a standard interface to the reporting unit. The system shall be supplied with all programming necessary to generate the alarm, status, and operating parameter messages described in these specifications.

Control. The system shall be designed to monitor and control specified parameters on a closed-loop basis. The control algorithms and sequential logic statements necessary for control shall be calculated in predefined software modules. Any system parameter may be examined and its setpoint or alarm limit changed by the operator as required. Direct digital control shall be accomplished using 4-20 mA analog signals and/or discrete contact closures. In the event of a

program malfunction, the system shall be equipped with manual back-up and override of the control outputs.

Each unit is complete with a 120 volt AC input DC output power supply and a minimum 8 hour battery backup when in the fully operating mode. It is the intent of the specification that the unit operate for extended periods of time when under power failure conditions.

9-44.5 MATERIALS

The system shall operate without failure due to local RFI from motors and other equipment such as SCR controllers, etc., in adjacent locations.

The system shall be complete with any incidental items necessary for proper and reasonable operation of the component parts, including power supplies, filters, isolation transformers or relays, delay, or suppression devices, interconnecting devices, etc., which are ordinarily furnished as a part of a system or which are necessary to successful operation of equipment.

9-44.6 RADIO TRANSMITTER

The digital radio transmitter shall be an Integra TR, with an integrated wireless modem as manufactured by Dataradio or Engineer approved equal. It shall be a 2 watt, 12.5 Khz channel width with a 2.5 pm frequency stability, and operates on a programmed frequency of 453.0625 MHz. The radio must operate on 12 vdc, be capable of transmitting 9,600 bps, and be a type-accepted under Part 90 of the FCC Rules.

9-44.8 ANTENNA AND CABLE

The antenna shall be a 5-element yagi type antenna. The elements shall be welded to the boom and the surfaces shall be anodized to prevent corrosion.

The antenna cable shall be double-shielded with a UV-protected sheath and the maximum loss of the cable shall not exceed 2 dB. The Contractor shall supply information to the Engineer which describes the cable loss in dB per 100 linear feet. From this information the Engineer shall determine the maximum run of cable that may be used at the site. The cable shall include a lightning arrestor between the antenna and the radio.

9-44.11 POWER SUPPLY

The power supply for the radio shall be 15 volt and 1.5 amp. It shall be manufactured by Sola or an Engineer approved equal

9-44.12 BATTERY

The battery for the radio shall be a sealed lead-acid, 12 volt battery, with gel electrolyte. It shall be a minimum of 4.0 amphours. The battery shall be a BCI model BC-1252 or an Engineer approved equal.

9-45 ANALOG INSTRUMENTATION

The process control instrumentation and equipment shall be of the solid-state type and of the manufacturer's latest design. The equipment shall use 4 to 20 milliamperes (mA) standard direct current (d-c) signals, unless otherwise specified. Transmitted electronic signals between equipment items shall be a separate isolated floating output for each item of equipment and shall conform to ISA Standard S50.1. Signals and equipment capacities, impedance, resistances, etc. shall be compatible throughout a loop and from loop to loop for similar equipment. The system components shall be designed to operate together as a complete system.

Analog instruments shall operate without loss of loop accuracy due to electromagnetic interference, resistive or inductive losses or similar problems related to field interconnection of components when connected with shielded 2/conductor No. 18 gauge copper wire in the manner shown on the drawings.

Current-to-current converters shall be used as power boosters to provide sufficient signal power as required. It is the Contractor's responsibility to determine the circumstances and locations where power boosters are required, provide them and to integrate them into the instrumentation system to make the system function properly.

Electronic signal converters/transmitters for primary elements shall have an isolated floating output signal of 4-20 mA d-c which is directly proportional to process variable regardless of the form of the input signal. Intrinsically safe systems, as approved by Factor Mutual, shall be furnished when called for. Each device shall be provided with adjustments for gain and bias. The resultant output shall be 4 to 20 mA d-c into approximately 750 ohms. Accuracy shall be plus or minus .5 percent of full scale output.

Unless otherwise specified, all signal converters shall be part of a true two-wire system in which the power to operate the signal converter is supplied by the next element. No external power connections shall be allowed unless specifically called for in the Specification.

Indicators, gauges, etc., shall display process variables such as flows, pressures, levels, temperatures, velocities in linear process units. Provide signal conditioners, transducers, converters, etc. to perform linearization, where necessary. Local indicators on transmitter may be directly actuated by the process flow where this requirement is met. Indicators and scales are shown in the schedules and shall be printed as shown. Standard scales and indicators will not be accepted without the Engineer's approval if they differ from those shown on the schedule.

9-45.2 PANEL INDICATORS

The panel indicators for flow, pressure, well level, hour meter, phase fail, air temp alarm, overtemp, low temp relay, and well pump shall be consolidated into an Allen-Bradley Panelview Plus 600 Grayscale unit with a keypad or Engineer approved equal.

9-45.3 PRESSURE TO CURRENT (P/I)

Provide pressure transmitters as follows:

USE	RANGE/UNITS
Discharge pressure	0-200 psig

The electronic pressure to current signal converter shall be of the force balance or strain gauge type and shall convert a pressure input to a proportional current output signal. The pressure

sensitive element shall be 316 stainless steel and shall be calibrated for the range as specified in the Schedules. The element shall convert the input pressure into an output motion to operate the transmitting mechanism. The unit shall include fully adjustable span and zero adjustments. Suppression and elevation shall be adjustable on the unit. The transmitter output shall be isolated, floating, 4 to 20 mA d-c into 650 ohms directly proportional to process variable. Accuracy shall be ± 0.5% of span.

The equipment shall be an ABB Series 2600T, Model 261GS or an Engineer approved equal.

9-45.4 PRESSURE TO CURRENT (IMMERSED) (P/I)

Provide pressure transmitters as follows:

USE	LOCATION	RANGE/UNITS
Well Water Level	Well 31	0-450 feet
Well Water Level	Well 19	0-350 feet

The electronic pressure to current signal converter shall be of the force balance or strain gauge type and shall convert a pressure input to a proportional current output signal. The pressure sensitive element shall be calibrated for the range as specified in the Schedules. The unit shall be provided with a cable loaded to the transmitter body of sufficient length to connect without splicing to the control panel. The transmitter output shall be isolated, floating, 4 to 20 mAd-c into 650 ohms directly proportional to process variable. Accuracy shall be ± 0.25% BSL.

The equipment shall be a PMC Model #ATM/N19-24 well level probe with a 0-300 psig range or an Engineer approved equal.

9-45.5 POWER TRANSDUCER

TAG	**USE**	**RANGE/UNITS**
JT 204	Well power	0-400 kW

Transmitter shall be Crompton/Paladin 256 series with 4-20mA output or Engineer approved equal.

9-46 INTERIOR SHEATHING

Interior sheathing for all rooms shall be 1/2-inch Sheetrock Gypsum Panels with a regular core as manufactured by USG or Engineer approved equal.

The joint compound shall be Beadex Lite as manufactured by USG or an Engineer approved equal.

9-47 FIBERGLASS REINFORCED PLASTIC PANELS

The fiberglass reinforced plastic (FRP) panels shall be a minimum of 3/32" thick and shall meet a Class C fire rating. The panels shall be white with a smooth surface. The panels shall be attached to the walls with a manufacturer recommended adhesive. The joints shall be sealed with a manufacturer recommended silicon sealant. The FRP panels shall be Marlite FRP, Sequential Structoglas, or an Engineer approved equal.

The cement board shall be 1/2-inch Durock as manufactured by USG or an Engineer approved equal.

9-48 COMMERCIAL STEEL DOORS AND FRAMES

Doors shall be commercial steel 18 gauge flush doors. The door edge shall be seamless. Exterior doors shall be insulated and interior doors may be hollow core. Door frames shall be 16 gauge welded steel construction.

9-49 LOCKSETS AND HARDWARE

Hinges shall be a full mortise template hinge. Hinge finish shall be satin stainless steel. Hinge shall be ball bearing supported and conform to the ANSI template.

Lock sets shall be ANSI Grade 1 cylindrical locksets with a satin stainless steel finish. Lockset shall be able to accept a BEST 6-pin core lock. The lockset shall operate per ANSI F81. The owner will provide the construction cores for use by the contractor and the final cores upon completion of the project.

9-50 WALL PENETRATIONS

Wall penetrations shall be sealed with Link-Seal Modular Seal as manufactured by Pipeline Seal & Insulator, Inc, Houston, TX, or Engineer approved equal.

MAE VALLEY WELLS PROJECT - 2010

APPENDIX A

STATE PREVAILING WAGES