



**CITY OF COLUSA**  
**Department of Public Works**

**CONTRACT DOCUMENTS**  
**FOR**  
**Wescott Road Rehabilitation Project**  
**Volume 1**

**PRE BID MEETING – TUESDAY, June 17<sup>th</sup>; 2:00 PM, at City Hall**  
**BID OPENING – TUESDAY, July 1<sup>st</sup>; 2:00 PM at City Hall**

Mayor: Ryan Codorniz

Mayor Pro Tem: Denise Conrado

Council Members: Daniel Vaca  
Greg Ponciano  
Dave Markss

City Manager: Jesse Cain  
Public Works Administrative Director: Jesse Cain

**CONTRACT DOCUMENTS  
AND  
SPECIFICATIONS  
FOR  
WESCOTT ROAD REHABILITATION PROJECT  
PROJECT NO. 25-102**

**Volume 1  
MAY 2025  
BID SUBMITTAL**

**Prepared by:**



**California Engineering Company, Inc.  
Civil Engineering ↔ Planning ↔ Surveying ↔ Construction Management  
[www.cecusa.net](http://www.cecusa.net) p 530.751.0952  
Yuba City and Chico, CA**

**CITY OF COLUSA**  
**WESCOTT ROAD REHABILITATION PROJECT**  
**LICENSEE RESPONSIBLE FOR SPECIFICATIONS**

Contract Documents prepared by or under the direction of the following registered persons:

Marisa Hewitt, PE  
CEC, Inc.  
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CITY OF COLUSA  
DEPARTMENT OF PUBLIC WORKS

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**NOTICE TO CONTRACTORS**

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**CONTRACT NO. 25-102  
PPNO 3185**

Sealed proposals for the work shown on the plans entitled:

**CITY OF COLUSA;  
DEPARTMENT OF PUBLIC WORKS  
PROJECT PLANS FOR:**

**WESCOTT ROAD REHABILITATION PROJECT**

**IN**

**THE CITY OF COLUSA**

will be received at the City of Colusa City Hall, 425 Webster St. Colusa, Ca 95932, until **2:00 PM on July 1<sup>st</sup>, 2025**, at which time they will be publicly opened and read.

Proposal forms for this work are included herein:

General work for this project consists of rehabilitating an existing roadway, approximately 4900 lineal feet, by performing a full depth reclamation. Work associated with the main work scope includes upgrade to the existing sidewalks, addition of sidewalks, replacement of existing water services, installing some new sewer services, installation of some curbs and gutters and driveway conforms, along with signage and striping.

**A mandatory pre-bid meeting is scheduled for June 17<sup>th</sup>, 2:00 pm** at Colusa City Hall, 425 Webster St. Colusa, Ca 95932. This meeting is to inform DBEs of subcontracting and material supply opportunities. Bidder's attendance at this meeting will be considered in determining the bidder's good faith effort to obtain DBE participation.

This project has a goal of 24% percent disadvantaged business enterprise (DBE) participation.

**A preconstruction conference will be required for this project. A time and date will be determined after contract award.**

**THIS PROJECT IS SUBJECT TO THE "BUY AMERICA" PROVISIONS OF THE SURFACE TRANSPORTATION ASSISTANCE ACT OF 1982 AS AMENDED BY THE INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991.**

Bids are required for the entire work described herein. All documents shall be submitted in the original Proposal and Contract book, or attached to the appropriate pages, to be considered a responsible bid. (Pages may be stapled in.)

The contractor shall possess either a Class A license or a combination of license classes required for all work at the time this contract is awarded.

This contract is subject to state contract nondiscrimination and compliance requirements pursuant to Government Code, Section 12990.

Plans and specifications for bidding of this project are obtainable at regional bid exchanges or electronically from the cities web site.

Please direct questions to the City Engineer @ 530-682-9832 or swartz@cecusa.net, attention David L. Swartz, PE, PLS.

The successful bidder shall furnish a payment bond and a performance bond.

The City of Colusa hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement; disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at the County of Colusa and available from the California Department of Industrial Relations' Internet web site at <http://www.dir.ca.gov>. The Federal minimum wage rates for this project as predetermined by the United States Secretary of Labor are set forth in the books issued for bidding purposes entitled "Proposal and Contract," and in copies of this book that may be examined at the offices described above where project plans, special provisions, and proposal forms may be seen. Addenda to modify the Federal minimum wage rates, if necessary, will be issued to holders of "Proposal and Contract" books. Future effective general prevailing wage rates which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the general prevailing wage rates.

Attention is directed to the Federal minimum wage rate requirements in the books entitled "Proposal and Contract." If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors shall pay not less than the higher wage rate. The Department will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate which most closely approximates the duties of the employees in question.

CITY OF COLUSA

CITY CLERK:

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Shelly Kittle

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DATED

*CITY OF COLUSA*

*DEPARTMENT OF PUBLIC WORKS*

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# **PROPOSAL AND CONTRACT**

**FOR**

**WESCOTT ROAD REHABILITATION PROJECT**

**IN**

**CITY OF COLUSA**

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For use in Connection with Standard Specifications and Standard Plans Dated 2018, of the California Department of Transportation, and the Labor Surcharge and Equipment Rental Rates in effect on the date the work is accomplished.

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**Contract No. 25-102; PPNO 3185**

**Bid Opening Date: July 1<sup>st</sup>, 2025**

**PROPOSAL TO THE CITY OF COLUSA  
DEPARTMENT OF PUBLIC WORKS**

**CONTRACT NO. 25-102**

**NAME OF BIDDER** \_\_\_\_\_

**BUSINESS P.O. BOX** \_\_\_\_\_

**CITY, STATE, ZIP** \_\_\_\_\_

**BUSINESS STREET ADDRESS** \_\_\_\_\_

*(Please include even if P.O. Box used)*

**CITY, STATE, ZIP** \_\_\_\_\_

**TELEPHONE NO:** \_\_\_\_\_ **AREA CODE ( )** \_\_\_\_\_

**FAX NO:** \_\_\_\_\_ **AREA CODE ( )** \_\_\_\_\_

**CONTRACTOR LICENSE NO.** \_\_\_\_\_

The work for which this proposal is submitted is for construction in conformance with these contract documents, and technical specifications, with the City of Colusa standards and municipal code and standard details, and the Cal Trans Standard Plans (including the payment of not less than the State general prevailing wage rates or Federal minimum wage rates). The project plans described below, including any addenda thereto, the contract annexed hereto, and also in conformance with the California Department of Transportation Standard Plans, dated July, 2010, the Standard Specifications, dated July, 2010, and the Labor Surcharge and Equipment Rental Rates in effect on the date the work is accomplished.

Bids are to be submitted for the entire work. The amount of the bid for comparison purposes will be the total of all items.

The bidder shall set forth for each unit basis item of work a unit price and a total for the item, and for each lump sum item a total for the item, all in clearly legible figures in the respective spaces provided for that purpose. In the case of unit basis items, the amount set forth under the "Item Total" column shall be the product of the unit price bid and the estimated quantity for the item. **Bid award is made solely on the base bid price, and any additive alternates that may exist are only awarded at the cities discretion.**

In case of discrepancy between the unit price and the total set forth for a unit basis item, the unit price shall prevail, except as provided in (a) or (b), as follows:

- (a) If the amount set forth as a unit price is unreadable or otherwise unclear, or is omitted, or is the same as the amount as the entry in the item total column, then the amount set forth in the item total column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price;
- (b) (Decimal Errors) If the product of the entered unit price and the estimated quantity is exactly off by a factor of ten, one hundred, etc., or one-tenth, or one-hundredth, etc. from the entered total, the discrepancy will be resolved by using the entered unit price or item total, whichever most closely approximates percentage wise the unit price or item total in the *CITY OF COLUSA's* Final Estimate of cost.

If both the unit price and the item total are unreadable or otherwise unclear, or are omitted, the bid may be deemed irregular. Likewise if the item total for a lump sum item is unreadable or otherwise unclear, or is omitted, the bid may be deemed irregular unless the project being bid has only a single item and a clear, readable total bid is provided.

Symbols such as commas and dollar signs will be ignored and have no mathematical significance in establishing any unit price or item total or lump sums. Written unit prices, item totals and lump sums will be interpreted according to the number of digits and, if applicable, decimal placement. Cents symbols also have no significance in establishing any unit price or item total since all figures are assumed to be expressed in dollars and/or decimal fractions of a dollar. Bids on lump sum items shall be item totals only; if any unit price for a lump sum item is included in a bid and it differs from the item total, the items total shall prevail.



The foregoing provisions for the resolution of specific irregularities cannot be so comprehensive as to cover every omission, inconsistency, error or other irregularity which may occur in a bid. Any situation not specifically provided for will be determined in the discretion of the *CITY OF COLUSA*, and that discretion will be exercised in the manner deemed by the *CITY OF COLUSA* to best protect the public interest in the prompt and economical completion of the work. The decision of the *CITY OF COLUSA* respecting the amount of a bid, or the existence or treatment of an irregularity in a bid, shall be final.

If this proposal shall be accepted and the undersigned shall fail to enter into the contract and furnish the 2 bonds in the sums required by the State Contract Act, with surety satisfactory to the *CITY OF COLUSA*, within 8 days, not including Saturdays, Sundays and legal holidays, after the bidder has received notice from the *CITY OF COLUSA* that the contract has been awarded, the *CITY OF COLUSA* may, at its option, determine that the bidder has abandoned the contract, and thereupon this proposal and the acceptance thereof shall be null and void and the forfeiture of the security accompanying this proposal shall operate and the same shall be the property of the *CITY OF COLUSA*.

The undersigned, as bidder, declares that the only persons or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any other person, firm, or corporation; that he has carefully examined the location of the proposed work, the annexed proposed form of contract, and the plans therein referred to; and he proposes, and agrees if this proposal is accepted, that he will contract with the *CITY OF COLUSA*, in the form of the copy of the contract annexed hereto, to provide all necessary machinery, tools, apparatus and other means of construction, and to do all the work and furnish all the materials specified in the contract, in the manner and time therein prescribed, and according to the requirements of the Engineer as therein set forth, and that he will take in full payment therefor the following prices, to wit:

# CONTRACTOR'S BID

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| Item No. | Item Description                                | Estimated Quantity | Unit of Measure | Unit Cost | Item Total |
|----------|---|--------------------|-----------------|-----------|------------|
| 1        | Mobilization                                    | 1                  | LS              |           |            |
| 2        | Traffic Control System                          | 1                  | LS              |           |            |
| 3        | Storm Water Pollution Control Plan              | 1                  | LS              |           |            |
| 4        | Pre-Construction Photographs                    | 1                  | LS              |           |            |
| 5        | Clearing and Grubbing/ Demolition               | 1                  | LS              |           |            |
| 6        | Relocate Mailboxes                              | 1                  | LS              |           |            |
| 7        | Relocate Signs                                  | 1                  | LS              |           |            |
| 8        | Adjust Sewer Manhole Frame and Cover to Grade   | 28                 | EA              |           |            |
| 9        | Adjust Monument Frame and Cover to Grade        | 3                  | EA              |           |            |
| 10       | Remove and Replace Fire Hydrant                 | 6                  | EA              |           |            |
| 11       | Clean Storm Drain Inlet                         | 8                  | EA              |           |            |
| 12       | Hydroflush Existing Storm Drain Pipe            | 8                  | EA              |           |            |
| 13       | Full Depth Reclamation with Cement (FDR-C)- 12" | 240,650            | SF              |           |            |
| 14       | Asphalt Concrete (Fiber Reinforced)- 5"         | 8,025              | TONS            |           |            |
| 15       | Asphalt Concrete Speed Table                    | 2                  | EA              |           |            |
| 16       | Shoulder Backing                                | 250                | TONS            |           |            |
| 17       | Minor Concrete- Vertical Curb and Gutter        | 100                | LF              |           |            |
| 18       | Minor Concrete- Rolled Curb and Gutter          | 1,610              | LF              |           |            |
| 19       | Minor Concrete- Valley Curb                     | 3,725              | LF              |           |            |
| 20       | Minor Concrete- Residential Driveway            | 8                  | EA              |           |            |
| 21       | Minor Concrete- Commercial Driveway             | 6                  | EA              |           |            |
| 22       | Minor Concrete- Pedestrian Ramp                 | 8                  | EA              |           |            |
| 23       | Minor Concrete- Valley Gutter                   | 1,050              | SF              |           |            |

|    |   |        |    |  |  |
|----|---|--------|----|--|--|
| 24 | Minor Concrete- Sidewalk                              | 21,455 | SF |  |  |
| 25 | Fire Hydrant and Appurtenances                        | 2      | EA |  |  |
| 26 | 15" HDPE Type S Storm Drain                           | 185    | LF |  |  |
| 27 | 18" HDPE Type S Storm Drain                           | 1,730  | LF |  |  |
| 28 | 30" CMP Culvert Pipe                                  | 110    | LF |  |  |
| 29 | Curb Inlet Catch Basin                                | 10     | EA |  |  |
| 30 | Storm Drain Manhole                                   | 4      | EA |  |  |
| 31 | LED Flashing Traffic Sign & Inpavement Warning Lights | 6      | EA |  |  |
| 32 | Roadway Sign  | 6      | EA |  |  |
| 33 | Thermoplastic Double Yellow Line- Caltrans Detail 22  | 4,650  | LF |  |  |
| 34 | Thermoplastic Bike Lane- Caltrans Detail 39           | 14,550 | LF |  |  |
| 35 | Themorplastic Bike Lane Dashed- Caltrans Detail 39A   | 2,110  | LF |  |  |
| 36 | Thermoplastic 12" Stripe (White)                      | 515    | LF |  |  |
| 37 | Thermoplastic Pavement Markings                       | 270    | SF |  |  |

**Bid Alternate #1**

| <b>Item No.</b> | <b>Item Description</b>                     | <b>Estimated Quantity</b> | <b>Unit of Measure</b> | <b>Unit Cost</b> | <b>Item Total</b> |
|-----------------|---|---------------------------|------------------------|------------------|-------------------|
| 1               | Adjust Water Valve Frame and Cover to Grade | 18                        | EA                     |                  |                   |
| 2               | Adjust Air Relief Valve Into Vault          | 1                         | EA                     |                  |                   |
| 3               | Water Service Line Replacement              | 34                        | EA                     |                  |                   |
| 4               | 2.5" Sch 40 Water Stub                      | 40                        | LF                     |                  |                   |
| 5               | 3" Sch 40 Water Stub                        | 50                        | LF                     |                  |                   |
| 6               | 6" PVC C-900 Water Stub                     | 15                        | LF                     |                  |                   |
| 7               | 8" PVC C-900 Water Stub                     | 15                        | LF                     |                  |                   |
| 8               | 10" PVC C-900 Water Stub                    | 55                        | LF                     |                  |                   |
| 9               | 10" Water Valve                             | 1                         | EA                     |                  |                   |

|    |                         |     |    |  |  |
|----|-------------------------|-----|----|--|--|
| 10 | Sanitary Sewer Manhole  | 1   | EA |  |  |
| 11 | 4" Sanitary Sewer Stub  | 50  | LF |  |  |
| 12 | 6" Sanitary Sewer Stub  | 340 | LF |  |  |
| 13 | 12" Sanitary Sewer Stub | 20  | LF |  |  |

**TOTAL BASE BID** \_\_\_\_\_

**TOTAL BID ALTERNATE** \_\_\_\_\_

**Contractor Signature** \_\_\_\_\_

**Date Signed** \_\_\_\_\_

The Bidder shall list the name and address of each subcontractor to whom the Bidder proposes to subcontract portions of the work, as required by the provisions in Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications and Section 2-1.02, " Required Listing of Proposed Subcontractors," of the special provisions.

**LIST OF SUBCONTRACTORS**

| <u>Name and Address and License No.</u> | <u>Description of Portion of Work Subcontracted</u> |
|---|---|
|   |   |
|   |   |
|   |   |
|   |   |
|   |   |
|   |   |

*(THE BIDDER'S EXECUTION ON THE SIGNATURE PORTION OF THIS PROPOSAL SHALL ALSO CONSTITUTE AN ENDORSEMENT AND EXECUTION OF THOSE CERTIFICATIONS WHICH ARE A PART OF THIS PROPOSAL)*

## EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

The bidder \_\_\_\_\_, proposed subcontractor \_\_\_\_\_, hereby certifies that he has \_\_\_\_\_, has not \_\_\_\_\_, participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, or 11246, and that, where required, he has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

**Note:** The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b) (1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b) (1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

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# **PUBLIC CONTRACT CODE**

## **Public Contract Code Section 10285.1 Statement**

In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder has \_\_\_\_, has not \_\_\_\_ been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or Federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

Note: The bidder must place a check mark after "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

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## **◆ Public Contract Code Section 10162 Questionnaire**

In conformance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?

Yes \_\_\_\_\_ No \_\_\_\_\_

If the answer is yes, explain the circumstances in the following space.

## Public Contract Code 10232 Statement

In conformance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

Note: The above Statement and Questionnaire are part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement and Questionnaire.  
Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

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## **Noncollusion Affidavit**

(Title 23 United States Code Section 112 and  
Public Contract Code Section 7106)

To the CITY OF COLUSA

*DEPARTMENT OF PUBLIC WORKS.*

In conformance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Note: The above Noncollusion Affidavit is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Noncollusion Affidavit.  
Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

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## DEBARMENT AND SUSPENSION CERTIFICATION

TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29

The bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

- is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency;
- has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal agency within the past 3 years;
- does not have a proposed debarment pending; and
- has not been indicted, convicted, or had a civil judgement rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Notes: Providing false information may result in criminal prosecution or administrative sanctions.

The above certification is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Certification.

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## **NONLOBBYING CERTIFICATION FOR FEDERAL-AID CONTRACTS**

The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in conformance with its instructions.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such subrecipients shall certify and disclose accordingly.

**DISCLOSURE OF LOBBYING ACTIVITIES**

COMPLETE THIS FORM TO DISCLOSE LOBBYING ACTIVITIES PURSUANT TO 31 U.S.C. 1352

|  |   |   |
|--|---|---|
| <b>1. Type of Federal Action:</b><br><input type="checkbox"/> a. contract<br><input type="checkbox"/> b. grant<br><input type="checkbox"/> c. cooperative agreement<br><input type="checkbox"/> d. loan<br><input type="checkbox"/> e. loan guarantee<br><input type="checkbox"/> f. loan insurance  | <b>2. Status of Federal Action:</b><br><input type="checkbox"/> a. bid/offer/application<br><input type="checkbox"/> b. initial award<br><input type="checkbox"/> c. post-award   | <b>3. Report Type:</b><br><input type="checkbox"/> a. initial<br><input type="checkbox"/> b. material change<br><br><b>For Material Change Only:</b><br>year _____ quarter _____<br>date of last report _____ |
| <b>4. Name and Address of Reporting Entity</b><br><br><input type="checkbox"/> Prime <input type="checkbox"/> Subawardee<br>Tier _____, if known<br><br>Congressional District, if known   | <b>5. If Reporting Entity in No. 4 is Subawardee, Enter Name and Address of Prime:</b><br><br>Congressional District, if known  |   |
| <b>6. Federal Department/Agency:</b>   | <b>7. Federal Program Name/Description:</b><br><br>CFDA Number, if applicable _____   |   |
| <b>8. Federal Action Number, if known:</b>   | <b>9. Award Amount, if known:</b>   |   |
| <b>10. a. Name and Address of Lobby Entity</b><br>(If individual, last name, first name, MI)<br><br>(attach Continuation Sheet(s) if necessary)  | <b>b. Individuals Performing Services</b> (including address if different from No. 10a)<br>(last name, first name, MI)  |   |
| <b>11. Amount of Payment (check all that apply)</b><br>\$ _____ <input type="checkbox"/> actual <input type="checkbox"/> planned   | <b>13. Type of Payment (check all that apply)</b><br><input type="checkbox"/> a. retainer<br><input type="checkbox"/> b. one-time fee<br><input type="checkbox"/> c. commission<br><input type="checkbox"/> d. contingent fee<br><input type="checkbox"/> e. deferred<br><input type="checkbox"/> f. other, specify _____ |   |
| <b>12. Form of Payment (check all that apply):</b><br><input type="checkbox"/> a. cash<br><input type="checkbox"/> b. in-kind; specify: nature _____<br>value _____  | <b>14. Brief Description of Services Performed or to be performed and Date(s) of Service, including officer(s), employee(s), or member(s) contacted, for Payment Indicated in Item 11:</b><br><br>(attach Continuation Sheet(s) if necessary)   |   |
| <b>15. Continuation Sheet(s) attached:</b> Yes <input type="checkbox"/> No <input type="checkbox"/>  |   |   |
| <b>16. Information requested through this form is authorized by Title 31 U.S.C. Section 1352. This disclosure of lobbying reliance was placed by the tier above when his transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to Congress semiannually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.</b> |   |   |
| Signature: _____<br>Print Name: _____<br>Title: _____<br>Telephone No.: _____ Date: _____  |   |   |
| <b>Federal Use Only:</b><br>Authorized for Local Reproduction<br>Standard Form - LLL   |   |   |

## INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of covered Federal action or a material change to previous filing pursuant to title 31 U.S.C. section 1352. The filing of a form is required for such payment or agreement to make payment to lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress an officer or employee of Congress or an employee of a Member of Congress in connection with a covered Federal action. Attach a continuation sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence, the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a follow-up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last, previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, state and zip code of the reporting entity. Include Congressional District if known. Check the appropriate classification of the reporting entity that designates if it is or expects to be a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the first tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in Item 4 checks "Subawardee" then enter the full name, address, city, state and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organization level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identification in item 1 (e.g., Request for Proposal (RFP) number, Invitation for Bid (IFB) number, grant announcement number, the contract grant or loan award number, the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitments for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, state and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influenced the covered Federal action.  
(b) Enter the full names of the individual(s) performing services and include full address if different from 10 (a). Enter Last Name, First Name and Middle Initial (MI).
11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.
12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.
14. Provide a specific and detailed description of the services that the lobbyist has performed or will be expected to perform and the date(s) of any services rendered. Include all preparatory and related activity not just time spent in actual contact with Federal officials. Identify the Federal officer(s) or employee(s) contacted or the officer(s) employee(s) or Member(s) of Congress that were contacted.
15. Check whether or not a continuation sheet(s) is attached.
16. The certifying official shall sign and date the form, print his/her name title and telephone number.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, D.C. 20503.

SF-LLL-Instructions Rev. 06-04-90«ENDIF»

Accompanying this proposal is \_\_\_\_\_

(NOTICE: INSERT THE WORDS "CASH(\$ \_\_\_\_\_)," "CASHIER'S CHECK,"  
"CERTIFIED CHECK," OR "BIDDER'S BOND," AS THE CASE MAY BE.)

in amount equal to at least ten percent of the total of the bid.

The names of all persons interested in the foregoing proposal as principals are as follows:

## IMPORTANT NOTICE

*If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager thereof; if a co-partnership, state true name of firm, also names of all individual copartners composing firm; if bidder or other interested person is an individual, state first and last names in full.*

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Licensed in conformance with an act providing for the registration of Contractors,

License No. \_\_\_\_\_ Classification(s) \_\_\_\_\_

### **ADDENDA** -

This Proposal is submitted with respect to the changes to the contract included in addenda number/s \_\_\_\_\_

*(Fill in addenda numbers if addenda have been received and insert, in this Proposal, any Engineer's Estimate sheets that were received as part of the addenda.)*

By my signature on this proposal I certify, under penalty of perjury under the laws of the State of California, that the foregoing questionnaire and statements of Public Contract Code Sections 10162, 10232 and 10285.1 are true and correct and that the bidder has complied with the requirements of Section 8103 of the Fair Employment and Housing Commission Regulations (Chapter 5, Title 2 of the California Administrative Code). By my signature on this proposal I further certify, under penalty of perjury under the laws of the State of California and the United States of America, that the Noncollusion Affidavit required by Title 23 United States Code, Section 112 and Public Contract Code Section 7106; and the Title 49 Code of Federal Regulations, Part 29 Debarment and Suspension Certification are true and correct.

Date: \_\_\_\_\_



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Signature and Title of Bidder

Business Address \_\_\_\_\_

Place of Business \_\_\_\_\_

Place of Residence \_\_\_\_\_

**CITY OF COLUSA**  
**DEPARTMENT OF PUBLIC WORKS**

**BIDDER'S BOND**

We, \_\_\_\_\_  
\_\_\_\_\_ as Principal, and

as Surety are bound unto the City OF COLUSA, State of California, hereafter referred to as "Obligee", in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the Obligee for the work described below, for the payment of which sum we bind ourselves, jointly and severally,

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:

WHEREAS, the Principal is submitted to the Obligee, for \_\_\_\_\_,

\_\_\_\_\_  
*(Copy here the exact description of work, including location as it appears on the proposal)*

for which bids are to be opened at \_\_\_\_\_ on \_\_\_\_\_  
*(Insert place where bids will be opened) (Insert date of bid opening)*

NOW, THEREFORE, if the Principal is awarded the contract and, within the time and manner required under the specifications, after the prescribed forms are presented to him for signature, enters into a written contract, in the prescribed form, in conformance with the bid, and files two bonds with the Obligee, one to guarantee faithful performance of the contract and the other to guarantee payment for labor and materials as provided by law, then this obligation shall be null and void; otherwise, it shall remain in full force.

In the event suit is brought upon this bond by the Obligee and judgement is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney's fee to be fixed by the court.

Dated: \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
*Principal*  
\_\_\_\_\_  
*Surety*  
By \_\_\_\_\_  
*Attorney-in-fact*

**CERTIFICATE OF ACKNOWLEDGEMENT**

State of California

City / County of \_\_\_\_\_ SS

On this \_\_\_\_\_ day of \_\_\_\_\_ in the year 20\_\_\_\_ before me

\_\_\_\_\_, personally appeared \_\_\_\_\_,  
*Attorney-in-fact*

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to this instrument as the attorney-in-fact of \_\_\_\_\_, and acknowledged to me that he (she) subscribed the name of the said company thereto as surety, and his (her) own name as attorney-in-fact.

(SEAL)

\_\_\_\_\_  
*Notary Public*

♦ **LOCAL AGENCY BIDDER - DBE - INFORMATION**

This information may be submitted with your bid proposal. If it is not, and you are the apparent low bidder or the second or third low bidder, it must be submitted and received as specified in Section 2-1.12B of the Special Provisions. Failure to submit the required DBE information will be grounds for finding the proposal nonresponsive.

**CO.-RTE.-K.P.:** \_\_\_\_\_

**CONTRACT NO.:** \_\_\_\_\_

**BID AMOUNT: \$** \_\_\_\_\_

**BID OPENING DATE:** \_\_\_\_\_

**BIDDER'S NAME:** \_\_\_\_\_

**DBE GOAL FROM CONTRACT:** \_\_\_\_\_

**DBE PRIME CONTRACTOR CERTIFICATION <sup>1</sup>:**

| CONTRACT<br>ITEM NO.  | ITEM OF WORK AND<br>DESCRIPTION OR SERVICES TO BE<br>SUBCONTRACTED OR MATERIALS<br>TO BE PROVIDED <sup>2</sup> | DBE CERT. NO. | NAME OF DBEs<br>(Must be certified on the date bids<br>are opened - include DBE address<br>and phone number)                    | DOLLAR<br>AMOUNT<br>DBE <sup>3</sup> |
|---|--|---------------|---|--------------------------------------|
|   |  |               |   |                                      |
| <b>IMPORTANT: Identify all DBE firms being claimed for credit, regardless of tier. Copies of the DBE quotes are required. Names of the First Tier DBE Subcontractors and their respective item(s) of work listed above shall be consistent, where applicable, with the names and items of work in the "List of Subcontractors" submitted with your bid pursuant to the Subcontractors Listing Law and Section 2-1.02, "Required Listing of Proposed Subcontractors," of the Special Provisions.</b> |  |               | ♦ <b>Total Claimed</b><br>♦ <b>Participation</b>  | \$ _____<br><br>_____ %              |
| 1. DBE prime contractors shall enter their DBE certification number. DBE prime contractors shall indicate all work to be performed by DBEs including work performed by its own forces.<br><br>2. If 100% of item is not to be performed or furnished by DBE, describe exact portion of item to be performed or furnished by DBE.<br><br>3. See Section 2-1.02, "Disadvantaged Business Enterprise," to determine the credit allowed for DBE firms.  |  |               | _____<br>Signature of Bidder<br><br>_____<br>Date (Area Code) Tel. No.<br><br>_____<br>Person to Contact (Please Type or Print) |                                      |

CT Bidder - DBE Information (Rev 09-28-99)



## • DBE INFORMATION—GOOD FAITH EFFORTS

The CITY OF COLUSA established a Disadvantaged Business Enterprise (DBE) goal of 24% for this project. The information provided herein shows that adequate good faith efforts were made.

- A. The names and dates of each publication in which a request for DBE participation for this project was placed by the bidder (please attach copies of advertisements or proofs of publication):

| <u>Publications</u> | <u>Dates of Advertisement</u> |
|---------------------|-------------------------------|
|---------------------|-------------------------------|

- B. The names and dates of written notices sent to certified DBEs soliciting bids for this project and the dates and methods used for following up initial solicitations to determine with certainty whether the DBEs were interested (please attach copies of solicitations, telephone records, fax confirmations, etc.):

| <u>Names of DBEs<br/>Solicited</u> | <u>Date of Initial<br/>Solicitation</u> | <u>Follow Up Methods<br/>and Dates</u> |
|------------------------------------|---|--|
|------------------------------------|---|--|

- C. The items of work which the bidder made available to DBE firms, including, where appropriate, any breaking down of the contract work items (including those items normally performed by the bidder with its own forces) into economically feasible units to facilitate DBE participation. It is the bidder's responsibility to demonstrate that sufficient work to facilitate DBE participation was made available to DBE firms.

| <u>Items of Work</u> | <u>Breakdown of Items</u> |
|----------------------|---------------------------|
|----------------------|---------------------------|

- D. The names, addresses and phone numbers of rejected DBE firms, the reasons for the bidder's rejection of the DBEs, and the firms selected for that work (please attach copies of quotes from the firms involved):

Names, addresses and phone numbers of rejected DBEs and the reasons for the bidder's rejection of the DBEs:

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Names, addresses and phone numbers of firms selected for the work above:

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- E. Efforts made to assist interested DBEs in obtaining bonding, lines of credit or insurance, and any technical assistance or information related to the plans, specifications and requirements for the work which was provided to DBEs:

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- F. Efforts made to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services, excluding supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate.

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- G. The names of agencies, organizations or groups contacted to provide assistance in contacting, recruiting and using DBE firms (please attach copies of requests to agencies and any responses received, i.e., lists, Internet page download, etc.).

| Name<br>Agency/Organization | of | Method/Date of<br>Contact | Results |
|-----------------------------|----|---------------------------|---------|
|-----------------------------|----|---------------------------|---------|

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- H. Any additional data to support a demonstration of good faith efforts (use additional sheets if necessary):

### **Contract Assurance**

The contractor ensures that the following clause is placed in every DOT-assisted contract and subcontract:

The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as recipient deems appropriate.

### **Prompt Progress Payment To Subcontractors**

A prime contractor or subcontractor shall pay to any subcontractor not later than 10 days of receipt of each progress payment in accordance with the provision in Section 7108.5 of the California Business and Professions Code concerning prompt payment to subcontractors. The 10 days is applicable unless a longer period is agreed to in writing. Any delay or postponement of payment over 30 days may take place only for good cause and with the agency's prior written approval. Any violation of Section 7108.5 shall subject the violating contractor or subcontractor to the penalties, sanctions, and other remedies of that Section. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise, available to the contractor or subcontractor in the event of a dispute involving late payment, or nonpayment by the contractor, or deficient subcontractor performance, or noncompliance by a subcontractor. This clause applies to both DBE and non-DBE subcontractors.

### **Prompt Payment Of Withheld Funds To Subcontractors**

The contractor shall include the following provision in all federal-aid contracts to ensure prompt and full payment of retainage [withheld funds] to subcontractors in compliance with 49 CFR 26.29).

The agency shall hold retainage from the prime contractor and shall make prompt and regular incremental acceptances of portions, as determined by the agency of the contract work and pay retainage to the prime contractor based on these acceptances. The prime contractor or subcontractor shall return all monies withheld in retention from all subcontractors within 30 days after receiving payment for work satisfactorily completed and accepted including incremental acceptances of portions of the contract work by the agency. Any delay or postponement of payment may take place only for good cause and with the agency's prior written approval. Any violation of these provisions shall subject the violating prime contractor to the penalties, sanctions, and other remedies specified in Section 7108.5 of the California Business Professions Code. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise, available to the prime contractor or subcontractor in the event of a dispute involving late payment, or nonpayment by the contractor, or deficient subcontractor's performance, or noncompliance by a subcontractor. This clause applies to both DBE and non-DBE subcontractors.

### **Overall Goal**

The City of Colusa' overall goal for the federal fiscal year 2004/2005 is the following: **24 %** of the federal financial assistance in DOT-assisted contracts. This overall goal is broken down into **12 %** race-conscious and **12 %** race-neutral components.

### **Contract Goals**

The City of Colusa will use contract goals to meet any portion of the overall goal the City of Colusa does not project being able to meet by the use of race-neutral means. Contract goals are established so that, over the period to which the overall goal applies, they will cumulatively result in meeting any portion of the overall goal that is not projected to be met through the use of race-neutral means.

Contract goals will be established only on those DOT-assisted contracts that have subcontracting possibilities. Contract goals need not be established on every such contract, and the size of contract goals will be adapted to the circumstances of each such contract (e.g., type and location of work, availability of DBEs to perform the particular type of work). The contract work items will be compared with eligible DBE contractors willing to work on the project. A determination will also be made to decide which items are likely to be performed by the prime contractor and which ones are likely to be performed by the subcontractor(s). The goal will then be incorporated into the contract documents. Contract goals will be expressed as a percentage of the total amount of a DOT-assisted contract.

### **Transit Vehicle Manufacturers**

If DOT-assisted contracts will include transit vehicle procurements, the City of Colusa will require each transit vehicle manufacturer, as a condition of being authorized to bid or propose on transit vehicle procurements, to certify that it has complied with the requirements of 49 CFR Part 26, Section 49. The City of Colusa will direct the transit vehicle manufacturer to the subject requirements located on the Internet at <http://osdbuweb.dot.gov/programs/dbe/dbe.htm>.

### **GOOD FAITH EFFORTS**

#### **Information to be Submitted**

The City of Colusa treats bidders'/offerors' compliance with good faith effort requirements as a matter of responsiveness. A responsive proposal is meeting all the requirements of the advertisement and solicitation.

Each solicitation for which a contract goal has been established will require the bidders/offerors to submit the following information to: **City Engineer, City of Colusa, P.O. Box 307, Colusa, CA 95932**, no later than 4:00 p.m. on or before the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening:

1. The names and addresses of known DBE firms that will participate in the contract;
2. A description of the work that each DBE will perform;
3. The dollar amount of the participation of each DBE firm participation;
4. Written and signed documentation of commitment to use a DBE subcontractor whose participation it submits to meet a contract goal;
5. Written and signed confirmation from the DBE that it is participating in the contract as provided in the prime contractor's commitment; and
6. If the contract goal is not met, evidence of good faith efforts.

#### **Demonstration of Good Faith Efforts**

**The obligation of the bidder/offeror is to make good faith efforts. The bidder/offeror can demonstrate that it has done so either by meeting the contract goal or documenting good faith efforts.**

The following personnel are responsible for determining whether a bidder/offeror who has not met the contract goal has documented sufficient good faith efforts to be regarded as responsive: **City Engineer, City of Colusa, 465 C Street, Colusa, CA 95932.**

The City of Colusa will ensure that all information is complete and accurate and adequately documents the bidder/offeror's good faith efforts before a commitment to the performance of the contract by the bidder/offeror is made.

#### **Administrative Reconsideration**

Within 10 days of being informed by the City of Colusa that it is not responsive because it has not documented sufficient good faith efforts, a bidder/offeror may request administrative reconsideration. Bidder/offerors should make this request in writing to the following reconsideration official: **City Manager, City of Colusa, 425 Webster Street, Colusa, CA 95932.**

The reconsideration official will not have played any role in the original determination that the bidder/offeror did not make or document sufficient good faith efforts.

As part of this reconsideration, the bidder/offeror will have the opportunity to provide written documentation or argument concerning the issue of whether it met the goal or made adequate good faith efforts to do so. The bidder/offeror will have the opportunity to meet in person with the reconsideration official to discuss the issue of whether it met the goal or made adequate good faith efforts to do so. The City of Colusa will send the bidder/offeror a written decision on reconsideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. The result of the reconsideration process is not administratively appealable to Caltrans, FHWA or the DOT.

#### **Good Faith Efforts when a DBE is Replaced on a Contract**

The City of Colusa will require a contractor to make good faith efforts to replace a DBE that is terminated or has otherwise failed to complete its work on a contract with another certified DBE, to the extent needed to meet the contract goal. The prime contractor is required to notify the RE immediately of the DBE's inability or unwillingness to perform and provide reasonable documentation.

In this situation, the prime contractor will be required to obtain the City of Colusa's prior approval of the substitute DBE and to provide copies of new or amended subcontracts, or documentation of good faith efforts. If the contractor fails or refuses to comply in the time specified, the City of Colusa contracting office will issue an order stopping all or part of payment/work until satisfactory action has been taken. If the contractor still fails to comply, the contracting officer may issue a termination for default proceeding.

#### **Counting DBE Participation**

The City of Colusa will count DBE participation toward overall and contract goals as provided in the contract specifications for the prime contractor, subcontractor, joint venture partner with prime or subcontractor, or vendor of material or supplies.

#### **Monitoring Payments to DBEs**

Prime contractors are required to maintain records and documents of payments to DBEs for three years following the performance of the contract. These records will be made available for inspection upon request by any authorized representative of the City of Colusa, Caltrans, FHWA, or DOT. This reporting requirement also extends to any certified DBE subcontractor.

Payments to DBE subcontractors will be reviewed by the City of Colusa to ensure that the actual amount paid to DBE subcontractors equals or exceeds the dollar amounts stated in the schedule of DBE participation.

#### **Confidentiality**

The City of Colusa will safeguard from disclosure to third parties information that may reasonably be regarded as confidential business information, consistent with federal, state, and local laws.

**STANDARD PUBLIC WORKS AGREEMENT FOR  
WESCOTT ROAD REHABILITATION PROJECT**

THIS AGREEMENT (herein "Agreement"), is made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_ by and between the CITY OF COLUSA, a municipal corporation, (herein "City") and \_\_\_\_\_ (herein "Contractor"). The parties hereto agree as follows:

**R E C I T A L S**

A. City requires the construction of \_\_\_\_\_, as set forth more fully in this Agreement. Contractor has represented to City that Contractor is qualified to perform said work and has submitted a proposal to City for same.

B. City desires to have Contractor perform said services on the terms and conditions set forth herein.

NOW, THEREFORE, based on the foregoing Recitals and for good and valuable consideration, the receipt and sufficiency of which is acknowledged by both parties, City and Contractor hereby agree as follows:

1-1 1. SERVICES OF CONTRACTOR

1-1.01 1.1 Scope of Services - In compliance with all terms and conditions of this agreement, the contractor shall provide those services and incorporated herein by this reference, which services may be referred to herein as the "Services" or "Work" hereunder. As a material inducement to the City entering into this agreement, contractor represents and warrants that contractor is a provider of first class work and services and contractor is experienced in performing the work and services contemplated herein and, in light of such status and experience, contractor covenants that it shall follow the highest professional standards in performing the work and services required hereunder and that all materials will be of good quality, fit for the purpose intended.

1-1.02 1.2 Documents Included in Contract - This contract consists of the request for proposal, bid documents (hereinafter "proposal"), proposal schedule, designation of subcontractors, Noncollusion affidavit, certification of principal, specifications, plans, this contract services agreement, faithful performance bond, labor and materials bond, supplemental information, guarantee, tax identification form and any and all schedules and attachments to it which are incorporated as if fully set forth herein. In the event of an inconsistency, this agreement shall govern.

1-1.03 1.3 Compliance with Law - All services rendered hereunder shall be provided in accordance with all ordinances, resolutions, statutes, rules, and regulations of the City and any federal, state or local governmental agency having jurisdiction in effect at the time service is rendered.

1-1.04 1.4 Licenses, Permits, Fees and Assessments - Contractor shall obtain at its sole cost and expense such licenses, permits and approvals as may be required by law for the performance of the services required by this agreement, including registration with the department of industrial relations of the state of California as required by labor code section 1725.5 before commencing performance under this agreement. Contractor shall have the sole obligation to pay for any fees, assessments and taxes, plus applicable penalties and interest, which may be imposed by law and arise from or are necessary for the contractor's performance of the services required by this agreement, and shall indemnify, defend and hold harmless City against any such fees, assessments, taxes penalties or interest levied, assessed or imposed against City hereunder. Contractor shall be responsible for all subcontractors' compliance with this section 1.4.

1-1.05 1.5 Familiarity with Work - By executing this contract, contractor warrants that contractor (a) has thoroughly investigated and considered the scope of services to be performed, (b) has carefully considered how the services should be performed, and (c) fully understands the facilities, difficulties and restrictions attending performance of the services under this agreement. If the services involve work upon any site, contractor warrants that contractor has or will investigate the site and is or will be fully acquainted with the conditions there existing, prior to commencement of services hereunder. Should the contractor discover any latent or unknown conditions, which will materially affect the performance of the services hereunder, contractor shall immediately inform the City of such fact and shall not proceed except at contractor's risk until written instructions are received from the contract officer.

1-1.06 1.6 Standard of Performance – Contractor, its subcontractors and their employees, in the performance of contractor's work under this agreement shall be responsible for exercising the degree of skill and care required by customarily accepted good professional practices and procedures used in the contractor's field.

1-1.07

1-1.08 Any costs for failure to meet the foregoing standard or to correct otherwise defective work that requires re-performance of the work, shall be borne in total by the contractor and not by the City. The failure of a project to achieve the performance goals and objectives stated in this agreement is not a basis for requesting re-performance unless the work conducted by contractor and/or its subcontractors is deemed by the City to have failed the foregoing standard of performance.

1-1.09 In the event contractor fails to perform in accordance with the above standard:

1. Contractor will re-perform, at its own expense, any task which was not performed to the reasonable satisfaction of City. Any work re-performed pursuant to this paragraph shall be completed within the time limitations originally set forth for the

- specific task involved. Contractor shall work any overtime required to meet the deadline for the task at no additional cost to the City;
2. The City shall provide a new schedule for the re-performance of any task pursuant to this paragraph in the event that re-performance of a task within the original time limitations is not feasible; and
  3. The City shall have the option to direct contractor not to re-perform any task which was not performed to the reasonable satisfaction of the City project manager pursuant to application of (1) and (2) above. In the event the City directs contractor not to re-perform a task, the City shall negotiate a reasonable settlement for satisfactory work performed. No previous payment shall be considered a waiver of the City's right to reimbursement.

1-1.10 Nothing contained in this section is intended to limit any of the rights or remedies which the City may have under law.

1-1.11 1.7 Care of Work - The contractor shall adopt reasonable methods during the life of the agreement to furnish continuous protection to the work, and the equipment, materials, papers, documents, plans, studies and/or other components thereof to prevent losses or damages, and shall be responsible for all such damages, to persons or property, until acceptance of the work by City, except such losses or damages as may be caused by City's own negligence.

1-1.12 1.8 Further Responsibilities of Parties - Both parties agree to use reasonable care and diligence to perform their respective obligations under this agreement. Both parties agree to act in good faith to execute all instruments, prepare all documents and take all actions as may be reasonably necessary to carry out the purposes of this agreement. Unless hereafter specified, neither party shall be responsible for the service of the other. Contractor shall require all subcontractors to comply with the provisions of this agreement.

1-1.13 1.9 Additional Services - City shall have the right at any time during the performance of the services, without invalidating this agreement, to order extra work beyond that specified in the scope of services or make changes by altering, adding to or deducting from said work. No such extra work may be undertaken unless a written change order is first given by the contract officer to the contractor, incorporating therein any adjustment in (i) the contract sum as set forth in section 2.1, and/or (ii) the time to perform this agreement, which said adjustments are subject to the written approval of the contractor. Any increase in compensation of twenty five percent (25%) or less of the contract sum, or in the time to perform of one hundred eighty (180) days or less may be approved by the contract officer. Any greater increases, taken either separately or cumulatively must be approved by the City council. It is expressly understood by contractor that the provisions of this section shall not apply to services specifically set forth in the scope of services or reasonably contemplated therein. Contractor hereby acknowledges that it accepts the risk that the services to be provided pursuant to the scope of services may be more costly or time consuming than contractor anticipates and that contractor shall not be entitled to additional compensation therefore.

1-1.14 1.10 Prevailing Wage Laws - In accordance with labor code section 1770 et seq., the director of the Department of Industrial Relations of the State of California has ascertained a general prevailing rate of wages, which is the minimum amount, which shall be paid to all workers employed to perform the work pursuant to this agreement. A copy of the general prevailing wage rate determination is on file in the office of the City clerk and is hereby incorporated by reference into this agreement. In accordance with the provisions of labor code section 1810 et seq., eight (8) hours is the legal working day. Contractor must forfeit to the city twenty-five dollars (\$25.00) a day for each worker who works in excess of the minimum working hours when contractor does not pay overtime. Contractor is required to post a copy of such wage rates at all times at the contract site. The statutory penalties for failure to pay prevailing wage or to comply with state wage and hour laws will be enforced. Contractor also shall comply with state law requirements to maintain payroll records and shall provide for certified records and inspection of records as required by California labor code section 1770 et. Seq., including section 1776. Contractor shall comply with all statutory requirements relating to the employment of apprentices.

## 1-1.15 2. COMPENSATION

1-1.16 2.1 Contract Sum - For the services rendered pursuant to this agreement, the contractor shall be compensated as specified herein, but not exceeding the maximum contract amount of \_\_\_\_\_ dollars (\$ \_\_\_\_\_ .00) (herein "contract sum"), except as provided in section 1.9. The contract sum shall include the attendance of contractor at all project meetings reasonably deemed necessary by the City; contractor shall not be entitled to any additional compensation for attending said meetings.

1-1.17 2.2 Progress Payments - Prior to the first day of the month, during the progress of the work, commencing on the day and month specified in the agreement, contractor shall submit to the contract officer a complete itemized statement of all labor and materials incorporated into the work during the preceding month and the portion of the contract sum applicable thereto. Upon approval in writing by the contract officer, payment shall be made in thirty (30) days. City shall pay contractor a sum based upon ninety percent (90%) of the contract price apportionment of the labor and materials incorporated into the work under the contract during the month covered by said statement. The remaining ten percent (10%) thereof shall be retained as performance security. Refer to section 7.3 of this agreement for retention of funds.

## 1-2 3. PERFORMANCE SCHEDULE

1-2.01 3.1 Time of Essence - Time is of the essence in the performance of this agreement.



1-2.02     3.2     Schedule of Performance - Contractor shall commence the services pursuant to this agreement upon receipt of a written notice to proceed and shall perform all services within 120 working days. When requested by the contractor, extensions to the time period(s) specified in the scope of services may be approved in writing by the contract officer.

1-2.03     3.3     Force Majeure - The time period(s) specified in the scope of services for performance of the services rendered pursuant to this agreement shall be extended because of any delays due to unforeseeable causes beyond the control and without the fault or negligence of the contractor, including, but not restricted to, acts of god or of the public enemy, unusually severe weather, fires, earthquakes, floods, epidemics, quarantine restrictions, riots, strikes, freight embargoes, wars, litigation, and/or acts of any governmental agency, including the City, if the contractor shall within ten (10) days of the commencement of such delay notify the contract officer in writing of the causes for the delay. The contract officer shall ascertain the facts and the extent of delay, and extend the time for performing the services for the period of the enforced delay when and if in the judgment of the contract officer such delay is justified. The contract officer's determination shall be final and conclusive upon the parties to this agreement.

1-2.04     3.4     Term - Unless earlier terminated in accordance with section 7.8 of this agreement, this agreement shall continue in full force and effect until final approval and acceptance of the project by the contract officer.

1-2.05     4.     COORDINATION OF WORK

1-2.06     4.1     representative of contractor - the following principals of contractor are hereby designated as being the principals and representatives of contractor authorized to act in its behalf with respect to the work specified herein and make all decisions in connection therewith:

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1-2.07

It is expressly understood that the experience, knowledge, capability and reputation of the foregoing principals were a substantial inducement for City to enter into this agreement. Therefore, the foregoing principals shall be responsible during the term of this agreement for directing all activities of contractor and devoting sufficient time to personally supervise the services hereunder. For purposes of this agreement, the foregoing principals may not be replaced nor may their responsibilities be substantially reduced by contractor without the express written approval of City.

1-2.08

1-2.09 4.2 Contract Officer - The contract officer shall be such person as may be designated by the City manager or City engineer of City. It shall be the contractor's responsibility to assure that the contract officer is kept informed of the progress of the performance of the services and the contractor shall refer any decisions that must be made by City to the contract officer. Unless otherwise specified herein, any approval of City required hereunder shall mean the approval of the contract officer. The contract officer shall have authority to sign all documents on behalf of the City required hereunder to carry out the terms of this agreement.

1-2.10 4.3 Prohibition Against Assignment - The experience, knowledge, capability and reputation of contractor, its principals and employees were a substantial inducement for the City to enter into this agreement. Neither this agreement nor any interest herein may be transferred, assigned, conveyed, hypothecated or encumbered voluntarily or by operation of law, whether for the benefit of creditors or otherwise, without the prior written approval of city. Transfers restricted hereunder shall include the transfer to any person or group of persons acting in concert of more than twenty five percent (25%) of the present ownership and/or control of contractor, taking all transfers into account on a cumulative basis. In the event of any such unapproved transfer, including any bankruptcy proceeding, this agreement shall be void. No approved transfer shall release the contractor or any surety of contractor of any liability hereunder without the express consent of City.

1-2.11 4.4 Independent Contractor - Neither the City nor any of its employees shall have any control over the manner, mode or means by which contractor, its subcontractors, agents or employees, performs the services required herein, except as otherwise set forth herein. City shall have no voice in the selection, discharge, supervision or control of contractor's employees, subcontractors, servants, representatives or agents, or in fixing their number, compensation or hours of service. Contractor shall perform all services required herein as an independent contractor of City and shall remain at all times as to City a wholly independent contractor with only such obligations as are consistent with that role. Contractor shall not at any time or in any manner represent that it or any of its subcontractors, agents or employees are agents or employees of City. City shall not in any way or for any purpose become or be deemed to be a partner of contractor in its business or otherwise or a joint venture or a member of any joint enterprise with contractor.

1-2.12 4.5 Identity of Persons Performing Work - Contractor represents that it employs or will employ at its own expense all personnel required for the satisfactory performance of any and all tasks and services set forth herein. Contractor represents that the tasks and services required herein will be performed by contractor or under its direct supervision, and that all personnel engaged in such work shall be fully qualified and shall be authorized and permitted under applicable state and local law to perform such tasks and services.

1-2.13 4.6 Utility Relocation - City is responsible for removal, relocation, or protection of existing main or trunkline utilities to the extent such utilities were not identified in the

invitation for bids or specifications. City shall reimburse contractor for any costs incurred in locating, repairing damage not caused by contractor and removing or relocating such unidentified utility facilities, including equipment idled during such work. Contractor shall not be assessed liquidated damages for delay arising from the removal or relocation of such unidentified utility facilities.

4.7 Trenches or Excavations - Pursuant to California Public Contract Code Section 7104, in the event the work included in this agreement requires excavations more than four (4) feet in depth, the following shall apply.

(a) Contractor shall promptly, and before the following conditions are disturbed, notify City, in writing, of any: (1) material that contractor believes may be material that is hazardous waste, as defined in section 25117 of the health and safety code, that is required to be removed to a class i, class ii, or class iii disposal site in accordance with provisions of existing law; (2) subsurface or latent physical conditions at the site different from those indicated; or (3) unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

(b) City shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in contractor's cost of, or the time required for, performance of any part of the work shall issue a change order per section 1.9 of this agreement.

(c) that, in the event that a dispute arises between City and Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in Contractor's cost of, or time required for, performance of any part of the work, Contractor shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all work to be performed under the contract. Contractor shall retain any and all rights provided either by contract or by law, which pertain to the resolution of disputes and protests between the contracting parties.

## 5. INSURANCE, INDEMNIFICATION AND BONDS

1-2.14 5.1 Insurance - The contractor shall procure and maintain, at its sole cost and expense, in a form and content satisfactory to City, during the entire term of this agreement including any extension thereof, the following policies of insurance:

| Coverage (check if applicable)  | Minimum Limits                                   |
|---|--|
| ( ) Comprehensive general liability insurance (including premises and operations)                         | \$1,000,000 per occurrence combined single limit |
| ( ) Contractual liability insurance<br>products liability insurance                                       | \$1,000,000 limit                                |
| ( ) Comprehensive automobile liability insurance (includes owned, non-owned, and hired automobile hazard) | \$1,000,000 per occurrence combined single limit |
| ( ) Errors and omissions insurance (providing for a one-year discovery period)                            | \$1,000,000 limit                                |
| ( ) Workers' compensation/employers' Liability insurance  | \$1,000,000 per occurrence                       |

Conditions:

in accordance with Public Contract Code Section 20170, the insurance of surety companies who provide or issue the policy shall have been admitted to do business in the state of California with a credit rating of a- or better.

This insurance shall not be canceled, limited in scope or coverage or non-renewed until after thirty (30) days prior written notice has been given to the City engineer, City of Colusa, 401 e. Chapman ave., Colusa, California 92870.

Any insurance maintained by the City of Colusa shall apply in excess of and not combined with insurance provided by this policy.

the City of Colusa, its officers, employees, representatives, attorneys, and volunteers shall be named as additional named insureds.

Prior to commencement of any work under this contract, contractor shall deliver to the City insurance endorsements confirming the existence of the insurance required by this contract, and including the applicable clauses referenced above.

Such endorsements shall be signed by an authorized representative of the insurance company and shall include the signator's company affiliation and title. Should it be deemed necessary by the City, it shall be contractor's responsibility to see that the City receives documentation, acceptable to the City, which sustains that the individual signing said endorsements is indeed authorized to do so by the insurance company.

If the contractor fails to maintain the aforementioned insurance, or secure and maintain the aforementioned endorsement, the City may obtain such insurance, and deduct and retain the amount of the premiums for such insurance from any sums due under the agreement. However, procuring of said insurance by the city is an alternative to other remedies the City may have, and is not the exclusive remedy for failure of contractor to maintain said insurance or secure said endorsement. In addition to any other remedies the City may have upon contractor's failure to provide and maintain any insurance or policy endorsements to the extent and within the time herein required, the City shall have the right to order Contractor to stop work hereunder, and/or withhold any payment(s) which became due to contractor hereunder until contractor demonstrates compliance with the requirements hereof.

Nothing herein contained shall be construed as limiting in any way the extent to which contractor may be held responsible for payments of damages to persons or property resulting from contractor's or its subcontractor's performance of the work covered under this agreement.

1-2.15 Each contract between the contractor and any subcontractor shall require the subcontractor to maintain the same policies of insurance that the contractor is required to maintain pursuant to this section 5.1.

1-2.16 5.2 Indemnification - Contractor shall indemnify the City of Colusa, its officers, agents and employees against, and will hold and save them and each of them harmless from, any and all actions, suits, claims, damages to persons or property, losses, costs, penalties, obligations, errors, omissions or liabilities, (herein "claims or liabilities") that may be asserted or claimed by any person, firm or entity arising or alleged to arise out of or in connection with the performance of the work, operations or activities of contractor, its agents, employees, subcontractors, or invitees, provided for herein, or arising or alleged to arise from the negligent acts or omissions of contractor hereunder, or arising or alleged to arise from contractor's performance of or failure to perform any term, provision, covenant or condition of this agreement, but excluding such claims or liabilities or portion of such claims or liabilities arising or alleged to arise from the willful misconduct of the City, its officers, agents or employees, and in connection therewith:

1-2.16.A

1-2.16.B (a) Contractor will defend any action or actions filed in connection with any of said claims or liabilities and will pay all costs and expenses, including legal costs and attorneys' fees incurred in connection therewith;

1-2.16.C

1-2.16.D (b) Contractor will promptly pay any judgment rendered against the City, its officers, agents or employees for any such claims or liabilities arising or alleged to arise out of or in connection with contractor's (or its agents', employees', subcontractors' or invitees') negligent performance of or failure to perform such work, operations or activities hereunder;

and contractor agrees to save and hold the City, its officers, agents, and employees harmless therefrom;

1-2.16.E (c) In the event the City, its officers, agents or employees is made a party to any action or proceeding filed or prosecuted against contractor for such damages or other claims arising or alleged to arise out of or in connection with the performance of or failure to perform the work, operation or activities of contractor hereunder, contractor shall pay to the City, its officers, agents or employees, any and all costs and expenses incurred by the City, its officers, agents or employees in such action or proceeding, including but not limited to, legal costs and attorneys' fees for counsel acceptable to City.

1-2.16.F (d) Contractor's duty to defend and indemnify as set out in this section 5.2 shall include any claims, liabilities, obligations, losses, demands, actions, penalties, suits, costs, expenses or damages or injury to persons or property arising or alleged to arise from, in connection with, as a consequence of or pursuant to any state or federal law or regulation regarding hazardous substances, including but not limited to the federal insecticide, fungicide and rodenticide act ("Fifra"), comprehensive environmental response, compensation and liability act of 1980 ("Cercla"), resource conservation and recovery act of 1976 ("Rcra"), the hazardous and solid waste amendments of 1984, the hazardous material transportation act, the toxic substances control act, the clean air act, the clean water act, the California hazardous substance account act, the California hazardous waste control law or the porter-cologne water quality control act, as any of those statutes may be amended from time to time.

The contractor's indemnification obligations pursuant to this section 5.2 shall survive the termination of this agreement. Contractor shall require the same indemnification from all subcontractors.

1-2.17 5.3 Labor and Materials and Performance Bonds – Concurrently with execution of this agreement, contractor shall deliver to City a labor and materials bond and a performance bond each in the sum of the amount of this agreement, in the forms provided by the City clerk, which secures the faithful performance of this agreement. The bonds shall contain the original notarized signature of an authorized officer of the surety and affixed thereto shall be a certified and current copy of his power of attorney. The bonds shall be unconditional and remain in force during the entire term of the agreement and shall be null and void only if the contractor promptly and faithfully performs all terms and conditions of this agreement.

1-2.18 5.4 Sufficiency of Insurer or Surety - Insurance or bonds required by this agreement shall be satisfactory only if issued by companies qualified to do business in California, rated "a" or better in the most recent edition of best rating guide, the key rating guide or in the federal register, and only if they are of a financial category class vii or better, unless such requirements are waived by the risk manager of the City due to unique circumstances. In the event the risk manager of City ("risk manager") determines that the

work or services to be performed under this agreement creates an increased risk of loss to the City, the contractor agrees that the minimum limits of the insurance policies and the performance bond required by this section 5 may be changed accordingly upon receipt of written notice from the risk manager; provided that the contractor shall have the right to appeal a determination of increased coverage by the risk manager to the City council of within ten (10) days of receipt of notice from the risk manager.

1-2.19            5.5        Substitution of Securities - Pursuant to California Public Contract Code Section 22300, substitution of eligible equivalent securities for any moneys withheld to ensure performance under the contract for the work to be performed will be permitted at the request and expense of the successful bidder.

## 1-3                            6.            RECORDS AND REPORTS

1-3.01            6.1        Reports - Contractor shall periodically prepare and submit to the contract officer such reports concerning the performance of the services required by this agreement as the contract officer shall require. Contractor hereby acknowledges that the City is greatly concerned about the cost of work and services to be performed pursuant to this agreement. For this reason, contractor agrees that if contractor becomes aware of any facts, circumstances, techniques, or events that may or will materially increase or decrease the cost of the work or services contemplated herein or, if contractor is providing design services, the cost of the project being designed, contractor shall promptly notify the contract officer of said fact, circumstance, technique or event and the estimated increased or decreased cost related thereto and, if contractor is providing design services, the estimated increased or decreased cost estimate for the project being designed.

1-3.02    6.2        Records - Contractor shall keep, and require subcontractors to keep, such books and records (including but not limited to payroll records as required herein) as shall be necessary to perform the services required by this agreement and enable the contract officer to evaluate the performance of such services. The contract officer shall have full and free access to such books and records at all times during normal business hours of City, including the right to inspect, copy, audit and make records and transcripts from such records. Such records shall be maintained for a period of three (3) years following completion of the services hereunder, and the City shall have access to such records in the event any audit is required.

1-3.03    6.3        Ownership of Documents - All drawings, specifications, reports, records, documents and other materials prepared by contractor, its employees, subcontractors and agents in the performance of this agreement shall be the property of City and shall be delivered to City upon request of the contract officer or upon the termination of this agreement, and contractor shall have no claim for further employment or additional compensation as a result of the exercise by City of its full rights of ownership of the documents and materials hereunder. Contractor may retain copies of such documents for its own use. Contractor shall have an unrestricted right to use the concepts embodied therein. All subcontractors shall provide for assignment to City of any documents or materials prepared by them, and in the event contractor

fails to secure such assignment, contractor shall indemnify city for all damages resulting therefrom.

1-4

1-5        7.        ENFORCEMENT OF AGREEMENT

1-5.01 7.1        California Law - This agreement shall be construed and interpreted both as to validity and to performance of the parties in accordance with the laws of the state of California. Legal actions concerning any dispute, claim or matter arising out of or in relation to this agreement shall be instituted in the superior court of the County of Colusa, state of California, or any other appropriate court in such county, and contractor covenants and agrees to submit to the personal jurisdiction of such court in the event of such action.

1-5.02 7.2        Disputes - In the event either party fails to perform its obligations hereunder, the nondefaulting party shall provide the defaulting party written notice of such default. The defaulting party shall have ten (10) days to cure the default; provided that, if the default is not reasonably susceptible to being cured within said ten (10) day period, the defaulting party shall have a reasonable time to cure the default, not to exceed a maximum of thirty (30) days, so long as the defaulting party commences to cure such default within ten (10) days of service of such notice and diligently prosecutes the cure to completion; provided further that if the default is an immediate danger to the health, safety and general welfare, the defaulting party shall take such immediate action as may be necessary. Notwithstanding the foregoing, the nondefaulting party may, in its sole and absolute discretion, grant a longer cure period. Should the defaulting party fail to cure the default within the time period provided in this section, the nondefaulting party shall have the right, in addition to any other rights the nondefaulting party may have at law or in equity, to terminate this agreement. Compliance with the provisions of this section 7.2 shall be a condition precedent to bringing any legal action, and such compliance shall not be a waiver of any party's right to take legal action in the event that the dispute is not cured.

1-5.03        7.3        Retention of Funds - Progress payments shall be made in accordance with the provisions of section 2.2 of this agreement. In accordance with said section, City shall pay contractor a sum based upon ninety-five percent (95%) of the contract price apportionment of the labor and materials incorporated into the work under the contract during the month covered by said statement. The remaining five percent (5%) thereof shall be retained as performance security to be paid to the contractor within sixty (60) days after final acceptance of the work by the City council, after contractor shall have furnished City with a release of all undisputed contract amounts if required by City. In the event there are any claims specifically excluded by contractor from the operation of the release, the city may retain proceeds (per public contract code 7107) of up to 150% of the amount in dispute. City's failure to deduct or withhold shall not affect contractor's obligations hereunder.

1-5.04 7.4        Waiver - No delay or omission in the exercise of any right or remedy by a nondefaulting party on any default shall impair such right or remedy or be construed as a waiver. A party's consent to or approval of any act by the other party requiring the party's consent or approval shall not be deemed to waive or render unnecessary the other party's consent to or approval of any subsequent act. Any waiver by either party of any default must



be in writing and shall not be a waiver of any other default concerning the same or any other provision of this agreement.

1-5.05 7.5 Rights and remedies are cumulative except with respect to rights and remedies expressly declared to be exclusive in this agreement, the rights and remedies of the parties are cumulative and the exercise by either party of one or more of such rights or remedies shall not preclude the exercise by it, at the same or different times, of any other rights or remedies for the same default or any other default by the other party.

1-5.06

1-5.07 7.6 Legal Action - In addition to any other rights or remedies, either party may take legal action, law or in equity, to cure, correct or remedy any default, to recover damages for any default, to compel specific performance of this agreement, to obtain declaratory or injunctive relief, or to obtain any other remedy consistent with the purposes of this agreement.

1-5.08 7.7 Liquidated Damages - Since the determination of actual damages for any delay in performance of this agreement would be extremely difficult or impractical to determine in the event of a breach of this agreement, the contractor and its sureties shall be liable for and shall pay to the City five hundred dollars (\$500) as liquidated damages for each working day of delay in the performance of any service required. The City may withhold from any moneys payable on account of services performed by the contractor any accrued liquidated damages.

1-5.09 7.8 Termination for Default of Contractor - If termination is due to the failure of the contractor to fulfill its obligations under this agreement, contractor shall vacate any City owned property which contractor is permitted to occupy hereunder and City may, after compliance with the provisions of section 7.2, take over the work and prosecute the same to completion by contract or otherwise, and the contractor shall be liable to the extent that the total cost for completion of the services required hereunder exceeds the compensation herein stipulated (provided that the City shall use reasonable efforts to mitigate such damages), and City may withhold any payments to the contractor for the purpose of setoff or partial payment of the amounts owed the City as previously stated.

1-6

1-7 8. CITY OFFICERS AND EMPLOYEES, NONDISCRIMINATION

1-7.01 8.1 Non-liability of City Officers and Employees - No officer or employee of the City shall be personally liable to the contractor, or any successor in interest, in the event of any default or breach by the City or for any amount which may become due to the contractor or to its successor, or for breach of any obligation of the terms of this agreement.

1-7.02 8.2 Conflict of Interest - The contractor warrants that it has not paid or given and will not pay or give any third party any money or other consideration for obtaining this agreement.

8.3 Covenant Against Discrimination - Contractor covenants that, by and for itself, its heirs, executors, assigns, and all persons claiming under or through them, that there shall be no discrimination against or segregation of, any person or group of persons on account of race, color, creed, religion, sex, marital status, national origin, or ancestry in the performance of this agreement. To the extent required by law, contractor shall take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, creed, religion, sex, marital status, national origin, or ancestry.

1-8 9. MISCELLANEOUS PROVISIONS

1-8.01 9.1 Notice - Any notice, demand, request, document, consent, approval, or communication either party desires or is required to give to the other party or any other person shall be in writing and shall be deemed to be given when served personally or deposited in the us mail, prepaid, first-class mail, return receipt requested, addressed as follows:

To City: City of Colusa  
425 Webster street  
Colusa, California 95932  
Attn.:

To Contractor:

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1-8.02

1-8.03 9.2 Interpretation - The terms of this agreement shall be construed in accordance with the meaning of the language used and shall not be construed for or against either party by reason of the authorship of this agreement or any other rule of construction which might otherwise apply.

1-8.049.3 Integration; Amendment it is understood that there are no oral agreements between the parties hereto affecting this agreement and this agreement supersedes and cancels any and all previous negotiations, arrangements, agreements and understandings, if any,

between the parties, and none shall be used to interpret this agreement. This agreement may be amended at any time by the mutual consent of the parties by an instrument in writing.

1-8.059.4 Severability. In the event that any one or more of the phrases, sentences, clauses, paragraphs, or sections contained in this agreement shall be declared invalid or unenforceable by a valid judgment or decree of a court of competent jurisdiction, such invalidity or unenforceability shall not affect any of the remaining phrases, sentences, clauses, paragraphs, or sections of this agreement which are hereby declared as severable and shall be interpreted to carry out the intent of the parties hereunder unless the invalid provision is so material that its invalidity deprives either party of the basic benefit of their bargain or renders this agreement meaningless.

1-8.06 9.5 Hiring of Illegal Aliens Prohibited - Contractor shall not hire or employ any person to perform work within the City of Colusa or allow any person to perform work required under this agreement unless such person is properly documented and legally entitled to be employed within the united states.

9.6 Unfair Business Practices Claims - In entering into a public works contract or a subcontract to supply goods, services or materials pursuant to a public works contract, the contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under section 4 of the clayton act (15 u.s.c. sec. 15) or under the Cartwright Act (chapter 2, (commencing with section 16700) of part 2 of division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to the Public Works Contract or the subcontract. This assignment shall be made and become effective at the time the awarding body renders final payment to the contractor without further acknowledgment by the parties. (sec. 7103.5, California Public Contract Code).

1-8.07 9.7 Corporate Authority - The persons executing this agreement on behalf of the parties hereto warrant that (i) such party is duly organized and existing, (ii) they are duly authorized to execute and deliver this agreement on behalf of said party, (iii) by so executing this agreement, such party is formally bound to the provisions of this agreement, and (iv) the entering into this agreement does not violate any provision of any other agreement to which said party is bound.

9.8 **Independent Contractor** - The Contractor is and shall at all times remain as to the City, a wholly independent contractor. Neither the City, nor any of their officer, employees or agents shall have control over the conduct of the Contractor or any of the Contractors' officers, employees or agents, except as herein set forth. The Contractor shall not at any time or in any manner represent that it or any of its officers, employees or agents are in any manner officers, employees or agents of the City, nor shall City officers, employees or agents be deemed the officers, employees, or agents of Contractor as a result of this Agreement.

9.9 **Legal Responsibilities** - The Contractor shall keep itself informed of City, State, and Federal laws, ordinances and regulations, which may in any manner affect the performance of its services pursuant to this Agreement. The Contractor shall at all times observe and comply with all such laws, ordinances and regulations. Neither the City, nor their officers, agents, or employees shall be liable at law or in equity as a result of the Contractor's failure to comply with this section.

9.10 **Termination for Convenience** – The City may terminate this Agreement without cause for convenience of the City upon giving contractor 30 days prior written notice of termination of the Agreement. Upon receipt of the notice of termination the Contractor shall cease all further work pursuant to the Agreement. Upon such termination by the City the Contractor shall not be entitled to any other remedies, claims, actions, profits, or damages except as provided in this paragraph. Upon the receipt of such notice of termination Contractor shall be entitled to the following compensation:

1. The contract value of the work completed to and including the date of receipt of the notice of termination, less the amount of progress payments received by contractor.
2. Actual move-off costs including labor, rental fees, equipment transportation costs, the costs of maintaining on-site construction office for supervising the mover-off.
3. The cost of materials custom made for this Agreement which cannot be used by the Contractor in the normal course of his business, and which have not been paid for by City in progress payments.
4. All costs shall not include any markups as might otherwise be allowed by any plans or specifications which were a part of the Agreement.

**The provisions of this paragraph shall supercede any other provision of the Agreement or any provision of any plans, specification, addendums or other documents which are or may become a part of this Agreement. City and Contractor agree that the provisions of this paragraph are a substantive part of the consideration for this Agreement.**

IN WITNESS WHEREOF, the parties have executed and entered into this Agreement as of the date first written above.

ATTEST:

CITY OF COLUSA,  
A Municipal Corporation

By: \_\_\_\_\_  
City Clerk

By: \_\_\_\_\_  
Mayor

APPROVED AS TO FORM:

City Attorney

CONTRACTOR:

By: \_\_\_\_\_  
(Print)

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

By: \_\_\_\_\_  
(Print)

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



CITY OF COLUSA  
DEPARTMENT OF PUBLIC WORKS

## PERFORMANCE BOND

(To Accompany Contract)

Bond

No.

\_\_\_\_\_  
**WHEREAS**, the City of Colusa , acting by and through the Department of Public Works, has awarded to Contractor \_\_\_\_\_, hereafter designated as the “Contractor”, a contract for the work described as follows:

**AND WHEREAS**, the Contractor is required to furnish a bond in connection with said contract, guaranteeing the faithful performance thereof:

**NOW, THEREFORE**, we the undersigned Contractor and Surety are held firmly bound to the City of Colusa in the sum of \$ \_\_\_\_\_ dollars (\$ \_\_\_\_\_), to be paid to said City / County or its certain attorney, its successors and assigns: for which payment, well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors or assigns, jointly and severally, firmly by these presents.

### THE CONDITION OF THIS OBLIGATION IS SUCH,

That if the above bound Contractor, its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the foregoing contract and any alteration thereof made as therein provided, on his or their part to be kept and performed at the time and in the manner therein specified, and in all respects according to their intent and meaning, and shall indemnify and save harmless the City of Colusa , its officers and agents, as therein stipulated, then this obligation shall become and be null and void; otherwise it shall be and remain in full force and virtue.

**IN WITNESS WHEREOF**, We have hereunto set our hands and seals on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

Correspondence or claims relating to this bond

\_\_\_\_\_  
should be sent to the surety at the following

\_\_\_\_\_  
address:

\_\_\_\_\_  
Contractor

\_\_\_\_\_  
Name of Surety (SEAL)

\_\_\_\_\_  
By : Attorney-in-Fact

NOTE: Signatures of those executing for the surety must be properly acknowledged.

### CERTIFICATE OF ACKNOWLEDGEMENT

State of California,  
City / County of \_\_\_\_\_ SS

On this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ in the year 20\_\_\_\_ before me  
\_\_\_\_\_, a notary public in and for the City / County of \_\_\_\_\_  
\_\_\_\_\_, personally appeared  
\_\_\_\_\_, known to me to be the person whose name is subscribed  
to this

*Attorney-in-fact*  
instrument and known to me to be the attorney-in-fact of \_\_\_\_\_  
and acknowledged to me that he/she subscribed the name of the said company thereto as surety, and his/her own name  
as attorney-in-fact.

\_\_\_\_\_  
♦ (SEAL)      **Notary Public**



CITY OF COLUSA  
DEPARTMENT OF PUBLIC WORKS

**PAYMENT BOND**

(Section 3247, Civil Code)

**WHEREAS**, The City of Colusa, acting by and through the Department of Public Works, hereafter referred to as "Obligee", has awarded to Contractor \_\_\_\_\_, hereafter designated as the "Principal", a contract for the work described as follows:

**AND WHEREAS**, said Principal is required to furnish a bond in connection with said contract, to secure the payment of claims of laborers, mechanics, materialmen and other persons as provided by law.

**NOW, THEREFORE**, we the undersigned Principal and Surety are bound unto the Obligee in the sum of \_\_\_\_\_ dollars (\$ \_\_\_\_\_), for which payment, we bind ourselves, jointly and severally.

**THE CONDITION OF THIS OBLIGATION IS SUCH,**

That if said Principal or its subcontractors shall fail to pay any of the persons named in Civil Code Section 3181, or amounts due under the Unemployment Insurance Code with respect to work or labor performed by such claimant, or any amounts required to be deducted, withheld, and paid over to the Franchise Tax Board for the wages of employees of the Principal and his subcontractors pursuant to Section 18806 of the Revenue and Taxation Code, with respect to such work and labor, that the surety herein will pay for the same in an amount not exceeding the sum specified in this bond, otherwise the above obligation shall be void. In case suit is brought upon this bond, the surety will pay a reasonable attorney's fee to fixed by the court.

This bond shall inure to the benefit of any of the persons named in Civil Code Section 3181 as to give a right of action to such persons or their assigns in any suit brought upon this bond.

Dated: \_\_\_\_\_, 20 \_\_\_\_

Correspondence or claims relating to this bond

should be sent to the surety at the following

address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Principal

Surety

(SEAL)

By : Attorney-in-Fact

NOTE: Signatures of those executing for the surety must be properly acknowledged.

**CERTIFICATE OF ACKNOWLEDGEMENT**

State of California

City / County of \_\_\_\_\_ SS

On this \_\_\_\_\_ day of \_\_\_\_\_ in the year 20 \_\_\_\_ before me  
\_\_\_\_\_, personally appeared  
\_\_\_\_\_, personally known to me (or proved to me  
\_\_\_\_\_  
*Attorney-in-fact*  
on the basis of satisfactory evidence) to be the person whose name is subscribed to this instrument as the attorney-in-  
fact of \_\_\_\_\_ and acknowledged to me that he/she  
subscribed the name of the said company thereto as surety, and his/her own name as attorney-in-fact.

\_\_\_\_\_  
(SEAL)

Notary Public

(Use of City form is required)

**SUPPLEMENTAL INFORMATION TO BE COMPLETED BY PRINCIPAL**

If an individual, so state. If a firm or co-partnership, state the firm and give the names of all individual co-partners composing the partnership. If a Corporation, state legal name of corporation; state also the names of the president, secretary, treasurer and manager thereof.

Business Address:

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---

Telephone Number:

---

Date:

---

Print Name:

---

Principal

Signature:

---

Title

### TAX IDENTIFICATION NUMBER

The Tax Equity and Fiscal Responsibility Act of 1982 requires the payer (City of Colusa) to report to the Internal Revenue Service taxable payments to payees.

You (as a payee) are required by law to provide us with your Taxpayer Identification Number (if an individual or partnership, your Social Security Number). If you do not provide us with your correct identification number, you may be subject to a penalty imposed by the Internal Revenue Service. The payments subject to withholdings may include, but are not limited to, interest, dividends, or other payments the City of Colusa and/or the Colusa Redevelopment Agency made to you. Other payments may include rents, royalties, commissions and fees for service of non-employees.

If you are exempt from income tax, we are still required, by law, to maintain a Tax Identification Number on file. **PLEASE PROVIDE YOUR TAX IDENTIFICATION NUMBER next to the appropriate listing below, sign, date and return to:**

#### CITY OF COLUSA FINANCE DEPARTMENT

401 E. Chapman

Colusa, CA 92870

Exempt: Yes\_\_\_ No\_\_\_ Telephone ( ) \_\_\_\_\_

CORPORATION: \_\_\_\_\_

U.S.A. OR ANY AGENCIES THEREOF: \_\_\_\_\_

IRS CODE #501 TAX-EXEMPT ORGANIZATION: \_\_\_\_\_

A NON-COMMISSIONED CITY OF W.C. EMPLOYEE: \_\_\_\_\_

SOLE PROPRIETOR: \_\_\_\_\_

A PARTNERSHIP: \_\_\_\_\_

OTHER: \_\_\_\_\_(Explain)

Signature/Title: \_\_\_\_\_ Date: \_\_\_\_\_

**GUARANTEE**

**TO THE CITY OF COLUSA**

**PROJECT NO. 25-102**

**AS A MATERIAL INDUCEMENT TO THE CITY TO AWARD THE CONTRACT FOR PROJECT NO. TO**

**, THE UNDERSIGNED (“GUARANTOR”) HAS AGREED TO ENTER INTO THIS GUARANTEE. THE GUARANTOR HEREBY UNCONDITIONALLY GUARANTEES TO THE FULLEST EXTENT ALLOWED BY LAW THE FOLLOWING WORK INCLUDED IN THIS PROJECT: (“THE WORK”).**

**GUARANTOR GUARANTEES THAT THE MATERIALS AND EQUIPMENT USED BY ITSELF AND ITS SUBCONTRACTORS WILL BE FREE FROM DEFECTS AND THAT THE WORK WILL CONFORM TO THE PLANS AND SPECIFICATIONS. SHOULD ANY OF THE MATERIALS OR EQUIPMENT PROVE DEFECTIVE OR SHOULD THE WORK AS A WHOLE, OR ANY PART THEREOF, PROVE DEFECTIVE FOR ANY REASON WHATSOEVER (EXCEPT DUE TO INTENTIONAL TORTS BY THE CITY), OR SHOULD THE WORK AS A WHOLE OR ANY PART THEREOF FAIL TO OPERATE PROPERLY OR FAIL TO COMPLY WITH THE PLANS AND SPECIFICATIONS, GUARANTOR WILL, AT THE CITY’S SOLE ELECTION: 1) REIMBURSE THE CITY, UPON WRITTEN DEMAND, FOR ALL OF THE CITY’S EXPENSES INCURRED REPLACING OR RESTORING ANY SUCH EQUIPMENT OR MATERIALS, INCLUDING THE COST OF ANY WORK NECESSARY TO MAKE SUCH REPLACEMENT OR REPAIRS; OR 2) REPLACE ANY SUCH DEFECTIVE MATERIAL OR EQUIPMENT AND REPAIR SAID WORK COMPLETELY, ALL WITHOUT ANY COST TO THE CITY. GUARANTOR FURTHER GUARANTEES THAT ANY SUCH REPAIR WORK WILL CONFORM TO THE PLANS AND SPECIFICATIONS FOR THE PROJECT. THIS GUARANTEE WILL REMAIN IN EFFECT FOR FIVE YEARS FROM THE DATE ON WHICH THE CONTRACTED FOR WORK IS ACCEPTED FOR USE BY THE CITY.**

Guarantor understands and agrees that the City shall have the unqualified option to make any replacements or repairs itself or to have such replacement, repair, performed by the undersigned. The City shall have no obligation to consult with Guarantor before the City proceeds to perform any repair, replacement, or work itself. If the City elects to have Guarantor perform said repair, replacement, or work, Guarantor agrees that the repair, replacement, or work shall be performed within 15 days after receipt of a written demand from the City.

If the City elects to perform the replacement, repairs itself, Guarantor agrees to make reimbursement payment within 15 days after receipt of a written demand for payment from the City.

If the Guarantor fails or refuses to comply with this guarantee, the City shall be entitled to all costs and expenses, including attorneys and expert fees, reasonably incurred by reason of Guarantor's failure or refusal.

Guarantor

Date: \_\_\_\_\_

Contractor: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

## STATEMENT OF NON COLLUSION BY CONTRACTOR

The undersigned who submits herewith to the City of Colusa a bid or proposal does hereby certify:

- a. That all statements of fact in such bid or proposal are true;
- b. That such bid or proposal was not made in the interest of or on behalf of any undisclosed person, partnership, company, association, organization or corporation;
- c. That such bid or proposal is genuine and not collusive or sham;
- d. That said bidder has not, directly or indirectly by agreement, communication or conference with anyone, attempted to induce action prejudicial to the interest of the City of Colusa or of any other bidder or anyone else interested in the proposed procurement;
- e. Did not, directly or indirectly, collude, conspire, connive or agree with anyone else that said bidder or anyone else would submit a false or sham bid or proposal, or that anyone should refrain from bidding or withdraw his bid or proposal;
- f. Did not in any manner, directly or indirectly seek by agreement, communication or conference with anyone to raise or fix the bid or proposal price of said bidder or of anyone else, or to raise or fix any overhead, profit or cost element of his bid or proposal price, or that of anyone else;
- g. Did not, directly or indirectly, submit his bid or proposal price or any breakdown thereof, or the contents thereof, or divulge information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member agent thereof, or to any individual or group of individuals, except to the City of Colusa, or to any person or persons who have a partnership or their financial interest with said bidder in his business.
- h. Did not provide, directly or indirectly to any officer or employee of the City of Colusa any gratuity, entertainment, meals, or anything of value, whatsoever, which could be objectively construed as intending to invoke any form of reciprocation or favorable treatment.
- i. That no officer or principal of the undersigned firm is related to any officer or employee of the city by blood or marriage within the third degree or is employed, either full or part time, by the City of Colusa either currently or within the last two (2) years.
- j. That no officer or principal of the undersigned firm nor any subcontractor to be engaged by the principal has been convicted by a court of competent jurisdiction of any charge of fraud, bribery, collusion, conspiracy or any other act in violation of any state or federal antitrust law in connection with the bidding upon award of, or performance of, any public work contract, with any public entity, within the last three years.

I certify, under penalty of perjury under the laws of the State of California, that the foregoing is true and correct and that this certification was executed:

On \_\_\_\_\_ at \_\_\_\_\_ California.

Firm \_\_\_\_\_

(Signature)

Street\_\_\_\_\_

\_\_\_\_\_  
(Print Name & Title)

City\_\_\_\_\_State\_\_\_\_\_Zip\_\_\_\_\_



**CONTRACTOR'S/SUBCONTRACTOR'S CERTIFICATION  
CONCERNING STATE LABOR STANDARDS AND PREVAILING WAGES**

All contractors and subcontractors shall give the following certification to the grantee and forward this certification to the grantee within 10 days after the execution of any contract or subcontract.

- A. "I am aware of the provisions of Section 1720 et seq. of the California Labor Code which requires that the State prevailing wage rate shall be paid to employees where this rate exceeds the Federal wage rate."
- B. "I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this contract."
- C. "It is further agreed that, except as may be provided in Section 1815 of the California Labor Code, the maximum hours a worker is to be employed is limited to eight hours a day and 40 hours a week and the subcontractor shall forfeit, as a penalty, \$25 for each worker employed in the execution of the subcontract for each calendar day during which a worker is required or permitted to labor more than eight hours in any calendar day or more than 40 hours in any calendar week."

(Contractor/Subcontractor)

By \_\_\_\_\_  
(Signature) (Typed Name and Title) (Date)

**CITY OF COLUSA**  
**Department of Public Works**

**CONTRACT DOCUMENTS  
FOR  
Wescott Road Rehabilitation Project  
Volume 2**

**TECHNICAL  
SPECIFICATIONS**



**FOR PUBLIC WORKS CONSTRUCTION**  
November 2024

# **TECHNICAL SPECIFICATIONS**

## **FOR PUBLIC CONSTRUCTION**

**City of Colusa  
California**

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## Section 1

### DEFINITIONS AND TERMS

Unless expressly indicated otherwise, the following terms or abbreviations used in these Specifications, or in any other Contract Documents, are defined as follows:

- 1-1 “A.A.S.H.T.O.” The American Association of State Highway and Transportation Officials.
- 1-2 “Addendum” means a document issued prior to the execution of the Agreement, that modifies or interprets any of the Contract Documents, by additions, deletions, clarifications, or corrections.
- 1-3 “Agreement” means the written agreement executed by Contractor and City, that constitutes one of the Contract Documents.
- 1-4 “A.S.T.M.” The American Society for Testing Materials.
- 1-5 “A.W.W.A.” The American Water Works Association.
- 1-6 “Bid” means a response to a request or invitation for bids or proposals. A “formal” Bid means a Bid submitted for a Contract required to be awarded by the Colusa City Council pursuant to the Colusa City Code, and “formal” bidding means the bidding process used for such Contracts.
- 1-7 “Bid Form” means the approved form upon which the City requires formal Bids for the Work to be prepared and submitted.
- 1-8 “Bid Security” means the bid security furnished by the Bidder as a guarantee of good faith that it will enter into a Contract and execute the required Bonds covering the Work if awarded the Contract.
- 1-9 “Bidder” means any individual, partnership, corporation, or other entity or combination thereof, submitting a Bid, whether acting directly or through a duly authorized representative.
- 1-10 “Change Order” means an amendment to a Contract issued after the effective date of the Contract.
- 1-11 “City” means the municipal corporation known as the City of Colusa, in the State of California.

- 1-12 “City Council” means the City Council of the City of Colusa or any other board, body, official or officials, to which or to whom the power belonging to the City Council may pass.
- 1-13 “City Manager” means the City Manager of the City of Colusa acting either directly or through properly authorized representatives acting within the scope of their authorized duties.
- 1-14 “Completion Date” means the date for completion of the entire Work as defined in Section 9 of the Agreement.
- 1-15 “Contract” shall mean the written Contract Documents covering the performance of the Work including the furnishing of labor, materials, tools, and equipment.
- 1-16 “Contract Documents” means the various documents that make up the Contract, which are identified in Section 1 of the Agreement.
- 1-17 “Contract Price” means the total dollar amount of the Contract.
- 1-18 “Contractor” means the individual, partnership, corporation, or other entity or combination thereof, or its duly authorized representative, that has entered into a Contract with the City.
- 1-19 “Controlling Operation” means an item of Work on the project’s critical path whose duration time directly affects the date that the entire Work can be completed.
- 1-20 “Critical Path Method Schedule” or “CPM Schedule” means a schedule with a consecutive sequence for completion of the Work with the least amount of float period(s).
- 1-21 “Day” means a working day, unless otherwise expressly defined in the Special Provisions.
- 1-22 “Date of signing” means the date upon which the Contract, properly executed by Contractor and delivered to the City, was executed by the City.
- 1-23 “Director” means the Director of the City Department administering the Contract.
- 1-24 “Division Manager” means the Division Manager of the City department and division administering the Contract, or other City employee

designated by such Division Manager to perform any duties assigned to the Division Manager in these Specifications.

- 1-25 “Engineer” means the Director, the Director’s subordinates, or other City representative(s) who have been duly authorized to exercise control and supervision of the Work. The Engineer typically is, but is not required to be, either a professional engineer architect, or landscape architect, depending on the nature of the Work.
- 1-26 “Federal Specifications” means the Standard Specifications of the United States Government designated in the Contract Documents.
- 1-27 “Field Order” means a written instruction from the Engineer to Contractor made in the field.
- 1-28 “Finance Director” means the Director of the Department of Finance of the City of Colusa.
- 1-29 “Fixed cost” means a cost that remains constant regardless of the quantity of work done.
- 1-30 “Float period” means such period(s) of time as may be shown on Contractor’s schedule(s) that are not allocated to the performance and completion of the Controlling Operation(s) of the Work.
- 1-31 “Inspector” means an engineering or construction inspector acting within the authorized scope of the particular duties and authority delegated to such inspector by the City.
- 1-32 “Laws or Regulations” means any and all applicable laws, rules, regulations, ordinances, codes, resolutions, requirements and/or orders of any and all governmental bodies, agencies, authorities and courts, including but not limited to provisions of the Colusa City and City Code.
- 1-33 “Liquidated damages” means the sum or sums prescribed in the Contract Documents, pursuant to the authority of Government Code Section 53069.85, to be paid to the City or to be deducted from any payment due or to become due to Contractor for delay beyond the time allowed in the



Contract Documents for completing the whole, or any specified portion, of the Work.

- 1-34 “Landscape Architect” means a Landscape Architect of the City of Colusa assigned to the Work.
- 1-35 “Payment Bond” has the same meaning as in Section 3096 of the California Civil Code, and refers to the approved form of security furnished by Contractor and its Surety to guarantee the payment in full of all bills, accounts and related costs for labor and materials used in construction of the Work.
- 1-36 “Performance Bond” means the approved form of security furnished by Contractor and its Surety to guarantee Contractor’s performance and completion of the Work in accordance with the terms of the Contract.
- 1-37 “Plans” means the official Project Plans and Standard Drawings, profiles, typical cross sections, general cross sections, working drawings and supplemental drawings, or reproductions thereof, approved by the Director, that show the location, character, dimensions and details of the work to be performed. All such documents are part of the Plans whether or not reproduced in the Special Provisions. In this definition, the terms “Standard Drawings” and “Project Plans” mean:
- (1) “Standard Drawings”: The Standard Drawings or Standard Drawing as set forth in these Specifications. “Standard Drawing(s)” means “Standard Detail(s)”.
  - (2) “Project Plans”: The Project Plans or Plans include specific details and dimensions peculiar to the Work and that are supplemented by the Standard Drawings as they may apply.
- 1-38 “Project Estimate” means the list of estimated quantities of Work to be performed that is included in the Notice to Contractors
- 1-39 “Proposal” means the offer of the Bidder, including a Bid, for performance and completion of the Work when properly completed, executed, guaranteed and submitted on the Bid form.
- 1-40 “Special Provisions” means the specific clauses setting forth conditions or requirements peculiar to the Work and supplementary to these Specifications.
- 1-41 “Specifications” means the directions, provisions, and requirements contained herein. In the Contract Documents, including the Special

Provisions, these Specifications may also be referred to as the “Standard Specifications”.

- 1-42 “State Specifications” means the Standard Specifications of the State of California, Department of Transportation, as currently approved and in effect and as thereafter amended or renumbered.
- 1-43 “Subcontractor” means any person or firm of any tier directly or indirectly utilized by Contractor to perform any portion of the Work.
- 1-44 “Substantially complete” means that the Engineer has determined that all of the Work has been performed, but there are minor deficiencies, as determined by the Engineer, that do not prevent the Work from being fully functional nor pose any risk to the public health, safety or welfare or public or private property, as determined by the Engineer. The Work shall be considered substantially complete on the date that the Engineer issues a punch list to Contractor as specified in Section 8-4 of these Specifications.
- 1-45 “Supplier” means any person or firm directly or indirectly supplying any materials or equipment for performance of, or incorporation in, the Work.
- 1-46 “Work” means all actions and activities that Contractor is contractually required to undertake and perform as specified, indicated, shown, or implied in the Contract, including all duly authorized Change Orders.
- 1-47 “Working day” means any day, except for the following:
  - (1) Saturdays, Sundays and legal holidays, unless otherwise indicated in the Special Provisions.
  - (2) Days on which Contractor is prevented from proceeding with the current Controlling Operation(s) of Work for at least (5) hours per day due to inclement weather, or conditions resulting immediately therefrom, as determined by the Engineer.
  - (3) Days on which Contractor is specifically required pursuant to the Contract Documents or by operation of law to suspend the Controlling Operation or Operations of Work, except in cases where such requirement applies due to the failure on the part of Contractor or any Subcontractor to carry out orders or to perform any provision of the Contract.

## **Section 2**

**DELETED**

**Section 3**

**DELETED**

## Section 4

### MOBILIZATION

**4-1 Mobilization:** Mobilization shall conform to the provisions in Section 9-1.16D, "Mobilization," of the Standard Specifications and to these Special Provisions.

Mobilization shall include the obtaining of all permits, moving onto the site of all equipment, and other construction facilities as required for the proper performance and completion of the work.

Mobilization shall include but not be limited to the following principal items:

1. Signed Contract by the City and the Contractor.
2. Completion of all tasks and submittal of all documents (bonds, insurance, schedule, etc.) required as conditions of issuing the Notice to Proceed.
3. Moving onto the site of all Contractor's equipment required for operations.
4. Installing temporary construction water supply, power, wiring and lighting facilities, as required.
5. Providing field office trailers if needed by the Contractor.
6. Providing all on-site communication facilities, including telephones and radio pagers.
7. Obtaining all required permits.
8. Having all OSHA required notices and establishment of safety programs.
9. Attendance at Pre-Construction Conference of Contractor's principal construction personnel.
10. Physical verification (potholing) of existing utilities- coordinate with Local Indian Tribe at least 72 hours prior to any excavation.
11. Beginning work on the project or at the subject site as applicable.

**4-2 Measurement and Payment:** Mobilization will be measured by the **lump sum**. Mobilization will be measured and paid for on a lump sum basis in accordance with the provisions of Section 9-1.16D, "Mobilization" of the Standard Specifications.

No payment for mobilization, or any part thereof will be approved for payment under the contract until all applicable mobilization items listed above have been completed.

## **Section 5**

### **CONTROL OF WORK AND MATERIALS**

#### **5-1 AUTHORITY OF ENGINEER**

As defined in Section 1 of these Specifications, “Engineer” may mean either the Director or the representatives authorized by the Director to exercise control and supervision of the Work. Much of the actual supervision and control of the project may be by subordinate representatives designated as “Engineer.” However, whenever in these Specifications, Plans or Special Provisions, the Director is designated as the authority in any matter, it will mean only the Director and not subordinates working under the Director’s supervision. Whenever the word “Engineer” is used in these Specifications, Plans or Special Provisions, then either the Director’s subordinates assigned to the supervision and control of the Work or the Director will exercise such authority.

The Engineer will decide any and all questions as to the quality and acceptability of materials furnished, work performed, and rate of progress of the Work. The Engineer will decide all questions as to the interpretation of the Specifications, Plans or Special Provisions, the fulfillment of the Contract on the part of Contractor, and the rights of different contractors on the project. The Engineer will determine the amount and quality of the Work performed and materials furnished, for payment under the Contract.

Whenever, in these Specifications, or upon the Plans, the words “directed,” “required,” “permitted,” “ordered,” “designated,” “prescribed,” or words of like import are used, the direction, requirement, permission, order, designation, or prescription of the Engineer is intended. Similarly, the words “approved,” “acceptable,” “satisfactory,” or words of like import, mean approved by, or acceptable to, or satisfactory to the Engineer, subject in each case to the final determination of the Director or the City Council.

#### **5-2 CONFORMITY WITH PLANS AND ALLOWABLE DEVIATIONS**

Finished surfaces shall conform to the lines, grades, cross-sections, and dimensions shown on the approved Plans and working drawings, unless a deviation from the Plans is authorized in writing by the Engineer.

#### **5-3 COORDINATION OF CONTRACT DOCUMENTS**

These Specifications, the Plans, Special Provisions, and all supplementary Plans, drawings, and other Contract Documents are essential parts of the Contract, and a requirement occurring in one is just as binding as though occurring in all. These documents are intended to be integrated to describe and

provide for a complete Work. Whenever a reference is made in these Specifications to a Section or subsection of another agency's Specifications, such reference shall be deemed to include the General Provisions of such other Specifications of which the Section or subsection is a part, to the extent pertinent to the reference and not inconsistent with the other Contract Documents. In the event of a conflict in the Contract Documents, unless expressly indicated otherwise, the governing priorities are as follows:

1. A Change Order.
2. The Agreement.
3. Addenda. Subsequent addenda shall govern over prior addenda only to the extent specified.
4. In case of conflict between the Specifications and the Special Provisions, the Special Provisions shall govern.
5. In case of conflict between Plans and Specifications, the Plans shall govern in matters of quantity and the Specifications shall govern in matters of quality.
6. In case of conflict within the Plans involving quantities and quality, Contractor shall furnish the greater quantity and quality material and procedure.
7. In case of conflict within a plan sheet involving figured or numerical dimensions the profile shall govern over the layout.
8. In case of conflict within the Specifications involving quality of material or procedure, Contractor shall furnish the higher quality material and procedure.
9. Specific notes shall govern over other notes and other portions of the Plans except Schedules.
10. Larger scale drawings shall govern over smaller scale drawings.
11. Detail plans shall govern over standard plates bound within the Specifications.
12. Figured or numerical dimensions shall govern over dimensions obtained by scaling.
13. Where provisions of codes, safety orders, Contract Documents, referenced manufacturers' specifications or industry standards are in conflict, the more restrictive and higher quality shall govern.

Contractor shall not take advantage of any error, discrepancy or omission in any of the Contract Documents if such error, discrepancy or omission was or should have been apparent to Contractor. As soon as Contractor discovers any apparent error, discrepancy or omission, Contractor shall immediately notify the Engineer, so that the Engineer may make a determination on the matter, which determination shall be final, subject to Contractor's right to submit a claim in accordance with applicable provisions of the Contract Documents.

The Work shall be performed and completed according to the meaning and intent of the Contract Documents.

In addition to the drawings made a part of this Contract at time of signing, by incorporation or reference, the Engineer may furnish such additional drawings from time to time during the progress of the Work, as are necessary to make clear and to define in greater detail, as may be necessary, the intent of the Specifications, Plans, Special Provisions and other Contract Documents and Contractor shall make its Work conform to all such drawings.

Should it appear that the Work to be done or any of the matters related to the Work are not sufficiently detailed or explained in the Contract Documents, Contractor shall provide the Engineer with a request for information (RFI) requesting such information or explanations as may be necessary to complete the Work. The City shall respond to RFIs within 20 calendar days of receipt, unless the Engineer reasonably determines that a longer time period is necessary to provide the information requested by Contractor. The City response (but not Contractor's RFI) shall become part of the Contract, and Contractor shall be responsible for conforming its activities and operations, including the activities and operations of all subcontractors and suppliers, to all applicable requirements, terms and conditions of the City's response.

#### **5-4 COOPERATION OF CONTRACTOR**

After all necessary signatures by City, City will supply Contractor a copy of the Plans, Special Provisions, and the fully executed Agreement. City will also make available to Contractor at least five (5) copies of the Plans and Special Provisions for Contractor's use in prosecuting the Work. If Contractor requests additional copies of the Plans or Special Provisions, the City or its designated reprographics firm will supply such additional copies at Contractor's expense.

Contractor shall give the Work the constant attention necessary to facilitate the satisfactory progress of the Work. Contractor shall cooperate with the Engineer, inspectors and with other contractors in every way possible. Contractor shall at all times have a competent Superintendent at the site of the Work. Contractor's Superintendent shall be fully authorized as Contractor's agent on the Work. The Superintendent shall be capable of reading and understanding all of the Contract Documents. Unless otherwise approved by the Engineer, the Superintendent shall be an employee of Contractor responsible for providing continuous on-site supervision of the Work and shall be fully authorized to receive and follow any instruction given by the Engineer and to sign Change Orders on behalf of Contractor. Unless specifically called for by the Special Provisions, Contractor is not required to provide an office for use by the Engineer.



If requested by the Engineer, Contractor shall provide daily reports signed by Contractor's Superintendent indicating the location and description of operations and details of the equipment and labor used to perform the items of Work. Such details shall include the description of the items of Work, names and classifications of laborers, hours worked, description of equipment used, equipment numbers, and hours equipment are in use, and hours equipment may be idle.

#### **5-5 CONSTRUCTION STAKES**

The Engineer will furnish Contractor with all lines, grades and measurements necessary for the proper prosecution and control of the Work unless stated otherwise in the Special Provisions. Contractor shall provide the Engineer with the City's standard Survey Request Form at least three (3) working days before construction stakes are required. The Engineer may reject any unreasonable or incomplete Survey Request Form and require Contractor to resubmit. Contractor shall have no claim for any costs, damages or extensions of time arising from any delay caused by Contractor's submittal of an unreasonable or incomplete Survey Request Form.

Such stakes and markings as the Engineer may set for either the City's or Contractor's guidance shall be preserved by Contractor. In the event that the stakes or marks placed by the Engineer are destroyed through carelessness or negligence on the part of Contractor or any Subcontractor and the destruction of these stakes or marks causes a delay in the Work, Contractor shall have no claim for damages or extensions of time. Additionally, the City reserves the right to charge Contractor or deduct from the progress payments the costs to the City for any re-staking or remarking required as a result of carelessness or negligence on the part of Contractor or any Subcontractor.

#### **5-6 PERMANENT SURVEY MONUMENTS**

Contractor is responsible for verifying that the arrangements have been made for preserving and perpetuating all permanent survey monuments that will be affected by the Work. Contractor is responsible for preserving all permanent survey monuments that are not proposed to be disturbed. Contractor shall provide a minimum of ten (10) working day notice to Engineer prior to disturbance or removal of any permanent survey monument, and shall coordinate with the Engineer to reset monuments or provide permanent witness monuments and file the required documentation with the County Surveyor pursuant to Business and Professions Code Section 8771.

## 5-7 SUBMITTALS

Contractor shall supply all submittals required by the Special Provisions or the Engineer. Unless otherwise specified herein, Contractor shall deliver five (5) copies of the submittals to the Engineer when required by the Contract Documents or the Engineer. Within twenty (20) calendar days after receipt of a submittal, the Engineer will return two (2) marked copies of the submittal to Contractor indicating one of the following four (4) actions taken by the Engineer, in the Engineer's sole discretion:

1. If the Engineer's review indicates no exceptions, copies will be returned marked "NO EXCEPTIONS TAKEN." Contractor may immediately incorporate the material and equipment covered by the submittal into the Work.
2. If the Engineer's review indicates limited corrections are required, copies will be returned marked "MAKE CORRECTIONS NOTED." Contractor may immediately incorporate into the Work the material and equipment covered by the corrected submittal, with the corrections noted by the Engineer.
3. If the Engineer's review indicates insufficient or incorrect data has been submitted, copies will be returned marked "REVISE AND RESUBMIT." No work may begin on incorporating the material and equipment covered by this submittal into the Work until the submittal is revised, resubmitted, and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."
4. If the Engineer's review indicates the material and equipment submittal is unacceptable, copies will be returned marked "RESUBMIT." No work may begin on incorporating the material and equipment covered by this submittal into the Work until a new submittal is submitted and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

After approval by the Engineer, submittals (including any corrections noted by the Engineer) shall become a part of the Contract, and the work shall be done in conformity with such approved submittals. No work shall be started or material or equipment purchased until the submittals have been approved. Submittals furnished to the Engineer shall include finished drawings, if required, that are neat, legible, to scale, and drawn to as large scale as reasonably possible.

## **5-8 RECORD DRAWINGS**

Contractor shall maintain a neatly and accurately marked set of record drawings showing the final locations and layout of all facilities as-built. Drawings shall be kept current weekly, with all work instructions and Change Orders, accommodations, and construction adjustments. Drawings are subject to the inspection by the Engineer at all times, and progress payments, or portions of progress payments, may be withheld if drawings are not accurate and current. Prior to City's acceptance of the Work, Contractor shall deliver to the Engineer one (1) set of neatly marked record drawings, accurately showing all the information required above. If the Engineer does not approve the record drawings, Contractor shall revise and resubmit the record drawings as necessary to obtain the Engineer's approval. If Contractor fails to comply with the requirements of this section, the City may deduct and retain the cost of preparing the record drawings from the Contract.

## **5-9 SUGGESTIONS TO CONTRACTOR ADOPTED AT CONTRACTOR'S OWN RISK**

Contractor is solely responsible for determining whether to follow or utilize any plan or method of work suggested by the Engineer to Contractor in whole or in part, and Contractor shall assume all risks for this determination. The Engineer and City will assume no responsibility or risk.

## **5-10 REQUEST FOR MODIFICATION OF WORK**

Should conditions occur during the progress of the Work that make it impossible for Contractor to comply strictly with the terms of the Contract with respect to a portion of the Work, Contractor shall make written request to the Engineer for a modification of such portion of the Work, provided that any modification is not detrimental to the Work or create any additional cost to the City. If the modification is acceptable to the Engineer, Contractor will be notified in writing, consistent with any conditions specified by the Engineer. If a modification is not acceptable to the Engineer, Contractor shall determine some other method of performing such portion of the Work that is acceptable to Engineer.

Such approved modifications do not affect or alter the application of any provision of the Contract to any portion of the Work for which no modification is approved by the Engineer.

## **5-11 RIGHT TO PERFORM EXTRA WORK**

In case of neglect or refusal by Contractor to perform any extra work as directed by the Engineer pursuant to Section 4-6 of these Specifications or to make satisfactory progress in the execution of extra work, the City may employ

any person or persons to perform such work, and Contractor shall not in any way interfere with the person or persons so employed.

#### **5-12 PROVISIONS FOR EMERGENCIES**

If, in the opinion of the Engineer, Contractor has not taken sufficient precautions for the safety of the public or the protection of the Work or adjacent structures or property and immediate action is necessary in order to protect the public, any person or any property or property interest ("emergency work"), the Engineer, with or without notice to Contractor, may, but is not obligated to, take such action or obtain or provide for such work and material as the Engineer may consider necessary and adequate to furnish such protection.

The City's cost to perform, obtain or provide for such action, work and material shall be paid by Contractor, and may be deducted by City from any payment due or to become due to Contractor.

The performance of emergency work under the direction of the Engineer shall in no way relieve Contractor from its responsibility or liability for any damages that may occur while or after any actions are or have been taken by the Engineer.

#### **5-13 SUSPENSION OF WORK TO PROTECT HEALTH, SAFETY OR WELFARE OF PERSONS OR PROPERTY**

If the Engineer determines, in the Engineer's sole discretion, that a situation exists where continuation of the Work is illegal or endanger the health, safety or welfare of persons or property on or affected by the Work, the Engineer may order Contractor in writing to delay or suspend the Work in whole or in part for a period of time equal to the period of time while such situation exists. Any order given to Contractor to suspend or delay the Work shall identify the situation that makes the suspension or delay necessary.

Such order of the Engineer does not modify or invalidate in any way any of the provisions of this Contract, and Contractor is not entitled to any damages or compensation from City on account of such delay or suspension.

#### **5-14 RIGHT TO RETAIN IMPERFECT WORK**

If any portion of the work done or material furnished under this Contract is defective and not in accordance with the Contract Documents, and if the defect is not of sufficient magnitude or importance to make the Work or any portion of the Work dangerous or undesirable, the Engineer may, but is not obligated to, retain the defective work instead of requiring the work to be removed and reconstructed. The Engineer may make such deduction from the

payments due or to become due to Contractor as determined appropriate by the Engineer to account for the defector pay the City's costs of removal and reconstruction.

#### **5-15 STORAGE OF MATERIALS AND EQUIPMENT**

Contractor is solely responsible for protecting work in place and materials and equipment stored on-site or off-site from contamination by dust, dirt, debris or mold. Materials and equipment shall be stored so as to ensure the preservation of their quality and fitness for the Work. Stores of equipment and materials shall be located to facilitate inspection by the City. Contractor is responsible for all damages that occur in connection with the care and protection of all materials and equipment to be incorporated in the Work until the completion and final acceptance of the Work by the City.

Prior to storing any materials or equipment on private property not owned by Contractor, Contractor shall obtain written permission from the property owner and, if different than the property owner, the occupant of the property. Contractor is solely responsible for obtaining such permission and complying with any and all conditions and requirements of the property owner or occupant.

Contractor is solely responsible for maintaining adequate security and warning signs and controlling dirt, debris and dust within the limits of Contractor's storage areas at all times. Contractor shall take all steps necessary or required by the Engineer to prevent and eliminate blowing dust.

Prior to commencing the Work, Contractor shall submit a written "Storage of Materials and Equipment Plan" for approval by the Engineer. The Plan shall specify the location, entry date and exit date for all locations where Contractor will store materials or equipment, and a site maintenance plan for all locations. Additionally, this Plan shall describe the measures that Contractor will undertake to minimize impacts to driveways, residents and the general public in the vicinity of such storage locations during work and non-work hours. If this Plan is not approved by the Engineer, Contractor shall revise and resubmit the Plan as necessary to obtain the Engineer's approval.

#### **5-16 MANUFACTURER'S DIRECTION**

Manufactured articles, material, and equipment shall be applied, installed, connected, erected, adjusted, tested, used, cleaned, maintained, and conditioned as recommended by the manufacturer. Copies of the manufacturer's installation instructions and procedures shall be submitted, in accordance with Section 5-7 of these Specifications.

## **5-17 QUALITY OF MATERIALS AND WORKMANSHIP**

If the Contract provides that Contractor shall furnish materials or manufactured articles or shall do work for which no detailed specifications are set forth, the materials or manufactured articles shall be of the best grade in quality and workmanship obtainable in the market from firms of established good reputation, or, if not ordinarily carried in stock, shall conform to the usual standards for first-class materials or articles of the kind required, with due consideration of their intended use. The work performed shall fully conform with the intent to secure the best standard of construction and equipment for the Work as a whole or in part.

## **5-18 TRADE NAMES AND ALTERNATIVES**

For convenience in designation, certain articles or materials to be incorporated in the Work may be designated under a trade name or the name of a manufacturer and its catalogue information. Unless the trade or manufacturer name is expressly designated as the only brand that will be accepted, for one or more of the purposes specified in Public Contract Code Section 3400(b), such designation is deemed to include the words "or equal," so that the use of an alternative article or material of equal quality and possesses the required features and characteristics for the purpose intended will be permitted, subject to the following requirements:

The burden of proof as to the quality and suitability of alternatives is upon Contractor, who shall furnish all relevant information as required by the Engineer. The Engineer will be the sole judge as to the quality and suitability of alternative articles or materials. The Engineer's decision will be final.

If the Contract Documents permit the substitution of a similar or equivalent material or article, no tests or action relating to the approval of the substitute material will be made until the request for substitution is made in writing by Contractor accompanied by complete data as to the equality of the material or article proposed. Such requests shall be made in ample time to permit approval without delaying the work, but need not be made within thirty (30) days after award of the Contract.

## **5-19 DUTIES AND POWERS OF INSPECTORS**

Inspectors are representatives of the City with respect to the duties and powers entrusted to them, subject to any limitations on their authority specified by contract or under any Laws or Regulations. Their duty is to inspect materials and workmanship of those portions of the Work to which they are assigned, either individually or collectively, under instructions of the Engineer, and to report any deviations from the Contract Documents. If an inspector deems it necessary, the

inspectors may order Contractor to stop the Work until the Engineer determines and orders that the Work may proceed.

## **5-20 INSPECTION**

All work and materials furnished pursuant to this Contract are subject to inspection and approval or rejection by the Engineer and such assistants as the Engineer deems necessary. Contractor shall notify the Engineer of the time and place of any factory tests required by the Contract, and the time and place of preparation, manufacture or construction of any material for the Work, or any part of the Work, that the Engineer notifies Contractor the Engineer wishes to inspect.

Contractor shall give notice not less than three (3) working days in advance of the beginning of the work on any such material or of the beginning of any such test to allow the Engineer to make arrangements for inspecting and testing or witnessing the inspection or testing, if such inspection and testing or witnessing are deemed beneficial by the Engineer or are required by the Contract.

If the Engineer considers it proper and practicable, the Engineer will, at the written request of Contractor, cause materials intended for use in the Work to be inspected at the point of production or manufacture. The Engineer may at any time cause such an inspection, however, it will not be undertaken until the Engineer is assured of the cooperation and assistance of both Contractor and the material producer. The Engineer or the Engineer's authorized representative(s) will have free entry at all times to such parts of the plant as concerns the manufacture or production of the materials. Adequate facilities shall be furnished free of charge to make the necessary inspection. Notwithstanding the foregoing, the City shall have no obligation to inspect materials at the source of supply.

Unless authorized by the Engineer, any work done in the absence of an inspector that is completed or in progress shall be subject to inspection. If required by the Engineer, Contractor shall furnish all tools, labor, materials, and other facilities necessary to make such inspection, even to the extent of uncovering or taking down portions of the finished work. Contractor shall pay the cost of such inspection and removing any defective work and performing any necessary reconstruction.

## **5-21 REMOVAL OF REJECTED MATERIALS AND STRUCTURES**

Contractor shall remove from the site of the Work, without delay, all rejected materials or structures brought to or incorporated in the Work. If Contractor fails to do so, or to make satisfactory progress in doing so within

forty-eight (48) hours after the service of a written notice from the Engineer, the rejected material or work may be removed by City and the City may deduct the cost of such removal from any payments that are due or may become due to Contractor. No such rejected material shall again be offered for use by Contractor under this Contract or any other contract with City. Contractor shall not use any such rejected material in the performance of the Contract.

## **5-22 APPROVAL OF SOURCES OF SUPPLY OF MATERIALS**

The Engineer may require Contractor to provide information on the source of supply of materials for the Work and may require that the Engineer's approval be obtained prior to Contractor securing any or all materials. The Engineer may require Contractor to submit representative samples of materials for inspection and testing by City.

Even though a source of supply has been approved, the approval shall not prevent subsequent disapproval or rejection of materials, if the quality of the product or material is later determined to be below the standard or requirements set by any of the Contract Documents.

## **5-23 PREPARATION FOR TESTING**

Contractor shall maintain proper facilities and provide safe access for inspection by City of all parts of the Work and of the shops or other locations where any portion of the Work is prepared. Where the Specifications or Special Provisions require work to be specially tested or approved, it shall not be tested or covered up without at least a 24 hour written notice to the Engineer of its readiness for inspection unless the written approval of the Engineer for such testing or covering is first obtained.

## **5-24 METHODS OF SAMPLING AND TESTING**

Contractor shall furnish samples of materials for testing as required by the Engineer. Contractor shall furnish such samples without cost to City. Testing shall be done to such standards as may be set forth in the Contract Documents. References made in these documents to standard methods of testing materials shall by such reference make such standards a part of the Contract.

## **5-25 REFERENCE TO STATE, FEDERAL OR NATIONAL SPECIFICATIONS**

Whenever a reference is made in the Contract Documents to a specification or test designation either of the A.S.T.M., the A.A.S.H.T.O., the A.W.W.A., the Federal Specifications, or any other recognized national organization or State of California agency, and the number or other identification representing the year of adoption or latest revision is omitted, it



shall mean the specification or test designation in effect on the day the Notice to Contractors for the Work was dated.

## **Section 6**

### **LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC**

#### **6-1 LAWS TO BE OBSERVED**

Contractor shall be familiar with all Federal, State, and local Laws or Regulations that affect those engaged or employed in the Work, or the material or equipment used in or upon the site of the Work, or the conduct of the Work. Any misunderstanding or ignorance on the part of Contractor of such Laws or Regulations shall not in any way relieve Contractor of any responsibility under the Laws or Regulations or the Contract or otherwise modify the Contract.

Contractor shall observe and comply with all Laws or Regulations affecting the conduct of the Work, and Contractor and its Sureties shall defend, indemnify and hold harmless City and all of its officers, agents, and employees against any claim for liability arising from, based upon, or resulting from a condition created as a result of, the violation of any such Law or Regulation, whether by Contractor or any Subcontractor or Supplier or any of their respective officers, employees or agents.

#### **6-2 CERTAIN LAWS AFFECTING THE WORK**

This list is not a comprehensive inventory of applicable Laws and Regulations, but is a summary of a few selected State laws and City ordinances applicable to the Work.

##### **1. State Laws**

###### **a. Labor Discrimination**

Contractor shall not discriminate in the employment of persons on any ground listed in Labor Code Section 1735. The penalty for any such discrimination will be as set forth in the Labor Code, Section 1735, and Chapter 1 of Part 7 of Division 2 of the Labor Code.

###### **b. Fair Labor Standards Act**

Contractors shall comply with the Fair Labor Standards Act of 1938 (52 Stat. 1060) as amended as it may be applicable.

###### **c. Contractor Licensing**

Bidders and Contractors shall maintain license as required by Chapter 9 of Division III of the Business and Professions Code.

**d. Subcontractors**

The rules concerning the use of Subcontractors have been discussed in Section 2-9 of these Specifications. Particular reference was made therein to Section 4101 to Section 4113, inclusive, of the Public Contract Code.

**e. Underground Service Alert**

Prior to conducting any excavation, Contractor shall contact the Underground Service Alert - Northern California as required by Government Code Section 4216.2, and shall take any and all other actions necessary to comply with and shall be subject to the provisions of Government Code Sections 4216.2 through 4216.9, inclusive.

**2. Local Ordinances**

**a. Prevailing Wages**

Pursuant to the Colusa City Municipal Code, Contractor shall pay not less than the prevailing rate of wages as determined by the Director of the California Department of Industrial Relations pursuant to Labor Code Section 1773. The wage rate determinations may be viewed on the Internet at <http://www.dir.ca.gov/dlsr/>. Withholdings and penalties shall be as set forth in the Colusa City Municipal Code and applicable Labor Code provisions.

For Federally funded projects, Contractor shall pay the higher of the Federal Davis Bacon Wage Rate, that is published with the Contract, or the rate specified herein for each trade or work classification employed. Contractor is responsible for submitting all required original signed payroll documents to the City for itself and all Subcontractors. The City shall not recognize any claim for additional compensation because of the payment by Contractor of any wage rate in excess of the prevailing wage rate required under the Contract.

The wage rates determined by the Director of the California Department of Industrial Relations refer to expiration dates. Prevailing wage determinations with a single asterisk (\*) after the expiration date apply to any contract advertised for bids prior to the expiration date and are good for the life of the contract. Prevailing wage determinations with double asterisks (\*\*) after the expiration date indicate that the wage rate to be paid for work performed after this date has been predetermined. If

Work under the Contract will extend past this date, Contractor and its Subcontractors will be required to pay the new rate after such expiration date.

Contractor should contact the Prevailing Wage Unit, Division of Labor Statistics and Research (DLSR), (415-703-4780), to obtain predetermined wage changes for rates designated by a double asterisk (\*\*) after the expiration date. The possibility of wage increases is one of the elements to be considered by Contractor in determining its bid, and shall not under any circumstances, be considered as the basis of a claim for additional compensation or damages against the City under the Contract.

**b. Hours of Labor**

Contractor shall comply with the provisions of the Colusa City Municipal Code and State Law regarding the maximum hours of labor. Withholdings and penalties shall be set forth in the Colusa City Municipal Code and applicable Labor Code provisions.

**c. Apprentices**

Contractor shall comply with the provisions of the Colusa City Municipal Code, as well as any other applicable Laws or Regulations.

**d. Grading, Erosion, and Sediment Control**

Contractor shall be responsible for the implementation and maintenance of erosion, sediment and pollution control measures, otherwise known as Best Management Practices (BMPs) within the limits of the Work site and all areas impacted by the project at all times during the course of construction, including evenings, nights, weekends and holidays in addition to the normal working days in accordance with the provisions of the Colusa City Municipal Code.

**e. Storm Water Management and Discharge Control**

Contractor shall be responsible for the implementation and maintenance of all BMP measures necessary to effectively prevent the discharge of sediment, construction debris, trash, and all associated construction pollutants from discharging to a river, creek, roadside ditch, canal, basin and/or the storm water conveyance system in accordance with Colusa City Municipal Code and State Water Board Laws and Regulations.

**f. Work Affecting the Public Right-of-way**

Contractor shall be responsible for obtaining City approval of and complying with a traffic control plan, providing for the maintenance of construction areas affected by the Work, protecting existing facilities in the Work area, repairing any existing facilities damaged by Contractor's operations, and notifying the public prior to performing the Work in accordance with the provisions of Colusa City Code.

**g. Noise Regulations**

Contractor shall comply with the provisions of the Colusa City Municipal Code.

**h. Dust Regulations**

Contractor shall take reasonable cautions to prevent and control the movement of dust created by Contractor's Work activities in accordance with Colusa City Municipal Code. Proposed and implemented measures shall be in compliance with sections d and e. The Engineer may stop Work activities during conditions of high winds that may carry dust from the Work-site.

**3. Amendments and Ordinance Changes**

The statute and ordinance citations set forth above shall be deemed to refer to future amended or renumbered versions of the statute or ordinance cited.

**6-3 PERMITS, LICENSES AND FEES**

Unless otherwise indicated in the Special Provisions, Contractor shall at Contractor's sole expense obtain all necessary permits and licenses for the construction of the Work, give all necessary notices, pay all fees required by law, and comply with all Laws and Regulations relating to the Work and to the preservation of the public health and safety.

**6-4 PROTECTION OF CITY AGAINST PATENT CLAIMS**

Contractor shall assume all cost arising from the use of patented, copyrighted, trademarked or other similarly protected materials, equipment, devices, or processes used on or incorporated in the Work and shall defend, indemnify and hold harmless the City of Colusa together with all of its

officers and employees, and their duly authorized representatives, from any and all claims and actions, including claims and actions for violation of intellectual property rights, arising on account of the use of any such materials, equipment, devices, or processes by Contractor or any Subcontractor or Supplier. Before final payment is made on the Contract, if requested by Engineer, Contractor shall furnish acceptable proof of a proper release from all claims, costs, and liabilities arising from the use of such materials, equipment, devices, or processes used on or incorporated in the Work.

#### **6-5 SANITARY REGULATIONS**

Contractor shall comply with all Laws or Regulations governing sanitation and public health, and shall defend, indemnify and hold harmless the City of Colusa together with all of its officers and employees, and their duly authorized representatives, from any and all claims, actions or other liabilities arising on account of any failure to do so by Contractor or any Subcontractor or Supplier.

Contractor shall construct and maintain the necessary sanitary conveniences for the use of the workers in such a manner and at such points as shall be approved by the Engineer, and the use of these facilities shall be strictly enforced.

Contractor shall obey and enforce such sanitary regulations and orders and shall take such precautions against contagious or infectious diseases as required by any Laws or Regulations or as the Engineer may deem necessary.

#### **6-6 PUBLIC CONVENIENCE AND SAFETY**

Contractor shall protect and preserve the safety of the public during the progress of the Work. Contractor shall not unnecessarily cause inconvenience to the public during the progress of the Work and shall minimize the inconvenience caused by Contractor's operations. Such operations include, but are not limited to, work performed on or adjacent to the Work site, traffic lane and pedestrian closures and deliveries of material and equipment.

Materials shall be stored on the work site so that no hazard to the public and no damage to public property will result. Damage to property caused by Contractor shall be repaired at Contractor's expense to the satisfaction of the Engineer. Spills resulting from hauling operations along or across any public traveled way shall be removed immediately by Contractor at Contractor's expense. Water or dust palliative shall be applied as necessary or if ordered by the Engineer for the alleviation or prevention of dust. Contractor shall insure that all utility services to customers in the project area are maintained.

Applicable Public Utilities Commission regulations are in effect at railroad grade crossings. Contractor shall not interfere with or impair railroad operations. If the Work could affect railroad operations, Contractor shall contact the railroad prior to construction and comply with all requirements pertaining to railroad operations or facilities.

## **6-7 HOUSEKEEPING PRACTICES**

Contractor shall implement good housekeeping practices during all construction activities until completion and final acceptance of the Work. In addition to practices specified elsewhere in the Contract Documents, Contractor shall implement, at a minimum, the following housekeeping practices: solid waste management, material storage and delivery area, concrete waste management, trash management, and spill prevention and control.

**Solid Waste Management:** Contractor shall maintain a clean construction site and provide designated areas for waste collection. The waste collection areas shall contain leak-proof disposal containers with lids or covers. Site trash shall be collected daily and placed in the disposal containers. Contractor shall make arrangements for regular waste collection and regularly inspect the waste disposal areas to determine if potential pollutant discharges exist.

**Material Storage and Delivery Area:** Contractor shall provide one central material storage and delivery area (MSDA) for the duration of the Work. This area shall be fenced or otherwise protected such that runoff will not leave the MSDA site. Contractor shall regularly inspect the MSDA site to ensure that any hazardous or non-hazardous materials have not spilled.

**Concrete Waste Management:** Contractor shall arrange for off-site disposal of concrete wastes or disposed of in one designated area. Concrete wastes, including left-over concrete and material from washing out the concrete truck, shall not be disposed to the storm drain system via curb and gutter or otherwise. If a designated area is provided, the area shall be bermed and protected from the elements to allow the concrete to dry. The dried concrete waste shall be removed and disposed of properly by Contractor at Contractor's expense. Proof of proper disposal may be required by the City inspector or engineer.

**Spill Prevention and Control:** Contractor is responsible for instructing employees and Subcontractors about preventing spills of hazardous materials and controlling spills if they occur. Proper spill control and cleanup materials shall be kept on-site near the MSDA and updated as materials change on site. If a significant spill has entered the City's drainage system, Contractor shall contact the City's drainage maintenance supervisor to ensure the discharge has not impacted a body of water or drainage facility.

More information about required BMPs can be obtained by referring to the City of Colusa's Administrative and Technical Procedures Manual for Grading, Erosion and Sediment Control available online at: <https://www.cityofcolusa.org/-/media/Corporate/Files/DOU/Specs-Drawings/Sediment-control-manual.pdf?la=en>

#### **6-8 TRENCH SAFETY PLANS**

Before beginning excavation for a trench five (5) feet or more in depth, Contractor shall secure a permit from the Division of Industrial Safety. A copy of this permit must be available at the construction site.

When required on the Plans or by the Engineer, Contractor shall submit to the Engineer a detailed Plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground. Such Plan shall be approved by the Engineer at least five (5) days before Contractor intends to begin work on the trench. If the Plan varies from the shoring system standards established by the Construction Safety Orders of the Division of Industrial Safety, the Plan shall be prepared by a registered civil or structural engineer. Nothing in this provision allows the use of shoring, sloping or protective systems less effective than that required by the Construction Safety Orders of the Division of Industrial Safety.

Contractor's bid for any item requiring excavation shall include all costs to furnish, install, maintain and remove adequate sheeting, shoring and bracing, and any other measures necessary to maintain adequate worker protection and conform to all applicable safety orders.

#### **6-9 COMPLIANCE WITH OSHA**

Contractor is responsible for strict compliance with applicable requirements of the California Occupational Safety and Health Act (Labor Code Sections 6500 et seq.). This includes, but is not limited to, all applicable Construction Safety Orders issued by the State of California, Division of Industrial Safety, under Title 8 of the California Code of Regulations.

#### **6-10 TRAFFIC CONTROL REQUIREMENTS**

Contractor is solely responsible for furnishing, installing and maintaining all warning signs and devices necessary to safeguard the public and the Work, and to provide for the proper and safe routing of vehicular, bicycle, and pedestrian traffic during the performance of the Work. This requirement is for the duration of the project, and is not limited to working hours. The use of



flagmen, barricades, and construction signing shall comply with the current edition of the California “Manual on Uniform Traffic Control Devices.”

Contractor shall submit a traffic control plan showing proposed traffic control measures and detours for vehicles and pedestrians a minimum of ten (10) working days prior to the start of any Work within or affecting the street right of way. The traffic control plan shall include the following information pursuant to City Code these standards and include the following:

1. The name and business address of the applicant.
2. Diagram showing:
  - a. The location of the proposed work area;
  - b. The location of areas where the public right-of-way will be closed or obstructed; and
  - c. The placement of traffic control devices necessary to perform the work.
3. The proposed phases of traffic control in a narrative format including a description and dates for the beginning and ending of each phase.
4. The time periods when the traffic control will be in effect.
5. A statement that the applicant will comply with the City’s noise ordinance during the performance of all work.
6. A statement that the applicant understands that the plan may be modified by the director at any time in order to eliminate or avoid traffic conditions that are hazardous to the safety of the public.

Contractor shall not work until a City-approved traffic control plan is on file with the Engineer. If the Engineer determines at any time that actual traffic conditions render the approved plan inadequate to ensure public safety, the Engineer may require the plan to be immediately modified. If a hazardous condition cannot be eliminated by plan modification the Engineer may require work under the plan to be stopped, and the plan suspended, until the safety hazard is remedied. Contractor is not entitled to any costs, damages or extension of Contract time arising from any stop work order issued by the Engineer under this Section.

Contractor shall provide safe pedestrian, bicycle, and disabled access through or around the construction area. Sidewalk closure shall comply with the “Policy for Sidewalk Closures” established by the City of Colusa’s Department of Public Works pursuant to federal and state disability access laws and regulations. Contractor

shall provide access to all existing driveways, adjacent parking areas, and buildings at all times unless other arrangements are made with the property owner and approved by the Engineer. Access for emergency vehicles shall be clear at all times.

Contractor shall use skid resistant steel plates to cover all excavations permitted to remain open in the roadway during non-working hours. Steel plates shall be placed in a safe and proper manner that does not impede the passage of pedestrians, bicycles, and the disabled community.

All Work within public streets and right-of-way shall be done in an expeditious manner so as to cause as little inconvenience to the public as possible. Unless otherwise approved, Contractor shall maintain at least one travel lane in each direction at all times on two-way Primary Streets (defined below), and at least two travel lanes at all times on one-way Primary Streets.

On working days, between 7:00 a.m. and 8:30 a.m. and 4:00 p.m. to 6:00 p.m., Contractor shall maintain the number of lanes normally available on all Primary Streets unless otherwise approved in writing by the City Engineer.

**6-11 CONTRACTOR NOT AN AGENT OF CITY**

During the term of the Contract, Contractor shall be an independent contractor and shall not under any circumstances be considered an employee, agent, or other representative of the City. Contractor is not authorized to bind City to any obligation. Nothing in this Contract creates any relationship of joint venture, partnership or any other association of any nature whatsoever between City and Contractor other than that of owner and independent contractor. City has the right to control Contractor only insofar as provided in this Contract and only insofar as the results of Contractor's work pursuant to the Contract. The City's right of supervision does not reduce or abrogate Contractor's liability for any and all damage or injury to persons, public property or private property that may arise directly or indirectly from Contractor's performance of the Work.

**6-12 APPROVAL OF CONTRACTOR'S PLANS NO RELEASE FROM LIABILITY**

The approval by the Engineer of any drawing or any method of work proposed by Contractor does not relieve Contractor of responsibility for any errors and is not an assumption of risk or liability by City or any City officer or

employee. Contractor has no claim under the Contract on account of the failure or partial failure or inefficiency of any plan or method so approved. Such approval by the Engineer merely means that the Engineer has no objection to Contractor's using, at Contractor's sole responsibility and risk, the plan or method Contractor proposes.

#### **6-13 CONTRACTOR SHALL NOT MORTGAGE EQUIPMENT**

Contractor shall not mortgage or otherwise convey the title of the plant, machinery, tools, appliances, supplies, or materials that may at any time be in use, or further required or useful, in the performance of the Contract, without prior written consent of the Engineer.

#### **6-14 PROPERTY RIGHTS IN MATERIALS**

Contractor is not vested with any right of property in the materials used after they have been attached, or affixed to the Work, and on which partial payments have been made by City. All such materials shall be the property of Contractor and City jointly as their interests may appear, and may not be removed from the Work by Contractor without the consent of City.

#### **6-15 USE OF EXPLOSIVES**

Explosives shall not be used on the Work unless permission to use them is granted by the Engineer in writing, and only then under such conditions as may be prescribed by the Engineer and in compliance with all applicable Laws or Regulations.

#### **6-16 CONTRACTOR'S LEGAL ADDRESS**

At Contractor's on site office, Contractor shall provide a representative authorized to receive drawings, samples, notices, letters, instructions, explanation or other communications or articles from City. Drawings, samples, notices, letters, instructions, explanations, or other articles or communications may be mailed or personally delivered either to Contractor's address given in the Proposal, or to Contractor's representative at the site of the Work, or to Contractor's office at the site of the Work. The delivery at any of these places of any such item from City to Contractor shall be deemed sufficient service upon Contractor, and the date of such service shall be the date of mailing or personal delivery. The address given in the Proposal may be changed by notice in writing from Contractor to City. Nothing herein contained shall be deemed to preclude or render inoperative the service of any drawing, sample, notice, letter, instruction, explanation, article or communication to or upon any authorized representative of Contractor personally.

## **6-17 ON STREET PARKING REMOVAL**

In performing the Work, Contractor shall minimize the inconvenience to the public and shall only place “No Parking” signs in areas where parking clearly needs to be removed to safely perform the Work. “No Parking” signs shall be 11” by 17” inches, with red letters on white construction paper or other material approved by the Engineer, and shall comply with all applicable Laws or Regulations. “No Parking” signs shall be neat and clean, and clearly indicate the specific times and dates when parking is to be prohibited. “No Parking” signs shall be securely fastened to barricades, and not placed on trees, utility poles, or other facilities not approved by the Engineer.

Contractor shall maintain the “No Parking” signs and barricades prior to and during the course of the Work. Contractor shall verify three days prior to commencing the Work, and continuously during the course of the Work, that the signs and barricades are adequately visible and properly placed.

The Engineer may arrange for vehicles that interfere with the Work to be towed. No vehicles parked in a “No Parking” area will be towed without acceptable documentation that the signs and barricades are properly placed, and no towing is allowed unless the Engineer determines that a reasonable person would have been able to determine that parking is not allowed. If Contractor requests towing of a vehicle, Contractor shall include in such request written documentation indicating that the “No Parking” barricades were placed at least seventy-two (72) hours in advance of the start of Work, and Contractor shall provide a photograph of the vehicle to be towed, showing the nearest “No Parking” sign. Contractor shall reimburse City for any payment of a claim filed against the City for the towing of any vehicle without the Engineer’s approval or acceptable documentation as provided herein.

### In Non-Metered Areas

Seventy-two (72) hours prior to the start of Work, Contractor shall place “No Parking” signs on approved barricades at fifty (50) to sixty (60) foot intervals.

### In Metered Parking Areas

Contractor shall obtain permission to remove parking stalls from the City Parking Division not less than three (3) working days before the start of construction and shall be responsible for the payment of parking removal fees pursuant to applicable provisions of the Colusa City Code. It is recommended that Contractor consult with the City’s Parking Division to obtain an estimate of the fees.

If Contractor pays the applicable fees and the removal of parking stalls is approved by City, seventy-two (72) hours prior to the start of Work, Contractor

shall place “No Parking” signs adjacent to every third parking stall to be removed, when an entire block of parking is to be removed. Contractor shall move these signs into every third parking stall at the beginning of the workday, in conjunction with the covering of parking meters for all stalls to be removed. If Contractor only needs to remove a portion of parking stalls on a block, every stall removed shall be barricaded with a “No Parking” sign in conjunction with the covering of parking meters for all stalls to be removed. Contractor shall comply with any other conditions specified by the City for such parking stall removals.

In addition to the foregoing, Contractor shall comply with all applicable requirements of the Colusa City Code pertaining to on-street parking removal.

## **6-18 MAIN AND TRUNKLINE UTILITIES**

The City is a member of the Underground Service Alert (U.S.A.) one-call program. Contractor or any Subcontractor must notify the U.S.A. at least two (2) working days, but not more than fourteen (14) calendar days, in advance of performing excavation work as provided in Government Code Section 4216.2, and Contractor shall comply with all other applicable requirements specified in Article 2 of Division 5 of the Government Code, commencing with Section 4216.

Contractor is responsible for the timely removal, relocation or protection of any existing main or trunkline utility facilities located on the Work site and identified on any of the Contract Documents in their approximate location (defined below). Subject to the provisions of this Section, City is responsible for the timely removal, relocation or protection of any existing main or trunkline utility facilities located on the Work site that are not identified in any Contract Documents in their approximate location. This does not require City to indicate the presence of existing service laterals or appurtenances whenever the presence of existing service laterals on the site can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, valves, service facilities, identification markings and other indicators, on, or adjacent to, the Work site. Contractor is responsible for the timely removal, relocation or protection of such service laterals.

If existing main or trunk line utility facilities on the Work site need to be located or repaired, or removed and relocated, or protected, and the subsurface main or trunk line utility facilities were not identified in any of the Contract Documents at their approximate location, and any damage occurring to such main or trunk line facilities was not due to the failure of Contractor or any Subcontractor to use reasonable care, City shall pay for the cost of locating and repairing, or removing and relocating, or protecting such main or trunk line utility facilities. A subsurface main or facility is deemed to be in the “approximate location” shown on the Contract Documents if the main or facility or any portion of it is located within a strip of land extending twenty-four inches

(24”) on either side of the location for the exterior surface of the main or facility shown on any of the Contract Documents. “Approximate location” does not refer to the depth of the subsurface main or facility.

The City’s obligation to pay in instances of a discovery of main or trunk line facilities on site in the circumstances described above is limited strictly to the costs described above and for any equipment on the site of the Work necessarily idled as a result of such circumstances.

In the event the completion of the project is delayed by (1) City’s failure to provide for the repair, removal, relocation or protection of an existing main or trunk line utility facility not identified in its approximate location on any of the Contract Documents, or (2) failure by another owner of an existing main or trunk line utility facility to provide for the repair, removal, relocation or protection of such main or facility, except in cases where Contractor is responsible under the Contract for causing such repair, removal, relocation or protection to occur, then such delay shall be an Excusable Delay as that term is defined in the Contract Documents.

Nothing in this section relieves a utility from a contractual or legal obligation to pay the cost of removal or relocation of existing utility facilities. For facilities owned by a public utility, the public utility has the sole discretion to perform repairs or relocation work or permit Contractor to do such repairs or relocation work at a reasonable price. Nothing in this section precludes City from pursuing any appropriate remedy against the utility for delays that are the responsibility of the utility.

If, after commencing the Work, Contractor discovers existing main or trunk line utility facilities located on the site of the Work that were not identified on any of the Contract Documents in their approximate location, Contractor shall immediately notify the Engineer and the owner of the utility facility in writing by the most expeditious means available.

#### **6-19 ITEMS CONTAINING TRADE SECRETS OR PROPRIETARY RIGHTS PROHIBITED**

Neither Contractor nor any Subcontractor shall furnish any item or combination of items to which, or in which, Contractor or any Subcontractor or Supplier claims any trade secret or proprietary right. City shall own without restriction all items furnished under this Contract. Such items shall include but not be limited to, any item assembly, combination of items, process, electrical or mechanical or electro-mechanical or microprocessor process or program, or any combination or sequence of these items. Neither Contractor nor any Subcontractor shall furnish any item or combination of items pursuant to this Contract containing any program or programmable item without first obtaining the written consent of the Engineer, that may be withheld or conditioned in any

manner determined to be in the best interest of the City by the Engineer in the Engineer's sole discretion.



## **Section 7**

### **PROSECUTION AND PROGRESS**

#### **7-1 ASSIGNMENT**

The Contract may be assigned only upon written consent of the City, and also with the consent of Contractor's Sureties.

#### **7-2 WORK SCHEDULE AND ADEQUATE RESOURCES**

Contractor shall perform the Work under this Contract with all materials, tools, machinery, apparatus, and labor necessary to the complete and timely execution of everything described, shown or reasonably implied under this Contract on or before the Contract Completion Date.

Contractor shall give full information to the Engineer as to Contractor's plans for carrying on any part of the Work before commencing that Work. Contractor shall submit to the Engineer prior to the pre-construction meeting or as otherwise required in the Special Provisions a detailed achievable schedule for the various items of Work and for completion of the Work as a whole, using the critical path method (CPM) or other format acceptable to the Engineer. If such schedule is not accepted in writing by the Engineer, Contractor shall revise and resubmit the schedule as necessary to obtain the Engineer's written acceptance. If at any time during performance of the Work the Engineer notifies Contractor that its latest accepted schedule is not reasonable or does not accurately reflect the current progress or sequence of Work, Contractor shall revise and resubmit an updated schedule within five (5) working days of the Engineer's notification. If such updated schedule is not accepted in writing by the Engineer, Contractor shall revise and resubmit the schedule as necessary to obtain the Engineer's written acceptance. Notwithstanding any contrary provision of the Contract Documents, Contractor is not entitled to claim any damages or compensation for any delay caused by the City unless Contractor's claim of City-caused delay is substantiated by an accurate CPM schedule accepted by the Engineer indicating the Controlling Operation(s) and sequence of Work, that Contractor submitted to the City prior to the occurrence of the delay.

The schedule(s) required by this section shall show the order in which Contractor proposes to carry out the Work, the total float period, the logical relationships between Work activities, the critical path, the dates on which Contractor will commence the different tasks comprising the Work (including procurement of materials, plant, and equipment), and the contemplated dates for completing such tasks.

The schedule(s) submitted shall be consistent in all respects with the completion time requirements and any order of work requirements indicated in the Contract.

Subsequent to the time that submittal of a schedule is required in accordance with these Specifications, no progress payments will be made for any Work until such schedule has been submitted to the Engineer.

If at any time before the beginning or during the progress of the Work, any part of Contractor's plant, or equipment, or any of Contractor's methods of execution of the Work, appear to the Engineer to be unsafe, inefficient, or inadequate to insure the required quality or rate of progress of the Work, the Engineer may order Contractor to increase or improve its facilities or methods, and Contractor shall promptly comply with such orders at no cost to the City; but neither compliance with such orders nor failure of the Engineer to issue such orders shall relieve Contractor from its obligation to secure the degree of safety, the quality of the Work, and the rate of progress required of Contractor under the Contract Documents. Contractor alone is responsible for the safety, adequacy, and efficiency of its plant, equipment, and methods.

### **7-3 WORK UNDER UNFAVORABLE WEATHER AND OTHER ADVERSE CONDITIONS**

During unfavorable weather and other adverse conditions, Contractor shall pursue only such portions of the Work as will not be damaged by the weather or other adverse conditions. If the quality or efficiency of any portions of the Work will be affected by any unfavorable conditions, such portions shall not be performed while those conditions exist, unless Contractor can overcome these conditions by special means or precautions approved by the Engineer.

### **7-4 SATURDAY, SUNDAY, HOLIDAY, AND NIGHT WORK**

No work shall be done between the hours of 6 p.m. and 7 a.m., nor on Saturdays, Sundays or legal holidays, except such work necessary for the proper care and protection of work already performed or except in case of emergency or special situation, and in any case only with the permission of the Engineer or as specified in the Special Provisions.

Notwithstanding the foregoing, if Contractor first requests and obtains the written permission of the Engineer, Contractor may establish different hours of work as a regular procedure, as specifically approved by the Engineer. However, the Engineer may revoke such permission at any time for any reason. If such off-period work is approved, Contractor shall comply with any and all conditions established for such work by the Engineer at Contractor's own cost and expense, and Contractor shall pay any and all costs incurred by the City in

connection with such off-period work, including but not limited to the City's costs to inspect such work.

#### **7-5 SEPARATE CONTRACTS**

City reserves the right to let other contracts in connection with the project. Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate Contractor's work with theirs.

If any part of Contractor's Work depends for proper execution or results upon the work of any other contractor, Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution or results. Contractor's failure to inspect and report any defects in the work shall constitute an acceptance of the other contractor's work as fit and proper for the reception of Contractor's Work, except as to defects not arising from the Contractor's Work that may develop in the other contractor's work after the execution of Contractor's Work.

#### **7-6 REMOVAL OF UNSATISFACTORY EMPLOYEES**

Contractor and Contractor's Subcontractors shall, on the site of the Work, employ only competent persons skilled in their respective lines of work. Whenever the Engineer notifies Contractor that any person employed by or representing Contractor or any Subcontractor on the Work is, in the Engineer's opinion, incompetent, unfaithful or disorderly, or refuses to carry out the provisions of this Contract, or uses threatening or abusive language to or otherwise threatens or abuses any City employee or representative or any member of the public, or is otherwise unsatisfactory, Contractor shall remove or require its Subcontractor to remove the person from the Work and shall not return that person to the Work unless approved by the Engineer.

#### **7-7 PROTECTION OF WORK, PERSONS AND PROPERTY AGAINST DAMAGE**

Contractor shall protect the Work, all materials incorporated or to be incorporated in the Work and all equipment used in connection with the Work, whether located on or off the Work-site, and all public and private improvements and facilities within the site of the Work, from damage due to the nature of the Work, the action of the elements, trespassers, vandalism, fire or any other cause whatsoever, until the completion and City acceptance of the Work. The City does not have or assume any responsibility for collecting indemnity from any person or persons causing damage to the work or property of Contractor. Any and all costs incurred by Contractor to protect the Work, materials, equipment, improvements and facilities as provided above shall be included in Contractor's

Proposal and Contractor shall not be entitled to any additional compensation or damages from City.

Contractor shall furnish such guards, fences, warning signs, walks, and lights as is necessary, or as may be ordered by the Engineer, and shall take all other necessary precautions to prevent damage or injury to persons or property. Existing public and private improvements including utilities and adjacent properties shall be protected from potential damage resulting from the operations of Contractor or any Subcontractor. Typical improvements to be protected include, but are not limited to: trees, shrubbery, fences, walls, existing pavement, sidewalks, street improvements and underground utilities that are either to be, or not to be, removed under the Contract.

All existing street signage, markings and striping damaged as a result of construction shall be replaced in kind by Contractor, to the satisfaction of the Engineer. In the case of partial damage, the whole stripe or marking in its entirety shall be replaced. Temporary marking and striping shall be installed within 3 working days of any damage.

All painted or other markings, such as Underground Service Alert (USA) markings, on the pavement, sidewalk or gutters used for constructing the project shall be removed by Contractor before final acceptance of the Work.

If public or private improvements are damaged by the operations of Contractor or any Subcontractor, the damaged improvements shall be replaced or restored at Contractor's expense to pre-damage condition.

Any underground facility not shown on the Plans does not relieve Contractor of the responsibility to appropriately notify USA in order to determine the location of underground facilities, or to exercise sound judgment when working in the vicinity of known, visible or reasonably ascertainable underground facilities. It is Contractor's responsibility to ascertain the location of those underground facilities that may be subject to damage by reason of Contractor's operations.

## **7-8 TIME OF COMPLETION**

Contractor shall complete all Work within the time set forth in the Agreement.

Contractor shall not be charged for a working day on which the Engineer determines, that as a result of inclement weather or conditions resulting from the weather, Contractor is or was prevented from engaging in the current Controlling Operation or Operations of the Work with its normal labor and effort for at least five (5) hours of the day.

The current Controlling Operation or Operations mean any feature of the Work (e.g., an operation or activity, or a settlement or curing period) that, if delayed or prolonged, will necessarily delay the time of completion of the entire Work, as determined by the Engineer based on Contractor's most recent schedule that has been accepted by the Engineer.

The Engineer will furnish Contractor a weekly statement showing the number of working days charged to the Contract for the preceding week, the number of working days of time extensions being considered or approved, the number of working days originally specified for the completion of the Contract and the extended date for completion, if any, except when working days are not being charged in accordance with the provisions in Section 7-9 "Temporary Suspension of Work." Contractor is allowed 15 calendar days from the date of the Engineer's issuance of the weekly statement of working days in which to file a written protest of the Engineer's determination of working days; otherwise the weekly statement is deemed accepted by Contractor as correct.

#### **7-9 TEMPORARY SUSPENSION OF WORK**

The Engineer has the authority to suspend the performance of the Work wholly or in part, for such period as the Engineer deems necessary, due to unsuitable weather, or for such other conditions as are considered unfavorable for the suitable prosecution of the Work, or for such time as the Engineer may deem necessary due to the failure on the part of Contractor or any Subcontractor to carry out orders, or to satisfactorily perform any provision of the Contract. Contractor shall immediately comply with the written order of the Engineer to suspend the Work wholly or in part. The suspended Work shall be resumed when conditions are favorable or methods are corrected, as ordered or approved in writing by the Engineer.

If a suspension of Work or any portion of the Work is ordered by reason of the failure of Contractor or any Subcontractor to carry out orders or to satisfactorily perform any portion of the Contract, or by reason of weather conditions being unsuitable for performing any item or items of Work, which items, in the opinion of the Engineer, could have been performed prior to the occurrence of such unsuitable weather conditions had Contractor diligently prosecuted the Work in accordance with the Contract when weather conditions were suitable, Contractor shall perform at its own expense all the work necessary to (i) preserve and protect the Work and related facilities and improvements from weather and other environmental conditions during the period of suspension, (ii) repair any damage to the Work and/or related facilities and improvements occurring before, during or after the period of suspension, and (iii) provide a safe, smooth, and unobstructed passageway through construction for use by public traffic and any other public use during the period of suspension.

In the event Contractor fails to timely perform such Work, the City may perform such work and the cost of the Work will be paid by Contractor or will be deducted from moneys due or to become due Contractor under the Contract.

Except as may be provided otherwise in the Contract Documents, if the Engineer orders a suspension of all or a portion of the Work, or a portion of the Work that is the current Controlling Operation or Operations, by reason of unsuitable weather conditions, and in the opinion of the Engineer the suspension is not due to the failure of the Contractor or any Subcontractor to carry out orders or to satisfactorily perform any portion of the Contract nor due to the Contractor's failure to diligently prosecute the Work in accordance with the Contract prior to such suspension, Contractor shall perform all work necessary to (i) preserve and protect the Work and related facilities and improvements from weather and other environmental conditions during the period of suspension, and (ii) provide a safe, smooth, and unobstructed passageway through construction for use by public traffic and any other public use during the period of suspension, provided that the cost of such work shall, upon approval by the Engineer, be paid for as extra work as provided in Section 4-4 above, or, at the option of the Engineer, all or a portion of such work shall be performed by the City at no cost to Contractor.

If the Engineer orders a suspension of all of the Work, or a portion of the Work that is the current Controlling Operation or Operations, due to unsuitable weather or due to such other conditions that the Engineer considers unfavorable to the suitable prosecution of the Work, and in the opinion of the Engineer the suspension is not due to the failure of the Contractor or any Subcontractor to carry out orders or to satisfactorily perform any portion of the Contract nor due to the Contractor's failure to diligently prosecute the Work in accordance with the Contract prior to the suspension, the days on which the suspension is in effect shall not be considered working days. If a portion of Work at the time of such suspension is not a current Controlling Operation or Operations, but subsequently becomes the current Controlling Operation or Operations, the determination of working days will be made on the basis of the current Controlling Operation or Operations.

If a suspension of all or a portion of the Work is ordered by the Engineer, due to the failure on the part of Contractor or any Subcontractor to carry out orders given or to satisfactorily perform any provision of the Contract, or by reason of weather conditions being unsuitable for performing any item or items of Work, which items, in the opinion of the Engineer, could have been performed prior to the occurrence of such unsuitable weather conditions had Contractor diligently prosecuted the Work in accordance with the Contract when weather conditions were suitable, the days on which the suspension order is in effect shall be considered working days unless such days are not working days pursuant to Section 1-48(1) of these Specifications.

A suspension of Work under any of the conditions set forth in this Section shall not relieve Contractor of its responsibilities under the Contract Documents. This Section 7-9 does not apply to any suspension of work to protect the health, safety, welfare or condition of persons or property pursuant to Section 5-13 of these Specifications.

## **7-10 DETOURS**

Contractor shall construct and remove detours and detour bridges for the use of public traffic as provided in the Special Provisions, or as shown on the Plans, or as directed by the Engineer. Payment for such work shall be made as set forth in the Special Provisions, or, if not addressed there, at the Contract prices for the items of work involved if such prices are specified in the Contract. If not addressed in the Special Provisions and no such prices are specified in the Contract, all detours shall be constructed and removed at no additional charge by Contractor.

Contractor shall pay all costs of repairing damage to detours caused by public traffic.

When public traffic is routed through the Work, Contractor's obligation to provide for a safe passageway through construction operations shall not be considered to constitute construction or maintenance of a detour and Contractor shall not be entitled to any additional payment therefor, unless otherwise specified in the Special Provisions.

Detours constructed by Contractor exclusively for Contractor's or any Subcontractor's own use and convenience for hauling materials and equipment shall be constructed and maintained by Contractor at its own expense.

The failure or refusal of Contractor to construct and maintain adequate detours at the proper time and in satisfactory condition for use by public traffic shall be sufficient cause for closing down the Work until the Engineer determines that such detours have been constructed and are in satisfactory condition for use by public traffic. Contractor is solely responsible for all costs incurred to repair any damage to any detour caused by Contractor's or any Subcontractor's hauling or other activity.

## **Section 8**

### **MEASUREMENT AND PAYMENT**

#### **8-1 MEASUREMENT OF QUANTITIES**

The Engineer shall determine quantities of Work acceptably completed under the terms of the Contract, or as directed by the Engineer in writing, based on measurements taken by the Engineer or the Engineer's assistants. In computing quantities, the length, area, solid content, number, weight or time in standard units, as the case may be, shall be computed as specified in the Contract. All earth excavation shall be computed to the neat lines and grades as set and directed by the Engineer and shall be computed in relation to the original undisturbed condition.

#### **8-2 SCOPE OF PAYMENT**

The compensation provided by the Contract constitutes full payment for all materials, supplies, equipment, tools, labor, and all incidentals necessary to complete the Work; for performing all work and services contemplated and implied by the Contract; for loss or damage arising from the nature of the Work, or from action of the elements; from unforeseen difficulties that may be encountered during the performance of the Work; for all risks of every description connected with the performance of the Work, and for any infringement of patent, trademark, or copyright; and for completing the Work according to the Contract Documents.

For unit price items, payment for those items at the unit price bid by Contractor constitutes full payment for all work and services related to such items, except as otherwise specified in the Contract Documents. For any work or services required to perform the Work that are not specifically described in the Contract Documents, Contractor will include payment for such work and services under the bid of any item(s) that Contractor deems appropriate and City shall not pay additional compensation for any such work or services. No payment shall be made for materials stored on- or off-site until such materials are properly installed and incorporated in the Work.

#### **8-3 PAYMENT ON ENGINEER'S CERTIFICATE**

City shall make no payment pursuant to the Contract until the Engineer certifies that such payment is due on account of Work done and material furnished in accordance with the Contract.



## **8-4 COMPLETION OF WORK AND FINAL PAYMENT**

### **1. Issuance of Punchlist**

A punch list may be issued when the Engineer determines as provided below, that the work is “substantially complete” as that term is defined in Section 1 of these Specifications. The Engineer may issue a punch list on the Engineer’s own initiative or in response to Contractor’s request. If Contractor believes the Work is substantially complete and requests issuance of a punch list, the following provisions shall apply:

- a. Contractor shall submit to the Engineer a written request for issuance of a punch list. Contractor also shall provide any information relating to the Work that may be requested by the Engineer after receiving Contractor’s request. The Engineer shall request such information, if any, not later than five (5) working days after receiving Contractor’s request for issuance of a punch list.
- b. After reviewing the request and information and performing such other investigations, inspections or reviews necessary to ascertain the condition or status of the Work, the Engineer, in the Engineer’s sole discretion, shall either (1) issue a punch list, or (2) notify Contractor in writing that the Work is not yet substantially complete, and include a list of items of the Work that are not yet complete and have more than minor deficiencies. Unless otherwise agreed by the parties, the Engineer shall take one of the above actions within ten (10) working days after receiving Contractor’s request for issuance of a punch list, or, if the Engineer requests information, within ten (10) working days after the Engineer receives such information. Any subsequent requests by Contractor for issuance of a punch list shall be made in accordance with the provisions of this Section.

The City may issue one or more punch lists, as determined necessary or appropriate by the Engineer. The issuance of a punch list is solely for purposes of identifying items of the Work that have minor deficiencies, and shall not modify or otherwise affect the meaning, application or operation of any provision of the Contract Documents, including but not limited to any warranty, liquidated damages or termination provisions.

### **2. Final Acceptance of the Work**

Final acceptance occurs when the Engineer determines that the entire Work is complete. The Engineer may make this determination on the Engineer’s

own initiative or in response to Contractor's request. If Contractor believes the entire Work, including all punch list work, is complete and requests final acceptance, the following provisions shall apply:

- a. Contractor shall submit to the Engineer a written request for final acceptance. Contractor shall provide any information relating to the condition or status of the Work as requested by the Engineer. The Engineer shall request such information, if any, not later than five (5) working days after receiving Contractor's request for final acceptance.
- b. After reviewing such request and information and performing such other investigations, inspections or reviews as may be necessary to ascertain the condition or status of the Work, the Engineer, in the Engineer's sole discretion, shall either (1) issue final acceptance establishing the date of completion of the entire Work, or (2) notify Contractor in writing that the entire Work is not yet complete, and include a list of items of the Work that are deficient. Unless otherwise agreed by the parties, the Engineer shall take one of the above actions within ten (10) working days after receiving Contractor's request for final acceptance, or, if the Engineer requests information, within ten (10) working days after the Engineer receives such information. Any subsequent requests by Contractor for final acceptance shall be made in accordance with the provisions of this Section. The date of completion of the entire Work determined by the Engineer shall be specified in any Notice of Completion filed pursuant to Civil Code Section 3093.

Completion of the Work shall not be deemed to occur under the Contract for any purpose until the Engineer determines the date of completion as provided above.

### **3. Final Payment**

After determining the date of completion, the Engineer shall make a final estimate of the amount and value of Work performed under the Contract. If necessary, the Engineer shall prepare a balancing Change Order. The Engineer shall send the final estimate to Contractor with a balancing Change Order, if required, for Contractor's review and signature.

Not later than fifteen (15) calendar days after receiving the final estimate and balancing Change Order, if any, Contractor shall either (1) sign the final estimate and balancing Change Order, if any, and return them to the Engineer, or (2) notify the Engineer in writing of any disagreement with the final estimate. If Contractor fails within this time period to either return the signed

final estimate and balancing Change Order, if any, or notify the Engineer in writing of any disagreement with the final estimate, this is deemed acceptance by Contractor of the Engineer's final estimate and balancing Change Order (if any).

After Contractor's signature or acceptance of the final estimate and balancing Change Order, if any, the City may approve the final payment amount and execute the balancing Change Order, if any, in accordance with applicable approval requirements of the Colusa City Code. If Contractor timely notifies the Engineer in writing of a disagreement with the final estimate, if such disagreement is not resolved fifteen (15) calendar days after the Engineer receives such notification, the City may unilaterally approve a final payment amount and execute a balancing Change Order, if required, in accordance with applicable approval requirements of the Colusa City Code. The unilateral approval by the City does not affect Contractor's right to seek additional compensation, if any, but only to the extent authorized under other provision(s) of the Contract Documents.

The City's final payment consists of the entire sum found to be due by the Engineer after deducting all previous payments and all amounts charged against or withheld from Contractor under any provision of the Contract Documents or any Laws or Regulations, and all amounts retained under the provisions of the Contract. All prior partial estimates and payments are subject to correction in the final estimate and payment. The City's release of any amounts charged, withheld or retained at the time of final payment are not considered a "final payment" as the term is used herein.

No payment made under the Contract constitutes acceptance by City of any defective work or improper materials.

#### **8-5 ASSIGNMENT OF CLAIMS**

Contractor shall not assign any right to any portion of the moneys that may become due or may be claimed to become due to Contractor under the Contract without the written approval of the City. No person other than the party signing the Contract shall have any claim arising from the Contract, except as specifically provided in these Specifications.

#### **8-6 PAYMENTS BY CONTRACTOR**

1. Contractor shall provide all labor, services, materials, and equipment necessary to perform and complete the Work under the Contract. Except as otherwise approved by City, Contractor shall: (1) pay in full for transportation and utility services on or before the 20<sup>th</sup> day of the month following the calendar month in which such services are rendered; and,

(2) pay for at least 90% of the cost off all materials, tools, and other expendable equipment, on or before the 10<sup>th</sup> day after payment by City of any progress payment relating to those costs.

2. In the absence of other provisions in the Contract applicable to any Subcontractor, Contractor shall pay each Subcontractor, within ten (10) days after each payment City makes Contractor, the sum allowed in such payment for and on account of the Work performed by the Subcontractor, to the extent of the Subcontractor's interest therein, as required by Section 7108.5 of the California Business and Professions Code.
3. In addition to other responsibilities specified in the Contract Documents, Contractor is responsible for payment of:
  - a. Restaking costs resulting from loss of stakes and survey markers due to Contractor's or any Subcontractor's negligence;
  - b. Repeat testing of soils and materials when the previous testing results failed to meet the requirement(s) specified in the Contract Documents; and
  - c. Overtime inspection costs when the Engineer determines the overtime inspection was performed primarily to benefit Contractor.

#### **8-7 RELEASE AT TIME OF FINAL PAYMENT**

If requested by City, as a condition precedent to final payment, Contractor and each assignee under any assignment approved in accordance with the Contract Documents and in effect at the time of final payment, shall execute and deliver a release in form and substance satisfactory to City that discharges City, its officers, agents and employees of and from all liability, obligations and claims arising under the Contract, provided that disputed Contract claims in stated amounts may be specifically excluded by Contractor from the operation of the release pursuant to Public Contract Code Section 7100, but only to the extent that Contractor has complied with all procedures and requirements applicable to the presentation and processing of such claim(s) under the Contract Documents.

#### **8-8 EXTRA WORK A PART OF THE CONTRACT**

If extra work is ordered or authorized by the City in accordance with the Contract, such work is a part of the Contract and subject to each and all of its terms and conditions.

## **8-9 INSPECTION AND PAYMENTS NO WAIVER OF CONTRACT PROVISIONS**

No inspection, order, measurement, approval, modification, certificate, payment, acceptance of work or material (including, but not limited to, acceptance of the entire Work), extension of time or possession of any part of or the entire Work shall operate as a waiver of any of the terms and conditions of the Contract, the powers reserved in the Contract to the City, or any right of City to damages or to reject work in whole or part. No waiver of any breach of the Contract constitutes a waiver of any other or subsequent breach. All remedies provided in the Contract are cumulative and in addition to all other rights and remedies that may exist at law or in equity.

## **8-10 PAYMENT BY COST AND PERCENTAGE**

Payment by cost and percentage shall be made as follows:

1. For all materials purchased by Contractor and used in the specific portion of the Work, Contractor shall receive the actual cost of such materials including freight charges, as shown by original receipted bills for material and freight, to which shall be added an amount equal to fifteen percent (15%) of the sum.
2. For all labor of any class including foremen engaged in the specific portion of the Work, Contractor shall receive the prevailing wage and fringe benefits (not including payroll taxes) paid for each hour such labor is engaged in the specific work, in accordance with the following method of calculation:

$$1.33 [(hourly wage + fringes) + 0.24 (hourly wage + fringes)]$$

3. For any Contractor-owned machine, power machinery and equipment deemed necessary and desirable to use on the specific portion of the Work, Contractor is allowed a rental price equivalent to the current Caltrans rental rate (less any state mark-ups) +15%. For machines and equipment rented by Contractor, a rental price, fully maintained, must be agreed upon by City and Contractor in writing before the specific work is begun, for each hour such machines and equipment are used, to which shall be added no percentage. If a rental price is not agreed to in writing as specified herein the current Caltrans rental rate shall be used.
4. Where extra work under cost and percentage is being performed by a Subcontractor, Contractor is allowed a five percent (5%) surcharge on the combined total of (1), (2), and (3) above for work performed by the Subcontractor. This surcharge is only allowed to Contractor and not to any Subcontractors.

Contractor shall keep and present to the City in such form as the Engineer may direct, complete and correct documentation of the net cost of all labor and materials subject to the provisions of this Section.

No claim for payment for extra work, whether done by cost and percentage or otherwise, can be honored unless the Engineer has given prior written authority and permission for such work.

**Section 9**  
**(RESERVED)**

## **Section 10**

### **CONSTRUCTION MATERIALS**

This Section describes various classes and types of materials used in public construction within the City of Colusa. Materials to be used for the work and not included in this section shall be described and specified in the Special Provisions.

#### **10-1 PORTLAND CEMENT**

Unless otherwise specified in the Special Provisions, all cement used in concrete shall conform to ASTM C 150 and these Specifications, and shall be Type II, unless otherwise specified herein.

ASTM C 150, Type III, Portland cement shall be used for concrete requiring high early strength where specifically required by the Special Provisions.

Type II and Type III Portland cements shall be “low alkali” containing not more than 0.60 percent by weight of alkalies, calculated as the percentage of  $\text{Na}_2\text{O}$  plus 0.658 times the percentage of  $\text{K}_2\text{O}$ .

When directed by the Engineer, Contractor shall furnish certificates of compliance stating that the cement delivered to the work complies with these Specifications.

#### **10-2 CONCRETE AGGREGATES**

Unless otherwise specified in the Special Provisions all concrete aggregates shall conform to ASTM C 33, except that grading requirements shall be as specified in Section 10-5 of these Specifications.

#### **10-3 WATER FOR CONCRETE**

Water used for mixing concrete and water used for curing concrete shall be clean, free from oil, acid, alkalies, vegetable matter, or other deleterious matter. No water containing excessive amounts of salts, sulphates, or chlorides shall be used.

#### **10-4 PREFORMED EXPANSION JOINT FILLER**

Unless otherwise specified in the Special Provisions, preformed expansion



joint filler material shall conform to ASTM D 1751.

## **10-5 PORTLAND CEMENT CONCRETE**

### **1. Composition:**

Portland cement concrete (referred to herein as concrete) shall be composed of Portland Cement, fine aggregate, coarse aggregate, admixtures if used, and water.

Concrete shall be designated as one of the following classes:

Class "A" Concrete shall contain six (6) sacks (564 pounds) of Portland cement per cubic yard and shall have a maximum size of coarse aggregate of one and one-half inches (1½").

Class "B" Concrete shall contain six (6) sacks (564 pounds) of Portland cement per cubic yard and shall have a maximum size of coarse aggregate of one inch (1").

Class "C" Concrete shall contain five (5) sacks (470 pounds) of Portland cement per cubic yard and shall have a maximum size of coarse aggregate of one inch (1").

Class "D" Concrete shall contain five (5) sacks (470 pounds) of Portland cement per cubic yard and shall have a maximum size of coarse aggregate of three-quarters inch (¾").

When approved by the Engineer, fly ash conforming to ASTM C 618 may be used to replace up to 20 percent of the Portland cement requirement for Class A and B concrete except that fly ash shall not replace Portland cement for concrete used to pave alleys.

Should the quantity of ingredients designed to produce a cubic yard of finished concrete result in a yield greater than one cubic yard, the relative proportions of fine and coarse aggregates shall be adjusted as necessary to maintain a constant quantity of Portland cement in each cubic yard of concrete.

Contractor shall determine the mix proportions for all concrete to be used in the work. A mix design for each class of concrete used in the work shall be submitted to the Engineer for approval at least five (5) working days prior to the proposed concrete being incorporated into the work.

**10-5 PORTLAND CEMENT CONCRETE (cont.)****2. Proportioning:**

The coarse and fine aggregates shall be combined in such proportions that the percentage composition by weight of the individual and primary sizes of aggregates and of the combined aggregates, as determined by laboratory screens and sieves, will be as follows:

**GRADING AND COMPOSITION REQUIREMENTS**

| <b>Sieve Size</b> | <b>Designation and Nominal Size</b> |              |             |                                 |             |             |
|-------------------|-------------------------------------|--------------|-------------|---------------------------------|-------------|-------------|
|                   | <b>Percentage Passing Sieves</b>    |              |             |                                 |             |             |
|                   | <b>Primary Aggregate Sizes</b>      |              |             | <b>Combined Aggregate Sizes</b> |             |             |
|                   | <b>1½"</b>                          | <b>1" x</b>  | <b>Fine</b> | <b>1½"</b>                      | <b>1"</b>   | <b>¾"</b>   |
|                   | <b>¾"</b>                           | <b>No. 4</b> |             | <b>Max.</b>                     | <b>Max.</b> | <b>Max.</b> |
| <b>2"</b>         | 100                                 | --           | --          | 100                             | --          | --          |
| <b>1½"</b>        | 88-100                              | 100          | --          | 90-100                          | 100         | --          |
| <b>1"</b>         | 1-59                                | 88-100       | --          | 50-86                           | 90-100      | 100         |
| <b>¾"</b>         | 0-17                                | 37-100       | --          | 45-75                           | 55-100      | 90-100      |
| <b>⅜"</b>         | 0-7                                 | 0-53         | 100         | 38-55                           | 45-75       | 60-80       |
| <b>No. 4</b>      | --                                  | 0-16         | 95-100      | 30-45                           | 35-60       | 40-60       |
| <b>No. 8</b>      | --                                  | 0-6          | 65-95       | 23-38                           | 27-45       | 30-45       |
| <b>No. 16</b>     | --                                  | --           | 45-85       | 17-33                           | 20-35       | 20-35       |
| <b>No. 30</b>     | --                                  | --           | 25-55       | 10-22                           | 12-25       | 13-23       |
| <b>No. 50</b>     | --                                  | --           | 10-35       | 4-9                             | 5-15        | 5-15        |
| <b>No. 100</b>    | --                                  | --           | 2-10        | 1-3                             | 1-5         | 1-5         |
| <b>No. 200</b>    | 0-2                                 | 0-2          | 0-5         | 0-2                             | 0-2         | 0-2         |

In addition to the above required grading analysis in the primary aggregate size, the distribution of the fine aggregate sizes shall be such that the difference between the total percentage passing the No. 16 sieve and the total percentage passing the No. 30 sieve shall be between 10 and 40; and the difference between the percentage passing the No. 30 and No. 50 sieves shall be between 10 and 40.

Exact proportions of primary aggregate sizes used in the concrete mix shall be as designated and/or approved by the Engineer. The Engineer may adjust the mix to accommodate changes in aggregates and moisture contents, to improve mixing and placing characteristics and to secure maximum quality of the finished concrete.

## 10-5 PORTLAND CEMENT CONCRETE (cont.)

### 3. Mixing:

All concrete mixing shall be done in machine batch mixers of an approved type, having a capacity of not less than a full one-sack batch, unless the quantity to be mixed is, in the opinion of the Engineer, too small to justify the use of a batch mixer. Sacks of cement shall be completely emptied by dumping directly upon other materials previously measured into the mixer, and no splitting of sacks of cement will be allowed, except where Contractor provides suitable equipment approved by the Engineer, the cement may be weighed into the batch from bulk storage.

Mixing shall continue for not less than one (1) minute and in mixers larger than one cubic yard capacity this minimum shall be increased so that minimum mixing time shall not be less than one (1) minute for each cubic yard or part thereof of mixer capacity.

Where transit mixers are used, the mixing period shall conform to the requirements of ASTM C 94.

The total volume of material mixed per batch shall not exceed the rated capacity of the mixer as determined by the standard requirements of the Associated General Contractors of America. All mixing equipment shall be operated at the speeds recommended by the manufacturer, provided, however, that the revolving drum type, except on transit mixers, shall not make less than fourteen (14) or more than eighteen (18) revolutions per minute, and that the rotation rate of transit mixing drums be such as to produce a peripheral speed of approximately two hundred feet (200') per minute. Each paving mixer or stationary mixer shall be equipped with an acceptable timing device.

Should Contractor elect to utilize transit mixing equipment, he shall make adequate advance arrangements for preventing delays in delivery and placing of the concrete. An interval of more than forty-five (45) minutes between any two consecutive batches or loads, or a delivery and placing rate of less than eight (8) cubic yards of concrete per hour, shall constitute cause for shutting down the work for the remainder of the day, and if so ordered by the Engineer, Contractor shall make at his own expense, a construction joint at the location and of the type directed by the Engineer, in the concrete already placed.

Transit-mixed concrete shall be delivered to the site of the work and discharge shall be completed within ninety (90) minutes after the addition of the cement to the aggregates or before the drum has been revolved 250

## **10-5 PORTLAND CEMENT CONCRETE (cont.)**

revolutions, whichever comes first. In hot weather or under conditions contributing to quick stiffening of the concrete or when the temperature of the concrete is 85 F. or above, the time between the introduction of the cement to the aggregates and discharge shall not exceed forty-five (45) minutes.

A ticket showing volume of concrete and the mix number shall accompany each batch of transit-mixed concrete delivered to the job site. The ticket shall also show the time of day at which the materials were batched.

### **4. Placing:**

The placing of the concrete from a stationary or transit mixer must be done in such a manner as to avoid separation of constituent materials of the concrete. The Engineer shall have the right to stop concrete pouring if the placing of the concrete is improper in this respect.

### **5. Water Control:**

Within the limits hereinafter specified, the amount of water required for the proper consistency of concrete shall be determined by the slump test in accordance with ASTM C 143, except that the ratio of weight of water (water cement ratio) shall not exceed 0.55 unless otherwise approved by the Engineer.

The allowance for slump, unless otherwise directed by the Engineer, shall be as follows:

- a. concrete paving and reinforced structures (heavy sections), not more than three inches (3");
  - b. reinforced structures (thin sections) and columns, not more than four inches (4");
- concrete placed under water, not less than six inches (6") nor more than eight inches (8").

No additional mixing water shall be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer. If the Engineer authorizes additional water to be incorporated into the concrete, the drum shall be revolved not less than 30 revolutions at mixing speed after the water is added and before discharge is commenced.

#### **10-5 PORTLAND CEMENT CONCRETE (cont.)**

If mixing in transit is allowed, the control equipment as above specified shall be at the proportioning plant and there shall be no water added after the mixture leaves the plant, unless directed by the Engineer.

Contractor shall furnish, without charge, such materials as may be required for making tests of concrete during the progress of the work. Such tests will be made at the expense of the City of Colusa, except that, if tested concrete does not meet required standards, the cost of additional testing shall be borne by Contractor.

No concrete shall be used which has partially set, and no concrete shall be re-tempered or remixed.

#### **10-6 CURING COMPOUNDS FOR CONCRETE**

Concrete curing compounds shall be used where specified in these Specifications and the Special Provisions. The compounds shall conform to the requirements of Section 90, "Concrete," of the State Specifications.

#### **10-7 AGGREGATE BASES**

Aggregate bases shall conform to the requirements of Section 26 of the State Specifications, except as modified herein.

The combined aggregate shall conform to the grading specified for the three-quarter inch ( $\frac{3}{4}$ ") maximum aggregate for Class 2 aggregate base, unless otherwise specified in the Special Provisions. Aggregate may include material processed from reclaimed asphalt concrete, Portland cement concrete, lean concrete base, cement treated base or a combination of any of these materials. The amount of reclaimed material may constitute up to 100% of the total volume of the aggregate used.

Aggregate base will be paid for at the contract price bid per ton or per cubic yard delivered to the job and placed according to the Plans and Specifications. The method used on any work will be shown by the list of quantities on the Proposal and by the type of unit price requested in the Proposal.

The weight of material to be paid for will be determined by deducting from the weight of material delivered to the work, the weight of water in the material, at the time of weighing, as determined by California Test 226, in excess of one (1) percentage point more than the optimum moisture content as determined by ASTM D 1557. The weight of water deducted as provided in this Section will not be paid for.

Quantities of aggregate base to be paid for by the ton or cubic yard will be calculated on the basis of the dimensions shown on the plans adjusted by the amount of any change ordered by the Engineer. No allowance will be made for aggregate base placed outside said dimensions unless otherwise ordered by the Engineer.

The above prices and payment shall be full compensation for furnishing all labor, material, tools, equipment, water, and incidentals, and for all work involved in constructing aggregate base complete in place as shown on the Plans, and as specified in these Specifications and the Special Provisions or as directed by the Engineer.

#### **10-8 AGGREGATE SUBBASE (GRADED)**

Aggregate subbase shall conform to the requirements of Section 25 of the State specifications. Aggregate subbase shall be Class 1, unless otherwise approved by the Engineer.

Payment for aggregate subbase shall be per ton of material delivered to the job and placed in accordance with the Plans and Special Provisions. The weight of material to be paid for will be determined by deducting from the weight of material delivered to the work, the weight of water in the material, at the time of weighing, as determined by California Test 226, in excess of one (1) percentage point more than the optimum moisture content as determined by ASTM D 1557. The weight of water deducted as provided in this Section will not be paid for.

The compacting of the material shall be done in accordance with the requirements for placing aggregate bases, as provided in these Specifications.

Payment for the material at a price per ton or cubic yard shall constitute full compensation for furnishing, hauling, placing, compacting, and finishing the material including the furnishing of all labor, material, tools, equipment, water and incidentals.

#### **10-9 CEMENT TREATED BASES**

Road-mixed and plant-mixed cement treated bases shall conform to the requirements of Section 27 of the State Specifications.

Measurement and payment for cement treated bases shall be in accordance with the State Specifications or may be paid for at a price per ton or cubic yard of cement treated base complete in place as so indicated in the Special Provisions.

## **10-10 LIME STABILIZATION**

Lime stabilization shall conform to the requirements of Section 24 of the State Specifications, except as modified herein.

Unless otherwise specified in the Special Provisions or approved by the Engineer the amount of lime to be added shall constitute a minimum of four and one-half percent (4.5%) by unit weight of the material to be stabilized.

## **10-11 TREATED PERMEABLE BASES**

Treated permeable bases shall conform to the requirements of Section 29 of the State Specifications.

## **10-12 GEOGRID**

Geogrid may be used in areas requiring soil stabilization, such as unsuitable subgrade, or as specified in the Special Provisions, or as approved by the Engineer. Geogrid material shall conform to the following requirements unless otherwise specified in the Special Provisions.

The reinforcement material shall be biaxially oriented geogrid with high tensile modulus in relation to the material being reinforced, with large apertures, thick ribs and junctions to permit significant mechanical interlock with the material being reinforced, and with high continuity of tensile strength through all ribs of the structure.

The geogrid shall maintain its reinforcement and interlock under normal construction practices, and be resistant to both ultraviolet degradation and all forms of biological degradation normally encountered in the material being reinforced. Geotextiles shall not be accepted as reinforcing material. The geogrid shall be installed per the manufacturers recommendations and as specified in the Special Provisions. Grid ties shall be installed a maximum of twenty feet apart and overlaps shall be a minimum of two feet, unless otherwise approved by the Engineer.

The geogrid shall be a single-layer grid that meets the dimensions and properties outlined below. Multi-layered grids fastened together shall not be acceptable. The biaxial geogrids shall conform to the property requirements listed below:

| Property                            | Test Method         | Units     | Value         |
|-------------------------------------|---------------------|-----------|---------------|
| Mass                                | ASTM D 5261-92      | oz/sy     | 8.75 (nom)    |
| Tensile                             |                     |           |               |
| Peak Tensile MD (a)                 | GRI GG1             | lb/ft     | 1,200 (min)   |
| Tensile at 5% MD                    | GRI GG1             | lb/ft     | 810 (min)     |
| Peak Tensile CMD (b)                | GRI GG1             | lb/ft     | 1,970 (min)   |
| Tensile at 5% CMD                   | GRI GG1             | lb/ft     | 1,340 (min)   |
| Stiffness                           |                     |           |               |
| Torsional Stiffness                 | Corps of Engineers  | cm-kg/deg | 6.5 (min)     |
| Flexural Stiffness True Initial     | ASTM D 1388         | mg-cm     | 750,000 (min) |
| Modulus in Use MD (c)               | GRI GG1 (b)         | lb/ft     | 20,500 (min)  |
| True Initial Modulus in Use CMD (c) | GRI GG1             | lb/ft     | 30,000 (min)  |
| Interlock                           |                     |           |               |
| MD dimension                        | I. D. Calipered     | in        | 0.75-1.50     |
| CMD dimension                       | I. D. Calipered     | in        | 0.75-1.50     |
| Open area (d)                       | COE Method Modified | %         | 70 (min)      |
| Junctions                           |                     |           |               |
| Efficiency                          | GRI GG2             | %         | 90 (min)      |
| Strength MD                         | GRI GG2             | lb/ft     | 1,080 (min)   |
| Strength CMD                        | GRI GG2             | lb/ft     | 1,778 (min)   |

(a) MD - Machine Direction which is along roll length

CMD - Cross Machine Direction which is across the roll width.

(b) Resistance to in-plane rotational movement measured by applying a 20 cm-kg moment to the central junction of a 9" x 9" specimen restrained at its perimeter. (U.S. Army Corps of Engineers Methodology).

(c) True resistance to elongation when initially subjected to a load measured via GRI-GG1 without deforming test materials under load before measuring such resistance or employing "secant" or "offset" tangent methods of measurement so as to overstate tensile properties.

(d) Percent open area measured without magnification by Corps of Engineers method as specified in CW 02215 Civil Works Construction Guide, November 1977.



Stress transfer capability through junctions (i.e. material overlaps). The value of the Peak Tensile Strength CMD multiplied by Junction Efficiency shall be greater than 1,080 lb/ft.

#### **10-13 BEDDING SAND**

Bedding Sand shall have a minimum sand equivalent of 50. Ninety to one hundred percent (90-100%) shall pass the #4 sieve and a maximum of fifteen percent (15%) shall pass the #200 sieve. Sand material shall be of a good quality with a minimum resistivity of 5,000 ohm-cm., a minimum pH of 6.0, a maximum chloride concentration of 300 ppm and a maximum sulfate concentration of 1,000 ppm.

| <b>Chemical Analysis</b> | <b>ASTM Method</b> |
|--------------------------|--------------------|
| Conductivity             | D 1125             |
| Sulfate                  | D 516A (SM 4500)   |
| PH                       | D 2976/D 4972/G 51 |
| Chlorides                | D 512C             |

#### **10-14 CRUSHED SCREENINGS**

In these Specifications, in the Special Provisions, or on the Plans, the use of crushed screenings may be specified for certain purposes. When so specified this shall mean a uniformly graded material that is the product of crushing rock or gravel; free of organic matter, oil, alkali, or other deleterious substances and is hard, sound and durable.

Unless otherwise indicated in the Special Provisions, the crushed screenings shall conform to the requirements for Class 1 Permeable Material Type A as set forth in Section 68 of the State Specifications.

#### **10-15 SLURRY CEMENT BACKFILL**

Slurry Cement Backfill specified herein for use as trench backfill shall conform to the requirements of Section 19 of the State Specifications and must be a fluid workable mixture of aggregate, cement, and water.

Slurry cement backfill may be used as structure backfill only for pipe culverts.

## 10-16 CONTROL DENSITY FILL (CDF)

Control Density Fill (CDF), also known as Controlled Low Strength Material (CLSM) or Ready Mixed Flowable Fill (RFF) as processed and distributed by the National Ready Mixed Concrete Association and referred to herein as CDF type materials), may be used as an alternate initial backfill and/or trench backfill material, if approved by the Engineer, or if specified in the Special Provisions. CDF type materials may only be used as an alternate trench backfill material above the initial backfill material if approved in writing by the engineer and the material supplier submits strength tests performed in accordance with either ASTM C31 & C39 or ASTM D4832 that show the mix consistently has a 28-day compressive strength not exceeding 150 psi. Separate approval by the Engineer of CDF type materials as specified herein is not required for filling abandoned pipelines.

Hand Excavatable: Material shall be a hand excavatable mixture of cement, aggregate, entrained-air admixture, and water mixed in accordance with ASTM C 94. The 28-day compressive strength shall not exceed 150 psi unless otherwise directed or approved in writing by the Engineer when used for trench backfill above the initial backfill zone.

Flowable: Material shall be flowable with a high slump, non-segregating consistency that readily flows and fills voids, congested areas, difficult to reach places, and that may additionally be used for pipe abandonment, structure backfill, and structure cavity fill as directed.

Rapid Set: Material shall obtain early strength gain, to allow traffic load or other live loads on the fill in less than one (1) day after placing the material.

Cement: Shall be type I or II in accordance with ASTM C 150. Mix designs consisting of up to equal parts cement and Type F pozzolan conforming to ASTM C618 may be submitted for consideration.

Pozzolan: Shall be added to improve flowability and shall be type F in accordance with the requirements of ASTM C 618.

Aggregate: Coarse aggregate, if used, shall consist of well graded mixture of crushed rock with a maximum size aggregate of  $\frac{3}{8}$  inch. 100% shall pass the  $\frac{1}{2}$ -inch sieve. Not more than 30% shall be retained by the  $\frac{3}{8}$  inch sieve and not more than 12% shall pass the number 200 sieve. Mix designs consisting of sand only with no coarse aggregate may be submitted for consideration. All aggregate shall be free from organic matter and not contain more alkali, sulfates, or salts than the native materials at the site of work.

Admixtures: Air entrainment admixture shall be added (minimum of 8%, maximum of 20%) to improve workability in accordance with ASTM C 260.

Water: Shall be potable, clean, and free from silty organic matter, alkali, salts, or other impurities.

Compressive Strength: The minimum 28 day compressive strength shall be 20 psi and the maximum shall be 150 psi.

Mixing, transporting and placing CDF type materials shall be in accordance with ACI 304 and ACI 304.6R. Prior to placement, the trench shall be free of loose soil and the trench bottom shall be stable and non-yielding with no excess moisture. The pipe haunch areas shall be clear so that the CDF type material will readily flow around the pipe. Place CDF type material simultaneously on both sides of the pipe to minimize potential lateral displacement of the pipe. Also, pipe sections may need to be secured against floating during CDF type material placement, or place the material in lifts to reduce the potential for flotation. Commence placement of granular trench backfill above CDF type initial backfill only when overlying material placement and compaction will not cause deformation of the initial backfill.

#### **10-17 CLEAN CRUSHED ROCK**

In these Specifications, on the Plans, or in the Special Provisions, the use of clean crushed rock may be specified for certain purposes. When so indicated on the Plans or in the Special Provisions, a clean crushed rock of the type indicated shall be provided which is the product of crushing rock or gravel.

Clean crushed rock shall have a minimum Cleanliness Value of sixty (60) as determined by California Test 227, and the portion of the material which is retained on the  $\frac{3}{8}$ -inch sieve shall contain at least fifty percent (50%) of particles having three (3) or more fractured faces. The percentage composition by weight of clean crushed rock shall conform to the following gradations for the Type specified.

| <b>% Passing Sieves</b> |               |               |               |               |
|-------------------------|---------------|---------------|---------------|---------------|
| <b>Sieve Size</b>       | <b>Type A</b> | <b>Type B</b> | <b>Type C</b> | <b>Type D</b> |
| 2"                      | --            | --            | --            | 100           |
| 1½"                     | --            | --            | 100           | --            |
| 1"                      | --            | 100           | 90-100        | --            |
| ¾"                      | 100           | 70-100        | 30-60         | 0-17          |
| ½"                      | 90-100        | 30-60         | 0-20          | --            |
| ⅜"                      | 20-60         | 0-20          | 0-6           | 0-7           |
| No. 4                   | 0-15          | 0-5           | 0-5           | --            |
| No. 200                 | 0-2           | 0-2           | --            | 0-2           |

## **10-18 ASPHALT BINDERS AND ASPHALTIC EMULSIONS**

Asphalt binders and asphaltic emulsions as required by these Specifications or by the Special Provisions shall mean respectively the asphalt binders as specified in Section 92 of the State Specifications and asphaltic emulsions as specified in Section 94 of the State Specifications.

## **10-19 SEWER AND DRAINAGE PIPE**

### **1. Joints**

Unless otherwise specified herein, sewer and drain pipes shall have elastomeric gasket joints providing a water tight seal. An exception to this requirement is fusion welded solid wall HDPE. Any leakage in solid wall, fusion jointed HDPE means that a joint is faulty and must be repaired at the contractor's expense.

### **2. Manhole Connections**

Unless otherwise specified, connecting a 24 inch or smaller inside diameter pipe, not cast into the base of a manhole, shall be accomplished by using a coring machine. The annular space between the outside of the pipe and the manhole wall shall be sealed by using a flexible annular space filler such as "Kor-N-Seal Cavity O-Ring" by NPC Inc. or approved equal. Such connection shall be made in conformance with manufacturer's recommendations.

Unless otherwise specified, connecting a pipe with an inside diameter greater than 24 inch to a manhole shall be accomplished by cutting a hole into

the manhole and grouting in the pipe. The hole shall be no more than the pipe outside diameter plus the thickness of the manhole wall. The annular space between the outside surface of the pipe and the hole in the wall shall be filled with non-shrink grout and the pipe shall be properly installed with an approved water stop.

In the connection of the pipe to a drop inlet, the use of a coring machine and flexible annular space filler are not required.

### **3. Deflection**

For all flexible pipe and fittings, the minimum pipe stiffness at 5% deflection shall be 46 PSI according to ASTM D 2412. All flexible conduits shall be tested with a mandrel 5% smaller than the average inside diameter of the pipe no sooner than 96 hours after placement of the backfill. Mandrel tests may be performed by the City after a 6 month period of time at which time a maximum deflection of 7-1/2% from the base I.D. will be allowed. The mandrel used shall be the PHOS PVC Sewer Pipe Deflection Gauge or other deflection gauge approved by the Engineer.

### **4. Drainage and Sewer Pipe Requirements**

The requirements for the various types of pipe are summarized in the following paragraphs:

#### **a. Acrylonitrile-Butadiene-Styrene (ABS)**

ABS gravity sewer pipe and fittings in sizes 4" & 6" shall conform to ASTM D 2661. Eight inch (8") and larger in diameter shall conform to either ASTM D 2751, SDR 23.5 or ASTM D 2680 (ABS composite pipe).

Joints shall be solvent cemented (SC). All Service connections shall be installed with "Tee" fittings. Saddles are not approved. When the sewer main is of a material other than ABS, the connection joint to the sewer main shall be made with a flexible adapter manufactured by FERNCO, or approved equal.

#### **b. Closed Profile Poly Vinyl Chloride (CPPVC)**

CPPVC pipe with integral bell and spigot joints shall conform to ASTM F 1803. Joints shall be of the bell and spigot type with elastomeric seals conforming to the requirements of ASTM D 3212. Gaskets shall be factory installed and chemically bonded to the bell end of the pipe. Gasket material shall conform to ASTM F 477 and shall be capable of the same water tightness requirements as smooth or solid wall PVC pipe.

**c. High Density Polyethylene (HDPE) Solid Wall Fusion Jointed**

HDPE pipe shall be as manufactured by Phillips Drisco pipe, a division of Phillips Petroleum company, or equal. The material shall be listed by PPI (Plastic Pipe Institute, a division of the Society of the Plastics Industry) in PPI TR-4 with a 73.4°F hydrostatic design basis of 800 psi. The PPI listing shall be in the name of the pipe manufacturer and shall be based on ASTM D 2837 and PPI TR-3 testing and validation of samples of the pipe manufacturer's production pipe.

Material Requirements - Pipe shall be high molecular weight, high density polyethylene pipe and shall have a standard dimension ratio of 32.5 (SDR 32.5). The material shall have a standard PE code designation of PE 3408 and have a cell classification of 345434C as described in ASTM D 3350. The pipe shall contain no recycled compound except that generated in the manufacturer's own plant from resin of the same specification from the same raw material pipe

The pipe shall be homogeneous throughout and free of visible cracks, bubbles, holes, foreign inclusions or other injurious defects. It shall be uniform in color, opacity, density, and other physical properties and produced to the dimensions and tolerances specified in ASTM F 714. The inside and outside surfaces shall be semi-matte or glossy in appearance. Any pipe not meeting these criteria shall be rejected.

The polyethylene pipe manufacturer shall provide certification that stress regression testing has been performed on the specific product. The said certification shall include a stress life curve per ASTM D 2837. The stress regression testing shall have been done in accordance with ASTM D 2837, and the manufacturer shall provide a product supplying a minimum Hydrostatic Design basis (HDR) of 1,600 psi, as determined in accordance with ASTM D 2837.

The manufacturer's certification shall state that the pipe was manufactured from one specific resin in compliance with these specifications. The certification shall state the specific resin used, its source, and list its compliance to these specifications.

Joints - All joints for the buried polyethylene pipe shall be of the thermal butt fusion type or bolted flanges reinforced with stainless steel.

Fittings - Polyethylene fittings shall be of the same material as the pipe and manufactured by the pipe manufacturer.

**d. Polyvinyl Chloride (PVC)**

PVC drain pipe and fittings, with at least eighteen inches (18") of cover to sub-grade, shall conform to ASTM D 3034 and ASTM F 679 and shall be SDR 35 pipe with elastomeric gasket joints providing a watertight seal.

PVC drain pipe and fittings, with less than eighteen inches (18") of cover to sub-grade, shall be class 100 SDR 25 or 26 pipe conforming to AWWA C 900.

All joints shall be integral wall bell and spigot configuration, factory formed. Pipes at joints are not to be inserted beyond "stop-mark" on spigot end. All service connections shall be installed with "Tee" fittings, gasketed "Tee" saddles with stainless steel bands, or other approved tapping devices. Solvent welded "Wye" saddles are not approved. All rubber rings shall conform to ASTM F 477.

**e. Reinforced Concrete Pipe (RCP)**

Reinforced concrete pipe shall conform to ASTM C 76 Class III, IV, or V. The class of pipe will be shown on the Plans or indicated in the Special Provisions. Sections of circular pipe with elliptical reinforcing shall have the location of the minor axis of the reinforcing indicated by three inch (3") wide, waterproof, painted stripes on the inside and outside of the pipe at the top and bottom, at least twelve inches (12") long at each end of the pipe section.

Joint materials for concrete pipe shall be rubber gasket joints conforming to the requirements of ASTM C 443 and shall be flexible and able to withstand expansion, contraction, and settlement. All rubber gaskets shall be stored in as cool a place as practicable, preferably at 70° F. or less, and in no case shall the rubber gaskets be exposed to the direct rays of the sun.

Rubber gaskets, of the type requiring lubrication, shall be lubricated with the lubricant recommended and supplied by the manufacturer of the pipe.

**f. Vitrified Clay Pipe (VCP)**

Vitrified clay pipe shall conform to the specifications for extra strength clay pipe as set forth in ASTM C 700.

Stoppers shall be used with branch pipes that are to be left unconnected. Stoppers for branch pipes having flexible compression joints may be either clay discs with flexible compression joints, factory

applied, that will mate with the branch joint; or a resilient material of controlled design and dimensions for mating with the branch pipe to which it is to be applied; or, of other material approved by the Engineer. Wooden stoppers will not be accepted.

Joint materials for vitrified clay pipe shall be an approved type of factory-made mechanical compression joint conforming to the requirements of ASTM C 425. Banded rubber couplings and sleeves conforming to ASTM C 425 are acceptable.

**g. Corrugated Metal Pipe**

Corrugated metal pipe may only be used for driveway culverts and shall conform to ASTM A 760, Type 1 or 1R. Minimum depth of cover shall be 6 inches.

**h. Corrugated HDPE Pipe**

Corrugated High Density Polyethylene (HDPE) pipe may only be used for driveway culverts. HDPE pipe shall have smooth interior and shall be Type S conforming to AASHTO M 252 for four inch (4") through ten inch (10") diameter pipe and to AASHTO M 294 for twelve inch (12") and larger pipe. Provide Grade 2A2 gasketed joints in conformance with ASTM D 1056. Installation shall be in accordance with manufacturer's standards and ASTM D 2321. Minimum depth of cover shall be 12 inches.

**i. Glass-Fiber-Reinforced Thermosetting-Resin Pipe**

Unless indicated otherwise in the Special Provisions, Glass-Fiber-Reinforced Thermosetting-Resin Pipe shall conform to the requirements of ASTM D 3262 with a pipe stiffness designation C (36 psi).

**10-20 SUBSURFACE DRAINS**

Subsurface drains shall comply with Section 68 of the State Specifications.

**10-21 RESERVED**

**10-22 FIELD ASSEMBLED PLATE CULVERT**

Field assembled plate culverts shall conform to Section 67 of the State Specifications.



## **10-23 REINFORCING STEEL**

Reinforcing steel shall conform to Section 52, "Reinforcement", in the State Specifications. Unless otherwise provided by the Special Provisions, bar reinforcement shall be deformed Grade 60 conforming to ASTM A 615, "Deformed Billet-Steel Bars for Concrete Reinforcement".

Welded steel wire fabric for concrete reinforcement shall conform to ASTM A 185. The gauge of the wire and the dimensions of the mesh will be as shown on the Plans or indicated in the Special Provisions.

## **10-24 CURB DOWEL AND TIE BARS**

Dowel and tie bars for curbs shall conform to ASTM A 615. Grade 60 or Grade 40 may be used at Contractor's option.

## **10-25 CASTINGS FOR MANHOLES, COVERS, ETC.**

Casting for manhole heads, covers, and other purposes shall be tough gray iron, free from cracks, holes, swells and cold sheets, be of workmanlike finish, and conform to ASTM A 48/A 48M, Class 30. The quality shall be such that a blow from a hammer will produce an indentation on a rectangular edge of the casting, without flaking or cracking the metal.

All castings are to be manufactured true to pattern and with satisfactory fit of component parts. Round frames and covers shall have machined bearing surfaces. All manhole covers which do not fit neatly and bear firmly in the ring shall be rejected.

### Alternate Castings for manhole covers

Where specified, casting shall be constructed of ductile iron in conformance with ASTM A536A, Class 60-45-12. Castings shall match the dimensions shown in City of Colusa Improvement and Design Standards Sections 7 & 9. Cover shall be hinged and may or may not be gasketed. Gasket shall be mechanically fitted to frame such that removal and attachment can be accomplished without the use of tools and glue, per manufacturer's instructions. Lid shall have a rated capacity in excess of H2O loading per AASHTO.

## **10-26 WATER PIPE - Distribution (12 inch diameter & smaller)**

Water Distribution System pipe shall be of the material type as indicated on the Plans or specified in the Special Provisions and shall comply with AWWA standards and NSF/ANSI Standard 61. All pipe shall be the regular product of a firm which has successfully manufactured comparable pipe for at least three (3) years.

Unless otherwise directed or approved:

- 12-inch diameter buried pipe shall be ductile iron only, and
- 12-inch diameter and smaller pipes placed on bridges shall be liquid-epoxy lined and coated welded steel per AWWA C200 and AWWA 210.

## **1. Ductile Iron Pipe**

All ductile iron pipe shall conform to the following AWWA Standards as listed below:

- a. AWWA C 104 (ANSI A21.4), "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water," if cement-mortar lined.
- b. AWWA C 111 (ANSI A21.11), "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings."
- c. AWWA C 150 (ANSI A21.50), "Thickness Design of Ductile-Iron Pipe."
- d. AWWA C 151 (ANSI A21.51), "Ductile-Iron Pipe, Centrifugally Cast, for Water."

Pipe shall comply with the following requirements:

- a. Size - 4, 6, 8, 12 inch diameter only
- b. Laying Condition - Type 5
- c. Minimum Depth of Cover - Three (3) feet for improved; four and one-half (4 -1/2) feet for unimproved
- d. Working Pressure-150psi
- e. Laying Length - Minimum eighteen (18) foot nominal lengths with allowable trim pipe lengths in accordance with AWWA C 151 and special shorter lengths provided as required by the drawings.
- f. Joints - Push on or mechanical
- g. Restrained Joints - Bolted flanged connections, push-on locking gasket such as "Field-Lok" gaskets as manufactured by U.S. Pipe, push-on joint restraint such as "TR-Flex" as manufactured by U.S. Pipe, wedge action joint mechanism such as "Megalug" as manufactured by EBAA Iron, Inc. or approved equal.
- h. Gasket Lubricant - Minimum required plus 10% additional

- i. Pressure Class-350
- j. Linings-Standard thickness of cement w/ asphalt seal coat.  
Coatings-Minimum one (1) mil thick petroleum asphaltic material.
- k. Certification by Manufacturer Required

## **2. Polyvinyl Chloride Pipe**

All polyvinyl chloride pipe in sizes ranging from four through eight inch (4"-8") shall conform to AWWA C 900 "Polyvinyl Chloride (PVC) Pressure Pipe," or AWWA C 909 "Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe". Pipe shall be manufactured with cast iron outside diameters (CIOD) for all sizes.

Pipe shall comply with the following requirements:

- a. Size - 4, 6, 8, 12 inch diameter only
- b. Class 150
- c. Dimension Ratio - 18
- d. Laying Length - 20 feet
- e. Joints - Integral bell and spigot joints conforming to the requirements ASTM D 3139 with factory supplied elastomeric gaskets meeting the requirements of ASTM F 477.
- f. Restrained Joints - Bolted flanged connections, Wedge action joint mechanism such as "Megalug" as manufactured by EBAA Iron, Inc. or approved equal.
- g. Gasket Lubricant-Minimum required plus 10% additional
- h. Each pipe length shall be marked showing the nominal pipe size and O.D. base, the AWWA pressure class, the AWWA specification designation, and the seal of the testing agency that verified the suitability of the material.

## **10-27 WATER PIPE FITTINGS - Distribution (12 inch diameter & smaller)**

Water pipe fittings shall be of the material type as indicated on the Plans or specified in the Special Provisions and comply with AWWA standards and AWSI 61. All fittings shall be the regular product of a firm which has successfully manufactured comparable fittings for at least three (3) years.

All water pipe fittings shall be Ductile Iron and shall conform to the following AWWA Standards:

1. AWWA C 104 (ANSI A21.4), "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water," if cement-mortar lined.
2. AWWA C 110 (ANSI A21.10), "Ductile-Iron and Gray-Iron Fittings for Water."
3. AWWA C 111 (ANSI A21.11), "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings."
4. AWWA C 153 (ANSI A21.53) "Ductile-Iron Compact Fittings for Water Service."
5. AWWA C 116 (ANSI A21.16) "Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior surfaces of the Ductile-Iron and Gray-Iron Fittings for Water Supply Service," if fusion-bonded epoxy lined or coated.

Fittings shall comply with the following requirements:

1. Pressure Rating - 250 psi minimum.
2. Coatings - Exterior: Minimum one (1) mil thick petroleum asphaltic material coated. Interior: Lined with standard thickness cement and asphaltic seal coated. Or, exterior and interior: Minimum eight (8) mil thick fusion bonded epoxy coated.
3. Joints - Push-On, mechanical, or flange
4. Certification by manufacturer
5. Dimensions - AWWA C 153 Compact Fittings are approved.
6. Bolts shall be carbon steel ASTM A 307, Grade B. Nuts shall be heavy hex nuts conforming to ASTM A 563, Grade C3.
7. Rubber gaskets for flanged joints shall be full faced with a thickness of eight of an inch ( $\frac{1}{8}$ "). The material used for the rubber gaskets shall be hardness (Shore A) 70 to 85 suitable for a minimum of one hundred and fifty pounds per square inch (150 psi), cold water service.

## **10-28 WATER PIPE - Transmission (greater than 12 inch diameter)**

Water Transmission System pipe shall be of the material type as indicated on the Plans or specified in the Special Provisions and comply with AWWA standards and ANSI 61. All pipe shall be the regular product of a firm which has successfully manufactured comparable pipe for at least three (3) years. Pipe shall conform to the following requirements:

### **1. Welded Steel Pipe (WSP)**

All welded steel pipe shall conform to the following AWWA Standards:

- a. AWWA C 200, "Steel Water Pipe - 6 in. and larger."
- b. AWWA M 11, "Steel Pipe - A Guide for Design and Installation" except as modified herein.
- c. AWWA C 205, "Cement-Mortar Protective Lining and Coating for Steel Water Pipe - 4 in. and Larger - Shop Applied."

Pipe shall comply with the following requirements:

- a. Pipe shall be designed for one hundred and fifty pounds per square inch (150 psi) working pressure with an additional seventy-five pounds per square inch (75 psi) allowance for surge. Pipe design shall be in accordance with AWWA M 11 to withstand the simultaneous application of external earth loads , HS-20 live load and internal pressures. The minimum steel cylinder thickness shall be ten (10) gauge. Drawings shall be submitted to the Engineer for approval and shall include the following:
  - i. Pipeline layout showing stations and elevations;
  - ii. Details of standard pipe, joints, specials and fittings;
  - iii. Calculations for pipe design field welded joint restraint and fittings reinforcement;
  - iv. Details of joint bonding and field welded joint restraint calculations.
- b. The nominal diameter or inside diameter of the pipe and other fabricated steel sections as shown on the plans is the clear diameter of the lined pipe after the application of the interior mortar lining.

**10-28 WATER PIPE - Transmission (greater than 12 inch diameter) (cont.)**

- c. Each piece of pipe shall be hydrostatically tested and the stress in the pipe during testing shall not be less than seventy-five percent (75%) of the steel minimum yield strength.
- d. Minimum Depth of Cover shall be three feet (3') in improved and four and a half feet (4½') in unimproved areas.
- e. Laying Length - thirty-two to fifty feet (32'-50'), depending on the shop practice of the manufacturer or fabricator, unless otherwise required by the Contract Documents. Sufficient short pieces shall be provided to allow for two foot (2') adjustments within each one-half mile of straight pipe.
- f. Pipe End Finish - The end finish of individual lengths of pipe to be provided under these Special Provisions shall be one of the following types, unless otherwise indicated on the Plans:
  - i. Bell and spigot pipe ends for joints with rubber gaskets.
    - a. Bell and spigot pipe ends for field welded joints.
    - b. Plain-ends fitted for butt straps for field welded joints.
  - iv. Plain-ends fitted with flanges.
  - v. Plain-ends for mechanically coupled field joints.

The types of joints proposed to be used shall have been thoroughly tested for water leaks at the design pressures. The Engineer may require Contractor to furnish a record of experience in installing the types of joints for comparable sizes of pipe called for on the Plans. Details of the type of pipe joints proposed to be used shall be included with the shop drawings and lay sheets submitted for the pipe.

Cement mortar lining and coating for WSP shall conform to AWWA C 205. Field joints shall be lined and coated to match pipe in accordance with AWWA C 205.

Bell and Spigot Joints with Rubber Gaskets for WSP shall employ joint rings (Carnegie rings) and shall be designed and fabricated to accommodate a rubber O-ring gasket seal in accordance with AWWA C 303.

The field welding of WSP with bell and spigot joint rings (Carnegie rings) or lap joints shall conform to Standard Drawing 8-54. Lap joints shall conform to AWWA C 200.

## **10-28 WATER PIPE - Transmission (greater than 12 inch diameter) (cont.)**

Field welded butt-strap joints shall typically only be used for closure pieces and shall conform to Standard Drawing 8-55. The ends of pipes to be fitted with butt straps for field welded joints shall conform to AWWA C 200.

When field conditions warrant and with the approval of the Engineer, straight butt strap welded joints may be used for directional changes in pipe alignment of up to five (5°) degrees.

WSP pipe flanges shall conform and be fitted to plain-end pipe in accordance with AWWA C 207, Class D, and AWWA C 200.

Rubber gaskets for flanged joints shall be full faced with a thickness of eight of an inch ( $\frac{1}{8}$ "). The material used for the rubber gaskets shall be hardness

(Shore A) 70 to 85 suitable for a minimum of one hundred and fifty pounds per square inch (150 psi), cold water service.

Bolts shall be carbon steel ASTM A 307, Grade B. Nuts shall be heavy hex nuts conforming to ASTM A 563, Grade C3.

WSP ends for mechanically coupled field joints shall be plain and conform to AWWA C 200 and these Standards Specifications. Mechanically coupled joints shall conform to the material, dimensions, and tests of AWWA C 219.

All plain-end pipe joined by flexible couplings shall be fitted with stiffener rings welded to the exterior pipe surface in a plane perpendicular to the axis of the pipe.

Stiffener rings shall have minimum dimensions of three eighths inch ( $\frac{3}{8}$ ") thick by three inches (3") in width. Stiffener rings that are to be integral with a joint harness shall be suitably increased in thickness and reinforced with plate gussets to adequately withstand the thrust from adjacent fittings. Stiffener rings and harness rings or lugs shall be installed at the pipe manufacturing or fabrication shop. Material for stiffener rings and plate gussets shall be carbon steel meeting the requirements of ASTM A 36 or ASTM A 283, Grade D.

All mechanically coupled field joints shall be encased with eight (8) mil minimum thickness polyethylene material.

Restrained Joints for WSP transmission lines shall conform to the requirements set forth in AWWA M 11, "Steel Pipe - A Guide for Design and Installation." Joints shall be one of the following types:

## **10-28 WATER PIPE - Transmission (greater than 12 inch diameter) (cont.)**

- a. Lap welded slip joint - The joint shall conform to and be welded in accordance with Standard Drawings in City of Colusa Improvement and Design Standards.
- b. Double welded butt strap joint - Butt straps shall conform to and be welded in accordance with Standard Drawing 8-55 in City of Colusa Improvement and Design Standards.
- c. Flanged and bolted - Flanges shall be in accordance with AWWA C 207 Class D for operating pressures to one hundred and fifty pounds per square inch (150 psi) and surge pressures to two hundred and twenty five pounds per square inch (225 psi).
- d. Mechanical coupling - Mechanical couplings shall be as specified in section 10-29 of these Technical Specifications and shall be harnessed for the maximum pressure in accordance with AWWA M 11.
- e. Carnegie end rings restrained by means of welding the bell and spigot ring in accordance with Standard Drawing 8-54 in City of Colusa Improvement and Design Standards.

Dimensions for standard and special fittings including tees, wyes, crosses, bends and elbows, reducers, flanged side and bottom outlets, access manholes, etc. shall conform to AWWA C 208. Materials and fabrication of standard and special fittings shall conform to AWWA C 200. All fittings shall be designed to have a strength at least equal to that of the adjacent straight pipe. Flanged outlets shall be designed in accordance with the AWWA Design Manual M 11.

The required transverse steel area in all welded steel pipe fittings shall be provided by the steel cylinder. The length of reducers shall not be less than the diameter of the largest end.

Cement mortar lining and coating of fittings shall conform to the applicable sections of AWWA C 205 and these Technical Specifications.

### **2. Concrete Cylinder Pipe (CCP)**

All concrete cylinder pipe shall conform to the following:

- a. AWWA C 303, "Concrete Pressure Pipe, Bar-Wrapped, Steel-Cylinder Type."



**10-28 WATER PIPE - Transmission (greater than 12 inch diameter) (cont.)**

- b. AWWA Manual M 9 “Concrete Pressure Pipe” except as modified herein.

Pipe shall comply with the following requirements:

- a. Pipe shall be designed for one hundred and fifty pounds per square inch (150 psi) working pressure with an additional seventy-five pounds per square inch (75 psi) allowance for surge. Pipe shall be designed in accordance with ANSI/AWWA C 303, and AWWA Manual M9 to withstand the simultaneous application of external earth loads, HS-20 live load and internal pressures. Drawings shall be submitted to the Engineer for approval and shall include the following:
  - i. Pipeline layout showing stations and elevations;
  - ii. Details of standard pipe, joints, specials and fittings;
  - iii. Calculations for pipe design field welded joint restraint and fittings reinforcement;
  - iii. Details of joint bonding and calculations.
- b. The cylinders shall be true right cylinders formed from one piece of sheet or coil steel. Field circumferential butt welds are not acceptable.
- c. Minimum steel cylinders shall be ten (10) gage.
- d. The nominal diameter or inside diameter of the pipe and other fabricated steel sections as shown on the plans is the clear diameter of the lined pipe after the application of the interior mortar lining
- e. Laying Length - thirty two to forty feet (32'- 40') for concrete cylinder pipe depending on the shop practice of the manufacturer or fabricator, unless otherwise required by the Contract Documents. Sufficient short pieces shall be provided to allow for two foot (2') adjustments within each one-half mile of straight pipe.

**10-28 WATER PIPE - Transmission (greater than 12 inch diameter) (cont.)**

- f. Pipe End Finish - The end finish of individual lengths of CCP to be provided under these Technical Specifications shall be one of the following types, unless otherwise indicated on the Plans:
  - i. Bell and spigot pipe ends for joints with rubber gaskets.
  - ii. Bell and spigot pipe ends for field welded joints.
  - iii. Plain-ends fitted for butt straps for field welded joints.
  - iv. Plain-ends fitted with flanges.
  - v. Plain-ends for mechanically coupled field joints.

The types of joints proposed to be used shall have been thoroughly tested for water leaks at the design pressures. The Engineer may require Contractor to furnish a record of experience in installing the types of joints for comparable sizes of pipe called for on the Plans. Details of the type of pipe joints proposed to be used shall be included with the shop drawings and lay sheets submitted for the pipe.

The exposed inside and outside surfaces of the joints, flanges, reinforcement lugs, and all other exposed steel shall be protected from the formation of rust with an AWWA approved coating applied at the time of manufacture or fabrication of the pipe.

The CCP ends shall employ joint rings (Carnegie rings) and shall be designed and fabricated to accommodate a rubber O-ring gasket seal in accordance with AWWA C 303.

The field welding of CCP with bell and spigot joint rings (Carnegie rings) or lap joints shall conform to the Drawing 8-54, City of Colusa Improvement and Design Standards. Lap joints shall conform to AWWA C 200.

Field welded butt-strap joints for CCP shall be typically used for closure pieces and shall conform to Standard Drawing 8-55. The ends of pipes to be fitted with butt straps for field welded joints shall conform to AWWA C 200.

When field conditions warrant and with the approval of the Engineer, straight butt-strap welded joints may be used for directional changes in pipe alignment of up to five degrees (5°).

## **10-28 WATER PIPE - Transmission (greater than 12 inch diameter) (cont.)**

Steel pipe flanges for CCP shall conform and be fitted to plain-end pipe in accordance with AWWA C 207, Class D, and AWWA C 200.

Rubber gaskets for flanged joints shall be full faced with a thickness of eighth of an inch ( $\frac{1}{8}$ "). The material used for the rubber gaskets shall be hardness (Shore A) 70 to 85 suitable for a minimum of one hundred and fifty pounds per square inch (150 psi), cold water service.

Bolts shall be carbon steel ASTM A 307, Grade B. Nuts shall be heavy hex nuts conforming to ASTM A 563, Grade C3.

CCP ends for mechanically coupled field joints shall be plain and conform to AWWA C 200 and these Technical Specifications. Mechanically coupled joints shall conform to the material, dimensions, and tests of AWWA C 219.

All plain-end pipe joined by flexible couplings shall be fitted with stiffener rings welded to the exterior pipe surface in a plane perpendicular to the axis of the pipe. Stiffener rings shall have minimum dimensions of three eighths inch ( $\frac{3}{8}$ ") thick by three inches (3") in width.

Stiffener rings that are to be integral with a joint harness shall be suitably increased in thickness and reinforced with plate gussets to adequately withstand the thrust from adjacent fittings. Stiffener rings and harness rings or lugs shall be installed at the pipe manufacturing or fabrication shop. Material for stiffener rings and plate gussets shall be carbon steel meeting the requirements of ASTM A 36 or ASTM A 283, Grade D.

All mechanically coupled field joints shall be encased with eight (8) mil minimum thickness polyethylene material.

Restrained Joints for CCP transmission lines shall conform to the requirements set forth in AWWA M 9, "Concrete Pressure Pipe." Joints shall be one of the following types:

- a. Lap welded slip joint - The joint shall conform to and be welded in accordance with Standard Drawing 8-54 in City of Colusa Improvement and Design Standards.
- b. Double welded butt strap joint - Butt straps shall conform to and be welded in accordance with Standard Drawing 8-55 in City of Colusa Improvement and Design Standards.

### **10-28 WATER PIPE - Transmission (greater than 12 inch diameter) (cont.)**

- c. Flanged and bolted - Flanges shall be in accordance with AWWA C 207 Class D for operating pressures to one hundred and fifty pounds per square inch (150 psi) and surge pressures to two hundred and twenty five pounds per square inch (225 psi).
- d. Mechanical coupling - Mechanical couplings shall be as specified in section 10-29 of these Technical Specifications and shall be harnessed for the maximum pressure in accordance with AWWA M 9.
- e. Carnegie end rings restrained by means of welding the bell and spigot ring in accordance with Standard Drawing 8-54 in City of Colusa Improvement and Design Standards.

Standard and special fittings for CCP shall include adapters, reducers, bends, tees, wyes, connections to mainline valves, closures, beveled pipe, restrained-joint pipe, short pipe, and pipe with outlets required for branches, access manholes, air valves, and blow-offs. The fabrication and manufacture of standard and special fittings shall conform to the requirements of Section 4 of AWWA C 303.

### **3. Ductile Iron Pipe (DIP)**

All ductile iron pipe shall conform to the following:

- a. AWWA C 104 (ANSI A21.4), "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water."
- b. AWWA C 110 (ANSI A21.10), "Ductile Iron and Gray Iron Fittings for Water."
- c. AWWA C 111 (ANSI A21.11), "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings."
- d. AWWA C 150 (ANSI A21.50), "Thickness Design of Ductile-Iron Pipe."
- e. AWWA C 151 (ANSI A21.51), "Ductile Iron Pipe, Centrifugally Cast, for Water."
- f. AWWA C 153 (ANSI A21.53), "Ductile-Iron Compact Fittings for Water Service."

**10-28 WATER PIPE - Transmission (greater than 12 inch diameter) (cont.)**

- g.** AWWA M41, "Ductile-Iron Pipe and Fittings."

DIP shall also comply with the following requirements:

- a.** The minimum wall thickness design shall be determined using AWWA C 150/A21.50.
- b.** The design working pressure shall be one hundred and fifty pounds per square inch (150 psi) minimum.
- c.** When determining the wall thickness of the pipe, the following shall be considered:
  - i.** internal pressure, including static and transient pressure;
  - ii.** external pressure, including trench loading and earth fill; and
  - iii.** practical considerations for handling, shipping, lining and coating, or similar operations.
- d.** Nominal inside diameter shall not be less than the design diameter or size specified.
- e.** Hydrostatic testing shall be made before the application of cement-mortar lining.
- f.** Ductile iron pipe laying lengths shall be furnished in standard lengths suited to the manufacturer's shop practice and in accordance with AWWA C 151/A21.51. Sufficient field pieces shall be provided to allow for a two foot (2') adjustment - within each one-half mile of straight pipe.

All DIP and fittings shall be cement-mortar lined in accordance with AWWA C 104/A21.4.

Pipe shall be lined by a centrifugal process. Fittings shall be lined by a projection method or by hand application.

The entire ductile iron pipeline including fittings, valves and appurtenances shall be encased in polyethylene material with a minimum thickness of eight (8) mil. The polyethylene shall conform to and be installed in accordance with AWWA C 105/A21.5.

## **10-28 WATER PIPE - Transmission (greater than 12 inch diameter) (cont.)**

The end finish of individual lengths of DIP to be provided under these Technical Specifications shall be one of the following types, unless otherwise indicated on the Plans:

- a. Bell and spigot pipe ends for joints with rubber gaskets.
- b. Mechanically coupled field joints.
- c. Plain-ends fitted with threaded flanges.

The types of joints proposed to be used shall have been thoroughly tested for water leaks at the design pressures. The Engineer may require Contractor to furnish a record of experience in installing the types of joints for comparable sizes of pipe called for on the Plans. Details of the type of pipe joints proposed to be used shall be included with the shop drawings and lay sheets submitted for the pipe.

The exposed inside and outside surfaces of the pipe joints shall be protected from the formation of rust with an AWWA approved coating applied at the time of manufacture of the pipe.

Bell and spigot joints with rubber gaskets for DIP shall conform to the requirements of AWWA C 111/A21.11 regarding push-on joints.

Mechanically coupled field joints, bolts and nuts for DIP shall conform to the requirements of AWWA C 111/A21.11. All mechanically coupled field joints shall be encased with a minimum eight (8) mil thick polyethylene.

Bolts shall be carbon steel ASTM A 307, Grade B. Nuts shall be heavy hex nuts conforming to ASTM A 563, Grade C3.

Ends fitted with threaded flanges for DIP shall conform to the requirements of AWWA C 115/A21.15.

Pipe ends fitted with restraining rings for DIP shall receive approval by the Engineer prior to the installation of the pipe. It is suggested that test documents from the manufacturer's testing documentation be submitted with the required pipe lay sheet submittals.

Restrained Joints for Ductile Iron transmission mains shall be one of the following types:

- a. Flanged and bolted - Flanges shall be in accordance with AWWA C

#### **10-28 WATER PIPE - Transmission (greater than 12 inch diameter) (cont.)**

110 or AWWA C 153 for operating pressures to one hundred and fifty pounds per square inch (150 psi) and surge pressures to two hundred and twenty five pounds per square inch (225 psi).

- b. Push-on locking gasket such as "Field-Lok" gaskets as manufactured by U.S. Pipe.
- c. Push-on joint restraint such as "TR-Flex" as manufactured by U.S. Pipe.
- d. Wedge action joint mechanism such as "Megalug" as manufactured by EBAA Iron, Inc. or approved equal.
- e. Mechanical coupling - Mechanical couplings shall be as specified in section 10-29 of these Technical Specifications.

Fittings and openings for DIP shall conform to the requirements of AWWA C 110/A21.10. Where outlets are required, tees shall be used, with the outlet branch being flanged.

Bolts shall be carbon steel ASTM A 307, Grade B. Nuts shall be heavy hex nuts conforming to ASTM A 563, Grade C3.

#### **10-29 BUTTERFLY VALVES & FLEXIBLE COUPLINGS (Transmission)**

##### **1. General**

Butterfly valves shall be short bodied, tight closing, and rubber-seated with flanged ends. Butterfly valves shall comply with the requirements of AWWA C 504, Class 150B and these Technical Specifications. Valves shall be bubble-tight at rated pressures in either direction, and shall be satisfactory for

throttling service and/or operation and for valve operation after long periods of inactivity. All butterfly valves shall be Triton XR or Groundhog valves as manufactured by the Henry Pratt Company, Lineseal III valves as manufactured by Mueller Company, or approved equals.

Valve discs shall rotate ninety degrees (90°) from the full open position to the tight shut position. The valves shall allow for an angular mis-position of the disc up to one degree (1°) off center without leakage. The manufacturer shall have successfully manufactured tight-closing, rubber seated AWWA butterfly valves for a period of at least five (5) years with local installation list.

Butterfly valves shall be provided with manual actuators. The actuators shall provide sufficient output torque to operate the valves at a shutoff pressure of one hundred and fifty pounds per square inch (150 psi) and at a maximum flow velocity of sixteen feet per second (16 fps) when opening or closing. In no case shall the torque rating be less than required for Class 150B valves per AWWA C 504. The Engineer may request Contractor to provide torque and actuator calculations to verify compliance.

## **2. Butterfly Valve Materials and Construction**

Materials for all parts and components shall be suitable for the intended use of the valve considering strength, ductility and corrosion protection. All materials shall conform to the requirements of AWWA C 504. Valves shall comply with NSF/ANSI 61.

**Valve Disc:** Valve discs shall be constructed from ductile iron ASTM A 536 for valve sizes thirty inches (30") and larger, from cast iron ASTM A 126, Class B for valve sizes less than twenty inches (20"), or from cast iron ASTM A 48/A48M

Class 40 for twenty-four inch (24") valves. Valve discs shall be furnished with 316 stainless steel seating edge, ground smooth and polished to mate with the rubber seat on the body. The disc shall not have any hollow chambers that can entrap water or ribs transverse to the flow stream. All surfaces shall be visually inspected and measured to assure all structural members are at full design parameters.

**Valve Seat:** All seats shall be Buna-N rubber in the body design. Valves twenty inches (20") and smaller shall have bonded seats that meet the test procedures of ASTM D 429 Method B. Seats for valve sizes twenty-four inches (24") and larger shall be retained in the valve body by mechanical means without retaining rings, segments, screws or hardware of any kind in the flow stream. Seats shall be a full three hundred and sixty degrees (360°) without interruption and have a plurality of grooves mating with a spherical disc edge

seating surface. Valve seats shall be field adjustable around the full three hundred and sixty degrees (360°) circumference and replaceable without dismantling operator, disc or shaft and without removing the valve from the line. Seats attached to the valve disc are not allowed.

**Valve Shaft:** All shafts shall be turned, ground and polished and constructed of 18-8 Type 304 stainless steel conforming to ASTM A 276. Valve shaft seals shall consist of self-adjusting "V" type packing capable of replacement without removal of the valve shaft.



## 10-29 BUTTERFLY VALVES & FLEXIBLE COUPLINGS (Transmission) (cont.)

**Valve Bearings:** All valves shall be fitted with non-metallic sleeve-type bearings. Bearings shall be corrosion resistant and self-lubricating. Bearing load shall not exceed one-fifth of the compressible strength of the bearing or shaft material. Non-adjustable thrust bearings designed to center the valve disc shall be furnished with the valve assembly and be preset at the factory.

**Manual Valve Actuator:** Manual valve actuators shall be of the traveling nut or permanently lubricated worm gear reducer type suitable for continuously buried and submerged use. All actuator gearing shall be totally enclosed in a rugged case that is both water tight and lubricant tight.

Actuators shall be fully grease packed and totally sealed by gaskets, O-rings, or similar means before shipment. A gasketed removable cover plate shall be provided for maintenance purposes. Actuators shall have a built in packing leak bypass to eliminate possible leakage into the actuator housing. Stuffing boxes are not acceptable.

Manual valve actuators shall be capable of withstanding an input torque of four hundred and fifty foot-pounds (450 ft-lbs) against the open and closed stops. The valve disc shall be moved through its full stroke with a minimum number of turns of the operating shaft consistent with the torque limitations.

The valve actuator mechanism shall be self-locking and shall hold the valve disc rigidly in any intermediate position between full open and fully closed without creeping or fluttering. Machining and fitting of all parts shall be held to close tolerances to reduce backlash and to keep lost motion to a minimum.

The actuator shall be equipped with a standard water works two inch (2") square wrench nut. The actuator shall open the valve left (counterclockwise), and shall be furnished with a position indicator if installed in a vault. Provide valve operating nut extensions in accordance with Standard Drawing 8-19 City of Colusa Improvement and Design Standards when installed valve operating nut is in excess of thirty inches (30") below finish grade.

**Valve Exterior Coating:** The exterior of the butterfly valves shall be shop coated with two part liquid epoxy per AWWA C550. The coating shall have a nominal thickness of eight (8) mils. Machine finished bearing surfaces shall not be painted. Exposed machined surfaces shall be covered with slush grease or other readily removable protective coating before shipment.

**Valve Interior Coating:** All interior ferrous surfaces of the butterfly valves, including the disc, which are exposed to fluid flow shall be factory coated

## **10-29 BUTTERFLY VALVES & FLEXIBLE COUPLINGS (Transmission) (cont.)**

with a two part liquid epoxy coating conforming to AWWA C 550 for potable water. The coating shall have a nominal thickness of eight (8) mils.

With no exceptions, all damage to coating incurred during shipping shall be repaired with the original coating material only. The coating shall be NSF/ANSI 61 certified.

**Bolts and Nuts:** Bolts connecting valves to main shall be carbon steel ASTM A 307, Grade B. Nuts shall be heavy hex nuts conforming to ASTM A 563, Grade C3. Bolts that thread into the valve body shall have the same thread pitch as the valve body.

### **3. Flexible Couplings**

Flexible couplings suitable for water main applications shall be as manufactured by Smith Blair, Inc., Series 411 or 413, or Dresser Industries, Inc., Style 38 or 162, or an approved equal. The steel middle ring of the flexible coupling shall be lined and coated with fusion bonded epoxy per AWWA C 213.

The flexible couplings shall be installed with provision for thrust restraint ties attached to the water main pipe. The thrust restraint ties on the pipe shall be welded lugs, lugs cast integrally with the pipe, or friction collars. Anchor studs placed perpendicular to the long axis of the pipe are unacceptable. Resistance to hydraulic thrust shall be adequate to sustain a force developed by a test pressure of two hundred and twenty five pounds per square inch (225 psi).

Flanged coupling adapters shall be Smith Blair 913, Romac Style FC400 or equal for steel piping with insulating gasket. Couplings shall be provided with thrust ties attached to the pipe with welding lugs, cast-in-place lugs, or friction collars. Lugs shall have a minimum thickness equal to that of adjacent flange and shall have holes the same size as those on the flange. Anchor studs placed perpendicular to the longitudinal axis of the pipe are unacceptable.

## **10-30 APPURTENANCES**

### **i. Air Vacuum and Release Valves**

Combination air vacuum and release valves for water transmission mains shall be two (2") or four inches (4") in size. The air vacuum and release valves shall have cast iron bodies and be equal to APCO Valve and Primer Corporation, Model 145C for the two-inch (2") valve and Model 149C for the four-inch (4") valve.

**ii. Blind Flanges and Dished Heads**

Blind flanges and dished heads for water transmission mains shall conform to the requirements of AWWA C 207 and NSF/ANSI 61. Design pressure classification shall be equivalent to that of the immediately adjacent pipe, valve, or appurtenance. Blind flanges and dished heads shall be epoxy coated. The epoxy coating shall have a minimum thickness of eight (8) mils and shall conform to the requirements of AWWA C 213. Temporary blind flanges and dished heads that are used during construction of the transmission main do not need to be coated when approved by the Engineer.

**10-31 FIRE HYDRANTS**

All Standard (Low Risk) fire hydrants shall be as specified herein unless otherwise indicated on the Plans or Special Provisions.

1. All fire hydrants shall conform to AWWA C 502 for Dry-Barrel Fire Hydrants as currently in effect or amended and ANSI 61. An Affidavit of Compliance as per Section 1.7 of AWWA C 502. Standard shall be furnished with all hydrants or groups of hydrants. The Certificate of Compliance shall provide assurance that all material and manufacturing requirements have been met and head losses are within specified limits.
2. Table 3 of AWWA C 502 is amended to limit loss of head (drop in pressure) to a maximum of three pounds per square inch (3 psi) at a flow rate of one thousand gallons per minute (1000 gpm) through one four and one-half inch (4½") diameter pumper outlet nozzle.
3. Markings-All fire hydrants shall be clearly and permanently marked so as to be readily discernable and legible after hydrants have been installed. Such marking should include:
  - a. Name of manufacturer
  - b. Model name or number
  - c. Size of main valve opening
  - d. Date of manufacture
  - e. Direction of operation
  - f. Ground or bury line (mark to reflect point of bury to maximize breakaway features.)

#### 10-31 FIRE HYDRANTS (cont.)

4. Two (2) copies of operating manuals and/or descriptive literature shall be furnished with all fire hydrants or groups of hydrants supplied by the same manufacturer. The manuals or literature shall include assembly drawings, schedule of parts, maintenance instructions, and complete tool kits.
5. A complete tool kit for those fire hydrants requiring special tools shall be provided.
6. In addition to the above, Standard fire hydrants shall meet the following requirements:
  - a. Size and Type of Inlet Connection:
    - i. Standard Hydrants-Dimension of the foot piece shall be as required to fit cast or ductile iron pipe of six inches (6") nominal inside diameter.
    - ii. Connection-Type of inlet connection for standard shall be either mechanical joint or "push-on" rubber ring. If the "push-on" rubber ring type is used the foot piece shall be provided with lugs for harnessing the hydrant to the branch or lead connection pipe or fitting.
  - b. Breakaway Features-A frangible section immediately above the ground or bury line is required. If breakable features depend upon bolts of reduced cross-section, hollowed out bolts will not be permitted.
  - c. Number and Size of Outlet Nozzles Standard Hydrants - Two (2) hose nozzles each with a nominal inside diameter of two and one-half inches (2½") and one (1) pumper nozzle with a nominal inside diameter of four and one-half inches (4½").
  - d. Outlet Nozzle Arrangement- Standard Hydrant-Nozzle arrangement requires that the two (2) two and one-half inch (2½") diameter hose nozzles be opposite (180°) of each other. The single four and one-half inch (4½") diameter pumper nozzle shall be at right angles (90°) to the hose nozzles. The horizontal centerline of all nozzles shall be on the same plane and not less than sixteen inches (16") above the hydrant ground flange or bury line.

## 10-31 FIRE HYDRANTS (cont.)

- e. Three hundred sixty Degree ( $360^{\circ}$ ) Nozzle Rotation-Nozzles, or the entire above ground section, shall allow three hundred sixty degree ( $360^{\circ}$ ) rotation to the exact desired position after installation.
- f. Outlet Hose Nozzles and Threads-Hose nozzles shall be made of Grade I, VII, or X bronze. The hose nozzles shall be fastened into the hydrant outlet tap by a thread of not less than seven and one half ( $7\frac{1}{2}$ ) threads per inch. A pin shall be employed to prevent the threaded outlet hose nozzle from turning or backing out. The cap or hose accepting end of the outlet nozzles shall be threaded with National (American) Standard Fire-Hose Coupling Screw Threads.
- g. Nozzle Cap Materials-Grey cast or ductile iron caps with a recess at the inner end of the thread to retain a gasket. Caps shall be securely chained to the hydrant barrel with a metal chain having links made from stock not less than one-eighth inch ( $\frac{1}{8}$ " ) in diameter. The attachment shall permit free rotation of the cap.
- h. Size of Hydrant- Nominal diameter of main valve shall be a minimum of five inches (5").
- i. Main Valve Seat and Seat Ring-Shall be bronze to bronze in hydrants which have the main valve assembly in the lower end of the barrel. Threads shall be isolated from the waterway by O-ring seals.
- j. Size and Shape of Operating Nut and Outlet Nozzle Cap Nuts shall be the National standard  $1\frac{1}{2}$ -inch pentagonal, full section without undercutting or hollowing out. A threaded hole not to exceed one-quarter inch ( $\frac{1}{4}$ " ) in diameter will be allowed in the operating nut for lubrication purposes. Any such hole shall be plugged flush with the top of the operating nut and be water tight.
- k. Operating Stem, Nut, and Lubricate Reservoir-The nut shall be made of bronze. Threads shall be lubricated by an oil or grease reservoir sealed by double O-rings, top and bottom to prevent intrusion of moisture and dirt. Length of operating stem surface in contact with O-ring seals shall be protected by a bronze sleeve.

A weather shield shall be provided to prevent dirt and moisture from entering between the sides of the operating nut and the hold down nut, or bonnet opening. Wet top hydrants are not acceptable.

### 10-31 FIRE HYDRANTS (cont.)

- l. Direction of Rotation: Hydrants shall open left (counter clockwise).
  - m. Stuffing boxes, if used, shall be provided with O-ring seals.
  - n. Barrel Drain Outlet-None required. If hydrant is provided with such an outlet, it must be plugged with a threaded bronze or cast iron plug.
  - o. Toggle Joint Hydrants-Shall be provided with bronze parts as follows: nozzles, lower threaded stem or spindle, stem nuts, seat ring, gate pins, cotter pins, main valve gate threaded stud, and nut.
  - p. All nozzles, caps, operating nuts, O-rings, friction bearing threaded surfaces, and grease fittings shall be lubricated with the appropriate factory recommended lubricating material. All reservoirs designed to hold a designated quantity of lubricant shall be filled to maximum capacity.
7. A coat of aluminum exterior paint shall be applied as a color or finish coat over the primer coat on the top (above ground) section. All hydrant bonnets shall be painted with OSHA approved safety paint. The color shall be based on the diameter of the main that the hydrant is connected to, as follows:
- Red:** for 6" and smaller mains
  - Yellow:** for 8" - 10" mains
  - Green:** for 12" and larger mains
8. Bolts shall be carbon steel ASTM A 307, Grade B. Nuts shall be heavy hex nuts conforming to ASTM A 563, Grade C3.

### 10-32 VALVES

- 1. Gate valves shall be cast iron, bronze disc, parallel seat, and non-rising stem with a two inch (2") square operating nut. Valves shall conform to AWWA C 500. All interior and exterior ferrous surfaces shall be and coated with factory applied epoxy in accordance with AWWA C 550. Minimum thickness shall be eight (8) mils.

2. Resilient - Seated gate valves shall be cast iron, non-rising stem with a two inch (2") square operating nut. Valves shall conform to AWWA C 509. All interior and exterior ferrous surfaces shall be and coated with factory applied epoxy in accordance with AWWA C 550. Minimum thickness shall be eight (8) mils.
3. Valves provided shall open left (counter clockwise), and shall have bonnet and valve body markings in accordance with the indicated AWWA standards. Unless otherwise directed, furnish valves with flange, mechanical, and/or push-on joints in accordance with the plans and special provisions. Provide valve operating nut extensions in accordance with Standard Drawing 8-19 in City of Colusa Improvement and Design Standards when installed valve operating nut is in excess of thirty inches (30") below finish grade.
4. Swing check valves are contained on an approved listing maintained by the Department of Utilities. Alternate swing check valves shall be added to this list upon review, test and acceptance by the Utility Department.
5. Bolts shall be carbon steel ASTM A 307, Grade B. Nuts shall be heavy hex nuts conforming to ASTM A 563, Grade C3.

#### **10-33 VALVE BOXES AND COVERS, DROP CAPS, AND SERVICE VALVE BOXES**

Valve boxes and valve box covers for streets and alleys, and drop caps in public utility easements shall conform to Standard Drawing 8-15. The castings shall be ductile iron with a minimum tensile strength of twenty five.

thousand pounds per square inch (25,000 psi). Riser sections shall be (8") diameter SDR 35 PVC pipe.

Service valve boxes shall be in conformance with Standard Drawings 8-16 and 8-18. The riser portion shall be as shown.

#### **10-34 WATER SERVICE CONNECTION MATERIALS**

Water service material shall be either copper or polyethylene tubing. The Department of Utilities maintains a listing of approved water service connection fittings which establish a standard of material quality. Fitting used shall be limited to those on the list. Alternate material may be added to this list upon review, testing and acceptance by the Department of Utilities.

Copper service tubing shall conform to ASTM B 88, Type K, soft tempered.

Polyethylene tubing shall be two hundred pounds per square inch (200 psi), SDR-9 conforming to ASTM D 2737 and AWWA C 901 standards. Tubing shall be copper tube size and shall be manufactured for use with compression or Mueller Insta-tite fittings. Stainless steel insert stiffeners shall be used at all compression joints. Insert stiffeners shall be flared at one end and beveled at the approximately forty five degrees (45°) at the other end. Stiffeners shall be supplied by the fitting manufacturer. Tubing shall be clearly marked showing manufacturer's trade name, nominal size, type of material, pressure rating, and the seal of approval of an accredited testing laboratory.

Threads for underground water service connection fittings shall conform to AWWA C 800 Threads for Underground Service Line Fittings.

#### **10-35 JOINT MATERIALS FOR CLAY PIPE**

Joint materials for vitrified clay pipe shall be an approved type of factory-made mechanical compression joint conforming to the requirements of ASTM C 425. Banded rubber couplings and sleeves conforming to ASTM C 425 are acceptable.

#### **10-36 JOINT MATERIALS FOR CONCRETE PIPE**

Joint materials for concrete pipe shall be rubber gasket joints conforming to the requirements of ASTM C 443 and shall be flexible and able to withstand expansion, contraction, and settlement. All rubber gaskets shall be stored in as cool a place as practicable, preferably at 70° F. or less, and in no case shall the rubber gaskets be exposed to the direct rays of the sun. Rubber gaskets, of the type requiring lubrication, shall be lubricated with the lubricant recommended and supplied by the manufacturer of the pipe.

#### **10-37 JOINT MATERIALS FOR MANHOLES**

Joint materials for precast reinforced concrete manhole sections shall conform to one of the following:

1. Mortar proportioned as one (1) cubic foot of Portland Cement to two (2) cubic feet of concrete sand. All mortar shall be used within thirty (30) minutes after the mixing water has been added.
2. Preformed plastic sealing compound shall conform to Type 1 - Rope Form, one and one-half inch (1½") diameter, Federal Specification SS-S-210A.





**10-38 GROUT**

This section specifies grout for uses other than masonry.

1. All grouts shall conform to applicable portions of the following:

|             |   |
|-------------|---|
| ASTM C 33   | Concrete Aggregates   |
| ASTM C 40   | Organic Impurities in Fine Aggregates for Concrete  |
| ASTM C 88   | Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate                                 |
| ASTM C 117  | Material Finer Than 75 um (No. 200) Sieve in Mineral Aggregates by Washing                            |
| ASTM C 136  | Sieve Analysis of Fine and Coarse Aggregates  |
| ASTM C 150  | Portland Cement   |
| ASTM C 289  | Potential Reactivity of Aggregates (Chemical Method)  |
| ASTM C 494  | Chemical Admixtures for Concrete  |
| ASTM C 881  | Epoxy-Resin-Base Bonding Systems for Concrete   |
| ASTM D 2419 | Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate                            |
| ASTM E 329  | Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction |
| CRD-C621    | Corps of Engineers Specification for Nonshrink Grout  |

- a. These provisions shall pertain to dry pack, cement, non-shrink, pressure and epoxy grouts, including adhesive capsules and polymer concrete.
- b. Portland cement portion of grout shall be ASTM C 150 Type II or Type V, low alkali, containing less than 0.60 percent alkalies. Aggregate in grout shall be non-reactive and shall be washed before use. When sources of aggregate are changed, test reports shall be provided for the new material. The tests specified shall be performed prior to commencing grout work.

**10-55 GROUT (cont.)**

- c. The fine aggregate portion of grout shall be hard, dense, durable particles of either sand or crushed stone regularly graded from coarse to fine and shall conform to ASTM C 33 as modified herein. When tested in accordance with ASTM C 136, gradation shall be such that one hundred percent (100%) by weight will pass a standard No. 8 mesh sieve and no less than forty-five percent (45%) by weight will pass a standard No. 40 mesh sieve.
- d. Variation from the specified gradations in individual tests will be acceptable if the average of three consecutive tests is within the specified limits and the variation is within the permissible variation listed below:

| U.S. standard sieve size | Permissible variation in individual tests, percent |
|--------------------------|--|
| 30 or coarse             | 2  |
| 50 or finer              | 0.5  |

- e. Other tests shall be in accordance with the following specifications:

| Test                                     | Test Method | Requirements                         |
|--|-------------|--------------------------------------|
| Organic Impurities                       | ASTM C 40   | Color lighter than standard          |
| Amount of Material Passing No. 200 Sieve | ASTM C 117  | 3% maximum by weight                 |
| Soundness                                | ASTM C 88   | 10% maximum loss with sodium sulfate |
| Reactivity                               | ASTM C 289  | Innocuous aggregate                  |
| Sand Equivalent                          | ASTM D 2419 | Minimum 80                           |

- 2. Grout admixtures shall conform to the following:

- a. Admixtures shall be compatible with the grout. Calcium chloride or admixtures containing calcium chloride are not acceptable. Admixtures shall be used in accordance with the manufacturer's recommendations and shall be added separately to the grout mix.

## 10-55 GROUT (cont.)

Water reducing retarder shall be ASTM C 494 Type D and shall be Master Builders Pozzolith 300-R, Sika Corporation Plastiment, or equal. Lubricant additive for cement pressure grouting shall be Intrusion Prepakt Intrusion Aid, Sika Intraplast N, or equal.

- b. Water for washing aggregate, for mixing and for curing shall be free from oil and deleterious amounts of acids, alkalies, and organic materials; shall not contain more than 1000 mg/1 of chlorides as Cl, nor more than 1300 mg/1 of sulfates as SO<sub>4</sub>; and shall not contain an amount of impurities that may cause a change of more

than twenty-five percent (25%) in the setting time of the cement nor a reduction of more than five percent (5%) in the compressive strength of the grout at fourteen (14) days when compared with the result obtained with distilled water. Additionally, water used for curing shall not contain an amount of impurities sufficient to discolor the grout.

### 3. Drypack Grout

- a. Drypack grout shall be used for built-up surfaces, setting miscellaneous metal items and minor repairs and shall be a mixture of approximately one (1) part cement, 1-1/2 to two (2) parts sand, water reducing retarder, and sufficient water to make a stiff workable mix.
- b. Surfaces required to be built up with drypack grout shall be roughened with a wire brush, cleaned, and immediately coated with an acrylic bonding agent such as Burke Acrylic Bondcrete, or equal, at the rate of 200 sq. ft. per gallon. Follow with placement of the grout after a minimum of one hour and after the film is dry to the touch. Install bonding agent in strict accordance with manufacturer's instructions. The drypack grout shall be applied in bands or strips to form a covering of the required thickness. The covering shall be smooth. Construction joints in the grout shall be sloped and shall be cleaned and wetted before application is resumed.
- c. Drypack grout shall be cured as for Cast-In-Place Concrete. Grout shall not be placed during freezing weather unless adequate protection is provided.

## 10-55 GROUT (cont.)

### 4. Cement Grout

- a. Cement grout shall be used for filling nonbearing portions of equipment pads and pressure grouting and shall be a mixture of one (1) part cement, two (2) parts sand, proportioned by volume, admixtures for pressure grouting, and sufficient water to form a workable mix.
- b. Except for the specialized equipment for pressure grouting, mixing, and placing apparatus shall be similar to that normally used for cast-in-place concrete. Grout shall be mixed for a period of at least one (1) minute. Diluted grout shall be agitated to keep ingredients mixed.

### 5. Nonshrink Grout

- a. Nonshrink, nonmetallic aggregate grout shall be used for the bearing surfaces of machinery and equipment bases, column base plates and bearing plates. Nonshrink metallic aggregate grout shall be used for setting anchor bolts and grouting reinforcing steel holes. Nonmetallic aggregate grout shall be Five Star Products, Inc. Five Star Grout, Master Builders Masterflow 928, Burke Company Non-Ferrous, Non-Shrink Grout, or equal. Grout shall meet the requirements of ASTM C1107 and shall be placed in accordance with manufacturer's instructions.
- b. Holes required for grouting shall be blown clean with compressed air and left free of dust or standing water. Horizontal holes for grouting shall be drilled at a slight downward angle to facilitate holding the grout until setting is complete. Bolts or reinforcing steel installed in horizontal grout holes shall be bent slightly accordingly.

### 6. Epoxy Grout

- a. Epoxy grout shall be used for repairing cracks by pressure grouting or gravity flow, repairing structural concrete, and may be used for setting reinforcing dowels or anchor bolts into holes for grouting. Except as noted below, epoxy grout shall be a high modulus, two (2) component, moisture insensitive, one hundred percent (100%) solids, thermosetting modified polyamide epoxy compound. The consistency shall be a paste form capable of not sagging in

## 10-55 GROUT (cont.)

horizontal or overhead anchoring configurations. Material shall conform to ASTM C 881 Type 1, Grade 3, such as Master Builder Concrecrete 1440 series, Sika Corporation Sikadur Hi-Mod Series, Adhesive Technology Corporation Solidbond 200 or equal, and shall have a heat deflection temperature in excess of 130 degrees F.

- b. Epoxy for pressure grouting/crack injection shall be a two (2) component, moisture insensitive, high modulus, injection grade, one hundred percent (100%) solids, blend of epoxy-resin compounds. The consistency shall be as required to achieve complete penetration in hairline cracks and larger. Material shall conform to ASTM C 881 Type 1 Grade 1, such as Sika Corporation Sikadur 52, Master Builders Concrecrete LPL, Adhesive Technology Corporation SLV 300 series, or equal.
- c. Concrete shall be primed in accordance with the grout manufacturer's instructions.
- d. Use of epoxy grout for anchorage of bolts or reinforcing dowels shall be subject to the following conditions:
- e. Use shall be limited to locations where exposure, on an intermittent or continuous basis, to acid concentrations higher than ten percent (10%), to chlorine gas, or to machine or diesel oils, is extremely unlikely.
- f. Use shall be limited to applications where exposure to fire or exposure to concrete or rod temperature above the product's heat deflection temperature or 120 degrees F (whichever is less) is extremely unlikely. Overhead applications (such as pipe supports) because of the above concerns, shall be disallowed.
- g. Approval from Engineer for specific application and from supplier of equipment to be anchored, if applicable.
- h. Anchor diameter and grade of steel shall be per contract documents or per equipment supplier specifications. Anchor shall be threaded or deformed full length of embedment and shall be free of rust, scale, grease, and oils. Embedment depth and hole diameter shall be as specified. Holes shall have rough surfaces, such as can be achieved using a rotary percussion drill. Holes shall be blown clean with compressed air and be free of dust or standing water prior to application of grout. Anchor shall be left undisturbed and unloaded

for full curing period. Anchors shall not be placed in concrete below twenty-five degrees (25°) F.

#### **10-56 POLYMER CONCRETE (FOR RESURFACING OR PATCHING)**

Polymer concrete (for resurfacing or patching) shall consist of a liquid binder and dry aggregate mixed together to make a mortar or grout of a consistency as required for the application. The liquid binder shall be a chemical and oil resistant, stress relieved, low modulus, moisture insensitive, two-component epoxy-resin compound. The consistency shall be similar to lightweight oil for proper mixing with aggregate. Material shall conform to ASTM C 881 Type 3 Grade 1, such as Sika Corporation Sikadur Lo-Mod series, Adhesive Engineering Concresive 1470, Adhesive Technology Corporation 400 series, or equal.

The aggregate shall be oven dry in sealed packages until time of mixing and shall be of size and consistency compatible with recommendations of manufacturer of liquid binder for intended application.

Primer, if required for polymer concrete, shall be provided per manufacturer's recommendation.

#### **10-57 ADHESIVE CAPSULES FOR DOWEL ANCHORAGE**

Adhesive resin capsules may be used for setting and anchoring reinforcing dowels or anchor bolts into predrilled holes in concrete.

Adhesive resin capsules shall consist of sealed glass capsules containing pre-measured amounts of a polyester or vinylester resin, quartz sand aggregate and a hardener contained in a separate vial within the capsule. Adhesive capsules shall be Hilti HVA Capsules, Molly Parabond Capsules, or equal.

#### **10-58 PRESSURE GROUTING**

Pressure grouting equipment shall include a mixer and holdover agitator tanks and shall be designed to place grout at pressures up to fifty (50) psi. Gauges shall be provided to indicate pressure used. The mixer shall be provided with a meter capable of indicating to 1/10 of a cubic foot the volume of grout used.

Grouting, once commenced, shall be completed without stoppage. In case of breakdown of equipment, the Contractor shall wash out the grouting system sufficiently to ensure fresh grout and adequate bond and penetration will occur upon restarting the grouting operation. Grout pressure shall be maintained until grout has set.

## **Section 11**

### **PRECONSTRUCTION PHOTOGRAPHS**

#### **11-1 REQUIREMENT**

Preconstruction photographs or video are required for this project.

#### **11-2 SPECIFICATION**

When pre-construction photographs are required, Contractor shall provide the Engineer in an email, cloud share file, thumb drive, or other approved method and the photo shall be a jpg or pdf format. The photographs shall be taken at one hundred foot (100') intervals, or closer as necessary to document existing conditions, along the route of the project before any work is started. Each view shall contain the date, project name, lateral or street, and station. This data shall not block the important areas of the picture and should be of the smallest size possible consistent with legible presentation of the required information when a 4" X 6" print is viewed.

All prints shall show good details in both shaded and sunlit areas. Digital photos are used a minimum resolution of 4 mega pixels is required.

At the option of Contractor, a video recording in an acceptable digital format may be submitted in lieu of pre-construction photographs. All essential features of the project area are to be recorded and all orientations of the view recorded in an accurate manner satisfactory to the Engineer.

Contractor shall submit the pre-construction photographs or digital video recording to the Engineer for review and approval prior to the starting of work.

#### **11-3 PAYMENT**

Payment for preconstruction photographs shall be at the lump sum price bid and shall include full compensation for providing all labor, materials, tools, and equipment necessary to furnish the required products.



## **Section 12**

### **CLEARING AND GRUBBING, AND TREE REMOVAL**

#### **12-1 TREES**

Unless specifically indicated on the Plans or set forth in the Special Provisions no trees may be removed without direct authority of the Engineer.

For the purposes of this section trees shall be considered as those having a trunk diameter of four inches (4") and greater measured at a height of four and a half feet (4'-6") above the ground.

In cases where tree removal is shown on the Plans or is called for by the Special Provisions the Contract may either require a lump sum price for removal of all trees or a unit price per each tree.

#### **12-2 CLEARING AND GRUBBING**

##### **1. General**

Clearing and grubbing shall consist of removing all objectionable material from within the rights-of-way, construction areas, or other areas that may be specified in the Special Provisions or as indicated on the plans which interferes with the work.

##### **2. Vegetation and Debris**

All vegetation such as weeds, grass, shrubbery, roots, and stumps and debris such as broken concrete and trash shall be removed. Tree branches which extend over roadways shall be trimmed to provide a minimum vertical clearance of fourteen feet (14'). Contractor shall have a California, C61 license, allowing him/her to perform D49 tree work and an arborist certified by the International Society of Arboriculture (ISA) on staff. All work shall be supervised by an ISA Certified Arborist and shall comply with the American National Standards Institute (ANSI) Standard Practices for Tree Care Operations (ANSI A300), the American National Standards Institute (ANSI) Safety Requirements for Arboriculture Operations (ANSI z133) and the City of Colusa Tree Ordinance Title 12.56-12.. Trees, shrubbery, lawns, and other vegetation adjacent to the work that is not to be removed shall be protected from injury or damage resulting from Contractor's operations.

### **3. Existing Facilities**

Existing facilities such as pavements, curbs, gutters, sidewalks, lawn sprinklers, mailboxes, fences, pipes, and culverts that interfere with the work shall be removed under the item of clearing and grubbing unless the Plans or Special Provisions provide for separate items.

The methods of removing existing facilities shall conform to Section 13 of these Specifications.

### **4. Disposal**

Materials resulting from clearing and grubbing operations and that are not to be salvaged or otherwise used shall be disposed of outside the project limits at an appropriate site and at the expense of Contractor.

## **12-3 PAYMENT**

In a lump sum contract, all clearing and grubbing is included in the lump sum bid. In unit price contracts, payment for clearing or for clearing and grubbing shall be at the lump sum price bid and shall include full compensation for all work required to complete this item. Payment for tree removal will be either at the lump sum price bid or at the price bid per each tree to remove as indicated in the Contract Documents. Where no separate bid item is included for tree removal, tree removal shall be included in "clearing" or "clearing and grubbing".

## **Section 13**

### **EXISTING FACILITIES**

#### **13-1 PROTECTION**

Existing facilities within the rights-of-way and construction areas that do not interfere with the work shall be protected from damage. Existing improvements, utilities, and adjacent property shall be protected from damage resulting from Contractor's operations. All trees, lawn, shrubbery, fences, walls, irrigation systems, and other improvements including, but not limited to, existing pavements, sidewalks, street improvements and underground utilities and other improvements not to be removed shall be protected from damage by Contractor throughout the construction period.

Contractor shall be responsible for repairing damage to existing improvements or replacing in kind at the Engineer's option.

All signs and street marking damage due to Contractor's operation shall be replaced in kind by Contractor. In the case of partial damage to lane stripes and traffic lettering the whole stripe or letter shall be replaced. Temporary markings and striping shall be installed within three (3) working days of damage. All painted or other disfiguring marks on the pavement, sidewalk or gutters shall be removed by Contractor before the work has been accepted.

#### **13-2 MAINTAINING WATER, SEWER, AND DRAINAGE FLOWS**

Contractor shall be responsible for maintaining all existing water, sewer, and drainage facilities within the limits of the project until new improvements are complete and functioning.

Contractor may elect to cut existing water service laterals and/or sewer services or tunnel beneath them. All water service laterals or sewer services cut by trench excavation or other construction activities shall become the responsibility of Contractor to repair. Maximum time of interruption of water service to any residence or business shall be four (4) hours. Any cut sewer services shall be replaced or repaired by nightfall of the same day per Standard Drawings 7-24, 7-26, and 7-28 of City of Colusa Improvement and Design Standards.

Should Contractor choose to cut existing water service laterals or sewer services, Contractor shall notify the Engineer at least three (3) working days in advance and shall give residences and businesses twenty-four (24) hour notice of interruption of service.

Should Contractor desire City forces to cut and repair existing water, sewer, or drain services, Contractor shall contact the Engineer at least three (3) working days in advance to schedule and coordinate the work. No compensation will be paid to Contractor for the repair by City crews of any water service laterals or sewer services accidentally or purposely cut by Contractor and all such work performed by City crews at the request of Contractor shall be at Contractor's expense. Any work performed or materials provided by City crews to repair and maintain existing drainage systems shall be at Contractor's expense or shall be deducted from amounts owed to Contractor.

Whenever, in the opinion of the Engineer, there arises an emergency situation within the limits of the project that involves maintenance of water, sewer, or drainage, or a situation that poses a danger to the public safety, or inconvenience and/or unreasonable nuisance to the general public, City's forces may be called upon to perform any work necessary to relieve the emergency. Contractor's attention is directed to Section 5-12 "Provisions for Emergencies."

If such emergency is the result of negligence by Contractor, the cost of any corrective measures taken or work performed by City crews shall be billed directly to Contractor or may be deducted from any payments owed to Contractor. The performance of such emergency work by the City forces shall not relieve Contractor of any responsibilities, obligations, or liabilities under the contract for the project.

Should it become necessary for Contractor to temporarily divert or convey flows carried by existing water, sewer, or drainage systems (which include, but are not necessarily limited to, pipelines, channels and pump stations), Contractor shall prepare a detailed, effective plan including, at minimum, the quantity of flow to be conveyed and/or the volume to be impounded, the number, size, and material type of any pipes, the size and configuration of any channel, the size and configuration of any impoundment basin, all pumping information (if applicable), the point of discharge and discharge details.

The plan shall be submitted to the Engineer for approval a minimum of ten (10) working days prior to the start of any work affected thereby and Contractor shall not begin such work until the plan is approved and is on file with the Engineer.

No separate payment will be paid to Contractor for maintenance of existing facilities; the cost of this work shall be included in the various contract items of work.

### **13-3 REMOVING/RELOCATING**

Existing facilities that interfere with the work shall be removed, reset, relocated, adjusted, or otherwise worked on as specified herein, on the Plans, or as directed by the Engineer. Removed facilities that are not to be salvaged or otherwise used shall be disposed of away from the project. Holes or depressions resulting from the removed facilities shall be filled, compacted, and brought to grade at the direction of the Engineer.

#### **1. Asphalt and Concrete**

Asphalt and concrete such as pavements, curbs, gutters, and sidewalks that are to be removed shall be cut to neat, straight lines with an approved saw or other means acceptable to the Engineer. Where the edge of the pavement removal is within two (2) feet of existing building, curb and gutter, or existing pavement edge, the remaining pavement shall also be removed and replaced. The exact limit of the asphalt and concrete to be removed shall be determined in the field by the Engineer. Any temporary surface placed shall be marked with the Contractor's name until such time as final restoration has been placed to the City's satisfaction.

#### **2. Mailboxes**

Existing mailboxes and supports shall be removed and reset where shown on the Plans or as directed by the Engineer. Existing posts shall be removed and transported from the job site and replaced with 4 X 4 pressure treated Douglas fir posts conforming to the provisions of Section 82, "Signs and Markers" of the State Specifications. The mailboxes shall be suitably mounted on a platform which shall be set three and one-half feet (3½') to four feet (4') above the ground. Posts shall be set at least two feet (2') in the ground and firmly positioned by tamping. Existing newspaper receptacles shall be attached to new posts.

Existing mailbox supports constructed of material other than normal 4 X 4 wooden posts shall be stacked in the owner's yard for his recovery. Contractor shall replace with 4 X 4 wooden posts as described above.

#### **3. Fences**

Fences shall be relocated where shown on the Plans or as directed by the Engineer. Fence shall be relocated to provide three foot

(3') minimum clearance from relocated or new fire hydrants. Replace only deteriorated fence parts.

The intent of this specification is for Contractor to relocate the fence in a more suitable location without completely rebuilding it and with an absolute minimum of effort and expense. It may not be known how much of any type of fencing Contractor will be required to replace. Contractor shall submit a unit price per lineal foot of fence to replace regardless of type or quantity.

**4. Sprinklers and lights**

Lawn sprinkler system pipes, heads, and yard lighting systems shall be relocated and re-plumbed to insure continued operation to an equal or better condition.

**5. Pipes and Culverts**

Pipes and culverts that are no longer to be used shall be removed if they are within two feet (2') of sub-grade. Such pipes that are lower than the aforementioned, shall be removed or the ends shall be plugged with concrete at the option of Contractor. Concrete plugs installed in the ends of abandoned sewer or storm drain lines shall be Class "C" or "D" concrete that extends at least two feet (2') into the pipe from the exposed end. Refer to Section 27-3 for capping the ends of water mains.

**6. Abandonment of water service**

Abandon the water service by closing corporation stop and crimping and cutting water service adjacent to the distribution main.

**7. Existing Utilities**

Unless otherwise noted, the location, alignment, and depth of existing underground utilities as shown on the Plans is taken from public records and no responsibility is assumed for the accuracy thereof. For the most part, underground utility services are not shown on the Plans. Attention is directed to the provisions in Section 6-19, "Main and Trunk line Utilities." The cost of relocating existing overhead and/or underground utilities not specified on the plans to be relocated, but which Contractor elects to relocate or cut and reconnect at his/her own convenience shall be borne by Contractor.

#### **13-4 PAVEMENT FOR TRENCH SURFACE RESTORATION**

Contractor shall restore surfaces in kind (using the same material as existing) unless otherwise noted on the Plans or Special Provisions.

Any temporary surface placed shall be marked with the Contractor's name until such time as final restoration has been placed to the City's satisfaction.

Asphalt pavement surface restoration for trenches shall conform to the applicable provisions of Sections 10, 22, 26 and 27.

Restoration of existing concrete pavement shall consist of a minimum of six (6) inches of Portland cement concrete. Portland cement concrete pavement and its placement shall conform to the requirements of Sections 10 and 19.

#### **13-5 PAYMENT**

There will be no separate payment for existing utilities work as described in this section, but full compensation will be considered as included in the bid for items of work Contractor deems appropriate.

## **Section 14**

### **EARTHWORK, EXCAVATION, EMBANKMENT AND SUBGRADE**

#### **14-1 ROADWAY EXCAVATION AND BACKFILL**

In the Contract this item shall consist of excavating, removing, and satisfactory disposal of all material within the limits of the work for roadways, drainage channels, ditches, and any other work as may be specified in the Special Provisions or shown on the Plans. Suitable excavated material may be used for embankment and for backfilling. The rough excavation shall be carried to such depths that sufficient material will be left above the finished grade to allow for compaction to the required grade. Should Contractor excavate below the designated lines he will be required to replace the material with suitably compacted import material or Class "D" Concrete as determined by the Engineer, without cost to the City.

No excavation shall be started on a project until approval has been given by the Engineer. This approval is to assure all necessary surveys, cross sections, and measurements which may be required for determining the quantities removed are performed.

If all or part of the excavated material is to be used as fill, and preparation for the fill placement has not been made, the Engineer may require the stockpiling of this material. The Engineer shall have the right to select excavated material to be used in fill.

Payment for excavation shall be based on cross section measurements taken prior to the beginning of work and the final lines and grades of the finished section. Payment shall be made per cubic yard of material excavated in accordance with the Plans.

#### **14-2 STRUCTURE EXCAVATION AND BACKFILL**

All compaction test results and test agent information shall be submitted to the Engineer for review and approval. Placement of forms, foundations, or footings shall not begin until the City has received written verification that the compaction test results meet the requirements of this specification.

Structure excavation shall consist of excavation performed to place structures such as footings, walls, manholes, junction boxes, etc.

Payment for structure excavation and backfilling shall be considered as included in the prices paid for the various items of work involved and no separate payment will be made therefore.



Excavation for placement of manholes will be paid for under the price bid for manholes, complete in place.

Backfill material shall be specified in the Special Provisions or indicated on the Plans. The backfill material shall be compacted by mechanically tamping in maximum eight-inch (8") layers so as to achieve a minimum relative compaction of ninety-five percent (95%).

Material excavated in excess of that required for backfilling will be disposed of away from the site of the work, unless otherwise permitted by the Engineer.

### **14-3 TRENCH EXCAVATION AND BACKFILL**

Trench excavation shall consist of the excavation required to install pipelines and its cost will not be paid for separately but compensation will be included in the price bid for placing pipe.

Before excavation of the pipe trench in fill areas of roadway embankments, the fill area or embankment shall be completed to a height above the pipe invert grade line of not less than twice the internal pipe diameter or to final fill or embankment subgrade, whichever is lower, but in no case less than twelve inches (12") above the top of the pipe. Such embankment shall be compacted to a minimum relative compaction of ninety percent (90%) for a distance on each side of the pipe equal to a least two (2) pipe diameters. The remainder embankment shall be compacted as specified elsewhere in these Specifications for the type of construction being pre-formed, or as specified in the Special Provisions or the Plans.

Backfill shall be placed as shown on Standard Drawing 4-20, shall be provided by Contractor and shall be placed in accordance with these Technical Specifications and the pipe manufacturer's recommendations. Initial backfill shall be the material between the top of the bedding material and six inches (6") above the top of the bell or barrel if the pipe does not have a bell.

Initial backfill shall be placed immediately after pipe joints have been completed, inspected, and passed by the Engineer. The material shall be carefully placed so as not to disturb or damage the pipe and shall be brought up evenly on both sides. Initial backfill material shall be placed in layers not exceeding eight inches (8") in depth before compaction at or near optimum moisture content. Contractor shall place initial backfill—by shovel slicing, tamping, and/or vibratory compaction in order to produce firmly compacted material under the haunches of the pipe. Compaction shall be by mechanical pneumatic or vibratory compaction equipment approved by the Engineer. Care shall be used to avoid dislodging the pipe. No wedging or blocking of the pipe shall be permitted. Ponding and jetting methods of achieving compaction shall

not be allowed. The compacted material must achieve a relative compaction of at least ninety percent (90%) as determined by ASTM D 698.

When the bedding material for the pipe consists of crushed rock, sand shall not be used as initial backfill material.

Unless otherwise approved by Engineer, trench backfill, as shown on Standard Drawing 4-20, shall be provided, and placed to grade by Contractor, in accordance with these Technical Specifications and the pipe manufacturer's recommendations. Trench backfill shall be the material between the initial backfill and the top of trench or sub-grade. The material for trench backfill may be of job excavated, native material provided that such material is free of organic materials or other unsuitable materials as determined by the Engineer that may cause voids or depressions to develop during or after placement of the backfill. Rocks, stones, and solid earth chunks exceeding three inches (3") in greatest dimension shall be removed from the trench backfill material.

Unless otherwise indicated on the Plans or specified in the Special Provisions, trench backfill material shall be placed in layers not exceeding eight inches (8") in depth before compaction at or near optimum moisture content. Until the total backfill above the top of the pipe exceeds three feet (3'), machine-placed backfill material shall not be allowed to "freefall" more than two feet (2').

Unless otherwise shown on the Plans or specified in the Special Provisions, compaction of trench backfill material shall be by mechanical pneumatic or vibratory compaction equipment. Minimum relative compaction of trench backfill material shall be ninety percent (90%) when tested according to ASTM D 1557, except that the top six inches (6") below the subgrade shall be compacted to a relative compaction of ninety-five percent (95%). Trenches in easements outside the street rights-of-way may be compacted to ninety percent (90%) relative compaction throughout the depth. Compaction testing will be performed by the Engineer and the cost thereof will be borne by the City, except that retests of areas which fail to meet the required compaction will be charged to Contractor and deducted from any payment due Contractor for work performed under the terms of the Proposal.

Ponding and jetting methods of achieving compaction are not allowed.

Refer to Section 10-16 Controlled Density Fill (CDF) regarding approval and mix design requirements for use of CDF, CLSM, and/or RFF as an alternate to granular material for initial backfill and trench backfill materials.

#### **14-4 TEMPORARY PAVING**

Unless stated otherwise in Contract documents, at the end of the day and

prior to opening to traffic, trenches shall be temporarily paved to provide a smooth riding surface. The paving material may be asphalt concrete or temporary paving, "cut back" or other Engineer approved material. Contractor may use non-skid plates to cover trenching when approved by the Engineer. Contractor shall nail down plates, and at edges Contractor shall create and maintain a uniform taper using temporary paving to ensure a smooth traveling surface over the plate.

Cutback shall be placed on the completed aggregate base course, constructed per the Plans and Special Provisions and shall be placed so that the compacted thickness is not less than two inches (2").

Compaction of temporary paving shall be performed using steel wheel rollers or mechanical equipment approved by the Engineer. Compaction by wheel rolling with backhoes or other rubber tire construction equipment shall not be allowed. The temporary paving shall be placed and maintained so that the maximum deviation does not exceed one-half inch ( $\frac{1}{2}$ ") using a ten (10) foot straight edge placed in any direction. If, in the opinion of the Engineer, the temporary paving is not properly maintained, Engineer may direct Contractor to install permanent asphalt concrete pavement at no additional cost to the City of Colusa.

#### **14-5 EMBANKMENT AND FILL**

Fill on a roadway will normally be made with material excavated on the same work unless otherwise indicated by the Special Provisions or Plans.

Fill will be paid for per cubic yard measured in place by computing the yardage between the original ground elevation and the final grades as shown on the Plans.

Tests performed to determine relative compaction shall be performed using the following methods:

1. ASTM D 1557 laboratory test for maximum dry density at optimum moisture
2. ASTM D 2922 field test for in-place wet density by nuclear methods.
3. ASTM D 3017 field test for in-place moisture content by nuclear methods.

Relative compaction shall mean the ratio of the field dry density to the laboratory maximum dry density expressed as a percentage.

In general, construction of fill shall be in accordance with the methods set forth in the State Specifications. The relative compaction shall be at least ninety percent (90%), unless otherwise indicated.

#### **14-6 LANDSCAPE FILL**

**The contractor shall provide the engineer a soil analysis report for proposed landscape fill material.** Landscape fill shall consist of fertile, friable soil of loamy character. It shall be obtained from well-drained arable land outside of the project limits and shall be free from subsoil, refuse, roots, heavy or stiff clay, stones larger than one inch (1") in size, coarse sand, noxious weeds, such as Bermuda, Nut Grass and Morning Glory, sticks, brush, litter and other deleterious substances. Topsoil shall be capable of sustaining healthy plant life.

Landscape fill will be paid for per cubic yard, measured in place by computing the yardage between the original ground elevation and the final grades as shown on the Plans; which price shall include full compensation for all labor, equipment and materials necessary for placement of landscape fill. The relative compaction shall be eighty-five percent (85%), unless otherwise indicated.

#### **14-7 SUBGRADE**

Sub-grades for pavement, curb and gutter, sidewalk, lined channels and ditches, or for rock base under pavements shall be finished accurately and true to the lines and sections shown on the Plans, within a tolerance of  $\pm .05$  feet. The top six inches (6") of sub-grade immediately prior to placing subsequent material thereon shall have a relative compaction of not less than ninety-five percent (95%). The sub-grade shall be free of segregated material and shall be smooth and true to the required grade and cross section. Contractor shall repair, at his expense, any damage to a prepared sub-grade caused by his operations or by use of public traffic. No material shall be placed upon the prepared sub-grade until it is in a condition meeting the requirements specified. Unless otherwise provided by the Special Provisions, the finishing of sub-grade will not be paid for as a separate item but this work will be included by Contractor under such items as Contractor deems appropriate.

#### **14-8 UNSUITABLE MATERIAL/IMPORT**

##### **1. Definition**

Unsuitable Material for roadway sub-base and trench backfill is defined as soil the Engineer determines to be:

- a. Loose, unstable or yielding, or

- b. Unable to be compacted to specified density using ordinary methods at optimum moisture content, or
- c. Contains visible or excessive deleterious material as determined by the Engineer, or
- d. Too wet to be properly compacted and circumstances prevent processing suitable in-place drying prior to being used as backfill; or
- e. Otherwise unsuitable for planned use.

## **2. Handling Trench Unsuitable Material**

Whenever the bottom of the trench is soft or rocky, or rendered not suitable by the Engineer for pipe bedding, the unsuitable material shall be removed to a minimum depth of six inches (6"), or deeper as determined by the Engineer, for pipelines or twelve inches (12") for manholes or appurtenant structures. Whenever excavated native soil is rendered by the Engineer to be unsuitable for trench strata backfill, Contractor shall remove and replace with import material approved by the Engineer.

For drainage, sewer and water pipelines the unsuitable material shall be replaced with Class 2 aggregate base or approved equal and shall be compacted to 90% relative compaction. For manholes and appurtenant structures, the unsuitable material shall be replaced with material subject to the approval of the Engineer. The Engineer may direct the Contractor to furnish and place geotextile fabric below the bedding materials. The geotextile material shall be a non-woven fabric equal to or exceeding the properties listed in the table below.

| <b>REQUIRED NONWOVEN GEOTEXTILE PROPERTIES</b> |                    |  |
|--|--------------------|--|
| <b>Physical Property</b>                       | <b>Test Method</b> | <b>Acceptable Minimum Test Results</b> |
| Tensile strength, lb                           | ASTM D 4632        | 200 lbs.                               |
| Elongation, %                                  | ASTM D 4632        | 50%                                    |
| Permittivity, sec <sup>-1</sup>                | ASTM D 4491        | 1.5 sec <sup>-1</sup>                  |
| Puncture strength, lb                          | ASTM D 4833        | 120 lbs.                               |
| Mullen Burst strength, psi                     | ASTM D 3786        | 380 psi                                |

The cost to remove and replace unsuitable bedding material to the above specified depths shall be included in the specific bid item cost. Excavation of unsuitable material beyond these depths, so ordered removed by the Engineer, will be paid as extra work as provided in Section 4 unless otherwise specified in the Special Provisions.

The cost to haul and replace native soil that is unsuitable for trench strata backfill shall be a separate bid item that includes the import material price and the transporting expenses for both unsuitable and the import material. The cost to replace unsuitable material rendered unsuitable due to any act or omission of Contractor or due to inclement weather shall be borne by Contractor and there will be no compensation therefore.

Excavated unsuitable material shall be the property of Contractor and shall be disposed of away from the project site. For off site disposal, Contractor shall have written permission from the owner upon whose property the disposal is to be made before any material is deposited thereon.

The quantity of unsuitable material/import for trenches shown on the Proposal is for bidding purposes only. The unit price indicated will not be adjusted because the actual quantity varies from the quantity shown on the Proposal.

Payment for handling Unsuitable Material/Import shall be at the contract unit price bid per tonnage of import.

### **3. Handling Roadway Unsuitable Material**

For road sub-grades unsuitable material shall be replaced with pit run base, aggregate base Class II, cement treated bases, lime treated bases, and with geogrid.

Payment for handling Roadway Unsuitable Material/Import shall be at the contract unit price bid per ton, shall be based solely on the tonnage of import, and shall include full compensation for furnishing all labor, materials, tools and equipment, and for performing all work necessary to complete this item in place.

As an alternate the Engineer may direct Contractor to furnish and place geotextile fabric below the bedding materials. The geotextile material shall be a high modulus woven fabric, and shall be inert to commonly encountered chemicals, rot-proof, and resistant to ultraviolet light, insects, and rodents. The geotextile fabric shall have a minimum grab tensile strength of two hundred pounds (200 lbs.) in any direction as measured in accordance with ASTM D 4632, a Mullen burst strength of at least four hundred pounds per square inch (400 psi) per ASTM D 3786, and an Equivalent Opening Size no larger than the U.S. Standard Sieve Number 50 as determined by ASTM D 4751. Geotextile fabric shall be Mirafi 600X or equal. Each roll of fabric shall be handled and placed in accordance with the manufacturer's recommendations. Furnishing and placing of geotextile fabric will be paid for as extra work as defined in 4-6, "Extra Work Force Account" unless otherwise indicated.

Where geogrid is utilized Contractor shall furnish equipment required for satisfactory progress and completion of the project. Before placement of the geogrid, the site shall be cleared of all topsoil, trees, stumps, rocks, and other debris. The grade shall be reasonably smoothed, minimizing all ruts, depressions, and other distortions that would inhibit smooth and proper placement of the geogrid. Geogrid shall be placed in accordance with the suppliers installation recommendations, but in no case shall grid ties be placed less than twenty feet apart or grid overlaps be less than two feet.

Geogrid shall be laid either at the elevation and alignment as shown on the Plans or to the limits approved by the Engineer in the field and shall be oriented such that the roll length runs parallel to the roadway. When geogrid rolls are placed side-by-side, or end-to-end, they shall be overlapped a minimum of two feet or a greater distance recommended by the supplier and approved by the Engineer. Overlap geogrid in the direction that fill will be spread. Geogrid material shall be tensioned by hand and secured to the ground surface.

Care shall be taken to ensure that geogrid sections do not separate at overlaps during construction. Placement of geogrids around corners may require

cutting of geogrid product and diagonal overlapping to ensure that excessive buckling of grid material does not occur. No more than two layers of geogrid are to be placed in direct contact with one another.

When very soft subgrade soils are encountered, fill material placed over the geogrid shall be back dumped from trucks and bladed onto the geogrid in such a manner that the fill rolls onto the geogrid ahead (e.g. by gradually raising the dozer blade while moving forward), Geogrid installation procedures shall be performed so that the geogrid does not “roll” or substantially deflect ahead of the operation and possibly fold over onto itself as this undermines the structural integrity of the geogrid. Care shall be taken during the initial lifts to avoid failing the weak structure of the subgrade by preventing heavy equipment from placing the initial lifts. On firmer but still structurally unsuitable subgrades, pneumatic tired vehicles may operate directly upon the geogrid at slow speeds, less than 5 MPH, provided the geogrid does not require a protective coating.

Tracked construction equipment shall not operate directly on the geogrid. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Care shall be taken by the operators to avoid sudden sharp turning. Fill material shall be placed over the geogrid to depth and dimensions shown on the plans or as approved by the Engineer. The backfill material placed in contact with the geogrid will be the approved aggregate base material or a material with a maximum aggregate size of one and one-half inches (1 ½”) and approved by the Engineer. For damaged or torn geogrids, or for geogrids with protective coatings, any damage to the coating incurred during transportation, storage or installation shall be repaired or replaced to the satisfaction of the Engineer by Contractor at their expense. The coating shall be restored to its original condition.

#### **14-9 PAYMENT**

Payment shall be at the unit price per cubic yard and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in the installation, and all other necessary work as directed by the Engineer to conform with this item.



## **Section 15**

### **WATER USED IN CONSTRUCTION**

#### **15-1 WATER USED IN CONSTRUCTION**

Elsewhere in these Specifications there is specified the quality of water used for concrete. This paragraph is intended to cover only water used in construction.

The application of water shall be under the control of the Engineer at all times and shall be applied in the amounts and at the locations designated by the Engineer or as specified.

At the option of Contractor, excavation areas may be watered prior to excavating the material.

All equipment used for the application of water shall be equipped with a positive means of shut off.

Unless otherwise permitted by the Engineer, at least one mobile unit with a minimum capacity of 1,000 gallons shall be available for applying water on the project at all times.

Water for compacting embankment material, sub-base, base and surfacing material, and for controlling dust shall be applied by means of pressure-type distributors that will insure a uniform application of water.

If Contractor elects to do so, he may use chemical additives in water used for compaction. If such additives are used, furnishing and applying the additives shall be at Contractor's expense. The right is reserved by the Engineer to prohibit the use of a particular type of additive, to designate the locations where a particular type of additive is to be used, if the Engineer has reasonable grounds for believing that such use will be in any way detrimental to the work.

Arrangements for obtaining water needed for construction purposes must be made with the supplying agency. Proof of such arrangement, including method of reimbursement, shall be subject to inspection and approval by the Engineer.

Unless otherwise approved by the Department of Utilities, connections to the City's water distribution system used to fill tank trucks or other such equipment, shall include an air gap to separate the water supply from the equipment to be filled. The Air-gap separation shall be at least double the diameter of the supply pipe, measured vertically from the flood rim of the receiving vessel to the supply pipe; however, in no case shall this separation be less than one inch (1"). In no case will a direct connection to the City's water supply be allowed.

Water used in construction, including compacting fill, preparing sub-grade, dust control, mixing concrete, concrete curing, laying and compacting any type of base material, settling backfill in trenches or at structures, or water used for any other purpose shall be provided and paid for in accordance with the Department of Utilities "Water Hydrant Policy". A copy of said policy is available at Customer Services, 1395-35<sup>th</sup> Avenue.

## **15-2 PAYMENT**

There will be no separate payment for water used during construction, but the price therefore shall be considered included in whatever items Contractor deems appropriate.

## **Section 16**

### **STORMWATER QUALITY CONTROL**

#### **16-1 WASTEWATER AND GROUND WATER DISCHARGES**

Contractor shall be responsible for the control, removal, and disposal of any groundwater that may be encountered in the course of excavating and backfilling trenches, placing pipe, or constructing any other improvements associated with the project. Unless approved in writing by the Engineer, groundwater and/or water from trench dewatering shall be free of sediment and other construction materials before entering the City sewer or storm drain system. Approval from the City's Department of Utilities will need to be obtained prior to any pumping or discharging of water to the City storm drain or sewer system.

Issues which require the regulation of groundwater discharges include: influence on existing or unknown contaminate plumes, exceeding sewer and drainage capacity, excessive demands on facility infrastructure, pumping costs, and maintenance worker safety.

It is the responsibility of the contractor to verify that groundwater is free of contamination through a regular monitoring program.

All Groundwater discharges within the City of Colusa must be arranged through the Department of Utilities, (916)808-1400, 1395 35<sup>th</sup> Avenue, Colusa CA 95822.

#### **DISCHARGE TO SEWER SYSTEM**

If 25,000 gallons of water per day, or more, is discharged to the City's Sewer System, Contractor will be required to obtain a discharge permit from the State Water Board. The City will reimburse Contractor for fees paid to the State to obtain a discharge permit, but Contractor shall be responsible to pay any fines levied if Contractor does not comply with the permit requirements.

All new discharges to the City of Colusa's sewer system must be regulated and monitored by the City Utilities Department. No Groundwater discharges are allowed to the City's sewer system

#### **DISCHARGES TO THE STORM DRAINAGE SYSTEM**

Any discharges to the storm drainage system must be secured with an individual National Pollutant Discharge Elimination System (NPDES) permit from the Central Valley Regional Water Quality Control Board (Water Board) and an

MOU from the City. The NPDES permit must be received prior to the City issuing an MOU to discharge to the City's storm drainage system.

## **16-2 STORMWATER QUALITY**

These requirements consist of regulations contained in the National Pollution Discharge Elimination System (NPDES) Municipal Stormwater Permit issued to the City and the City's Stormwater Management and Discharge Control Ordinance.

Contractor shall comply with all City and County of Colusa air pollution control rules, regulations, ordinances, and statutes which apply to any work performed pursuant to the contract, including any air pollution control rules, regulations, ordinances, and statutes, specified in the Government Code. Contractor shall be responsible for the control of dust within the limits of the project at all times including weekends and holidays in addition to normal working days. Contractor shall take whatever steps are necessary or required by the Engineer to eliminate the nuisance of blowing dust to prevent sediment, debris, or litter from entering the City storm drain system.

### **16-3 EROSION, SEDIMENT, AND POLLUTION CONTROL**

Contractor shall be responsible for the implementation and maintenance of erosion, sediment and, pollution control measures, otherwise known as Best Management Practices (BMPs), within the limits of the Work site and all areas impacted by the project at all times during the course of construction, including evenings, nights, weekends and holidays in addition to the normal working days, in accordance with the provisions of Colusa City Municipal Code.

Contractor shall provide the following erosion, sediment, and pollution control Best Management Practices (BMPs) when and where applicable:

Contractor shall place Filter Bags in and Gravel bags around any storm drain inlets which receive runoff from the limits of the construction zone, including storage and staging areas. Alternative storm drain inlet protection BMPs may be used with approval of the Engineer. (City of Colusa Improvement and Design Standards, drawings 11-2 and 11-9)

Contractor shall cover all stockpiles prior to a forecasted rain event and/or place gravel berms (or approved equal) around material piles as required to prevent migration of material to gutters or storm drains.

Contractor shall keep gutter flowlines unimpeded and free of soil, debris, and construction materials at all times.

Contractor shall install and maintain an effective construction entrance at any soil to concrete/asphalt interface used by Contractor vehicles and equipment in accordance with City of Colusa Improvement and Design Standards, drawing 11-1.

Contractor shall place silt fences, fiber rolls or approved equal at any soil to concrete/asphalt interface at which soil may be washed onto the concrete/asphalt in accordance with City of Colusa Improvement and Design Standards, drawings 11-3 and 11-4.

Wash water, slurry and sediment from concrete or asphalt saw-cutting operations shall not be allowed to enter the City storm drain system, but instead must be collected and disposed of, by Contractor, in a manner approved by the Engineer.

Contractor is required to implement, at a minimum, the following housekeeping practices:

### **Site Cleanup:**

Contractor shall be responsible for the control of dust, mud and debris resulting from Contractor's operations within the limits of the project at all times including weekends and holidays in addition to normal working hours. Contractor shall take whatever steps are necessary or required by the Engineer and daily clean up throughout the project shall be required as Contractor progresses with the work.

Daily or as needed, all paved areas within the limits of the project shall be cleaned and free of sediments, asphalt, concrete and any other construction debris. Contractor shall not clean sediment and debris from the street by using water to wash down streets.

Spillage of earth, gravel, concrete, asphalt, or other materials resulting from hauling operations along or across any public traveled way shall be removed immediately by Contractor at their expense. If site is not kept sufficiently clean, the City will take measures to clean it and subtract the cost thereof from payments owing the Contractor.

### **Solid Waste Management:**

Contractor shall maintain a clean construction site. Contractor shall provide designated areas for waste collection. The waste collection areas shall be leak-proof containers with lids or covers. Site trash shall be collected daily and placed in the disposal containers. Contractor shall make arrangements for regular waste collection. Contractor shall also regularly inspect the waste disposal areas to determine if potential pollutant discharges exist.

### **Hazardous Material Storage and Delivery Area:**

Contractor shall provide one central hazardous material storage and delivery area (HMSDA) for the duration of the project. Examples of hazardous materials include pesticides and herbicides; fertilizers; detergents; petroleum products; acids; lime; glues; paint; solvents and curing compounds. This area shall be protected such that polluted runoff will not be allowed to leave the HMSDA site. Contractor shall regularly inspect the HMSDA site to ensure that any hazardous or non-hazardous materials have not spilled.

### **Concrete Waste Management:**

Contractor shall arrange for concrete wastes to be disposed of off-site or in one designated on-site area. Concrete wastes, including left-over concrete and material from washing out the concrete truck, shall not be disposed or washed into the storm drain system. A designated on-site concrete waste

containment area shall be provided. The site shall be bermed and lined to keep concrete waste from leaving the containment area. The dried concrete waste shall be removed and disposed of properly by Contractor at their expense.

#### **Spill Prevention and Control:**

Contractor shall be responsible for instructing employees and sub-contractors about preventing spills of hazardous materials such as equipment fuel, and about controlling spills if they occur. Proper spill control and cleanup materials and procedures shall be kept on site near the storage and equipment fueling areas and updated as materials change on site. Contractor is strictly responsible for the prevention, clean-up and consequences of any hazardous materials spills.

Throughout the duration of the project, Contractor shall inspect and maintain, in effective condition, all erosion, sediment, and pollution control BMPs before and after each storm event and as needed. Contractor shall immediately correct or replace any ineffective BMPs.

More information about required Best Management Practices and proper Housekeeping Practices can be obtained by referring to the City of Colusa's Administrative and Technical Procedures Manual for Grading, Erosion and Sediment Control available at <https://www.cityofcolusa.org/-/media/Corporate/Files/DOU/Specs-Drawings/Sediment-control-manual.pdf?la=en>

Contractor shall prepare and submit an erosion, sediment and pollution control plan (ESC Plan) to the Engineer for review. The submittal shall include a description of all pollutants to be managed during construction, and all activities that could potentially impact a waterway. Detail plan of areas to be disturbed and staging areas. All proposed BMP measures to be implemented to mitigate pollutants and activities listed. The ESC Plan shall be submitted a minimum of 48 hours prior to start of the work. **Contractor shall not begin work until an accepted ESC Plan is on file with the Engineer.** The erosion, sediment and pollution control plan shall be updated as necessary and re-submitted to the Engineer.

#### **16-4 ENFORCEMENT**

Per City Code, Contractor shall be subject to Notice of Violations (NOVs) resulting in possible Stop Work Orders and Administrative Penalties for non-compliance of this section of the Special Provisions.

Per the State's Porter Cologne Water Quality Act, Contractor shall also be subject to inspection by Staff from the Central Valley Regional Water Quality Control Board who have the authority to issue Notices of Violation (NOVs) and Penalties of up to \$10,000 per day for non-compliance. Contractor shall be liable for any fines issued to the project by the State or Federal Government for NPDES non-compliance due to Contractor negligence.

The City reserves the right to take corrective action and withhold the City's costs for corrective action from progress payments or final payment in accordance with Section 7, Retention of Sums Charged against Contractor, of the Agreement. Any fines, including third-party claims, levied against the Agency as a result of Contractor's non-compliance are Contractor's sole responsibility and will be withheld from progress payments or final payment in accordance with Section 7, Retention of Sums Charged against Contractor, of the Agreement.

#### **16-5 PAYMENT**

The contractor shall be responsible for providing a state approved SWPPP, including the NOI, WDID Number, and all monitoring requirements throughout the construction of the project. The contractor shall be paid per lump sum item for performing all the work associated with this work and compliance, and should there be any fines issued the contractor shall also be responsible for the payment thereof under this item.



**Section 17**

**DELETED**

**Section 18**

**DELETED**

## **Section 19**

### **PORTLAND CEMENT CONCRETE PAVEMENT, JOINTS AND CURING**

#### **19-1 GENERAL DESCRIPTION**

Portland Cement concrete pavement shall be constructed to the dimensions, lines and grades shown on the Plans. Unless otherwise provided in the Special Provisions, the pavement shall be constructed of Class "B" concrete, conforming to the requirements of Section 10-5 of these Specifications. Unless otherwise indicated in the Special Provisions, the Portland Cement used in the concrete shall be Type II as described in Section 10-1 of these Specifications.

#### **19-2 SUBGRADE**

Sub-grade for concrete pavement shall be prepared as specified in Section 14-7 of these Specifications. Sub-grade shall also be free of all loose and extraneous material when concrete is placed thereon and shall be uniformly moist. Any excess water on the surface shall be removed prior to placing concrete as directed by the Engineer.

#### **19-3 SIDE FORMS**

Side forms shall be furnished and installed in accordance with Section 18 of these Specifications.

#### **19-4 CONCRETE CUTTING**

Where new concrete is to join existing concrete, the existing concrete shall be cut to a true line to a minimum depth of one and one-half inches (1½") with a power driven abrasive type saw.

#### **19-5 EXPANSION JOINTS IN ALLEY PAVEMENT**

An expansion joint shall be placed ten feet (10') from each end of the work and every twenty feet (20') there from and at other places shown on the Plans. The expansion joint material shall be not less than three-eighths inch ( $\frac{3}{8}$ ") in thickness and shall conform to Section 10-4 of these Specifications.

#### **19-6 PLACING CONCRETE PAVEMENT**

Contractor shall make adequate advance arrangements for preventing delay in delivery and placing of the concrete. An interval of more than 45 minutes between placing of any 2 consecutive batches or loads shall constitute cause for stopping paving operations, and Contractor shall make a contact joint

at his expense at the location and of the type directed by the Engineer in the concrete already placed.

Slip-form paving and finishing machines shall be in satisfactory adjustment and operational condition. Prior to placing concrete, Contractor shall demonstrate proper adjustment of all screeds and floats on slip-form pavers by measurements from grade stakes driven to known elevation. Satisfactory operation and adjustment of all propulsion and control equipment, including pre-erected grade and alignment lines, shall be demonstrated by moving slip-form pavers and finishing machines over a five hundred foot (500') length of prepared sub-grade with all propulsion and control equipment fully operational.

Unless otherwise required by these Specifications, the Plans or the Special Provisions, pavement shall be constructed in twelve foot (12') traffic lane widths separated by contact joints, or monolithically in multiples of twelve foot (12') traffic lane widths with a longitudinal weakened plane joint at each traffic lane line.

All concrete shall be placed while fresh. The use of water for retempering any concrete will not be permitted. The temperature of the concrete mix at the time of placement shall not exceed 90° F.

#### **19-7 FINISHING CONCRETE PAVEMENT**

The surface of the concrete shall be finished smooth and true to grade with wooden floats. Floats shall be operated from the end of the pavement and parallel with the centerline of the pavement by means of a long handle.

The edge of the float shall be used to cut down all high areas and the material so removed shall be floated into the depressions until a true surface is obtained.

Finishers and floatmen shall be required to remain at work, after placing of concrete has stopped, long enough to complete the finishing of the pavement when the concrete has hardened sufficiently.

#### **19-8 CURING PORTLAND CEMENT CONCRETE PAVEMENT**

The curing of Portland Cement concrete pavement shall be with a pigmented sealing compound as specified in Section 10-6 of these Specifications. The application of the sealing compound shall be in accordance with the requirements of Section 90, "Concrete," of the State Specifications.

## **19-9 PROTECTION OF PAVEMENT**

Contractor shall protect the surface of the concrete pavement against all damage and markings, both from pedestrian and other traffic. Barriers shall be placed at the proper locations to protect the concrete from traffic.

The concrete pavement shall be maintained at a temperature of not less than 45°F for 72 hours after placement. When required by the Engineer, Contractor shall submit a written outline of his proposed methods for protecting the concrete pavement and maintaining the required temperature.

When required by the Special Provisions, bridges or other devices of the type shown on the Plans, or approved by the Engineer, shall be installed across the pavement to provide crossing for the public and private traffic such as will prevent damaging or marking the pavement.

The crossing devices shall be maintained in satisfactory condition throughout the period of use at any location, and, when no longer required, shall be removed by and become the property of Contractor.

After the Engineer has ordered the pavement opened to traffic, Contractor will not be held responsible for damage resulting from its use by public traffic, provided, however, that Contractor shall be liable for any damage to the newly laid pavement caused by his operations or due to an inferior product.

## **19-10 PAVEMENT DAMAGE AND REPAIR**

All damage done to or openings cut in concrete pavement or alley crossings during the progress of the work shall be repaired by Contractor under the direction of the Engineer, using for such repairs, materials conforming to the requirements of these Specifications.

## **19-11 PAYMENT**

Clearing, grubbing, and tree removal prior to grading for laying of concrete pavement shall be paid for as set forth in Section 12 of these Specifications.

Excavation and fill will be paid for as provided for in Section 14 of these Specifications.

Sub-grade preparation shall be paid for in accordance with Section 14-7 of these Specifications.

Payment for portland cement concrete pavement shall be per cubic yard of concrete required to construct the pavement to the lines, grade and to the thickness shown on the Plans. Should the sub-grade be low or irregular, thus requiring additional yardage above that computed from the thickness specified on the Plans, no allowance shall be made for such additional concrete yardage.

The price paid per cubic yard for furnishing and placing portland cement concrete in pavements shall include full compensation for preparing and finishing the sub-grade, cutting existing concrete, furnishing and placing the concrete, furnishing and placing pre-molded joint filler, furnishing and installing expansion joint material, finishing concrete surface, furnishing and applying curing compound and bond breaker, protecting the pavement, repairing any damage thereto before final acceptance and all other labor and materials to complete the work.

## Section 20

### CONCRETE IN STRUCTURES

#### 20-1 GENERAL

“Concrete in structures” shall mean concrete placed in structures such as culverts, headwalls, retaining walls, drop inlets, pump sumps, drain inlets, slabs, foundations and other concrete structures. Concrete in structures shall be Class “B” unless otherwise indicated. Concrete in pavements, curbs, gutters, and sidewalks, shall be specifically excluded from this section.

The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of publications in effect at the time of bid shall govern.

American Concrete Institute (ACI) Standard:

|           |  |
|-----------|--|
| ACI SP-15 | Field Reference Manual: Standard Specifications for Structural Concrete with Selected ACI and ASTM references. |
| ACI 211   | Recommended Practice for Selecting Proportions for Concrete.   |
| ACI 301   | Structural Concrete for Buildings.   |
| ACI 302   | Guide for Concrete Floor and Slab Construction.  |
| ACI 304   | Guide for Measuring, Mixing and Placing Concrete.  |
| ACI 305   | Hot Weather Concreting.  |
| ACI 306   | Cold Weather Concreting.   |
| ACI 309   | Consolidation of Concrete.   |
| ACI 318   | Building Code Requirement for Reinforced Concrete, with Commentary.  |
| ACI 347   | Guide to Formwork for Concrete   |
| ACI SP-4  | Publication 4 Formwork for Concrete  |

American Society for Testing and Materials (ASTM) Standards:

|             |  |
|-------------|--|
| ASTM C 31   | Method of Making and Curing Concrete Test Specimens.                   |
| ASTM C 33   | Concrete Aggregates.   |
| ASTM C 39   | Compressive Strength of Cylindrical Concrete Specimens.                |
| ASTM C 94   | Ready Mixed Concrete.  |
| ASTM C 143  | Slump of Portland Cement Concrete.                                     |
| ASTM C 150  | Portland Cement.   |
| ASTM C 171  | Sheet Materials for Curing Concrete.                                   |
| ASTM C 172  | Method of Sampling Freshly Mixed Concrete.                             |
| ASTM C 192  | Making and Curing Concrete Test Specimens in the Laboratory.           |
| ASTM C 227  | Test for Potential Alkali Reactivity of Cement-Aggregate Combinations. |
| ASTM C 231  | Air Content of Freshly Mixed Concrete by the Pressure Method.          |
| ASTM C 260  | Air Entraining Admixture for Concrete.                                 |
| ASTM C 289  | Test of Potential Reactivity of Aggregates.                            |
| ASTM C 295  | Petrographic Examination of Aggregates.                                |
| ASTM C 309  | Liquid Membrane Forming Compounds for Curing Concrete.                 |
| ASTM D 98   | Calcium Chloride.  |
| ASTM D 1785 | Poly (Vinyl Chloride 40, 80 and 120.) PVC Plastic Pipe, Schedules      |
| ASTM C 138  | Unit Weight, Yield and Air Content of Concrete                         |
| ASTM C 173  | Air Content of Concrete by the Volumetric Method                       |



U.S. Dept. of Commerce, National Bureau of Standards Publications,  
Product Standards:

|     |                                     |
|-----|-------------------------------------|
| PS1 | Construction and Industrial Plywood |
|-----|-------------------------------------|

West Coast Lumber Inspection Bureau (WCLB) Standard:

|        |  |
|--------|--|
| No. 16 | Standard Grading and Dressing Rules for Douglas Fir, Western Hemlock, Western Red Cedar, White Fir, and Sitka Spruce Lumber. |
|--------|--|

National Forest Products Association (NFPA): National Design Specification for stress grade lumber and its fastening.

Western Wood Products Association (WWPA): Western Lumber Grading Rules.

Concrete shall also conform to Section 10 of the Technical Specifications.

Notes pertaining to concrete on the Plan sheets are a part of these Specifications.

Contractor shall submit the following in accordance with Section 5-7:

1. Proposed mix designs, including admixtures and curing material
2. Certificate of Compliance that concrete meets the specified requirements and delivery tickets for all concrete delivered to the project site.
3. Shop Drawings including:

**a. Formwork:**

Drawings of all formwork showing form plywood patterns, formwork, and ties.

**b. Concrete placement:**

Vertical limits of concrete placements horizontal lifts, and construction joints.

**c. Shoring:**

Drawings and structural calculations showing members, connections, and anchorage of the proposed shoring system. Calculations and drawings shall be stamped by a Civil Engineer currently licensed in the State of California.

**20-2 FOOTINGS**

Footing elevations shown on the Plans shall be considered as approximate only and only when excavation is completed and the character of the supporting natural ground is ascertained can the elevation of the bottom of footings be determined by the Engineer.

**20-3 DRAIN INLETS**

Drain Inlets shall conform to the Standard Drawings contained within City of Colusa Improvement and Design Standards.

Concrete for drain inlets shall be Class "A" or "B", and shall conform to Section 10 of these Specifications. The concrete box portion of the drain inlet shall be cast to the proper grade in a maximum of two (2) placements of concrete. Use of grout to adjust the drain inlet frame to the proper grade will not be permitted without specific approval of the Engineer.

Reinforcing bar supports or other approved means shall be used to hold the frame at proper grade during final placement of concrete. Broken pieces of concrete, or other debris, shall not be used for this purpose. At the option of Contractor, drain inlets may be furnished and installed as precast units, or the units may be combined precast and cast-in-place structures, provided the structures in place substantially conform to cast-in-place construction as specified in these Specifications.

**20-4 CONCRETE FORMWORK**

Forms shall be designed, constructed, and maintained so as to insure that after removal of forms, the formed concrete will have true surfaces free of offset, waviness or bulges, and will conform accurately to the indicated shapes, dimensions, lines, elevations, and positions.

Form shall be provided with accessories and openings in forms as required for placement of equipment and materials. Remove forms after concrete has cured.

Unless otherwise specified or approved by the Engineer, form materials shall be as follows:

**1. Plywood:**

PS 1, B-B Plyform Class 1, EXT-APA, edge-sealed, 5/8" thick when studs are spaced 12" on center and 3/4" thick when studs are spaced 16" on center. As an alternate OSB may be used, of equal quality, strength and dimensions.

**2. Wood strips for forming reveals, chamfers and quirks:**

Any close grain hardwood or softwood, free of knots.

**3. Framing lumber:**

Douglas Fir "Standard" grade, sized to uniform width and depth.

**4. Sheathing:**

Douglas Fir "Construction" grade boards and sheathing, 10" maximum width.

Form accessories shall be as follows:

**1. Form Ties:**

Ties for concrete building structures, exposed to view shall be adjustable type, arranged to leave no metal within 1" of surface. They shall have no lugs, cones, or other devices that will leave holes larger than 1" diameter in exposed concrete surfaces. In all other instances, "Snap" ties and spreaders shall be used with approved clamps or separate metal spreaders. Do not use wood spreaders or wire ties.

**2. Form Coatings:**

Burke Concrete Accessories, Inc.'s "Burke Release", Nox-Crete, or approved equal. Apply per manufacturer's printed instructions.

Contractor shall provide openings for mechanical and electrical work and work of other sections shall place items to be incorporated in concrete and support on formwork and shall seal forms around openings to prevent concrete seepage.

The design and engineering of all formwork, falsework and shoring, as well as its construction and protection, is Contractor's responsibility and shall conform to ACI 347 unless otherwise directed or approved.

Forms for exposed concrete surfaces shall be designed and constructed so that the formed surface of the concrete does not undulate excessively in any direction between studs, joists, form stiffeners, form fasteners, or wales. Undulations exceeding either 3/32 inch or 1/270 of the center to center distance between studs, joists, form stiffeners, form fasteners or wales will be considered to be excessive.

Forms shall be constructed to provide concrete conforming to dimensions shown, and to tolerance limits listed in ACI 301 "Specifications for Structural Concrete for Buildings".

Installation of forms shall conform to ACI 301, 347, P4 and this section. Forms shall be designed for easy removal. Contractor shall not pry against face of concrete, shall use wooden wedges only, and, in order that reused forms will not contain patches resulting from alterations, forms for concrete exposed-to-view shall be reused only on identical sections.

Forms shall not be used if there is any evidence of surface wear or tear which would impair the quality of the exposed-to-view concrete. Forms shall be thoroughly cleaned and re-lubricated before reuses. Formwork for exposed-to-view concrete shall be observed continuously while concrete is being placed to see that there are no changes of elevation, plumbness, or camber. If, during construction, any weakness develops and the falsework shows any undue settlement or distortion, the work shall be stopped, the affected construction removed, if permanently damaged, and the falsework strengthened.

Forms shall be substantial, true to line and level, sufficiently tight to prevent leakage and shall conform to indicated dimensions. Locate form ties for exposed concrete in straight horizontal and vertical lines and as indicated on Drawings and specified herein. Provide cleanout holes at bottom of forms. Remove debris before concrete is placed. Construct forms for exposed surfaces so that joints in forms are either horizontal or vertical and are located to the pattern indicated.

External corners on all concrete shall be formed with chamfer strips in corners of forms to form bevel at external angles. All form joints in forms for exposed-to-view concrete shall be sealed with specified form tape to prevent leakage. Camber soffits to accommodate anticipated deflections caused by wet concrete and construction loads. Provide positive means of adjustment for shores and struts. Take up settlement as concrete is placed.

## **20-5 REMOVAL OF FORMS**

Remove forms, shoring and bracing carefully to avoid damage to fresh concrete, but not before concrete is capable of self support and support of

construction loads. Do not pull tie rods until concrete is hard enough to permit withdrawal without damage to concrete. Pull ties that are entirely withdrawn from wall toward inside face.

Regardless of strengths attained by concrete, leave forms in place for following periods when supporting:

1. Vertical surfaces: 3 days minimum
2. Slabs, on grade: 7 days minimum
3. Beams, girders and elevated slabs: 15 days minimum, but do not remove vertical support until concrete has reached its 28-day strength.

Before reuse of plywood forms, thoroughly clean, sand and recoat them with form coating. Do not reuse plywood that has torn grain, patches, worn edges, damaged phenolic resin covered surfaces, or other defects which would impair texture of finished surface. Other wood forms shall be prepared for reuse by thorough cleaning and recoat with form coating. Repair damaged forms and replace loose or damaged boards.

Live loading of new construction while reshoring is under way is not permitted. Do not over stress new construction by over tightening reshores. Leave reshores in place until concrete has reached its specified 28-day strength. Reshore floors that support shores under wet concrete, or leave original shores in place. Reshores shall have at least half the capacity of the shores above and be distributed in approximately the same pattern. Leave these reshores in place until freshly placed concrete has reached 75% of its specified 28-day strength.

For concrete exposed-to-view in completed structures use specified "B-B" or better plyform plywood or phenolic resin covered form board.

For concealed concrete, plywood, lumber or steel is acceptable. Footings may be poured directly against earth banks where soil conditions are such that vertical banks will remain stable during placing operations. Earth forms at walls are not permitted.

## **20-6 REINFORCEMENT**

Reinforcement shall conform to Section 21 of the Technical Specifications.

## **20-7 DESIGN OF MIXES**

Contractor shall be responsible to design concrete mixtures resulting in

the required 28-day compressive strength and other required characteristics. Design of mixes shall be in accordance with Section 10.

## **20- 8 PREPARING TO PLACE CONCRETE**

Contractor shall provide inserts, required or shown on the Plans: embedded items, including installation of work built into concrete such as waterstop sleeves, anchor bolts, wood nailers, reglets, frames and sleeves for piping, conduit and fittings. Forms shall be cut and reinforced as required to accommodate them. No concrete shall be placed until all inserted items are installed in their proper locations, secured against displacement, cleaned, inspected and approved. Furnish ties and supports necessary to keep embedded items in place when concrete is placed.

Contractor shall remove excess water from forms before concrete is deposited, and shall remove hardened concrete, debris, and foreign materials from interior of forms and from surfaces of mixing and conveying equipment.

Prior to placing concrete, Contractor shall wet wood forms sufficiently to tighten up cracks and shall wet all other materials sufficiently to reduce suction and maintain concrete workability.

Contractor shall lightly dampen subgrade no more than 24 hours in advance of concrete placement, but do not muddy. Reroll where necessary for smoothness and remove loose earth material.

Set screeds for flatwork placement at walls and at maximum of 8-foot horizontal distance between adjacent screeds.

Concrete shall not be placed during rainy weather unless approved measures are taken to prevent damage to concrete.

## **20- 9 FLATNESS TOLERANCE FOR FLOOR SLABS**

Finish slabs monolithically. Uniformly slope floor slabs to provide positive draining of indicated areas. Special care shall be taken so that a smooth, even joint is obtained between successive pours.

Finished surfaces shall be true plane surfaces with no deviation in excess of 1/8 inch measured using a 10 feet long straight edge.

Replace or repair any slab which fails to meet this standard. If slabs fail to drain as indicated, remove drains and faulty floor section and refinish topping so that it drains according to the Drawings. No deviations will be allowed.

## 20-10 PLACING CONCRETE

Place concrete only after subgrade, forms, and reinforcement have been approved. Limit free vertical drop in concrete walls or columns to three (3) feet. In other concrete, limit the drop to five (5) feet. Deposit concrete in horizontal layers not more than 18" deep and continue pouring until section is completed. Control rate of pouring and depth of layers so that each layer will be covered within one hour after it is poured. Pour columns to top and allow to settle two (2) hours before additional concrete is placed. Place concrete continuously between pour joints.

Grout mix shall be regular concrete mix with  $\frac{1}{2}$  the large aggregate omitted. Use to cover the following before additional concrete is placed:

1. Flat form surfaces next to congested steel.
2. Construction joints.
3. Top of column and wall footings.
4. On surfaces where concrete has set.

Vibration and tamping shall be performed as concrete is placed in forms, to work concrete around reinforcing steel, built-in items and into corners and angles. Extra care shall be given to work architectural concrete around inserts, reveals, quirks, corners and plastic cones of ties to preclude rock pockets, air pockets, and other defects, and to produce sharp corners, edges and smooth surfaces. Provide mechanical vibrators operated by experienced workers for agitating concrete in forms. Vibrate thoroughly within five (5) minutes after layer is placed. Carry vibration well into previous layer. Vibrators shall not be used to transport concrete inside forms. Internal vibrators shall maintain a speed of not less than 7,000 impulses per minute when submerged in concrete. Supplement vibration by suitable methods to eliminate voids along forms for full depth of layer as directed. Do not allow vibrators to strike overlaid plywood surfaces. Do not use vibrators to work concrete along forms. Keep at least one spare vibrator on job at all times while concrete is being placed. Comply with ACI Committee 309 Consolidation of Concrete, Committee Report.

Upon completion of a pour and after concrete has partially hardened, wash scum or laitance off concrete surface with stiff brush and stream of water. When work is resumed, brush clean with wire brushes or sandblast, then place fresh concrete.

The following applies when pumping concrete:

**1. General:**

Do not use aluminum or aluminum lined pipe. Prevent concrete from contacting aluminum fittings

**2. Mix:**

Do not add more water to mix unless approved by the Engineer. Check that the mix design entered on delivery ticket complies with that ordered.

**20-11 CONSTRUCTION JOINTS**

The location and design of joints not shown or specified are subject to approval of the Engineer prior to placement of concrete.

Where Horizontal joints occur in exposed concrete, set smooth painted wood strips in form to provide a straight and level joint in which upper pour laps lower pour. Place concrete level with, but not above top of pour joint strip as shown on Drawings. Allow 24 hours before concrete is placed over horizontal joints. Remove loose material and laitance. Clean by sandblasting, or wire brushing. Allow enough time between placing of adjacent pour sections to provide for initial shrinkage. Horizontal joints will not be allowed in beams, girders and slabs unless otherwise indicated.

Vertical joints not shown on the Drawings shall be so made and located as to least impair the strength of the structure and shall be approved by the Engineer prior to placement of concrete.

**20-12 EXPANSION JOINTS AND RUBBER WATERSTOPS**

When premolded joint filler is shown on the Plans or specified, the filler shall be placed in correct position before concrete is placed against the filler. The edges of the concrete at the joint shall be edger finished. Unless otherwise provided in the Special Provisions, expansion joint material shall be as specified in Section 10-4 of these Specifications.

Neoprene or rubber water stops shall be placed where shown on the Plans, and shall conform to the requirements of Section 51, "Concrete Structures," of the State Specifications.

**20- 13 CURING OF CONCRETE**

Concrete shall be cured in accordance with Section 90, "Concrete," of the State Specifications.



## **20- 14 SURFACE FINISHES OF CONCRETE STRUCTURES**

The ordinary surface finish required on concrete structures shall be that obtained by careful forming, proper consolidation and even texture of concrete.

Immediately after forms have been removed, all form bolts shall be cut off one inch (1") below the finished surface of the structure or snap ties removed. Remove honeycombed and other defective concrete to sound concrete, but not less than 1" deep. Make the walls of the cut area perpendicular to the surface. Do not feather out the edges. Dampen the patch area and the adjacent area six (6) inches around the patch area. Brush the patch area with a bond of neat cement and water paste and apply patching mortar when the water sheen is off the bond. The holes remaining shall be filled with cement mortar using one (1) part cement to two (2) parts sand with the least water required to produce a workable mass. Rework this mortar until it is the stiffest consistency that will permit placing. After entirely filling voids, strike off the mortar slightly higher than the surrounding surface, let set for one hour and finish flush with the surrounding surface.

Any defects in the concrete surface caused by poor material in the forms, poor form construction, or by voids or pockets in the concrete, yet are not sufficiently severe to cause rejection of the pour, will be repaired and finished to make the surface finish uniform. The Engineer will direct Contractor to correct such defects and they shall be repaired without extra compensation.

The surface finish of any structure may be given further treatment if such a requirement is called out on the plans or by the Special Provisions.

## **20-15 FINISHING FORMED SURFACES**

Finish formed surfaces by removing any and all fins. The tolerances of finished formed surfaces shall conform to ACI 301.

## **20-16 FLATWORK**

Place floor slabs on grade in alternate strips. Place each unit against construction joint forms with formed control joints perpendicular to the poured strips. Pour slabs-on-grade against a moist subgrade. Wet the subgrade the day before placing concrete. Moisten subgrade just ahead of concrete as it is placed. Do not place concrete in standing water. Provide new, clean cut, sharp-edged wood headers at construction joints of suspended slabs. Deposit concrete evenly, consolidated with mechanical vibrators, particularly at side forms, and screed to indicated elevations and contours. Maintain full indicated thickness of slab over all parts of cambered support. Concrete shall be compacted with a grid tamper to eliminate voids and pockets and to produce a uniformly dense

slab. Where ground slabs are left to receive deferred finishes, provide protection against contamination from time of placing concrete until time of placing finish. Remove contamination mechanically leaving a clean surface.

Joint location and detail shall be as indicated. Tooling is required at control and pour joints.

### **Control joints**

After concrete surface is screeded, cut concrete with a cutting bar, or other approved tool, approximately 1/4" thick x 2" deep. Form straight clean lines. After slot is formed in stiff concrete, insert 1/8" thick x 1-1/2" strip of tempered hardboard or plastic joint form zip strip. Butt strips neatly to line and flush with concrete surface. Finish slab flush with top of hardboard strips without tooling.

### **2. Construction joints:**

Form construction joints with 2" nominal dressed lumber, or approved steel forms. Provide enough stakes to prevent sagging and misalignment under construction loads. Leave forms in place as long as possible and remove without chipping the edge of the slab. Protect the slab edge until the adjacent slab is placed.

### **3. Expansion joints**

Provide sponge neoprene joint filler where shown on the Drawings. Place filler to provide space for sealant as indicated. Seal joints with specified sealant per manufacturer's printed instructions. Thickness of filler material is indicated.

Contractor shall apply a medium broom finish just after final troweling to all flat slabs not specified to receive another finish.

Where wood float finish is indicated, screed slabs to elevations indicated. Compact with motor driven disk type compactor float and bull float to smooth, even surface. Perform final finishing with wood hand floats to give finished surface uniform, slightly roughened texture.

Where steel trowel finish is indicated, tamp fresh concrete with a grid tamper enough to raise a thin bed of mortar to surface. Before finishing, remove any excess water. Level and compact with motor drive disk type compactor float. Immediately after floating, the surface shall be further leveled and compacted with a motor driven rotary trowel with flat-pitched blades. Final troweling shall be done with steel hand trowel after surfaces have become hard enough to produce a hard, dense, smooth, burnished surface.

## **20-17 GROUTING AND DRYPACKING**

Grout shall consist of one (1) part cement, two (2) parts sand and sufficient water that the grout will just flow under its own weight. Water reducing and workable agent may be added at Contractor's option.

Drypack shall consist of one (1) part cement, 2 parts sand, with just enough water to bind the materials together.

Dampen surfaces before grouting and slush with neat cement. Force grout into place and rod so as to fill all voids and provide uniform bearing under plates. Provide smooth finish on exposed surfaces and damp cure for at least three (3) days.

Non-shrink grout shall be used exclusively under structural steel base plates in accordance with manufacturer's printed instructions.

When concrete overlay bonding is required, the surface of the existing concrete is to be roughened by sandblasting to remove loose material, rust and oils. Sufficient cement matrix should be removed to expose surface aggregates and to form a roughened surface for bonding. Clean with a high pressure water jet and allow to surface dry. Immediately apply an acrylic bonding agent such as Burke Acrylic Bondcrete at the rate of 200 sq. ft. per gallon and follow with placement of the concrete overlay after a minimum of one hour and after the film is dry to the touch. Install bonding agent in strict accord with manufacturer's instructions.

## **20-18 WEEP HOLES IN WALLS**

Weep holes or drains in wall shall be provided as shown on the Plans and with drain rock backing or as indicated. Placement of the drain rock behind the weep hole shall be made in a manner satisfactory to the Engineer.

## **20-19 CONCRETE PLACED UNDER WATER**

Unless specifically indicated on the Plans or called for by the Special Provisions, no concrete may be poured underwater without approval of the Engineer. When underwater placement of concrete is so approved, the placement shall be by approved tremie or bottom dump bucket. The consistency of the concrete shall be varied to suit this type of placement and must meet the approval of the Engineer. Underwater pours shall be continuous until completed. Pouring of concrete in running water will not be permitted.

**20-20 QUALITY CONTROL**

The Engineer will be responsible for the routine quality control testing of concrete mixes. Contractor shall assist the Engineer in obtaining samples of fresh concrete.

Slump Test: Slump test shall be performed at the job site by the Engineer in accordance with ASTM Test Method C 143.

Compressive Strength Tests: Each day concrete is poured, the Engineer shall mold four concrete test cylinders in accordance with ASTM C 31. Contractor shall pay for the service of an independent testing company to cure and test the concrete cylinders in accordance with ASTM C 39 and C 172. Cylinders shall be tested at 7 days, 14 days, 21 days, and 28 days. Methods of sampling and testing concrete mixtures shall include but not be limited to the following:

|                       |                      |
|-----------------------|----------------------|
| Composite Samples:    | ASTM C 172.          |
| Specimen Preparation: | ASTM C 31.           |
| Compressive Strength: | ASTM C 39.           |
| Air content:          | ASTM C 173 or C 231. |
| Slump:                | ASTM C 143.          |
| Unit Weight:          | ASTM C 138           |

Evaluation and acceptance of concrete and concrete structures shall be in accordance with Chapters 17 and 18 of ACI 301.

Any retesting and inspection of concrete due to inadequacy, deficiency, failure, or removal shall be done at Contractor's expense.

**20-21 MEASUREMENT OF QUANTITIES**

The volume of concrete to be paid for shall be determined by computation from the dimensions of the structures as shown on the Plans and as amended by approved change order. No deduction will be made for volume of reinforcing steel.

**20-22 PAYMENT FOR CONCRETE IN STRUCTURES**

The price bid per cubic yard for concrete in structures shall include full compensation for all excavation and backfill, unless there is a separate payment for that item, for furnishing and building all necessary forms, for furnishing and

placing all concrete, for furnishing and placing all reinforcing steel, for furnishing and placing expansion joint material and rubber water stop if shown on the Plans, for curing the concrete, for weep holes in walls, for finishing all concrete surfaces, and for doing such other work as may be necessary to construct concrete in structures as indicated on the Plans and in the special provisions.

Unless otherwise indicated in the Special Provisions payment for drop inlets shall be at the unit price bid per each and shall include full compensation for excavation, backfill, furnishing all material, labor, tools and equipment and doing all work necessary for construction, complete in place.

## Section 21

### PLACING STEEL REINFORCEMENT

#### 21-1 MATERIALS

Provide reinforcing steel as shown on the Plans. Conform to Section 10-23 of these Technical Specifications except as modified herein. All materials covered by this Section shall be manufactured in the United States.

The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of publications at the time of bid shall govern.

#### American Concrete Institute (ACI) Standard

|           |   |
|-----------|---|
| ACI 318   | Building Code Requirements for Reinforced Concrete. |
| ACI SP-66 | ACI Detailing Manual.                               |

#### American Welding Society (AWS)

|            |   |
|------------|---|
| AWS D 12.1 | Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Construction. |
|------------|---|

#### Concrete Steel Reinforcing Institute (CRSI)

|         |                                      |
|---------|--------------------------------------|
| 1 MSP   | Manual of Standard Practice          |
| 1 SPLBK | Reinforcement Anchorages and Splices |
| 1 PLACE | Placing Reinforcing Bars             |

Use galvanized steel chairs and accessories or plastic coated units for work exposed to view, weather, or moisture so that finished surfaces will not be marred or stained; use precast concrete only (no metal), suitably sized for load distribution, in slabs-on-grade. Use no supports of wood or other cellulose material.

#### 21-2 SUBMITTALS

Before starting concrete work, submit shop drawings in accordance with Section 5. Comply with requirements of ACI 318, ACI SP-66, CRSI 1MSP, CRSI

1SPLBK, and CRSI 1DET. Show bar size, dimensions, bends, placing, and construction joint details. Submit drawing showing locations of any construction joints not shown on the plans. Maximum submittal drawing size shall be 22-inches by 34-inches. Submit type, size, and location of all slab and bar supports. Hooks, lap splices, bends and offsets shall be in accordance with the drawings. Obtain approval before shop fabrication. Such approval is intended only as an additional precaution against errors, and shall not be construed as relieving Contractor of his responsibilities for the accuracy of the information.

Submit Certificate of Compliance stating that reinforcement complies with specified requirements. Reinforcing steel shall be properly identified. Contractor shall bear costs for test of steel by an approved laboratory if the reinforcing steel is not properly identified.

### **21-3 CLEANING**

Reinforcing steel, before being placed in the forms, shall be thoroughly cleaned of loose mill and rust scale, mortar, oil, dirt, and of coatings of any character which would reduce or destroy the bond. Clean surfaces to be welded of loose scale and all foreign material. Clean welds each time electrode is changed. Chip burned edges clean before welds are deposited.

### **21-4 BENDING**

Bending and Forming: Fabricate indicated size bars into shapes and lengths shown on approved shop drawings by methods not injurious to materials. Do not heat reinforcement for bending. Bars with kinks or bends not inschedule will be rejected

Reinforcing steel shall conform accurately to the dimensions shown on the Plans. The term "standard hook" used herein shall conform to ACI SP-66.

Bends for all bars other than stirrups, tie hooks, and standard hooks shall have diameters on the inside of the bar not less than allowed by the above references.

### **21-5 PREPARATION FOR PLACING**

Bundle reinforcement and tag with suitable identification to facilitate sorting and placing, and transport and store at site so as not to damage material.

Prior to installation of reinforcing steel work, Contractor shall inspect surfaces to receive work, and arrange for satisfactory correction of defects in workmanship and material that could have adverse affect on reinforcing steel work.

Contractor shall receive approval in writing from the Engineer of all reinforcing work prior to ordering concrete for placement.

## **21-6 PLACING**

Conform to CRSI 1 MSP, and CRSI 1 PLACE except as modified herein.

At each location during concrete placing, inspect reinforcement and maintain bars in correct positions. Templates to maintain the correct position of reinforcing may be required. Contractor shall install templates, if required by the inspector, at no additional cost to the City.

Reinforcing bars shall be firmly and securely held in place at the intersections by wiring with No. 14 or No. 16 wire and by using concrete or metal chairs, spacers, metal hangers, supporting wires, and other approved devices of sufficient strength to hold the reinforcement in its proper place as the concrete is poured. These supporting devices and the wire shall be furnished by Contractor at his own expense.

The clear distance between parallel bars shall not be less than two and one-half ( $2\frac{1}{2}$ ) diameters of the bar with a minimum of two inches (2"). Reinforcing bars shall have a minimum concrete cover of not less than twice the bar diameter and in no case less than one and one-half inches ( $1\frac{1}{2}$ "). The concrete cover of slab steel may be less than this minimum if so shown on the Plans. Reinforcing bars shall have a minimum concrete cover of three inches (3") from edges that are placed against earth or that are to be submerged in water.

Wire mesh used for reinforcement shall be rolled flat before placing concrete unless shown differently on the Plans. Mesh reinforcement shall be held firmly in place against vertical or transverse movement by means of devices satisfactory to the Engineer.

## **21-7 WELDS AND SPLICING**

Reinforcing bars for beams and for longitudinal slab spans shall not be spliced, except as shown on the Plans. Splices of tensile reinforcement at points of maximum stress shall be avoided. Where bars are spliced, they shall be either lapped at least forty-five (45) bar diameters for No. 8 bars and smaller and sixty (60) bar diameters for Nos. 9, 10, and 11 bars. No lapped splices will be permitted at points where the section is not sufficient to provide a minimum distance to two inches (2") between the splice and the nearest adjacent bar or the surface of the concrete.

In lapped splices, the bars shall be placed in contact and wired together in such a manner as to maintain a clearance of not less than the minimum clear distance to other bars and the minimum clear distance to the surface of the concrete. Splices shall be staggered at least the length required for a lapped



splice and not more than one-third ( $1/3$ ) of the bars may be spliced at one location provided the specific clearances are maintained.

Where wire mesh reinforcement is spliced, it shall be lapped at least the dimension of one (1) mesh.

#### **21-8 PAYMENT FOR PLACING STEEL REINFORCEMENT**

Payment for reinforcing steel shall not be made separately unless so indicated by the Special Provisions, but shall be included in other bid items and shall include full compensation for furnishing all steel, for cutting and bending, for placing, for furnishing all wire, stirrups, hangers, and placement devices for cleaning the reinforcement, and for insuring the proper placement of the steel reinforcement in the finished structure.

## **Section 22**

### **ASPHALTIC CONCRETE**

#### **22-1 ASPHALTIC CONCRETE TYPE AND MIX DESIGN**

Asphaltic concrete shall be Type A (coarse) or as designated on the Plans or specified in the Special Provisions, and shall conform to the provisions of Section 39 of the State Specifications.

Asphaltic concrete shall be produced in conformance with the requirements of a job-mix formula. The job-mix formula will take into consideration the quality of the aggregate, the type of asphalt binder material, the immersion compression retention index, the void relationships and other criteria, and said job-mix formula shall be the responsibility of Contractor. The amount of asphalt binder material, as a percentage of the total weight of the mixture shall be determined by California Test 367.

Contractor shall be responsible for designing a job-mix formula by the material supplier or through an approved testing laboratory, and shall submit it to the Engineer for approval ten (10) working days prior to any mixing and/or placing of asphaltic concrete.

During the production of either mineral aggregate or asphaltic concrete, the Engineer or Contractor may request that adjustments be made in the job-mix formula. Such request shall be in writing and substantiated through the material supplier or an approved testing laboratory. Consideration will be given promptly to such request.

#### **22-2 MATERIALS FOR ASPHALTIC CONCRETE**

Aggregate material shall conform to the requirements of Section 39 of the State Specifications for three-quarter inch ( $\frac{3}{4}$ " ) maximum aggregate for major streets and one half inch ( $\frac{1}{2}$ " ) for residential streets or as determined by the Engineer. Where two lifts are placed, the Engineer may require that the base course be  $\frac{3}{4}$ " maximum aggregate and the surface course be  $\frac{1}{2}$ " maximum aggregate. Consideration shall be given to percentage of heavy vehicles and bus stop locations.

Paving asphalts shall meet the requirements of Section 10-18 of these Specifications.

Unless otherwise indicated on the Plans or in the Special Provisions, asphalt binder to be mixed with aggregate shall be steam-refined paving asphalt: PG 64-10 or PG 64-16 for residential and collector streets and PG 70-10 for on/off

ramps, Intersections, arterials, and thoroughfares. Use ARHM-GG (Asphalt Rubber hot Mix - Gap Graded) with PG 64-16 for overlays, unless otherwise indicated.

### **22-3 MIXING EQUIPMENT FOR ASPHALTIC CONCRETE**

Mixing equipment shall conform to that specified in Section 39 of the State Specifications.

### **22-4 GENERAL REQUIREMENTS FOR PLACING ASPHALT CONCRETE AND ASPHALT CONCRETE OVERLAYS**

Contractor shall notify the public seventy-two (72) hours prior to the start of work by placing door hangers to all business and residences that may be affected by the work as determined by the Engineer. Contractor may be required to contact business owners in person to explain the work schedule as determined by the engineer. No work shall be permitted until the public has been notified.

If Required by the Engineer, Contractor shall notify the following City departments and agencies seven (7) days prior to performing the work: Public Works Solid Waste Division (Street Cleaning Section), Public Works Parking Division, Public Works Street Maintenance Section (Traffic Signs and Markings Section and Traffic Signals and Lighting Section), Police Department Communications Center, Fire Department Communications Center, and Colusa Metro Regional Transit (bus stops and light rail). If required, Contractor shall contact the appropriate representative of each City department or agency, and provide a work schedule in writing.

Contractor shall be responsible for trimming of trees necessary to perform the work as determined by the Engineer. Contractor shall obtain a tree-trimming permit from City Tree Services Division prior to trimming trees.

Contractor shall be responsible for removing all yard waste and debris effecting the work at his expense. Yard waste shall not be relocated to planter strips, pedestrian areas, or other areas not approved by the Engineer. Garbage cans that are temporarily removed from the street shall be placed back in their original position at the end of the workday.

Contractor shall be responsible for removing all vegetation from the roadway surface and edge of pavement, and sweeping in advance of placing the pavement operation (prior to tack coat) to the satisfaction of the Engineer.

Contractor shall clean, sweep, and maintain the cleanliness of the streets to be paved to the satisfaction of the Engineer throughout the course of the work. Materials spilled or dispersed as a result of the work on adjacent streets

shall also be cleaned at the expense of Contractor. The street shall be swept with a mechanical type pickup machine and shall be left thoroughly clean and clear of any pavement grindings at the end of each working day. The machine shall spray adequate amounts of water to control dust.

Contractor shall remove and dispose of existing pavement markers prior to placing asphalt. All thermoplastic limit lines, crosswalks, and legends applied to the road surface shall be scarified prior to placing the overlay. Excess crack seal shall be removed as directed by the Engineer.

Contractor shall place temporary pavement delineation necessary for the safety of vehicular and pedestrian traffic. Temporary pavement delineation layout shall be approved by the Engineer.

All manholes and utility covers concealed with asphalt concrete shall be carefully referenced out ("cross-tied") prior to the placement of asphalt by Contractor. All exposed survey monuments shall be referenced out prior to the overlay, covered by an appropriate method approved by the Engineer, and uncovered after the overlay without disturbing or damaging the survey monument. All relevant iron (manholes, water valves, etc.) shall be lowered prior to pavement planing as directed by the Engineer. Contractor shall submit "cross ties" to the Engineer prior to the lowering of iron.

Contractor shall coordinate the removal of on-street parking with the Engineer Seventy-two (72) hours prior to the start of work in accordance with Section 6-18 of these specifications.

## **22-5 PAVEMENT KEYCUTTING, CONFORMS, AND PLANING**

Where specified by the Engineer, pavement planing shall be done to profile the street to a planer surface. The general depth of planing shall be equal to the depth of the overlay unless otherwise approved by the Engineer.

Where specified by the Engineer, pavement keycutting shall be done to provide a key wedge against existing gutter lips. Asphalt concrete removal shall be to a minimum depth of one and a half inch (1½") adjacent to the lip and shall be tapered to the existing pavement grade over a distance of eight feet (8') minimum, from the gutter lip. At cross streets, where the condition of the side street is very good, pavement keycutting shall continue in a straight line from curb line to curb line parallel to the direction of work as directed by the Engineer.

At the beginning and ending limits of pavement keycutting, a planed pavement conform shall be constructed to the drawings shown in City of Colusa Improvement and Design Standards or as directed by the Engineer. At cross streets,

where the condition of the side street is poor, planed pavement conforms shall be done between the lip of the main street to the curb return of the side streets. When the beginning or ending limit of work is a crossing street, a fifty feet (50') planed conform extending to the round corner of the crossing street shall be constructed except that an eighteen foot (18') planed pavement conform shall be constructed on residential streets. The conform shall span the full width of the street for a distance of fifty feet (50') back from the limit line or feature resulting in the discontinuity in the work. At bridge decks, the conform shall span the full width of the street for a distance of fifty feet (50'). The depth of cut shall be equal to the depth of overlay at the limit of work and shall be progressively decreased to zero (0") over the conform length.

Where specified by the Engineer, pavement planing shall be done to retain the existing street elevation. The depth of planing below the gutter lip shall be equal to the specified thickness of asphalt concrete. The depth of planing at the centerline shall be equal to the specified thickness of asphalt concrete to be placed on the street, and shall increase from the lip of gutter to the street centerline linearly should the specified depths differ.

Contractor shall exercise care to avoid damaging the gutter lips during the grinding operations. Damaged gutter lips which have spalls in excess of one inch (1") deep by five inches (5") long shall be repaired at Contractor's expense.

Grinding operations shall be completed to the satisfaction of the Engineer prior to beginning the paving operation.

Contractor shall remove existing asphalt concrete from the top of the gutter pan and from the face of gutter lip as directed by the Engineer.

The grindings shall become the property of Contractor and disposed of off-site.

At the end of the workday, there shall not be any elevation difference between planed pavement and unplaned pavement in the traveled vehicle lanes and all curb ramps. Any differences that parallel the centerline of the street in a longitudinal direction shall be sloped by either a temporary asphalt plant mix cut back or additional planing, to produce a bevel within the planed pavement. The slope of either the cutback or the bevel shall be not greater than one-inch (1") vertical in twelve inches (12") horizontal. Other than for curb ramps, elevation differences between planed pavement and lips of gutters are not required to be sloped.

Elevation differences perpendicular to the centerline of the street, in a transverse direction, or elevation differences between the planed street and

cross-streets, shall be sloped as directed by the Engineer with cutback and shall not exceed one inch (1") vertical in twelve inches (12") horizontal.

If Contractor fails to slope elevation differences as required by these Special Provisions, Contractor shall pay administrative penalties of \$500 per each infraction per each calendar day elevation differences are not sloped.

Not more than three (3) calendar days shall elapse between the time pavement planing and/or pavement keycutting begins on any particular section of roadway and the time that the asphalt concrete surfacing is placed unless approved by the Engineer.

## **22-6 PLACING**

Placing of asphaltic concrete shall conform to the requirements of Section 39 of the State Specifications. The maximum paving lift shall be three inches (3") thick.

Contractor shall fill and level all surface irregularities and ruts to ensure compliance with specified tolerances.

Contractor shall use a thirty foot (30') leveling ski on the free floating edge unless otherwise approved.

Before placing asphaltic concrete surface course on an asphaltic concrete base course, a tack coat shall be applied unless otherwise approved.

The material shall be brought to the site of the work in suitable vehicles so equipped that they will operate properly with the spreading equipment being used. The Engineer shall have the right to remove any vehicle from service which is not operating satisfactorily in the spreading of the material. Tarpaulins shall be provided for all trucks and shall be used whenever the Engineer may direct.

Asphaltic concrete shall not be placed on a wet base or subgrade, and the ambient air temperature shall be 50°F. and rising. The temperature of the mix shall not exceed 320°F. nor shall it be laid at a temperature below 250°F unless authorized by the Engineer.

When base course and surface course are used, the extent to which the base course may be laid ahead of the surface course, and the requirement for a tack coat, shall be determined by the Engineer.

## **22-7 TACK COAT**

Tack coats shall be in conformance with the requirements of Section 39 "Paint Binder (tack coat)" of the State Specifications. A tack coat shall be applied to all planed surfaces, paved surfaces to be resurfaced, vertical surfaces of existing pavements, curbs, gutters, and construction joints, and other surfaces as directed by the Engineer.

Tack coats shall be SS-1 asphalt emulsion unless otherwise approved. The proportion of SS-1 and water shall be 80/20, or as determined by the engineer, and shall be applied to the surface at an application rate from .02 to 0.10 gallons per square yard. Typical application rates vary from .05 gallons per square yard for smooth finished surfaces to .10 gallons per square yard for planed pavement surfaces.

Prior to applying tack coat, the street surface shall be swept clean by brooming or washed clean to the satisfaction of the Engineer. The length of the tack coat placed in advance of the paving operation shall be determined by the Engineer to minimized degradation of the tack coat by vehicular traffic. The street surface shall also be free of moisture and dry to the satisfaction of the Engineer.

Under cold weather conditions, the Engineer may approve the use and application rate of PG 64-10 or PG 64-16 paving asphalt as a tack coat.

## **22-8 SPREADING AND COMPACTING**

Spreading and compacting requirements shall be in conformance with Section 39 of the State Specifications except as noted herein. Compaction shall be subject to density testing as defined in Section 22-9 and 22-10 of these specifications in accordance with California Test Methods 304 and 308.

Contractor shall furnish a minimum of two (2) ten (10) ton steel wheel rollers and one (1) twelve (12) ton pneumatic tired roller unless otherwise approved by the Engineer. Vibratory rollers may be substituted when approved by the Engineer.

The initial or breakdown rolling of surface course shall be followed by additional rolling consisting of three (3) complete coverage with a pneumatic-tire roller, while the temperature of the mixture is at or above 150° F. The final rolling of surface course shall be performed with a ten (10) ton, two (2) axle tandem roller.

The rolling of the asphaltic concrete material shall commence immediately after its placement. Rolling shall continue until all ruts and surface imperfections are eliminated and the proper degree of compaction is achieved.

Finish rolling shall be accomplished with a steel wheel tandem roller. A vibrating roller may be used as the finish roller provided that it meets the requirements for a finish roller as herein specified and is operated with the vibratory unit turned off. Rolling shall commence at the lower edge and shall progress toward the highest portion, except that when compacting layers which exceed 0.25-foot in compacted thickness rolling shall commence at the center and shall progress outwards.

At the commencement of the asphaltic concrete paving operations, Contractor shall cooperate with City forces in establishing and agreeing upon a rolling pattern that will insure the obtainment of the maximum possible density in the compacted asphaltic concrete surface. Once the rolling pattern is established, Contractor shall follow this pattern unless otherwise directed by the Engineer.

The City will perform compaction testing at no cost to Contractor. Contractor shall cooperate fully with City forces to take such tests, and shall make all provisions to allow the Engineer to sample the asphaltic concrete mixture from the completed surface immediately following placement by the lay-down machine.

When a straightedge twelve feet (12') long is laid on the finished surface and parallel with the center line, the surface shall not vary more than 0.01-foot from the lower edge of the straightedge. The transverse slope of the finished surface shall be uniform to a degree such that no depressions greater than 0.02-foot are present when tested with a straightedge twelve feet (12') long laid in a direction transverse to the center line and extending from edge to edge of a twelve foot (12') traffic lane. Contractor shall conform to the tolerance requirements of this specification unless otherwise approved by the Engineer in writing prior to the start of work. Contractor shall request information regarding tolerances for streets having a parabolic section prior to the start of work.

Contractor shall place asphalt such that its finished surface is  $\frac{1}{4}$  to  $\frac{1}{2}$  inches above the gutter lip.

Pavement surface shall be deemed unacceptable should the surface hold water, the pavement ravel, an uneven gradation of mix be visible, or cracking occur during rolling. Pavement shall be removed by surface planing (a minimum depth of one and one-half inches (1½") when using one-half inch (½") mix, and two inches (2") inches when using three-quarter inch mix), and repaved to the satisfaction of the Engineer. Areas to be removed and replaced will be determined by the Engineer. Should a significant amount of surface be deemed unacceptable, the entire travel lane shall be resurfaced. A series of spot patches will not be accepted. The mix design used during resurfacing shall be the same as the adjacent pavement.



Pursuant to Section 5-14 of these Specifications, the Engineer will have the right and authority, but shall not be obligated, to retain imperfect work instead of requiring the imperfect work to be removed and reconstructed. Patch paving of imperfect work will not be allowed, and the amount of the deduction shall be based on full travel lane widths from beginning to end of the work limits or two nearest intersections as determined by the Engineer.

## **22-9 PAVEMENT DENSITY TESTING**

Pavement density will be determined by comparing the average density of cores taken from the compacted pavement to the maximum theoretical density as determined by ASTM D 2041. As required by the Engineer, the pavement will be inspected on a lot basis. A lot will consist of either five hundred (500) tons of asphalt for a surfacing project or four hundred (400) lineal feet of pavement for a trenching project. One sample shall be taken from each lot on a random basis. One laboratory-compacted specimen shall be prepared from each lot.

Cores for determining the density of compacted pavement will be taken on a lot basis with a minimum of three cores per lot. The density of each core shall be determined per ASTM D 2726-89. The cores shall be four inches (4") in diameter.

Contractor shall plug core holes taken by the material tester with asphalt compacted greater than ninety percent (90%) of relative compaction if cores are taken the same day as Contractor's paving operations. The core holes shall be plugged prior to the end of the workday. If required to facilitate the taking of cores, Contractor shall leave lane closures in place for a reasonable period of time (approximately thirty minutes after pavement has cooled enough to drive on).

## **22-10 PAY FACTORS**

For all asphalt pavement subject to acceptance testing, the lot will be paid for using the following pay factors:

| In Place relative Compaction           | Payment Factor                             |
|--|--|
| 97.1% or higher (over-asphalted mix)   | 90%  |
| 92% - 97%                              | 100%                                       |
| 89%-91.9% (marginal air voids)         | 85%  |
| 88.9% or less (unacceptable air voids) | Not acceptable (60% if otherwise approved) |

The amount paid shall be at the unit price bid times the pay factor. For lots with average densities of 91.9% or less, the Engineer reserves the right to deem the lot as not acceptable and require the work to be removed and reconstructed. Unless otherwise approved by the Engineer, lots with average densities of less than 89% relative compaction shall be removed and reconstructed.

## 22-11 PAVEMENT REINFORCING FIBER

This Section includes specifications for furnishing all materials, equipment, labor, and incidentals for mixing aramid fiber reinforcement to hot mix asphalt. Aramid polymer fiber adds reinforcement to the asphalt mixture to improve high temperature rutting and low temperature cracking properties while allowing the mixture to withstand high stress applications.

-Store aramid product in a dry environment and do not allow them to be in contact with moisture.

-Standard dosage is 2.1 oz minimum of pure aramid per ton of asphalt mixture. This amount can be increased as needed such as 1.5x (3.15 oz) or 2x (4.2 oz) minimum dosage for additional mixture performance with no change to the mix design. The weight applied is for pure aramid fibers only. The weight of any delivery or packaging materials is not considered.

-The aramid fiber supplier's representative should be on site during the first day of production mixing. This requirement can be waived if fiber supplier and HMA producer can supply evidence of supplier's brand of fiber product being successfully produced by the HMA producer. The fiber supplier's representative may be on site for additional days as requested by the Engineer.

-Introduce the aramid fiber with delivery material(s) as follows:

-Batch Plant - When a batch type plant is used, add the aramid product dosage to aggregate in the weigh hopper or pugmill. This may be done with loose fibers and a fiber metering device or may be done by using manual dosing equipment. If necessary, increase the batch dry mixing time to ensure the aramid fibers are uniformly distributed prior to the injection of asphalt cement into the mixer.

-Drum Plant - When a continuous or drier-drum type plant is used, add the aramid product at the Recycled Asphalt Pavement (RAP) collar or to the RAP belt in a continuous manner to uniformly disperse with the aggregate. Use a separate aramid product metering device feed system to proportion by weight of total mix, the required percentage of fiber

reinforcement into the mixture. Control the aramid product metering system with a proportioning device to meet the dosing requirements.

*NOTE: When a continuous or drier-drum type plant is used for limited production volumes, the addition of the aramid product may be done by using manual measuring tools or equipment at the location listed above. Because this is not an automated process, a written protocol must be supplied by the producer to demonstrate how they will attain the dosage requirement, and documentation must be supplied by the material manufacturer assuring this method will produce the desired uniform aramid fiber distribution.*

-As determined by the Engineer, mix the aramid fiber with the aggregate longer, if needed, to allow thorough distribution of aramid fibers at the end of the mixing process and to promote asphalt coating of individual strands of aramid fiber. At the start of any fiber mixing, visually observe the reinforced asphalt mixture at the plant and in first three trucks at the point of discharge and prior to delivery to the job site. Observation shall include using a shovel or other tool to inspect the mixture by allowing it to slightly cool and fall from the shovel's or tool's edge. Further inspection can be performed by allowing the loose mixture to cool and pulling apart to inspect for strands of aramid. Adjust mixing time and temperature if needed to ensure aramid fiber distribution.

| Property            | Measure                            | Standard           |
|---------------------|------------------------------------|--------------------|
| Material            | Aramid                             | ASTM D276          |
| Form                | Monofilament fibers                | Manufacturer       |
| Length              | 0.75 to 1.50 inches (19 to 38mm) ± | Manufacturer Cert. |
| Filament Diameter   | 12 ± 2 microns                     |                    |
| Specific Gravity    | 1.44 ± 0.01 g/cm <sup>3</sup>      | ASTM D2256         |
| Tensile Strength    | 400,000 psi (2.758 GPa) minimum    | ASTM D2256         |
| Elongation at Break | 4.4 % maximum                      | ASTM D2256         |
| Degradation         | 800° F (426° C) minimum            | ASTM D2256         |
| Acid and Alkali     | Inert                              | Manufacturer       |
| Treatment Type      | Sasobit® Wax                       |                    |

## **22-12 PAYMENT FOR ASPHALTIC CONCRETE**

Payment for asphaltic concrete pavement with fiber reinforcement shall be at a price per ton of delivered and place material or at a price per ton for finished pavement. The method used on any work will be shown by the list of quantities on the Proposal and by the type of unit price requested in the Proposal.

Payment for asphaltic concrete pavement by either of the above two methods, as may be specified in the Proposal for that particular work, shall include full compensation for furnishing and placing the material without additional compensation. Tack coat, where required, shall also be furnished without additional compensation and as part of the bid per ton or per square foot of asphaltic concrete pavement.

Payment for pavement key cutting shall be at the unit price per lineal foot of street surface planed and shall include full compensation for furnishing all labor, materials tools, equipment and incidentals, and for doing all work involved in placing pavement reinforcing fabric, complete in place, as specified herein.

Payment for pavement conforms and pavement planing shall be at the unit price per square yard and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in placing pavement reinforcing fabric, complete in place, as specified herein.

**Section 23 - DELETED**

## **Section 24**

### **CURBS, GUTTERS AND SIDEWALKS**

#### **24-1 CONCRETE IN CURBS, GUTTERS, AND SIDEWALKS**

Concrete in curbs, gutters, and sidewalks shall be Class "B", as specified in Section 10-5 of these Specifications. The cement shall be Type II as set forth in Section 10-1 of these Specifications. Fly ash shall not be substituted for cement if subgrade is expansive clay or if the "R Value" is ten or less.

When placing new concrete next to the existing concrete, Contractor shall match the color of the existing concrete. The color additive and amount may vary, and shall be approved by the Engineer prior to placing the new concrete. Without prior approval, new concrete that does not match the color of the existing concrete shall be removed and replaced at Contractor's expense.

#### **24-2 CONCRETE CUTTING**

Where new concrete is to join existing concrete, the exact limits of existing concrete removal shall be determined by the Engineer prior to saw cutting. Concrete saws shall be water-equipped for dust control. Contractor shall take the necessary precautions to prevent cut material and saw cutting run-off from entering the City's storm drain system.

#### **24-3 SUBGRADE AND AGGREGATE BASE**

Subgrade shall be prepared as specified in Section 14-7, and aggregate base shall be prepared as specified in Section 17-1 of these specifications. A minimum of six inches (6") of Class 2 aggregate base shall be placed under all curb, gutter, sidewalk and driveways, except that twelve inches (12") of Class 2 aggregate base shall be placed if the subgrade is expansive clay or the "R Value" is ten or less. Prior to placing concrete, aggregate base shall be uniformly moist, and any excess water shall be removed.

#### **24-4 FORMWORK - NON EXTRUDED CONSTRUCTION**

Forms for curb, gutter, and sidewalk shall be of a width equal to the full depth of the curb and gutter and wood forms shall be a minimum of one and one half inches (1 1/2") thick. Warped forms and forms not having a smooth straight upper edge shall not be used. Benders, or thin plank forms, rigidly placed, may be used for returns and other curves.

All forms must be carefully set to proper alignment and grades and shall be rigidly held in place by the use of not less than five (5) pairs of stakes to every

twenty-foot (20') section, unless otherwise approved. Clamps, spreaders, and braces shall be used when necessary to obtain tolerances specified herein.

Sidewalks shall be set with the upper edge true to line and grade and shall be rigidly held in place by stakes placed on the outside of the forms and set flush with the top edge of the form. The side forms shall not be removed for at least eight (8) hours after concrete finishing has been completed.

#### **24-5 EXTRUDED (SLIP-FORM) CONSTRUCTION**

Extrusion machines shall be properly adjusted and in satisfactory operating condition. Prior to placing concrete, contractor shall demonstrate proper adjustment of all screeds and floats by measurements from grade stakes driven to known elevations. Satisfactory operation and adjustment of all propulsion and control equipment, including pre-erected grade and alignment lines, shall be demonstrated to the satisfaction of the Engineer prior to and during the extrusion of concrete.

Concrete used with extruded construction shall be of such consistency that, after extrusion, it will maintain the shape of the curb section without support. Concrete shall be fed to the machine at a uniform rate. The machine shall be operated under sufficient uniform restraint to forward motion to produce a well-compacted mass of concrete free from surface pits. Finishing with a brush application of grout to repair defects will not be permitted.

Unless otherwise indicated in the Contract Documents, extruded concrete curb shall be anchored to existing pavement by the use of dowel reinforcing, an approved adhesive, or both, as directed by the Engineer. If an adhesive is used, the surface shall be thoroughly cleaned prior to its application. The existing pavement shall be cleaned by wire brush, by blast cleaning, or as approved by the Engineer. The cleaned surface shall be free from dust, loose material, or oil. The adhesive shall conform to Section 95, "Epoxy", of the State Specifications.

#### **24-6 EXPANSION JOINTS AND SCORE LINES**

In curbs, gutters, and sidewalks, expansion (weakened planed) joints shall be placed at curb returns, top of driveway transitions, light poles, fire hydrants, beginning of drain inlet transition, other fixed objects, or where directed by the engineer. Expansion joints shall be placed every sixty feet (60'). The joint material shall be three-eighths inches ( $\frac{3}{8}$ " ) thick, a minimum of two and one-half inches ( $2\frac{1}{2}$ " ) deep, and shall conform to Section 10-4 of these Specifications. Expansion joints must be at right angles to the line of the work.

Deep-score lines shall be one and one-half inches ( $1\frac{1}{2}$ " ) deep, one-eighth inch to one-quarter inch ( $\frac{1}{8}$ " -  $\frac{1}{4}$ " ) in width, and placed every twelve feet (12') with a standard four-foot (4') bite score in between. Expansion joints, score lines, and

bite scores shall conform to the City of Colusa Improvement and Design Standards.

When placing new concrete next to the existing concrete, Contractor shall match the score lines of the existing concrete. The score lines spacing may vary and shall be approved by the Engineer prior to placing the new concrete. Without prior approval, new concrete that does not match the score lines of the existing concrete shall be removed and replaced at Contractor's expense.

#### **24-7 FINISHING CONCRETE SURFACES**

The top and exposed surface of the concrete shall be finished, whereby the concrete is poured to form or extruded, properly screeded, floated, troweled, edged, and smoothly finished, after which it shall be broomed with a fine hair push broom drawn over the surface transverse to the line of work.

Non-extruded concrete shall be placed in the forms in layers not to exceed six inches (6") and each layer shall be spaded and tamped until the concrete is thoroughly compacted. Surfaces of non-extruded sidewalks shall be finished by double screeding, which shall include working the concrete with a jitterbug until the coarse aggregate is forced down into the body of the concrete and a layer of mortar is thus forced to the top for floating, and troweling.

The top and face of the finished curb shall be true and straight, and the top surface of curbs shall be of uniform width, free from humps, sags, or other irregularities. Grade tolerance of the gutter flow line, lip of gutter, back of curb, and back of sidewalk shall not exceed plus or minus 0.05-foot in any twenty-five foot (25') length from the elevations shown on the plans. When a straightedge 10 feet long is placed on the top of a finished surface, the surface shall not vary more than .02 feet except at grade changes or curves. Contractor shall water test the gutter at the time of construction, and no more than .02 feet of water shall remain shortly after water supply is stopped.

Partial concrete pours shall terminate at an expansion joint or deep-score line. The end of such a partial pour shall be vertical and square ended. If the partial pour is terminated at a deep-score line dowels shall be required.

#### **24-8 CURING OF CONCRETE**

Concrete shall be cured in conformance with the provisions set forth in Section 10-6 of these specifications.

#### **24-9 DAMAGE AND REPAIRS**

Any damage done to concrete curbs, gutters, sidewalks, or driveways during the progress of the work shall be repaired by Contractor to the satisfaction of the



Engineer. Contractor shall protect the work from graffiti and vandalism. Patching of damaged areas shall not be allowed. Damaged or vandalized areas shall be removed and replaced to the nearest score line as directed by the Engineer at Contractor's expense.

#### **24-10 SLOPE AND WIDTH OF SIDEWALKS**

Sidewalks and planting strip between curb and sidewalk shall slope uniformly towards the street at a rate of not more than two percent (2%) and not less than one percent (1%). The transverse slope of the finished surface shall be uniform to a degree such that no depressions greater than 0.01-foot are present when tested with a straightedge laid in a direction transverse to the centerline and extending across the width of the sidewalk.

Unless otherwise shown on the Plans or by the Special Provisions, sidewalks shall be four feet six inches (4'-6") wide and three and five eighths inches (3 $\frac{5}{8}$ ") thick.

#### **24-11 DOWEL REINFORCEMENT**

Dowel reinforcement shall be installed to join existing concrete to new concrete as directed by the Engineer. A typical dowel installation consists of a No. 4 bar snugly fit or epoxied four to six inches, and spaced between 18 and 24 inches apart, in the existing concrete. The dowels shall conform to Section 21 of these Specifications.

#### **24-12 CURB RAMPS AND DRIVEWAYS**

Curb ramps for the physically handicapped and driveways shall be constructed to the dimensions, lines, grades as shown on the plans, and to the drawings shown in City of Colusa Improvement and Design Standards.

#### **24-13 CURBS & GUTTER RECONSTRUCTION TO ACCOMMODATE DRIVEWAYS**

Where curbs are removed for the purpose of constructing a driveway, the entire curb and gutter shall be removed to the nearest score line and the gutter rebuilt as directed by the Engineer.

#### **24-14 PAYMENT**

On unit price proposals, unit prices will be required as set forth in this paragraph. The price bid on each of the following items shall include full compensation for furnishing all material, labor, and equipment necessary to construct the completed work as shown on the Plans.

**1. Concrete Curb and Gutter**

Payment for concrete curb and gutter will be at the price bid per lineal foot which will include full compensation for finishing the subgrade, dampening the subgrade, including furnishing the water; furnishing, placing, and later removing necessary forms and form work; furnishing and finishing concrete; curing concrete; furnishing and placing expansion joint material; furnishing and placing dowel reinforcement; and doing such other work as may be necessary to construct the curb and gutter complete in place as shown on the Plans.

If curbs and gutters of more than one type are specified on one job, then separate unit prices will be bid for each type specified.

**2. Sidewalks**

Payment for sidewalk will be at the price bid per square foot which will include full compensation for finishing the subgrade; dampening the subgrade, including furnishing the water; furnishing, placing, and later removing necessary forms and form work; furnishing concrete; furnishing and placing expansion joint material; finishing the sidewalk surfacing; curing the sidewalk, furnishing and placing dowel reinforcement; and doing such other work as may be necessary to construct the sidewalk as shown on the Plans.

If sidewalk thickness varies on a job, then separate unit prices will be for each thickness specified.

**3. Curb Ramps and Driveways**

There will be no separate payment for curb ramps and driveways and the cost thereof shall be included in the price bid for sidewalk and/or curb and gutter, unless otherwise indicated in the Special Provisions.

**4. Removal of Existing Curb, Gutter, and Sidewalk**

Payment for Removal of Existing Curb, Gutter and Sidewalk will be included in the payment for "Clearing" or "Clearing and Grubbing" per Section 13. If there is no item for "Clearing" or "Clearing and Grubbing", payment for removal of curb, gutter and sidewalk will be at the price bid per lineal foot and will include full compensation for sawcutting, removal of curb, gutter and sidewalk and disposal at an appropriate location and all other effort associated with this item.

## **Section 25**

### **SANITARY SEWER AND STORM DRAIN MANHOLES**

#### **25-1 STANDARD MANHOLES**

City standard manholes shall conform to Sections 10, 14, 25, and to the drawings shown in City of Colusa Improvement and Design Standards. Unless otherwise shown on the Plans or called for in the Special Provisions, only City standard manholes shall be used on City work.

#### **25-2 MANHOLE CASTINGS**

Castings for manhole heads and manhole covers shall conform to Section 10-25 of these Specifications. Dimensions of manhole heads and covers shall be as shown in City of Colusa Improvement and Design Standards.

#### **25-3 CONSTRUCTION OF MANHOLES**

Sanitary sewer and storm drain manholes shall be watertight structures constructed by placing precast concrete sections on a cast in place or precast concrete base. All construction of sewer and storm drain manholes shall be constructed using precast concrete bases.

##### **1. Precast Concrete Sections**

Precast concrete sections shall conform to ASTM C 76 for Class III pipe, or C478 for precast reinforced concrete manhole sections. Manhole barrels, precast bases, cones, flat top lids, and grade rings shall conform to the requirements of ASTM C 478. Lifting holes shall be sealed with plastic sealing compound conforming to Section 10-37 on the side facing the soil and grouted smooth on the interior with a non-metallic, non-shrink grout in conformance with Section 10-55.

##### **2. Cone sections**

Cone sections shall be constructed of concentric cones except in the following cases:

- a. Eccentric Cone, Type 3A - Manholes 8-foot deep and greater
- b. Eccentric Cone, Type 4 - Manholes for sewer mains 21-inch and larger; storm mains 27-inch diameter and larger
- c. Reduced Height Cone - Manholes for pipe with depths of cover measuring 30 inches to 42 inches above crown of largest

connecting pipe

- d. Flat Top Lid - Manholes for pipe depths of cover of 18 inches to 30 inches above the crown of the largest connecting pipe

### **3. Concrete Bases, General**

Concrete manhole bases may be either cast in place or pre-cast of a type and manufacture as approved by the Engineer. Unless otherwise approved by the Engineer, a minimum of twelve-inches (12") of Type A clean crushed rock conforming to Section 10-14 of these Specifications shall be placed and compacted below the base to provide a firm foundation. If subgrade cannot be compacted using standard construction methods, it will be considered unsuitable material and handled in accordance with Section 14-8 of these Specifications.

Stubs in the base shall match inlet pipe sizes and shall align true with all inlet and outlet pipes (within a tolerance of  $\pm 4$  degrees). Reducers will not be permitted. All inlet pipes that enter the manhole at the bases shall be channelized through the manhole with smooth uniform bends toward the direction of flow. In all cases, positive slope for all inlet pipes shall be maintained through the manhole. Two flexible joints shall be provided outside manhole barrel for each pipe connecting to a precast manhole base. Flexible joints shall consist of standard bell and spigot connections. Upon written approval by the Engineer, flexible connectors with stainless steel shear bands as manufactured by Fernco, or equal, may be installed. Joints shall be one pipe diameter apart and a minimum of 24-inches apart. Pipe connections to base shall be grouted in place and made watertight.

Manhole bench shall slope upwards from the spring-line of the pipe to the projected level of the crown of the pipe at the manhole wall, or 12 inches above the spring-line, whichever is less. All holes, cracks, and seams shall be grouted flush with the manhole interior using non-shrink nonmetallic grout in accordance with Section 10-55. All internal surfaces shall be constructed with a smooth and uniform finish.

### **4. Cast-in-place Bases**

Cast in place concrete bases shall be Class "B" concrete as set forth in Section 10-5 of these Specifications. Portland Cement shall be Type II, as set forth in Section 10-1 of these Specifications. Installation of cast in place bases shall require written approval of the Engineer.

### **5. Manhole Flowlines**

Manhole flowlines for main pipe and intersecting mains thirty-six inches (36") or less in diameter shall be constructed of vitrified clay pipe liners. If the

main is “laid through”, flowline material shall be same as the host pipe. PVC flowlines are not allowed.

Where multiple pipes are joined, the host pipe for purposes of this specification is defined as the downstream pipe. If inlet and outlet pipes are of different sizes, new flowline pipe size shall match larger pipe size. If host pipe is not utilized as the flowline, new flowline shall match inlet and outlet pipe elevations and shall extend to inside face of manhole. For host pipes up to 36-inches in diameter, all inlet pipes shall be channelized through the manhole base using clay pipe bends, grouted smooth to prevent the accumulation of debris.

Manholes not constructed in streets shall have three (3), six inch (6”) adjusting rings placed between the top of the cone and the bottom of the manhole head. Top of head to be six inches (6”) above the ground surface.

Manholes constructed in streets shall have the top of the cone within twelve inches (12”) to eighteen inches (18”) of final street grade.

## **6. Precast Bases**

Precast concrete bases and their details shall have the prior approval of the Engineer and shall conform to ASTM C 478 and the Standard Drawings.

Openings in the base that are not connected to a pipe shall be sealed with a watertight plug such as a “Gripper” mechanical wing nut plug by Cherne, or equal, and grouted smooth.

## **7. Joining Precast Manhole Sections**

Preformed plastic sealing compound, in conformance with Section 10-37 of these Specifications, shall be used for joining all precast manhole sections. Prior to application of preformed plastic sealing compound, all joint surfaces shall be thoroughly cleaned. The sealing compound shall be protected from dirt during placing. Ends of the compound shall be joined end-to-end and not joined by overlapping. Squeeze-out on the inside of the manhole shall be neatly trimmed flush with the inside surface.

All surface irregularities and joints in the interior of the manhole shall be grouted smooth with non-shrink metallic grout in conformance with Section 10-55. In areas of high groundwater, the external joint of each barrel section and of the barrel/cone connection shall be sealed with an external rubber sealing wrap as manufactured by Infi-Shield Inc. or equal. The seal shall be made of neoprene and EPDM rubber and have a minimum total thickness of 60 mils. Material shall conform to specifications of ASTM C 923, ASTM C 443, and ASTM F 477.

Material shall extend beyond each side of the joint a minimum of 3-inches, be continuous around the perimeter of the barrel section, and overlapped a

minimum of 6-inches. "High groundwater" will be considered a location where the groundwater reaches the level of the manhole barrel during a typical rainy season.

## **8. Manhole Chimneys**

For manholes constructed in streets, the height of the manhole chimney shall be between six and three-quarters inches (6-¾") and eighteen inches (18") and in accordance with these guidelines. In general, manhole precast components shall be selected to produce the minimum practical chimney height. In newly constructed streets, chimney height shall be between six and three-quarters inches (6-¾") and thirteen inches (13"). On streets with average cross slopes greater than 3% or streets receiving overlays, chimney height shall be between twelve and eighteen inches.

## **9. Chimney Collars**

There shall be a minimum of eight inches (8") of concrete placed around the head after it is set to the final street grade. The concrete shall extend from two inches (2") below the top of the manhole cone to a point two inches (2") below the pavement grade. After the concrete has hardened, the remaining two-inch (2") space will be filled with asphaltic concrete carefully raked and compacted by approved powered tampers.

## **10. Concrete Collars (unimproved areas)**

For manholes not constructed in streets, three (3), six inch (6") adjusting rings shall be placed between the top of the cone and the bottom of the manhole head. Top of head shall be a minimum of six inches (6") above the ground surface. A concrete collar shall be constructed around head a minimum of six inches (6") wide, from top of cone to top of head.

## **11. Manhole Location Signs**

For manholes not constructed in streets a manhole location sign shall be installed in accordance with these specifications and as directed by the Engineer. The use of concrete for mount stabilization will not be allowed. Sign posts shall be driven a minimum of three feet into the undisturbed or compacted soil. If a stable mount cannot be achieved at minimum sign post mounting heights, greater driven depths must be used in conjunction with longer channel posts. All signs shall be mounted on the wide, or open, side of the channel post. Bolts shall protrude beyond the lock nut by at least a full thread after assembly, and care shall be exercised when tightening the bolts so as not to create a "Dimple" in the aluminum sign.

## **12. Manhole Connections**

Connections to an existing manhole shall be made using a “Core-Bore” technique or other method approved by the Engineer. All connections to sanitary sewer manholes shall be made using a resilient connector conforming to ASTM C 923, as made by Kor-N-Seal, A-LOK, or approved equal, and shall be watertight. For connections not part of the base, the annular space between the resilient connector and the manhole wall shall be filled with a flexible material approved by the pipe manufacturer.

## **13. Manhole Testing**

In areas where ground water is expected, including but not limited to Pocket Area, Willow Creek, North Natomas and areas close to the rivers, all manholes shall be tested and shall meet the requirements of ASTM C 1244 prior to acceptance. For installations not affected by groundwater a minimum of 25% of manholes shall be tested. At the discretion of the Engineer, a failed test may result in an increased number of manholes to be tested. Manholes shall be tested prior to backfill. If the manhole fails the test at this time, the manhole shall be repaired by Contractor and retested. This procedure shall be repeated until the manhole passes the required test. The Engineer may also require the manholes to be tested using this method after backfilling if he has reason to suspect that the manhole has been disturbed during the backfilling operation, or at other times during construction of the improvements being installed as part of the development.

In order to prepare the manhole for this test, all lift holes shall be plugged and all pipes entering the manhole shall be temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn in to the manhole.

The test procedure shall be as follows:

- a. The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.
- b. A vacuum of 10 inches of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 inches of mercury.
- c. The manhole shall pass if the time for the vacuum to drop from 10 inches of mercury meets or exceeds the values indicated in Table 1 of ASTM C 1244.

The vacuum gauge used for this test shall be supplied by Contractor, and

shall have maximum scale division of 0.1 psi, and shall have an accuracy of 0.04 psi. Accuracy and calibration of the gauge shall be certified by a reliable testing firm at six month intervals, or when requested by the Engineer. In addition, the Engineer may compare Contractor's gauge with a City owned gauge at any time. During testing, the vacuum gauge shall be located such that it is readily visible.

Surface restoration shall be in accordance with the section of the General Requirements entitled "Pavement Cutting and Surface Restoration" and shall be paid for under this item of the contract. Pavement cutting shall be perpendicular and parallel to the centerline of the road.

#### **25-4 ADJUSTING MANHOLE HEADS**

Existing manholes in streets shall be adjusted to grade when shown on the Plans or called for in the Special Provisions.

Manhole heads shall be raised by wiring the frame to two 2" X 4"s of sufficient length to span the excavation. The space between the old manhole and the bottom of the head will then be filled with a cement mortar, conforming to Section 10-37 of these Specifications, poured against a suitable form on the inside of the structure. Concrete will then be poured around the head to a point two inches (2") below the top of the head. Concrete shall be Class "A" concrete, conforming to Section 10-5 of these Specifications. After the concrete has hardened, the remaining two-inch (2") space will be filled with asphaltic concrete carefully raked and compacted by approved powered tampers.

When adjusting a manhole head will result in less than six and three-quarters inches ( $6\frac{3}{4}$ "), or more than eighteen inches (18") between the top of the cone and final street grade, the cone shall be removed and forty-eight inch or sixty inch (48" or 60") diameter manhole barrels shall be added or removed so that the top of the cone is within six and three-quarters to eighteen inches ( $6\frac{3}{4}$ " to 18") of final street grade.

Manhole heads that need to be lowered shall be removed as directed by the Engineer to a depth that will allow the manhole to be reconstructed with the proper cone and to the lines and elevation shown on the Plans. Manholes that require lowering shall be indicated on the Plans or Special Provisions as manholes to reconstruct. Manholes that require raising shall be indicated on the Plans or Special Provisions as manholes to raise.

When manholes are required to be adjusted in a street that is open to traffic, all work involved in adjusting shall be fully completed during the work day so as to permit full use by traffic at 4 p.m. of the same day. Should Contractor be unable to fully complete a manhole by the above time, a temporary asphaltic cutback surface shall be placed in any depression so as to provide a smooth traveling surface until the manhole can be fully completed.



The use of barricades around incomplete manholes during night hours is not permitted.

#### **25-5 FLUSHER BRANCHES**

Flusher branches are not permitted for new construction.

#### **25-6 PAYMENT FOR MANHOLES**

On unit price Proposals, payment for manholes shall be at the unit price bid per manhole. This price shall include full compensation for all necessary excavation, form work, pre-cast and cast-in-place concrete, furnishing all other material and doing all work necessary to construct the manholes complete in place to the dimensions shown on the Plans or in these Specifications. If shown in the list of bid quantities, the Proposal may require separate unit prices on standard manholes of various depths but if only a single item is shown for standard manholes, then manholes of all depths will be included and shall be paid for at the price bid.

Special manholes, that is, those which may be shown on the Plans which are separately detailed and do not conform to standard manhole details shall be paid for under a separate item or items of the Proposal. The price bid per special manhole shall include full compensation for doing all work and furnishing all material necessary to construct the special manhole as shown on the Plans.

Payment for raising or reconstructing manholes shall be at a unit price bid, which shall include full compensation for doing all work and furnishing all material necessary to raise or reconstruct the manholes as shown on Plans or Special Provisions. On overlay projects, raising of cones will be considered as Extra Work and shall be paid for according to the terms and conditions of Section 4-6 of these Specifications.

**Section 26****LAYING SEWER AND DRAIN PIPE****26-1 EXCAVATION**

Trench excavation for all sewer and drain pipe shall conform to standard drawing 4-20 and the following requirements

| <b>Table 26-1.1 - Minimum and Maximum Trench Width (TW) @ Top of Drainage Pipe</b> |  |  |
|--|--|--|
| <b>Pipe Inside Diameter (inches)</b>   | <b>(Min. Trench Width) Pipe Outside Diameter Plus (inches)</b> | <b>(Max. Trench Width) Pipe Outside Diameter Plus (inches)</b> |
| 33 or less   | 12   | 16   |
| 36 or greater  | 12   | 24   |

| <b>Table 26-1.2 - Minimum and Maximum Trench Width (TW) @ Top of Sewer Pipe</b> |  |  |
|---|--|--|
| <b>Pipe Inside Diameter (inches)</b>  | <b>(Min. Trench Width) Pipe Outside Diameter Plus (inches)</b> | <b>(Max. Trench Width) Pipe Outside Diameter Plus (inches)</b> |
| <b>Flexible Pipes</b>   |  |  |
| 15 or less  | 12   | 24   |
| 18 or greater   | 12   | 36   |
| <b>Vitrified Clay Pipe</b>  |  |  |
| All Pipe Sizes  | 24   | No Limit   |

Contractor shall substitute stronger pipe or increased bedding and backfill requirements, subject to approval of the Engineer, **at no extra cost**, if the specified trench width is exceeded by the fault of Contractor. If field conditions do not allow for a trench within the above limitations, at no fault of Contractor, as determined by the Engineer, alternative bedding and backfill requirements shall be incorporated as directed by the Engineer and added cost will be reimbursed as extra work.

At a minimum, the depth of excavation shall be three inches (3") below the outside diameter of the barrel or one inch (1") below the outside diameter of the bell, whichever is deeper.

No tunnels shall be allowed, except when, in the opinion of the Engineer, it is impossible or impracticable to prevent tunneling.

Contractor shall comply with the requirements set forth in paragraph 6-8 "TRENCH SAFETY PLANS", Section 6.

Trenches shall be excavated only as far in advance of pipe laying as can be backfilled in the same day. The maximum total length of open trench shall be five hundred feet (500'). Under no condition shall more than fifty feet (50') of trench remain open overnight. A trench in an existing roadway which is not to be regraded is defined as open until backfilled and paved with temporary surfacing, ready for traffic. Other trenches are defined as being open until backfilled to subgrade or the original ground line. Temporary surfacing is defined in 26-11, "Repaving Trenches".

Contractor, at his/her option, may elect to cut existing sewer services that are encountered or tunnel under them. All sewer services cut by trench excavation shall be replaced before nightfall of the same day in accordance with Standard Drawing 7-24, City of Colusa Improvement and Design Standards. No additional compensation will be paid Contractor for any sewer services purposely or accidentally cut and repaired

## **26-2 DEWATERING**

Contractor shall be responsible for the control, removal, and disposal of any groundwater that may be encountered in the course of excavating and backfilling trenches or placing pipe. Whenever water or over-saturated soil conditions exist which may interfere with proper installation, trenches shall be dewatered to a level twelve inches (12") below the trench bottom before placement of any pipe or material. Unless approved in writing by the Engineer, groundwater and/or water from trench dewatering shall be free of sediment and other construction materials before entering the City storm drain system. A dewatering plan, including a water de-sedimentation plan, shall be submitted to

the Engineer for approval prior to any pumping or discharge of water to the City storm drain system.

### **26-3 HEALTH AND SAFETY**

Contractor is warned that existing sanitary sewers and appurtenances have been exposed to sewage and industrial wastes. These facilities shall therefore be considered contaminated with disease-causing organisms. Personnel in contact with contaminated facilities, debris, wastewater, or similar items shall be advised by Contractor of the necessary precautions that must be taken to prevent infection. It is Contractor's responsibility to urge his personnel to observe a strict regime of proper hygienic precautions, including any inoculations recommended by the local public health officer.

Because of the danger of solvents, gasoline, and other hazardous material in the existing sewers or drains, these areas shall be considered hazardous to open flame, sparks, or unventilated occupancy. Contractor shall be aware of these dangers and shall take the necessary measures to assure his personnel observe proper safety precautions when working in these facilities.

Contractor shall not allow any wastewater to discharge from sanitary sewage collection systems onto adjacent lands or waters. In case of accidental discharge, Contractor at his/her expense shall be responsible for containment, immediate cleanup, and disposal to the full satisfaction of the Engineer. Where containment is not possible, Contractor at his/her expense shall provide adequate disinfection as directed by the Engineer or jurisdictional agency. If, in the opinion of the Engineer, Contractor fails to adequately follow the above guidelines, the City will make arrangements to have the work done by others, and have the cost deducted from amounts owing to Contractor.

### **26-4 PIPE MATERIALS/TYPES**

Sewer and drain pipe shall conform to Sections 10, 26, and City of Colusa Improvement and Design Standards. The type, class and size of pipe are generally shown on the Plans and/or in the list of quantities contained within the Proposal.

#### **1. Continuous types**

Only one type of pipe shall be used between manholes with the exception of changing from Class III to Class IV RCP as long as the pipes are completely compatible with no modifications and both classes of pipe come from the same manufacturer and are of the same manufacturing process.

Prior to the start of work, Contractor shall submit a plan showing types of pipe and locations to the Engineer. Any deviation in the plan thereafter shall not be allowed unless approved in advance by the Engineer.

## **2. Acceptable Sewer Pipe Types**

Sewer pipe types shall be as shown on the Plans or as noted in the Special Provisions and shall be of one of the following types unless otherwise noted: Vitreous Clay (VCP); Closed Profile Polyvinyl Chloride (CPPVC); Polyvinyl Chloride (PVC); Glass Fiber-Reinforced Thermosetting-Resin; calcareous aggregate reinforced concrete (RCP) Class ; or HDPE Solid Wall Fusion Jointed.

## **3. Acceptable Drainage Pipe Types**

Drainage pipe types shall be as shown on the Plans or as noted in the Special Provisions and shall be of one of the following types unless otherwise noted : Reinforced Concrete (RCP) Class III or Class IV; Closed Profile Polyvinyl Chloride (CPPVC); Polyvinyl Chloride (PVC); Glass Fiber-Reinforced Thermosetting-Resin; or HDPE Solid Wall Fusion Jointed.

# **26-5 LAYING PIPE**

Laying sewer and drain pipe shall conform to Sections 10, 14, 26, and City of Colusa Improvement and Design Standards. Pipe shall be placed in accordance with the Plans, Special Provisions, manufacturer's recommendations, and as directed by the Engineer.

## **1. Saw-cutting over existing pipelines**

Prior to saw-cutting, Contractor shall mark the exact location of the existing pipeline on the pavement using a ferreting device or equivalent.

## **2. Manhole connections**

All connections to the manholes not cast as part of the manhole base shall be made by use of a coring machine. The annular space between the outside of the pipe and the manhole shall be sealed by using a flexible annular space filler such as "Kor n' Seal Cavity O-Ring" by NPC Inc. or approved equal.

## **3. Bedding**

Bedding shall be Type A clean crushed rock and shall be placed in accordance with these Technical Specifications and the pipe manufacturer's recommendations. The bedding material shall provide uniform support of the full length of the pipe to a width of at least fifty percent (50%) of the pipe internal diameter. Initial backfill shall be brought to uniformity on each side of the pipe

to prevent distortion or displacement. Consolidation under pipe haunches shall be accomplished by shovel slicing or rodding to assure all voids are filled. Remaining initial backfill shall be placed in lifts and then consolidated with vibratory equipment to insure proper compaction. Ponding and jetting methods of achieving compaction will not be allowed.

#### **4. Special foundation treatment**

Whenever the bottom of the trench is soft or rocky, or, in the opinion of the Engineer, otherwise unsuitable as a foundation for pipe bedding, the unsuitable material shall be removed to a minimum depth of six inches (6") and replaced with Type D clean crushed rock, "pit run" or cobbles or any combination thereof. Pit run shall have a minimum sand content of 25 and shall be compacted to 90% relative compaction. Cobbles shall be a maximum of 12" and a minimum of 4".

As an alternate to, or in addition to, the bedding materials specified above, the Engineer may direct Contractor to furnish and place geotextile fabric below the bedding materials. The geotextile material shall be a high modulus woven fabric, and shall be inert to commonly encountered chemicals, rot-proof, and resistant to ultraviolet light, insects, and rodents. The geotextile fabric shall have a minimum grab tensile strength of two hundred pounds (200 lbs.) in any direction as measured in accordance with ASTM D 4632, a Mullen burst strength of at least four hundred pounds per square inch (400 psi) per square inch per ASTM D 3786, and an Equivalent Opening Size no larger than the U.S. Standard Sieve Number 50 as determined by ASTM D 4751. Geotextile fabric shall be Mirafi 600X or equal. Each roll of fabric shall be handled and placed in accordance with the manufacturer's recommendations. Furnishing and placing of geotextile fabric will be paid for as extra work as defined in 4-6, "Extra Work, Force Account".

If material more than twelve inches (12") below the typical trench bottom is ordered removed by the Engineer, the excavation below that point and the imported material required to backfill the trench to that elevation will be paid as extra work as provided in Section 4 unless otherwise specified in the Special Provisions. Before excavation of the pipe trench in fill areas of roadway embankments, the fill area or embankment shall be completed to a height above the pipe invert grade line of not less than twice the internal pipe diameter or to final fill or embankment subgrade, whichever is lower, but in no case less than twelve inches (12") above the top of the pipe. Such embankment shall be compacted to a minimum relative compaction of ninety percent (90%) for a distance on each side of the pipe equal to a least two (2) pipe diameters. The remainder of the embankment shall be compacted to the minimum relative compaction specified elsewhere in these Specifications for the type of construction being done, or as specified in the Special Provisions or on the Plans.

**5. Trench backfill**

**a. Initial backfill**

Initial Backfill shall be provided by Contractor and shall be placed in accordance with these Technical Specifications and the pipe manufacturer's recommendations. Initial backfill shall be the material between the top of the bedding material and six inches (6") above the top of the bell or barrel if the pipe does not have a bell. Unless otherwise indicated in the Special Provisions, initial backfill shall be granular material consisting of imported Type A, or Type B clean crushed rock, conforming to the requirements of 10-17, "Clean Crushed Rock" of these Technical Specifications.

Initial backfill shall be placed immediately after pipe joints have been completed, inspected, and passed by the Engineer. The material shall be carefully placed so as not to disturb or damage the pipe and shall be brought up evenly on both sides. Initial backfill material shall be placed in layers not exceeding eight inches (8") in depth before compaction at or near optimum moisture content. Contractor shall place initial backfill by shovel slicing, tamping, and/or vibratory compaction in order to produce firmly compacted material under the haunches of the pipe. Compaction shall be by mechanical pneumatic or vibratory compaction equipment approved by the Engineer. Care shall be used to avoid dislodging the pipe. No wedging or blocking of the pipe will be permitted. Ponding and jetting methods of achieving compaction shall not be allowed.

When the bedding material for the pipe consists of crushed rock, sand shall not be used as initial backfill material.

**b. Trench backfill**

Unless otherwise approved by Engineer, trench backfill shall be provided, and placed to grade by Contractor, in accordance with these Technical Specifications and the pipe manufacturer's recommendations. Trench backfill shall be the material between the initial backfill and the top of trench or subgrade. The material for trench backfill may be of job excavated, native material provided that such material is free of organic materials or other unsuitable materials as determined by the Engineer that may cause voids or depressions to develop during or after placement of the backfill. Rocks, stones and solid earth chunks exceeding three inches (3") in greatest dimension shall be removed from the trench backfill material.

Trench backfill material shall be placed in layers not exceeding

eight inches (8") in depth before compaction at or near optimum moisture content. Until the total backfill above the top of the pipe exceeds three feet (3'), machine-placed backfill material shall not be allowed to "freefall" more than two feet (2').

Unless otherwise shown on the Plans or specified in the Special Provisions, compaction of all backfill material shall be by mechanical pneumatic or vibratory compaction equipment. Minimum relative compaction of the trench backfill material shall be ninety percent (90%) when tested according to ASTM D 1557, except that the top six inches (6") below the subgrade shall be compacted to a relative compaction of ninety-five percent (95%). Trenches in easements outside the street rights-of-way may be compacted to ninety percent (90%) relative compaction throughout the depth. Compaction testing will be performed by the Engineer and the cost thereof will be borne by the City, except that retests of areas which fail to meet the required compaction shall be charged to Contractor and deducted from any payment due Contractor for work performed under the terms of the Proposal.

Ponding and jetting methods of achieving compaction shall not be allowed.

Upon written request by Contractor, and upon approval of the Engineer, the trench may completely backfilled to the bottom of the AC pavement with slurry cement or Control Density Fill backfill provided in conformance with 10-16, "Controlled Density Fill". For pipes and conduits two inches (2") and smaller, bedding, initial backfill, and trench backfill shall be slurry cement backfilled, placed to within one and one-half inches (1½") of finished grade.

**c. Unsuitable material/import**

If the portion of existing, native material removed in the excavation of trenches to be used for backfill is determined by the Engineer to be unsuitable for backfill not due to any action or negligence of Contractor nor because native material is inadequately protected from inclement weather, Contractor shall remove unsuitable material and import and place suitable backfill material.

The cost for this item shall be paid separately and it includes all associated costs including hauling away unsuitable material, disposal, and transportation and material cost for import material, except that the cost of placing and compacting import material is not included in this item but is included in the item for placing pipe. The quantity of "Unsuitable Material/Import" and the cost thereof shall not include that native



material which is removed from the trench in the area wherein the pipe bedding, initial backfill, aggregate base course, asphalt concrete or the pipe itself is placed. Such material, whether unsuitable or not, and its replacement material of whatever kind shall be included in the cost of the pipe.

The quantity of unsuitable material/import shown on the Proposal is for bidding purposes only. The unit price indicated will not be adjusted because the actual quantity varies from the quantity shown on the Proposal. The cost for replacing unsuitable material rendered unsuitable due to any act or omission of Contractor or due to inclement weather shall be borne by Contractor and there will be no compensation therefore.

Trench import material shall be placed in accordance with "Trench Backfill" herein.

**d. Unstable trench**

Contractor may assume that trench side walls may be maintained, without shoring, at a slope of three-quarter vertical to one horizontal (3/4:1). When trench side slopes are not able to be maintained at this slope due to unstable materials or excessively high ground water or both, as determined by the Engineer, and not based on improper or insufficient dewatering nor because of inadequate shoring and not due to any action or negligence of Contractor, the trench shall be considered an unstable trench. When such unstable trenches are encountered, as defined herein, additional effort and materials will be paid for as extra work, as described in Section 4, unless otherwise directed in the Special Provisions.

In areas of trench determined to be unstable, flexible pipe may be used in sizes up to nominal 24-inch diameter. Larger sizes up to and including 42-inch diameter may only be used if submitted with an engineered design for trench details for normal installation and for unstable trench conditions, stamped and signed by an engineer registered in the State of California and with prior written approval by the Engineer. Additional trench width shall also be provided in accordance with manufacturer's recommendations for installation in unstable conditions.

When placing flexible pipes in unstable trench locations, Contractor shall perform that work necessary to create a stable trench. All work shall conform to pipe manufacturer's recommendations, to ASTM D 2321, and the special provisions. At a minimum, vertical, stable trench walls shall be maintained to 12 inches above the top of the pipe and additional trench width shall be excavated, in accordance with pipe manufacturer's recommendations, to a point 12 inches above the top of

the pipe, and replaced with Type A clean crushed rock. Initial backfill shall be brought to uniformity on each side of the pipe to prevent distortion or displacement. Consolidation under pipe haunches shall be accomplished by shovel slicing or rodding to assure all voids are filled. Remaining initial backfill shall be placed in lifts and then consolidated with vibratory equipment to insure proper compaction.

**e. Precast manhole bases**

Where pre-cast manhole bases are used, Contractor shall install a flexible bell and spigot joint a horizontal distance of 18-inches to 24-inches from the wall of the manhole.

**f. Existing pipe**

Existing pipe shall be removed at such places as shown on the Plans or as designated by the Engineer in accordance with Section 13 and the Special Provisions. All removed pipes or portions thereof shall be disposed of by Contractor.

**g. Pipe laying, grade and alignment:**

After the trench for pipe has been brought to the proper line and grade, the pipe shall be laid in the following manner:

Pipe laying shall proceed upgrade with the bell or groove end of the pipe placed upstream. Each section of pipe shall be laid true to line and grade and in such a manner as to form a watertight, concentric joint with the adjoining pipe. The interior of the pipe shall be cleared of all dirt and debris as the work progresses. Pipe shall not be laid when the condition of the trench or the weather is unsuitable, in the opinion of the Engineer, because of water or mud which may interfere with proper jointing. All open ends of pipe and fittings shall be adequately and securely closed whenever the work is discontinued.

Circular reinforced concrete pipe with elliptical reinforcement shall be placed with the minor axis of the reinforcement in a vertical position.

The pipe shall be laid in strict conformity to the prescribed line and grade—and each pipe length checked to the top grade line. Three (3) consecutive points on the same grade of slope shall be used at all times to detect any variation from a straight grade. In case any discrepancy exists, the work shall be stopped and the discrepancy immediately reported to the Engineer. In addition, when requested by the Engineer, a

string line shall be used in the bottom of the trench to insure a straight grade and alignment of the pipe.

At the option of Contractor, grade and alignment controlled by a laser beam system which complies with OSHA requirements may be used. The laser system shall have good visibility when used with suitable target material. The laser system must be of the self-leveling type so that the laser beam is automatically compensated for minute grade disturbances.

The laser system must also have an early warning system that instantly warns the pipe layer when the laser is off grade. The laser system is to be provided by Contractor and shall have a minimum accuracy of  $\pm 0.01$  foot per one hundred feet (100') on line; and a minimum visible range of one thousand feet (1000').

Grade tolerance of the flow line of pipe shall not exceed plus or minus 0.05 feet. In addition, the total variation plus and minus from flow line grade shall not exceed 0.05 feet in any twenty-five foot (25') length. Both joint surfaces shall be cleaned before the joints are made. Care shall be used to prevent chipping or cracking of either end of the pipe during installation.

**h. Moveable trench support:**

When using movable trench support, care should be exercised not to disturb the pipe location, jointing or its embedment. Removal of any trench protection below the top of the pipe and within two and one-half ( $2\frac{1}{2}$ ) pipe diameters of each side of the pipe shall be prohibited after the pipe embedment has been placed and compacted. Movable trench supports shall only be used in either wide trench construction where supports extend below the top of the pipe or on a shelf above the pipe with the pipe installed in a narrow, vertical wall subditch. Any voids left in the trench wall or embedment material by support removal shall be carefully filled with bedding material which shall be adequately compacted. Removal of bracing between sheeting shall only be done where backfilling proceeds and bracing is removed in a manner that does not relax trench support. When advancing trench boxes or shield, there shall be no longitudinal pipe movement or disjoints.

**i. Protecting existing sewers and drains:**

Mortar or brick plugs shall be installed and maintained in existing manholes as directed by the Engineer in order to prevent surface water, ground water, and debris from entering existing sewer or drain systems during construction. Inflatable plugs will not be permitted. Care shall be

exercised in installing plugs to avoid interrupting service. Plugs shall be removed upon completion of testing as described in 26-10.

**j. Installation procedures for HDPE solid wall pipe:**

**i. Handling:**

Pipe, fittings, and accessories shall be carefully inspected before and after installation and those found defective shall be rejected. Pipe and fittings shall be free from fins and burrs. Before being placed in position, pipe, fittings, and accessories shall be cleaned, and shall be maintained in a clean condition. Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall pipe, fittings or any other material be dropped or dumped into trenches.

**ii. Joint welding:**

Sections of polyethylene pipe shall be joined into continuous lengths on the job site above ground. The joining method shall be the thermal butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. Fusion equipment used in the joining procedure shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, fusion temperature, alignment, and fusion pressure.

Butt fusion shall conform to ASTM D 2657 and pipe manufacturer's criteria for the type of joining. Butt fusion joining shall be 100% efficient and shall provide a joint strength equal to or better than the tensile strength of the adjacent pipe.

Fusion equipment shall be operated only by technicians who have been certified by the pipe manufacturer, and who have a minimum of two (2) years of experience fusion welding pipelines of the diameters used in this project. The technician's experience shall be documented in the HDPE pipeline submittal.

**iii. Installation of pipe:**

All pipe shall be carefully placed and supported at the proper lines and grades and all pipe flanges shall be set level, plumb, and aligned. All flanged fittings shall be true and perpendicular to the axis of the pipe. All bolt holes in flanges shall straddle vertical centerline of pipes. Piping shall be installed without springing or

forcing the pipe in a manner which would set up stresses in the pipe, valves, or connected equipment.

## **26-6 SEWER AND DRAIN SERVICES**

Sewer services shall be installed at the points shown on the Plans. All sewer services shall be installed perpendicular to the main unless otherwise shown on the plans or approved by the Engineer. All services, where not connected shall be closed with a stopper or plug of proper size. Where services are carried from the main line to the property line, stoppers shall be placed in the ends of the pipe. Before backfilling, a 2" X 2" redwood post shall be placed with its lower end at the end of the pipe, and its upper end extended vertically twelve inches (12") above the street grade. Where grade of sewer permits, the flow line of a sewer service at the property line shall be four feet (4') below the street grade.

In addition, where curb and gutter exists, or is to be constructed concurrently with sewer facilities, the location of each sewer service shall be permanently indicated by inscribing the letter "S" two inches (2") in height in the curb directly above the line when the service is perpendicular to the street centerline. Otherwise, the "S" mark for skewed or angling services shall be placed at a right angle to the end of the service. When sewer services are installed in an existing street, the curb mark shall be placed at the time the service is installed to assure proper location.

In new subdivisions when the sewer services are installed before the curb is constructed, it shall be Contractor's responsibility to establish the exact location of each sewer service and to furnish this information to the Engineer. In all alley improvements where a main is being replaced, all services to that main will be replaced and a clean-out installed as indicated on the Plans or specified in the Special Provisions.

## **26-7 DRAIN AND DITCH BOX LEADS**

RCP or PVC ditch box leads and fittings shall be constructed to the details on the Plans, the Special Provisions and shall conform to Sections 10 and 14. Where noted on the plans, C900 class 100 PVC pipe shall be used.

All connections of drain leads to the maintenance holes not cast as part of the maintenance hole base shall be made by use of a coring machine. The annular space between the outside of the pipe and the maintenance hole shall be sealed by using a flexible annular space filler such as "Kor n' Seal Cavity O-Ring" by NPC Inc. or approved equal.

## **26-8 PIPE JOINTS**

All pipes shall have elastomeric gasket joints providing a water tight seal. Joints in pipe shall conform to section 10-19 of these Specifications.

## **26-9 PROTECTIVE COVERING**

Whenever sewer or drain pipe is laid in trenches at such an elevation that the top of the pipe bell is less than eighteen inches (18") below sub-grade of the street, the pipe must be covered with a protective covering as shown on Drawing 7-25, of City of Colusa Improvement and Design Standards. The concrete used in making the covering shall conform to Portland Cement concrete Class "A", as denoted in these Specifications. As an alternate, C900, C905, or ductile iron pipe with controlled density fill placed as shown in City of Colusa Improvement and Design Standards Drawing 7-25 may be used, as approved by the Engineer.

## **26-10 TESTING OF PIPE**

After laying pipes, backfilling, trench compaction, and before placing any road base or asphalt, sewer and drainage pipelines shall be inspected and tested for obstructions and leakage, unless otherwise specified, as follows.

### **1. Test for obstructions**

All lines or mains shall be cleaned by balling, and any obstructions or irregularities shall be removed or repaired by Contractor. All testing, cleaning and repairing shall be done to the satisfaction of the Engineer. Water used in cleaning shall not be permitted to enter existing sewer or drainage systems. Contractor shall provide all necessary labor, materials, tools and equipment for the tests and shall dispose of all waste, including water at their own expense.

### **2. Test for leakage**

As directed by the Engineer, individual pipeline joints or any section of constructed pipeline shall be tested by the Contractor using the methods listed or described in (3) and (4) of this Section, or the pipe manufacturer's recommendations. An exception to this requirement is HDPE solid wall pipe where only a hydrostatic test for leakage is required as recommended by the manufacturer. For sections of pipe between manholes, no leakage is acceptable for solid wall HDPE. Leakage testing must take place in the presence of the Engineer.

### **3. Air test for leakage**

Air testing of joints for RCP pipelines 27 inches and larger in diameter

shall follow ASTM C-1103. Pipeline sections tested at any one time shall be limited to the length between adjacent manholes. The test section shall be pressurized to 3.5 psi and shall be held above 3.0 psi for not less than five (5) minutes. Air shall be added if necessary to keep the pressure above 3.0 psi. At the end of this five (5) minute saturation period, note the pressure (must be 3.0 psi minimum) and begin the timed period. If the pressure drops 0.5 psi in less than the time given in the following table, the section of pipe shall not have passed the test.

| <b>Table 2610.1 - Minimum Time for Prescribed Pressure Drop</b> |                            |
|---|----------------------------|
| <b>Pipe Diameter (inches)</b>                                   | <b>Time Span (seconds)</b> |
| 4   | 122                        |
| 6   | 184                        |
| 8   | 245                        |
| 10  | 306                        |
| 12  | 367                        |
| 15  | 460                        |

For larger diameter pipe use the following formula: Minimum time in seconds = 370 X pipe diameter in feet. If the time for the pressure to drop 0.5 psi is less than the time given in the table, the leakage shall be repaired and the line retested until found satisfactory to the Engineer.

When the prevailing ground water is above the pipe being tested, air pressure shall be increased 0.43 psi for each foot the water table is above the invert of the pipe.

House sewer services shall be considered part of the lateral to which they are connected and no adjustment of test time shall be allowed to compensate for the smaller diameter of the house services.

The pressure gauge used shall be supplied by Contractor, shall have minimum divisions of 0.10 psi, and shall have an accuracy of 0.04 psi. Accuracy and calibration of the gauge shall be certified by a reliable testing firm at six-month intervals, or when requested by the Engineer.

#### **4. Hydrostatic test for leakage**

Hydrostatic testing of RCP pipelines 27 inches and larger in diameter shall

follow ASTM C-1103. Hydrostatic testing of pipeline sections shall be prepared for testing by plugging the upper side of the downstream manhole and all openings in the upstream manhole except the downstream opening. Where grades are steep and excessive heads would result by testing from one manhole to another, test tees, the same size as the main, shall be installed at intermediate points so the maximum head on any section under test shall not exceed twelve feet (12').

A section of line prepared as above shall be tested by filling with water to an elevation five feet (5') above the top of pipe at the upstream end of the test section, or five feet (5') above the existing ground water elevation, whichever is greater. The water shall be introduced into the test section at least four (4) hours in advance of the official test period to allow the pipe and joint material to become saturated with water. The water level shall then again be brought to the five foot (5') mark. At the beginning of the test, the elevation of the water in the upper manhole shall be carefully measured from a point on the manhole rim or test tee. After a period of four (4) hours, or less, with the approval of the Engineer, the water elevation shall be measured from the same point on the manhole rim and the loss of water during the test period calculated. If this calculation is difficult, enough water shall be measured into the upper manhole to restore the water to the level existing at the beginning of the test, and the amount added taken as the total leakage.

The allowable leakage in the test section shall not exceed five hundred (500) gallons per mile per day per inch diameter of pipe tested at the five foot (5') test head, unless otherwise specified. If it is necessary or desirable to increase the test head above five feet (5'), the allowable leakage will be increased at the daily rate of eighty (80) gallons for each foot of increase in head.

Test sections showing leakage in excess of that allowed shall be repaired or reconstructed as necessary to reduce the leakage to that specified above. Water used in testing will not be permitted to enter existing sewer systems.

## **5. Testing for deflection**

For all flexible sewer and drain pipes and fittings, the minimum pipe stiffness ( $F/\Delta y$ ) at 5% deflection shall be 46 PSI in accordance with ASTM D 2412, "External Loading Properties of Plastic Pipe by Parallel-Plate Loading." A deflection test shall be made by Contractor upon completion and acceptance by the Engineer of all backfill operations and prior to the placement of the finished surface, if any. Deflection testing shall be conducted no sooner than 96 hours following completion and acceptance of all backfill operations, unless otherwise approved by the Engineer.



The deflection testing shall be witnessed by the Engineer and shall be conducted by Contractor's forces and performed at the expense of Contractor. One-hundred percent (100%) of all flexible sewer and drain pipe mainline installed shall be deflection tested for excessive deflection using a pre-sized, rigid mandrel or "Go-No-Go" device 5% smaller than the average inside diameter of the pipe as approved by the Engineer. Mandrel tests may be performed by the City after a 6 month period of time at which time a maximum deflection of 7½% from the base internal diameter, as specified in ASTM D 3034 and ASTM D 2680 for PVC or ABS gravity sewer pipe, respectively will be allowed. The mandrel used shall be the PHOS PVC Sewer Pipe Deflection Gauge or other deflection gauge approved by the Engineer.

The mandrel shall be drawn through the pipe using only the force that can be exerted by one individual on the end of a rope, using no mechanical advantage. Under no conditions shall the mandrel device be attached to the cleaning ball.

Pipe which does not pass all specified mandrel tests shall be replaced at Contractor's expense. Re-rounding or other attempts to reduce deflection beyond the allowable shall not be acceptable. All re-tests for deflection shall be made at the expense of Contractor.

#### **6. Closed Circuit T.V. inspection**

Unless otherwise directed by the Engineer, Contractor shall perform Closed Circuit TV (CCTV) camera inspections of all new installations of sewer, main lines. Comply with Section 26-12 requirements.

### **26-11 REPAVING TRENCHES**

Certain construction projects may require the cutting of existing pavements, the laying of pipe, backfilling and then repaving of the cut pavement. When the trench is in an existing paved area, the pavement shall be sawed or scored and broken ahead of the trenching operations. Before saw cutting the pavement, Contractor shall use a ferreting device or equivalent to determine the exact location of the existing pipes and mark them on the pavement. The proper tools and equipment shall be used in marking and breaking so that the pavement will be cut accurately to a neat and parallel line six inches (6") wider on each side than the trench width required. All cuts in Portland Cement concrete pavements shall be sawcut with approved equipment.

Where the edge of the trench is within two (2) feet of existing curb and gutter or pavement edge, the asphalt concrete pavement between the trench and the curb or pavement edge shall be removed and replaced.

Contractor shall restore all surfaces which have been removed or damaged by Contractor in kind, using the same material as existing, unless otherwise noted on the Plans or in the Special Provisions. The repaving is to be done in such a manner to, as closely as possible, replace the cut pavement with a similar type and an equal or greater structural section. In any case, where a trench is cut in existing pavement, or as directed by the Engineer, a temporary asphaltic plant mix cut back surface not less than two inches (2") in thickness shall be placed immediately after the top backfill has been completed and compacted and maintained at a level surface until removal. Temporary surfacing material shall be removed just prior to placing the permanent surfacing material. Payment for temporary paving shall be included in the price bid per foot of pipe placed, unless otherwise set forth in the Special Provisions.

**1. Asphalt concrete replacement**

The structural section shall be no less than four inches (4") of asphaltic concrete over twelve inches (12") of Class 2 aggregate base. Asphalt concrete shall be Type B, medium, and its placement shall conform to the requirements of Section 22 of these Technical Specifications. Class 2 aggregate base and its placement shall conform to the requirements of Sections 10-7 and 17.

**2. Portland cement concrete replacement**

Restoration of existing Portland cement concrete pavement shall consist of at least six (6) inches of Portland cement concrete and shall conform to the requirements of Sections 10 and 19. Concrete surfaces to be replaced shall be colorized, as necessary, to match existing adjacent concrete color by the addition of Lamp Black coloring agent. Contractor shall submit concrete mix design for approval including a proposed proportion of coloring agent appropriate to the shade of adjacent concrete. Where entire alley requires replacement, concrete shall not include coloring agent, unless directed by the Engineer.

**3. Unpaved surfaces**

Unless otherwise provided on the Plans or in the Special Provisions, pipeline trenches in unpaved portions of street rights-of-way shall have the top twelve inches (12") filled with aggregate base Class 2, conforming to Section 10-7 of these Specifications and compacted to ninety-five percent (95%) relative compaction as determined by ASTM D 1557.

## 26-12 PROCEDURES FOR CLOSED-CIRCUIT TELEVISION (CCTV) INSPECTIONS OF PIPING SYSTEMS

### 1. Standards

Unless otherwise directed or approved by the Engineer, CCTV recording performed for acceptance of new pipelines shall conform to the requirements herein. Submit, in accordance with Section 5-7 of these Technical Specifications, one (1) electronic copy of the CCTV video, database, and report on a portable electronic data storage device for approval.

### 2. Equipment

#### a. Camera

The camera shall record in color. The footage read-out shall appear on screen away from the central focus of the main. A target shall precede the camera for measuring sags and offsets (size of target shall be noted within the video and on the video label). Target sizes shall be as follows, unless otherwise specified or directed by the City:

| <u>TARGET SIZE</u> | <u>PIPE SIZE</u>           |
|--------------------|----------------------------|
| ¾ inch             | ≤ 12 inches                |
| 1 inch             | >12 inches and ≤ 36 inches |
| 2 inches           | >36 inches                 |

The focal distance shall be adjustable through a range from 6 inches to infinity. The camera shall be tractor driven with a rotating camera head suitably sized for each pipe diameter to be inspected.

#### b. Recorder

The recorder shall record in digital video format using MPEG-2 technology or shall be capable of being converted to an MPEG-2 (\*.mpg file format) or the latest digital video format compatible with the City's applications without the loss of video quality.

#### c. Video Quality

The digital video recording shall be a high-resolution video of DVD quality with a minimum of 720 columns of pixels by 480 rows of lines (720x480) with a minimum refresh rate of 60 interlaced fields per second (60Hz or 30 frames per second) as established by the National Television System Committee (NTSC).

**d. Lighting**

There shall be sufficient lighting to produce a clear and sharp image of the entire inside periphery of the pipe for all conditions encountered during the work. Lighting is to be adjusted according to the size of pipe. In an eight-inch diameter pipe with joints at five-foot intervals, the lighting shall allow the camera to reveal not less than three consecutive joints, or up to ten feet of unobstructed pipe shall be visible in the monitor picture.

**e. Locator**

A locating device or other acceptable locating method shall be used to locate points of deficiencies on the ground, in green paint, or green flag.

**3. Procedure**

**a. Timing**

The Contractor shall notify the Construction Inspector two (2) working days prior to televising the mains to allow the Inspector the option of being on-site at time of televising.

The job is ready for CCTV inspection, only after compaction of street sub-grade and prior to placement of road base. The following must be completed before CCTV inspection:

- i. All underground facilities, utility piping, conduits, and access structures are installed, backfilled, and trench backfill compacted.
- ii. Final joint testing.

**b. Schematic**

The manholes shall be uniquely identified (e.g., location stationing, letter identifier, consecutive numbering, etc.) on a plan to be provided to the Inspector and the televised segments tied to the assigned manhole reference. Use existing City Mapbook manhole identifiers unless otherwise approved by City. The length of televised run shall be measured from pipe end to pipe end in one contiguous pipeline segment from manhole to manhole. Maximum allowable tolerance for the TV counter shall not exceed 1 foot in 1,000 feet for location accuracy.

**c. Camera Run**

The main shall be flushed cleaned prior to running the TV camera. TV runs shall not be performed during cleaning operations and shall provide a clear view of the interior of the pipe and manholes. The camera is to be placed in the main with the footage counter at zero (0) at the pipe end within the manhole. The camera is to travel at a speed not to exceed 30 feet per minute with slowdowns at joints and services. Inspect service connections with a rotating camera head. The picture shall be clear and bright enough to allow a photograph of a section to be made. The footage counter, date, and time shall appear on screen at all times, and show the upstream and downstream manhole line segments being televised. All service laterals shall be televised and recorded from point of service cleanout or manhole to City connection on City main or manhole tap.

**d. Water Introduction**

Prior to performing the TV on new construction, the Contractor must introduce enough water in the pipe segment(s) to fill all low sections and flow through the final downstream structure included within the pipe segment to be inspected. If any section of the pipe segment appears to be dry, additional water must be introduced as described above. The City Inspector will verify the adequacy of water and target size before the TV is performed. The TV must begin within 30 minutes of introducing water into the pipe segment.

**e. Recording**

The following items are to be recorded on the first 15 seconds of the recording:

- i. Location, subdivision name and/or project name and number
- ii. Date and time
- iii. Upstream and downstream manhole identifier or stationing reference number associated with the project construction plans
- iv. Company name, Operator's name and NASSCO's PACP Certification Number
- v. Direction of travel (e.g.; against flow, with flow)
- vi. Pipe size
- vii. Pipe shape

- viii. Pipe material
- ix. Significant comments

A label shall be affixed to the portable electronic data storage device and jacket or envelope with the above information, start-end footage, and size of target.

Each televised segment shall be preceded by the following:

- i. Location (MH to MH identifier or station reference number associated with the project construction plans)
- ii. main size, type of pipe, pipe shape
- iii. main slope and flow direction
- iv. length of run (measured per asbuilt plans)
- v. number of pipes entering MH and sizes
- vi. number of service connections

The portable electronic data storage device shall be given to the City's Engineer or Construction Inspector and shall become the property of the City of Colusa upon completion of the televised inspection. The City reserves the right to reject any televised inspection not conforming to the requirements herein. Any televised inspection that is rejected shall be re-inspected at the Contractor's expense.

#### **4. Acceptance Criteria**

Maximum acceptable sag for sewer pipes is  $\frac{3}{4}$  inch, unless otherwise specified in the Special Provisions and the Project Plans. All other criteria as set by the City Technical Specifications and the Contract Documents shall apply for both sewer and drain pipes. Within ten full working days from receipt of the digital video, database, and report, the Inspector shall review and either approve the main(s) or call for repairs. The Contractor is to be notified in writing of any deficiencies revealed by the television inspection that will require repair. If the Contractor is to make repairs and wishes to review the television inspection with the Inspector, the Contractor shall contact the Inspector to set a time for viewing. Upon completion of any repairs, the main is to be re-inspected.

#### **5. Report**

Perform and record all CCTV inspections in accordance with the National Association of Sewer Service Companies' (NASSCO's) Pipeline Assessment

Certification Program (PACP). CCTV inspections shall be conducted entirely in digital video format compatible with Granite XP software (version 7, Granite Net or City's most current version), recorded in accordance with section 26-12, 2.b., and stored on a portable electronic data storage device.

CCTV inspection reports shall be accurate to within +/- 2 (two) feet or less of the total measured footage along the pipe from upstream end of the pipe to the downstream end of the pipe or vice versa.

Every section of the pipe (access point to access point) shall be identified on the video display in accordance with section 26-12, 3.d. In addition to inspecting the pipe, all manholes shall be panned with the CCTV camera.

Documentation of the work shall consist of digital video recordings, the PACP CCTV Report(s), and the unmodified PACP database. The database shall contain PACP scoring for each inspection observation or defect. The documentation shall note important features and any defects encountered. One copy of the digital video recording, inspection observation database, and report (one printed copy & one digital copy) shall be submitted to the City on a portable electronic data storage device for approval. With the submission, it shall also include the CCTV Inspection video form (attached to the end of this Section 26) filled with required information.

## **26-13 PAYMENT FOR SEWER AND DRAIN PIPE**

Payment for sewer and drain pipe will be at a price bid per lineal foot which will include full compensation for pavement cutting and removal, excavation, trenching, shoring, dewatering, removal and disposal of existing pipe, bedding, furnishing and laying of pipe, initial backfill, trench backfill, manhole connections, temporary paving, final paving and all other work necessary to construct the sewer or drain pipe complete in place as shown on the Plans.

Measurement of such lineal footage shall be the total distance along the centerline of the pipe from the centerline of manhole to centerline of manhole and shall include the straight run of all tees where used.

Payment for clean crushed rock or bedding material provided for use shall be considered as included in the price paid for laying pipe, unless otherwise indicated in the Special Provisions.

Payment for concrete or control density fill used as protective covering shall be paid for at a separate price per lineal foot for protective covering in place, unless otherwise set forth in the Special Provisions.

Where tee fittings are placed in a main sewer or drain line in connection

with sewer or drain services, payment for the fittings shall be considered as included in the price per lineal foot for the main sewer or drain pipe and no deduction or addition will be made to the length of main line laid.

Placing of sewer and drain services will be paid for at the contract unit price bid per service, which price shall include full compensation for furnishing and placing all service pipe from the tee or the fitting in the main sewer or drain line to the property line, and furnishing and placing other necessary bends and stoppers to construct the service complete in place.

The cost for testing and inspecting the pipe shall be included in the price bid for the pipe in place.

The cost of removing and replacing pavement over trenches shall be included in the price bid for installation of the pipe in place, unless otherwise set forth in the Special Provisions.



**CCTV Inspections of Pipe Systems** (☐ Submission for Sewer or ☐ Storm Drain) **Insp Form 020**  
 \*\*\*\*\* **ManHole Inspection is not Included** \*\*\*\*\*

This submission is submitted by, Name: \_\_\_\_\_; Tel: \_\_\_\_\_; Dept: \_\_\_\_\_; Date: \_\_\_\_\_

This submission is received by, Name: \_\_\_\_\_; Tel: \_\_\_\_\_; Dept: \_\_\_\_\_; Date: \_\_\_\_\_

Project ID: \_\_\_\_\_, ☐ CPC or ☐ RPC; Project Name: \_\_\_\_\_ (Phase \_\_\_\_\_)

Developer, Name: \_\_\_\_\_

TV Operator: Name: \_\_\_\_\_, Tel: \_\_\_\_\_

NASSCO Cert #: \_\_\_\_\_ or ☐ Not Certified

Remarks: \_\_\_\_\_

\*\*\*\*\*

**The submitted items:** 1) ☐ DVD video; ☐ Flash drive; ☐ Others: \_\_\_\_\_  
 2) ☐ NASSCO, PACP Report

\*\*\*\*\*

**-- Inspection Section --**

**Type of Tests/Inspections required to be done Before CCTV Inspections Submission**

| Sewer Collection System   | Storm Drain Collection System   |
|---|---|
| <input checked="" type="checkbox"/> those have been tested & passed)              | <input checked="" type="checkbox"/> those have been tested & passed)              |
| <input type="checkbox"/> Mains, test type: _____                                  | <input type="checkbox"/> Mains, test type: _____                                  |
| <input type="checkbox"/> MH, test type: _____                                     | <input type="checkbox"/> MH, test type: _____                                     |
| The above information has been verified and                                       | The above information has been verified and                                       |
| Approved by, Name : _____   | Approved by, Name : _____   |
| Signed: _____ Date: _____   | Signed: _____ Date: _____   |
| Tel: _____  | Tel: _____  |
| <input type="checkbox"/> Result, attached; <input type="checkbox"/> No attachment | <input type="checkbox"/> Result, attached; <input type="checkbox"/> No attachment |
| Remarks: _____  | Remarks: _____  |
| Compaction Tested & passed, Approved by, Name: _____, Tel: _____                  |   |
| <input type="checkbox"/> Result, attached; Signed: _____, Date: _____             |   |
| Remarks: _____  |   |

\*\*\*\*\*

CCTV Examiner, Name: \_\_\_\_\_; Tel: \_\_\_\_\_; Date: \_\_\_\_\_

Approved, Sign: \_\_\_\_\_; Date: \_\_\_\_\_

Approved with Comments: \_\_\_\_\_

Reject this submission, By: \_\_\_\_\_ Date: \_\_\_\_\_

- Rejection because of: 1) ☐ The said inspection section has not been completed;  
 2) ☐ NSAACO, PACP: Main Inspection with Pipe-Run Graph Report is incomplete;  
 3) ☐ NSAACO, PACP: Observation Report is incomplete;  
 4) ☐ TV the pipe line partial, not from MH to MH;  
 5) ☐ The plug for stub is not wing nut or equivalent device  
 6) ☐ Exceed the maximum acceptable sag for: ☐ Sewer, 3/4"; ☐ Storm Drain, \_\_\_\_

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

----- After the approval of this TV inspection, please call for the project final walkthrough! -----

## Section 27

### WATER DISTRIBUTION SYSTEMS

#### 27-1 GENERAL

All water pipe, fittings, valves, fire hydrants, blow-offs, air release valves and other appurtenances shall be installed in accordance with the requirements of the project Plans and Special Provisions, these Technical Specifications, the American Water Works Association (AWWA), ANSI-61, the City's Cross Connection Control Policy, and the manufacturer's recommendations. Materials shall be as specified in Section 10 "Construction Materials" of these Technical Specifications.

During construction, **Contractor shall not operate any valves in the City's distribution system** and must request that City Utilities Department Personnel operate them. Contractor shall request the Engineer to notify the City Utility Department Personnel as specified in Section 27-11 of these Technical Specifications.

If shown on the Plans or specified in the Special Provisions, Contractor shall pay all fees for taps, tie-in connections, and meters in advance at the Department of Utilities Customer Service Office, 1395 35<sup>th</sup> Avenue. Fees shall be paid after the "Notice to Proceed" has been issued, and prior to the work being performed by the Department of Utilities. For current fee information, contact Customer Service at 264-5371.

#### 27-2 WATER PIPE

**1. General** - All water pipes shall be designed to withstand the external earth load and the AASHTO H-20 vehicle live load. The pipe shall also be designed to withstand an internal working pressure of one hundred and fifty pounds per square inch (150 psi).

**2. Water Services** - Pipe used for water services two inches (2") in diameter or less shall be copper or polyethylene tubing as specified in Section 10 of these Technical Specifications. Pipe used for water services four inches (4") in diameter or large shall be the same as specified for distribution mains.

Polyethylene services shall be a single piece of tubing (no joints allowed including butt welds) and shall have a locating wire attached with ten (10) mil tape at three foot (3') spacing. The minimum allowable radius shall be thirty (30) times the tubing diameter.

**3. Distribution Mains (4" to 12")** - Unless otherwise specified on the Plans or Special Provisions, water mains four inches (4") through twelve inches (12") diameter in water distribution systems shall be made of ductile iron pipe (DIP),

or polyvinyl chloride pipe (PVC) meeting the applicable requirements of Section 10 of these Technical Specifications.

**4. Transmission Mains (greater than 12")** - Water mains greater than twelve inches (12") in diameter shall be ductile iron pipe (DIP), concrete cylinder pipe (CCP) or welded steel pipe (WSP) meeting the applicable requirements of Section 10 of these Technical Specifications.

### **27-3 TRENCHING FOR WATER PIPE**

Trenches for water pipe including water transmission mains, water distribution mains, fire hydrants branch leads, and water services shall be as specified herein unless otherwise indicated on the Plans or in the Special Provisions.

Prior to cutting pavement Contractor shall notify Underground Service Alert (USA) per Section 6-19 of these Technical Specifications and shall bring to the Engineer's attention any possible conflicts.

Existing pavement to be removed shall be saw cut the full depth to provide a neat straight pavement break along both sides of the pipe trench as shown on Standard Drawing 4-20. Contractor shall perform the pavement cutting operation by saw cutting.

Trenches for water main pipe shall be excavated to the lines and grades indicated on the Plans and as detailed by Standard Drawing 4-20 in City of Colusa Improvement and Design Standards. Contractor shall furnish, install, and maintain a trench shoring system in compliance with Section 6-8 of these Technical Specifications.

Water distribution mains constructed in fully improved streets with curb, gutter, and sidewalk shall be installed with a minimum of thirty-six inches (36") of cover and a maximum of fifty-four inches (54") of cover measured from the top of the pipe to pavement surface.

Water distribution mains in unimproved areas or in existing streets lacking curb, gutter, and sidewalk shall be installed with a minimum cover of fifty-four inches (54") and a maximum cover of sixty inches (60") measured from the top of the pipe to the existing ground or pavement surface.

In order to avoid conflicts with other utilities, particularly at street intersections, it may be necessary to deviate from the above-specified minimum and maximum cover requirements. At locations where the crossing of water mains with other underground utilities results in grade conflicts, adjustment to the vertical alignment of the water main may be required. Adjustments over or

under the conflicting utility line shall be made as detailed in Standard Drawing 8-5 in City of Colusa Improvement and Design Standards. The cost to make these adjustments shall be included in the bid price to install the pipe when the conflicts are shown on the Plans.

In designing the distribution system, it was intended that ten feet (10') be the minimum horizontal distance between parallel water and sanitary sewer lines and services, and that the water main be at least twelve inches (12") higher. No field changes shall be made that conflict with the requirement without prior approval of the Engineer. When crossing a sanitary sewer force main, the water main shall be a minimum of three feet (3') above the sewer line and no fittings within ten feet (10') of the crossing.

The bottom of the excavated trench shall be cleared of rocks and clay lumps larger than two inches (2") in size. All grade stakes, wood, cut and abandoned pipe, or other material shall be removed from the trench. The bottom of the trench shall be smoothed and compacted to provide uniform support of the pipe between the joints. The bottom of the trench shall be compacted to a minimum of ninety percent (90%) of maximum dry density as determined by ASTM Test Designation D698.

Whenever the bottom of the trench is soft or rocky, or, in the opinion of the Engineer, otherwise unsuitable as a foundation for pipe bedding, the unsuitable material shall be removed per Section 14-8 of these Technical Specifications.

Unsuitable material encountered during excavation of the trench shall be excavated and disposed of as directed by the Engineer. Contractor shall excavate unsuitable material and the resulting space shall be filled per Section 14-8 of these Technical Specifications.

At the end of each working day, the maximum amount of trench open on any portion of the project shall not exceed the length of open trench necessary for placing pipe the next working day. This open trench shall be bridged. Open trench exceeding the length necessary for placing the pipe the next day shall be backfilled, compacted, and temporarily paved. Within the traveled way in a direction crossing traffic flow, the open trench shall either be bridged or shall be backfilled, compacted, and temporarily repaved. Temporary paving shall be installed in accordance with the requirements of Section 14-4 of these Technical Specifications.

Temporary bridges placed over excavated trenches at street intersections, pedestrian crosswalks, driveways, and private roadways shall be provided by Contractor for the safe passage of pedestrian and vehicular traffic in accordance with Section 6-10 of these Technical Specifications.

Footbridges adequate for pedestrians shall have a minimum width of five feet (5'). The footbridges shall be designed and constructed to withstand a minimum uniform load of one hundred and fifty pounds per square foot (150 psf). Handrails and support posts shall be made with dressed lumber.

Bridges for vehicle traffic shall be a minimum of twelve feet (12') in width, skid resistant and structurally able to withstand an AASHTO H-20 vehicle load. Temporary bridges shall be installed over the trenches at all intersections whenever excavation is in excess of one-half the street width. Bridges shall also be provided at residential and commercial driveways for the safe access of vehicle traffic onto public streets.

All temporary bridges over excavated trenches shall remain in place for public safety and convenience during the duration of the work. At Contractor's risk, the bridges may be temporarily removed or relocated to accommodate the work as approved by the Engineer.

Unless directed or indicated otherwise, plug or seal the ends of existing pipes cut to install new pipe. As a minimum, provide temporary end covers to prevent dirt from entering pipes that are to be reconnected. The cut ends of abandoned pipes made of plastic, clay, Transite, concrete, or similar materials shall be permanently sealed with a concrete plug extending at least two feet (2') into the cut pipe. Use Class "C" or Class "D" concrete per Technical Specifications Section 10-5. Cut ends of abandoned steel pipes may either be plugged with concrete as above, or sealed by welding quarter inch ( $\frac{1}{4}$ ") thick steel plates onto each end. Cut ends of abandoned pipe that will be removed do not require permanent seals.

When active water mains must be cut, Contractor shall anticipate that existing water system valves do not seal drip tight, and thus pipes downstream of existing valves may become pressurized. Seal the cut ends of active water mains with watertight 150 psi pressure rated end caps suitable for potable water use. Pressure rated end caps shall be left in-place until the cut pipe is restored, or the Engineer determines that the cut pipe is fully isolated and thus is no longer an active main. If end caps are removed from water mains to be abandoned, plug the exposed ends as described above.

Contractor shall be responsible for the control, removal, and disposal of any groundwater that may be encountered in the course of excavating and backfilling trenches or placing pipe. Whenever water or over-saturated soil conditions exist which may interfere with proper installation, trenches shall be dewatered before placement of any pipe or material. Unless approved in writing by the Engineer, groundwater and/or water from trench dewatering shall be free of sediment and other construction materials before entering the City storm

drain system. A dewatering plan, including a water de-sedimentation plan, shall comply with Section 16-1 of these Technical Specifications and be approved by the Engineer prior to any discharge of water to the City's storm drain system.

## **27-4 LAYING WATER PIPES**

### **1. General**

Contractor shall take all appropriate measures to prevent any type of foreign material or animals from entering the pipe while the water pipe is being placed. Contractor shall clean the inside of the pipe as directed by the Engineer.

Pipe for water mains shall not be placed during inclement weather or when the conditions in the trench will interfere with proper jointing of the pipe as determined by the Engineer. Whenever the work of placing the water main is discontinued and at the end of each workday, all open ends of water main pipe, fittings and valves at the pipe end shall be sealed. The seal shall be water tight and shall be easily installed and removed. The trench shall be temporarily backfilled to completely cover the seal.

All metallic pipe and fittings shall be wrapped with eight (8) mil polyethylene material in accordance with AWWA Standard C105/A21.5. Polyethylene shall be installed in accordance with the requirements of Section 27-17 "Corrosion Monitoring" in these Technical Specifications.

Pipe for the project shall not be stockpiled within public street right-of-way along the alignment of the water transmission main in excess of an amount representing a five (5) day supply at current rates of pipe laying, and shall never exceed a maximum length of five hundred feet (500') unless otherwise indicated in the Special Provisions. Stockpiling of pipe on the opposite side of the street from construction shall not be allowed without the approval of the Engineer.

Each section of pipe and each fitting shall be thoroughly cleaned before it is installed. All pipes, valves, fittings, and appurtenances shall be lowered into the trench in such a manner as to prevent any damage, particularly to the pipe lining and coating. Under no circumstance shall pipe or appurtenances be dropped into the trench.

The pipe shall be laid true and uniform to line and grade, with no visible change in alignment at any joint unless a curved alignment is shown on the Plans, in which case the maximum deflection at any joint shall not exceed two-thirds ( $\frac{2}{3}$ ) the manufacturer's recommendation for the type of pipe and joint being used.

All pipe jointing, including the deflection at joints in curved alignments, shall be in accord with accepted best practice and as detailed herein and in the manufacturer's installation manual. Both joint surfaces shall be clean before joints are made. Materials used to join the pipe shall only be that furnished with the pipe or recommended by the manufacturer.

When field cutting pipe, the cut ends shall be cut square and all burrs removed from the pipe interior. The beveling of the pipe ends shall be as specified by the manufacturer. Guide marks for jointing the pipe, after cutting, shall be made on the pipe in accordance with the manufacturer's recommendations.

Contractor shall prevent undue pipe deflection and/or unit loading during pipe handling. Damage to the pipe lining or coating shall be repaired by Contractor in accordance with the manufacturer's recommendations as directed by the Engineer

## **2. Rubber Gasket Joints**

The joining of lengths of pipe with rubber gasket joints shall be performed in the following sequence and in accordance with the pipe manufacturer's recommendations:

- a. The spigot groove, inside bell sealing surface and rubber O-ring gasket shall be thoroughly cleaned.
- b. The above-cleaned surfaces shall be thoroughly lubricated with a soft, vegetable soap compound.
- c. The gasket shall be uniformly stretched while placing it in the spigot groove to assure a consistent volume of rubber distributed uniformly around the circumference.
- d. The pipe shall be joined by a firm horizontal push without binding.
- e. A feeler gauge shall be inserted between the bell and spigot to check the position of the rubber gasket around its periphery. If the gasket is in an improper position, it shall be removed, inspected, reassembled, and rechecked.

## **3. Field Welding of Pipe Joints**

Field welding of pipe joints for welded steel pipe and concrete cylinder pipe shall be performed in accordance with the requirements of AWWA C206,

AWSD 7.0 "Field Welding of Steel Water Pipe Joints" and Standard Drawings 8-54 and 8-55 in City of Colusa Improvement and Design Standards.

All welding, whether done in the shop or in the field, shall be performed by experienced and skilled operators familiar with the methods and materials to be used. Welding operators and welding procedures for all manual welding of joints and fittings shall be qualified in accordance with the standard qualifications procedure of Section IX of the ASME Boiler and Pressure Vessel Code. Welder operators shall be certified for three position welding in accordance with AWWA, ASME or other similar three position root bend test method of qualification.

All shop and field welding shall be performed by the submerged or shielded electric arc method unless specified in the Special Provisions. The minimum number of passes for welded joints shall be as follows:

| <b>Steel Cylinder Thickness (inches)</b> | <b>Minimum Number of Passes for Welds</b> |
|--|---|
| Less than 0.25                           | 2   |
| Equal to or greater than 0.25            | 3   |

Welds shall be full circumferential and shall be done in passes no more than one-quarter inch ( $\frac{1}{4}$ ") in thickness. Welding electrodes shall comply with the requirements of American Welding Society A5.1 or A5.5. Size and type of electrodes and the magnitude of the voltages and currents used shall be consistent with methods, materials, and loads to be resisted.

Artificial cooling of the weld area during welding or quenching the completed weld is not permitted. The Engineer will have the option of requesting welding sample coupons for testing. The tests shall show the weld strength to be at least equal to the strength of the plates being welded to be acceptable.

Particular attention shall be given to the alignment of edges to be joined to allow complete penetration and fusion throughout the full depth of the weld. Welds shall contain no undercuts or valleys in the center or at the edges of the weld. Each weld pass shall be thoroughly cleaned of dirt, slag, and flux before each succeeding weld bead is applied.

Completed field welds of pipe joints shall be cleaned of dirt, slag and flux, and then visually inspected. Subject to the approval of the Engineer, all porosity and cracks, trapped flux, or other defects in the welds, discovered during inspection, shall be completely chipped out in a manner that shall allow proper



and complete repair by re-welding. Under no circumstances shall caulking of defective welds be permitted.

#### **4. Cement Mortar Joint Finish**

Following satisfactory testing of the welds, the interior of all joints shall be cement mortar lined and the exterior of the joints shall be cement mortar coated in accordance with AWWA C205 for welded steel pipe and AWWA C303 for concrete cylinder pipe.

The application of cement mortar to the joints on the exterior of the pipe shall be made after the pipe is adequately bedded. Interior joints shall be mortared after initial backfill is in place or after pipe is secured in or on a structure.

To minimize annular shrinkage cracks due to temperature change, exterior joints shall be poured when the pipe is cool. Water jetting to cool the pipe shall be done when the joint mortar is still in a plastic state and is protected from washing by canvas or impervious joint wrapping.

Cracks occurring in interior or exterior joint mortar shall not exceed four hundredths of an inch (0.04"). Where cracks exceed this limit, they shall be removed to the metal to a width of at least three eighths inch ( $\frac{3}{8}$ ") and new mortar set in.

##### **a. Exterior Joints**

After cleaning, a sail cloth band with three eighths inch ( $\frac{3}{8}$ ") wide steel box strapping attached to the two long ends shall be placed around the pipe outside and centered over the joint with the band, opening for grout on the pipe top. The strapping band shall fit snugly around the pipe.

The cement mortar shall consist of one (1) part Portland Cement to two (2) parts sand mixed to a consistency of thick fluid cream. After the joint is moistened, the cement mortar shall be poured into the joint recess on one side, rodded, if necessary, until it appears on the opposite side, then the remainder shall be poured. Portland Cement shall meet the requirements of Section 10 of these Technical Specifications.

The cement mortar shall completely fill the outside joint exposed metal annular space. Upon completion, the joint cover shall be placed over the opening and the mortar allowed to set.

**b. Interior Joints**

The cement mortar shall consist of one (1) part Portland Cement and one and one-half (1½) parts sand, dry mixed and wetted with sufficient water to permit caulking and troweling without crumbling or sloughing. Sufficient time shall be allowed for curing prior to use. Portland Cement shall meet the requirements of Section 10 of these Technical Specifications.

For pipe less than twenty-two inches (22") in diameter cement mortar shall be placed in the inside recess prior to joining the pipe. After each new length of pipe has been placed in final position, a ball shall be pulled through the joint in order to smooth the mortar at the joint. This procedure is not necessary if a hand hole is used to mortar the joint.

For pipes greater than or equal to twenty-two inches (22") in diameter, cement mortar shall be placed in the inside of recess while working inside the pipe. Foreign substances which adhere to the steel joint rings shall be removed, the surface cleaned, and stiff cement mortar packed into each joint. The mortar shall be finished with a steel trowel to match the lining in the adjoining pipes. Excess mortar and other construction debris shall be removed from the pipe interior.

Closure assemblies shall be cement-mortar lines to a mortar thickness at least equal to the adjoining standard pipe sections. The steel shall be cleaned with wire brushes and a cement and water wash coat applied prior to applying the cement mortar. Where more than a 4-inch joint strip of mortar is required, welded wire mesh reinforcement having a 2-inch by 4-inch pattern of No. 13 gage shall be placed over the exposed steel. The mesh shall be installed so that the wires on the 2-inch spacing run circumferentially around the pipe. The wires on the 4-inch spacing shall be crimped to support the mesh 3/8 inch from the metal surface. The interior mortar shall have a steel-troweled finish to match adjoining mortar lined pipe sections.

**5. Cleanup-Up Behind Pipe Laying Operations**

Contractor shall maintain cleanup operations in pace with pipe laying. Concurrently with or immediately after placing a temporary bituminous surface within paved areas, or the placing of backfill in unpaved locations, all areas affected by Contractor's operations shall be restored to their original conditions (except for final repaved surfacing) and left in a neat and orderly condition.

Paved areas shall be swept with a power broom and then flushed with water.

Excavations at locations of valves, blow-offs, air relief valves, and tie-in connections shall not be left open without the Engineer's written permission.

Replacement of removed improvements or repairs to damaged or disturbed real property or improvements shall be performed concurrently with the cleanup work.

Failure to perform the above work in pace with the forward trenching progress shall be sufficient cause for the Engineer to order Contractor to stop trenching until the Engineer has determined that the work has been caught up.

## **27-5 PLACING LOCATING WIRE WITH DISTRIBUTION MAINS**

All runs of distribution mains (4" to 12") including metal and plastic shall have a locating wire taped to the top of the pipe to facilitate location after installation, as shown on Standard Drawing 8-1 in City of Colusa Improvement and Design Standards. The locating wire shall be a No. 10 gauge copper wire insulated with high molecular weight polyethylene (HMWPE), blue in color, and suitable for direct burial.

## **27-6 THRUST BLOCKING AND RESTRAINED JOINTS**

### **1. Distribution Main (4"-12")**

All plugs, caps, tees, or bends with a deflection greater than eleven and a quarter degrees ( $11\frac{1}{4}^{\circ}$ ) shall be provided with concrete thrust blocks installed as detailed on Standard Drawing 8-2. Nuts or bolt heads of bolted connections shall not be covered by concrete or form materials. The thrust block shall extend from the fitting to undisturbed soil.

Deadman thrust assemblies shall not be allowed without prior approval from the Engineer.

Mechanically restrained joints may be used in lieu of concrete thrust blocks when approved by the Engineer and shall be the type recommended by the manufacturer of the pipe.

### **2. Transmission Mains (Greater than 12")**

Contractor shall submit to the Engineer for approval, calculations for minimum lengths of restrained pipe where there is unbalanced hydraulic thrust, such as at abrupt changes in horizontal and/or vertical alignment, at tees, valves and caps. Thrust restraint calculations shall be based on an internal test pressure of two hundred and twenty-five pounds per square inch (225 psi). Any

demarcations of restrained joint requirements on the Plans indicate only possible segments for restrained pipe joints. Contractor is responsible for verifying the necessity of and minimum lengths for restrained joints. Concrete thrust blocking is not allowed.

Joints shall be restrained when deflection of the pipe at the joint exceeds two-thirds ( $\frac{2}{3}$ ) manufacturer's recommendation. Transmission mains constructed of welded steel pipe or concrete cylinder pipe shall be restrained by field welding the joints. Ductile iron pipe shall be restrained with Field Lok Gaskets, TR Flex, or an approved equal.

Thrust restraints for fittings, elbows, reducers, in-line valves, appurtenances, etc., shall be provided by means of restrained pipe joints, utilizing pipe skin friction for horizontal restraint, and dead load for vertical restraint (uplift). In-line valves shall be considered as a dead end main for thrust restraint calculations. Thrust forces shall be calculated using the internal diameter of the pipeline. Skin friction shall be calculated with allowance for pipe dead and live load. Earth load above the pipe when backfilling prior to testing, and a friction coefficient incorporating the properties of the actual backfill materials shall be used.

The friction coefficient shall not exceed 0.25 for C200 and C303 unless a geotechnical evaluation is submitted. In no case shall the friction coefficient exceed 0.30. For polyethylene encased ductile iron pipe, only skin friction between the encasement and the pipe shall be considered with no allowance for soil cohesion or the internal friction angle of the soil. The skin friction for polyethylene wrapped ductile iron pipe shall be reduced thirty percent (30%) to a maximum of 0.17 unless Contractor submits a geotechnical evaluation.

## **27-7 APPURTENANCES**

### **1. General**

Appurtenances shall comply with the material requirements of Section 10 of these Technical Specifications and shall be installed per the manufacturer's recommendations. All new valves and hydrants to open counter-clockwise.

Appurtenances shall be installed at elevations and locations as shown on the Plans. The joints between the main pipe and side fittings shall be restrained in compliance with the Plans, Special Provisions, and these Technical Specifications. The trench bottom shall be graded uniformly to provide a level base for the fittings and minimize torsional strain when the backfill is placed.

On transmission mains, insulated flanged joints shall be provided at every butterfly valve, gate valve, flanged outlet, at each tie-in connection, at fire hydrant connections, at air release valves, at blow-off connections, at intervals of two thousand five hundred feet (2,500') along the water main pipe, and/or as

otherwise indicated on the Plans. Insulated joints shall be installed in accordance with the requirements of Section 27-17, "Corrosion Monitoring", and Standard Drawings 8-53 and 8-68 in City of Colusa Improvement and Design Standards.

Polyethylene material with a minimum thickness of eight (8) mil shall be placed around the exterior of the appurtenances in accordance with AWWA Standard C105/A21.5. Polyethylene shall be installed in accordance with the requirements of Section 27-17, "Corrosion Monitoring".

## **2. Fire Hydrants**

In no case shall a fire hydrant be installed within three feet (3') of a building or any other structure that would limit access. All hydrants shall be set plumb and installed and located in accordance with Standard Drawing 8-8 in City of Colusa Improvement and Design Standards.

Only ductile iron or polyvinyl chloride pipe shall be used as branch leads that connect fire hydrants to water mains.

Where the Plans indicate that existing fire hydrants are to be removed and salvaged, the salvaged hydrants shall be removed intact and delivered undamaged to the Corporation Yard as directed by the Engineer.

Fire hydrants placed at street intersections shall be installed at the beginning or end of round corners (curb returns) and not be positioned along the arc of the round corner.

Only one six inch (6') or twelve inch (12') fire hydrant extension kit per hydrant shall be allowed. Contractor shall meet the bury depth requirements by use of forty five degree (45°) fittings.

## **3. Gate Valves**

All gate valves shall be restrained in both directions.

Value operating nut extensions are required in accordance with Standard Drawing 8-19 in City of Colusa Improvement and Design Standards when valve nut is in excess of thirty inches (30") below finished grade.

Contractor shall carefully place valve into position, avoiding contact or impact with other equipment, or trench walls. The pipe ends shall be prepared in accordance with the manufacturer's instructions. The water main shall be properly supported to avoid line stress on valve. The pipe/valve joint shall not be deflected nor shall the valve be used as a jack to pull the pipe into alignment.

#### **4. Backflow Prevention Assemblies and Swing Check Valves**

The City maintains a backflow prevention and cross-connection control program in accordance with the requirements of Title 17 of the California Administrative Code. Backflow prevention assemblies shall be installed in accordance with the appropriate Standard Drawings in City of Colusa Improvement and Design Standards (Drawing Numbers 8-27 thru 8-37 and 8-34 thru 8-39). The backflow prevention assembly must be installed such that the device is readily accessible for testing and maintenance, and shall be located as close as practical to the point of service delivery (meter).

The City of Colusa Department of Utilities maintains a list of approved assemblies. Only assemblies that appear on this list are acceptable for installation. Assemblies shall be shipped from the manufacturers in the fully assembled configuration. This includes bypass arrangements and shutoff valves. Assemblies received for installation not completely assembled are not approved. Field conversions of double check assemblies to a detector assembly, or vice versa, are not permitted.

The City of Colusa's requirements for designing, constructing, installing, and maintaining backflow prevention assemblies is found in the Cross Connection Control Policy of Department of Utilities. Copies of the "Cross Connection Control Policy" are available from the Department of Utilities Customer Service at 1395 35th Avenue. Following acceptance of the installation, the device must be performance tested at the owner's expense by a certified tester selected from the City approved list.

All assemblies shall be installed to provide protection from vandalism and freezing. Cages must be installed so that adequate clearance is available for maintenance and testing or it should be completely removable and allow for any discharge from the relief valve to fully drain from the protective cage or cover.

As a minimum, backflow prevention assemblies shall be sized equivalent to the diameter of the service connection. The installation of backflow prevention assemblies shall be aboveground.

#### **5. Blow-Offs**

##### **a. Distribution Mains**

Standard two inch (2") and four inch (4") blow-offs shall conform to and be installed in accordance with Standard Drawing 8-13 in City of Colusa Improvement and Design Standards.

##### **b. Transmission Mains**

Blow-offs shall be six inches (6") in size and shall conform to and be installed in accordance with Standard Drawings 8-50 or 8-51 in City of Colusa Improvement and Design Standards.

## **6. Butterfly Valves**

Butterfly valves shall conform to and be installed in accordance with Standard Drawing 8-42 in City of Colusa Improvement and Design Standards.

Value operating nut extensions are required in accordance with Standard Drawing 8-19 in City of Colusa Improvement and Design Standards when valve nut is in excess of thirty inches (30") below finished grade.

Contractor shall carefully place valve into position, avoiding contact or impact with other equipment, or trench walls. The pipe ends shall be prepared in accordance with the manufacturer's instructions. The water main shall be properly supported to avoid line stress on valve. The pipe/valve joint shall not be deflected nor shall the valve be used as a jack to pull the pipe into alignment.

## **7. Combination Air Vacuum and Release Valves**

Combination air vacuum and release valves shall be two inches (2") or four inches (4") in size, as indicated on the Plans. Installation of air vacuum and release valves shall conform to and be installed in accordance with Standard Drawings 8-43 thru 8-48 in City of Colusa Improvement and Design Standards.

## **8. Flexible Couplings and Flanged Coupling Adaptors**

### **a. Transmission Mains**

The flexible couplings shall be installed with provision for thrust restraint ties attached to the water main pipe. The thrust restraint ties on the pipe shall be welded lugs, lugs cast integrally with the pipe, or friction collars. Anchor studs placed perpendicular to the long axis of the pipe are unacceptable. Resistance to hydraulic thrust shall be adequate to sustain a force developed by a test pressure of two hundred and twenty-five pounds per square inch (225 psi).

Flanged coupling adapters shall be provided with thrust ties attached to the pipe with welding lugs, cast-in-place lugs, or friction collars. Lugs shall have a minimum thickness equal to that of adjacent flange and shall have holes the same size as those on the flange. Anchor studs placed perpendicular to the longitudinal axis of the pipe are unacceptable.

Contractor shall ensure that the pipe is in proper alignment. Contractor shall clean all dirt, rust, oil or loose scale from pipe ends for a distance of two inch (2") greater than the length of the flanged coupling. Contractor shall check area where gaskets will seat on pipe and flange faces to make sure there are no dents, projections, gouges, etc. that will interfere with the gasket seals. Welds must be ground flush. Bolt tightening should be done evenly, alternating to diametrically opposite positions to bring bolts to recommended tightness.

**b. Distribution Mains:**

Flexible couplings shall be installed with provisions for thrust restraint.

**9. Mechanical Joints**

Contractor shall thoroughly clean socket and plain end of all rust or foreign material. The socket, gasket and plain end shall be lubricated with soapy water or an approved pipe lubricant meeting requirements of AWWA C111. The bolts shall be tightened to draw gland toward the pipe flange evenly, maintaining approximately the same distance between the gland and the face of the flange at all points around the joint using torque-measuring wrenches.

**10. Valve Boxes**

Valve boxes shall be furnished and installed in accordance with Standard Drawings 8-15, 8-16, and 8-17 in City of Colusa Improvement and Design Standards.

**11. Access Manholes**

Installation of access manholes shall conform to and be installed in accordance with Section 25 and Standard Drawing 8-40 in City of Colusa Improvement and Design Standards.

**27-8 PIPE BEDDING AND BACKFILLING OF TRENCHES**

Pipe bedding and initial backfill for water mains, fire hydrant branch leads, and water services shall be furnished and placed according to the requirements contained herein and as detailed on Standard Drawing 4-20 in City of Colusa Improvement and Design Standards. The pipe bedding and initial backfill material shall consist of sand meeting the requirements as given in Section 10-13 of these Technical Specifications unless otherwise specified in the Special Provisions.



Bedding material shall be placed and compacted along the bottom of the trench to provide uniform support for the water main pipe at every point between the joints. Support of the pipe by wedging or blocking shall not be permitted. At the location of each joint, holes of adequate size shall be provided in the bottom and sides of the trench to permit easy joint preparation, pipe assembly, and visual inspection of the entire joint.

Initial backfill shall be placed immediately after pipe joints have been completed, inspected, and passed by the Engineer. Trench backfill shall be earth material, unless otherwise specified in the Special Provisions, placed and compacted above the granular bedding and initial backfill material to the level of the subgrade in paved areas or to the top of the trench in unpaved areas. Backfill shall be provided by Contractor and shall be placed in accordance with Section 14-3 of these Technical Specifications and the pipe manufacturer's recommendations.

Imported granular material may be used to backfill pipe trenches in place of job excavated native material. The imported granular material placed above the initial backfill shall be uniformly graded Class 2 aggregate base, meeting the requirements of Section 10-7 of these Technical Specifications. Compaction and placement requirements for imported granular material shall be the same as required for compaction of job excavated native material.

Full depth select or imported backfill will be required under the following circumstances:

1. At locations where over excavation is required, i.e., butterfly valves, blow-offs, system tie-in connections, insulated joints, etc.
2. At locations where pipes for sewage or drainage cross above the water transmission main pipe.
3. In areas where the trench section is of unusual configuration.
4. Jacking and receiving pits for the boring and jacking of pipe casings.

Full depth select backfill shall be placed in layers not exceeding eight inches (8") in depth and shall extend to the level of subgrade road subbase and to undisturbed earth on the sides. Compaction and placement requirements for full depth select backfill shall be the same as required for compaction of job excavated native material. Unless otherwise specified on the Plans or Special

Provisions, full depth select backfill material shall consist of sand, Class 2 aggregate base or controlled density fill (CDF) meeting the requirements of Section 10 of these Technical Specifications.

## **27-9 REPAVING WATER PIPE TRENCHES**

Repaving of trenches for water mains, fire hydrant branch leads, and water services shall be as specified in this Section of these Technical Specifications unless otherwise indicated on the Plans or in the Special Provisions

Contractor shall restore all surfaces, which have been removed or damaged by Contractor in kind, using the same material as existing, unless otherwise noted on the Plans or in the Special Provisions. The repaving is to be done in such a manner to, as closely as possible, replace the cut pavement with a similar type and an equal or greater structural section.

Upon completion of trench backfill, existing pavement as well as any curbs, gutters and sidewalks that have been cut or damaged as a result of the construction activities shall be replaced. The replacement of pavement, curb, gutter or other improvements shall match that of the original as close as practical unless otherwise indicated on the Plans. Segments of pavement that were damaged during construction shall be cut to a neat straight line. To form the required "T" trench, the existing pavement shall be ground or saw cut an additional six inches (6") outside the excavated area prior to paving. The minimum pavement section within public street right-of-way shall be four inches (4") of asphaltic concrete over twelve inches (12") of Class 2 aggregate base unless otherwise noted on the Plans or in the Special Provisions.

Aggregate base for repair and/or replacement of existing pavement shall meet the requirements for Class 2 aggregate base as contained in Section 10 of these Technical Specifications. Aggregate base shall be placed and compacted in accordance with Section 14 of these Technical Specifications, except that it shall be compacted to a relative compaction of not less than ninety-five percent (95%) as measured by tests specified in Section 14 of these Technical Specifications.

Asphaltic concrete pavement and its placement shall conform to the requirements of Section 22 of these Technical Specifications.

Restoration of existing concrete pavement shall consist of at least six inches (6") of concrete and shall conform to the requirements of Section 19. Concrete surfaces to be replaced shall be colorized, as necessary, to match existing adjacent concrete color by the addition of Lamp Black coloring agent. Contractor shall submit concrete mix design for approval including a proposed proportion of coloring agent appropriate to the shade of adjacent concrete.

Where entire alley requires replacement, concrete shall not include coloring agent, unless directed by the Engineer.

Concrete used in the repair and/or replacement of curb, gutter, or sidewalk shall conform to Section 24-1 of these Technical Specifications. Concrete used in the replacement of existing concrete "V" gutter or pavement shall be Class "A" concrete in accordance with Section 10 of these Technical Specifications. Placement of concrete shall conform to the requirements of Section 24 of these Technical Specifications.

Where less than two feet (2') of existing pavement is left between the edge of the trench and the lip of concrete gutter or pavement edge, the narrow strip of existing pavement shall be removed and the area repaved along with the area overlying the trench. All existing asphaltic concrete or concrete pavement adjacent to the pipe trench that has been loosened, cracked, or damaged as a result of Contractor's operations shall be removed and replaced.

Unless otherwise provided on the Plans or in the Special Provisions, pipeline trenches in unpaved portions of street rights-of-way shall have the top twelve inches (12") filled with aggregate base Class 2, conforming to Section 10 of these Specifications and compacted to ninety-five percent (95%) relative compaction as determined by ASTM Designation D1557.

All pavement debris and other excavated material not destined to be used for backfill shall be removed and disposed of outside the limits of the project at Contractor's expense.

## **27-10 WATER SERVICES**

Materials for services shall meet the requirements specified in Section 10 and shall be installed in accordance with the Standard Drawings. All new and reconnected services shall be metered.

The location of water services extending beneath curbs, gutters and sidewalks shall be denoted by imprinting a two inch (2") size Gothic letter "W" on the upper face of the curb, unless otherwise directed by the Engineer.

Service saddles for one inch (1"), one and a half inch (1½") and two inch (2") services shall be installed in accordance with Standard Drawing 8-23 in City of Colusa Improvement and Design Standards. Three inch (3") services are not allowed. A three inch (3") meter shall be installed on a four inch (4") tap. Tapping sleeves for services four inch (4") and larger shall have a stainless steel sleeve and stainless steel flange.

Gate valves for water services four inches (4") and larger in diameter shall be installed at the main with a flanged connection and shall include a valve box and riser. Boxes and risers shall be as specified in and installed in accordance with Standard Drawing 8-15 in City of Colusa Improvement and Design Standards.

No hydrant branch lead, services or fitting (tee, ell, etc.) shall be tapped to accommodate any service.

## **27-11 WATER TAPS TO NEW AND EXISTING MAINS**

Prior to scheduling taps on new or existing water mains, Contractor shall provide the Engineer a copy of a bacteriological report showing that all piping including on-site fire services, private fire hydrants, and domestic services meet the requirements of these Technical Specifications.

Water taps on new mains prior to being accepted by the City shall be made by Contractor. Water taps on existing City mains shall only be made by City crews at Contractor's expense.

For any given project, a maximum of two (2) water main shutdowns, water main tie-in connections (tap or "cut-in"), or combination thereof directly involving work by the City crews, shall be scheduled per day. Such work performed by City crews will be between 9:00 am and 3:00 pm. Modification to this procedure may be requested by Contractor and will be considered on a case-by-case basis with the final determination to be made by the Engineer.

Contractor shall notify the Engineer that a shutdown is required and the City will schedule the shutdown within five (5) working days of notification. The Engineer will notify Contractor of the time of shutdown at least two (2) working days prior to the shutdown. Contractor shall excavate around the water main, per Standard Drawing 8-24, twenty-four (24) hours prior to the City tapping the water main.

Any change made to the vertical and horizontal alignment of water services shall be made behind the sidewalk and outside the City right-of-way. Within the City right-of-way the water services shall be installed perpendicular to the main.

## **27-12 DISINFECTION OF WATER MAINS**

### **1. General**

The intent of this section is to present procedures essential for the disinfection of newly constructed water mains and appurtenances. No new mains shall be connected to existing mains until they have been disinfected in

accordance with this section, and pressure tested in accordance with Section 27-13 in these Technical Specifications. All disinfection and testing shall be made in the presence of the Engineer. The basic procedure consists of the following:

- a. Preventing contaminating materials from entering the water mains during construction.
- b. Disinfecting any residual contamination that may remain.
- c. Determining the bacteriological quality by laboratory testing after disinfection.

Contractor shall furnish all hoses, pumps, gauges, connections, valves, other necessary apparatus, and personnel required for disinfecting, flushing, and disposal of chlorinated water.

Precautions shall be taken to protect pipe interiors, fittings, and valves against contamination during the construction of the water system.

Chlorination and testing of the pipeline shall be in accordance with AWWA C 651 with the following exception: the first bacteria sample after flushing the main is not required. Water distribution mains up to and including twelve inches (12") in diameter shall be disinfected using the Tablet Method or Continuous-feed Method described in AWWA C 651. Water transmission mains eighteen inches (18") in diameter and greater shall be disinfected using the Continuous-feed Method described in AWWA C 651.

Disinfecting the pipeline may be performed concurrently with the hydrostatic testing in accordance with Section 27-13. In the event repairs are necessary, as indicated by the hydrostatic test, additional disinfecting may be required as directed by the Engineer.

## **2. Tablet Method**

The Tablet Method shall employ the use of a sufficient number of calcium hypochlorite tablets as a disinfectant to yield an average chlorine dose of approximately twenty-five milligrams per liter (25 mg/l). The five-gram (5g) calcium hypochlorite tablets shall contain at least sixty-five percent (65%) available chlorine by weight. These tablets shall meet the requirements of AWWA B 300, standard for hypochlorites.

Because preliminary flushing cannot be performed when tablets are used, cleanliness must be exercised during construction of the water main.

The calcium hypochlorite tablets shall be placed in each section of pipe and also in hydrants, hydrant branches and other appurtenances. They shall be attached by an adhesive at the top of the pipe to prevent washing to the pipe end. If the tablets are fastened before the pipe section is placed in the trench, their position shall be marked on the section to assist in keeping the tablet's position at the top of the pipe.

| Number of 5 Gram Calcium Hypochlorite Tablets*  |                               |    |    |    |    |
|---|-------------------------------|----|----|----|----|
| Pipe Diameter<br>(Inches)   | Length of pipe section (feet) |    |    |    |    |
|   | 13 or<br>less                 | 18 | 20 | 30 | 40 |
| 4   | 1                             | 1  | 1  | 1  | 1  |
| 6   | 1                             | 1  | 1  | 2  | 2  |
| 8   | 1                             | 2  | 2  | 3  | 4  |
| 10  | 2                             | 3  | 3  | 4  | 5  |
| 12  | 3                             | 4  | 4  | 6  | 7  |
| *Based on 3.25 grams of available grams of chlorine per tablet. Any portion of tablet rounded to next highest number. |                               |    |    |    |    |

The adhesive shall be Permatex No. 1, or approved equal. There shall be no adhesive on the tablet except on the broad side next to the surface to which the tablet is attached. The number of calcium hypochlorite tablets required for main disinfections shown by the table above.

### 3. Continuous Feed Method

The continuous feed method consists of completely filling the main to remove all air pockets, flushing the completed main to remove particulates, and filling the main with chlorinated potable water so that after a twenty four (24) hour holding period in the main there will be a free chlorine residual of not less than ten milligrams per liter (10mg/l) at all locations in the main.

Prior to being chlorinated the main shall be filled to eliminate air pockets and shall be flushed to remove particulates. The Flushing velocity in the main shall be not less than two and a half feet per second (2.5fps) unless otherwise directed by the Engineer.

A chlorine-water solution shall be applied by means of a solution feed chlorinating device. Care shall be taken to prevent the highly chlorinated water in the pipeline being treated from flowing back into the pipeline supplying the water. At a point not more than ten feet (10') downstream from the beginning of a new main, the concentrated chlorine solution shall be pumped into the main

at a uniform feed rate until the desired chlorine residual (at least 25mg/l) is measured in the flushed water at the terminal outlet. Chlorine application shall not cease until the entire main is filled with chlorinated water. If at any time the application of chlorine is interrupted, the flow of water shall be stopped until chlorine application is resumed.

#### **4. Pipeline Filling**

Before filling the pipeline, Contractor shall:

- a. Remove any and all residual water from the entire pipeline to be tested.
- b. Open all air vents.
- c. Furnish a double check valve assembly to make a single supply connection for testing. Installation of the double check valve assembly shall be in accordance with Standard Drawing 8-6 in City of Colusa Improvement and Design Standards. A double check valve assembly hook-up to the City water system must be approved by the Engineer prior to water use. The double check valve assembly shall be approved by a certified tester. The certification tags shall be displayed on the double check valve assembly after approval.

Each section of the pipe to be disinfected shall be slowly filled with water at a velocity of less than one foot per second (1fps), and all air shall be expelled from the pipe. The release of the air can be accomplished by opening fire hydrants and service line cocks at the high points of the system and blow-offs at all dead ends. If required, Contractor shall provide a corporation stop at high points to provide air vents and insure that all air is released. The valve controlling the admission of water into the section of pipe to be disinfected should be opened wide before shutting the hydrants or blow-offs. After the system has been filled with water and all the air expelled, all the valves controlling the section to be tested shall be closed.

#### **5. Disinfection, Flushing and Testing**

The disinfection, flushing and testing sequence shall be as follows:

- a. Chlorination and testing of the pipeline shall be in accordance with AWWA Standard C651 with the following exception: the first bacteria sample after flushing the main is not required.
- b. The heavily chlorinated water shall be retained in the main for at least twenty-four (24) hours, during which time all valves and

hydrants shall be operated to ensure disinfection of the appurtenances. At the end of the twenty-four (24) hour period, the main shall have a residual of not less than ten milligrams per liter (10 mg/L) of free chlorine or the disinfection procedure shall be repeated using the continuous-feed or other method described in AWWA C651 as directed by the Engineer.

- c. Contractor shall flush the main until the chlorine residual is less than one part per million (1.0 ppm) or matches distribution system chlorine residual level and turbidity is less than one nephelometric turbidity unit (1.0 NTU). The chlorinated water shall be flushed from the system at its extremities and at each appurtenance, using potable water from a source designated by the Engineer. The minimum water velocity during flushing shall be two and a half feet per second (2.5 fps) or as directed by the Engineer. Temporary inlets/outlets shall be sized to provide adequate velocity to flush the main. The minimum inlet/outlet size shall be two inches (2") in diameter.
- d. Samples will be collected at locations along the pipeline identified by the Engineer. Contractor shall notify the Engineer at least twenty-four (24) hours in advance of the time that the bacteriological samples are to be drawn for testing. Contractor shall furnish and install temporary sampling devices in accordance with Standard Drawing 8-14 in City of Colusa Improvement and Design Standards at the locations indicated by the Engineer spaced no greater than twelve hundred feet (1200') apart.
- e. Twenty-four (24) hours after flushing the chlorinated water from the main the Engineer will collect samples for testing.
- f. Bacteriological examination of the samples shall meet the following criteria:
  - i. Total Coliform absent
  - ii. Total Plate Count less than five hundred (500) colony forming units per milliliter

Re-disinfection, if required due to test failure, shall be performed by Contractor at Contractor's expense. Cost to retest the water will be at Contractor's expense.



The water shall meet State and Federal drinking water standards; Title 22, California Administrative Code and the Safe Drinking Water Act of 1974, as amended.

#### **6. Disposal of Chlorinated Water**

After disinfection of the system and prior to coliform bacteria and turbidity testing, chlorinated water shall be disposed of such that water does not flood, inundate or damage property. Contractor shall dechlorinate the water by use of apparatus that injects or mixes EPA approved chemicals with the water to neutralize the chlorine before it is hard piped to a manhole on the nearest storm or sanitary sewer system. Residual chlorine levels shall be reduced and maintained to a maximum of one hundredth of a milligram per liter (0.01 mg/l). Contractor shall test the discharge at fifteen minute (15) intervals to insure that acceptable levels of neutralization are maintained. Discharge shall be stopped if chlorine levels exceed one hundredth of a milligram per liter (0.01 mg/l).

Dechlorinating apparatus shall be the de-chlorinator by Romac Industries or approved equal. All procedures shall be in accordance with manufacturer's recommendations and as approved by the Engineer.

### **27-13 PRESSURE TESTING WATER MAIN INSTALLATIONS**

Following disinfection, Contractor may use the chlorinated water to perform a hydrostatic pressure test of the system. Prior to making final tie-in connections, the entire system shall be pressure tested by Contractor independent of the existing system or systems to be connected.

Contractor shall furnish all hoses, pumps, pressure gauges, leakage measuring devices, connections, relief valves, temporary pressure heads, other necessary apparatus, and personnel required for hydrostatic pressure and leakage testing. Pressure gauges shall register pressure in pounds per square inch gauge (psig). The range of the gauge shall be from zero to two hundred and seventy-five pounds per square inch gauge (0-275 psig). The gauge readings shall have a five (5) psig incremental tick marks. The gauge shall be calibrated within forty-five (45) days of the hydrostatic test and the calibration tag affixed to the gauge.

In no case shall there be placement of permanent pavement prior to successful completion of the test. Joints and fittings must be backfilled to the springline of the pipe and the pipe between joints backfilled to a depth necessary to hold the line securely during the test, but in no case less than eighteen inches (18") above pipe. Thrust blocks shall have been in place for at least thirty-six (36) hours if high-early-strength concrete was used or at least seven (7) days if standard concrete was utilized.

A hydrostatic test pressure of one hundred fifty pounds per square inch gauge (150 psig) shall be maintained for 60 minutes. The allowable leakage criterion is “zero”. No leakage, as represented by a measurable drop in pressure below the starting test pressure, is allowed.

Contractor shall determine the cause of unacceptable leakage results, take corrective measures, and conduct subsequent tests until the pipeline meets the allowable leakage criteria. Contractor shall perform any excavation required to locate and repair leaks or other defects that may develop during the test, including removing backfill that has been already placed. The Engineer shall witness the test and Contractor shall provide the Engineer a forty-eight (48) hour notice prior to the test.

Contractor at his expense shall repair any leaks detected by visual inspection regardless whether test results are acceptable.

Contractor shall take all necessary precautions to prevent joints from drawing while the pipelines and their appurtenances are being tested. Any damage to the pipes and their appurtenances, or any other structures, resulting from or caused by these tests, shall be repaired by Contractor at Contractor’s expense.

#### **27-14 “CUT-IN” CONNECTION TO EXISTING WATER MAINS**

Connection of new water mains to existing mains shall be made only after the newly constructed water mains have been successfully disinfected and pressure tested including onsite fire systems and domestic services.

Contractor shall furnish and install all pipe, fittings, and valve boxes necessary to complete the “cut-in” as shown on Standard Drawing 8-4 in City of Colusa Improvement and Design Standards.

City crews shall perform all shutdowns of existing water mains. See Section 27-11 for water main shut down procedure.

Contractor shall expose the existing water main at the “cut-in” locations per Standard Drawing 8-24 and shall have all material necessary to complete work onsite at least one day prior to the scheduled “cut-in” to the satisfaction of the Engineer. Contractor shall have all necessary manpower and equipment ready at the time of the scheduled “cut-in” necessary to be able to complete the “cut-in” within four (4) hours of the shutdown to the satisfaction of the Engineer. Failure to comply with above-specified requirements shall result in the cancellation of the scheduled shutdown.

New pipe, fittings and valves required for connection but not included in the hydrostatic pressure testing and disinfection procedures shall be disinfected prior to connection in accordance with AWWA Standard C651 relating to "Connections Equal To or Less Than One Pipe Length".

In the connection of new water mains to existing mains, any offset in horizontal or vertical alignment between the exposed ends of new and existing water main pipes that is six inches (6") or greater shall be taken up by the use of elbow fittings. Ninety degree (90°) elbows shall be used only with the Engineer's approval. Deflection of the pipe joints or the use of flexible couplings shall not be permitted.

#### **27-15 SETTING, ADJUSTING AND LOCATING VALVE BOXES**

For all new water valves installed, Contractor shall furnish and install valve box-es, covers, drop caps, and steel risers in accordance with Standard Drawings and 8-16 in City of Colusa Improvement and Design Standards. Unless otherwise shown on the Plans, or specified in the Special Provisions, in construction areas involving elevation changes or where existing valve boxes or risers are disturbed, or as indicated on the Plans, Contractor shall furnish and adjust to final grade all existing valve boxes in accordance with Standard Drawings 8-15, 8-16 and 8-17 in City of Colusa Improvement and Design Standards. All non-steel risers shall be replaced with steel risers in accordance with Standard Drawings 8-15 and 8-17 in City of Colusa Improvement and Design Standards. When approved by the Engineer, Contractor may reuse existing valve boxes that meet these Standards Specifications and are in an undamaged condition.

All water valve boxes removed for subsequent reinstallation to allow reconstruction of existing streets shall be temporarily replaced with a protective metal container. The temporary container shall cover the riser over the valve and will assist in keeping the location of the valve visible during street reconstruction activities, the risers at each valve shall be kept free of debris and the valve operating nut left exposed.

Prior to construction Contractor shall furnish locations or swing ties to all existing valves within the streets to be resurfaced. A copy of the valve location measurements shall be provided for the Engineer prior to any street construction or resurfacing.

#### **27-16 ADJUSTING AIR RELEASE VALVES**

Contractor shall install new or adjust existing air valve box or manhole head and cover in accordance with Standard Drawing 8-43 thru 8-46 in City of Colusa Improvement and Design Standards.

All precast concrete sections used to construct the vaults or manholes for air release valves shall be set in Portland Cement mortar or preformed plastic sealing compound. The preformed plastic sealing compound and the mixing of the mortar shall meet the requirements specified in Section 10-37 of these Technical Specifications.

The interior and exterior surfaces of the joints of the precast concrete sections shall be coated with Portland Cement mortar. The precast sections shall be cleaned and moistened immediately prior to setting the sections in the mortar. A moistened brush shall be used to apply and smooth the mortar to the interior and exterior joint surfaces of the precast concrete sections.

## **27-17 CORROSION MONITORING**

### **1. General**

All metallic pipe and appurtenances larger than 12" in diameter shall be bonded such that all joints and fittings are electrically continuous, except across insulated joints. Contractor shall furnish and install the corrosion monitoring system components as indicated on the Plans and these Technical Specifications. Material shall be as specified in Section 10 and this section of these Technical Specifications. All corrosion monitoring equipment shall be supplied by a manufacturer regularly engaged in the production of such equipment. Equipment shall not be installed without prior review and approval by the Engineer.

Contractor shall install each system component in a workmanlike manner and in strict conformance with the latest edition of the following standards.

NEC - NATIONAL ELECTRICAL CODE

NEMA - NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

ASTM - AMERICAN SOCIETY FOR TESTING AND MATERIALS

IEEE - INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS

ANSI - AMERICAN NATIONAL STANDARD INSTITUTE

IPCEA - INSULATED POWER CABLE ENGINEERS ASSOCIATION

OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

NACE - NATIONAL ASSOCIATION OF CORROSION ENGINEERS

UL - UNDERWRITERS LABORATORIES

All electrical equipment and materials and the design, construction and installation thereof shall comply with all applicable provisions of the National Electric Code (NEC) and applicable local codes and regulations.

Corrosion Specialist shall refer to a California registered Corrosion Engineer or NACE certified Corrosion Protection Specialist.

The system shall be complete and in a satisfactory operating condition at the time of acceptance of the work.

## **2. Equipment Locations**

The locations of corrosion monitoring equipment, devices, outlets, and appurtenances as indicated on the Plans are approximate only. Exact locations shall be per these Specifications, unless otherwise determined by the Engineer.

Contractor shall verify in the field, all data and final locations of work done under other sections of these Technical Specifications required for placing of the electrical work.

## **3. Test Stations/Traffic Valve Boxes**

Test stations shall be provided where shown on the Plans, and shall conform to the Standard Drawing 8-57 in City of Colusa Improvement and Design Standards. Test stations for insulated joints shall conform to the Standard Drawing 8-56 in City of Colusa Improvement and Design Standards. Test stations for anodes shall conform to the Standard Drawing 8-64 in City of Colusa Improvement and Design Standards. Test station junction boxes shall conform to the Standard Drawing 8-58 in City of Colusa Improvement and Design Standards.

Attachment of wire identification tags, split bolts and shunts shall be made as stated in these Technical Specifications.

At a minimum, test stations shall be installed as follows:

- **Insulated Joint Test Stations (IJTS)** - Shall be installed at all isolation points (such as isolation gaskets) on pipelines larger than 12" in diameter.
- **Corrosion Monitoring Test Stations (CMTS)** - Shall be installed on transmission mains every 1000-ft at readily identifiable locations (such as hydrants, air-vacs, or tie-in points). Corrosion Test Stations are not required if another test station is connected to the pipe addressing the 1000-ft spacing.
- **Foreign Pipe Test Stations (FPTS)** - Shall be required where high voltage power, or high pressure metallic gas pipelines, cross within 2-feet from a new transmission main, unless otherwise directed by Engineer.
- **Anode Test Station (ATS)** - Shall be installed where foreign pipe test stations are not permitted by the foreign pipeline owner to be installed (in order to negate possible stray current impacts).
- **Casing Test Stations (CTS)** - Shall be installed where transmission mains are encased within a metallic casing. Casing Test Stations shall be installed on both the entry and exit points of the casing, unless the casing is less than 30-feet in length at which time only one Casing Test Station is required.

Anodes and grounding beds shall be installed at test stations as required by the Engineer.

Junction boxes for test stations shall be B9X Utility Boxes, as manufactured by Christy Products Inc., or 36 Box as manufactured by Brooks Products or equal. Junction boxes covers shall be steel checker plates with welded bead legend "Test Station" and shall be installed out of traffic lanes.

#### **4. Test Boards**

Panel boards for test stations shall be made of phenolic plastic one-quarter inch ( $\frac{1}{4}$ " ) thick and sized as shown on Standard Drawings 8-59, 8-60, and 8-65 in City of Colusa Improvement and Design Standards. Solderless copper lugs and capacitors shall be installed on the panel boards as shown on the Details. Shunts for the anode junction boxes shall be one-hundredth (0.01) ohm, eight (8) ampere, manganin wire type, as indicated. Shunts shall be as manufactured by Holloway or equal.

#### **5. Wire**

Conductors shall consist of solid or stranded copper of the gage as shown on the Standard Drawings in City of Colusa Improvement and Design Standards. Wire sizes shall be based on American Wire Gage (AWG). Copper wire shall be in conformance with ASTM Designations B3 and B8.

Wires buried in the ground shall be laid straight, without kinks and shall have a minimum cover of twenty-four inches (24"). The bottom of the finished trench shall be free from stones, roots or other materials that may damage the wire during or after installation.

Each wire run shall be continuous in length and free of joints or splices. Care shall be taken during installation to avoid punctures, cuts, or other damage to the wire insulation. Damage to insulation will require replacement of the entire length of wire.

At least eighteen inches (18") of slack shall be left for each conductor at each test station housing. Slack in the wire shall be sufficient to allow removal of wire extension for testing. Wire shall not be bent into a radius of less than eight (8) times the diameter of the wire.

The wire attached to the anodes shall be (AWG) stranded, single conductor, copper and insulated for six hundred (600) volts. Wire size shall be minimum No. 10 AWG THWN and conform to the requirements of ASTM D 2220 and NEMA WC-5. Connection of wire to the anode shall have a pulling strength,

which shall exceed the tensile strength of the wire. Any damage to the wire insulation or anode shall require complete replacement of the wire and anode.

The anode manufacturer shall conduct and report resistance tests performed on each anode wire connection to assure the finished connection does not exceed four-thousandths (0.004) ohms. These resistance tests shall be performed with a Kelvin bridge circuit or equal. All anode wire connections that have a resistance value of greater than four-thousandths (0.004) ohms shall require replacement by the anode supplier prior to shipment. An accurate record of tests shall be submitted by the anode supplier to the Engineer.

Anode wires shall be of one continuous length without splices from the anode connection to the respective Junction Box. Anode wires with the attached anode shall be shipped to the job site with the wire wound on a reel. The minimum core diameter of the reel shall be five and a half inches (5½").

Wire identifiers shall be installed in conformance with Standard Drawing 8-66 in City of Colusa Improvement and Design Standards. Wire identifiers for anodes shall be the wrap around type with a high resistance to oils, solvents, and mild acids. Marker shall fully encircle wire with imprinted alphanumeric characters for pipe identification. Wire identifiers shall be placed on the wires prior to backfill, using nylon straps.

Red caution tape three inches (3") in width shall be installed above buried wire and conduits at a maximum depth of eighteen inches (18") below grade over the wire and conduit location.

Unless otherwise permitted by the Engineer, wire colors shall be as follows:

- White - new pipe or valve
- Red - existing pipe or insulated pipe
- Yellow - permanent reference electrode
- Black - anode
- Green - casing or foreign pipe

## **6. Exothermic Welds**

Exothermic welds shall be provided for cable to structure connections in strict accordance with the manufacturer's recommendations. Connections shall be made in accordance with Standard Drawing 8-62 in City of Colusa Improvement and Design Standards.

The shape and charge of the exothermic weld shall be chosen based on the following parameters:

- Pipe material
- Pipe size
- Wire material
- Number of strands to be welded
- Orientation of weld (vertical or horizontal)

Type of exothermic weld to be used shall be submitted to the Engineer for approval. Exothermic weld connections shall be installed in the manner and at the locations shown on the plans. Coating materials shall be removed from the surface over an area of sufficient size to make the connection. The steel surface shall be cleaned to white metal by grinding or filing prior to welding the conductor. The use of resin impregnated grinding wheels will not be allowed. The conductor shall be welded to the pipe by the exothermic welding process with a copper sleeve fitted over the conductor. Only enough insulation shall be removed such that the copper conductor can be placed in the welding mold. After the weld has cooled, all slag shall be removed and the metallurgical bond shall be tested for adherence to the pipe or casing. All defective welds shall be removed and replaced. Connections to the piping shall not be buried prior to inspection and approval by the Engineer.

Exothermic welds shall be tested by Contractor for adherence to the pipe or casing and for electrical continuity between the pipe or casing and wires. A twenty-two ounce (22oz.) hammer shall be used for adherence testing by striking a blow to the weld. Care shall be taken to avoid hitting the wires.

## **7. Field Repair of Coatings**

After installation of coated items, contractor shall repair damaged shop-applied coatings and coat field welds with the coating manufacturer's recommended repair material. Contractor shall furnish all materials, clean surfaces, and repair any damage to protective coatings and linings damaged as a result of the welding. This shall be done in accordance with these specifications.

For ductile iron or dielectrically coated steel, the coating shall be a bitumastic coating as listed in these specifications. All surfaces must be clean and dry and free of oil, dirt, loose particles, and all other foreign materials prior to application of the coating. Exothermic welds shall be coated and then covered with a plastic weld cap.

For cement mortar lined and coated pipe or concrete cylinder pipe, the coating shall match the exterior mortar.

For epoxy-coated appurtenances, Contractor shall use an epoxy-coating touch-up kit. Prior to coating, surfaces shall be cleaned and ground to bare metal. Apply one or two coats as required to obtain a dry film thickness of eight (8) mils minimum using brush or spray. Brush shall be used for touch-up work of



less than three square feet (3 sf). Field repairs shall comply with the recommendations of the coating manufacturer.

#### **8. Bitumastic Coating**

Bitumastic coating shall be TC Mastic, as manufactured by Tapecoat Company, Bitumastic 505 as manufactured by Koppers Company, Inc. or approved equal.

Contractor shall furnish all materials, clean surfaces, and repair any damage to protective coatings and linings damaged as a result of the welding. This shall be done in accordance with these specifications.

#### **9. Weld Caps**

Weld caps shall be Royston Handy Cap, as manufactured by Royston Laboratories, Incorporated, Thermite Weld Cap, as manufactured by Phillips Petroleum Company, or an approved equal.

#### **10. Insulating Flange Kits**

Insulating flange kits shall be installed to effectively isolate metallic piping from foreign metallic structures. Flange insulators shall be installed as shown on Standard Drawings 8-53 and 8-68 in City of Colusa Improvement and Design Standards.

Insulating flange gaskets shall include full-faced gaskets, insulating washers and sleeves, and steel washers. The complete assembly shall have a pressure rating equal to that of the flanges between which it is installed. Gaskets shall be neoprene faced phenolic, 1/8-inch thick having a high dielectric constant. Insulating sleeves shall be fabric reinforced resin, 1/32-inch thick. Insulating washers shall consist of two sets of 1/8-inch thick neoprene faced phenolic, having a high dielectric constant.

The central gasket shall have a minimum electrical resistance of eighteen thousand megohms (18,000mΩ) for flanged joints larger than twelve inches (12") in diameter and sixteen thousand megohms (16,000mΩ) for flanged joints twelve inches (12") in diameter and smaller, be temperature rated to one hundred and fifty degrees Fahrenheit (150°F), and possess a water absorbency of no more than five (5) percent when tested in accordance with ASTM D 229.

Steel washers shall be stainless steel (Type 316) and fit well within the bolt facing on the flange. Insulating washers shall fit within the bolt facing the flange over the outside diameter of the sleeve.

Bolts and nuts used for insulated flanged joints shall be stainless steel (Type 304) and shall conform to ASTM F593, Group 1, and ASTM F594, Group 1, respectively.

Insulating flange kits shall be installed to effectively isolate metallic piping from foreign metallic structures. Contractor shall test the performance of these insulating flange kits prior to backfill. An electric resistance test of at least fifty thousand ohms ( $50,000\Omega$ ) shall be performed on all insulated joints after each joint installation has been completed. If the results of the test for electrical resistance are less than fifty thousand ohms ( $50,000\Omega$ ), the joint shall be inspected for damage, repaired, as needed, and retested.

## **11. Joint Bonds**

Bond cables or clips shall be provided across flexible couplings on steel pipe, cement mortar coated steel cylinder pipe joints, and ductile iron pipe joints as necessary to ensure electrical continuity. Joint bonds shall be installed as shown on Standard Drawings 8-61, 8-62, and 8-63 in City of Colusa Improvement and Design Standards. Bond wires shall have minimal slack in the wire at each weld but otherwise be as short as possible.

After installation, all joint bonds shall be tested for effectiveness. The testing shall be performed prior to backfill of the pipe and shall be verified upon completion of backfilling operations. Prior to backfilling, current shall be circulated through the pipe and the measured resistance shall be compared to the theoretical resistance of the pipe and bond cables. The resistance measured shall not exceed one hundred and twenty percent (120%) of the theoretical resistance.

## **12. Polyethylene Encasement**

Polyethylene encasement shall completely encase and cover all metal surfaces to form a continuous and all-encompassing layer of polyethylene between the iron and the surrounding earth or backfill material. Polyethylene encasement material shall conform to AWWA C 105.

Pipe: All ductile-iron pipe shall be encased with polyethylene sleeves in accordance with Method A described in AWWA C 105, or with polyethylenewrap in accordance with Method C described in AWWA C 105.

Fittings: Fittings such as tees, bends, reducers, and flanged outlets shall be encased with polyethylene wrap in accordance with AWWA C 105.

Valves: Valves shall have only the stem and operating nut exposed and the wrap shall be attached so that valve operation will not disturb the wrapping or break the seal.

Polyethylene sleeves shall be secured with polyethylene or vinyl adhesive tape or plastic tie straps at the ends and quarter points along the sleeve in a manner that will hold the sleeve securely in place during backfill. Polyethylene wrap shall be secured with polyethylene or vinyl adhesive tape in a manner that will hold the wrap securely in place during backfill.

### **13. Magnesium Anodes**

Magnesium anodes shall be "High Potential" magnesium anodes of the following composition, percent by weight:

- Aluminum 0.01% max
- Manganese 0.50 - 1.30%
- Copper 0.02% max
- Nickel 0.001% max
- Iron 0.03% max
- Other 0.05% each or 0.30% max total
- Magnesium Remainder

The anodes shall be prepackaged in a cloth bag containing backfill of the following composition; seventy-five percent (75%) gypsum, twenty percent (20%) bentonite and five percent (5%) sodium sulfate. The magnesium anodes shall be of the size indicated and placed where indicated. Cable for the anodes shall be black, No. 10 AWG THWN, stranded, and of sufficient length to extend to the junction box without splicing.

Anodes shall be cast with a galvanized steel core strap. One end of the anode shall be recessed to provide access to the rod for connection of the lead wire. The lead wire shall be silver brazed to the rod, making a mechanically secure connection. The connection shall be insulated to a six hundred volt (600v) rating by filling the recess with asphaltic concrete. The asphaltic concrete material shall be extended over the lead wire insulation by not less than one half inch ( $\frac{1}{2}$ "). Contractor shall repair all damaged lead wire insulation as directed by the Engineer and at no additional cost to the City.

Prepackaged anodes shall be installed at the locations indicated. Plastic or paper wrap shall be removed from the anode prior to lowering the anode into the hole. Anodes shall not be suspended by the lead wires. When compacted soil is required and has been placed to the top of the anode and prior to the filling of the hole with soil, a minimum of 10 gallons of water shall be poured into the hole to saturate the anode backfill and surrounding soil.

Backfilling with native soil shall proceed in six inch (6") lifts, compacting the soil around the anode during each lift until the backfill has reached grade.

Damage to the canvas bag, anode to wire connection, copper wire or wire insulation will require replacement of entire assembly.

Anodes shall not be backfilled prior to inspection and approval of the Engineer.

#### **14. Zinc Grounding Mats**

Zinc grounding mats shall be installed when pipelines are exposed to high voltage and stray current impacts are possible.

Where installed, zinc anodes shall be 99.99 % zinc bars, conforming to ASTM B-418, zinc grounding mat shall be 5/8 inch x 7/8 inch and 180 feet long zinc ribbon anode. Cable for the grounding mat shall be Black, No. 8 AWG HMWPE, stranded, and of sufficient length to extend to the test station without splicing.

The wire attached to the grounding mat shall be (AWG) stranded, single conductor, copper and insulated for 600 volts. Wire size shall be minimum #8 AWG HMWPE and conform with the requirements of ASTM D-1248, Type 1, Class C, Grade 5, and IPCEA-NEMA S-61-402. Connection of wire to the grounding mat shall have a pulling strength which shall exceed the tensile strength of the wire. Any damage to the wire insulation or grounding mat will require complete replacement of the wire and grounding mat.

The grounding mat supplier shall conduct and report resistance tests performed on each wire connection to assure the finished connection does not exceed 0.004 ohms. These resistance tests shall be performed with a Kelvin bridge circuit or equal. All wire connections that have a resistance value of greater than 0.004 ohms shall require replacement by the supplier prior to shipment. An accurate record of tests shall be submitted by the grounding mat supplier to the Engineer. The records shall include, as a minimum, six (6) copies of the following information:

- Grounding mat numbering system to identify anode under test
- Grounding mat wire length
- Resistance value as indicated by test
- Test equipment
- Test method

The supplier shall mark the reel holding the wire for shipment to the job site with the same numbering system used on the test records and the total length of attached grounding mat wire.

Grounding mat wires shall be of one continuous length without splices from the connection to the respective test station as shown on the Plans. Grounding mat wires with the attached mat shall be shipped to the job site with the wire wound on a reel. The minimum core diameter of the reel shall be 5- 1/2 inches. The anode wire insulation shall be free of surface damage such as nicks, abrasions, scratches, etc. in all respects throughout the entire length of the wire. Precaution shall be taken during fabrication, transportation and installation of the anodes to see that the wire is not kinked or sharply bent. Bends sharper than 2-1/2 inches in radius are not permissible.

## **15. System Check-Out**

Upon completion of the installation, Contractor shall provide testing of the system by a qualified Corrosion Specialist, approved by the Engineer, to ensure compliance with the Plans and these Technical Specifications. The testing by the Corrosion Specialist shall be in addition to, and not a substitution for, any required testing of individual items at the manufacturer's plant or in the field by Contractor.

### **a. Testing**

The following test results shall be submitted to the Engineer:

- i. Continuity test report
- ii. Insulator test results
- iii. Initial pipe-to-soil potential survey
- iv. On-off potential survey (when sacrificial or impress current cathodic protection systems are in place)

The assembled flange shall be tested with a Gas Electronics Model 601 Insulator Checker or equivalent instrument that is specifically designed for the testing of insulating flanges. The testing shall be done in accordance with NACE RP0286-97. If a short is indicated, each bolt shall be tested to verify the integrity of each insulating sleeve before the flange is disassembled. Contractor shall provide assistance in finding any and all shorts or shorted bolts.

Contractor shall locate and repair any defects that may become apparent during testing. All efforts by Contractor to test and repair defects, including excavation and replacement of backfill that has been already placed, will be at Contractor's expense. The system will not be considered free from defects until the Corrosion Specialist retests and confirms that all defects have been eliminated.

**b. Written Report:**

The Corrosion Specialist retained by Contractor shall prepare a final report that contains the following:

- i. Verification that all test stations have been installed properly.
- ii. Verification that all insulating flanges have been tested with an approved test instrument and that all have passed. If the pipe-to-soil potential on each side of the insulating flange has less than 10-mV difference between them, additional testing with a temporary impressed current system shall be conducted to confirm insulation.
- iii. Field continuity test data, calculations of actual (measured) pipe resistance from the data and calculations of the theoretical resistance for each section of pipe tested. The report shall include a statement that each section of pipe that contains a bonded or mechanical joint was tested and that the resistance of each section tested was less than or equal to one hundred and twenty percent (120%) of the theoretical resistance.
- iv. Verification that all casings are isolated from the pipe.
- v. Tabulation of all pipe-to-soil potential survey data.
- vi. Verification that all anodes are “high potential” anodes.
- vii. Other information that the Corrosion Engineer believes is pertinent with respect to the corrosion status or long-term performance of the pipeline or structure installed.

**27-18 PAYMENT FOR FURNISHING AND INSTALLING WATER DISTRIBUTION SYSTEMS**

Unless unit bid prices are required by the Special Provisions, payment for the item “Water Distribution System to construct” shall be made at the lump sum price. Such payment shall be full compensation for furnishing all labor, material, tools, and equipment and doing all work involved in cutting, trenching, laying, blocking, making connections, disinfecting, testing, backfilling, and paving or repaving, as required herein, on the Plans or in the Special Provisions.

## **Section 28**

### **DRIVEWAY CULVERT AND SIDEWALK FRENCH DRAINS**

#### **28-1 DRIVEWAY CULVERT**

Driveway culvert shall be reinforced concrete pipe (RCP), high density polyethylene (HDPE) with smooth bore, corrugated metal pipe (CMP), or field assembled metal plate as called for on the plans. Material shall conform to Section 10 and the following:

##### **1. Pipe Materials**

RCP shall be ASTM C 76, Class III. CMP and field assembled plate shall be minimum of 12 gage, galvanized or aluminized pipe. HDPE shall be smooth interior, shall conform to ASTM F 894 and referenced standards contained therein or AASHTO M 294 with HDPE belled ends; resin utilized in manufacture of M294 polyethylene pipe shall conform to ASTM D 1248 and ASTM D 3350. HDPE pipe shall have a minimum Ring Stiffness Constant (RSC) of 63 and/or a minimum SDR rating of 26. Joints shall be rubber gasket material conforming to ASTM F 477, or shall be fused, and shall be capable of the same water tightness as PVC (ASTM 3212).

##### **2. Installation**

Installation of RCP shall be in accordance with Section 26. Installation of HDPE shall conform to ASTM D 2321 and additional requirements contained therein or ASTM F 714, ASTM D 3261, ASTM D 3350, and ASTM 1248. CMP shall be placed in accordance with Section 66 of the State Specifications. Field assembled plate culvert shall be placed in accordance with Section 67 of the State Specifications.

#### **28-2 SIDEWALK FRENCH DRAINS**

Sidewalk French drains shall be placed in new construction when directed by the Engineer or when shown on the plans and shall conform to applicable portions of Section 26 and the following:

##### **1. Pavement Cutting**

Pavement cutting shall conform to

City of Colusa Improvement and Design Standards. The thickness of existing AC to be cut and AB is variable. There shall be no additional payment due to the varying thickness of AC and AB. Existing street surface to be removed shall be saw cut in a neat line and shall be disposed of away from the project site in a location and manner satisfactory to the Engineer.

Pavement removal shall not precede trenching by more than seven (7) calendar days unless approved by the Engineer.

## **2. Placement of French Drains**

In new construction, French drains are normally placed underneath, and in alignment with the gutter in accordance Standard Drawing 4-8.

## **3. Trench Excavation**

Trenches shall be graded to the lines and sections as shown on the Plans or where directed by the Engineer and shall be in accordance with the provisions of Section 14.

Care shall be exercised to prevent excavation below the grade for the bottom of the trench, and areas excavated below grade shall be filled with suitable material and thoroughly compacted by Contractor at his/her expense.

Excavated material shall become the property of Contractor and shall be disposed of away from the site.

## **4. Crushed Rock**

Contractor shall place Type C Crushed Rock conforming to Section 10 and in accordance with Standard Drawing 4-8.

## **5. Perforated Pipe**

All French drains shall be four inches (4") in diameter unless otherwise indicated. Perforated pipe shall be polyvinyl chloride (PVC) pipe with perforations throughout the length of the pipe and conforming to the applicable portions of AASHTO M 252. Alternatively, pipe may be perforated corrugated polyethylene tubing conforming to the applicable portions of AASHTO M 252 or M 294.

## **6. Filter Fabric**

Filter fabric shall conform to Sections 68 and 96 of the State Specifications.

## **7. Drain Inlet Penetrations**

Cast in place drain inlets shall be core bored and french drain lead pipes connected to manholes using "Kor n' Seal Cavity O-Ring" by NPC Inc., or approved



equal. Connecting French drains to pre-cast drain inlets shall be per Section 30, "Drain Inlets."

### **28-3 PAYMENT**

Payment for pipe culvert will be at the price bid per lineal foot and will include full compensation for furnishing and laying the pipe, excavation, backfill, compaction, special foundation treatment, dewatering, incidentals and all other work necessary to place pipe culvert.

Payment for sidewalk French drains will be at the price bid per lineal foot and will be considered full compensation for constructing the French drains, connections to drain inlets or manholes, clean crushed rock, filter fabric, all labor, materials, tools, equipment and all incidentals and work necessary to complete this item in place. Steel under sidewalk drains and replacement of existing asphalt pavement shall be paid for separately.

## **Section 29**

### **MOVING OR CHANGING UTILITIES AND WATER SERVICES**

#### **29-1 UTILITIES AND FRANCHISES**

If it is required to move a public utility or franchise, the owner will be notified by the Engineer to move such, and Contractor shall protect the facility from damage and not interfere with such facilities until after it is moved.

The City and owners of public utilities and franchises reserve the right to enter upon the street for the purpose of making necessary repairs or making changes in their facilities made necessary by the work.

#### **29-2 PROVISION FOR UTILITY CONNECTION**

The City reserves the right to construct or reconstruct any sewer, water, drain, electric or any other facility, to grant permits to lay gas, electric, or communication lines, conduits, and other facilities, and to make connections thereto, at any time during the work.

#### **29-3 COOPERATION OF CONTRACTOR DURING RELOCATIONS AND UTILITY CONNECTIONS**

Contractor shall not interfere with or place any impediment in the way of any person or persons authorized by the City to perform such relocations and utility connections.

The City of Colusa reserves the right to suspend the work on any part of an improvement at any time during the construction of the same, for the purposes stated above.

## **Section 30**

### **DRAIN INLETS, GUTTER DRAINS AND DITCH BOXES**

#### **30-1 DRAIN INLETS**

Drain inlets shall conform to Sections 10 and Standard Drawings 9-2, 9-3, 9-4, 9-5, and 9-11 of City of Colusa Improvement and Design Standards. Drain inlets shall be pre-cast or cast in place or a combination of the two. Hand forming of concrete will not be allowed. For cast in place drain inlets, maximum wall thickness shall be 8 inches. Concrete shall be Type A or B in Accordance with Section 10 of these Specification.

#### **30-2 DRAIN INLET GRATE AND HOOD**

The grate shall conform to drawings included in City of Colusa Improvement and Design Standards. Joints and connections between grate frame, hood and vertical walls of drain inlet shall be smooth and continuous, with a slight broom finish or equivalent. If steel, surfaces shall be covered with an asphaltic paint.

#### **30-3 GUTTER DRAINS**

Gutter drains shall conform to Standard Drawings 9-6, 9-7, 9-8, 9-9, and 9-10 of City of Colusa Improvement and Design Standards.

#### **30-4 WATER QUALITY MARKING**

All drain inlet and gutter drain installations shall include a permanent storm water quality marking conforming to City of Colusa Improvement and Design Standards.

#### **30-5 PAYMENT**

Payment for drain inlets, gutter drains or ditch boxes will be at the price bid per each and will be considered full compensation for excavation, material, and labor necessary to construct this item in place.

**Section 31**

**DELETED**

## **Section 32**

### **TRAFFIC SIGNS, MARKINGS, AND BARRICADES**

#### **32-1 TRAFFIC SIGNS**

##### **1. General**

Signs shall conform to Section 82, “Signs and Markers”, of the State Specifications, and these Specifications.

##### **2. Overhead Sign Structures**

Overhead sign structures shall conform to Section 56, “Overhead Sign Structures, Standards and Poles”, of the State Specifications and these Specifications.

##### **3. Roadside Signs**

Roadside signs shall conform to Section 82, “Signs and Markers”, of the State Specification, and these Specifications. Unless otherwise shown or specified in the Contract, all signs and pipe posts shall be furnished and installed by Contractor.

City Specialty Signs shall conform to City of Colusa Improvement and Design Standards.

City Specialty Signs may be purchased from the Signs and Markings operation of the Streets Division.

Construction signs shall conform to the provisions of the U.S. Department of Transportation, Federal Highway Administration, “Manual on Uniform Traffic Control Devices” and the California Supplement.

##### **4. Material**

Sign panel fastening hardware shall conform to Section 82, “Signs and Markers”, of the State Specifications, and these Specifications. Lag screws, bolts, metal washers, and nuts may be cadmium-plated steel instead of commercial quality galvanized steel. All street name signs shall be fastened with stainless steel hardware and strapping.

Wood posts and laminated wood box posts as referenced in Section 82, “Signs and Markers,” of the State Specifications shall not be allowed.

## 5. Construction

Construction shall conform to Section 82, “Signs and Markers”, of the State Specifications and these Specifications. Wood Posts and Laminated Wood Box Posts shall not be allowed.

## 6. Installation

Installation shall conform to Section 82 “Signs and Markers,” of the State Specifications and these Specifications. Socket-Mounted Stanchions: Socket-mountings shall conform to Standard Drawing 4-44. Socket mounting is used on median signs and on signs installed in asphalt, or as specified on plans.

### 32-2 THERMOPLASTIC PAVEMENT MARKINGS

Thermoplastic traffic stripes and markings, both white and yellow, shall be placed as shown on the Plans, and in conformance with Sections 84 of the State Technical Specifications. All striping details shall be in conformance with the State Standard Plans (latest edition).

#### 1. Material

Thermoplastic shall be Alkyd type for extrusion application and shall produce an adherent reflectorized strip capable of resisting deformation by traffic.

The thermoplastic material shall be 100 percent solids. The binder shall consist of synthetic alkyd resins and shall be homogeneously incorporated with all the necessary prime pigments, fillers, and glass beads to produce a traffic coating to meet the requirements as specified herein. The characteristics of finished thermoplastic are shown on Table 32-2.01

Table 32-2.01

|  | White | Yellow |
|--|-------|--------|
| Glass Beads, AASHTO M-247, Type I, percent by weight, min.<br>(Cal. Test Method 423) | 30    | 30     |
| Titanium Dioxide (TiO <sub>2</sub> ), percent by weight, min.<br>(AASHTO T250-77)    | 10    |        |
| Lead Chromate, Medium Heat Stability, percent by weight, min.                        |       | 2.5    |
| Specific Gravity, max.<br>(Cal. Test Method 423)                                     | 2.15  | 2.15   |

|  | White     | Yellow    |
|--|-----------|-----------|
| Binder, percent by weight, min.<br>(Cal. Test Method 423)  | 18        | 18        |
| Ring & Ball Softening Point, °F (ASTM E28)   | 200 - 240 | 200 - 240 |
| Tests on Material after 4 hours heat with stirring at 425°F + 2°F, which includes 1 hour for meltdown and temperature stabilization:     |           |           |
| Bond Strength to Concrete, 0.125-inch thick film drawdown at 425°F test at 75°F + 2°F, psi, min. (Cal. Test Method 423)                  | 180       | 180       |
| Brookfield Thermosel Viscosity, Spindle SC4-27, 20 RPM at 425°F, Poise<br>(Cal. Test Method 423)   | 30 - 45   | 30 - 45   |
| Impact Resistance, Falling Ball Method, 0.125-inch thick film drawdown at 425°F on concrete. Test at 75°F + 2°F inch-lbs., (ASTM D 2794) | 10        | 10        |
| Daylight Luminous Reflectance, min. (ASTM E97)   | 75        | 40        |
| Yellowness Index, max., (ASTM E313)  | 15        |           |
| Hardness, Shore A-2 Durometer with 2 kilogram weight at 115°F<br>(Cal. Test 423)   | 60 - 80   | 60 - 80   |
| Low Temperature Stress Cracking, Resistance at 25°F (AASHTO)   | No Crack  | No Crack  |
| Color Match, Federal Std. No. 595a, Color No. 33538  |           | Passes    |

## 2. Removal

Traffic stripes and pavement markings shall be removed by any method that does not materially damage the existing pavement. Pavement marking images shall be removed in such a manner that the old message cannot be identified. Where grinding is used, the pavement marking image shall be removed by grinding a rectangular area. The minimum dimensions of the rectangle shall be the height and width of the pavement marking. Residue resulting from removal operations shall be removed from pavement surfaces by sweeping or vacuuming before the residue is blown by the action of traffic or

wind, migrates across lanes or shoulders, or enters into drainage facilities. The Contractor shall be responsible for disposal of all removed striping material.

Traffic stripes shall be removed before any change is made in the traffic pattern.

### **3. Application**

The thermoplastic material shall be applied by extrusion methods in a single uniform layer. Stencils shall be used when applying thermoplastic material for pavement markings. Stencils may be new or used, if in good condition. If stencils are bent or damaged, they shall be replaced at the request of the Engineer.

The pavement surface to which thermoplastic material is applied shall be completely coated by the material and the voids of the pavement surface shall be filled. Surface must be dry before application. Contractor may use artificial method to dry the pavement surface.

Unless otherwise specified in the Special Provisions, the thermoplastic material for traffic stripes shall be applied at a minimum thickness of 0.075-inch. Thermoplastic Material for pavement markings shall be applied at a minimum thickness of 0.125-inch. Glass beads shall be applied immediately to the surface of the molten thermoplastic material, at a rate of not less than 8 lbs. per 100 sq. ft. The amount of glass beads applied shall be measured by stabbing the glass beads tank with a calibrated rod.

Contractor shall apply all traffic stripes and markings on new asphalt surface in accordance with the manufacturer's recommendations.

### **3. Tolerances and Appearance**

The completed traffic stripes and markings shall have clean and well-defined edges without deformations, and shall be free of tears or other disfigurements. Improperly placed, defective, or disfigured traffic stripes and markings shall be immediately removed from the pavement surface by methods approved by the Engineer. All such removal work shall be at Contractor's expense.

Completed traffic stripes shall be uniform, shall be straight on tangent alignment, and shall be on a true arc on curved alignment. On tangent alignment, when a 100' string line is stretched taught and placed directly on the outer edge of the completed traffic stripe, the distance between the string and the edge of the traffic stripe shall not exceed three-fourths of one inch (3/4") when measured anywhere along any 100' interval of the tangent alignment. On curved alignment, the outer edge of the traffic stripe shall not deviate more than three-



fourths of one inch (3/4") from the true arc. The lengths of the gaps and individual stripes that form broken traffic stripes shall not deviate more than 2" from the lengths required to produce a uniformly repeating, broken-stripe pattern.

#### **4. Time Limitations**

All permanent marking must be placed no earlier than three (3), and no less than seven (7), days from the placement of slurry seal. Partial removal of roadway markings shall be replaced within two (2) weeks. Contractor may contact City Signs and Markings to replace markings at cost.

### **32-3 RAISED REFLECTIVE PAVEMENT MARKERS**

#### **1. General Requirements**

Raised reflective pavement markers shall conform to Section 81 of the State Specifications except as noted herein.

#### **2. Materials**

Raised reflective pavement markers shall be #290 manufactured by 3M Company or approved equivalent and shall be placed in conformance with Section 81 of the State Standard Specifications.

#### **3. Placement**

Blue raised reflective pavement markers shall be placed in the street, 6" - 12" off of centerline and perpendicular to the fire hydrant. Markers shall be blue with two reflective faces.

Green raised reflective pavement markers shall be placed in the street, 6" - 12" off of centerline and perpendicular to the "backyard" manhole. Markers shall be green with two reflective faces. Contractor shall be responsible for locating, inventorying, and replacing all green raised reflective markers. Contractor shall provide to the Engineer an inventory list of all green raised reflective markers before starting construction.

### **32-4 TEMPORARY PAVEMENT MARKINGS**

#### **1. General Requirements**

Temporary pavement markers shall be furnished, placed, maintained, and later removed as specified in the Special Provisions, and as directed by the Engineer.

## **2. Materials**

The following markers are approved for use on City of Colusa street resurfacing projects:

Temporary Overlay marker (Types Y and W) manufactured by Davidson Plastics Company, 18726 East Valley Highway, Kent, Washington 98032, telephone (206) 251-8140.

Safe-Hit Temporary Pavement Marker, manufactured by Safe-Hit Corporation, 1930 West Winton Avenue, Building #11, Hayward, CA 95545, telephone (415) 783-6550.

Swareflex Pavement Marker (Models 3553, 3554, Cat Eyes Nos. 3002 and 3004), manufactured by Swareco and distributed by Servtech Plastics Inc., 1711 South California Street, Monrovia, CA 91016, telephone (818) 359-9248.

Stimsonite Construction Zone Marker (Model 66), manufactured by Amerace Corporation, Signal Products Division, 7542 North Natchez Avenue, Niles, IL 60648, telephone (312) 647-7717.

Flex-O-Lite Raised Construction Marker (RCM), manufactured by Flex-O-Lite, Lukens Company, P.O. Box 4366, St. Louis, MO 63123-0166, telephone (800) 325-9525.

3M Scotch-Lane A200 Pavement Marking System (reflective raised pavement marker on reflective traffic line tape), manufactured by 3M Company, Highway Safety Products, 1010 Hurley Way, Suite 300, Colusa, CA 95825, telephone (916) 924-9605.

MV Plastics Chip Seal Marker (1280/1281 Series with Reflexite Polycarbonate, PC 1000, reflector unit), manufactured by MV Plastics, Inc., 533 W. Collines Avenue, Orange, CA 92667, telephone (714) 532-1522.

## **3. Placement**

Temporary reflective raised pavement markers shall be placed in accordance with the manufacturer's instructions. Temporary reflective raised pavement markers shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used.

At the direction of the Engineer, Temporary pavement striping may be required.

After paving and or planing, temporary pavement markers shall be placed on all existing striped streets that are opened to public traffic prior to final striping in accordance with the striping diagrams. Temporary pavement markers that are damaged from any cause during the progress of the work shall be

repaired or replaced by Contractor at his expense.

When no longer required for the work as determined by the Engineer, temporary pavement markers shall be removed in accordance with the provisions in Section 15-2, "Miscellaneous Highway Facilities," of the State Standard Specifications, except as otherwise provided herein. If the temporary pavement markers to be removed are on surfacing that is to be removed, the temporary pavement markers may be removed and disposed of in conjunction with the removal of the surfacing, providing such pavement markers do not interfere with the required traffic lane delineation, as determined by the Engineer.

The 14-day waiting period for placing pavement markers on new asphalt concrete surfacing shall not apply to temporary pavement markers.

### **32-5 TEMPORARY STREET SIGNS**

Temporary street signs shall conform to this Section 32-1 and City of Colusa Improvement and Design Standards. The signs shall be placed as shown on the Plans. Their exact location and orientation shall be designated by the Engineer.

The dimensions of the materials shall be as shown in City of Colusa Improvement and Design Standards. The post shall be either redwood or Douglas Fir. Douglas Fir shall be treated with a wood preservative in conformance with Section 58 of the State Specifications. The signboard shall be exterior plywood. Paint shall be a quality latex base for exterior wood.

The sign shall have black letters on a white background. Gothic letters similar to those in City of Colusa Improvement and Design Standards shall be used. The lettering shall be four inches (4") in height with a stroke width of no less than one-half inch ( $\frac{1}{2}$ ") or more than three-fourths inch ( $\frac{3}{4}$ "). Numeral suffixes, i.e., st, nd, rd, and th, shall be two inches (2") in height with a stroke width of no less than one-fourth inch ( $\frac{1}{4}$ ") or more than three-eighths inch ( $\frac{3}{8}$ "). The back of the sign-board and the post shall also be painted white.

Each sign-board shall be fastened to the post by bolts. The bottom of the sign shall be no less than seven feet (7') above the ground. Payment for temporary street signs shall be the Contract price bid per each complete in place.

### **32-6 STREET BARRICADES**

Street barricades shall conform to this Section and City of Colusa Improvement and Design Standards. The barricades shall be placed where shown on the Plans or designated by the Engineer.

Wood members shall be either redwood or Douglas Fir. Douglas Fir shall

be treated with a wood preservative in conformance with Section 58 of the State Specifications.

A fully reflectorized sign 18 inches by 18 inches (18" X 18") (2.25 square feet) shall be placed on the barricade with bolts, nuts, and washers, and shall face on-coming traffic to designate dead end streets. All barricades shall be painted white in color, with two (2) applications of a quality latex base paint for exterior wood.

### **32-7 PAYMENT**

Payment for traffic signs, including overhead sign structures and roadside signs shall be at the price bid per each and shall conform to Section 56-1.06, "Payment" of the State Specifications, and these Specifications. The price bid for each sign of the type or types designated in the Contract will include full compensation for furnishing all labor, materials, (except City furnished material), tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing roadside signs, complete in place, including the installation of sign panels, shown or specified in the Contract, specified in these Specifications, and as directed by the Engineer.

Measurement for overhead and roadside sign structures shall conform to Section 56-1.10, "Measurement" of the State Specifications, and these Specifications. Signs will be measured by the unit from actual count, complete in place, of the type or types of signs designated in the Contract.

Payment for thermoplastic pavement markings will be at the unit price bid per lineal foot for striping as measured by the lineal foot of thermoplastic material placed. No payment will be made for gaps in broken traffic stripes. Double center stripes will be paid as two (2) four-inch (4") stripes. Regular cross walks, parking Tees and L's will be measured by the lineal foot. Payment for all other thermoplastic marking will be at the price bid per square foot of thermoplastic material placed. Payment for all thermoplastic markings will be considered full compensation for furnishing all labor, material, tools, equipment and incidentals, and for doing all work involved in removing existing striping and placing stripes and markings, as specified in the Special Provisions and as directed by the Engineer. Existing striping shall be removed by grinding.

The quantities of thermoplastic traffic stripes or thermoplastic pavement markings may be adjusted, deleted, or omitted as directed by the Engineer to meet the existing requirements. No adjustment to the unit price bid will be made because of a change in quantity from the Engineer's estimate.

Payment for bike legends will be at the unit price bid per square foot and will include full compensation for furnishing all labor, material, tools, equipment and incidentals, and for doing all work involved in removing existing and painting new pavement markings, as specified in the Special Provisions and as directed

by the Engineer.

Payment for painted pavement markings will be at the price bid per square foot bid for the actual area painted.

Payment for painted pavement markings will be at the price bid per square foot bid for the actual area painted.

Payment for raised reflective pavement markers shall be at the unit price bid per each and shall include full compensation for furnishing all labor, material, tools, equipment, incidentals required to perform all work involved with placing pavement markers, including removal of existing pavement markers, as shown on the layout diagrams, as specified in these Special Provisions and as directed by the Engineer.

Payment for street barricades shall be at a unit price for each barricade constructed. This price will include full compensation for constructing street barricades complete in place as shown on the Plans.

### **Section 33**

#### **LED FLASHING TRAFFIC SIGN ASSEMBLY &**

#### **INPAVEMENT WARNING LIGHTS**

##### **33-1 LED Flashing Traffic Sign Assembly and Inpavement Warning Light System (LFTSA and IWLS):**

LFTSA and IWLS are to be installed at the crosswalks as shown on the plans. The signs associated with the LFTSA are to be installed as shown on the plans.

Contractor shall furnish & install Traffic Safety Corp. TS40 W11-2 solar powered with push button, W16-7PL sign and sign post or approved equal.

Contractor shall furnish & install Traffic Safety Corp. TS-SR-48 (Stainless steel, bi-directional) inpavement lights or approved equal.

##### **33-2 Measurement and Payment:**

**LED Flashing Traffic Sign Assembly** is paid for by the **each**. Payment for the Solar Powered LED Flashing Traffic Sign Assembly includes the sign post, LFTSA equipment, the LED Flashing W11-2 sign, and W16-7PL sign to go on the post.

**Inpavement warning lights** are included as part of this bid item payment. Payment for the inpavement lights includes the lights and the installation assembly.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing

all the work involved in installing LFTSA and IWLS includes saw cutting, removal of asphalt concrete, removal of concrete, excavation, backfill, compaction, furnishing and installing LFTSA equipment, sign post, and IWLS installed per manufacturer's requirements, specifications, and installation procedures.

## SECTION 34

### FULL DEPTH RECLAMATION

#### **34-1 Description:**

Work shall consist of pulverizing existing asphalt concrete, base, and subgrade soil to a total depth as shown on the plans. Regrade and haul away excess material or use as shoulder backing or in place of aggregate base fill in other areas of the project, to allow for the net placement of new pavement. Add cement and water to the blended material to a total depth as shown on the plans in accordance with the specifications provided below. Fine grade as required prior to placement of pavement. Microcracking of the completed cement stabilized surface before new pavement is placed directly on top of the cement treated surface.

This item shall consist of constructing a mixture of pulverized asphalt concrete, base material, subgrade soil, cement, and water in accordance with this specification, and in conformity with the lines, grades, thickness, and typical cross sections shown on the plans. Full Depth Reclamation with Cement (FDR-C) shall be constructed in a series of parallel lanes such that longitudinal and transverse joints are minimized.

Preliminary Roadway slope Grading: Areas shown on the plans where roadway will be realigned or adding to existing width of road and will require some minor cut slopes to be graded to match conditions.

#### **34-2 Materials:**

**34-2.1 Portland Cement:** All cement to be used or furnished shall conform to ASTM C150 or ASTM C595. The cement shall be protected from moisture until used and be sufficiently dry to flow freely when handled. Cement shall be furnished in bulk and not exposed until applied to prepared grade. There are no substitutions for Portland cement.

**34-2.2 Water:** Water used for mixing or curing shall be reasonably clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product. Water shall not contain more than 1000 ppm of chlorides (as Cl), nor more than 1000 ppm of sulfates (as SO<sub>4</sub>). Contractor shall contact Colusa Utilities for construction water meter.

**34-3 Pulverized Material:** Existing asphalt concrete surfacing shall be pulverized with underlying base materials and subgrade soil to the specified depths and widths in conformance to the Project Plans and Special Provisions.

The asphalt concrete surfacing and underlying base/soil materials shall be pulverized such that 100 percent of the material will pass a 2-inch sieve and a minimum of 85-percent will pass a 1½-inch sieve. All materials other than rock and pulverized asphalt concrete shall be broken up such that these materials will pass a one-inch sieve. The pulverized materials shall be free of roots, sod, weeds, wood, and construction debris.

**34-4 Submittals:** The Contractor performing the FDR-C shall conduct a Just-In-Time Training (JITT). The training shall be mandatory and consist of a formal joint training class on the process, required special equipment, placement and compaction methods, and quality control. Construction operations for FDR-C shall not begin until the Contractor's and the City's personnel have completed the JITT. The JITT training class shall be conducted at a location convenient for both the Contractor and the City. The JITT class shall be completed not more than 7 days prior to the start of the FDR-C process. The class shall be held during normal working hours. The Contractor shall provide a JITT instructor experienced in the construction methods, materials, and test methods associated with construction of FDR-C projects. A copy of the course syllabus, handouts, and presentation material shall be submitted to the City at least 7 days before the day of the training. The Contractor and the City shall mutually agree to the course instructor, course content, and training site.

During the process, the Contractor shall furnish the following information to the Engineer on a daily basis:

- 1) Certified weight tickets of cement delivered to the project location.
- 2) A summary of quantity of FDR-C constructed each day.

### **34-5 Construction Methods**

**34-5.1 General:** Prior to beginning any cement treatment, the existing pulverized material shall be shaped to conform to the typical sections, lines, and grades as shown on the plans. The Engineer shall check and verify the conformance of the material to the lines, grade, and elevation as shown on the plans, prior to beginning cement treatment.

Trimming and disposal of excess material, if required, will be performed on the intimate mixture of pulverized asphalt concrete, base materials and subgrade soil prior to cement treatment.

**34-5.2 Application:** Cement shall be applied at a rate of not less than 4% percent based on the in-place dry unit weight of soil and for the depth of subgrade treatment shown on the plans. For estimating purposes, an in-place dry unit weight of soil of **120 pcf** should be used as a basis for the application rate mixed to a depth of 12 inches.

The cement content shall vary no more than 0.5 percent under and not more than 1.0 percent over the specified cement content (example: tolerance on spread rate of 5.0% is 4.5% to 6.0%). However, the moving average of the rate of cement content tests/inspections shall not be less than the specified cement content.

Cement shall be distributed with a non-pressurized mechanical vane-feed spreader equipped with on-board scales and controls capable of spreading the cement at a prescribed weight per unit area. Cement shall not be spread upon the prepared material more than 2 hours prior to the mixing operation. No traffic other than the mixing equipment shall be allowed to pass over the spread cement until the mixing operation is completed.

**34-5.3 Mixing:** Mixing of the pulverized material, cement, and water shall be done with a four-wheel

drive rotary mixer (CMI RS-650, CAT 500 or equivalent). The mixing machine shall have equipment provisions for introducing water at the time of mixing through a metering device.

The full depth of the treated FDR-C section shall be mixed a minimum of two times with the approved mixing machine. At least one of the two mixes shall be done while introducing water into the pulverized material through the metering device on the mixer. Water shall be added to the FDR-C section during mixing to provide a moisture content not less than 1 percentage point below nor more than two percentage points above (-1 to +2 of OMC) the optimum moisture of the soil-cement mixture (ASTM D 558) to ensure chemical action of the cement and soil.

To ensure a uniformly treated section, any material/soil around manholes, utility risers, valves and adjacent to curbs/gutters or in corners, must have that material/soil pulled out by the contractor, at the depth of treatment, where it is accessible to be mixed with the reagent. After that material is mixed with the reagent, it will be placed back and compacted by the contractor.

**34-5.4 Compaction:** The Contractor shall regulate the sequencing of the cement treatment operations, such that the final compaction of the FDR-C mixture to the specified density will be completed within 2 1/2 hours after the initial application of water during the mixing operation. However, trimming (cuts only) can be completed within 24 hours of mixing.

Maintain moisture above the optimum moisture content, but within allowable moisture range as determined by the moisture/density relationship of the compaction curve. The FDR-C section shall be compacted to 95 percent of the maximum dry density as determined by ASTM D1557.

The maximum compacted thickness of a single layer shall be limited to that thickness the contractor can demonstrate using his equipment and method of operation will provide the required compacted density throughout the treated layer to the satisfaction of the Engineer. No layer thickness shall exceed 18 inches.

**Initial Compaction.** Contractor shall achieve the specified minimum compaction requirement during the initial compaction operation. Lifts with thickness greater than 12 inches shall be compacted by an open ring pad foot style compactor designed to prevent bridging of the lower half of the FDR-C section. Areas inaccessible to rollers shall be compacted to the required compaction by other means satisfactory to the Engineer.

**Surface Compaction.** Surface compaction is defined as the upper 3 inches of the FDR-C section. Surface compaction shall be by means of steel-drum or pneumatic-tired roller.

**34-5.5 Construction Joints:** Construction joints shall have vertical faces and shall be made in thoroughly compacted material. Additional mixture shall not be placed against the construction joint until the joint has been approved by the Engineer. The face of the cut joint shall be lean and free of deleterious material and shall be kept moist until the placing of the adjacent FDR-C.

**34-5.6 Finishing & Curing:** After placement and compaction of the FDR-C section is completed, it shall be protected against drying by curing until covered with the initial layer of pavement surfacing. Curing shall be a bituminous seal, or other method approved by the Engineer. If water/moist curing is selected and approved, a curing plan shall be submitted to the Engineer detailing: a watering schedule, plan for handling hot, arid, and/or windy weather conditions, and the period of time the material will be cured. If moist curing is used, exposed surfaces of the FDR-C section shall be kept continuously moist with a fog spray and shall not be allowed to dry out. If a bituminous curing is used, it shall consist of liquid asphalt or emulsified asphalt meeting the requirements of Caltrans Standard Specifications Section 94 and shall be sufficient to penetrate the FDR-C surface for proper bonding.



The bituminous curing seal shall be applied in sufficient quantity to provide a continuous membrane over the exposed FDR-C section at a rate of between 0.45 L/m<sup>2</sup> and 0.90 L/m<sup>2</sup> (0.10 and 0.20 gallon per square yard) of surface with the exact rate determined by the Engineer. It shall be applied as soon as possible after the completion of final rolling. The surface shall be kept moist until the seal is applied. At the time the bituminous material is applied, the soil surface shall be dense, shall be free of all loose and extraneous material, and shall contain sufficient moisture to prevent excessive penetration of the bituminous material.

**34-5.7 Microcracking:** After beginning the initial moist curing period, the finished FDR-C course shall be tested to determine the stiffness of the layer. The stiffness measurement of the FDR-C shall be determined using an approved device, such as the Humboldt Stiffness Gauge (HSG), or equivalent. One test will be made along each 500 ft section of street. The test location shall be marked with paint for later retesting. If the initial HSG readings are in the range of 50 to 60 (MN/m), then microcracking of the FDR-C course shall begin. If the readings are below the stated range, the FDR-C course shall be allowed to cure until stiffness readings are within the required range to commence microcracking activities.

Microcracking of the FDR-C shall be accomplished by a 12-ton steel-wheel vibratory roller, traveling at a speed of approximately 2 mph and vibrating at maximum amplitude (or as directed by the Engineer). The section shall have 100% coverage exclusive of the outside 1 foot, or as directed by the Engineer, so as to induce minute cracks in the FDR-C. The microcracking operations may be terminated when a minimum 40% reduction in the stiffness of the FDR-C course is achieved as compared to the initial (pre-cracked) readings. After one pass of the vibratory roller, the stiffness of the FDR-C shall be determined. Based on the target total stiffness minimum reduction of 40%, it will be decided if additional passes are required. Additional passes of the steel roller may be required to achieve the desired crack pattern or section modulus as determined by the Engineer. The FDR-C course shall be tested for stiffness after each additional rolling. It is anticipated that the roller will have to make between 1 to 4 passes to achieve the required reduction in stiffness.

**34-5.8 Final Curing:** After cessation of microcracking the section shall be cured for a period of at least 48-72 hours or as required by the Engineer.

**Pavement Section Completion.** Once the FDR-C section is finished, contractor may be allowed to place subsequent pavement layers over the FDR-C section provided that the following criteria are met:

- A. The FDR-C section is stable and non-yielding under a minimum 10-ton proof-roll.
- B. The FDR-C section has no evidence of cracking other than those achieved during microcracking.
- C. The FDR-C section criteria's have been met, including FDR-C thickness, percentage of cement applied, compaction, and square footage of the treated area confirmed.

**34-5.9 Repair:** If the FDR-C is damaged, it shall be repaired by removing and replacing the entire depth of affected layers in the damaged area. Feathering will not be permitted for repair of low areas.

**35 Measurement & Payment:** The pulverization and cement treatment of the existing pavement shall be paid for at the contract unit price per **square foot** for **“Full Depth Reclamation with Cement”** and shall include costs for all pulverizing, and mixing of the existing pavement and underlying materials; for all water and Portland cement; for all preliminary roadway slope grading, spreading, compacting trimming and grading to the proper grade to conform to roadway slope specified on plans and existing pavement and as specified; for all haul away of all excess pulverized material or placement throughout the project site; for all microcracking, curing, protection and sealing of the FDR-C section. Additional cement and work required above and beyond the specified amount will be paid on a change order basis.

## Section 35

### Asphalt Concrete Speed Table

This section includes the requirements for furnishing and installing asphalt concrete speed tables atop existing asphalt or concrete pavement for traffic calming purposes. Installation includes thermoplastic striping and pavement markings. The design speed of the speed table shall be 35 mph.

**Section 35-1 Materials** - Hot Mix Asphalt (HMA), 1/2" maximum aggregate size, Type B per Caltrans specifications.

- Binder: PG 64-10 unless otherwise specified.
- Compaction: 95% minimum relative compaction per CTM 375.
- Lift Thickness: as shown on plans.

**Section 35-2 Tack Coat** - Asphalt emulsion (SS-1h or approved equal), applied at 0.05 to 0.15 gallons per square yard.

- Tack coat shall be applied to all vertical and horizontal surfaces of the existing pavement that will come in contact with new asphalt.

**Section 35-3 Preparation** - Clean the existing pavement surface of all debris, loose material, and contaminants.

- Ensure surface is dry and at appropriate temperature for asphalt and tack coat application.

**Section 35-4 Installation** - Apply tack coat uniformly over the existing pavement within the speed table limits.

- Place hot mix asphalt to the dimensions shown on the plans:
    - Flat Top Length: as shown on plans
    - Ramp Length: as shown on plans
  - Place in one or more lifts as required.
  - Compact asphalt to achieve 95% minimum relative compaction.
  - Ensure smooth transitions and uniform surface finish. Avoid any abrupt vertical discontinuities.
- Install Thermoplastic striping as shown on plans.

**Section 35-5 Measurement and Payment** - Speed Table Installation: Measured and paid per each unit installed, complete in place including all materials, tack coat, AC placement, compaction, and surface preparation.

**Section 36 & 37**

**Deleted**

## **Section 38**

### **CLARIFICATION/DEVIATION**

#### **38-1 REQUESTS FOR CLARIFICATION**

- A. Contractor requests for clarification of the plans and/or specifications shall be directed to the ENGINEER in writing. Such requests shall not be received directly from a Subcontractor or Supplier.
- B. Normally, a separate form shall be used for each specific item for which a clarification is required. Requests for clarification for more than one item using a single transmittal form will be permitted only when the items are so functionally related that expediency indicates review of the group of items as a whole.
- C. The ENGINEER will reply to Contractor's request for clarification within fifteen (15) working days following receipt by the ENGINEER.

#### **38-2 DEVIATION REQUESTS**

- A. Contractor requests for deviation from the plans and/or specifications shall be directed to the ENGINEER in writing. Such requests shall not be received directly from a subcontractor or Supplier.
- B. The ENGINEER will reply to Contractor's request for deviation from the plans within fifteen (15) working days following receipt by theENGINEER.