



TOWN OF COLMA

MASS GRADING AND SITE IMPROVEMENTS PACKAGE COLMA TOWN HALL AND ADDITION

BID AND CONTRACT DOCUMENTS

Mass Grading and Site Improvements Package – Colma Town Hall and Addition

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TOWN OF COLMA

NOTICE INVITING BIDS

NOTICE IS HEREBY GIVEN that the **TOWN OF COLMA, DEPARTMENT OF PUBLIC WORKS** (“Colma”) will receive sealed bids for the Selective Demolition – Colma Town Hall and Addition Project at the office of the Director of Public Works no later than **Thursday November 19th, at 2:00pm.** at which time or thereafter said bids will be opened and read aloud. Bids received after this time will be returned unopened. Bids shall be valid for ninety (90) calendar days after the bid opening date. No bidder may withdraw his / her bid for a period of ninety (90) calendar days after the date set for the opening of bids.

Bids must be submitted on Colma’s Bid Forms in a seal envelope clearly marked in accordance with the Information For Bidders.

Bidders may obtain a copy of the Contract Documents from the Public Works Department at: 1188 El Camino Real (650) 757-8888 for \$21.65 (\$20.00 plus \$1.65 tax). A non-refundable charge of Twenty Dollars (\$20.00) will be required of any bidder who requests that the Contract Documents be mailed within California (costs for out-of-state mailings will be higher). Colma will also make the Contract Documents available for review at one or more plan rooms.

Bids must be accompanied by cash, a certified or cashier’s check, or a Bid Bond in favor of Colma in an amount not less than ten percent (10%) of the submitted Total Bid Price. Each bid shall also be accompanied by the non-collusion declaration, the list of proposed subcontractors, and all additional documentation required by the Information For Bidders.

A Mandatory Pre-Bid Conference will be held at 1188 El Camino Real on the following date and time: **2:00pm on Thursday November 12th.**

Each and every bidder must attend the Pre-Bid Conference. Prospective bidders may not visit the Project Site without making arrangements through the office of the Director of Public Works. Bids will not be accepted from any bidder who did not attend the Mandatory Pre-Bid Conference.

The successful bidder will be required to furnish Colma with a Performance Bond equal to 100% of the successful bid, and a Payment Bond equal to 100% of the successful bid, prior to execution of the Contract. All bonds are to be secured from a surety that meets all of the State of California bonding requirements, as defined in Code of Civil Procedure Section 995.120, and is admitted by the State of California.

Pursuant to Public Contract Code Section 22300, the successful bidder may substitute certain securities for funds withheld by City to ensure his performance under the Contract. At the request and expense of the successful bidder, securities equivalent to any amount withheld shall be deposited at the discretion of Colma, with either Colma or a state or federally chartered bank, as the escrow agent, who shall then pay any funds otherwise subject to retention to the successful

NOTICE INVITING BIDS

bidder. Upon satisfactory completion of the Contract, the securities shall be returned to the successful bidder.

The Director of Industrial Relations has determined the general prevailing rate of per diem wages in the locality in which this work is to be performed for each craft or type of worker needed to execute the Contract which will be awarded to the successful bidder, copies of which are on file and will be made available to any interested party upon request at the Office of the Director of Public Works or online at <http://www.dir.ca.gov/dlsr>. A copy of these rates shall be posted by the successful bidder at the job site. The successful bidder and all subcontractor(s) under him, shall comply with all applicable Labor Code provisions, which include, but are not limited to the payment of not less than the required prevailing rates to all workers employed by them in the execution of the Contract, the employment of apprentices, the hours of labor and the debarment of contractors and subcontractors.

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations (“DIR”). No bid will be accepted nor any contract entered into without proof of the contractor’s and subcontractors’ current registration with the DIR to perform public work. If awarded a contract, the bidder and its subcontractors, of any tier, shall maintain active registration with the DIR for the duration of the Project.

This Project is subject to compliance monitoring and enforcement by the DIR. In bidding on this Project, it shall be the bidder’s sole responsibility to evaluate and include the cost of complying with all labor compliance requirements under this contract and applicable law in its bid.

Each bidder shall be a licensed contractor pursuant to the Business and Professions Code and shall be licensed in the following appropriate classification(s) of contractor’s license(s), for the work bid upon, and must maintain the license(s) throughout the duration of the Contract: General Contractor License.

Award of Contract: Colma shall award the Contract for the Project to the lowest responsive, responsible bidder as determined from the addition of Bid Schedules 1, 2 and 3 combined by Colma. Colma reserves the right to reject any or all bids or to waive any irregularities or informalities in any bids or in the bidding process. Bid protests, if any, must comply with the requirements set forth in the Information For Bidders in order to be timely and considered by Colma.

For further information, contact Dave Bishop at (650) 757-8888. **The last day to submit questions shall be Friday November 13th at 5pm.** All questions must be submitted in accordance with the procedures set forth in the Information For Bidders.

NOTICE INVITING BIDS

**TOWN OF COLMA
INFORMATION FOR BIDDERS**

1. AVAILABILITY OF CONTRACT DOCUMENTS

Bids must be submitted to Colma on the Bid Forms which are a part of the Bid Package for the Project. Contract Documents may be obtained from Colma at the location(s) and at the time(s) indicated in the Notice Inviting Bids. Prospective bidders are encouraged to telephone in advance to determine the availability of Contract Documents. Any applicable charges for the Contract Documents are outlined in the Notice Inviting Bids.

As required by Public Contract Code Section 20103.7, Colma shall also make an electronic version of the Contract Documents available for review at one or more plan rooms, upon request. Please Note: Prospective bidders who choose to review the Contract Documents at a plan room must contact Colma to obtain the required Contract Documents if they decide to submit a bid for the Project.

2. EXAMINATION OF CONTRACT DOCUMENTS

Colma has made copies of the Contract Documents available, as indicated above. Bidders shall be solely responsible, at their own expense and prior to submitting their bids, for examining the Project Site and the Contract Documents, including any Addenda issued during the bidding period, and for informing itself with respect to local labor availability, means of transportation, necessity for security, laws and codes, local permit requirements, wage scales, local tax structure, contractors' licensing requirements, availability of required insurance, and other factors that could affect the Work. Bidders are responsible for consulting the standards referenced in the Contract. Failure of bidder to receive and so examine and inform itself shall be at its sole risk, and no relief for error or omission will be given except as required under State law.

3. INTERPRETATION OF CONTRACT DOCUMENTS

Discrepancies in, and/or omissions from the Plans, Specifications or other Contract Documents or questions as to their meaning shall be immediately brought to the attention of Colma by submission of a written request for an interpretation or correction to Colma. Such submission, if any, must be sent to the Director of Public Works by faxing (650) 757-8890 or emailing to brad.donohue@colma.ca.org. The person submitting the request for interpretation or correction is responsible for its prompt delivery. The final date for submittal of requests for interpretation or correction, if any, shall be specified in the Notice Inviting Bids.

Any interpretation of the Contract Documents will be made only by written addenda duly issued and mailed or delivered to each person or firm who has purchased a set of Contract Documents. Colma will not be responsible for any explanations or interpretations provided in any other manner. No person is authorized to make any oral interpretation of any provision in the Contract Documents to any bidder, and no bidder should rely on any such oral interpretation.

Bids shall include complete compensation for all items that are noted in the Contract Documents as the responsibility of the Contractor.

INFORMATION FOR BIDDERS

4. **INSPECTION OF SITE; PRE-BID CONFERENCE AND SITE WALK**

Each prospective bidder is responsible at its own expense for fully acquainting itself with the conditions of the Project Site (which may include more than one site), as well as those relating to the construction and labor of the Project, to fully understand the facilities, difficulties and restrictions which may impact the cost or effort required to complete the Project. To this end, a Pre-Bid Conference and Site Walk will be held on the date(s) and time(s) indicated in the Notice Inviting Bids.

Bids will not be accepted from any bidder who did not attend the mandatory pre-bid conference. Bidders will be required to sign the attendance sheet at the mandatory pre-bid conference. Only bidders attending the pre-bid conference and signing in will receive any Addenda that are issued. Storm, surface, nuisance, or other waters may be encountered at various times during construction of the Project. Federal and State laws require Colma and its contractors to appropriately manage such waters pursuant to the requirements of California State Water Resources Control Board Order Number 2009-0009-DWQ, the Federal Clean Water Act, and the California Porter Cologne Water Quality Control Act. By submitting a bid, each bidder acknowledges that it has investigated the risk arising from such waters, has prepared its bid accordingly, and assumes any and all risks and liabilities arising therefrom.

5. **MANDATORY EXPERIENCE REQUIREMENTS**

Each prospective bidder must have experience with similar construction projects involving facilities similar to those contemplated by the project and must have successfully completed at least one such project within the last five (5) years. Appropriate experience would include, but not necessarily be limited to, other town or city mass grading projects of similar size and scope of work. Such experience must be appropriately documented through submission of appropriate documentation with the Information Required of Bidders form with each bid. Failure to provide appropriate documentation of this mandatory experience may result in the bid being rejected.

6. **ADDENDA**

Colma reserves the right to revise the Contract Documents prior to the bid opening date. Revisions, if any, shall be made by written Addenda. All addenda issued by Colma shall be included in the bid and made part of the Contract Documents. Pursuant to Public Contract Code Section 4104.5, if Colma issues an Addendum which includes material changes to the Project less than 72 hours prior to the deadline for submission of bids, Colma will extend the deadline for submission of bids. Colma may determine, in its sole discretion, whether an Addendum warrants postponement of the bid submission date. Each prospective bidder shall provide City a name, address and facsimile number to which Addenda may be sent, as well as a telephone number by which Colma can contact the bidder. Copies of Addenda will be furnished by facsimile, first class mail, express mail or other proper means of delivery without charge to all parties who have obtained a copy of the Contract Documents and provided such current information. Please Note: Bidders are responsible for ensuring that they have received any and all Addenda. Each bidder's bid form shall acknowledge receipt, understanding and full consideration of all Addenda. To this end, each bidder should contact the Public Works

INFORMATION FOR BIDDERS

Department to verify that he has received all Addenda issued, if any, prior to the bid opening. Failure to acknowledge receipt of all Addenda may result in rejection of the bid.

7. ALTERNATE BIDS

If alternate bid items are called for in the Contract Documents, the lowest bid will be determined on the basis of the base bid only, unless otherwise specified in the Notice Inviting Bids. However, Colma may choose to award the contract on the basis of the base bid alone or the base bid and any alternate or combination of alternates. The time required for completion of the alternate bid items has been factored into the Contract duration and no additional Contract time will be awarded for any of the alternate bid items. Colma may elect to include one or more of the alternate bid items, or to otherwise remove certain work from the Project scope of work, accordingly each bidder must ensure that each bid item contains a proportionate share of profit, overhead and other costs or expenses which will be incurred by the bidder.

8. COMPLETION OF BID FORMS

Bids shall only be prepared using copies of the Bid Forms which are included in the Contract Documents. The use of substitute bid forms other than clear and correct photocopies of those provided by Colma will not be permitted. Bids shall be executed by an authorized signatory as described in the Information For Bidders. In addition, bidders shall fill in all blank spaces (including inserting "N/A" where applicable) and initial all interlineations, alterations, or erasures to the Bid Forms. Bidders shall neither delete, modify, nor supplement the printed matter on the Bid Forms nor make substitutions thereon. **USE OF BLACK OR BLUE INK, INDELIBLE PENCIL OR A TYPEWRITER IS REQUIRED.** Deviations in the bid form may result in the bid being deemed non-responsive. Bidders should not deface or mutilate the bid documents to the extent that they may not be usable for construction purposes.

9. MODIFICATIONS OF BIDS

Each bidder shall submit its Bid in strict conformity with the requirements of the Contract Documents. Unauthorized additions, modifications, revisions, conditions, limitations, exclusions or provisions attached to a Bid may render it non-responsive and may cause its rejection. Bidders shall neither delete, modify, nor supplement the printed matter on the Bid Forms, nor make substitutions thereon. Oral, telephonic and electronic modifications will not be considered, unless the Notice Inviting Bids authorizes the submission of electronic bids and modifications thereto and such modifications are made in accordance with the Notice Inviting Bids.

10. DESIGNATION OF SUBCONTRACTORS

Pursuant to State law, the bidders must designate on the form provided herein, and submit with their bids, the name and location (City and State), contractor's license number, and DIR registration number of each subcontractor who will perform work or render services for the bidder in an amount that exceeds one-half of one percent (1/2%) of the Bidder's Total Bid Price, as well as the portion of work each such subcontractor will perform on the form provided herein by Colma. No additional time will be provided to bidders to submit any of the information requested in this subsection.

INFORMATION FOR BIDDERS

11. ANTI-DISCRIMINATION

It is the policy of Colma that in connection with all work performed under contracts, there be no discrimination against any prospective or active employees engaged in the work because of race, color, ancestry, national origin, religious creed, sex, age or marital status. The successful bidder agrees to comply with applicable Federal and California laws including, but not limited to, the California Fair Employment Practice Act, beginning with Government Code 12900, and Labor Code 1735. In addition, the successful bidder agrees to require like compliance by any subcontractors employed on the work by him.

12. LICENSING REQUIREMENTS

Pursuant to Section 7028.15 of the Business and Professions Code and Section 3300 of the Public Contract Code, all bidders must possess proper licenses for performance of this Contract at the time of submission of their bid, and must maintain the licenses throughout the duration of the Contract. Subcontractors must possess the appropriate licenses for each specialty subcontracted, including but not limited to all certifications required by the United States Environmental Protection Agency Lead Renovation, Repair, and Paint Rule set forth at Title 40, Part 745 of the Code of Federal Regulations. Pursuant to Section 7028.5 of the Business and Professions Code, Colma shall consider any bid submitted by a contractor not currently licensed in accordance with state law and pursuant to the requirements found in the Contract Documents to be nonresponsive, and Colma shall reject the Bid. Colma shall have the right to request, and bidders shall provide within five (5) calendar days, evidence satisfactory to Colma of all valid license(s) currently held by that bidder and each of the bidder's subcontractors, before awarding the Contract. Please also note that, pursuant to Public Contract Code Section 20676, sellers of "mined material" must be on an approved list of sellers published pursuant to Public Resources Code Section 2717(b) in order to supply mined material for this Contract. Failure of a bidder to obtain proper and adequate licensing for an award of a contract shall constitute a failure to execute the contract and may result in forfeiture of the bidder's bid security.

13. SIGNING OF BIDS

All Bids submitted shall be executed by the bidder or its authorized representative. Bidders may be asked to provide evidence in the form of an authenticated resolution of its Board of Directors or a Power of Attorney evidencing the capacity of the person signing the bid to bind the bidder to each bid and to any Contract arising therefrom.

If a bidder is a joint venture or partnership, it may be asked to submit an authenticated Power of Attorney executed by each joint venturer or partner appointing and designating one of the joint venturers or partners as a management sponsor to execute the Bid on behalf of bidder. Only that joint venturer or partner shall execute the bid. The Power of Attorney shall also: (1) authorize that particular joint venturer or partner to act for and bind the bidder in all matters relating to the Bid; and (2) provide that each venturer or partner shall be jointly and severally liable for any and all of the duties and obligations of the bidder assumed under the bid and under any Contract arising therefrom. The Bid shall be executed by the designated joint venturer or partner on behalf of the joint venture or partnership in its legal name.

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14. BID SECURITY

Each bid shall be accompanied by: (a) cash; (b) a certified check made payable to Colma; (c) a cashier's check made payable to Colma; or (d) a bid bond payable to Colma executed by the bidder as principal and surety as obligor in an amount not less than 10% of the maximum amount of the bid. Personal sureties and unregistered surety companies are unacceptable. The surety insurer shall be California admitted surety insurer, as defined in Code of Civil Procedure Section 995.120. The cash, check or bid bond shall be given as a guarantee that the bidder shall execute the Contract if it be awarded to the bidder, shall provide the payment and performance bonds and insurance certificates and endorsements as required herein within ten (10) calendar days after notification of the award of the Contract to the bidder. Failure to provide the required documents may result in forfeiture of the bidder's bid deposit or bond to Colma and Colma may award the Contract to the next lowest responsive, responsible bidder, or may call for new bids.

15. SUBMISSION OF SEALED BIDS

Once the Bid and supporting documents have been completed and signed as set forth herein, they shall be placed, along with the Bid Guarantee and other required materials in an envelope, sealed, addressed and delivered or mailed, postage prepaid to Colma at the place and to the attention of the person indicated in the Notice Inviting Bids. No oral or telephonic bids will be considered. No forms transmitted via the internet, e-mail, facsimile, or any other electronic means will be considered unless specifically authorized by City as provided herein. The envelope shall also contain the following in the lower left-hand corner thereof:

Bid of (Bidder's Name)
for the Mass Grading and Site Improvements Package – Colma Town Hall and Addition

16. DELIVERY AND OPENING OF BIDS

Bids will be received by Colma at the address shown in the Notice Inviting Bids up to the date and time shown therein. Colma will leave unopened any Bid received after the specified date and time, and any such unopened bid will be returned to the bidder. It is the bidder's sole responsibility to ensure that its bid is received as specified. Bids may be submitted earlier than the dates(s) and time(s) indicated. Bidders are advised that on the bid date, Colma's telephones WILL NOT be available for use by bidders or their representatives.

Bids will be opened at the date and time stated in the Notice Inviting Bids, and the amount of each Bid will be read aloud and recorded. All bidders may, if they desire, attend the opening of Bids. Colma may in its sole discretion, elect to postpone the opening of the submitted Bids. City reserves the right to reject any or all Bids and to waive any informality or irregularity in any Bid. In the event of a discrepancy between the written amount of the Bid Price and the numerical amount of the Bid Price, the written amount shall govern.

17. WITHDRAWAL OF BID

Prior to bid opening, a bid may be withdrawn by the bidder only by means of a written request

INFORMATION FOR BIDDERS

signed by the bidder or its properly authorized representative. Any request to withdraw a bid after bid opening shall be submitted in writing and in accordance with all requirements of Public Contract Code Section 5100 et seq.

18. BASIS OF AWARD; BALANCED BIDS

Colma shall award the Contract to the lowest responsive, responsible bidder submitting a responsive Bid. The basis for the selection of lowest responsible bidder will be according to the GRAND TOTAL of Bid Schedules A, B, 1 and 2. Upon selection of the lowest responsible bidder according to the cumulative total of all bid schedules, the Town will award a contract for any or all combination of the bid schedules submitted. Town of Colma may reject any Bid Schedule which, in its opinion exceeds available budget, internal estimates or does not accurately reflect the cost to perform the Work. Colma may reject as non-responsive any bid which unevenly weights or allocates costs, including but not limited to overhead and profit to one or more particular bid items.

19. DISQUALIFICATION OF BIDDERS; INTEREST IN MORE THAN ONE BID

No bidder shall be allowed to make, submit or be interested in more than one bid. However, a person, firm, corporation or other entity that has submitted a subproposal to a bidder, or that has quoted prices of materials to a bidder, is not thereby disqualified from submitting a subproposal or quoting prices to other bidders submitting a bid to Colma. No person, firm, corporation, or other entity may submit subproposal to a bidder, or quote prices of materials to a bidder, when also submitting a prime bid on the same Project.

20. INSURANCE REQUIREMENTS

Prior to commencement of any work under the Contract, the successful bidder shall procure the insurance in the form and in the amount specified in the Contract Documents, from insurers meeting all requirements specified therein.

21. AWARD PROCESS

Once all bids are opened and reviewed to determine the lowest responsive and responsible bidder, Colma Council may award the contract. The apparent successful bidder should begin to prepare the following documents: (1) the Performance Bond; (2) the Payment Bond; and (3) the required insurance certificates and endorsements. Once Colma notifies the bidder of the award, the bidder will have ten (10) consecutive calendar days from the date of this notification to execute the Contract and supply Colma with all of the required documents and certifications. In the event the bidder fails or refuses to pose the required bonds, return executed copies of the Contract within ten (10) consecutive calendar days, Colma may declare the bidder's bid deposit or bond forfeited as damages caused by the failure of the bidder to post the required bonds and execute such copies of the Contract, and may award the Contract to the next lowest responsible bidder, or may call for new bids. Alternatively, Colma may in its sole discretion extend the time for the bidder to provide the required documents and certifications, however, regardless of whether or not the bidder supplies the required documents and certifications in a timely manner, the Contract time will begin to run ten (10) calendar days from the date of the notification. Once

INFORMATION FOR BIDDERS

Colma receives all of the properly drafted and executed documents and certifications from the bidder, Colma shall issue a Notice to Proceed to that bidder.

22. FILING OF BID PROTESTS

Submitted bids will be timely made available for review upon the request of any bidder. Bidders may file a “protest” of a Bid with Colma’s Director of Public Works. In order for a bidder’s protest to be considered valid, the protest must:

- A. Be filed in writing within five (5) calendar days after the bid opening date;
- B. Clearly identify the specific irregularity or accusation;
- C. Clearly identify the specific City staff determination or recommendation being protested;
- D. Specify, in detail, the grounds of the protest and the facts supporting the protest; and
- E. Include all relevant, supporting documentation with the protest at time of filing.

If the protest does not comply with each of these requirements, it may be rejected without further review.

If the protest is timely and complies with the above requirements, Colma’s Director of Public Works, or other designated City staff member, shall review the basis of the protest and all relevant information. The Director of Public Works will provide a written response to the protestor.

23. WORKERS COMPENSATION

Each bidder shall submit the Contractors Certificate Regarding Workers’ Compensation form.

24. PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the DIR. No bid will be accepted nor any contract entered into without proof of the contractor’s and subcontractors’ current registration with the DIR to perform public work. If awarded a contract, the bidder and its subcontractors, of any tier, shall maintain active registration with the DIR for the duration of the Project. To this end, the bidder shall sign and submit with its bid the Public Works Contractor Registration Certification on the form provided, attesting to the facts contained therein. Failure to submit this form may render the bid non-responsive. In addition, each bidder shall provide the registration number for each listed subcontractor in the space provided in the Designation of Subcontractors Form.

INFORMATION FOR BIDDERS

25. SUBSTITUTION OF SECURITY

The Contract Documents call for monthly progress payments based upon the percentage of the work completed. Colma will retain five percent (5%) of each progress payment as provided by the Contract Documents. At the request and expense of the successful bidder, Colma will substitute securities for the amount so retained in accordance with Public Contract Code Section 22300.

26. PREVAILING WAGES

Colma has obtained from the Director of the DIR the general prevailing rate of per diem wages in the locality in which this work is to be performed for each craft or type of worker needed to execute the Contract. These rates are on file and available at the Office of the Director of Public Works or may be obtained online at <http://www.dir.ca.gov/dlsr>. Bidders are advised that a copy of these rates must be posted by the successful bidder at the job site(s).

27. DEBARMENT OF CONTRACTORS AND SUBCONTRACTORS

In accordance with the provisions of the Labor Code, contractors or subcontractors may not perform work on a public works project with a subcontractor who is ineligible to perform work on a public project pursuant to Section 1777.1 or Section 1777.7 of the Labor Code. Any contract on a public works project entered into between a contractor and a debarred subcontractor is void as a matter of law. A debarred subcontractor may not receive any public money for performing work as a subcontractor on a public works contract. Any public money that is paid to a debarred subcontractor by the Contractor for the Project shall be returned to Colma. The Contractor shall be responsible for the payment of wages to workers of a debarred subcontractor who has been allowed to work on the Project.

28. PERFORMANCE BOND AND PAYMENT BOND REQUIREMENTS

Within the time specified in the Contract Documents, the bidder to whom a Contract is awarded shall deliver to Colma four identical counterparts of the Performance Bond and Payment Bond in the form supplied by Colma and included in the Contract Documents. Failure to do so may, in the sole discretion of City, result in the forfeiture of the Bid Guarantee. The surety supplying the bond must be an admitted surety insurer, as defined in Code of Civil Procedure Section 995.120, authorized to do business as such in the State of California and satisfactory to Colma. The Performance Bond and the Payment Bond shall be for one hundred percent (100%) of the Total Bid Price.

29. REQUEST FOR SUBSTITUTIONS

The successful bidder shall comply with the substitution request provisions set forth in the General Conditions and/or Special Conditions, including any deadlines for substitution requests which may occur prior to the bid opening date.

30. SALES AND OTHER APPLICABLE TAXES, PERMITS, LICENSES AND FEES

The Contractor and its subcontractors performing work under this Contract will be required to

INFORMATION FOR BIDDERS

pay California sales tax and other applicable taxes, and to pay for permits, licenses and fees required by the agencies with authority in the jurisdiction in which the work will be located, unless otherwise expressly provided by the Contract Documents.

31. EXECUTION OF CONTRACT

As required herein, the bidder to whom an award is made shall execute the Contract in the amount determined by the Contract Documents, which should be carefully examined by the bidder. Colma may require appropriate evidence that the persons executing the Contract are duly empowered to do so.

32. REQUIRED CERTIFICATIONS

Bidders for all projects involving state funds are required to submit the “Asbestos-Free Materials Certification.” This form is included in this package and must be signed under the penalty of perjury and dated, and shall be submitted to Colma in accordance with Section 83 of the General Conditions. The successful bidder shall also execute, under the penalty of perjury and dated, the “Recycled Content Certification” and the “Drug-Free Workplace Certification” included in this package.

33. BID DEPOSIT RETURNS

Colma will return the security accompanying the bids of all unsuccessful bidders, except as otherwise provided herein, no later than sixty (60) calendar days after award of the Contract.

END OF INFORMATION FOR BIDDERS

INFORMATION FOR BIDDERS

BASE BID SCHEDULE A

(No Walls Concept)

NO.	ITEM DESCRIPTION	UNIT OF MEASURE	EST. QTY.	UNIT PRICE	ITEM COST
A1.	Mobilization	LS	1		
A2.	Demolition, Recycling and Offhaul of fill, AC Paving, Concrete, Trees and other miscellaneous metals	LS	1		
A3.	Underpinning of the existing 1941 Building for Zones A thru C as shown on Attachment 0 with Helical Anchors or an approved equal. Per linear foot of building supported.	LF	100		
A4.	Remove and Recompact Existing Fill (to 95% Relative Compaction) Below Level 1 within 5 feet outside of the footprint of the footing from Elevation 184 to existing grade. Recompact in place from Elev 182 to 184. Per Sheet C-200 Bid Schedule 1 concept.	CY	5800		
A5.	Import of fill needed to replace the exported unsuitable material to restore existing grades.	CY	1000		
A6.	Shoring Systems for Deep Excavations and Backfill as needed to prevent sloughing adjacent to excavation and beneath 1941 building.	LS	1		
A7.	Dewatering Systems for Deep Excavations and Backfill as needed to lower groundwater table to 5 foot below bottom of excavation per geotechnical report.	LS	1		
A8.	Storm Drain Manhole	EA	1		
A9.	6" Storm Drain and Sewer Cleanouts	EA	6		
A10.	Storm Drain 6 – inch PVC Piping	LF	230		
A11.	Storm Drain 4 – inch PVC Subdrain System where not part of wall sections	LF	130		

BID SCHEDULE

	including cleanouts per Sheet C-200.				
A12.	Storm Drain Catch Basins	EA	2		
A13.	Sewer Manhole	EA	1		
A14.	6" Sewer Pipe (SDR 26)	LF	210		
A15.	Site Erosion Control	LS	1		
TOTAL BASE BID SCHEDULE A					

BASE BID SCHEDULE B

(No Walls Concept)

NO.	ITEM DESCRIPTION	UNIT OF MEASURE	EST. QTY.	UNIT PRICE	ITEM COST
B1.	Additional Mobilization	LS	1		
B2	Additional Demolition, Recycling and Offhaul of fill, AC Paving, Concrete, and other miscellaneous metals including Railing and top 2 feet of retaining Wall.	LS	1		
B3	Additional Underpinning of the existing 1941 Building for Zone D as shown on Attachment 0 with Helical Anchors or an approved equal. Per linear foot of building supported.	LF	50		
B4	Remove and Recompact Existing Fill (to 95% Relative Compaction) Below Level 1 to 5 feet outside of the footprint of the footing from Elevation 184 to existing grade. Recompact in place from Elev 182 to 184. Per Sheet C-200 Bid Schedule 2 concept. Incremental	CY	400		

BID SCHEDULE

	increase quantity only above and beyond Bid Schedule A quantities.				
B5	Additional Import of fill needed to replace the exported unsuitable material to restore existing grades.	CY	60		
B6	Additional Shoring Systems for Deep Excavations and Backfill as needed to prevent sloughing adjacent to excavation and beneath 1941 building.	LS	1		
B7	Additional Dewatering Systems for Deep Excavations and Backfill as needed to lower groundwater table to 5 foot below bottom of excavation per geotechnical report.	LS	1		
B8	Additional Site Erosion Control	LS	1		
TOTAL BASE BID SCHEDULE B					

BID SCHEDULE 1

(Walls Included Concept)

NO.	ITEM DESCRIPTION	UNIT OF MEASURE	EST. QTY.	UNIT PRICE	ITEM COST
1.1	Additional Mobilization	LS	1		
1.2	Concrete Retaining Walls and Footings Type A, including water proofing, reinforcing strip and backdrain system, and cleanout installation	LF	130		
1.3	Concrete Retaining Walls and Footings Type B, including water proofing, reinforcing strip and	LF	20		

BID SCHEDULE

	backdrain system installation				
1.4	Concrete Retaining Walls and Footings Type C, including water proofing, reinforcing strip and backdrain system installation	LF	73		
1.5	Import of fill needed to fill from grade to pad elevations as shown on plan after wall installations. This item also includes fill of overexcavation areas as indicated on Sheet C-200. Local source as provided by the Owner.	CY	3100		
TOTAL BASE BID SCHEDULE 1					

BID SCHEDULE 2

(Walls Included Concept)

NO.	ITEM DESCRIPTION	UNIT OF MEASURE	EST. QTY.	UNIT PRICE	ITEM COST
2.1	Additional Mobilization	LS	1		
2.2	Additional Concrete Retaining Walls and Footings Type C Including water proofing, reinforcing strip and backdrain system installation	LF	45		
2.3	Additional Import of fill needed to fill from grade to pad elevations as shown on plan after wall installations. Local source as provided by the Owner.	CY	250		
TOTAL BASE BID SCHEDULE A					

BID SCHEDULE

In case of discrepancy between the unit price and the item cost set forth for a unit basis item, the unit price shall prevail and, shall be utilized as the basis for determining the lowest responsive, responsible bidder. However, if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any cause, or is omitted, or is the same amount as the entry in the "Item Cost" column, then the amount set forth in the "Item Cost" 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. Final payment shall be determined by the Engineer from measured quantities of work performed based upon the unit price.

**TOTAL BID PRICE (BASED ON THE ADDITION OF BID SCHEDULE A, B, 1 and 2)
THE SUM OF THE TOTAL OF UNIT PRICES:**

\$ _____
Total Bid Price in Numbers

Total Bid Price in Written Form

In case of discrepancy between the written price and the numerical price, the written price shall prevail.

The undersigned agrees that this Bid Form constitutes a firm offer to Colma which cannot be withdrawn for the number of calendar days indicated in the Notice Inviting Bids from and after the bid opening, or until a Contract for the Work is fully executed by Colma and a third party, whichever is earlier.

BID SCHEDULE

The Contract duration shall commence on the date stated in Colma's Notice to Proceed, and shall be completed by the Contractor in the time specified in the Contract Documents. In no case shall the Contractor commence construction prior to the date stated in Colma's Notice to Proceed.

Bidder certifies that it is licensed in accordance with the law providing for the registration of Contractors, License No. _____, Expiration Date _____, class of license _____. If the bidder is a joint venture, each member of the joint venture must include the above information.

Notice of acceptance or requests for additional information provided by Colma should be addressed to the undersigned at the address stated below:

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

(IMPORTANT NOTICE: If the 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 comprising the firm; if bidder or other interested person is an individual, state first and last names in full.)

The undersigned acknowledges receipt, understanding and full consideration of the following addenda to the Contract Documents.

Addenda No. _____

Addenda No. _____

Addenda No. _____

1. Attached is the required bid security in the amount of not less than 10% of the Total Bid Price.
2. Attached is the completed Designation of Subcontractors form.
3. Attached is the completed Bidder Information form.
4. Attached is the completed Contractor's Certificate Regarding Workers' Compensation form.

BID SCHEDULE

5. Attached is the fully executed Non-Collusion Declaration form.
6. Attached is the completed Asbestos-Free Materials Certification form, if required.
7. Attached is the completed Recycled Content Certification form.
8. Attached is the completed Drug-Free Workplace Certification form.
9. Attached is the completed Public Works Contractor Registration Certification form.

Pursuant to Section 7103.5 of the Public Contract Code submitting a bid to Colma, the bidder offers and agrees that if the bid is accepted, it will assign to Colma 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. Section 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, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

I hereby certify under penalty of perjury under the laws of the State of California, that all of the information submitted in connection with this Bid and all of the representations made herein are true and correct.

Name of Bidder _____

Signature _____

Name and Title _____

Dated _____

NOTE: If the bidder is a corporation, the legal name of the corporation shall be set forth above together with the signatures of authorized officers or agents and the document shall bear the corporate seal; if bidder is a partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if bidder is an individual, his or her signature shall be placed above.

Business Address: _____

Place of Residence: _____

Telephone: () _____

BID SCHEDULE

**CONTRACTOR'S CERTIFICATE REGARDING
WORKERS' COMPENSATION**

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.

Name of Bidder _____

Signature _____

Name _____

Title _____

Dated _____

**CONTRACTOR'S CERTIFICATE REGARDING
WORKERS' COMPENSATION**

BID BOND

KNOW ALL MEN BY THESE PRESENTS: THAT we, _____, as Principal, and _____, as Surety, are held and firmly bound unto the **TOWN OF COLMA**, hereinafter called Colma, in the penal sum of _____ PERCENT (_____%) OF THE TOTAL AMOUNT OF THE BID of the Principal submitted to the said CITY for the work described below for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted the accompanying bid dated _____ 20__, for _____.

NOW, THEREFORE, the Principal shall not withdraw said bid within the period specified therein after the opening of the same, or, if no period be specified, within sixty (60) days after said opening; and, if the Principal be awarded the contract, and shall within the period specified therefor, or if no period be specified, within ten (10) consecutive calendar days after the Award of Contract (which date shall be the day following the governing board approval of the award) complete the prescribed forms are presented to him for signature enter into a written contract with Colma in accordance with the bid as accepted and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract and for the payment for labor and materials used for the performance of the contract, or in the event of the withdrawal of said bid within the period specified or the failure to enter into such contract and give such bonds within the time specified. If the Principal shall pay Colma the difference between the amount specified in said bid and the amount for which Colma may procure the required work and/or supplies, if the latter amount be in excess of the former, together with all costs incurred by Colma in again calling for bids, then the above obligation shall be void and of no effect, otherwise to remain In full force and virtue.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract on the call for bids, or to the work to be performed thereunder, or the specifications accompanying the same, shall in anywise affect its obligation under this bond, and It does hereby waive notice of any such change, extension of time, alteration or addition to the terms of said contract or the call for bids, or to the work, or to the specifications.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this ____ day of _____, 20__, the name and corporate seal of each corporate party being hereto affixed and these presents duly assigned by its undersigned representative, pursuant to authority of Its governing body.

(Corporate Seal)

Principal
By _____
Title _____

BID BOND

(Corporate Seal)

Surety

By _____

Attorney-in-Fact

(Attach Attorney-in-Fact Certificate)

Title _____

BID BOND

-21-

Mass Grading and Site Improvements Package – Colma Town Hall and Addition

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
 COUNTY OF _____

On _____, 20___, before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

DESCRIPTION OF ATTACHED DOCUMENT

- Individual
- Corporate Officer

_____ Title(s)

_____ Title or Type of Document

- Partner(s) Limited
- General

_____ Number of Pages

- Attorney-In-Fact
- Trustee(s)
- Guardian/Conservator
- Other:

_____ Date of Document

Signer is representing:
 Name Of Person(s) Or Entity(ies)

_____ Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for the Attorney-in-Fact. The Power-of-Attorney to local representatives of the bonding company must also be attached.

BID BOND

DESIGNATION OF SUBCONTRACTORS

In compliance with the Subletting and Subcontracting Fair Practices Act of the Public Contract Code of the State of California, each bidder shall set forth below: (a) the name and the location of the place of business, (b) the California contractor license number, (c) the DIR public works contractor registration number, and (d) the portion of the work which will be done by each subcontractor who will perform work or labor or render service to the Contractor in or about the construction of the work in an amount in excess of one-half of one percent (1/2%) of the Contractor’s Total Bid Price. No time extension will be allowed for submission of information required by this document.

If no subcontractor is specified, for a portion of the work, or if more than one subcontractor is specified for the same portion of Work, to be performed under the Contract in excess of one-half of one percent (1/2%) of the Contractor’s Total Bid Price the Contractor shall be deemed to have agreed that it is fully qualified to perform that Work, and that it shall perform that portion itself.

Work to be done by Subcontractor	Name of Subcontractor	Location of Business	CSLB Contractor License Number	DIR Registration Number

DESIGNATION OF SUBCONTRACTORS

Work to be done by Subcontractor	Name of Subcontractor	Location of Business	CSLB Contractor License Number	DIR Registration Number

Name of Bidder _____

Signature _____

Name and Title _____

Dated _____

DESIGNATION OF SUBCONTRACTORS

INFORMATION REQUIRED OF BIDDERS

A. INFORMATION ABOUT BIDDER

Colma expressly reserves the right to reject the bid of any bidder who, upon investigation, has been determined to fail to complete similar contracts in a timely fashion or in a satisfactory manner. Such rejection would, if applicable, be based upon the principle that the bidder is “non-responsible” and poses a substantial risk of being unable to complete the work in a cost-effective, professional and timely manner.

In performing the above-described responsibility determination, Colma reserves the right to utilize all possible sources of information in making its determination, including but not limited to: inquiries to regulatory State Boards and agencies; Dun and Bradstreet credit reports, inquiries to companies and public entities for which the Contractor has previously performed work, reference checks and examination of all public records. Bidders are advised that failure to complete all required information set forth below may render the bid non-responsive.

The bidder must provide the following information

[**Indicate not applicable (“N/A”) where appropriate.**]

NOTE: Where bidder is a joint venture, pages shall be duplicated and information provided for all parties to the joint venture.

1.0 Name of bidder: _____

2.0 Type, if Entity: _____

3.0 Bidder’s Address: _____

Facsimile Number Telephone Number

4.0 How many years has Bidder’s organization been in business as a Contractor?

5.0 How many years has bidder’s organization been in business under its present name? _____

5.1 Under what other or former names has bidder’s organization operated?: _____

6.0 If bidder’s organization is a corporation, answer the following:

6.1 Date of Incorporation: _____

INFORMATION REQUIRED OF BIDDERS

6.2 State of Incorporation: _____

6.3 President's Name: _____

6.4 Vice-President's Name(s): _____

6.5 Secretary's Name: _____

6.6 Treasurer's Name: _____

7.0 If an individual or a partnership, answer the following:

7.1 Date of Organization: _____

7.2 Name and address of all partners (state whether general or limited partnership):

8.0 If other than a corporation or partnership, describe organization and name principals:

9.0 List other states in which bidder's organization is legally qualified to do business.

10.0 What type of work does the bidder normally perform with its own forces?

11.0 Has bidder ever failed to complete any work awarded to it? If so, note when, where, and why:

INFORMATION REQUIRED OF BIDDERS

12.0 Within the last five years, has any officer or partner of Bidder's organization ever been an officer or partner of another organization when it failed to complete a contract? If so, attach a separate sheet of explanation:

13.0 List Trade References:

14.0 List Bank References (Bank and Branch Address):

14.0 Name of Bonding Company and Name and Address of Agent:

INFORMATION REQUIRED OF BIDDERS

D. EXPERIENCE AND TECHNICAL QUALIFICATIONS QUESTIONNAIRE

Personnel:

The Bidder shall identify the key personnel to be assigned to this project in a management, construction supervision or engineering capacity.

- 1. List each person’s job title, name and percent of time to be allocated to this project:

- 2. Summarize each person’s specialized education:

- 3. List each person’s years of construction experience relevant to the project:

- 4. Summarize such experience:

Bidder agrees that personnel named in this Bid will remain on this Project until completion of all relevant Work, unless substituted by personnel of equivalent experience and qualifications approved in advance by Colma.

INFORMATION REQUIRED OF BIDDERS

Additional Bidder's Statements:

If the Bidder feels that there is additional information which has not been included in the questionnaire above, and which would contribute to the qualification review, it may add that information in a statement here or on an attached sheet, appropriately marked:

E. VERIFICATION AND EXECUTION

These Bid Forms shall be executed only by a duly authorized official of the Bidder:

I declare under penalty of perjury under the laws of the State of California that the foregoing information is true and correct:

Name of Bidder _____

Signature _____

Name _____

Title _____

Dated _____

INFORMATION REQUIRED OF BIDDERS

ASBESTOS-FREE MATERIALS CERTIFICATION

The undersigned declares that he or she is the person who executed the bid for Mass Grading and Site Improvements Package – Colma Town Hall and Addition (hereinafter referred to as the “Project”), and submitted it to the **TOWN OF COLMA** (hereinafter referred to as the “City”) on behalf of _____ (hereinafter referred to as the “Contractor”).

To the best of my knowledge, information and belief, in completing the Contractor’s Work for the Project, no material furnished, installed or incorporated into the Project will contain, or in itself be composed of, any materials listed by the federal or state EPA or federal or state health agencies as a hazardous material.

Any disputes involving the question of whether or not material installed with asbestos-containing equipment is settled by electron microscopy; the cost of any such tests shall be paid by the Contractor.

All work or materials installed by the Contractor which is found to contain asbestos, or work or material installed with asbestos-containing equipment, will be immediately rejected and this work shall be removed and replaced by the Contractor at no additional cost to Colma.

Decontamination and removal of work found to contain asbestos or work installed with asbestos-containing equipment shall be done only under supervision of a qualified consultant, knowledgeable in the field of asbestos abatement and accredited by the Environmental Protection Agency.

The ASBESTOS REMOVAL CONTRACTOR shall be an EPA accredited contractor qualified in the removal of asbestos and shall be chosen and approved by the Asbestos Consultant who shall have sole discretion and final determination in this matter.

The asbestos consultant shall be chosen and approved by the Construction Manager/Architect or Colma who shall have sole discretion and final determination in this matter.

The work will be not accepted until asbestos contamination is reduced to levels deemed acceptable by the Asbestos Consultant.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on this _____ day of _____, 20__ at _____.

Name of Contractor (Print or Type)

By _____
Signature

Print Name

ASBESTOS-FREE MATERIALS CERTIFICATION

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
 COUNTY OF _____

On _____, 20___, before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

DESCRIPTION OF ATTACHED DOCUMENT

- Individual
- Corporate Officer

_____ Title(s)

_____ Title or Type of Document

- Partner(s) Limited
- Attorney-In-Fact General

_____ Number of Pages

- Trustee(s)
- Guardian/Conservator
- Other:

_____ Date of Document

Signer is representing:
 Name Of Person(s) Or Entity(ies)

_____ Signer(s) Other Than Named Above

ASBESTOS-FREE MATERIALS CERTIFICATION

RECYCLED CONTENT CERTIFICATION

The undersigned declares that he or she is the person who executed the bid for the Mass Grading and Site Improvements Package – Colma Town Hall and Addition (hereinafter referred to as the “Project”), and submitted it to the **TOWN OF COLMA** (hereinafter referred to as the “City”) on behalf of hereinafter referred to as the “Contractor”).

Pursuant to Public Contract Code Sections 12205 and 22152, all contractors are required to certify in writing under penalty of perjury the minimum (if not exact) percentage of recycled content in materials, goods, or supplies offered or products used in the performance of their contract, regardless of whether the product meets the required recycled product percentage as defined in Public Contract Code Section 12209. The recycled content shall include both post-consumer material and secondary material as defined in Public Contract Code Section 12200 shall apply.

I declare under penalty of perjury under the laws of the State of California that the following percentages of Post-consumer Material and Secondary Material is in the materials, goods or supplies offered for, or products used in, the performance of the Contract for the Project:

_____ % Post consumer Material _____ % Secondary Material.

Executed on this _____ day of _____, 20 at _____
_____.

Name of Contractor (Print or Type)

By _____
Signature

Print Name

Title

RECYCLED CONTENT CERTIFICATION

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
 COUNTY OF _____

On _____, 20___, before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

DESCRIPTION OF ATTACHED DOCUMENT

- Individual
- Corporate Officer

_____ Title(s)

_____ Title or Type of Document

- Partner(s) Limited
- Attorney-In-Fact General

_____ Number of Pages

- Trustee(s)
- Guardian/Conservator
- Other:

_____ Date of Document

Signer is representing:
 Name Of Person(s) Or Entity(ies)

_____ Signer(s) Other Than Named Above

RECYCLED CONTENT CERTIFICATION

DRUG-FREE WORKPLACE CERTIFICATION

This Drug-Free Workplace Certification form is part of the Contract made by and between the **TOWN OF COLMA** (hereinafter referred to as the "City") and _____

_____ (hereinafter referred to as the "Contractor") for the Mass Grading and Site Improvements Package – Colma Town Hall and Addition Project (hereinafter referred to as the "Project"). This form is required from all successful bidders pursuant to the Drug-Free Workplace Act of 1990 (Government Code Section 8350 et seq.) The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract or grant for procurement of any property or service from any State agency must certify that it will provide a drug-free workplace by doing certain specified acts. In addition, the Act provides that each contract or grant awarded by a State agency may be subject to suspension of payments or termination, and the contractor or grantee may be subject to debarment from future contracting, if the contracting agency determines that specified acts have occurred.

Pursuant to Government Code Section 8355, every person or organization awarded a contract or grant from a State agency shall certify that it will provide a drug-free workplace by doing all of the following:

- A.** Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in their workplace and specifying actions which will be taken against employees for violations of the prohibition;
- B.** Establishing a drug-free awareness program to inform employees about all of the following:
 - (1)** The dangers of drug abuse in the workplace;
 - (2)** The person's or organization's policy of maintaining a drug-free workplace;
 - (3)** The availability of drug counseling, rehabilitation and employee-assistance programs; and
 - (4)** The penalties that may be imposed upon employees for drug abuse violations.
- C.** Requiring that each employee engaged in the performance of the contract or grant be given a copy of the statement required by subdivision "A," and that, as a condition of employment on the contract or grant, the employee agrees to abide by the terms of the statement.

I, the undersigned, agree to fulfill the terms and requirements of the Drug-Free Workplace Act as it now exists or may hereinafter be amended. Particularly, I shall abide by Government Code Section 8355 when performing the Contract for the Project by:

DRUG-FREE WORKPLACE CERTIFICATION

A. Publishing a statement notifying employees concerning the prohibition of controlled substance at my workplace;

D. Establishing a drug-free awareness program; and

E. Requiring that each employee engaged in the performance of the contract be given a copy of the statement required by Section 8355(a) and agree to abide by the terms of that statement.

I also understand that if Colma determines that I have either: (a) made a false certification herein; or (b) violated this certification by failing to carry out the requirements of Section 8355, the Contract awarded herein is subject to termination, suspension of payments, or both. I further understand that if I violate the terms of the Drug-Free Workplace Act of 1990, I may be subject to debarment in accordance with the requirements of the Act.

I acknowledge that I am aware of the provisions of Government Code Section 8350 et seq., and hereby certify that I will adhere to the requirements of the Drug-Free Workplace Act of 1990.

Executed on this _____ day of _____,
20_____ at _____.

Name of Contractor (Print or Type)

By _____

Signature

Print Name

Title

DRUG-FREE WORKPLACE CERTIFICATION

PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. See <http://www.dir.ca.gov/PublicWorks/PublicWorks.html> for additional information.

No bid will be accepted nor any contract entered into without proof of the contractor’s and subcontractors’ current registration with the Department of Industrial Relations to perform public work.

Bidder hereby certifies that it is aware of the registration requirements set forth in Labor Code sections 1725.5 and 1771.1 and is currently registered as a contractor with the Department of Industrial Relations.

Name of Bidder: _____

DIR Registration Number: _____

Bidder further acknowledges:

(1) Bidder shall maintain a current DIR registration for the duration of the project.

(2) Bidder shall include the requirements of Labor Code sections 1725.5 and 1771.1 in its contract with subcontractors and ensure that all subcontractors are registered at the time of bid opening and maintain registration status for the duration of the project.

(3) Failure to submit this form or comply with any of the above requirements may result in a finding that the bid is non-responsive.

Name of Bidder _____

Signature _____

Name and Title _____

Dated _____

PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION

NON-COLLUSION DECLARATION

The undersigned declares:

I am the _____ (*Title*) of _____ (*Firm*), the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. 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. All statements contained in the bid are true. 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, to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ (*Date*), at _____ (*City*), _____ (*State*).

By: _____

Printed Name: _____

Date: _____

NON-COLLUSION DECLARATION

IRAN CONTRACTING ACT CERTIFICATION

(Public Contract Code Section 2200 et seq.)

As required by California Public Contract Code Section 2204, the Contractor certifies subject to penalty for perjury that the option checked below relating to the Contractor’s status in regard to the Iran Contracting Act of 2010 (Public Contract Code Section 2200 et seq.) is true and correct:

- The Contractor is not:
 - (i) identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203; or
 - (ii) a financial institution that extends, for 45 days or more, credit in the amount of \$20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran.

- Colma has exempted the Contractor from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, Colma will be unable to obtain the goods and/or services to be provided pursuant to the Contract.

- The amount of the Contract payable to the Contractor for the Project does not exceed \$1,000,000.

Signed: _____

Titled: _____

Firm: _____

Date: _____

Note: In accordance with Public Contract Code Section 2205, false certification of this form shall be reported to the California Attorney General and may result in civil penalties equal to the greater of \$250,000 or twice the Contract amount, termination of the Contract and/or ineligibility to bid on contracts for three years.

IRAN CONTRACTING ACT CERTIFICATION

CONTRACT

THIS CONTRACT is made this ____ day of _____, 201_, in the County of San Mateo, State of California, by and between the TOWN OF COLMA, hereinafter called City, and _____, hereinafter called the Contractor. Colma and the Contractor for the considerations stated herein agree as follows:

ARTICLE 1. SCOPE OF WORK. The Contractor shall perform all Work within the time stipulated the Contract and shall provide all labor, materials, equipment, tools, utility services, and transportation to complete all of the Work required in strict compliance with the Contract Documents as specified in Article 5 below for the following Project:

Mass Grading and Site Improvements Package – Colma Town Hall and Addition

Mass excavation and grading of the site to re-compact loose soil beneath the footprint of the new building. Project includes dewatering, shoring, underpinning and mass grading to pad elevations. Site utilities for sewer, storm drain and wall drains are included.

The Contractor and its surety shall be liable to Colma for any damages arising as a result of the Contractor's failure to comply with this obligation, and the Contractor shall not be excused with respect to any failure to so comply by act or omission of the Construction Manager, Architect, Engineer, Inspector, or representative of any of them, unless such act or omission actually prevents the Contractor from fully complying with the Contract Documents and the Contractor protests, in accordance with the Contract Documents, that the act or omission is preventing the Contractor from fully complying with the Contract Documents. Such protest shall not be effective unless reduced to writing and filed with Colma within five (5) days of the date of occurrence of the act or omission preventing the Contractor from fully complying with the Contract Documents.

ARTICLE 2. TIME FOR COMPLETION. The Work shall be commenced on the date stated in Colma's Notice to Proceed. The Contractor shall complete all Work required by the Contract Documents within:

- For Bid Schedule A and B the Time of Completion shall be **40 (Fourty) Working Days,**
- For Bid Schedule 1 and 2 the Time of Completion shall be **25 (Twenty-Five) Working Days**

A total of 65 working days will be granted for the project including Bid Schedules A, B, 1 and 2 from the commencement date stated in the Notice o Proceed. By its signature hereunder, the Contractor agrees the time for completion set forth above is adequate and reasonable to complete the Work.

CONTRACT

ARTICLE 3. CONTRACT PRICE. Colma shall pay to the Contractor as full compensation for the performance of the Contract, subject to any additions or deductions as provided in the Contract Documents, and including all applicable taxes and costs, the sum of _____ Dollars (\$ _____). Payment shall be made as set forth in the General Conditions.

ARTICLE 4. LIQUIDATED DAMAGES. In accordance with Government Code section 53069.85, it is agreed that the Contractor will pay Colma the sum of **\$500** for each and every calendar day of delay beyond the time prescribed in the Contract Documents for finishing the Work, as Liquidated Damages and not as a penalty or forfeiture. In the event this is not paid, the Contractor agrees Colma may deduct that amount from any money due or that may become due the Contractor under the Contract. This Article does not exclude recovery of other damages specified in the Contract Documents.

ARTICLE 5. COMPONENT PARTS OF THE CONTRACT. The “Contract Documents” include the following, all of which are component parts of this Contract as if herein set out in full or attached hereto:

- Notice Inviting Bids
- Information For Bidders
- Bid Form
- Contractor’s Certificate Regarding Workers’ Compensation
- Bid Bond
- Designation of Subcontractors
- Information Required of Bidders
- Asbestos-Free Material Certification
- Drug-Free Workplace Certification
- Recycled Content Certification
- Public Works Contractor Registration Certification
- Non-Collusion Declaration
- Iran Contracting Act Certification
- Contract
- Performance Bond
- Payment Bond
- General Conditions
- Special Provisions (or Special Conditions)
- Technical Specifications
- Caltrans Standard Specifications
- Addenda
- Plans and Contract Drawings
- Approved and fully executed change orders
- Any other documents contained in or incorporated into the Contract

The Contractor shall complete the Work in strict accordance with all of the Contract Documents.

All of the Contract Documents are intended to be complementary. Work required by one of the

CONTRACT

Contract Documents and not by others shall be done as if required by all. This Contract shall supersede any prior agreement of the parties.

ARTICLE 6. PROVISIONS REQUIRED BY LAW. Each and every provision of law required to be included in these Contract Documents shall be deemed to be included in these Contract Documents, which shall be read and enforced as though it were included herein. The Contractor shall comply with all requirements of applicable federal, state and local laws, rules and regulations, including, but not limited to, the provisions of the California Labor Code and California Public Contract Code which are applicable to this Project.

ARTICLE 7. SUBSTITUTION OF SECURITIES. At the request and expense of the successful bidder, Colma will substitute securities for the amount so retained in accordance with Public Contract Code Section 22300.

ARTICLE 8. INDEMNIFICATION. The Contractor shall provide indemnification as set forth in the General Conditions.

ARTICLE 9. PREVAILING WAGES. The Contractor shall comply with the prevailing wage provisions of the California Labor Code and the prevailing wage rate determinations of the Department of Industrial Relations. These rates are on file at Colma offices or may be obtained online at <http://www.dir.ca.gov/dlsr>. A copy of these rates shall be posted at the job Site by the Contractor.

ARTICLE 10. RECORD AUDIT. In accordance with Government Code, Section 8546.7, records of both Colma and the Contractor shall be subject to examination and audit by the Auditor General for a period of three (3) years after final payment.

IN WITNESS WHEREOF, this Contract has been duly executed by the above-named parties, on the day and year above written.

TOWN OF COLMA

By:

Signature

Name

Title

Attest:

City Clerk

Recommended By:

Signature

Name

Title

[NAME OF CONTRACTOR]

By:

Signature

Name

Title

License Number

CONTRACT

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, _____ (hereinafter referred to as “City”) has awarded to _____, (hereinafter referred to as the “Contractor”) _____ an agreement for the Mass Grading and Site Improvements Package – Colma Town Hall and Addition (hereinafter referred to as the “Project”).

WHEREAS, the work to be performed by the Contractor is more particularly set forth in the Contract Documents for the Project dated _____, (hereinafter referred to as “Contract Documents”), the terms and conditions of which are expressly incorporated herein by reference; and

WHEREAS, the Contractor is required by said Contract Documents to perform the terms thereof and to furnish a bond for the faithful performance of said Contract Documents.

NOW, THEREFORE, we, _____, the undersigned Contractor and _____ as Surety, a corporation organized and duly authorized to transact business under the laws of the State of California, are held and firmly bound unto Colma in the sum of _____ DOLLARS, (\$_____), said sum being not less than one hundred percent (100%) of the total amount of the Contract, for which amount well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, if the Contractor, his or 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 Contract Documents and any alteration thereof made as therein provided, on its 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 faithfully fulfill all obligations including the one-year guarantee of all materials and workmanship; and shall indemnify and save harmless Colma, its officers and agents, as stipulated in said Contract Documents, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees including reasonable attorney’s fees, incurred by City in enforcing such obligation.

As a condition precedent to the satisfactory completion of the Contract Documents, unless otherwise provided for in the Contract Documents, the above obligation shall hold good for a period of one (1) year after the acceptance of the work by City, during which time if the Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect Colma from loss or damage resulting from or caused by defective materials or faulty workmanship. The obligations of Surety hereunder shall continue so long as any obligation of the Contractor remains. Nothing herein shall limit Colma’s rights or the Contractor or Surety’s

PERFORMANCE BOND

obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

Whenever the Contractor shall be, and is declared by Colma to be, in default under the Contract Documents, the Surety shall remedy the default pursuant to the Contract Documents, or shall promptly, at Colma's option:

- (1) Take over and complete the Project in accordance with all terms and conditions in the Contract Documents; or
- (2) Obtain a bid or bids for completing the Project in accordance with all terms and conditions in the Contract Documents and upon determination by Surety of the lowest responsive and responsible bidder, arrange for a Contract between such bidder, the Surety and Colma, and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to the Contractor by Colma under the Contract and any modification thereto, less any amount previously paid by Colma to the Contractor and any other set offs pursuant to the Contract Documents.
- (3) Permit Colma to complete the Project in any manner consistent with California law and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to the Contractor by Colma under the Contract and any modification thereto, less any amount previously paid by Colma to the Contractor and any other set offs pursuant to the Contract Documents.

Surety expressly agrees that Colma may reject any contractor or subcontractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Contractor.

Surety shall not utilize the Contractor in completing the Project nor shall Surety accept a bid from the Contractor for completion of the Project if Colma, when declaring the Contractor in default, notifies Surety of Colma's objection to the Contractor's further participation in the completion of the Project.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project to be performed thereunder shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project.

[Remainder of Page Left Intentionally Blank.]

PERFORMANCE BOND

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20__.

CONTRACTOR/PRINCIPAL

Name

By _____

SURETY:

By: _____
Attorney-In-Fact

The rate of premium on this bond is _____ per thousand. The total amount of premium charges, \$ _____.
(The above must be filled in by corporate attorney.)

THIS IS A REQUIRED FORM

Any claims under this bond may be addressed to:

(Name and Address of Surety)

(Name and Address of Agent or Representative for service of process in California, if different from above)

(Telephone number of Surety and Agent or Representative for service of process in California)

PERFORMANCE BOND

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF _____

On _____, 20____, before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

DESCRIPTION OF ATTACHED DOCUMENT

- Individual
- Corporate Officer

_____ Title(s)

_____ Title or Type of Document

- Partner(s) Limited
- General

_____ Number of Pages

- Attorney-In-Fact
- Trustee(s)
- Guardian/Conservator
- Other:

_____ Date of Document

Signer is representing:
Name Of Person(s) Or Entity(ies)

_____ Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for the Contractor/Principal.

PERFORMANCE BOND

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Mass Grading and Site Improvements Package – Colma Town Hall and Addition

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
 COUNTY OF _____

On _____, 20___, before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

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- General

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- Attorney-In-Fact
- Trustee(s)
- Guardian/Conservator
- Other:

_____ Date of Document

Signer is representing:
 Name Of Person(s) Or Entity(ies)

_____ Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for the Attorney-in-Fact. The Power-of-Attorney to local representatives of the bonding company must also be attached.

PERFORMANCE BOND

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS That

WHEREAS, the Town of Colma (hereinafter designated as the “City”), by action taken or a resolution passed _____, 20____ has awarded to _____ hereinafter designated as the “Principal,” a contract for the work described as follows: Mass Grading and Site Improvements Package – Colma Town Hall and Addition (the “Project”); and

WHEREAS, said Principal is required to furnish a bond in connection with said contract; providing that if said Principal or any of its Subcontractors shall fail to pay for any materials, provisions, provender, equipment, or other supplies used in, upon, for or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, or for amounts due under the Unemployment Insurance Code or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of said Principal and its Subcontractors with respect to such work or labor the Surety on this bond will pay for the same to the extent hereinafter set forth.

NOW THEREFORE, we, the Principal and _____ as Surety, are held and firmly bound unto Colma in the penal sum of _____ Dollars (\$_____) lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, his or its subcontractors, heirs, executors, administrators, successors or assigns, shall fail to pay any of the persons named in Section 9100 of the Civil Code, fail to pay for any materials, provisions or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department or Franchise Tax Board from the wages of employees of the contractor and his subcontractors pursuant to Section 18663 of the Revenue and Taxation Code, with respect to such work and labor the Surety or Sureties will pay for the same, in an amount not exceeding the sum herein above specified, and also, in case suit is brought upon this bond, all litigation expenses incurred by Colma in such suit, including reasonable attorneys’ fees, court costs, expert witness fees and investigation expenses.

This bond shall inure to the benefit of any of the persons named in Section 9100 of the Civil Code so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

It is further stipulated and agreed that the Surety on this bond shall not be exonerated or released from the obligation of this bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, specifications, or agreement pertaining or relating to any scheme or work of improvement herein above described, or pertaining or

PAYMENT BOND

relating to the furnishing of labor, materials, or equipment therefore, nor by any change or modification of any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement herein above described, nor by any rescission or attempted rescission or attempted rescission of the contract, agreement or bond, nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the bond and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given, and under no circumstances shall Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the owner or City and original contractor or on the part of any obligee named in such bond, but the sole conditions of recovery shall be that claimant is a person described in Section 9100 of the Civil Code, and has not been paid the full amount of his claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed unoriginal thereof, have been duly executed by the Principal and Surety above named, on the ____ day of _____ 20____ the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

(Corporate Seal of Principal,
if corporation)

Principal (Property Name of Contractor)

By _____
(Signature of Contractor)

(Seal of Surety)

Surety

By _____
Attorney in Fact

(Attached Attorney-In-Fact
Certificate and Required
Acknowledgements)

*Note: Appropriate Notarial Acknowledgments of Execution by Contractor and surety and a Power of Attorney MUST BE ATTACHED.

THIS IS A REQUIRED FORM.

PAYMENT BOND

Notary Acknowledgment

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
 COUNTY OF _____

On _____, 20___, before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

DESCRIPTION OF ATTACHED DOCUMENT

- Individual
- Corporate Officer

_____ Title(s)

_____ Title or Type of Document

- Partner(s) Limited
- General

_____ Number of Pages

- Attorney-In-Fact
- Trustee(s)
- Guardian/Conservator
- Other:

_____ Date of Document

Signer is representing:
 Name Of Person(s) Or Entity(ies)

_____ Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for the Contractor/Principal.

PAYMENT BOND

GENERAL CONDITIONS

ARTICLE 1. DEFINITIONS

- a. Acceptable, Acceptance or words of similar import shall be understood to be the acceptance of the Engineer and/or Colma .
- b. Act of God an Act of God is an earthquake of magnitude 3.5 on the Richter scale and tidal waves.
- c. Approval means written authorization by Engineer and/or City.
- d. Architect means the architect employed by Colma to provide architecture and related services for the Project.
- e. Construction Manager means the Construction Manager, if any, employed by Colma to provide construction management and related services for the Project.
- f. Contract or Contract Documents includes all documents as stated in the Contract.
- g. Day shall mean calendar day unless otherwise specifically designated.
- h. City and Contractor are those stated in the Contract. The terms City and Owner may be used interchangeably.
- i. City Representative shall mean the General Manager, or his or her designee, of the Department of the Director of Public Works for the Town of Colma, acting either directly or through properly authorized agents, such as agents acting within the scope of the particular duties entrusted to them. Also sometimes referred to as the “City’s Representative” or “Representative” in the Contract Documents.
- j. Equal, Equivalent, Satisfactory, Directed, Designated, Selected, As Required and similar words shall mean the written approval, selection, satisfaction, direction, or similar action of the Engineer and/or City.
- k. Indicated, Shown, Detailed, Noted, Scheduled or words of similar meaning shall mean that reference is made to the drawings, unless otherwise noted. It shall be understood that the direction, designation, selection, or similar import of the Engineer and/or City is intended, unless stated otherwise.
- l. Install means the complete installation of any item, equipment or material.
- m. Material shall include machinery, equipment, manufactured articles, or construction such as form work, fasteners, etc., and any other classes of material to be furnished in connection with the Contract. All materials shall be new unless specified otherwise.
- n. Perform shall mean that the Contractor, at Contractor’s expense, shall take all actions necessary to complete The Work, including furnishing of necessary labor, tools, and

GENERAL CONDITIONS

- equipment, and providing and installing Materials that are indicated, specified, or required to complete such performance.
- o. Project is The Work planned by City as provided in the Contract Documents.
 - p. Provide shall include provide complete in place, that is furnish, install, test and make ready for use.
 - q. Recyclable Waste Materials shall mean materials removed from the Project site which are required to be diverted to a recycling center rather than an area landfill. Recyclable Waste Materials include asphalt, concrete, brick, concrete block, and rock.
 - r. Required and words of similar meaning when used shall mean “as required to properly complete the work” as required by the Construction Manager, Architect and/or Colma, unless otherwise stated.
 - s. Specifications means that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the work. Work shall be done in accordance with the Caltrans Standard Specifications, including all current supplements, addenda, and revisions thereof. In the case of conflict between the Caltrans Standard Specifications and the Contract Documents, the Contract Documents shall prevail.
 - t. Site or Project Site shall mean the lands and facilities upon which The Work is to be performed, including such access to other lands and facilities designated in the Contract Documents.
 - u. Subcontractor as used herein, includes those having a direct contract with the Contractor and those who furnish materials worked to a special design according to plans, drawings, and specifications of this work, but does not include one who merely furnishes materials not so worked.
 - v. Surety is the person, firm, or corporation, admitted as a California admitted surety, that executes as surety the Contractor’s Performance Bond and Payment Bond for Public Works. Surety must be an admitted surety insurer pursuant to Code of Civil Procedure Section 995.120.
 - w. The Work or Work shall mean the entire improvement planned by Colma pursuant to the Contract Documents.
 - x. Work means labor, equipment and materials incorporated in, or to be incorporated in the construction covered by the Contract Documents.
 - y. Worker includes laborer, worker, or mechanic, and any supervisors thereto.

GENERAL CONDITIONS

ARTICLE 2. CONTRACT DOCUMENTS

- a. **Contract Documents.** The Contract Documents are complementary, and what is called for by one shall be as binding as if called for by all. The intention of the Contract Documents is to provide Colma with complete and fully operational facilities as indicated and specified, including all labor and materials, equipment and transportation necessary for the proper execution of the Work. Materials or work described in words which as applied have a well-known technical or trade meaning shall be deemed to refer to such recognized standards.
- b. **Interpretations.** The Contract Documents are intended to be fully cooperative and to be complementary. If the Contractor observes that any documents are in conflict, the Contractor shall promptly notify the Engineer in writing by submission of a Request For Information. The Request For Information procedure may not be used to request any changes which shall be adjusted as provided in the Contract Documents for changes in work. In case of conflicts between the Contract Documents, the order of precedence shall be as follows:
1. Change Orders or Work Change Directives
 2. Addenda
 3. Special Provisions (or Special Conditions)
 4. Scope of Work
 5. Contract
 6. General Conditions
 7. Information For Bidders
 8. Notice Inviting Bids
 9. Contractor's Bid Forms
 10. Caltrans Standard Specifications
 11. Standard Plans
 12. Reference Documents

With reference to the Drawings, the order of precedence shall be as follows:

1. Figures govern over scaled dimensions
 2. Detail drawings govern over general drawings
 3. Addenda or Change Order drawings govern over Contract Drawings
 4. Contract Drawings govern over Standard Drawings
 5. Contract Drawings govern over Shop Drawings
- c. **Conflicts in Contract Documents.** Notwithstanding the orders of precedence established above, in the event of conflicts, the higher standard shall always apply.
- d. **Compliance with Applicable Laws.** Drawings and specifications are intended to comply with all laws, ordinances, rules and regulations of authorities having jurisdiction, and where referred to in the Contract Documents, said laws, ordinances, rules and regulations shall be considered as part of said Contract Documents within the limits specified.

GENERAL CONDITIONS

- e. **Addenda and Deferred Approvals.** Addenda shall govern over all other Contract Documents. Subsequent addenda issued shall govern over prior addenda only to the extent specified.
- f. **Organization of Contract Documents.** Organization of the Contract Documents into divisions, sections, and articles, and arrangement of drawings shall not control the Contractor in dividing The Work among subcontractors or in establishing the extent of Work to be performed by any trade.

ARTICLE 3. CONTRACTS DOCUMENTS: COPIES & MAINTENANCE

The Contractor will be furnished, free of charge, at least one (1) copy of the Contract Documents. Additional copies may be obtained at cost of reproduction.

The Contractor shall maintain a clean, undamaged set of Contract Documents at the Project site.

ARTICLE 4. DETAIL DRAWINGS AND INSTRUCTIONS

- a. **Examination of Contract Documents.** Before commencing any portion of The Work, the Contractor shall again carefully examine all applicable Contract Documents, the Project site and other information given to the Contractor as to materials and methods of construction and other Project requirements. The Contractor shall immediately notify the Engineer of any potential error, inconsistency, ambiguity, conflict or lack of detail or explanation. If the Contractor performs, permits, or causes the performance of any Work which is in error, inconsistent or ambiguous, or not sufficiently detailed or explained, the Contractor shall bear any and all resulting costs, including, without limitation, the cost of correction. In no case shall the Contractor or any subcontractor proceed with Work if uncertain as to the applicable requirements.
- b. **Additional Instructions.** After notification of any error, inconsistency, ambiguity, conflict or lack of detail or explanation, the Engineer will provide any required additional instructions, by means of drawings or other written direction, necessary for proper execution of Work.
- c. **Quality of Parts, Construction and Finish.** All parts of The Work shall be of the best quality of their respective kinds and the Contractor must use all diligence to inform itself fully as to the required construction and finish. In no case shall the Contractor proceed with The Work without obtaining first from the Engineer such Approval may be necessary for the proper performance of Work.
- d. **Contractor's Variation from Contract Document Requirements.** If it is found that the Contractor has varied from the requirements of the Contract Documents including the requirement to comply with all applicable laws, ordinances, rules and regulations, the Engineer may at any time, before or after completion of the Work, order the improper Work removed, remade or replaced by the Contractor at the Contractor's expense.

GENERAL CONDITIONS

ARTICLE 5. EXISTENCE OF UTILITIES AT THE WORK SITE

- a. Colma has endeavored to determine the existence of utilities at the Project site from the records of the owners of known utilities in the vicinity of the Project. The positions of these utilities as derived from such records are shown on the Plans.
- b. No excavations were made to verify the locations shown for underground utilities. The service connections to these utilities are not shown on the plans. It shall be the responsibility of the Contractor to determine the exact location of all service connections. The Contractor shall make its own investigations, including exploratory excavations, to determine the locations and type of service connections, prior to commencing Work which could result in damage to such utilities. The Contractor shall immediately notify Colma in writing of any utility discovered in a different position than shown on the Plans or which is not shown on the Plans.
- c. All water meters, water valves, fire hydrants, electrical utility vaults, telephone vaults, gas utility valves, and other subsurface structures shall be relocated or adjusted to final grade by the Contractor. Locations of existing utilities shown on the Plans are approximate and may not be complete. The Contractor shall be responsible for coordinating its Work with all utility companies during the construction of The Work.
- d. Main or Trunkline Facilities
 - i. Notwithstanding the above, pursuant to Section 4215 of the Government Code, as it may be amended from time to time, Colma has the responsibility to identify, with reasonable accuracy, main or trunkline facilities on the plans and specifications. In the event that main or trunkline utility facilities are not identified with reasonable accuracy in the plans and specifications made a part of the invitation for bids, Colma shall assume the responsibility for their timely removal, relocation, or protection.
 - ii. The Contractor shall be compensated by Colma for the costs of locating and repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing, relocating, protecting or temporarily maintaining such main or trunkline utility facilities not indicated with reasonable accuracy in the plans and specifications, and for equipment in the Project necessarily idled during such work.
 - iii. Alternatively, Colma may make changes in the alignment and grade of the work to obviate the necessity to remove, relocate, or temporarily maintain the utility, or Colma may make arrangements with the owner of the utility for such work to be done at no cost to the Contractor.
 - iv. The Contractor shall not be assessed a forfeiture for delay in completion of the Project when such delay is caused by the failure of Colma or the owner of the utility to provide for the removal, relocation, protection or temporary maintenance of all such main or trunkline facilities not indicated with reasonable accuracy.

GENERAL CONDITIONS

- v. Nothing herein shall preclude Colma from pursuing any appropriate remedy against the utility for delays which are the responsibility of the utility.
 - vi. Nothing herein shall be construed to relieve the utility from any obligation as required either by law or by contract to pay the cost of removal or relocation of existing utility facilities.
 - vii. If the Contractor while performing the Contract discovers utility facilities not identified by Colma in the Contract plans or specifications, he shall immediately notify Colma and utility in writing.
 - viii. The owner of the public utility shall have the sole discretion to perform repairs or relocation work or hire the Contractor to do such repairs or relocation work at a reasonable price.
- e. Other Utilities. In case it should be necessary to remove, relocated, or temporarily maintain a utility because of interference with The Work, the work on the utility shall be performed and paid for as follows:
- i. When it is necessary to remove, relocate or temporarily maintain a service connection, the cost of which is not required to be borne by the owner thereof, the Contractor shall bear all expenses incidental to the work on the service connection. The work on the service connection shall be done in a manner satisfactory to the owner thereof; it being understood that the owner of the service connection has the option of doing such work with his own forces or permitting the work to be done by the Contractor.
 - ii. When it is necessary to remove, relocate, or temporarily maintain a utility which is in the position shown on the plans, the cost of which is not required to be borne by the owner thereof, the Contractor shall bear all expenses incidental to the work on the utility. The work on the utility shall be done in a manner satisfactory to the owner thereof; it being understood that the owner of the utility has the option of doing such work with his own forces or permitting the work to be done by the Contractor.
 - iii. When it is necessary to remove, relocate, or temporarily maintain a utility which is not shown on the plans or is in a position different from that shown on the plans and were it in the position shown on the plans would not need to be removed, relocated, or temporarily maintained, and the cost of which is not required to be borne by the owner thereof, Colma will make arrangements with the owner of the utility for such work to be done at no cost to the Contractor, or will require the Contractor to do such work in accordance with the provisions herein or will make changes in the alignment and grade of the work to obviate the necessity to remove, relocate, or temporarily maintain the utility. Changes in alignment and grade will be ordered in accordance with the provisions herein.

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- iv. No representations are made that the obligations to move or temporarily maintain any utility and to pay the cost thereof is or is not required to be borne by the owner of such utility, and it shall be the responsibility of the Contractor to investigate to find out whether or not said cost is required to be borne by the owner of the utility.

The right is reserved to governmental agencies and to owners of utilities to enter at any time upon any street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the work and for the purpose of maintaining and making repairs to their property.

ARTICLE 6. PROJECT SCHEDULE

- a. **Estimated Schedule.** Within ten (10) days after the issuance of the Notice To Proceed, the Contractor shall prepare a Project schedule and shall submit this to the Engineer for Approval. The receipt or Approval of any schedules by the Engineer or Colma shall not in any way relieve the Contractor of its obligations under the Contract Documents. The Contractor is fully responsible to determine and provide for any and all staffing and resources at levels which allow for good quality and timely completion of the Project. The Contractor's failure to incorporate all elements of Work required for the performance of the Contract or any inaccuracy in the schedule shall not excuse the Contractor from performing all Work required for a completed Project within the specified Contract time period. If the required schedule is not received by the time the first payment under the Contract is due, the Contractor shall not be paid until the schedule is received, reviewed and accepted by the Engineer.
- b. **Schedule Contents.** The schedule shall allow enough time for normal inclement weather, based on the total time period during which The Work will be ongoing and local climatological averages for the Project Site during that entire time period. Colma may specify in the Special Conditions the minimum number of inclement weather days which must be included in the Project schedule. The schedule shall indicate the beginning and completion dates of all phases of construction; critical path for all critical, sequential time related activities; and "float time" for all "slack" or "gaps" in the non-critical activities. The schedule shall clearly identify all staffing and other resources which in the Contractor's judgment are needed to complete the Project within the time specified for completion. Schedule duration shall match the Contract time. If the Work fails to meet the milestones stated in the Schedule, at any time, the Contractor shall submit to Colma within forty-eight (48) hours, an explanation in writing as to why the Schedule is not being maintained as well as a recovery schedule indicating how the Contractor will make up the delay and get the Project back on Schedule. Schedules indicating early completion will be rejected.
- c. **Schedule Updates.** The Contractor shall continuously update its construction schedule. The Contractor shall submit an updated and accurate construction schedule to the Engineer whenever requested to do so by Engineer and with each progress payment request. The Engineer may withhold progress payments or other amounts due under the

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Contract Documents if the Contractor fails to submit an updated and accurate construction schedule (including failure to provide a recovery schedule when required).

ARTICLE 7. SUBSTITUTIONS

- a. Pursuant to Public Contract Code Section 3400(b) Colma may make a finding that is described in the invitation for bids that designates certain products, things, or services by specific brand or trade name.
- b. Unless specifically designated in the Contract Documents, whenever any material, process, or article is indicated or specified by grade, patent, or proprietary name or by name of manufacturer, such Specifications shall be deemed to be used for the purpose of facilitating the description of the material, process or article desired and shall be deemed to be followed by the words “or equal.” The Contractor may, unless otherwise stated, offer for substitution any material, process or article which shall be substantially equal or better in every respect to that so indicated or specified in the Contract Documents. However, Colma may have adopted certain uniform standards for certain materials, processes and articles.
- c. Unless otherwise specified in the Special Conditions, the Contractor shall submit requests, together with substantiating data, for substitution of any “or equal” material, process or article no later than thirty-five (35) days after award of the Contract. To facilitate the construction schedule and sequencing, some requests may need to be submitted before thirty-five (35) days after award of Contract. Provisions regarding submission of “or equal” requests shall not in any way authorize an extension of time for performance of this Contract. If a proposed “or equal” substitution request is rejected, the Contractor shall be responsible for providing the specified material, process or article. The burden of proof as to the equality of any material, process or article shall rest with the Contractor. Colma has the complete and sole discretion to determine if a material, process or article is an “or equal” material, process or article that may be substituted.
- d. Data required to substantiate requests for substitutions of an “or equal” material, process or article data shall include a signed affidavit from the Contractor stating that, and describing how, the substituted “or equal” material, process or article is equivalent to that specified in every way except as listed on the affidavit. Substantiating data shall include any and all illustrations, specifications, and other relevant data including catalog information which describes the requested substituted “or equal” material, process or article, and substantiates that it is an “or equal” to the material, process or article. The substantiating data must also include information regarding the durability and lifecycle cost of the requested substituted “or equal” material, process or article. Failure to submit all the required substantiating data, including the signed affidavit, to Colma in a timely fashion will result in the rejection of the proposed substitution.
- e. The Contractor shall bear all of Colma’s costs associated with the review of substitution requests.

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- f. The Contractor shall be responsible for all costs related to a substituted “or equal” material, process or article.
- g. The Contractor is directed to the Special Conditions (if any) to review any findings made pursuant to Public Contract Code section 3400.

ARTICLE 8. SHOP DRAWINGS

- a. The Contractor shall check and verify all field measurements and shall submit with such promptness as to provide adequate time for review and cause no delay in his own Work or in that of any other contractor, subcontractor, or worker on the Project, six (6) copies of all shop or setting drawings, calculations, schedules, and materials list, and all other provisions required by the Contract. The Contractor shall sign all submittals affirming that submittals have been reviewed and approved by the Contractor prior to submission to Engineer. Each signed submittal shall affirm that the submittal meets all the requirements of the Contract Documents except as specifically and clearly noted and listed on the cover sheet of the submittal.
- b. The Contractor shall make any corrections required by the Engineer, and file with the Engineer six (6) corrected copies each, and furnish such other copies as may be needed for completion of the Work. Engineer’s approval of shop drawings shall not relieve the Contractor from responsibility for deviations from the Contract Documents unless the Contractor has, in writing, called Engineer’s attention to such deviations at time of submission and has secured the Engineer’s written Approval. Engineer’s Approval of shop drawings shall not relieve the Contractor from responsibility for errors in shop drawings.

ARTICLE 9. SUBMITTALS

- a. The Contractor shall furnish to the Engineer for approval, prior to purchasing or commencing any Work, a log of all samples, material lists and certifications, mix designs, schedules, and other submittals, as required in the specifications. The log shall indicate whether samples will be provided in accordance with other provisions of this Contract.
- b. The Contractor will provide samples and submittals, together with catalogs and supporting data required by the Engineer, to the Engineer within a reasonable time period to provide for adequate review and avoid delays in the Work.
- c. These requirements shall not authorize any extension of time for performance of this Contract. The Engineer will check and approve such samples, but only for conformance with design concept of work and for compliance with information given in the Contract Documents. The Work shall be in accordance with approved samples and submittals.
- d. If Colma’s response results in a change in the Project, then such change shall be effected by a written change order.

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ARTICLE 10. MATERIALS

- a. Except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, lights, power, transportation, superintendence, temporary constructions of every nature, and all other services and facilities of every nature whatsoever necessary to execute and complete this Contract within specified time.
- b. Unless otherwise specified, all materials shall be new and the best of their respective kinds and grades as noted and/or specified, and workmanship shall be of good quality.
- c. Materials shall be furnished in ample quantities and at such times as to ensure uninterrupted progress of The Work and shall be stored properly and protected as required by the Contract Documents. The Contractor shall be entirely responsible for damage or loss by weather or other causes to materials or Work.
- d. No materials, supplies, or equipment for Work under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. The Contractor warrants good title to all material, supplies, and equipment installed or incorporated in the work and agrees upon completion of all work to deliver the Project, to Colma free from any claims, liens, or charges.
- e. Materials shall be stored on the Project Site in such manner so as not to interfere with any operations of Colma or any other third party or any other contractor performing work at the Site. On-Site storage space is limited. The Contractor shall coordinate all material deliveries with Colma's Representative prior to delivery. Deliveries shall coincide closely with installation dates.
- f. Storage requirements must be reviewed and approved by Colma's Representative. Materials may be stored only in those areas designated as storage areas by Colma's Representative. Material stored on-Site without the approval of Colma's Representative, or stored outside of designated areas, will be removed from Site and warehoused at the Contractor's expense. The Contractor shall obtain a Professional Engineer's approval for loading limitations of stored material as required. The Contractor will cooperate and move materials as may be required by Colma's Representative, at no additional cost.
- g. The Contractor shall maintain its storage area and shall keep its storage areas clean, safe and secure. All materials will be palletized and/or stored upon appropriate dunnage. Notwithstanding the assignment provisions of the Contract Documents, Colma shall procure Builder's Risk insurance for the Project.
- h. The Contractor shall be responsible for providing off-Site storage facilities for its own materials at its cost. The storage of materials and equipment at the Site shall be permitted only to the extent approved in advance by Colma's Representative. Colma's Representative shall approve location of the Contractor's items of plant and tools such as hoists, mixers, cutters, etc. in advance.

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- i. The Contractor shall schedule all major deliveries through Colma's Representative or such deliveries may be turned away from the Site. Deliveries must be made during normal working hours, _____ a.m. to _____ p.m., Monday through Friday. Colma's Representative will not accept or unload any deliveries for the Contractor. The Contractor shall provide Colma's Representative with a minimum of forty eight (48) hours' notice of major deliveries to Project Site. The Contractor shall be responsible for any and all costs resulting from deliveries made, or attempted to be made, during non-working or overtime hours.
- j. **Recyclable Waste Materials.** As required by applicable local waste reduction and recycling requirements, the Contractor shall divert all Recyclable Waste Materials to appropriate recycling centers. The Contractor will be required to submit weight tickets and written proof of diversion with its monthly progress payment requests. The Contractor shall complete and execute any certification forms required by Colma or other applicable agencies to document the Contractor's compliance with these diversion requirements. All costs incurred for these waste diversion efforts shall be the responsibility of the Contractor. The Contractor shall make reasonable efforts to identify other waste materials which are recyclable or saleable but which are not subject to mandatory diversion prior to disposal, recycling, sale or other disposition, shall communicate the value thereof to Colma's Representative and request Colma's instruction regarding disposition. In the event the Contractor receives any income from the sale or recycling of such waste materials, Colma may deduct payment in the actual amount of income from contract payments.

ARTICLE 11. CONTRACTOR'S SUPERVISION

The Contractor shall continuously keep at the Project site, a competent and experienced full-time Project superintendent approved by Colma. Superintendent must be able to proficiently speak, read and write in English and shall be onsite whenever workers are present. The Project superintendent shall represent the Contractor in the Contractor's absence and all directions given to the Project superintendent shall be as binding as if given to the Contractor. The Contractor shall continuously provide efficient supervision of the Project.

ARTICLE 12. WORKERS

- a. The Contractor shall at all times enforce strict discipline and good order among its employees. The Contractor shall not employ on the Project any unfit person or any one not skilled in the Work assigned to him or her.
- b. Any person in the employ of the Contractor whom Colma may deem incompetent or unfit shall be dismissed from The Work and shall not be employed on this Project except with the written Approval of Colma.

ARTICLE 13. CONTRACT SECURITY

Unless otherwise specified in Special Conditions, the Contractor shall furnish a surety bond in an amount equal to one hundred percent (100%) of the Contract Price as security

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for faithful performance of this Contract and shall furnish a separate bond in an amount at least equal to one hundred percent (100%) of the Contract Price as security for payment of persons performing labor and furnishing materials in connection with this Contract. Both the Payment and Performance Bonds must be executed by an admitted Surety, as defined in California Code of Civil Procedure Section 995.120. The Payment and Performance Bonds must be accompanied by the original or a certified copy of the unrevoked power of attorney or other appropriate instrument entitling or authorizing the person who executed the bond to do so. In addition, to the extent required by law, the Payment and Performance Bonds must be accompanied by a certified copy of the certificate of authority of the insurer issued by the Insurance Commissioner of the State of California, a certificate from the Clerk of the County of San Mateo that the certificate of authority of the insurer has not been surrendered, revoked, cancelled, annulled, or suspended, or if it has that it has been renewed, and four copies of the insurer's most recent annual statement and quarterly statement filed with the Department of Insurance of the State of California. Aforesaid bonds shall be in form set forth in these Contract Documents. Upon request of the Contractor, Colma will consider and accepting multiple sureties on such bonds.

ARTICLE 14. SUBCONTRACTORS

- a. The Contractor agrees to bind every subcontractor to the terms of the Contract Documents as far as such terms are applicable to subcontractor's portion of The Work. The Contractor shall be as fully responsible to Colma for the acts and omissions of its subcontractors and of persons either directly or indirectly employed by its subcontractors, as the Contractor is for acts and omissions of persons directly employed by the Contractor. Nothing contained in these Contract Documents shall create any contractual relationship between any subcontractor and Colma. Colma shall be deemed to be the third party beneficiary of the contract between the Contractor and the subcontractor.
- b. Colma reserves the right to Approve all subcontractors. Colma's Approval of any subcontractor under this Contract shall not in any way relieve the Contractor of its obligations in the Contract Documents.
- c. Substitution or addition of subcontractors shall be permitted only as authorized by the Subletting and Subcontracting Fair Practices Act pursuant to California Public Contract Code section 4100 et seq.
- d. Pursuant to Labor Code sections 1725.5 and 1771.1, all subcontractors, of any tier, that perform public work must be registered with the Department of Industrial Relations ("DIR"). The Contractor shall be required to ensure compliance with the DIR by all of its subcontractors of all tiers. The Contractor shall keep and maintain records documenting the DIR registration information for all such subcontractors and shall make such information available to Colma upon request.

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ARTICLE 15. PERMITS AND LICENSES

Permits and licenses necessary for prosecution of The Work shall be secured and paid for by the Contractor, unless otherwise specified in the Contract Documents.

- a. The Contractor shall obtain and pay for all other permits and licenses required for The Work, including excavation permit and for plumbing, mechanical and electrical work and for operations in or over public streets or right of way under jurisdiction of public agencies other than Colma, all applicable environmental permits, approvals, and certifications including but not limited to certifications required by the United States Environmental Protection Agency's Lead Renovation, Repair, and Painting rule set forth at Title 40, Part 745 of the Code of Federal Regulations.
- b. The Contractor shall arrange and pay for all off-site inspection of the Work related to permits and licenses, including certification, required by the specifications, drawings, or by governing authorities, except for such off-site inspections delineated as Colma's responsibility pursuant to the Contract Documents.
- c. Before Acceptance of the Project, the Contractor shall submit all licenses, permits, certificates of inspection and required approvals to Colma.

ARTICLE 16. UTILITY USAGE

- a. All temporary utilities, including but not limited to electricity, water, gas, and telephone, used on the Work shall be furnished and paid for by the Contractor. The Contractor shall Provide necessary temporary distribution systems, including meters, if necessary, from distribution points to points on The Work where the utility is needed. Upon completion of The Work, the Contractor shall remove all temporary distribution systems.
- b. The Contractor shall provide necessary and adequate utilities and pay all costs for water, electricity, gas, oil, and sewer charges required for completion of the Project.
- c. All permanent meters Installed shall be listed in the Contractor's name until Project Acceptance.
- d. If the Contract is for construction in existing facilities, the Contractor may, with prior written Approval of Colma, use Colma's existing utilities by compensating Colma for utilities used by the Contractor.
- e. Refer to Specification Section 01500 Construction Facilities and Temporary Controls of the Contract Documents for further information.

ARTICLE 17. INSPECTION FEES FOR PERMANENT UTILITIES

All inspection fees and other municipal charges for permanent utilities including, but not limited to, sewer, electrical, phone, gas, water, and irrigation shall be paid for by Colma. The Contractor shall be responsible for arranging the payment of such fees, but inspection fees and other municipal fees relating to permanent utilities shall be paid by Colma. The Contractor may either

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request reimbursement from Colma for such fees, or shall be responsible for arranging and coordination with City for the payment of such fees.

ARTICLE 18. TRENCHES

- a. Trenches Five Feet or More in Depth. The Contractor shall submit to Colma, in advance of excavation, 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 during the excavation of any trench or trenches five feet or more in depth. If the plan varies from shoring system standards, the plan shall be prepared by a registered civil or structural engineer. The plan shall not be less effective than the shoring, bracing, sloping, or other provisions of the Construction Safety Orders, as defined in the California Code of Regulations.
- b. Excavations Deeper than Four Feet. If work under this Contract involves digging trenches or other excavation that extends deeper than four feet below the surface, the Contractor shall promptly, and before the following conditions are disturbed, notify Colma, in writing, of any:
 - 1) Material that the 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 differing from those indicated.
 - 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.

Colma shall promptly investigate the conditions, and if it finds that the conditions do so materially differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of The Work, shall issue a change order under the procedures described in the Contract Documents.

In the event that a dispute arises between Colma and the Contractor as to whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of The Work, the 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. The 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 parties.

ARTICLE 19. DIVERSION OF RECYCLABLE WASTE MATERIALS

In compliance with the applicable Colma's waste reduction and recycling efforts, the Contractor shall divert all Recyclable Waste Materials to appropriate recycling centers. The Contractor will be required to submit weight tickets and written proof of diversion with its monthly progress

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payment requests. The Contractor shall complete and execute any certification forms required by Colma or other applicable agencies to document the Contractor's compliance with these diversion requirements. All costs incurred for these waste diversion efforts shall be the responsibility of the Contractor.

ARTICLE 20. REMOVAL OF HAZARDOUS MATERIALS

Should the Contractor encounter material reasonably believed to be polychlorinated biphenyl (PCB) or other toxic wastes and hazardous materials which have not been rendered harmless at the Project site, the Contractor shall immediately stop work at the affected Project site and shall report the condition to Colma in writing. Colma shall contract for any services required to directly remove and/or abate PCBs and other toxic wastes and hazardous materials, if required by the Project site(s), and shall not require the Contractor to subcontract for such services. The Work in the affected area shall not thereafter be resumed except by written agreement of Colma and the Contractor.

ARTICLE 21. SANITARY FACILITIES

The Contractor shall provide sanitary temporary toilet buildings for the use of all workers. All toilets shall comply with local codes and ordinances. Toilets shall be kept supplied with toilet paper, hand sanitizers, and shall have workable door fasteners. Toilets shall be serviced no less than once weekly and shall be present in a quantity of not less than 1 per 20 workers as required by CAL-OSHA regulation. The toilets shall be maintained in a sanitary condition at all times. Use of toilet facilities in The Work under construction shall not be permitted. Any other Sanitary Facilities required by CAL-OSHA shall be the responsibility of the Contractor.

ARTICLE 22. AIR POLLUTION CONTROL

The Contractor shall comply with all air pollution control rules, regulations, ordinances and statutes. All containers of paint, thinner, curing compound, solvent or liquid asphalt shall be labeled to indicate that the contents fully comply with the applicable material requirements.

ARTICLE 23. COMPLIANCE WITH STATE STORM WATER PERMIT

- a. The Contractor shall be required to comply with all aspects of the State Water Resources Control Board (State Water Board) Water Quality Order No. 2009-0009-DWQ, as amended, National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity (Permit) for all projects that involve construction on or disturbance of one acre or more of land or which are part of a larger common area of development.
- b. The Contractor shall be responsible for filing the Notice of Intent (NOI) and for obtaining coverage under the Permit. This includes preparing and implementing a Storm Water Pollution Prevention Plan (SWPPP) for the Project site. Before any NOI, SWPPP, or other Permit related document may be submitted to the State Water Board or implemented on the Project site it must first be reviewed and approved by Colma. The

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Contractor shall include all costs of compliance with specified requirements in the Contract amount.

- c. Colma retains the right to procure coverage under the Permit for the Project site if the Contractor fails to draft a satisfactory NOI or SWPPP or proceed in a manner that is satisfactory to Colma. Any costs incurred by Colma in procuring coverage under the Permit, or drafting an NOI or SWPPP shall be paid by the Contractor.
- d. The Contractor shall be responsible for maintaining compliance with all aspects of the Permit during the course of the Project. The Contractor shall provide copies of all reports and monitoring information to Colma's Representative. If the Contractor has failed or is unable to maintain compliance with the Permit, Colma reserves the right to implement its own SWPPP at the Project site, and hire additional contractors to maintain compliance. Whether the Contractor has adequately maintained compliance with the Permit shall be Colma's sole determination. Any costs incurred by Colma in drafting and implementing a SWPPP, or otherwise maintaining compliance with the Construction General Permit shall be paid by the Contractor.
- e. In bidding on this Contract, it shall be the Contractor's responsibility to evaluate and include in the contract amount the cost of procuring coverage under the Permit, preparing a SWPPP that is acceptable to Colma, and complying with the SWPPP and any revisions to the SWPPP that become necessary during the course of construction.
- f. In addition to compliance with the Permit, the Contractor shall comply with the lawful requirements of any applicable municipality, Colma, drainage district, and other local agencies regarding discharges of storm water to the storm drain system or other watercourses under their jurisdiction, including applicable requirements in municipal storm water management programs.
- g. Storm, surface, nuisance, or other waters may be encountered at various times during construction of the Work. The Contractor, by submitting a bid, hereby acknowledges that it has investigated the risk arising from such waters, has prepared its bid accordingly, and assumes any and all risks and liabilities arising therefrom.
- h. Failure to comply with the Permit is a violation of federal and state law. The Contractor hereby agrees to indemnify and hold harmless Colma, its officials, officers, agents, employees and authorized volunteers from and against any and all claims, demands, losses or liabilities of any kind or nature which Colma, its officials, officers, agents, employees and authorized volunteers may sustain or incur for noncompliance with the Permit arising out of or in connection with the Project, except for liability resulting from the sole established negligence, willful misconduct or active negligence of Colma, its officials, officers, agents, employees or authorized volunteers. Colma may seek damages from the Contractor for delay in completing the Contract in accordance with the Contract Documents, caused by the Contractor's failure to comply with the Permit.

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ARTICLE 24. CLEANING UP

- a. The Contractor at all times shall keep premises free from debris such as waste, rubbish, and excess materials and equipment. The Contractor shall not store debris under, in, or about the premises. Upon completion of the Work, the Contractor shall clean the interior and exterior of the building or improvement including fixtures, equipment, walls, floors, ceilings, roofs, window sills and ledges, horizontal projections, and any areas where debris has collected so surfaces are free from foreign material or discoloration. The Contractor shall clean and polish all glass, plumbing fixtures, and finish hardware and similar finish surfaces and equipment and the Contractor shall also remove temporary fencing, barricades, planking and construction toilet and similar temporary facilities from site. The Contractor shall also clean all buildings, asphalt and concrete areas to the degree necessary to remove oil, grease, fuel, or other stains caused by the Contractor operations or equipment.
- b. The Contractor shall fully clean up the site at the completion of the Work. If the Contractor fails to immediately clean up at the completion of the Work, Colma may do so and the cost of such clean up shall be charged back to the Contractor.

ARTICLE 25. LAYOUT AND FIELD ENGINEERING

All field engineering required for laying out The Work and establishing grades for earthwork operations shall be furnished by the Contractor at its expense. Layout shall be done by a registered civil engineer Approved by the Engineer. Any required “as-built” drawings of the Work shall be prepared by the registered civil engineer.

ARTICLE 26. EXCESSIVE NOISE

- a. The Contractor shall use only such equipment on the work and in such state of repair so that the emission of sound therefrom is within the noise tolerance level of that equipment as established by CAL-OSHA.
- b. The Contractor shall comply with the most restrictive of the following: (1) local sound control and noise level rules, regulations and ordinances and (2) the requirements contained in these Contract Documents, including hours of operation requirements. No internal combustion engine shall be operated on the Project without a muffler of the type recommended by the manufacturer. Should any muffler or other control device sustain damage or be determined to be ineffective or defective, the Contractor shall promptly remove the equipment and shall not return said equipment to the job until the device is repaired or replaced. Said noise and vibration level requirements shall apply to all equipment on the job or related to the job, including but not limited to, trucks, transit mixers or transit equipment that may or may not be owned by the Contractor.

ARTICLE 27. TESTS AND INSPECTIONS

- a. If the Contract Documents, the Engineer, or any instructions, laws, ordinances, or public authority require any part of The Work to be tested or Approved, the Contractor shall

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provide the Engineer at least two (2) working days' notice of its readiness for observation or inspection. If inspection is by a public authority other than Colma, the Contractor shall promptly inform Colma of the date fixed for such inspection. Required certificates of inspection (or similar) shall be secured by the Contractor. Costs for Colma testing and Colma inspection shall be paid by Colma. Costs of tests for the Work found not to be in compliance shall be paid by the Contractor.

- b. If any Work is done or covered up without the required testing or approval, the Contractor shall uncover or deconstruct the Work, and the Work shall be redone after completion of the testing at the Contractor's cost in compliance with the Contract Documents.
- c. Where inspection and testing are to be conducted by an independent laboratory or agency, materials or samples of materials to be inspected or tested shall be selected by such laboratory or agency, or by Colma, and not by the Contractor. All tests or inspections of materials shall be made in accordance with the commonly recognized standards of national organizations.
- d. In advance of manufacture of materials to be supplied by the Contractor which must be tested or inspected, the Contractor shall notify Colma so that Colma may arrange for testing at the source of supply. Any materials which have not satisfactorily passed such testing and inspection shall not be incorporated into the Work.
- e. If the manufacture of materials to be inspected or tested will occur in a plant or location outside the geographic limits of Colma, the Contractor shall pay for any excessive or unusual costs associated with such testing or inspection, including but not limited to excessive travel time, standby time and required lodging.
- f. Reexamination of Work may be ordered by Colma. If so ordered, the Work must be uncovered or deconstructed by the Contractor. If the Work is found to be in accordance with the Contract Documents, Colma shall pay the costs of reexamination and reconstruction. If such work is found not to be in accordance with the Contract Documents, the Contractor shall pay all costs.

ARTICLE 28. PROTECTION OF WORK AND PROPERTY

- a. The Contractor shall be responsible for all damages to persons or property that occur as a result of The Work. The Contractor shall be responsible for the proper care and protection of all materials delivered and Work performed until completion and final Acceptance by Colma. All Work shall be solely at the Contractor's risk. The Contractor shall adequately protect adjacent property from settlement or loss of lateral support as necessary. The Contractor shall comply with all applicable safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the Project site where the Work is being performed. The Contractor shall erect and properly maintain at all times, as required by field conditions and progress of work, all necessary safeguards, signs, barriers, lights, and watchmen for protection of workers and the public, and shall post danger signs warning against hazards created in the course of construction.

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- b. In an emergency affecting safety of life or of work or of adjoining property, the Contractor, without special instruction or authorization from the Engineer, is hereby permitted to act to prevent such threatened loss or injury; and the Contractor shall so act, without appeal, if so authorized or instructed by the Engineer or Colma. Any compensation claimed by the Contractor on account of emergency work shall be determined by and agreed upon by Colma and the Contractor.
- c. The Contractor shall provide such heat, covering, and enclosures as are necessary to protect all Work, materials, equipment, appliances, and tools against damage by weather conditions.
- d. The Contractor shall take adequate precautions to protect existing sidewalks, curbs, pavements, utilities, and other adjoining property and structures, and to avoid damage thereto, and the Contractor shall repair any damage thereto caused by the Work operations. The Contractor shall:
 - 1) Enclose the working area with a substantial barricade, and arrange work to cause minimum amount of inconvenience and danger to the public.
 - 2) Provide substantial barricades around any shrubs or trees indicated to be preserved.
 - 3) Deliver materials to the Project site over a route designated by the Engineer.
 - 4) Provide any and all dust control required and follow the Applicable air quality regulations as appropriate. If the Contractor does not comply, Colma shall have the immediate authority to provide dust control and deduct the cost from payments to the Contractor.
 - 5) Confine the Contractor's apparatus, the storage of materials, and the operations of its workers to limits required by law, ordinances, permits, or directions of the Engineer. The Contractor shall not unreasonably encumber the Project site with its materials.
 - 6) Take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed by accident, they shall be replaced by an approved civil engineer or land surveyor, at no cost to Colma.
 - 7) Ensure that existing facilities, fences and other structures are all adequately protected and that, upon completion of all Work, all facilities that may have been damaged are restored to a condition acceptable to Colma.
 - 8) Preserve and protect from injury all buildings, pole lines and all direction, warning and mileage signs that have been placed within the right-of-way.
 - 9) At the completion of work each day, leave the Project site in a clean, safe condition.

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- 10) Comply with any stage construction and traffic handling plans. Access to residences and businesses shall be maintained at all times.

These precautionary measures will apply continuously and not be limited to normal working hours. Full compensation for the Work involved in the preservation of life, safety and property as above specified shall be considered as included in the prices paid for the various contract items of Work, and no additional allowance will be made therefor.

- e. Should damage to persons or property occur as a result of The Work, the Contractor shall be responsible for proper investigation, documentation, including video or photography, to adequately memorialize and make a record of what transpired. Colma shall be entitled to inspect and copy any such documentation, video, or photographs.

ARTICLE 29. CONTRACTORS MEANS AND METHODS

The Contractor is solely responsible for the means and methods utilized to perform the Work. In no case shall the Contractor's means and methods deviate from commonly used industry standards.

ARTICLE 30. AUTHORIZED REPRESENTATIVES

Colma shall designate representatives, who shall have the right to be present at the Project site at all times. Colma may designate an inspector who shall have the right to observe all of the Contractor's Work. The inspector is not authorized to make changes in the Contract Documents. The inspector shall not be responsible for the Contractor's failure to carry out The Work in accordance with the Contract Documents. The Contractor shall provide safe and proper facilities for such access.

ARTICLE 31. PROHIBITION ON HARASSMENT

Colma is committed to providing a campus and workplace free of sexual harassment and harassment based on factors such as race, color, religion, national origin, ancestry, age, medical condition, marital status, disability or veteran status. Harassment includes without limitation, verbal, physical or visual conduct which creates an intimidating, offensive or hostile environment such as racial slurs, ethnic jokes, posting of offensive statements, posters or cartoons or similar conduct.

The Contractor shall adopt and implement all appropriate and necessary policies prohibiting any form of discrimination in the workplace, including without limitation harassment on the basis of any classification protected under local, state or federal law, regulation or policy. The Contractor shall take all reasonable steps to prevent harassment from occurring, including without limitation affirmatively raising the subject of harassment among its employees, expressing strong disapproval of any form of harassment, developing appropriate sanctions, informing employees of their right to raise and how to raise the issue of harassment and informing complainants of the outcome of an investigation into a harassment claim. The

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Contractor shall require that any subcontractor performing any portion of the work on the Project to adopt and implement policies in conformity with this Article.

The Contractor shall not permit any person, whether employed by the Contractor, a subcontractor, sub-subcontractor, or any other person or entity, performing any work on the Project at or about the Site to engage in any prohibited form of harassment. Any such person engaging in a prohibited form of harassment directed to any individual performing or providing any portion of the Work at or about the Site shall be subject to appropriate sanctions in accordance with the Contractor's anti-harassment policy adopted and implemented pursuant to this Article. Any person performing or providing work on the Project on or about the Site who engages in a prohibited form of harassment directed to any student, faculty member or staff of Colma or directed to any other person on or about the Site shall be subject to immediate removal and shall be prohibited thereafter from providing or performing any portion of the Work on the Project.

ARTICLE 32. HOURS OF WORK

- a. Eight (8) hours of work shall constitute a legal day's work. The Contractor and each subcontractor shall forfeit, as penalty to Colma, twenty-five dollars (\$25) for each worker employed in the execution of Work by the Contractor or any subcontractor for each day during which such worker is required or permitted to work more than eight (8) hours in any one day and forty (40) hours in any week in violation of the provisions of the Labor Code, and in particular, Section 1810 to Section 1815, except that work may be performed by employees of the Contractor and his subcontractors in excess of eight hours per day at not less than one and one-half times the basic rate of pay, as provided in Labor Code Section 1815.
- b. Work shall be accomplished on a regularly scheduled eleven (11) hour per day work shift basis, Monday through Friday, between the hours of 7 a.m. and 6 p.m., unless specifically approved in writing Colma's Representative.
- c. It shall be unlawful for any person to operate, permit, use, or cause to operate any of the following at the Project site, other than between the hours of 8 a.m. to 5 p.m., Monday through Friday, with no Work allowed on City-observed holidays, unless otherwise specifically approved in writing by Colma's Representative:
 - 1) Powered Vehicles
 - 2) Construction Equipment
 - 3) Loading and Unloading Vehicles
 - 4) Domestic Power Tool.

ARTICLE 33. PAYROLL RECORDS

- a. Pursuant to Labor Code Section 1776, the Contractor and each subcontractor shall maintain weekly certified payroll records showing the name, address, social security

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number, work classification, straight time and overtime hours paid each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed in connection with the work. The Contractor shall certify under penalty of perjury that records maintained and submitted by the Contractor are true and accurate. The Contractor shall also require subcontractor(s) to certify weekly payroll records under penalty of perjury.

- b. In accordance with Labor Code section 1771.4, the Contractor and each subcontractor shall furnish the certified payroll records directly to the Department of Industrial Relations (“DIR”) on a weekly basis and in the format prescribed by the DIR, which may include electronic submission. The Contractor shall comply with all requirements and regulations from the DIR relating to labor compliance monitoring and enforcement.
- c. The payroll records described herein shall be certified and submitted by the Contractor at a time designated by Colma. The Contractor shall also provide the following:
 - 1) A certified copy of the employee’s payroll records shall be made available for inspection or furnished to such employee or his or her authorized representative on request.
 - 2) A certified copy of all payroll records described herein shall be made available for inspection or furnished upon request of the DIR.
- d. Unless submitted electronically, the certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement (“DLSE”) of the DIR or shall contain the same information as the forms provided by the DLSE.
- e. Any copy of records made available for inspection and furnished upon request to the public shall be marked or obliterated in such a manner as to prevent disclosure of an individual’s name, address, and social security number. The name and address of the Contractor or any subcontractor shall not be marked or obliterated.
- f. In the event of noncompliance with the requirements of this Section, the Contractor shall have ten (10) days in which to comply subsequent to receipt of written notice specifying any item or actions necessary to ensure compliance with this section. Should noncompliance still be evident after such ten (10) day period, the Contractor shall, as a penalty to Colma, forfeit One Hundred Dollars (\$100.00) for each day, or portion thereof, for each worker until strict compliance is effectuated. Upon the request of the DIR, such penalties shall be withheld from contract payments.

ARTICLE 34. PREVAILING RATES OF WAGES

- a. The Contractor is aware of the requirements of Labor Code Sections 1720 et seq. and 1770 et seq., as well as California Code of Regulations, Title 8, Section 16000 et seq. (“Prevailing Wage Laws”), which require the payment of prevailing wage rates and the performance of other requirements on certain “public works” and “maintenance” projects. Since this Project involves an applicable “public works” or “maintenance”

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project, as defined by the Prevailing Wage Laws, and since the total compensation is \$1,000 or more, the Contractor agrees to fully comply with such Prevailing Wage Laws. The Contractor shall obtain a copy of the prevailing rates of per diem wages at the commencement of this Agreement from the website of the Division of Labor Statistics and Research of the Department of Industrial Relations located at www.dir.ca.gov/dlsr/. In the alternative, the Contractor may view a copy of the prevailing rates of per diem wages at Colma. The Contractor shall make copies of the prevailing rates of per diem wages for each craft, classification or type of worker needed to perform work on the Project available to interested parties upon request, and shall post copies at the Contractor's principal place of business and at the Project site. The Contractor shall defend, indemnify and hold Colma, its elected officials, officers, employees and agents free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or alleged failure to comply with the Prevailing Wage Laws.

- b. The Contractor and each subcontractor shall forfeit as a penalty to Colma not more than Two Hundred Dollars (\$200.00) for each calendar day, or portion thereof, for each worker paid less than the stipulated prevailing wage rate for any work done by him, or by any subcontract under him, in violation of the provisions of the Labor Code. The difference between such stipulated prevailing wage rate and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor.
- c. The Contractor shall post, at appropriate conspicuous points on the Project site, a schedule showing all determined general prevailing wage rates and all authorized deductions, if any, from unpaid wages actually earned.
- d. As a further material part of this Contract, the Contractor agrees to hold harmless and indemnify Colma, Colma Council and each member of Colma Council, its officers, employees and agents from any and all claims, liability, loss, costs, damages, expenses, fines and penalties, of whatever kind or nature, including all costs of defense and attorneys' fees, arising from any alleged failure of the Contractor or its subcontractors to comply with the prevailing wage laws of the State of California. If Colma or any of the indemnified parties are named as a party in any dispute arising from the failure of the Contractor or its subcontractors to pay prevailing wages, the Contractor agrees that Colma and the other indemnified parties may appoint their own independent counsel, and the Contractor agrees to pay all attorneys' fees and defense costs of Colma and the other indemnified parties as billed, in addition to all other damages, fines, penalties and losses incurred by Colma and the other indemnified parties as a result of the action.

ARTICLE 35. LABOR COMPLIANCE

This Project is subject to labor compliance monitoring and enforcement by the Department of Industrial Relations. It shall be the Contractor's sole responsibility to evaluate and pay the cost of complying with all labor compliance requirements under this Contract and applicable law. This includes, but is not necessarily limited to the submission of certified payroll records electronically or otherwise as required by the Department of Industrial Relations.

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ARTICLE 36. EMPLOYMENT OF APPRENTICES

The Contractor's attention is directed to the provisions of Sections 1777.5, 1777.6, and 1777.7 of the Labor Code concerning employment of apprentices by the Contractor or any subcontractor. The Contractor shall obtain a certificate of apprenticeship before employing any apprentice pursuant to Section 1777.5, 1777.6, and 1777.7 of the Labor Code. Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, the Administrator of Apprenticeships, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices. Knowing violations of Section 1777.5 will result in forfeiture not to exceed \$100 for each calendar day of non-compliance pursuant to Section 1777.7.

ARTICLE 37. NONDISCRIMINATION/EQUAL EMPLOYMENT OPPORTUNITY

Pursuant to Labor Code Section 1735 and other applicable provisions of law, the Contractor and its subcontractors shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap on this Project. The Contractor will take affirmative action to insure that employees are treated during employment or training without regard to their race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap.

ARTICLE 38. LABOR/EMPLOYMENT SAFETY

The Contractor shall maintain emergency first aid treatment for his employees which complies with the Federal Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.), and California Code of Regulations, Title 8, Industrial Relations Division 1, Department of Industrial Relations, Chapter 4.

ARTICLE 39. WORKERS' COMPENSATION INSURANCE

The Contractor shall Provide, during the life of this Contract, workers' compensation insurance for all of the employees engaged in Work under this Contract, on or at the Project site, and, in case any of sublet Work, the Contractor shall require the subcontractor similarly to provide workers' compensation insurance for all the latter's employees as prescribed by State law. Any class of employee or employees not covered by a subcontractor's insurance shall be covered by the Contractor's insurance. In case any class of employees engaged in work under this Contract, on or at the Project site, is not protected under the Workers' Compensation Statutes, the Contractor shall provide or shall cause a subcontractor to provide, adequate insurance coverage for the protection of such employees not otherwise protected. The Contractor is required to secure payment of compensation to his employees in accordance with the provisions of Section 3700 of the Labor Code. The Contractor shall file with Colma certificates of his insurance protecting workers. Company or companies providing insurance coverage shall be acceptable to Colma, if in the form and coverage as set forth in the Contract Documents.

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ARTICLE 40. EMPLOYER’S LIABILITY INSURANCE

The Contractor shall provide during the life of this Contract, Employer’s Liability Insurance, including Occupational Disease, in the amount of, at least, one million dollars (\$1,000,000.00) per person per accident. The Contractor shall provide City with a certificate of Employer’s Liability Insurance. Such insurance shall comply with the provisions of the Contract Documents. The policy shall be endorsed, if applicable, to provide a Borrowed Servant/Alternate Employer Endorsement and contain a Waiver of Subrogation in favor of Colma.

ARTICLE 41. COMMERCIAL GENERAL LIABILITY INSURANCE

- a. The Contractor shall procure and maintain during the life of this Contract and for such other period as may be required herein, at its sole expense, Commercial General Liability insurance coverage, including but not limited to, premises liability, contractual liability, products/completed operations if applicable, personal and advertising injury – which may arise from or out of the Contractor’s operations, use, and management of the Project site, or the performance of its obligations hereunder. Policy limits shall not be less than One Million Dollars (\$1,000,000) per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.
- b. Such policy shall comply with all the requirements of the Contract Documents. The limits set forth herein shall apply separately to each insured against whom claims are made or suits are brought, except with respect to the limits of liability. Further the limits set forth herein shall not be construed to relieve the Contractor from liability in excess of such coverage, nor shall it limit the Contractor’s indemnification obligations to Colma, and shall not preclude Colma from taking such other actions available to Colma under other provisions of the Contract Documents or law.
- c. The Contractor shall make certain that any and all subcontractors hired by the Contractor are insured in accordance with this Contract. If any subcontractor’s coverage does not comply with the foregoing provisions, the Contractor shall indemnify and hold Colma harmless from any damage, loss, cost, or expense, including attorneys’ fees, incurred by Colma as a result thereof.
- d. Company or companies providing insurance coverage shall be acceptable to Colma and authorized to conduct business in the State of California.
- e. All general liability policies provided pursuant to the provisions of this Article shall comply with the provisions of the Contract Documents.
- f. All general liability policies shall be written to apply to all bodily injury, including death, property damage, personal injury, owned and non-owned equipment, blanket contractual liability, completed operations liability, explosion, collapse, under-ground excavation, removal of lateral support, and other covered loss, however occasioned, occurring during

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the policy term, and shall specifically insure the performance by the Contractor of that part of the indemnification contained in these General Conditions, relating to liability for injury to or death of persons and damage to property. If the coverage contains one or more aggregate limits, a minimum of 50% of any such aggregate limit must remain available at all times; if over 50% of any aggregate limit has been paid or reserved, Colma may require additional coverage to be purchased by the Contractor to restore the required limits. The Contractor may combine primary, umbrella, and as broad as possible excess liability coverage to achieve the total limits indicated above. Any umbrella or excess liability policy shall include the additional insured endorsement described in the Contract Documents.

ARTICLE 42. AUTOMOBILE LIABILITY INSURANCE

The Contractor shall take out and maintain at all times during the term of this Contract Automobile Liability Insurance in the amount of, at least, One Million Dollars (\$1,000,000). Such insurance shall provide coverage for bodily injury and property damage including coverage for non-owned and hired vehicles, in a form and with insurance companies acceptable to Colma. Such insurance shall comply with the provisions of Article 45 below.

~~ARTICLE 43. BUILDER'S RISK ["ALL RISK"]~~

- ~~a. — It is the Contractor's responsibility to maintain or cause to be maintained Builder's Risk ["All Risk"] extended coverage insurance on all work, material, equipment, appliances, tools, and structures which are a part of the Contract and subject to loss or damage by fire, and vandalism and malicious mischief, in an amount to cover 100% of the replacement cost. Colma accepts no responsibility until the Contract is formally accepted by the Governing Board for the work. The Contractor is required to file with Colma a certificate evidencing fire insurance coverage.~~
- ~~b. — Provide insurance coverage on completed value form, all risk or special causes of loss coverage.
 - ~~1) — Insurance policies shall be so conditioned as to cover the performance of any extra work performed under the Contract.~~
 - ~~2) — Coverage shall include all materials stored on site and in transit.~~
 - ~~3) — Coverage shall include the Contractor's tools and equipment.~~
 - ~~4) — Insurance shall include boiler, machinery and material hoist coverage.~~~~
- ~~e. — Such insurance shall comply with all provisions of the Contract Documents.~~

ARTICLE 44. FORM AND PROOF OF CARRIAGE OF INSURANCE

- a. Any insurance carrier providing insurance coverage required by the Contract Documents shall be admitted to and authorized to do business in the State of California unless waived, in writing, by Colma Risk Manager. Carrier(s) shall have an A.M. Best rating of

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not less than an A:VIII. Insurance deductibles or self-insured retentions must be declared by the Contractor, and such deductibles and retentions shall have the prior written consent from Colma. At the election of Colma, the Contractor shall either 1) reduce or eliminate such deductibles or self-insured retentions, or 2) procure a bond which guarantees payment of losses and related investigations, claims administration, and defense costs and expenses.

- b. The Contractor shall cause its insurance carrier(s) to furnish Colma with either 1) a properly executed original Certificate(s) of Insurance and certified original copies of Endorsements effecting coverage as required herein, or 2) if requested to do so in writing by Colma Risk Manager, provide original Certified copies of policies including all Endorsements and all attachments thereto, showing such insurance is in full force and effect. Colma, its director' and officers, employees, agents or representatives shall be named as Additional Insureds on all policies of Commercial General Liability and Automobile Liability Insurance, the Contractor shall provide a Waiver of Subrogation in favor of those parties. Further, said Certificate(s) and policies of insurance shall contain the covenant of the insurance carrier(s) that shall provide no less than thirty (30) days written notice be given to the City prior to any material modification or cancellation of such insurance. In the event of a material modification or cancellation of coverage, Colma may terminate or Stop Work pursuant to the Contract Documents, unless Colma receives, prior to such effective date, another properly executed original Certificate of Insurance and original copies of endorsements or certified original policies, including all endorsements and attachments thereto evidencing coverages set forth herein and the insurance required herein is in full force and effect. The Contractor shall not take possession, or use the Project site, or commence operations under this Agreement until Colma has been furnished original Certificate(s) of Insurance and certified original copies of Endorsements or policies of insurance including all Endorsements and any and all other attachments as required in this Section. The original Endorsements for each policy and the Certificate of Insurance shall be signed by an individual authorized by the insurance carrier to do so on its behalf.
- c. It is understood and agreed to by the parties hereto and the insurance company(s), that the Certificate(s) of Insurance and policies shall so covenant and shall be construed as primary, and Colma's insurance and/or deductibles and/or self-insured retentions or self-insured programs shall not be construed as contributory.
- d. Colma reserves the right to adjust the monetary limits of insurance coverage's during the term of this Contract including any extension thereof-if in Colma's reasonable judgment, the amount or type of insurance carried by the Contractor becomes inadequate.
- e. The Contractor shall pass down the insurance obligations contained herein to all tiers of sub-contractors working under this Contract.

ARTICLE 45. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

- a. **Time for Completion/Liquidated Damages.** Work shall be commenced within ten (10) days of the date stated in Colma's Notice to Proceed and shall be completed by the

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Contractor in the time specified in the Contract Documents. Colma is under no obligation to consider early completion of the Project; and the Contract completion date shall not be amended by Colma's receipt or acceptance of the Contractor's proposed earlier completion date. Furthermore, the Contractor shall not, under any circumstances, receive additional compensation from Colma (including but not limited to indirect, general, administrative or other forms of overhead costs) for the period between the time of earlier completion proposed by the Contractor and the Contract completion date. If The Work is not completed as stated in the Contract Documents, it is understood that Colma will suffer damage. In accordance with Government Code section 53069.85, being impractical and infeasible to determine the amount of actual damage, it is agreed that the Contractor shall pay to Colma as fixed and liquidated damages, and not as a penalty, the sum stipulated in the Contract for each day of delay until The Work is fully completed. The Contractor and its surety shall be liable for any liquidated damages. Any money due or to become due the Contractor may be retained to cover liquidated damages.

- b. **Inclement Weather.** If adverse weather conditions are the basis for a request for an extension of time, the Contractor must document the claim in writing and submit it to Colma's Representative within five (5) days of the cited weather conditions, with data substantiating that weather conditions were abnormal as compared to the average historical climate conditions based on the preceding ten year records published by the National Oceanic and Atmospheric Administration ("NOAA") entitled "Local Climatological Data" for the period of time. Time extensions for inclement weather shall only be granted when the Work stopped during inclement weather is on the critical path of the Project schedule. Where causes of delays are unusually severe weather as described herein, any time extension will be considered to be excusable, however it shall not be compensable, including any costs that would be borne by the Contractor in the regular course of business, including but not limited to home office overhead and ongoing insurance costs. The Contractor is responsible for all costs associated with such delay. The sole remedy of the Contractor for such inclement weather shall be the grant of a time extension directly related to the delay. The Contractor shall abide Colma's Representative's determination of what constitutes excusable inclement weather pursuant to this section. Refer to the Construction Schedule for inclement weather related delays and extensions.
- c. **Extension of Time.** The Contractor shall not be charged liquidated damages because of any delays in completion of the Work due to unforeseeable causes beyond the control and without the fault or negligence of the Contractor (or its subcontractors or suppliers). The Contractor shall within five (5) Days of identifying any such delay notify Colma in writing of causes of delay. Colma shall ascertain the facts and extent of delay and grant extension of time for completing the Work when, in its judgment, the facts justify such an extension. Time extensions to the Project shall be requested by the Contractor as they occur and without delay. No delay claims shall be permitted unless the event or occurrence delays the completion of the Project beyond the Contract completion date.
- d. **No Damages for Reasonable Delay.** Colma's liability to the Contractor for delays for which Colma is responsible shall be limited to only an extension of time unless such delays were unreasonable under the circumstances. In no case shall Colma be liable for

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any costs which are borne by the Contractor in the regular course of business, including, but not limited to, home office overhead and other ongoing costs. Damages caused by unreasonable City delay, including delays caused by items that are the responsibility of Colma pursuant to Government Code section 4215, shall be based on actual costs only, no proportions or formulas shall be used to calculate any delay damages.

ARTICLE 46. COST BREAKDOWN AND PERIODIC ESTIMATES

The Contractor shall furnish on forms Approved by Colma:

- a. Within ten (10) Days of award of the Contract a detailed estimate giving a complete breakdown of the Contract price;
- b. A monthly itemized estimate of Work done for the purpose of making progress payments. In order for Colma to consider and evaluate each progress payment application, the Contractor shall submit a detailed measurement of Work performed and a progress estimate of the value thereof before the tenth (10th) Day of the following month.
- c. The Contractor shall submit, with each of its payment requests, an adjusted list of actual quantities, verified by the Engineer, for unit price items listed, if any, in the Bid Form.
- d. Following Colma's Acceptance of the Work, the Contractor shall submit to Colma a written statement of the final quantities of unit price items for inclusion in the final payment request.
- e. Colma shall have the right to adjust any estimate of quantity and to subsequently correct any error made in any estimate for payment.

The Contractor shall certify under penalty of perjury, that all cost breakdowns and periodic estimates accurately reflect the Work on the Project.

ARTICLE 47. MOBILIZATION

- a. When a bid item is included in the Bid Form for mobilization, the costs of Work in advance of construction operations and not directly attributable to any specific bid item will be included in the progress estimate ("Initial Mobilization"). When no bid item is provided for "Initial Mobilization," payment for such costs will be deemed to be included in the other items of The Work.
- b. Payment for Initial Mobilization based on the lump sum provided in the Bid Form, which shall constitute full compensation for all such Work. No payment for Initial Mobilization will be made until all of the listed items have been completed to the satisfaction of the Engineer. The scope of the Work included under Initial Mobilization shall include, but shall not be limited to, the following principal items:
 1. Obtaining and paying for all bonds, insurance, and permits.

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2. Moving on to the Project site of all the Contractor's plant and equipment required for first month's operations.
3. Installing temporary construction power, wiring, and lighting facilities.
4. Establishing fire protection system.
5. Developing and installing a construction water supply.
6. Providing and maintaining the field office trailers for the Contractor and the Engineer, complete, with all specified furnishings and utility services including telephones, telephone appurtenances, computer and printer, and copying machine.
7. Providing on-site communication facilities for the Owner and the Engineer, including telephones, radio pagers, and fax machines.
8. Providing on-site sanitary facilities and potable water facilities as specified per Cal-OSHA and these Contract Documents.
9. Furnishing, installing, and maintaining all storage buildings or sheds required for temporary storage of products, equipment, or materials that have not yet been installed in the Work. All such storage shall meet manufacturer's specified storage requirements, and the specific provisions of the specifications, including temperature and humidity control, if recommended by the manufacturer, and for all security.
10. Arranging for and erection of the Contractor's work and storage yard.
11. Posting all OSHA required notices and establishment of safety programs per Cal-OSHA.
12. Full-time presence of the Contractor's superintendent at the job site as required herein.
13. Submittal of Construction Schedule as required by the Contract Documents.

ARTICLE 48. PAYMENTS

- a. Colma shall make monthly progress payments following receipt of undisputed and properly submitted payment requests. The Contractor shall be paid a sum equal to ninety-five percent (95%) of the value of Work performed up to the last day of the previous month, less the aggregate of previous payments. Notwithstanding the foregoing, the Contractor shall not be entitled to payment for work so long as any lawful or proper direction concerning the Work or any portion thereof given by Colma, Colma's Representative, or the Architect shall remain not complied with.

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- b. The Contractor shall, after the full completion of the Work, submit a final payment application. All prior progress estimates shall be subject to correction in the final estimate and payment.
- c. Unless otherwise required by law, the final payment of five percent (5%) of the value of the Work, if unencumbered, shall be paid no later than sixty (60) Days after the date of recordation of a Notice of Completion.
- d. Acceptance by the Contractor of the final payment shall constitute a waiver of all claims against Colma arising from this Contract.
- e. Payments to the Contractor shall not be construed to be an acceptance of any defective work or improper materials, or to relieve the Contractor of its obligations under the Contract Documents.
- f. The Contractor shall submit with each payment request the Contractor's conditional waiver of lien for the entire amount covered by such payment request, as well as a valid unconditional waiver of lien from the Contractor and all subcontractors and materialmen for all work and materials included in any prior invoices. Waivers of lien shall be in the forms prescribed by California Civil Code Section 8134. Prior to final payment by Colma, the Contractor shall submit a final waiver of lien for the Contractor's work, together with releases of lien from any subcontractor or materialmen.
- g. Unless otherwise required by law, the final payment of five percent (5%) of the value of the Work, if unencumbered, shall be paid no later than sixty (60) days after the date of Completion, provided however, that in the event of a dispute between Colma and the Contractor, Colma may withhold from the final payment an amount not to exceed one hundred and fifty percent (150%) of the disputed amount. Completion means any of the following as provided by Public Contract Code section 7107:
 - i. The occupation, beneficial use, and enjoyment of a work of improvement, excluding any operation only for testing, startup, or commissioning, by the public agency, or its agent, accompanied by cessation of labor on the work of improvement.
 - ii. The acceptance by the public agency, or its agent, or the work of improvement.
 - iii. After the commencement of a work of improvement, a cessation of labor on the work of improvement for a continuous period of 100 calendar days or more, due to factors beyond the control of the Contractor.
 - iv. After the commencement of a work of improvement, a cessation of labor on the work of improvement for a continuous period of 30 calendar days or more, if the public agency files for record a notice of cessation or a notice of completion.
- h. Prior to final payment, the Contractor shall submit a final waiver of lien for the Contractor's Work together with releases of lien from any of its subcontractor or materialmen, pursuant to Civil Code Section 8138. The final payment shall not be due

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and payable until the expiration of thirty-five (35) calendar days from the date of acceptance of the work by Colma, which acceptance shall be by formal action of Colma Council.

- i. No payment (final or otherwise) made under or in connection with this Agreement shall be conclusive evidence of the performance of the Work or of this Agreement, in whole or in part, and no such payment shall be construed to be an acceptance of defective, faulty or improper work or materials nor shall it release the Contractor from any of its obligations under this Agreement; nor shall entrance and use by Colma constitute acceptance of the Work or any part thereof.
- j. For purposes of this Contract, the acceptance by Colma means acceptance made only by an action of the governing body of Colma in session. At any time after fifty percent (50%) of the work has been completed, if Colma, by action of its governing body, finds that satisfactory progress is being made, Colma may make any of the remaining payments in full for actual work completed or may withhold any amount up to five percent (5%) thereof as Colma may find appropriate based on the Contractor's progress.
- k. No certificate given or payments made under the Contract, except the final certificate or final payment shall be evidence of the performance of the Contract, either wholly or in part, and no payment shall be construed to be an acceptance of any defective work or improper materials.
- l. Whenever any part of the work is in a condition suitable for use, and the best interest of Colma requires such use, Colma may take possession of, connect to, open for public use, or use a part thereof. When so used, maintenance and repairs due to ordinary wear and tear or vandalism will be made at Colma's expense. The use by Colma as contemplated in this Article shall in no case be construed as constituting acceptance of the work or any part thereof. Such use shall neither relieve the Contractor of any of his responsibilities under the Contract nor act as a waiver by Colma of any of the conditions thereof. Colma shall continue to maintain all insurance, including Builder's Risk insurance, on the Project.

ARTICLE 49. PAYMENTS WITHHELD AND BACK CHARGES

In addition to amounts which Colma may retain under other provisions of the Contract Documents Colma may withhold payments due to the Contractor as may be necessary to cover:

- a. Stop Payment Notice Claims.
- b. Defective work not remedied.
- c. Failure of the Contractor to make proper payments to its subcontractors or suppliers.
- d. Completion of the Contract if there exists a reasonable doubt that the work can be completed for balance then unpaid.
- e. Damage to another contractor or third party.

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- f. Amounts which may be due Colma for claims against the Contractor.
- g. Failure of the Contractor to keep the record (“as-built”) drawings up to date.
- h. Failure to provide updates on the construction schedule and/or a recovery schedule if required.
- i. Site cleanup.
- j. Failure of the Contractor to comply with requirements of the Contract Documents, including but not limited to the Contractor’s failure to provide approved complete as-builts prior to the recording of a Notice of Completion.
- k. Liquated damages.
- l. Legally permitted penalties.

Colma may apply such withheld amount or amounts to payment of such claims or obligations at its discretion with the exception of subsections (a), (c) and (e) of this Article, which must be retained or applied in accordance with applicable law. In so doing, Colma shall be deemed the agent of the Contractor and any payment so made by the Contractor shall be considered as a payment made under contract by Colma to the Contractor, and Colma shall not be liable to the Contractor for such payments made in good faith. Such payments may be made without prior judicial determination of the claim or obligations. Colma will render the Contractor a proper accounting of such funds disbursed on behalf of the Contractor.

Upon completion of the Contract, Colma will reduce the final Contract amount to reflect costs charged to the Contractor, back charges or payments withheld pursuant to the Contract Documents.

ARTICLE 50. CHANGES AND EXTRA WORK

- a. Owner Initiated Change. Colma, without invalidating the Contract, may order changes in the Work consisting of additions, deletions or other revisions, the Contract amount and Contract time being adjusted accordingly. All such changes in the Work shall be authorized by written Change Order, and shall be performed under the applicable conditions of the Contract Documents. A Change Order signed by the Contractor indicates the Contractor’s agreement therewith, including any adjustment in the Contract amount or the Contract time, and the full and final settlement of all costs (direct, indirect and overhead) related to the Work authorized by the Change Order.
 - 1. The Contractor must submit a complete cost proposal, including any change in the Contract time, within seven (7) Days after receipt of a scope of a proposed Change Order, unless Colma requests that proposals be submitted in less than seven (7) Days.
- b. Contractor Initiated Change. The Contractor must give written notice to Colma’s Representative of a proposed Change Order required for compliance with the Contract

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Documents within seven (7) Days of discovery of the facts giving rise to the proposed change order.

c. Contract Price Adjustment.

1. All claims for additional compensation to the Contractor shall be presented in writing before the expense is incurred and will be adjusted as provided herein. No Work shall be allowed to lag pending such adjustment, but shall be promptly executed as directed, even if a dispute arises. No claim will be considered after the Work in question has been done unless a written contract change order has been issued or a timely written notice of claim has been made by the Contractor. The Contractor shall not be entitled to claim or bring suit for damages, whether for loss of profits or otherwise, on account of any decrease or omission of any item or portion of Work to be done. Whenever any change is made as provided for herein, such change shall be considered and treated as though originally included in the Contract, and shall be subject to all terms, conditions and provisions of the original Contract.
2. Whenever possible, any changes to the Contract amount shall be in a lump sum mutually agreed to by the Contractor and Colma.
3. All price quotations submitted by the Contractor shall be accompanied by sufficiently detailed supporting documentation to permit verification by Colma.

d. Force Account Work. If the Contractor fails to submit the cost proposal for a Change Order within the seven (7) Day period (or as requested), Colma has the right to order the Contractor in writing to commence the Work immediately on a force account basis and/or issue a lump sum change to the Contract price in accordance with Colma's estimate of cost. If the change is issued based on Colma's estimate, the Contractor will waive its right to dispute the action unless within fifteen (15) Days following completion of the added/deleted Work, the Contractor presents written proof that Colma's estimate was in error.

e. Cost Estimates. Estimates for lump sum quotations and accounting for cost-plus-percentage Work shall be limited to direct expenditures necessitated specifically by the subject extra work, and shall be segregated as follows:

- (a) Labor. The costs of labor will be the actual cost for wages prevailing locally for each craft or type of worker at the time the extra work is done, plus employer payments of payroll taxes and insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State or local laws, as well as assessment or benefits required by lawful collective bargaining agreements. The use of a labor classification which would increase the extra work cost will not be permitted unless the Contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.

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- (b) Materials. The cost of materials reported shall be at invoice or lowest current price at which such materials are locally available in the quantities involved, plus sales tax, freight and delivery. Materials cost shall be based upon supplier or manufacturer's invoice. If invoices or other satisfactory evidence of cost are not furnished within fifteen (15) Days of delivery, then Colma's Representative shall determine the materials cost, at its sole discretion.
- (c) Tool and Equipment Use. No payment will be made for the use of small tools, tools which have a replacement value of \$1,000 or less. Regardless of ownership, the rates to be used in determining equipment use costs shall not exceed listed rates prevailing locally at equipment rental agencies, or distributors, at the time the Work is performed.
- (d) Overhead, Profit and Other Charges. The mark-up for overhead (including supervision) and profit on Work added to the Contract shall be according to the following:
- i. "Net Cost" is defined as consisting of costs of labor, materials and tools and equipment only excluding overhead and profit. The costs of applicable insurance and bond premium will be reimbursed to the Contractor and subcontractors at cost only, without mark-up.
 - ii. For Work performed by the Contractor's forces the added cost for overhead and profit shall not exceed fifteen (15%) percent of the Net Cost of the Work.
 - iii. For Work performed by a subcontractor, the added cost for overhead and profit shall not exceed fifteen (15%) percent of the Net Cost of the Work to which the Contractor may add five (5%) percent of the subcontractor's Net Cost.
 - iv. For Work performed by a sub-subcontractor the added cost for overhead and profit shall not exceed fifteen (15%) percent of the Net Cost for Work to which the subcontractor and general Contractor may each add an additional five (5%) percent of the Net Cost of the lower tier subcontractor.
 - iv. No additional markup will be allowed for lower tier subcontractors, and in no case shall the added cost for overhead and profit payable by Colma exceed twenty-five (25%) percent of the Net Cost as defined herein.
- (e) For added or deducted Work by subcontractors, the Contractor shall furnish to Colma the subcontractor's signed detailed estimate of the cost of labor, material and equipment, including the subcontractor markup for overhead and profit. The same requirement shall apply to sub-subcontractors.

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- (f) For added or deducted Work furnished by a vendor or supplier, the Contractor shall furnish to Colma a detailed estimate or quotation of the cost to the Contractor, signed by such vendor or supplier.
 - (g) Any change in the Work involving both additions and deletions shall indicate a net total cost, including subcontracts and materials. Allowance for overhead and profit, as specified herein, shall be applied if the net total cost is an extra; overhead and profit allowances shall not be applied if the net total cost is a credit. The estimated cost of deductions shall be based on labor and material prices on the date the Contract was executed.
 - (h) The Contractor shall not reserve a right to assert impact costs, extended job site costs, extended overhead, constructive acceleration and/or actual acceleration beyond what is stated in the change order for Work. No claims shall be allowed for impact, extended overhead costs, constructive acceleration and/or actual acceleration due to a multiplicity of changes and/or clarifications. The Contractor may not change or modify Colma's change order form in an attempt to reserve additional rights.
- f. Agreement as to Change in Contract Price/ Time. If Colma disagrees with the proposal submitted by the Contractor, it will notify the Contractor and Colma will provide its opinion of the appropriate price and/or time extension. If the Contractor agrees with Colma, a Change Order will be issued by Colma. If no agreement can be reached, Colma shall have the right to issue a unilateral change order setting forth its determination of the reasonable additions or savings in costs and time attributable to the extra or deleted work. Such determination shall become final and binding if the Contractor fails to submit a claim in writing to Colma within fifteen (15) Days of the issuance of the unilateral change order, disputing the terms of the unilateral change order.
- g. No dispute, disagreement or failure of the parties to reach agreement on the terms of the change order shall relieve the Contractor from the obligation to proceed with performance of the Work, including extra work, promptly and expeditiously.
- h. Any alterations, extensions of time, extra work or any other changes may be made without securing consent of the Contractor's surety or sureties.

ARTICLE 51. OCCUPANCY

Colma reserves the right to occupy or utilize any portion of The Work at any time before completion, and such occupancy or use shall not constitute Acceptance of any part of Work covered by this Contract. This use shall not relieve the Contractor of its responsibilities under the Contract.

ARTICLE 52. INDEMNIFICATION

Colma, Colma's Representative, Colma Council, its members, directors, officers, employees, agents and authorized volunteers shall not be answerable or accountable in any manner for any

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loss or damage that may happen to the Work or any part thereof, or for any of the materials or other things used or employed in performing the Work, or for injury or damage to any person or persons, either workers, employees of the Contractor or its subcontractors or the public, or for damage to adjoining or other property, from any cause whatsoever arising out of or in connection with the performance of the Work. The Contractor shall be responsible for any damage to adjoining or other property, from any cause whatsoever arising out of or in connection with the performance of the Work. The Contractor shall be responsible for any damage or injury to any person or property resulting from defects or obstructions or from any cause whatsoever arising out of or in connection with the performance of the Work; provided, however, that the Contractor shall not be liable for the sole established negligence, willful misconduct or active negligence of Colma, Colma's Representative, Colma Council, its members, directors, officers, employees, agents and authorized volunteers who are directly responsible to Colma.

The Contractor shall defend (with counsel of Colma's choosing), indemnify and hold Colma, its officials, officers, agents, including but not limited to Colma's Representative, employees, representatives and authorized volunteers free and harmless from any and all claims, demands, causes of action, costs, expenses, liabilities, losses, damages or injuries, in law or equity, regardless of whether the allegations are false, fraudulent, or groundless, to property or persons, including wrongful death, to the extent arising out of or incident to any acts, omissions or willful misconduct of the Contractor, its officials, officers, employees, agents, consultants and contractors arising out of or in connection with the performance of the Work or this Contract, including claims made by subcontractors for nonpayment, including without limitation the payment of all consequential damages and attorneys' fees and other related costs and expenses. The Contractor shall defend, at the Contractor's own cost, expense and risk, with counsel of Colma's choosing, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against Colma, its officials, officers, agents, employees and representatives. To the extent of its liability, the Contractor shall pay and satisfy any judgment, award or decree that may be rendered against Colma, its officials, officers, employees, agents, employees and representatives, in any such suit, action or other legal proceeding. The Contractor shall reimburse Colma, its officials, officers, agents, employees and representatives for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided. The only limitations on this provision shall be those imposed by Civil Code Section 2782. Colma may retain, to the extent it deems necessary, the money due to the Contractor under and by virtue of the Contract Documents until disposition has been made of such actions or claims for damages as specified hereinabove.

ARTICLE 53. PERSONAL LIABILITY

Neither Colma, Colma Council, Colma's Representative, the Construction Manager, the Architect, nor any other director, officer or authorized assistant or agent of Colma, Colma Council, Colma's Representative, the Construction Manager, or the Architect shall be personally responsible for any liability arising under the Contract.

ARTICLE 54. RECORD ("AS BUILT") DRAWINGS

- a. The Contractor shall prepare and maintain a complete set of record drawings (herein referred to as "as-builts") and shall require each trade to prepare its own as-builts. The

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as-builts must show the entire site for each major trade, including but not limited to water, sewer, electrical, data, telephone, cable, fire alarm, gas and plumbing. The Contractor shall mark the as-builts to show the actual installation where the installation varies from the Work as originally shown. The Contractor shall mark whichever drawings are most capable of showing conditions fully and where shop drawings are used, the Contractor must record a cross-reference at the corresponding location on the contract drawings. The Contractor shall give particular attention to concealed elements that would be difficult to measure and record at a later date. The Contractor shall use colors to distinguish variations in separate categories of The Work.

- b. The Contractor shall note related change order numbers where applicable. The Contractor shall organize as-builts into manageable sets, bound with durable paper cover sheets and shall print suitable title, dates and other identification on the cover of each set. Prior to recording a Notice of Completion, complete as-builts for the Project shall be turned over Colma's Representative. The Contractor shall also provide an electronic version of the as-builts. The suitability of the as-builts will be determined by Colma's Representative. Final as-builts shall be signed off by the Engineer upon determination of suitability.

ARTICLE 55. RESOLUTION OF CONSTRUCTION CLAIMS

- a. In accordance with Public Contract Code Sections 20104 *et seq.* and other applicable law, public works claims of \$375,000 or less which arise between the Contractor and Colma shall be resolved under the following the statutory procedure unless Colma has elected to resolve the dispute pursuant to Public Contract Code Section 10240 *et seq.*
- b. **All Claims:** All claims shall be submitted in writing and accompanied by substantiating documentation. Claims must be filed on or before the date of final payment unless other notice requirements are provided in the Contract Documents. "Claim" means a separate demand by the claimant for (1) a time extension, (2) payment of money or damages arising from work done by or on behalf of the claimant and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled, or (3) an amount the payment of which is disputed by Colma. The Contractor shall promptly comply with the Contract Documents in the performance of Work and/or the request of Colma even though a written claim has been filed. The Contractor and Colma shall make good faith efforts to resolve any and all claims that may arise during performance of the Work covered by this Contract.
- c. **Claims Under \$50,000.** Colma shall respond in writing to the claim within 45 days of receipt of the claim, or, Colma may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims Colma may have. If additional information is needed thereafter, it shall be provided upon mutual agreement of Colma and the claimant. Colma's written response shall be submitted 15 days after receiving the additional documentation, or within the same period of time taken by the claimant to produce the additional information, whichever is greater.

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- d. **Claims over \$50,000 but less than or equal to \$375,000.** Colma shall respond in writing within 60 days of receipt, or, may request in writing within 30 days of receipt of the claim, any additional documents supporting the claim or relating to defenses or claims Colma may have against the claimant. If additional information is needed thereafter, it shall be provided pursuant to mutual agreement between Colma and the claimant. Colma's response shall be submitted within 30 days after receipt of the further documents, or within the same period of time taken by the claimant to produce the additional information or documents, whichever is greater. The Contractor shall make these records and documents available at all reasonable times, without any direct charge.
- e. The Contractor will submit the claim justification in the following format:
- 1) Summary of claim merit and price, and the Contract clause pursuant to which the claim is made.
 - 2) List of documents relating to claim
 - (a) Specifications
 - (b) Drawings
 - (c) Clarifications (Requests for Information)
 - (d) Schedules
 - (e) Other
 - 3) Chronology of events and correspondence
 - 4) Analysis of claim merit
 - 5) Analysis of claim cost
 - 6) Analysis of time impact analysis in CPM format
 - 7) Cover letter and certification of validity of the claim
- f. If the claimant disputes Colma's response, or if Colma fails to respond within the statutory time period(s), the claimant may so notify Colma within 15 days of the receipt of the response or the failure to respond, and demand an informal conference to meet and confer for settlement. Upon such demand, Colma shall schedule a meet and confer conference within 30 Days.
- g. If following the meet and confer conference, the claim or any portion thereof remains in dispute, the claimant may file a claim pursuant to Government Code 900 et seq. and Government Code 910 et seq. For purposes of those provisions, the time within which a claim must be filed shall be tolled from the time the claimant submits the written claim

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until the time the claim is denied, including any time utilized for the meet and confer conference.

- h. Submission of a claim, properly certified, with all required supporting documentation, and written rejection or denial of all or part of the claim by City, is a condition precedent to any action, proceeding, litigation, suit, general conditions claim, or demand for arbitration by the Contractor.

ARTICLE 56. CITY'S RIGHT TO TERMINATE CONTRACT

- a. **Termination for Cause:** Colma may, without prejudice to any other right or remedy, serve written notice upon the Contractor of its intention to terminate this Contract if the Contractor: (i) refuses or fails to prosecute The Work or any part thereof with such diligence as will ensure its completion within the time required; (ii) fails to complete The Work within the required time; (iii) should file a bankruptcy petition or be adjudged a bankrupt; (iv) should make a general assignment for the benefit of its creditors; (v) should have a receiver appointed; (vi) should persistently or repeatedly refuse or fail to supply enough properly skilled workers or proper materials to complete the work; (vii) should fail to make prompt payment to subcontractors or for material or labor; (viii) persistently disregard laws, ordinances, other requirements or instructions of Colma; (ix) should violate any of the provisions of the Contract Documents; or (x) otherwise be guilty of a substantial violation of any provision of the Contract.

The notice of intent to terminate shall contain the reasons for such intention to terminate. Unless within ten (10) Days after the service of such notice, such condition shall cease or satisfactory arrangements (acceptable to Colma) for the required correction are made, this Contract shall be terminated. In such case, the Contractor shall not be entitled to receive any further payment until the Project has been finished. In event of any such termination, Colma shall immediately serve written notice thereof upon surety and the Contractor written notice of termination stating that the contract has ceased and is terminated. Surety shall have the right to investigate, take over and perform this Contract, provided, however, that if Surety, within fifteen (15) calendar days after service upon it of said notice of termination, does not give Colma written notice of its intention to take over and perform this Contract and does not commence performance thereof within twenty (20) calendar days from the date of service upon it of such notice of termination, Colma may take over and complete The Work by any method it may deem appropriate. The Contractor and its surety shall be liable to Colma for any excess costs or other damages incurred by Colma to complete the Project. If Colma takes over the Work, Colma may, without liability for so doing, take possession of and utilize in completing the Work such materials, appliances, plant, and other property belonging to the Contractor as may be on the Project Site. If Colma takes over the Work as herein above provided, Colma may, without liability for so doing, take possession of and utilize in completing the Work such materials, appliances, plant, and other property belonging to the Contractor as may be on the Site of The Work and necessary therefor.

If the unpaid balance of the Contract Price exceeds the expense of finishing work, including compensation for additional architectural, managerial, and administrative

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services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor shall pay the difference to Colma. Expense incurred by Colma as herein provided, and damage incurred through the Contractor's default, shall be certified by Colma's Representative.

- b. **Termination For Convenience:** Colma may terminate performance of the Work in whole or, in part, if Colma determines that a termination is in Colma's interest.

The Contractor shall terminate all or any part of the Work upon delivery to the Contractor of a Notice of Termination specifying that the termination is for the convenience of Colma, the extent of termination, and the effective date of such termination.

After receipt of the Notice of Termination, and except as directed by Colma, the Contractor shall, regardless of any delay in determining or adjusting any amounts due under this Termination for Convenience clause, immediately proceed with the following obligations:

- 1) Stop Work as specified in the Notice.
- 2) Complete any Work specified in the Notice of Termination in a least cost/shortest time manner while still maintaining the quality called for under the Contract Documents.
- 3) Leave the property upon which the Contractor was working and upon which the facility (or facilities) forming the basis of the Contract Documents is situated in a safe and sanitary manner such that it does not pose any threat to the public health or safety.
- 4) Terminate all subcontracts to the extent that they relate to the portions of The Work terminated.
- 5) Place no further subcontracts or orders, except as necessary to complete the remaining portion of The Work.
- 6) Submit to Colma, within ten (10) Days from the effective date of the Notice of Termination, all of the documentation called for by the Contract Documents to substantiate all costs incurred by the Contractor for labor, materials and equipment through the Effective Date of the Notice of Termination. Any documentation substantiating costs incurred by the Contractor solely as a result of Colma's exercise of its right to terminate this Contract pursuant to this clause, which costs the Contractor is authorized under the Contract Documents to incur, shall: (i) be submitted to and received by Colma no later than thirty (30) Days after the Effective Date of the Notice of Termination; (ii) describe the costs incurred with particularity; and (iii) be conspicuously identified as "Termination Costs Occasioned by Colma's Termination for Convenience."

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- 7) These provisions are in addition to and not in limitation of any other rights or remedies available to Colma.
- c. Notwithstanding any other provision of this Article, when immediate action is necessary to protect life and safety or to reduce significant exposure or liability, Colma may immediately order Contractor to cease Work on the Project until such safety or liability issues are addressed to the satisfaction of Colma or the Contract is terminated.
- d. Should Colma determine that environmental considerations mandate that the underlying Project should not go forward, Colma may notify the Contractor that this Contract is terminated due to environmental considerations and Colma shall only be obligated to pay the Contractor for the Work that the Contractor had performed at the time of notification of termination of this Contract for environmental considerations.
- e. Termination of the Contract shall not relieve Surety of its obligation for any just claims arising out of or relating to the Work performed. In the event that Colma exercises its right to terminate this Contract pursuant to this provision, Colma shall pay the Contractor, upon the Contractor's submission of the documentation required by this clause and other applicable provisions of the Contract Documents, all actual reimbursable costs incurred according to the provisions of this Contract.
- f. The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to Colma.
- g. Notwithstanding the foregoing provisions, this Contract may not be terminated or modified where a trustee-in-bankruptcy has assumed the Contract pursuant to 11 U.S.C. section 365 (Federal Bankruptcy Act)

ARTICLE 57. WARRANTY AND GUARANTEE

- a. The Contractor warrants that all materials and equipment furnished under this Contract shall be new unless otherwise specified in the Contract Documents; and that all Work conforms to the Contract Document requirements and is free of any defect whether performed by the Contractor or any subcontractor or supplier.
- b. Unless otherwise stated, all warranty periods shall begin upon the recording of a Notice of Completion. Unless otherwise stated, the warranty period shall be for two years.
- c. The Contractor shall remedy at its expense any damage to City-owned or controlled real or personal property.
- d. The Contractor shall furnish Colma with all warranty and guarantee documents prior to final Acceptance of the Project by Colma.
- e. Colma shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage. The Contractor shall within ten (10) Days after being notified commence and perform with due diligence the repair or replacement of any or all such Work, together with any other Work, which may be displaced in so doing, that may

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prove defective in workmanship and/or materials without expense whatsoever to Colma, ordinary wear and tear, unusual abuse or neglect excepted. If the Contractor fails to promptly remedy any defect, or damage; Colma shall have the right to replace, repair, or otherwise remedy the defect, or damage at the Contractor's expense. The Contractor hereby agrees to pay costs and charges therefore immediately on demand.

- f. The Contractor shall repair or replace any or all such Work, together with any other Work, which may be displaced in so doing, that may prove defective in workmanship and/or materials within a two-year period from date of acceptance without expense whatsoever to Colma, ordinary wear and tear, unusual abuse or neglect excepted. Colma will give notice of observed defects with reasonable promptness. The Contractor shall notify Colma upon completion of repairs. In the event of failure of the Contractor to comply with above-mentioned conditions within one week after being notified in writing, Colma is hereby authorized to proceed to have defects repaired and made good at the expense of the Contractor. The Contractor hereby agrees to pay costs and charges therefor immediately on demand.
- g. In the event of any emergency constituting an immediate hazard to health, safety, property, or licensees, when caused by Work of the Contractor not in accordance with the Contract requirements, Colma may undertake at the Contractor's expense, and without prior notice, all Work necessary to correct such condition.
- h. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for Work performed and Materials furnished under this Contract, the Contractor shall:
 - 1) Obtain for City all warranties that would be given in normal commercial practice;
 - 2) Require all warranties to be executed, in writing, for the benefit of Colma; and
 - 3) Enforce all warranties for the benefit of Colma, unless otherwise directed in writing by Colma.

This Article does not in any way limit the guarantee of any times for which a longer guarantee is specified or on any items for which a manufacturer gives a guarantee for a longer period.

This Article shall not limit Colma's rights under this Contract or with respect to latent defects, gross mistakes, or fraud. Colma specifically reserves all rights related to defective work, including but not limited to the defect claims pursuant to California Code of Civil Procedure Section 337.15.

ARTICLE 58. DOCUMENT RETENTION & EXAMINATION

- a. In accordance with Government Code Section 8546.7, records of both Colma and the Contractor shall be subject to examination and audit by the State Auditor General for a period of three (3) years after final payment.

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- b. Contractor shall make available to Colma any of the Contractor's other documents related to the Project immediately upon request of Colma.
- c. In addition to the State Auditor rights above, Colma shall have the right to examine and audit all books, estimates, records, contracts, documents, bid documents, subcontracts, and other data of the Contractor (including computations and projections) related to negotiating, pricing, or performing the modification in order to evaluate the accuracy and completeness of the cost or pricing data at no additional cost to Colma, for a period of four (4) years after final payment.

ARTICLE 59. SOILS INVESTIGATIONS

When a soils investigation report for the Project site is available, such report shall not be a part of the Contract Documents. Any information obtained from such report as to subsurface soil condition, or to elevations of existing grades or elevations of underlying rock, is approximate only and is not guaranteed. The Contractor acknowledges that any soils investigation report (including any borings) was prepared for purposes of design only and the Contractor is required to examine the site before submitting its bid and must make whatever tests it deems appropriate to determine the underground condition of the soil.

ARTICLE 60. REQUIRED CERTIFICATIONS

The Contractor shall, for all contracts involving state funds, submit a "Drug-Free Workplace Certification" and a "Recycled Content Certification." These forms are included in the Contract Documents and must be signed under the penalty of perjury and dated prior to commencing work on this Project.

ARTICLE 61. SEPARATE CONTRACTS

- a. Colma reserves the right to let other contracts in connection with this Work or on the Project site. The Contractor shall permit other contractors reasonable access and storage of their materials and execution of their work and shall properly connect and coordinate its Work with theirs.
- b. If any part of The Work depends for proper execution or results upon work of any other contractor, the Contractor shall inspect and promptly report to Colma's Representative any defects in such work that renders it unsuitable for such proper execution and results. The Contractor's failure to so inspect and report shall constitute its acceptance of the other contractor's work as fit and proper for reception of the Contractor's Work, except as to defects which may develop in the other contractor's work after execution of the Contractor's Work.
- c. To ensure proper execution of its subsequent Work, the Contractor shall immediately inspect work already in place and shall at once report to Colma's Representative any problems with the Work in place or discrepancies with the Contract Documents.
- d. The Contractor shall ascertain to its own satisfaction the scope of the Project and nature of any other contracts that have been or may be awarded by Colma in prosecution of the

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Project to the end that the Contractor may perform this Contract in the light of such other contracts, if any. Nothing herein contained shall be interpreted as granting to the Contractor exclusive occupancy at site of the Project. The Contractor shall not cause any unnecessary hindrance or delay to any other contractor working on the Project. If simultaneous execution of any contract for the Project is likely to cause interference with performance of some other contract or contracts, the Engineer shall decide which the Contractor shall cease Work temporarily and which contractor shall continue or whether work can be coordinated so that contractors may proceed simultaneously. Colma shall not be responsible for any damages suffered or for extra costs incurred by the Contractor resulting directly or indirectly from award, performance, or attempted performance of any other contract or contracts on the Project site.

ARTICLE 62. NOTICE AND SERVICE THEREOF

All notices shall be in writing and shall be dated and signed by the party giving such notice, or by the duly authorized representative of such party, and shall be either served by personal delivery or mailed to the other party as designated in the Bid Forms. Written notice to the Contractor shall be addressed to the Contractor's principal place of business unless the Contractor designates another address in writing for service of notice. Notice to Colma shall be addressed to Colma as designated in the Notice Inviting Bids unless Colma designates another address in writing for service of notice. Notice shall be effective upon receipt or five (5) Days after being sent by first class mail, whichever is earlier. Notice given by facsimile shall not be effective unless acknowledged in writing by the receiving party.

ARTICLE 63. NOTICE OF THIRD PARTY CLAIMS

Pursuant to Public Contract Code Section 9201, Colma shall provide the Contractor with timely notification of the receipt of any third-party claim relating to the Contract.

ARTICLE 64. STATE LICENSE BOARD NOTICE.

The Contractors are required by law to be licensed and regulated by the Contractors' State License Board which has jurisdiction to investigate complaints against contractors if a complaint regarding a patent act or omission is filed within four (4) years of the date of the alleged violation. A complaint regarding a latent act or omission pertaining to structural defects must be filed within ten (10) years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License Board, P.O. Box 26000, Sacramento, California 95826.

ARTICLE 65. INTEGRATION

- a. Oral Modifications Ineffective. No oral order, objection, direction, claim or notice by any party or person shall affect or modify any of the terms or obligations contained in the Contract Documents.
- b. Contract Documents Represent Entire Contract. The Contract Documents represent the entire agreement of Colma and the Contractor.

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ARTICLE 66. ASSIGNMENT

The Contractor shall not assign, transfer, convey, sublet, or otherwise dispose of this Contract or any part thereof including any claims, without prior written consent of Colma. Any assignment without the written consent of Colma shall be void. Any assignment of money due or to become due under this Contract shall be subject to a prior lien for services rendered or Material supplied for performance of Work called for under the Contract Documents in favor of all persons, firms, or corporations rendering such services or supplying such Materials to the extent that claims are filed pursuant to the Civil Code, the Code of Civil Procedure or the Government Code.

ARTICLE 67. CHANGE IN NAME AND NATURE OF CONTRACTOR’S LEGAL ENTITY

Should a change be contemplated in the name or nature of the Contractor’s legal entity, the Contractor shall first notify Colma in order that proper steps may be taken to have the change reflected on the Contract.

ARTICLE 68. ASSIGNMENT OF ANTITRUST ACTIONS

Pursuant to Section 7103.5 of the Public Contract Code, in entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to Colma 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. Section 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 the purchase of goods, services, or materials pursuant to this Contract or any subcontract. This assignment shall be made and become effective at the time Colma makes final payment to the Contractor, without further acknowledgment by the parties.

ARTICLE 69. PROHIBITED INTERESTS

No City official or representative who is authorized in such capacity and on behalf of Colma to negotiate, supervise, make, accept, or approve, or to take part in negotiating, supervising, making, accepting or approving any engineering, inspection, construction or material supply contract or any subcontract in connection with construction of the project, shall be or become directly or indirectly interested financially in the Contract.

ARTICLE 70. LAWS AND REGULATIONS

- a. The Contractor shall give all notices and comply with all federal, state and local laws, ordinances, rules and regulations bearing on conduct of work as indicated and specified by their terms. References to specific laws, rules or regulations in this Contract are for reference purposes only, and shall not limit or affect the applicability of provisions not specifically mentioned. If the Contractor observes that drawings and specifications are at variance therewith, he shall promptly notify the Engineer in writing and any necessary changes shall be adjusted as provided for in this Contract for changes in work. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules

GENERAL CONDITIONS

and regulations, and without such notice to the Engineer, he shall bear all costs arising therefrom.

- b. The Contractor shall be responsible for familiarity with the Americans with Disabilities Act (“ADA”) (42 U.S.C. § 12101 et seq.). The Work will be performed in compliance with ADA laws, rules and regulations. The Contractor shall comply with the Historic Building Code, including, but not limited to, as it relates to the ADA, whenever applicable.
- c. The Contractor acknowledges and understands that, pursuant to Public Contract Code Section 20676, sellers of "mined material" must be on an approved list of sellers published pursuant to Public Resources Code Section 2717(b) in order to supply mined material for this Contract.

ARTICLE 71. PATENT FEES OR ROYALTIES.

The Contractor shall include in its bid amount the patent fees or royalties on any patented article or process furnished or used in the Work. The Contractor shall assume all liability and responsibility arising from the use of any patented, or allegedly patented, materials, equipment, devices or processes used in or incorporated with The Work, and shall defend, indemnify and hold harmless Colma, its officials, officers, agents, employees and representatives from and against any and all liabilities, demands, claims, damages, losses, costs and expenses, of whatsoever kind or nature, arising from such use.

ARTICLE 72. OWNERSHIP OF DRAWINGS

All Contract Documents furnished by Colma are Colma’s property. They are not to be used by the Contractor or any subcontractor on other work, nor shall the Contractor claim any right to such documents. With exception of one complete set of Contract Documents, all documents shall be returned to Colma on request at completion of the Work.

ARTICLE 73. NOTICE OF TAXABLE POSSESSORY INTEREST

In accordance with Revenue and Taxation Code Section 107.6, the Contract Documents may create a possessory interest subject to personal property taxation for which the Contractor will be responsible.

ARTICLE 74. CITY’S INSPECTOR

Colma’s Inspector shall have access to all plant operations involving work under this Contract and shall be provided reasonable advance notice of the time and place of operations which the inspector desires to observe. The Inspector shall be provided with all necessary samples of materials and work for testing purposes. All work shall be under the observation of said Inspector. He or she shall have free access to any or all parts of work at any time. The Contractor shall furnish the Inspector reasonable facilities for obtaining such information as may be necessary to keep him/her fully informed respecting progress and manner of work and character of materials. Inspection of work shall not relieve the Contractor from any obligation to fulfill this Contract. The Inspector, after consultation with the Construction Manager *shall have*

GENERAL CONDITIONS

authority to stop work whenever the provisions of the Contract Documents are not being complied with and contractor shall instruct his employees accordingly.

ARTICLE 75. MISCELLANEOUS

The Contract Documents shall be interpreted in accordance with the laws of the State of California. If any action is brought to interpret or enforce any term of these Contract Documents, the action shall be brought in a state or federal court situated in the County of San Mateo, State of California.

ARTICLE 78. NO WAIVER

No provision of these Contract Documents shall be deemed waived by either party unless such waiver shall be expressly specified in writing, regardless of the actions or inaction of the parties.

SPECIAL CONDITIONS

- a. Colma has not made findings pursuant to Public Contract Code Section 3400(c) regarding the use of specific materials, products, things, and/or services that must be utilized for the Project.
- b. The intent for Mass Grading and Site Improvements Package scope as described on the drawings and in the Project Manual, is to provide the building pad for the New Addition without incurring any structural or physical damage to the 1941 original Town Hall, unless where shown on the drawings and in the Project Manual.
- c. The intent of the Mass Grading and Site Improvements Package scope is to include the foundation walls necessary for backfill and compaction to the finish pad elevation. Additional foundation documents will be released at a later date.
- d. During the Pre-Construction Meeting, the existing condition of the 1941 structure will be reviewed. It is intended that no vibration and/or stress is to be transferred to the 1941 structure, during the Site Improvements work.
- e. Any use of vibrating tools that might damage the upper level of the 1941 Town Hall will be reviewed prior to commencing the work.
- f. The Contractor must at all times, maintain a continuous dust barrier between all areas of the Site Improvement work to all areas of the upper floor level of the 1941 Town Hall. A dust control plan as proposed by the Contractor will be reviewed and approved during the Pre-Construction Meeting before any work commences.
- g. The site construction fence and any gates, and associated locks and keys will be provided by the Owner. Final location of fence boundary to be discussed with Contractor at the Pre-Construction Meeting. The Contractor is responsible for any damage to the fence and gates. The contractor shall also coordinate with the demolition and abatement contractor that may be working on site in the same time frame.

TECHNICAL SPECIFICATIONS

THE FOLLOWING TECHNICAL SPECIFICATIONS ARE INCORPORATED HEREIN BY REFERENCE AS IF SET FORTH IN THEIR ENTIRETY:

1. COLMA TOWN HALL - Mass Grading and Site Improvements Package

Dated: October 23, 2015

- a) 100 Definition of Bid Items
- b) 03 10 00 - Concrete Forms and Accessories
- c) 03 30 00 - Cast-In-Place Concrete
- d) 07 13 00 Sheet Waterproofing
- e) 22 00 00 Plumbing Systems
- f) 31 11 00 - Clearing and Grubbing
- g) 31 14 00 - Earth Stripping and Stockpiling
- h) 31 23 00 - Excavation and Fill
- i) 31 23 33 - Trenching and Backfilling
- j) 31 25 00 - Erosion and Sedimentation Controls
- k) 31 31 19 - Vegetation Control
- l) 32 11 00 - Base Courses
- m) 33 05 13 - Manhole Grade Adjustment
- n) 33 05 16 - Utility Structures
- o) 33 46 00 – Subdrainage
- p) 33 10 00 - Water Utilities
- q) 33 40 00 - Storm Drainage Utilities
- r) Subdrainage

SECTION 100

DEFINITION OF BID ITEMS

GENERAL

The bid items listed in the Bid Schedule of the proposal are not intended to be exclusive and comprehensive descriptions of all the work categories and scope necessary to complete the project. As such, the Contractor shall determine, segregate and include in his pricing for each bid item the cost for furnishing and installing all labor, materials, tools, equipment and other incidentals necessary to complete all of the contract work involved in the project, as described by the Contract Documents, complete in place.

Unless otherwise noted, estimated quantities on the bid schedule are believed to be accurate, however, the Contractor should self-verify the quantities as it relates to ordering sufficient material and scheduling work. Actual field measured quantities, complete in place, not the quantities listed in the bid schedule, will govern final payment.

BID ITEM DESCRIPTIONS FOR BASE BID SCHEDULE A

1 - Mobilization (Bid Item No. A1)

The contract lump sum price paid for Mobilization shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for performing the scope of work as shown. Mobilization shall be measured and paid by lump sum. The Contract lump sum price for Mobilization should not exceed five percent (5%) of the total base bid contract price per schedule. Any amount bid on the bid schedule in excess of five percent (5%) shall be withheld from payment until the completion of project, to be paid as part of the final payment.

2 – Demolition, Recycling and Offhaul of fill, AC Paving, Concrete, Trees and other miscellaneous metals (Bid Item No. A2)

The contract lump sum price paid for Demolition shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for performing the scope of work as shown. The work shall include removal of existing AC, Concrete, Trees, Metals as shown on the drawings, including removal and disposal of the top two feet of existing fill under the existing AC, railing and top two feet of the existing concrete wall between Town Hall and Annex buildings and compliance with the Town's Construction and Demolition Ordinance and all other items of work necessary to prepare the site for Mass Grading. This pay item shall also include cutting and capping of storm drain and sewer laterals per the plans.

Payment for complying with the provisions for “**Demolition, Recycling and Offhaul of fill, AC Paving, Concrete, Trees and other miscellaneous metals**” shall be paid by lump sum.

3 – Underpinning of the existing 1941 Building for Zones A thru C as shown on Attachment 0 with Helical Anchors or an approved equal. (Bid Item No. A3)

The contract price paid for per linear foot of building supported as shown on Attachment 0 shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for underpinning the existing 1941 building to the enable mass grading and over-excavation to proceed. This bid item includes the review of the Geotechnical Report and other reference material in Attachments 1 and 2. Submittal of the proposed underpinning shop drawings and calculations for Town approval, and shall be submitted within 10 Days of the Notice of Award. Upon approval of the shop drawings and calculations the contractor shall install the underpinning system to support the existing 1941 Building. This item shall be completed prior to any shoring or mass excavation that will take place adjacent to the existing 1941 building.

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Payment for complying with the provisions for **“Underpinning of the existing 1941 Building along line C as shown on Sheet AX-101 with Helical Anchors or approved equal”** shall be paid per linear foot of existing 1941 building supported.

4 – Remove and Recompact Existing Fill (to 95% Relative Compaction) Below Level 1 within 5 feet of the footprint of the footing from Elevation 184 to existing grade (Bid Item No. A4)

The contract price paid per cubic yard of in place fill includes shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for the removal and recompaction of existing soils to at least 95% relative compaction within 5 feet outside of the footprint of the footing from Elevation 184 to existing grade(the restoration to existing grade will be in conjunction with work outlined in Bid Item No. A5). This contractor shall recompact the existing soil in place from Elev 182 to 184. Per Sheet C-200 Bid Schedule 1.

Payment for complying with the provisions for **“Remove and Recompact Existing Fill (to 95% Relative Compaction) Below Level 1 within 5 feet of the footprint of the footing from Elevation 184 to existing grade”** shall be paid per in-place cubic yard. Quantities are to be verified in field as agreed and signed off by the Town authorized representative and the project superintendent or other authorized representative from the contractor.

5 – Import of fill needed to replace the exported unsuitable material to restore existing grades (Bid Item No. A5)

The contract price paid per cubic yard of compacted in place (Bank Yards) imported fill shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for the import from a local source within the Town, including hauling, moisture conditioning, placement and re-compaction of import soils and compaction to at least 95% relative compaction. Import of fill needed to replace the exported unsuitable material to restore existing grades. The Import consists of approximately 2 feet of soil over same areas as bid item A4 from offsite local source. Local source as provided by the Owner. The Town has prearranged with a local source of import soil at no cost to the contractor. The borrow location is in the vicinity of Hillside and Lawndale intersection in the Town of Colma.

Payment for complying with the provisions for **“Import of fill needed to replace the exported unsuitable material to restore existing grades”** shall be paid per in-place cubic yards. Quantities are to be verified in field as agreed and signed off by the Town authorized representative and the project superintendent or other authorized representative from the contractor.

6 – Shoring Systems for Deep Excavations and Backfill as needed to prevent sloughing adjacent to excavation and beneath 1941 building. (Bid Item No. A6)

The contract price paid for per linear foot of building supported as shown on Attachment 0 shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary including submittal of shop drawing, calculations and installation of shoring system to facilitate excavation and placement of fills per drawings to existing grade.

7 – Dewatering Systems for Deep Excavations and Backfill as needed to lower groundwater table to 5 foot below bottom of excavation per geotechnical report. (Bid Item No. A7)

The contract lump sum price paid for dewatering systems shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary to dewater the site and lower the groundwater table to 5 foot below Elevation 182 (177'), the bottom of the excavation per the

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geotechnical report. The lump sum price also includes the submittal of shop drawing and calculations and testing for water quality (PH and Turbidity) prior to discharge for the dewatering system installation.

8 – Storm Drain and Sewer Improvements (Bid Item Nos. A8 through A14)

The contract price paid for Storm Drain and Sewer Improvements shall include full compensation for performing the scope of work including but not necessarily limited to, trenching and backfilling, installation of new storm drain pipe, manholes, catch basins, cleanouts, vacuum testing of manholes, pressure testing and performing a video inspection of the final in-place storm drain and sewer pipes.

9 – Site Erosion Control (Bid Item No. A6)

The contract price paid for site erosion control BMP's per sheet GX-001 shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary to eliminate any sediment laden runoff from leaving the site or entering the storm drain.

Payment for complying with the provisions for “**Site Erosion Control**” shall be paid by lump sum.

BID ITEM DESCRIPTIONS FOR BASE BID SCHEDULE B

10 – Additional Mobilization (Bid Item No. B1)

The contract lump sum price paid for Mobilization shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for performing the scope of work as shown, in addition to Base Bid Schedule A. Mobilization shall be measured and paid by lump sum. The Contract lump sum price for Mobilization should not exceed five percent (5%) of the total Base Bid Schedule B contract price. Any amount bid on the bid schedule in excess of five percent (5%) shall be withheld from payment until the completion of project, to be paid as part of the final payment.

11 – Additional Demolition, Recycling and Offhaul of fill, AC Paving, Concrete, Trees and other miscellaneous metals (Bid Item No. B2)

The contract lump sum price paid for Demolition shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for performing the scope of work as shown for Bid Schedule B. The work shall include removal of existing AC, Concrete, Trees, Metals as shown on the drawings and top two feet of existing fill under the existing AC, railing and top two feet of the existing concrete wall between Town Hall and Annex buildings and compliance with the Town's Construction and Demolition Ordinance and all other items of work necessary to prepare the site for Mass Grading.

Payment for complying with the provisions for “**Additional Demolition, Recycling and Offhaul of fill, AC Paving, Concrete, Trees and other miscellaneous metals**” shall be paid by lump sum.

12 – Underpinning of the existing 1941 Building for Zone D, as shown on Attachment 0, with Helical Anchors or an approved equal. (Bid Item No. B3)

The contract price paid for per linear foot of building supported as shown on Attachment 0 shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for underpinning the existing 1941 building to the enable mass grading and over-excavation to proceed. This bid item includes the review of the Geotechnical Report and other reference material in Attachments 1 and 2. Submittal of the proposed underpinning shop drawings and calculations for Town approval, and shall be submitted within 10 Days of the Notice of Award. Upon approval of the shop drawings and calculations the contractor shall install the underpinning system to support the existing

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1941 Building. This item shall be completed prior to any shoring or mass excavation that will take place adjacent to the existing 1941 building.

Payment for complying with the provisions for **“Underpinning of the existing 1941 Building along line C as shown on Sheet AX-101 with Helical Anchors or approved equal”** shall be paid per linear foot of existing 1941 building supported.

13 – Remove and Recompact Existing Fill (to 95% Relative Compaction) Below Level 1 within 5 feet of the footprint of the footing from Elevation 184 to existing grade (Bid Item No. B4)

The contract price paid per cubic yard of in place fill includes shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for the removal and recompaction of existing soils to at least 95% relative compaction within 5 feet outside of the footprint of the footing from Elevation 184 to existing grade (the restoration to existing grade will be in conjunction with work outlined in Bid Item No. A5). This contractor shall recompact existing soil in place from Elev 182 to 184. Per Sheet C-200 Bid Schedule 2.

Payment for complying with the provisions for **“Remove and Recompact Existing Fill (to 95% Relative Compaction) Below Level 1 within 5 feet of the footprint of the footing from Elevation 184 to existing grade”** shall be paid per in-place cubic yard. Quantities are to be verified in field as agreed and signed off by the Town authorized representative and the project superintendent or other authorized representative from the contractor.

14 – Additional import of fill needed to replace the exported unsuitable material to restore existing grades. (Bid Item No. B5)

The contract price paid per cubic yard of compacted in place (Bank Yards) imported fill shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for the import from a local source within the Town, including hauling, moisture conditioning, placement and recompaction of import soils and compaction to at least 95% relative compaction. The import consists of approximately 2 feet of soil over same areas as bid item B4 from offsite local source. Local source as provided by the Owner. The Town has prearranged with a local source of import soil at no cost to the contractor. The borrow location is in the vicinity of Hillside and Lawndale intersection in Town of Colma.

Payment for complying with the provisions for **“Additional Import of fill needed to replace the exported unsuitable material to restore existing grades”** shall be paid per in-place cubic yards. Quantities are to be verified in field as agreed and signed off by the Town authorized representative and the project superintendent or other authorized representative from the contractor.

15 – Additional Shoring Systems for Deep Excavations and Backfill as needed to prevent sloughing adjacent to excavation and beneath 1941 building. (Bid Item No. B6)

The contract price paid for per linear foot of building supported as shown on Attachment 0 shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary including submittal of shop drawing, calculations and installation of shoring system to facilitate excavation and placement of fills per drawings to existing grade.

16 – Additional Dewatering Systems for Deep Excavations and Backfill as needed to lower groundwater table to 5 foot below bottom of excavation per geotechnical report. (Bid Item No. B7)

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The contract lump sum price paid for dewatering systems shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary to dewater the site and lower the groundwater table to 5 foot below Elevation 182 (177'), the bottom of the excavation per the geotechnical report. The lump sum price also includes the submittal of shop drawing and calculations and testing for water quality (PH and Turbidity) prior to discharge for the dewatering system installation.

17 – Additional Site Erosion Control (Bid Item No. B8)

The contract price paid for site erosion control BMP's per sheet GX-001 shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary to eliminate any sediment laden runoff from leaving the site or entering the storm drain for this additional area.

Payment for complying with the provisions for “**Site Erosion Control**” shall be paid by lump sum.

BID ITEM DESCRIPTIONS FOR BID SCHEDULE 1

18 – Additional Mobilization (Bid Item No. 1.1)

The contract lump sum price paid for Mobilization shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for performing the scope of work as shown. Mobilization shall be measured and paid by lump sum. The Contract lump sum price for Mobilization should not exceed five percent (5%) of the total Bid Schedule 1 contract price. Any amount bid on the bid schedule in excess of five percent (5%) shall be withheld from payment until the completion of project, to be paid as part of the final payment.

19 – Concrete Retaining Walls and Footings Type A Including water proofing, reinforcing strip and backdrain system, and cleanout installation (Bid Item No. 1.2)

The contract price paid for per linear foot of Type A retaining wall and footings installed as shown on Attachment AX-101 as shown in Level 0 - plan - Schedule 1 shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for the installation of the wall system. The linear foot price also includes the installation of water proofing, rebar, forming, reinforcing strips and backdrain system, pipes, rock, fabric and cleanouts.

Payment for complying with the provisions for “**Concrete Retaining Walls and Footings Type A Including water proofing, reinforcing strip and backdrain system, and cleanout installation**” shall be paid per linear foot of retaining wall installed.

20 – Concrete Retaining Walls and Footings Type B, Including water proofing, reinforcing strip and backdrain system, and cleanout installation (Bid Item No. 1.3)

The contract price paid for per linear foot of Type B retaining wall and footings installed as shown on Attachment AX-101 as shown in Level 0 - plan – Bid Schedule 1 shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for the installation of the wall system. The linear foot price also includes the installation of water proofing, rebar, forming, reinforcing strips and backdrain system, pipes, rock, fabric and cleanouts.

Payment for complying with the provisions for “**Concrete Retaining Walls and Footings Type B Including water proofing, reinforcing strip and backdrain system, and cleanout installation**” shall be paid per linear foot of retaining wall installed.

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21 – Concrete Retaining Walls and Footings Type C, Including water proofing, reinforcing strip and backdrain system, and cleanout installation (Bid Item No. 1.4)

The contract price paid for per linear foot of Type B retaining wall and footings installed as shown on Attachment AX-101 as shown in Level 0 - plan – Bid Schedule 1 shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for the installation of the wall system. The linear foot price also includes the installation of water proofing, rebar, forming, reinforcing strips and backdrain system, pipes, rock, fabric and cleanouts.

Payment for complying with the provisions for “**Concrete Retaining Walls and Footings Type C Including water proofing, reinforcing strip and backdrain system, and cleanout installation**” shall be paid per linear foot of retaining wall installed.

22 – Import of fill needed to fill from grade to pad elevations as shown on plan after wall installations. This item also includes fill of over-excavation areas as indicated on Sheet C-200 Bid Schedule 1. Source of fill is from a local source as provided by the Owner. (Bid Item No. 1.5)

The contract price paid per cubic yard of compacted in place (Bank Yards) imported fill shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for the import from a local source within the Town, including hauling, moisture conditioning, placement and re-compactation of import soils and compaction to at least 95% relative compaction. Local source as provided by the Owner. The Town has prearranged with a local source of import soil at no cost to the contractor. The borrow location is in the vicinity of Hillside and Lawndale intersection in Town of Colma.

Payment for complying with the provisions for “**Import of fill needed to replace the exported unsuitable material to restore existing grades**” shall be paid per in-place cubic yards. Quantities are to be verified in field as agreed and signed off by the Town authorized representative and the project superintendent or other authorized representative from the contractor.

BID ITEM DESCRIPTIONS FOR BID SCHEDULE 2

23 – Additional Mobilization (Bid Item No. 2.1)

The contract lump sum price paid for Mobilization shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for performing the scope of work as shown. Mobilization shall be measured and paid by lump sum. The Contract lump sum price for Mobilization should not exceed five percent (5%) of the total Bid Schedule 1 contract price. Any amount bid on the bid schedule in excess of five percent (5%) shall be withheld from payment until the completion of project, to be paid as part of the final payment.

24 – Concrete Retaining Walls and Footings Type B, Including water proofing, reinforcing strip and backdrain system, and cleanout installation (Bid Item No. 2.2)

The contract price paid for per linear foot of Type B retaining wall and footings installed as shown on Attachment AX-101 as shown in Level 0 - plan – Bid Schedule 1 shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for the installation of the wall system. The linear foot price also includes the installation of water proofing, rebar, forming, reinforcing strips and backdrain system, pipes, rock, fabric and cleanouts.

Payment for complying with the provisions for “**Concrete Retaining Walls and Footings Type B Including water proofing, reinforcing strip and backdrain system, and cleanout installation**” shall be paid per linear foot of retaining wall installed.

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25 – Import of fill needed to fill from grade to pad elevations as shown on plan after wall installations. This item also includes fill of over-excavation areas as indicated on Sheet C-200 Bid Schedule 2. Source of fill is from a local source as provided by the Owner. (Bid Item No. 2.3)

The contract price paid per cubic yard of compacted in place (Bank Yards) imported fill shall include full compensation for furnishing all labor, material and equipment and other incidentals necessary for the import from a local source within the Town, including hauling, moisture conditioning, placement and re-compaction of import soils and compaction to at least 95% relative compaction. Local source as provided by the Owner. The Town has prearranged with a local source of import soil at no cost to the contractor. The borrow location is in the vicinity of Hillside and Lawndale intersection in Town of Colma.

Payment for complying with the provisions for “**Import of fill needed to replace the exported unsuitable material to restore existing grades**” shall be paid per in-place cubic yards. Quantities are to be verified in field as agreed and signed off by the Town authorized representative and the project superintendent or other authorized representative from the contractor.

END OF SECTION 100

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.
- B. Openings for other work.
- C. Form accessories.
- D. Form stripping.

1.3 RELATED REQUIREMENTS

- A. Section 03 20 00 - Concrete Reinforcing.
- B. Section 03 30 00 - Cast-In-Place Concrete.
- C. Section 05 12 00 - Structural Steel Framing.
- D. Section 31 23 16 - Excavation: Shoring and underpinning for excavation.

1.4 REFERENCE STANDARDS

- A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010.
- B. ACI 301 - Specifications for Structural Concrete; American Concrete Institute International; 2010 (Errata 2012).
- C. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute; 2011.
- D. ACI 347 - Guide to Formwork for Concrete; American Concrete Institute; 2004.
- E. PS 1 - Structural Plywood; 2009.

1.5 SUBMITTALS

- A. See Division 1 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate pertinent dimensions, materials, bracing, blockouts, locations of chamfer and reveal strips, locations of pour pockets, locations and methods for supporting other structural work, proposed construction joint locations, and arrangement

of joints and ties. Drawings are to be prepared by, signed and sealed by a Professional Engineer registered in the State of California.

- C. Shoring Drawings: All shoring and re-shoring drawings are to be prepared by, signed and sealed by a Professional Engineer registered in the State of California.

1.6 QUALITY ASSURANCE

- A. Designer Qualifications: Design formwork under direct supervision of a Professional Engineer experienced in design of concrete formwork and licensed in California.

PART 2 - PRODUCTS

2.1 FORMWORK - GENERAL

- A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.
- B. Design and construct to provide resultant concrete that conforms to design with respect to shape, lines, and dimensions.
- C. Chamfer outside corners of beams, joists, columns, and walls, unless otherwise indicated on drawings.
- D. Comply with applicable State and local codes with respect to design, fabrication, erection, and removal of formwork.
- E. Comply with relevant portions of ACI 347, ACI 301, and ACI 318.

2.2 WOOD FORM MATERIALS

- A. Form Materials: At the discretion of the Contractor.

2.3 FORMWORK ACCESSORIES

- A. Form Ties: Snap-off type, galvanized metal, fixed length, cone type, with waterproofing washer, 1-1/2 inch back break dimension, free of defects that could leave holes, fractures, spalls, or other surface defects larger than 1 inch in concrete surface.
- B. Form Release Agent: Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, compatible with concrete and form materials, and not requiring removal for satisfactory bonding of coatings to be applied.
 - 1. Composition: Colorless reactive, mineral oil-based, soy-based, or vegetable-oil based compound.
 - 2. Do not use materials containing diesel oil or petroleum-based compounds.
 - 3. VOC Content: In compliance with applicable local, State, and federal regulations.

- C. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
- D. Embedded Anchor Shapes, Plates, Angles and Bars: As specified in Section 05 12 00.
- E. Foam Tape: 1/8 inch tick adhesive backed closed cell PVC foam tape with tape width corresponding to edge thickness of plywood.
- F. Waterstops: Rubber, minimum 1,750 psi tensile strength, minimum 50 degrees F to plus 175 degrees F working temperature range, _____ inch wide, maximum possible lengths, ribbed profile, preformed corner sections, heat welded jointing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.
- B. Verify earth form excavations are neatly and accurately cut.

3.2 EARTH FORMS

- A. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.

3.3 ERECTION - FORMWORK

- A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.
- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
- C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- D. Align joints and make watertight. Keep form joints to a minimum.
- E. Obtain approval before framing openings in structural members that are not indicated on drawings.
- F. Install void forms in accordance with manufacturer's recommendations. Protect forms from moisture or crushing.
- G. Coordinate this section with other sections of work that require attachment of components to formwork.
- H. Do not reuse formwork with patches or repairs that would result in adverse effects to exposed concrete.

- I. Verify that reinforcing steel has specified concrete cover over reinforcement and has been inspected prior to concealing with formwork.

3.4 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.5 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Provide formed openings where required for items to be embedded in passing through concrete work.
- B. Locate and set in place items that will be cast directly into concrete.
- C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
- D. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Install waterstops in accordance with manufacturer's instructions, so they are continuous without displacing reinforcement. Heat seal joints so they are watertight.
- F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- G. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.6 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
 1. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

3.7 FORMWORK TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI 117, unless otherwise indicated.

3.8 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control inspection, as specified in Division 1.
- B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.

3.9 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Form and Shoring Removal:
 - 1. Forms for walls: 3 days.
 - 2. Forms for footings and grade beams: 2 days.
- C. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- D. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Concrete for composite floor construction.
- B. Elevated concrete slabs.
- C. Floors and slabs on grade.
- D. Concrete foundations.
- E. Concrete walls.
- F. Joint devices associated with concrete work.
- G. Miscellaneous concrete elements, including equipment pads and curbs.
- H. Concrete curing.

1.3 RELATED REQUIREMENTS

- A. Section 03 10 00 - Concrete Forms And Accessories.
- B. Section 03 20 00 - Concrete Reinforcing.

1.4 REFERENCE STANDARDS

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2002).
- B. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete; American Concrete Institute International; 1998 (Reapproved 2004).
- C. ACI 301 - Specifications for Structural Concrete; American Concrete Institute International; 2010 (Errata 2012).
- D. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (Errata 2007).
- E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.
- F. ACI 304.2R - Placing Concrete by Pumping Methods; 1996.

- G. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 2010.
- H. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 2010.
- I. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).
- J. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.
- K. ASTM C 31 - Standard Method of Making and Curing Concrete Test Specimens in the Field. 2003.
- L. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.
- M. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2014.
- N. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2014.
- O. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2013.
- P. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2012.
- Q. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
- R. ASTM C 157/C 157M - Standard Test Method for Length Change of Hardened Hydraulic-Cement, Mortar, and Concrete; 2004.
- S. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2007.
- T. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2014.
- U. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.
- V. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
- W. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2014.
- X. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2013.
- Y. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2012.

- Z. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2011.
- AA. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2010.
- AB. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014.
- AC. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2012.
- AD. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
- AE. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 1996 (Reapproved 2008).
- AF. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2011.

1.5 SUBMITTALS

- A. See Division 1 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's data on manufactured products, curing material, slab treatments, evaporation reducing compound and joint fillers showing compliance with specified requirements.
 - 1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
- C. Certified Mix Design: Submit for each type and strength of concrete, at least 4 weeks prior to placement.
 - 1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
 - 2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.
 - 3. Include results of testing or test data used to establish mix proportions. This is to include unit weight, slump, shrinkage, and compression test reports. Mix designs to be prepared, stamped and signed by a Professional Engineer registered in the State of California.
- D. Samples: Submit samples of underslab vapor barrier to be used.
- E. Samples: Submit as required by Owner's Testing Agency or Architect.

- F. Placement Schedule: Submit plans and schedule of concrete placement operations prior to commencement of work. Indicate locations of construction joints.
- G. Certificates of Compliance:
 - 1. Cement.
 - 2. Aggregates.
 - 3. Admixtures.
 - 4. Color Pigments.
- H. Proposed construction joint locations.
- I. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

1.6 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
 - 1. Maintain one copy of each document on site.
- B. Manufacturer Qualifications:
 - 1. A firm experienced in manufacturing ready mixed concrete products complying with ASTM C 94 and requirements for production facilities and equipment.
 - 2. Manufacturer to be certified according to the National Ready Mixed Concrete Association certification for ready mixed concrete production facilities.
- C. Placement and Finishing contractor to have a minimum of five year's experience with similar types of projects.

PART 2 - PRODUCTS

2.1 FORMWORK

- A. Comply with requirements of Section 03 10 00.

2.2 REINFORCEMENT

- A. Comply with requirements of Section 03 20 00.

2.3 CONCRETE MATERIALS

- A. Cement: ASTM C 150, Type I - Normal or Type II - Moderate Portland type.
 - 1. Acquire all cement for entire project from same source.

- B. Fine and Coarse Aggregates: ASTM C 33. Cleanliness not to be less than 75 when tested in accordance with California Test 217 for Fine Aggregates or California Test 227 for Coarse Aggregates.
 - 1. Acquire all aggregates for entire project from same source.
- C. Lightweight Aggregate: ASTM C330/C330M.
 - 1. Coarse Aggregate to be rotary kiln-expanded shale or clay having surface scaled by firing.
 - 2. Fine Aggregate to be a blend of natural sand and lightweight fines.
- D. Fly Ash: ASTM C618, Class F.
- E. Calcined Pozzolan: ASTM C618, Class N.
- F. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.
- G. Color Additives: Pure, concentrated mineral pigments specifically intended for mixing into concrete and complying with ASTM C979.
 - 1. Color(s): To match Architect's sample(s) when incorporated into specified mix design(s).
- H. Water: Clean and not detrimental to concrete.

2.4 ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Admixtures to be compatible with all other components in the mix.
- C. Admixtures are to be included in the mix used to establish the mix design.
- D. Air Entrainment Admixture: ASTM C260/C260M.
- E. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
- F. Water Reducing Admixture: ASTM C494/C494M Type A.
- G. Shrinkage Reducing Admixture: ASTM C 494/C 494M, ASTM C 157
 - 1. Acceptable Products:
 - a. Eclipse; Grace Construction Products: www.na.graceconstruction.com.
 - b. Substitutions: See Section 01600 - Product Requirements.

2.5 ACCESSORY MATERIALS

- A. Underslab Vapor Barrier: Multi-layer plastic extrusion or equivalent, complying with ASTM E 1745, Class A, 0.38mm (15mil) or greater; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single ply polyethylene is prohibited.
1. Permeance: 0.01 perms [grains/(ft² · hr · inHg)] maximum as tested in accordance with ASTM E 1745 Section 7. Provide independent testing data showing compliance.
 2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations in vapor retarder.
 3. Products:
 - a. Stego Industries, LLC; Stego Wrap Vapor Barrier 15-mil (Class A): www.stegoindustries.com.
 - b. W.R. Meadows, Inc.; PERMINATOR Class A - 15 mils: www.wrmeadows.com.
- B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
1. ASTM C1107/C1107M; Grade A, B, or C.
 2. Minimum Compressive Strength at 48 Hours, ASTM C109/C109M: 2,000 pounds per square inch.
 3. Minimum Compressive Strength at 28 Days, ASTM C109/C109M: 7,000 pounds per square inch.
 4. Flowable Products:
 - a. Five Star Products, Inc; Five Star Fluid Grout 100: www.fivestarproducts.com.
 - b. Masterflow 713 Plus; Degussa Building Systems: www.chemrex.com.
 - c. Five Star Grout; Five Star Products, Inc.: www.fivestarproducts.com.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.

2.6 BONDING AND JOINTING PRODUCTS

- A. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
- B. Joint Filler: Nonextruding, resilient asphalt impregnated fiberboard, felt, or cork, complying with ASTM D 1751, 1/4 inch thick and 4 inches deep unless otherwise indicated; tongue and groove profile.

2.7 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
 - 1. Use admixtures as necessary to produce concrete of a consistency that will allow thorough compaction of the concrete into corners and around reinforcing without excessive puddling, spading or vibration, and without permitting the materials to segregate or free water to collect on the surface. Produce dense and uniform concrete free from rock pockets, honeycomb and other irregularities.
 - 2. Contractor to review and approve the proposed concrete mix designs for compatibility with placing requirements to insure that the concrete as designed can be placed in accordance with the Drawings and Specifications.
- B. Proportioning Structural Lightweight Concrete: Comply with ACI 211.2 recommendations.
- C. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience, as specified in ACI 301. Mix design to be prepared by a licensed Professional Engineer.
- D. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
- E. Cements and aggregates to have a proven history of successful use together. Alternatively submit evidence satisfactory to Architect that aggregate will not react harmfully in presence of alkalis in cement.
- F. Normal Weight Concrete:
 - 1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: As indicated on drawings.
 - 2. Fly Ash Content: Minimum 25 percent and maximum 50 percent of cementitious materials by weight.
 - 3. Calcined Pozzolan Content: Maximum 20 percent of cementitious materials by weight.
 - 4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
 - 5. Water-Cement Ratio: Maximum 45 percent by weight.
 - 6. Dry Unit Weight: Minimum 144 lbs per cubic foot and maximum of 150 lbs per cubic foot.
 - 7. Total Air Content: 6 percent maximum, determined in accordance with ASTM C 173/C 173M..
 - 8. Admixtures: High Range Water Reducer at contractors option.
 - 9. Maximum Slump at point of placement: 4 inches.
 - a. Maximum Slump With Water Reducing Admixture: 8 inches.

10. Minimum Slump at point of placement: 1 inch.
11. Maximum Aggregate Size: 1 inch.
12. Drying Shrinkage:
 - a. Typical: Maximum 0.050 percent unless otherwise indicated.
 - b. Slabs-on-Grade and Suspended Slabs: Maximum 0.045 percent.
 - c. Shrinkage Reducing Admixture: Provide as required to attain maximum drying shrinkage when adequate shrinkage data for concrete mix design is not available.

G. Structural Lightweight Concrete:

1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
2. Water-Cement Ratio: Maximum 45 percent by weight.
3. Total Air Content: 5 percent maximum, determined in accordance with ASTM C 173/C 173M.
4. Maximum Slump: 3 inches.
5. Maximum Aggregate Size: 1 inch.
6. Maximum dry unit weight: ____ lb per cubic foot.

- H. Patching Mortar: Mix in proportions by volume of one-part cement to two parts water. Substitute white cement for part of cement as necessary to produce color matching surrounding concrete.

2.8 MIXING

- A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
1. Colored Concrete: Add pigments in strict accordance with manufacturer's instructions to achieve consistent color from batch to batch.
- B. Transit Mixers: Comply with ASTM C94/C94M.

2.9 SOURCE QUALITY CONTROL

- A. An independent testing agency will perform source quality control review, as specified in Division 1.
- B. Review mix designs and certificates of compliance for materials Contractor proposes to use.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.2 PREPARATION

- A. Verify that forms are clean and free of rust before applying release agent.
- B. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- C. Roughen surfaces of previously placed and existing concrete to 1/4 inch amplitude by heavy sand-blasting, waterblasting or bush-hammering. Prior to receiving concrete, clean surfaces of dust and debris using compressed air or water.
- D. Clean surfaces of reinforcement and forms previously coated with cementitious materials by wire brushing or other acceptable means.
- E. Thoroughly wet all concrete and wood forms before application of concrete. Do not allow free water to remain on the surface.

3.3 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Notify Architect not less than 48 hours prior to commencement of placement operations.
- D. Do not place concrete until testing agency has inspected reinforcing placement.
- E. Water may be added once to each truckload in the field provided the specified water-cement ratio is maintained.
- F. Ensure reinforcement, inserts, embedded parts, and formwork and subgrade will not be disturbed during concrete placement.
- G. Consolidate concrete in accordance with ACI 309.
- H. Maximum placement area for placing of concrete to be 10,000 square feet. Contractor to submit proposed construction joint locations.
- I. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.4 SLAB JOINTING

- A. Locate joints as indicated on the drawings.

- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

3.5 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. An independent testing agency, as specified in Section 01 40 00, will inspect finished slabs for conformance to specified tolerances.
- B. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
 - 1. Exposed to View and Foot Traffic: F(F) of 35; F(L) of 25.
 - 2. Under Thick-Bed Tile: F(F) of 20; F(L) of 15.
 - 3. Under Carpeting: F(F) of 25; F(L) of 20.
 - 4. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25.
- C. Measure F(F) and F(L) in accordance with ASTM E1155, within 48 hours after slab installation; report both composite overall values and local values for each measured section.
- D. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.
- E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.6 CONCRETE FINISHING

- A. Drypack surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Concrete Walls: Smooth formed.
- D. Concealed Concrete Surfaces: Rough Formed.
- E. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows, unless otherwise noted on architectural drawings:
 - 1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, thin set quarry tile, thin set ceramic tile, and fluid applied waterproofing.
 - 2. Other Surfaces to Be Left Exposed: "Steel trowel" as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

- a. Chemical Hardener: After slab has cured, apply water-diluted hardener in three coats per manufacturer's instructions.
3. Float surfaces that will be left exposed in non-public areas

3.7 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 1. Normal concrete: Not less than 7 days.
- C. Formed Surfaces: Cure by moist curing with forms in place. Provide curing for remainder of curing period after form removal.
- D. Surfaces Not in Contact with Forms:
 1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
 2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
 3. Final Curing: Begin after initial curing but before surface is dry.

3.8 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Division 1.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Provide full time special inspection during concrete placement.
- D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- E. Compressive Strength Tests: ASTM C 39/C 39M. For each test, mold and cure four concrete test cylinders. Obtain test samples for every 150 cu yd or less of each class of concrete placed in any one day. 1 specimen tested at 7 days, 2 specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
- F. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

- G. Concrete Temperature: Test hourly when air temperature is 40F (4C) and below, and when 80F (27C) and above; and each time a set of compression test specimens is made.
- H. Review the ticket of each batch of concrete delivered to the site for conformance.
- I. Verify proper curing procedure and applications at initial curing and final curing stages.
- J. Verify within 72 hours after placement that floor tolerances are within the limits specified herein.

3.9 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Where deficiencies are noted, the testing agency or Contractor to report defective concrete in writing to Architect within 24 hours.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing, repair and design services to be borne by Contractor when defective concrete is identified.
- D. Contractor to submit repair of defective concrete within 2 days of discovery.
- E. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

1. Positive-side, below grade sheet membrane waterproofing (pre-applied “blindsided” and/or post-applied) to vertical walls (designated on drawings as: SAWP), related accessories including drainage panel, protective cover and perforated drainage piping; coordination with other waterproofing systems where they intersect.
2. Pre-applied, blindsided sheet membrane waterproofing below slabs on-grade at locations indicated (designated on drawings as: BSWP).
3. Waterproofing membrane for elevated plaza deck, located beneath plaza paver systems.

B. Related Sections:

1. Section 03 30 00 – Cast In Place Concrete.
2. Section 07 26 00 – Vapor Retarders: Tie-in of sheet waterproofing with below-slab vapor retarders.
3. Section 07 62 00 – Sheet Metal Flashing and Trim: Coordination with perimeter flashing components.
4. Section 07 76 00 – Plaza Paver Systems: Provision of waterproofing membrane and protection course below paver systems.

1.2 REFERENCES

A. American Society for Testing and Materials International (ASTM):

1. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
2. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
3. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
4. ASTM D822 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
5. ASTM D5957 - Standard Guide for Flood Testing Horizontal Waterproofing Installations.
6. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.

1.3 SYSTEM DESCRIPTION

A. Waterproofing Systems:

1. Comply with local regulatory restrictions for Volatile Organic Compounds (VOC).
2. Prevent water or moisture migration to interior.
3. Protect surfaces noted against permeation by water from above grade.
4. Compatible with related waterproofing systems.
5. Furnish products of, or accepted by, single manufacturer for each system type furnished.

1.4 SUBMITTALS

- A. Comply with Division 1 – Submittal Procedures.
- B. Product Data. Include manufacturer's written instructions for evaluating, preparing and treating substrate, installation instructions, technical data and tested physical and performance properties of materials.
- C. Certification that manufacturer and installer meet requirements of QUALITY CONTROL article in this Section.
- D. Certification by manufacturer's representative accepting the proposed use of waterproofing materials and methods as specified under Jobsite Meeting.
- E. Submit copy of manufacturer's technical representative's field inspection reports on installation and water test inspection of sheet membrane waterproofing.
- F. Warranties: Special warranties specified in this Section.

1.5 QUALITY CONTROL

- A. Comply with Division 1 – Quality Control.
- B. Single Responsibility: Obtain waterproofing materials and accessory items through one source from a single manufacturer. Work shall be performed by single installer having undivided responsibility for providing complete work, including all components and related work, and for performance and quality of waterproofing.
- C. Acceptance is required of products of service, of proposed manufacturer and installer, and will be based upon submission of certification that:
 1. Manufacturer regularly and presently manufactures sheet membrane waterproofing as one of manufacturer's principal products.
 2. Manufacturer's product submitted has been in satisfactory and efficient use on three installations similar or equivalent to this project for three years. Submit list of installations. List shall include name and location of project and name of owner.

3. Installer has had a minimum of five years successful experience in applying sheet membrane waterproofing.
 4. Installer has been licensed or approved by sheet membrane waterproofing manufacturer, and certified by the manufacturer as having the necessary expertise to install the specified system.
- D. Contractor shall arrange for manufacturer's technical representative to be on Site to advise installer of proper procedures and precautions for use of materials and to review installation.
- 1.6 PRE-INSTALLATION MEETINGS:
- A. Required Conferences:
1. Contractor-Installer-Manufacturer Review: Contractor and installer shall review Drawings and Specifications with representative of waterproofing materials manufacturer and obtain manufacturer's agreement that selected systems are proper, compatible, and adequate for application shown and that conditions and details do not conflict with manufacturer's warranty/guaranty.
 2. Pre-Application Conference: Contractor shall arrange conference to review waterproofing work prior to actual installation.
 - a. Conference to be attended by Owner, Consultants, Contractor, and Installer, authorized representatives of accepted manufacturer, and other installers whose work may be affected by quality of waterproofing. Contractor to provide at least one week's advance notice of conference date and time.
 - b. Conference shall be held at Site and shall be conducted with accepted submittal and prior to delivering any material to Site.
 - c. Following major considerations shall be reviewed at conference:
 - i. Review in detail surface preparation, protection of adjacent surfaces, installation procedures, field quality control, and other related items.
 - ii. Review in detail project conditions, schedule, construction sequence, application requirements, and quality of completed installation.
 - iii. Review methods for storing and handling materials.
 - iv. Review in detail means of protecting completed work during remainder of construction period.
 - v. Record discussions of conference and any conflict, incompatibility, or inadequacy, and furnish a copy of record to each participant.
 - vi. Meeting notes of this conference will be produced by Contractor that will record discussions of conference and any conflict, incompatibility, or inadequacy and they will indicate that installer of waterproofing has reviewed and accepted substrates for waterproofing. Distribute meeting notes to attendees prior to installation of waterproofing.

vii. Flood testing.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle packaged materials in original containers with seals unbroken and labels intact until time of use.
- B. Discharge materials carefully and store on clean concrete surface or raised platform in safe, dry area at temperatures above 40 and below 75 degrees F. Do not dump onto ground.
- C. Remove and replace materials that cannot be applied within their stated shelf life.
- D. Store rolls according to manufacturer's written instructions and protect materials from direct sunlight.

1.8 PROJECT CONDITIONS

- A. Environmental Requirements: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to damp or wet substrate.
 - 1. Do not apply waterproofing in snow, rain, fog or mist.
 - 2. Apply waterproofing within range of ambient and substrate temperatures recommended by manufacturer.

- B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.9 SCHEDULING

- A. Schedule work such that membrane will not be left exposed to weather for longer than time period recommended by manufacturer.
- B. Schedule installation immediately prior to installation of wearing surfaces.

1.10 WARRANTY

- A. Manufacturer Warranty: Warrant sheet waterproofing system, including related and integral flashings, watertight and weather-tight for period of 10 years from Substantial Completion.
- B. Contractor Warranty: Furnish a two year written performance warranty, countersigned by the waterproofing installer that the installed systems shall not deteriorate or fail to perform as a result of workmanship.

PART 2 - PRODUCTS

2.1 SHEET WATERPROOFING

- A. Manufacturers: Furnish products of one of the following or approved equal:
 - 1. Grace Construction Products
 - 2. Polyguard Products
- B. System Description: Waterproofing membrane products for blind-side and/or post-applied applications. Component products and Accessories identified below are products of Grace Construction for clarification of specification basis.

2.2 COMPONENTS

- A. Post-Applied Sheet Waterproofing Membrane (designated on drawings as: SAWP): Self-adhesive, cold-applied, composite HDPE membrane; minimum 1.5mm (0.056 inch) thick; black color; conforming to following criteria:

Properties	Test	Results
Tensile Strength, Membrane	ASTM D412	2240 kPa (325 lbs/in ²) minimum
Elongation, Rubberized Asphalt Ultimate Failure	ASTM D412	300% minimum
Puncture Resistance, Membrane	ASTM E154	222N (50 lbs) minimum
Peel Strength	ASTM D903	1576 N/m (9 lbs/in) minimum
Water Absorption	ASTM D570	0.1% maximum
Water Vapor Permeance (perms)	ASTM E96 Water Method	2.9 ng/m ² sPa (0.05 perms) maximum
Resistance to Hydrostatic Head	ASTM D5385	70 m (210 ft) water

- 1. Design Basis Product: “Bituthene 4000”

- B. Below-Slab, Blind-Side Waterproofing Membrane (designated on drawings as: BSWP): Pressure-sensitive self-adhering, blind-side composite HDPE membrane with protective release liner; minimum 1.2mm thick; conforming to following criteria:

Properties	Test	Results
Tensile Strength, Membrane	ASTM D412	4000 psi minimum
Elongation, Rubberized Asphalt Ultimate Failure	ASTM D412	500% minimum
Puncture Resistance, Membrane	ASTM E154	220 lbs minimum
Peel Strength	ASTM D903	5 lbs/inch minimum
Water Absorption	ASTM D570	0.5% maximum
Water Vapor Permeance (perms)	ASTM E96 Water Method	0.01 perms maximum
Resistance to Hydrostatic Head	ASTM D5385	230 feet water minimum

- 1. Basis of Specification: “Preprufe 300R”.
- 2. Pre-formed Corners: Furnish for all inside and outside corners, including slab-edge upturns.

2.3 ACCESSORIES

- A. Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
- B. Drainage Panel / Protection Course:
 - 1. Vertical Applications: Provide sheet membrane manufacturer's standard or recommended product. Minimum 9.5 mm (0.375 inch) thick composite drainage sheet system with hollow core protected with filter fabric cover sheet. Design Basis Product: "Hydroduct 220".
 - 2. Horizontal Applications: Provide sheet membrane manufacturer's standard or recommended high impact product. Minimum 9.5 mm (0.375 inch) thick composite drainage sheet system with hollow core protected with filter fabric cover sheet. Minimum compressive strength: 18,000 lbs/ft². Design Basis Product: "Hydroduct 660".
- C. Primer (Surface Conditioner): Sheet membrane manufacturer's water-based latex standard or recommended product to bind site dust and concrete efflorescence. Shall dry quickly and slightly tacky. Design Basis Product: "Bituthene Primer B2 LVC".
- D. Deck Preparation: Sheet membrane manufacturer's recommended deck levelling and repair material for elevated plaza decks. Design Basis Product: "Bituthene Deck Prep".
- E. Liquid Membrane: Two component, elastomeric, cold-applied trowel-grade material. Grace Construction Products' "Bituthene Liquid Membrane" as required for Grace system.
- F. Sheet Strips: Self-adhering, rubberized asphalt sheet strips of same material and thickness as waterproofing.
- G. Metal Termination Bars: Manufacturer's standard pre-punched extruded aluminum bars, or, aluminum bars approximately 1- by 1/8-inch thick, predrilled holes at 9-inch centers.
- H. Fasteners: Waterproofing manufacturer's standard fasteners or as recommended by waterproofing manufacturer.
- I. Perforated Drainage Piping: Perforated corrugated high density polyethylene tubing for sub-drainage applications, meets or exceeds requirements of ASTM D1248 Type III, Category 4 or 5, Grade P33 or P34, Class C, 4-inches diameter. Oxford Plastics Inc.; ADS; or accepted equal.
- J. Geotextile (Filter Fabric): Polyolefin or polyester fabric, non-woven, formed into sock or sleeve, water pervious type. TenCate's "Mirifi 140N"; Carriff Engineered Fabrics' "Drain Sleeve Filter"; or accepted equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General: Inspect and remove from surfaces to receive waterproofing all dirt, debris, grease, oil, form releasing agents, paints and other penetrating contaminants. Verify that penetrations and projections through the substrate have been installed. Remove fins, ridges, mortars and other projections and fill honeycomb, aggregate pockets, and other voids, and verify that concrete substrate and patches have cured a sufficient length of time in accordance with membrane manufacturer's recommendations but in no case less than seven days.
- B. Satisfactory Conditions: Do not commence installation until conditions are satisfactory to manufacturer of primary waterproofing membrane, as certified in writing. Start installation only in presence of manufacturer's representative.

3.2 PREPARATION – POST-APPLIED SHEET WATERPROOFING

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
- E. Prepare, fill, prime, and treat voids, joints and cracks in substrates as recommended by sheet membrane waterproofing manufacturer. Remove dust and dirt from joints and cracks according to ASTM D4258.
 - 1. Install sheet strips and center over treated construction and contraction joints and cracks exceeding width of 1/16-inch as instructed by sheet membrane manufacturer.
- F. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D6135.
- G. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D6135.

3.3 POST-APPLIED SHEET WATERPROOFING MEMBRANE INSTALLATION

- A. General: Comply with specifications and installation instructions in manufacturer's published literature.
 - 1. Install two complete layers of sheet waterproofing at elevated decks with plaza paver systems located over interior space below. Waterproofing membranes

shall be installed over deck preparation product applied directly to concrete or plywood substrate.

- B. Prime concrete surfaces immediately prior to application of tapes and pressure sensitive waterproofing accessories. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Re-prime areas exposed for more than 24 hours.
- C. Install self-adhering sheets according to waterproofing manufacturer's written instructions and recommendations in ASTM D6135.
- D. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 6-inch minimum lap widths and end laps. Overlap and seal seams and stagger end laps to ensure watertight installation.
 - 1. When ambient and substrate temperatures range between 25- and 40- degrees F, install self-adhering, rubberized-asphalt sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60-degrees F.
 - 2. Seal all laps with Liquid Membrane.
 - 3. Hand roll all laps and strips to ensure full adhesion.
- E. Apply continuous sheets over sheet strips bridging substrate cracks, construction, and contraction joints.
- F. Seal exposed edges of sheets at terminations not concealed by metal counterflashings or ending in reglets with mastic or sealant.
- G. Install sheet waterproofing and auxiliary materials to tie into adjacent waterproofing. Use pre-formed corners at blind-side slab edges and furnish adequate upturn for 6 inch lap of positive-side membrane material.
- H. Terminate top edge of membrane with termination bar.
 - 1. At fasteners installed to concrete, pre-drill fastener penetrations to minimize spalling at substrate.
 - 2. Fasten at 9-inch on center with accepted fasteners.
 - 3. Coat top edge and termination bar with 90-mil application of liquid membrane.
- I. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheets extending 6 inches beyond repaired areas in all directions.
- J. Correct deficiencies in or remove sheet waterproofing that does not comply with requirements, repair substrates, reapply waterproofing, and repair sheet flashings.

- K. Projection Treatment: Apply liquid membrane and 9-inch detail sheet around pipes and similar projections at least 2-1/2 inches in all directions.
- L. Penetrations: Cut holes to fit tightly around penetrations and apply collar flashing.
- M. Protrusions: Apply two layers of membrane around protrusions and drains at least 6 inches in all directions and seal with mastic.
- N. Repair tears, punctures, air blisters, and inadequately lapped seams, in accordance with the manufacturer's instructions before or protection board is applied.
 - 1. Damage or Puncture of Modified Bituminous Sheet Membrane: Install patch of short membrane set in liquid membrane. Patch must extend 3-inches in every direction around extent of damaged area. Install waterproofing tape centered over edge of the patch. If damaged areas does not have 5-inches of sound material around it, inject liquid membrane into puncture until liquid membrane backs out, and proceed with patch as space allows.
 - 2. Scratch on White Coating Exposing Underlying Black Surfacing of Sheet Membrane: Install waterproofing tape at areas where white coating of membrane is damaged, including boot scuff marks and abrasion by rebar.
- O. Install composite drainage panel / protection course over vertical and horizontal waterproofing membrane applications per manufacturer's directions. Do not install until after successful flood testing specified in Field Quality Control, where required.

3.4 PRE-APPLIED BELOW SLAB SHEET WATERPROOFING INSTALLATION

- A. General: Comply with specifications and installation instructions in manufacturer's published literature.
- B. Examine substrate to ensure that it is sound so as to eliminate movement during concrete placement. Remove any standing water and eliminate sharp protrusions and loose aggregate.
- C. Place the membrane with HDPE film side to the substrate. Stagger end laps to avoid build-up and leave plastic release liner in place until overlap procedure is completed.
- D. Lap the previous sheet 3 inches along marked selvedge. Do not lap sheets unless underside of the succeeding sheet is clean, dry and free from contamination. Peel back release liner between the overlap as the two layers are bonded together. Ensure a continuous bond is achieved without creases and roll firmly with heavy roller.
- E. Completely remove liner to expose the protective coating.
- F. Penetrations: Grout around the penetrant if not stable. Scribe membrane tight to the penetrant. Apply manufacturer's detailing tape to cover gaps exceeding 1/4-inch. Apply Liquid Membrane around the penetration using a fillet to provide a watertight seal between membrane and tape. Remove any liner from the tape.

- G. Perimeters: Install membrane beyond perimeter of slab and/or footings to leave “tail” with length adequate to permit a minimum of 6-inch overlap at tie-in with post-applied vertical waterproofing system per Drawings and manufacturer’s standard recommendations.
- H. Repair damaged areas by wiping clean with a damp cloth and allowing to dry prior to installing manufacturer’s detailing tape. Remove any liner from the tape.

3.5 PROTECTION

- A. Protect waterproofing from damage and wear during remainder of construction period.
- B. Protection installed membrane, drainage panels and protection boards from damage due to UV light, harmful weather exposure, physical abuse and other causes. Provide temporary coverings where material will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer for affected construction.

3.6 FIELD QUALITY CONTROL

- A. Contractor shall provide all inspections required from the manufacturer for the specified warranty. Engage full-time site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions; surface preparation; membrane application, flashings, protection, and drainage components; and to furnish daily reports to Contractor and Owner.
- B. Horizontal Post-Applied Sheet Waterproofing Membrane Testing: Furnish flood test, in conformance with ASTM D5957, of each installation of waterproofing assembly located over habitable space for leaks after waterproofing installation and before protection course and overlaying construction are installed. Plug or dam drains and fill with water to a depth of 2-inches across entire area. Keep separate container of water to similar depth nearby to establish evaporation rates. Flood each area for 48 hours.
 - 1. Correct deficiencies as specified herein and re-test plaza deck areas at no additional cost to Owner as necessary to determine compliance with requirements for a watertight assembly.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. All materials and operations for a complete and operating plumbing and drainage system, including, but not necessarily limited to, the following:
 1. Soil, waste, and vent piping systems inside the building to connections to existing piping.
 2. Cold water and hot water piping systems inside the building to connections to existing piping.
 3. Natural gas piping system inside the building to connections to existing piping.
 4. Condensate drain piping systems.
 5. Plumbing fixtures and trim, including required backing.
 6. Connection to mechanical equipment.
 7. Trenching and backfilling required for plumbing systems.

1.3 RELATED SECTIONS

- A. Heating, Ventilating & Air Conditioning Systems, Section 23 00 00.
- B. Electrical, Division 26.
- C. Earthwork, Division 31.

1.4 GENERAL REQUIREMENTS

- A. Verification of Conditions
 1. Prior to installation of plumbing work, Contractor shall inspect all surfaces to receive said work and arrange with the general Contractor for the satisfactory correction of all defects in workmanship and/or material that could interfere with the work specified herein.
 2. Installation of any plumbing work or materials on any surface shall constitute acceptance by the Contractor of such surfaces as being in proper condition to receive herein specified materials.
- B. Examination of site: Examine site prior to bidding. Compare it with drawings and specifications. Check conditions and take measurements, which may affect work. No allowance shall subsequently be made for any extra expense due to failure to make such examination.

- C. Manufacturer's directions: Follow manufacturer's directions covering points not shown on the drawings or specified herein. Manufacturer's directions do not take precedence over drawings and specifications. Where these are in conflict with drawings and specifications, notify Architect for clarifications before installing the work.
- D. Codes: Work and materials shall be in full accordance with all applicable local or state ordinances, California Building Code, California Plumbing Code, National Fire Protection Association, State of California Safety Orders, and State Fire Marshal. Whenever drawings and specifications require larger sizes or higher standards than are required by regulations, drawings and specifications govern. Whenever drawings or specifications require something, which will violate regulations, regulations govern. No extra charge will be paid for furnishing items required by regulations but not specified or shown on drawings.
- E. Cooperation with other trades: Schedule work and cooperate with other divisions to avoid delays, interferences and unnecessary work, conforming to construction schedule, making installation when and where required. A special effort shall be made to coordinate with the mechanical Contractor so as not to block installation of the mechanical systems. The clearances above ceilings on this project are limited and the ductwork and piping are to have the highest priority. All plumbing work is to be coordinated with the mechanical Contractor such that the ductwork and piping can be installed in the locations shown on the mechanical drawings. If installed work is later found to interfere with work of other divisions, make all necessary changes at Contractor's expense.
- F. Licenses, permits, services, and fees: Secure and pay for all licenses required to begin, perform, and complete work.
- G. Quietness of operation: Adjust, repair, or replace any equipment producing objectionable noise or vibration in any occupied areas of building, including providing additional brackets, bracing, etc., to prevent objectionable noise or vibration.
- H. All components of the cold water system are to be in full compliance with CA AB 1953.

1.5 SUBMITTALS

- A. General:
 - 1. Refer also to Division 01 for additional submittal requirements.
 - 2. When specific names are used in connection with materials, they are used as standards only, but this implies no right to use other materials or methods unless approved by the Architect.
 - 3. Decision of the Architect shall govern as to what materials are acceptable substitutions. Burden of proof as to equality of any proposed fixtures, material, or equipment shall be upon the Contractor. Petition in favor of proposed substitute materials shall be made directly by the Contractor. If any tests are necessary to determine quality of proposed items, such tests shall be made at the expense of the Contractor by an unbiased laboratory satisfactory to the Architect.
 - 4. Submit shop drawings and material list in six (6) copies. Submit material list and shop drawings after official award of contract. Obtain approval of the Architect

- before installation. Shop drawings shall be submitted for all materials, equipment, and controls.
5. Check shop drawings and submittals before forwarding to Architect and ascertain that submittals meet all requirements of drawings and specifications and conform to structural space conditions.
 6. Shop drawings also shall be prepared for modifications to architectural, plumbing, electrical, and mechanical work required by proposed materials - i.e., relocation of drains, revised electrical circuits, relocation of penetrations, etc.
 7. Installation of any approved substituted equipment is the Contractor's responsibility and any changes required to work included under other sections for installation of approved substituted equipment must be made to the satisfaction of the Architect and without any additional cost. Approval by Architect of substituted equipment and/or dimension drawings does not waive these requirements.
 8. Review of drawings and materials submitted for approval shall not be construed as a complete check or constitute a waiver of the requirements of the drawings and specifications. This review shall not relieve the Contractor of the responsibility to fit the proposed materials to the spaces provided and to effect necessary rearrangement or construction of other work. Contractor agrees that shop drawing submittals processed by the Architect do not become contract documents and are not change orders; that the purpose of the shop drawing review is to establish a reporting procedure and is intended for the Contractor's convenience in organizing his work and to permit the Architect to monitor the Contractor's progress and understanding of the design. If deviations, discrepancies, or conflicts between shop drawing submittals and the contract documents are discovered either prior to or after the shop drawing submittals are processed by the Architect, the Contractor agrees that the contract documents shall control and shall be followed.
 9. Submittal lists shall include the identifying marks assigned to the items. Give name of manufacturer, brand name, and catalog number of each item. Submit complete list at one time with items arranged and identified in numerical sequence within each section and article specifications. Listing items "as specified" without both make and model or type designation is not acceptable, except as noted. Only pipe and fittings not specified by brand names may be listed "as specified" without manufacturer's name, provided proposed materials comply with specification requirements.
 10. Descriptive Data: Submit six (6) copies of complete description information and performance data covering equipment that is specified but for which catalog plate numbers, brand names, or specific models have not been used.
 11. Submittal of substitutions shall be limited to one proposal for each type or kind of item, unless otherwise permitted by the Architect.
- 1.6 DRAWINGS, SPECIFICATIONS, AND COORDINATION OF WORK
- A. Drawings are essentially diagrammatic. Size and locations of equipment are generally shown to scale. Make use of data in all contract documents, and verify this information against field conditions.

- B. The drawings indicate the required size and point of termination of ductwork, pipes, and equipment. Install pipe with all necessary offsets and fittings to conform to the structure, avoid obstructions, preserve headroom, maintain required accessibility, and satisfy the requirements of the governing codes and the standards of good practice.
- C. The architectural and structural drawings and specifications take precedence over the mechanical drawings in the representation of the general construction work. Refer to the drawings, specifications, and review shop drawings for all work in order to coordinate plumbing work with the other work of the project.
- D. Where changes in indicated locations or arrangements are necessary due to conditions in building construction, interference with work in other divisions, or conflict in location, make changes at no cost to the Owner deviations, offsets, rises or drops in piping that may be necessary, whether shown or not, shall be made at no expense to Owner.
- E. Bring discrepancies between different drawings, between drawings and actual field conditions, or between drawings and specifications promptly to the attention of the Architect for decision, and stop all work on affected areas subject to resolution of the conflict.

1.7 MATERIALS AND WORKMANSHIP

- A. All materials and equipment to be new and in perfect condition. Materials or equipment for similar uses are to be of same type and manufacturer.
- B. Workmanship shall be of best standard practice of the trade.

1.8 PROTECTION OF EQUIPMENT

- A. The Contractor shall be responsible for damage to any of the work of this section until final acceptance. Cover all openings, apparatus, equipment, and appliances both before and after being set in place to prevent misuse or disfigurement of the apparatus, equipment, or appliances.

1.9 OPENINGS

- A. The Contractor shall cooperate with other trades in providing information for openings required in walls, floors, and roof for pipe and equipment.
- B. The Contractor shall pay all extra costs for cutting of openings as a result of incorrect, delayed, or neglected information.
- C. Make absolutely watertight any openings through waterproofed construction caused by the penetration of piping and in a manner approved by the Architect.

1.10 CLEAN-UP

- A. Thoroughly clean all parts of the apparatus and equipment. Exposed parts which are to be painted shall be thoroughly cleaned and all grease and oil spots removed with cleaning solvent.
- B. Remove all debris and surplus equipment and leave installation in perfect condition ready for use.

1.11 CONSTRUCTION REVIEW

- A. All services rendered by the Architect or any of his consultants consist of professional opinions and recommendations made in accordance with generally accepted engineering practice.
- B. Under no circumstances is it the intent of the Architect or any of his consultants to directly control the physical activities of the Contractor or the Contractor's workmen in the accomplishment of work on this project.
- C. The presence of the field representative of the Architect or any of his consultants at the site is to provide to the Owner and/or Architect an additional source of professional advice, opinions, and recommendations based upon the field representative's observations.

1.12 SAFETY

- A. In accordance with generally accepted construction practices, the Contractor will be solely and completely responsible for conditions on the jobsite, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours.
- B. Construction review by the Architect or any of his consultants is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the construction take out extra space site or at any other location.

1.13 OPERATING INSTRUCTIONS

- A. Comply with the requirements of Division 1 – General Requirements.
- B. Upon completion of work, the Contractor shall place a competent person in charge who will operate the system and instruct the Owner's representative in all details of the operation and maintenance of the plumbing system.
- C. The Contractor shall carefully prepare four (4) descriptive booklets of the entire plumbing systems and a full description of the operation and maintenance of each piece of equipment.

- D. Operating instructions manuals are to include names, addresses, and telephone numbers for the following: project name, Owner, General Contractor, Plumbing Subcontractor, and equipment manufacturer's (including local representatives).

1.14 GUARANTEE

- A. The Contractor shall furnish a written guarantee to the Owner that the new materials, equipment, and installation are new, free from mechanical defects, noiseless, and are in perfect operating condition.
- B. He shall guarantee to replace and repair at his own expense any and all unsatisfactory and defective work and items to the satisfaction of the Owner for a period of one (1) year after the system is put to beneficial use.
- C. The Contractor shall also furnish the Owner with all manufacturer's written guarantees of materials and equipment.
- D. Refer also to Division 1 requirements

1.15 RECORD DRAWINGS

- A. Refer to Division 01 – General Requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Soil, Waste and Vent Piping:
 - 1. Above Grade: No-Hub cast iron soil pipe and fittings. All pipe and fittings shall conform to CISPI 301, ASTM 888 or ASTM A-74 standards. Pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute. Pipe and fittings are to be manufactured by AB&I Foundry, Charlotte Pipe, or Tyler Pipe. Joints shall be made with No-Hub couplings with neoprene gasket, stainless shield and clamp, Tyler pipe, or equal. No-Hub couplings shall conform to CISPI Standard 310 and ASTM A 1277. Pipe, fittings and joints shall be manufactured in the U.S.A.
 - 2. Below Grade: No-Hub cast iron soil pipe and fittings. All pipe and fittings shall conform to CISPI 301, ASTM 888 or ASTM A-74 standards. Pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute. Pipe and fittings are to be manufactured by AB&I Foundry, Charlotte Pipe or Tyler Pipe. Joints shall be made with heavy duty No-Hub couplings, Husky SD4000, Clamp All 125 or MG Coupling. No-Hub couplings shall conform to CISPI Standard 310 and ASTM A 1277. Pipe, fittings and joints shall be manufactured in the U.S.A.
- B. Cold Water and Hot Water Piping:

1. Above and Below Grade: Type L copper tubing ANSI H23.1 with wrought copper sweat fittings ANSI B16.22 joined with lead free solder. Wrap below grade piping per AWWA HOC 203.
- C. Natural Gas Piping:
1. Above grade: Schedule 40 black steel pipe ANSI B125.2 and 150 PSI black malleable iron screwed fittings ANSI B16.3 for piping 2" and smaller and seamless welded joint 2-1/2" and larger. Pipe and fittings outside of the buildings are to be galvanized. Wrap below grade piping per AWWA HOC 203.
 2. Below grade: Polyethylene pipe, tubing, and fittings manufactured from a PE 2306-2406 compound meeting ASTM D 1248 and ASTM D 3350.
 - a. All components of the polyethylene piping system for gas shall conform to the requirements of ASTM D 2513 with a maximum SDR 11.5. Fittings shall also meet the requirements of ASTM D 2683 for socket type fusion and ASTM D 3261 for butt type fusion.
 - b. Polyethylene to steel pipe transition fittings to meet D.O.T. requirements and are to be C.S.A. and IAPMO listed. Wayne Manufacturing Co., or approved equal.
 - c. Install AWG. No. 14 copper locating wire over entire length of buried pipe. Locating wire to be strapped to plastic pipe at convenient intervals with polyethylene backed tape and terminated per the manufacturer's installation instructions.
 - d. A trained gas distribution technician provided by the PE pipe supplier shall give on-site technical assistance to the Contractor. This assistance shall be based on the Department Of Transportation, Materials Transportation Bureau, contained in the Code Of Federal Regulations Title 49, Part 192, Section 192.285.
 - e. Pipe system supplier shall provide the following:
 - i. Fusion machine with qualified technician.
 - ii. Letter of qualification from pipe manufacturer stating qualification of pipe supplier and fusion machine technician.
- D. Condensate Drain Piping:
1. Type M copper tubing ANSI H23.1 with wrought copper sweat fittings ANSI B16.22 joined with lead free solder.
- E. Unions and Flanges:
1. Steel pipe unions: Malleable iron ground joint pattern with brass to iron seats, 150 psi.
 2. Steel pipe flanges: ANSI B16.C, 150 psi forged steel welding type with flat face.
 3. Copper tubing unions: 150 psi ground joint cast bronze unions with sweat connections.
 4. Copper tubing flanges: ANSI B16.24, bronze, 150 psi to match standard ASA 150 psi steel flanges with flat face.
 5. Flange gaskets: Crane Co Cranite, 1/16" full face sheet packing, 150 psi. Coat gaskets with thread lubricant before installation.
- F. Dielectric Protection:

1. Location: For connection between dissimilar metals in the piping systems to control corrosion caused by galvanic or electrolytic action. No dielectric unions allowed.
 2. Listing: Victaulic Style 47, Lochinvar V-line, Waterway or equal.
 - a. Dielectric couplings: Threaded for sizes 2 inches and smaller, grooved or flanged for 2-1/2 inches and larger.
- G. Thread Lubricant For Steel Pipe: Armité Joint Seal Compound No. 250.
- H. Valves: Shall be a product of single manufacturer, Red-White, NIBCO, Milwaukee or equal.
1. Gate valves (threaded): #280, bronze, 125 psi.
 2. Gate valves (solder): #281, bronze, 125 psi.
 3. Ball valves (threaded): #5092, bronze, 400 psi.
 4. Ball valves (solder): #5095, bronze, 400 psi.
 5. Ball valves (natural gas): #5044F, Brass Body, 600 psi, full port.
 6. Valves shall be same size as line in which they are installed. No valve shall be installed with stem pointed below horizontal.
- I. Pipe Sleeves: Adjus-To-Crete 24 ga., electrogalvanized sheet metal adjustable sleeve, or equal.
- J. Pipe Hangers and Supports: Superstrut or equal.
1. Plumbing Piping – Soil, Waste, and Vent:
 - a. Conform to ASME B31.9.
 - b. Hangers for Pipe Sizes ½ inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
 - c. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - d. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - e. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
 2. Plumbing Piping – Water:
 - a. Conform to ASME B31.9
 - b. Hangers for Pipe Sizes ½ inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
 - c. Hangers for Cold Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - d. Hangers for Hot Pipe Sizes 2 Inches to 4 inches and Over: Carbon steel, adjustable, clevis.
 - e. Multiple or Trapeze hangers: Steel channels with welded supports and hanger rods.
 - f. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- K. Seismic Bracing: Conform to SMACNA Seismic Restraint Manual Guidelines for Mechanical Systems, Second Edition, 1998.

- L. Cleanouts:
1. Zurn, Josam, J.K. Smith or equal, as scheduled on drawings. Cleanouts shall be furnished with flashing collars when installed in membraned slabs. Furnish suitable wrought iron or steel wrenches for each style of cleanout plug cap.
 2. Cleanouts at Interior Finished Floor Areas:
 - a. Lacquered cast iron with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.
 3. Cleanouts at Interior Finished Wall Areas:
 - a. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.
 4. Cleanouts at Interior Unfinished Accessible Areas: Caulked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.
- M. Drains: Zurn, Josam, J.R. Smith or equal, as scheduled on drawings. Drains shall be furnished with flashing collars when installed in membraned slabs. Furnish floor drains with trap primer connections. ASME A1123.6.3; lacquered cast iron two piece body with double drainage flange, weep holes, reversible clamping collar, and round, adjustable nickel-bronze strainer.
- N. Insulation:
1. Hot Water Piping:
 - a. Owens/Corning Fiberglass ASJ/SSL-II, or equal, heavy density, 2-piece sectional pipe insulation, jacketed with vapor barrier laminate, continuous pressure sealing adhesive lap and butt joint stripe, 1-1/2" thick.
 - b. Apply insulation over clean, dry surfaces butting adjoining sections firmly together, seal smoothly and securely with self-sealing longitudinal lap. Adhere factory furnished 3" wide pressure sealing strips to joints.
 - c. Insulate fittings with fiberglass strips and finish with one-piece PVC fitting cover (Zeston).
- O. Piping Identification:
1. Piping identification shall be manufactured by Marking Services, Incorporated or equal.
 2. Materials:
 - a. Color: Unless specified otherwise, conform with ANSI/ASNE A13.1.
 - b. Plastic nameplates: Laminated 3-layer plastic with engraved black 2 inch high letters on light contrasting background color.
 - c. Metal tags: brass aluminum with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.
 - d. Plastic pipe markers: Factory fabricated, flexible, semi-rigid, preformed to fit around pipe or pipe covering, minimum information indicating flow direction arrow and fluid being conveyed.
- P. Plumbing Fixtures: Make and model as scheduled on the drawings or equal.
1. Fixtures and trim: As described in manufacturer's catalog with modifications noted.
 2. Vitreous ware fixtures: White, twice-fired, vitreous china.

3. Fixture trim and exposed metal items: Chrome plated unless otherwise noted. Pipes passing through finished walls shall have chrome plated escutcheon plates.
 4. Install stops in each water supply to fixtures.
 5. No unoccupied fixture faucet holes shall be permitted.
 6. Fit exposed fixture setting bolts with china caps.
 7. Properly support and securely fasten all fixtures to adequate backing per manufacturer's recommendations.
 8. Point up joints between fixtures and wall or floors with white mastic. Mastic shall have sufficient resiliency to prevent cracking or pulling away from wall due to fixture movement.
 9. Rough-in and set fixtures to height shown on Architectural drawings or as standard for the industry.
 10. Plumbing faucets and all other components in the cold water and hot water systems are to be in full compliance with CA AB 1953.
- Q. Escutcheon Plates: For pipes passing through finished ceilings, walls, and floors in conspicuous locations, use chromium-plated steel floor and ceiling plates with set screw or other approved means of holding securely in place.
- R. Flashing and Counterflashing: For cast iron pipe penetrations through roof, use 4 pound lead flashing with counterflashing. For copper pipe penetrations through roof, use copper flashing and counterflashing.
- S. Access Panels:
1. In areas other than toilet rooms: Karp Model DSC-214-M, or equal prime coated steel with 14 gauge door and trim and 16 gauge frame, continuous concealed piano hinge, flush screwdriver operated cam latch, size shall be 12"x12".
 2. In toilet rooms: Karp Model DSC-214-M, or equal, Type 304 stainless steel, continuous concealed piano hinge, flush screwdriver operated cam latch, size shall be 12"x12".
- T. Underground, Uninsulated, Steel Pipe Lines: Shall be wrapped conforming to AWWA HOC203.
- U. Equipment Scheduled on Drawings – Make and model as scheduled on the drawings or equal:
1. Sinks.
 2. Faucets and accessories at sinks provided by others.
 3. Showers.
 4. Floor drains.
 5. Floor cleanouts.
 6. Wall boxes.

PART 3 - EXECUTION

3.1 GENERAL

- A. Support exposed and concealed piping on specified hangers properly spaced and set to allow piping to adjust for temperature change expansion and contraction. Evenly space and support piping in parallel.
- B. Coordinate with other trades to provide continuous support channel for all pipes and conduit in exposed locations.
- C. Conceal piping in ceilings, furred walls, partitions and pipe spaces, except where noted otherwise. Provide maximum head room and run piping to maintain proper clearance for piping runs beforehand and with other divisions to insure clearance. Where work of other divisions prevents installation of piping shown on drawings, reroute piping as directed by Architect at no extra cost to Owner.
- D. Install exposed piping parallel to or at right angles with building walls.
- E. No valve, piece of equipment, or trim shall support the weight of any pipe. Install valves, traps, cleanouts, etc., in accessible locations.
- F. Install piping free from traps and air pockets.
- G. Use special wrenches in assembly of polished, chrome plated tubing and fittings so that no tool marks are left on pipe or fittings.
- H. Wherever changes in sizes of piping occur, use reducing fittings.
- I. Install unions adjacent to threaded valves, equipment, and at other points where required for disassembly.
- J. Provide sleeves wherever pipes run through walls, slabs, beams, footings, and floors large enough for passage of pipe and/or pipe insulation. Sufficiently size sleeves to allow for contraction and expansion of pipe. Pack sleeves with approved packing material. Pack sleeves in walls and slabs below grade and through exterior walls above grade with waterproof mastic or grout.
- K. Set floor cleanouts so top of plate and rim will be flush with top of finish flooring.
- L. Where sleeves are missed or misplaced during canning, core holes with rotary diamond tooth core drills.
- M. Fit exposed pipes, which pass through walls, ceilings, or floors in finished rooms and conspicuous locations with escutcheon plates.
- N. Install insulating unions or flanges at ferrous and nonferrous piping connections.

- O. Install 12" long air chamber on hot and cold water supplies to all fixtures and hose bibbs not protected by water hammer arrestors.
- P. Install water hammer arrestors at all locations of fast closing positive shut-off valves and equipment with fast closing solenoid valves; including but not limited to flush valves, single handle faucets, dishwashers, etc. Install behind wall access panel with ball shut-off valve. Follow manufacturer's installation instructions for proximity to valve and specific configuration of inlet piping.
- Q. Install trap primers in complete accordance with the manufacturer's recommendations.
- R. Minimum bury for exterior piping: 30" below finish grade, except as otherwise noted or determined by invert elevations. Comply with NFPA 24 Section 104.4 and with CBC Section 1806.11 Pipes and Trenches.

3.2 PIPE HANGERS, SUPPORTS, AND BRACES

- A. General: Support piping from building structure so that there is no apparent deflection in piping runs. Fit piping with steel sway braces and anchors to prevent vibration and/or horizontal displacement under load when required. Support piping only by approved pipe hangers. Pipes shall not be supported from, or braced to, ducts, other pipes, conduits, or any materials except building structure. Piping or equipment shall not be supported or hung by wire, rope, plumbers tape, or blocking of any kind.
- B. Hanger spacing (not for piping or multiple piping supports):

Type of Pipe	1-1/2" diam. & smaller	2" diam. & lgr
Steel pipe	8'- 0"	10'- 0"
Copper tubing	6'- 0"	8'- 0"
Cast iron pipe	All sizes 5'- 0" max. and not less than one hanger per joint	
- C. Multiple piping supports: 6'- 0".
- D. Support vertical piping at each floor level with rise clamps.
- E. Piping at completion of job shall be rigid and immobile. Install additional pipe supports, brackets, and hangers as required to accomplish a rigid and immobile piping system.
- F. Double wrap copper pipe with heavy vinyl tape where pipe comes in contact with ferrous materials.

3.3 EXCAVATING, TRENCHING, AND BACKFILLING

- A. Trenches: Shall have uniform grades. In case of over excavation, fill to bottom of pipe with selected fill or sand. Provide dewatering pumping as required.
- B. Shoring: Comply with earthwork section of specifications.
- C. Cleaning of Trenches: After pipe lines have been tested, inspected, and approved, and prior to backfilling, remove forms, trash, and debris from trenches, then backfill.

- D. Backfill and Compaction: Comply with earthwork section of specifications.

3.4 CLEANING

- A. Thoroughly clean exterior and interior of piping, equipment, and materials before systems are put in operation. Clean plumbing fixtures with soap and water. Remove marks and labels. Clean and polish chrome. Remove paint, concrete, plaster, and other foreign materials. Clean valve handles and stems of any paint, dirt, or other foreign materials. Clean drains of dirt and debris. Remove shipping paper from cleanout covers and polish. Remove and clean out dirt and debris from pipe spaces, including wire and blocking.

3.5 TESTING

- A. Soil, waste and vent piping: Test with minimum height of stand pipe 10'-0". Test duration to be a minimum of four (4) hours.
- B. Cold water and hot water piping: Hydrostatically test under pressure of 150 psi at highest point for a minimum test duration of four (4) hours.
- C. Gas piping: Test with air under pressure of 100 psi for a minimum test duration of four (4) hours.
- D. Condensate drainage piping: Test with a minimum height of stand pipe 10'-0". Test duration to be a minimum of four (4) hours.
- E. If systems are tested in sections, include connection to previously tested section. Final pressures at end of test period shall be no more nor less than that caused by expansion or contraction of test medium due to temperature changes. Apply tests for a minimum period of four (4) hours or as required by local codes or agencies having jurisdiction. Where testing pressures are higher than rated pressure for equipment, or special trim, remove and bypass item with temporary piping for purposes of test.
- F. Testing shall be done in the presence of the Owner's representatives.

3.6 PIPING IDENTIFICATION

- A. Installation:
- B. Degrease and clean surfaces to receive adhesive for identification materials.
- C. Plastic nameplates: Install with corrosive-resistant mechanical fasteners or adhesive.
- D. Plastic pipe markers: Install in accordance with manufacturer's instructions. Maximum spacing is to be twenty (20) feet on center.
- E. Valves: Identify valves in main and branch piping with tags.

- F. All exposed piping and piping above accessible ceilings shall be neatly identified spaced not more than twenty (20) feet on center.

3.7 STERILIZATION OF WATER MAINS

- A. At the completion of all work and after the system is tested, flushed, and cleaned, all potable water lines shall be sterilized in accordance with local Department of Public Health, "AWWA" Standard C601, and the following:
 - B. Water treatment firm shall be Bennett Marine Utility, Inc., Burlingame, California, or equal.
 - C. A solution of sodium hypochlorite containing not less than 200 ppm of free chlorine shall be injected into the system in such a manner as to insure that the entire system is completely filled with the solution. During this procedure, all valves shall be operated and outlets shall be tested for residual chlorine. Injection shall continue until all outlets indicate at least 200 ppm of free chlorine.
 - D. After injection, the system shall be isolated and the solution held in retention for a period of not less than three (3) hours. Tests shall be made for residual chlorine for retention. If such tests indicate less than 200 ppm of residual chlorine, the entire procedure shall be repeated. After satisfactory sterilization has been effected, the system shall be flushed from an approved source, until all traces of chlorine have been removed or until the chlorine content is no greater than that in the existing supply.
 - E. A Certificate of Sterilization/Chlorination, together with bacteriological reports, shall be prepared by the water treatment firm and delivered to the Architect and mechanical engineer stating the work has been done in accordance with the specifications set forth above and prior to final acceptance by Owner. Provide copy of certificate to the Owner's representative.

END OF SECTION

SECTION 31 11 00 – CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 SUMMARY

- A. Clearing vegetation, debris, trash and other materials within limits indicated.
- B. Grubbing of vegetation within limits indicated.

1.2 RELATED DOCUMENTS

- A. Caltrans Standard Specifications.
Section 16, Clearing and Grubbing.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

- A. Locate and clearly flag vegetation to remain or to be relocated.

3.2 RESTORATION

- A. Repair or replace vegetation indicated to remain that is damaged by construction operations, as directed by the Owner.
- B. Employ a qualified arborist, licensed in jurisdiction where the Project is located, to submit details of proposed repairs and to repair damage to shrubs.

3.3 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.
- B. Remove trash, debris, logs, concrete, masonry and other waste materials.
- C. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
- D. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18-inches below subgrade.
- E. Use only hand methods for grubbing within drip line of remaining trees.

END OF SECTION

SECTION 31 14 00 – EARTH STRIPPING AND STOCKPILING

PART 1 - GENERAL

1.1 SUMMARY

- A. Stripping of topsoil within limits indicated.

1.2 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2-inches in diameter; and free of weeds, roots, and other deleterious materials.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
- C. Remove trash, debris, weeds, roots, and other waste materials.
- D. Stockpile topsoil materials designated to remain on site at a location approved by the Owner at a location away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
- E. Do not stockpile topsoil within drip line of remaining trees.

3.2 DISPOSAL

- A. Remove surplus soil material and unsuitable topsoil, and legally dispose of them off the Owner's property.

END OF SECTION

SECTION 31 23 00 – EXCAVATION AND FILL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Excavation and/or embankment from existing ground to subgrade, including soil sterilant, for roadways, driveways, parking areas, walks, paths, or trails and any other site improvements called for on the Plans.

1.2 SECTION EXCLUDES

- A. Earthwork related to underground utility installation, see Section 31 23 33 – Trenching and Backfilling.

1.3 RELATED SECTIONS

- A. Section 31 11 00 – Clearing and Grubbing
- B. Section 31 23 33 – Trenching and Backfilling
- C. Section 31 31 19 – Vegetation Control
- D. Section 33 46 00 – Subdrainage

1.4 RELATED DOCUMENTS

- A. Geotechnical Report.
- B. ASTM:
 - 1. D 1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - 2. D 1586, Method for Penetration Tests and Split-Barrel Sampling of Soils.
 - 3. D 2487, Classification of Soils for Engineering Purposes.
 - 4. D 3740, Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
 - 5. D 4318. Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
 - 6. E 329, Specification for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
 - 7. E 548, Guide for General Criteria Used for Evaluating Laboratory Competence.
- C. California Administrative Code, Title 24, Part 2 - Basic Building Regulations, Chapter 24, Excavations, Foundations, and Retaining Walls.
- D. Caltrans Standard Specifications:
 - 1. Section 17, Watering.
 - 2. Section 19, Earthwork.

- E. CAL/OSHA, Title 8.

1.5 DEFINITIONS

- A. Borrow: Approved soil material imported from off-site for use as Structural Fill or Backfill.
- B. Excavation: Removal of material encountered above subgrade elevations.
 - 1. Authorized Over-Excavation: Excavation below subgrade elevations or beyond indicated horizontal dimensions as shown on plans or authorized by the Geotechnical Consultant.
 - 2. Unauthorized Over-Excavation: Excavation below subgrade elevations or beyond indicated horizontal dimensions without authorization by the Geotechnical Consultant. Unauthorized excavation shall be without additional compensation.
- C. Geotechnical Testing Agency: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock definition testing, as documented according to ASTM D 3740 and ASTM E 548.
- D. Structural Backfill: Soil materials approved by the Geotechnical Consultant and used to fill excavations resulting from removal of existing below grade facilities, including trees. See Section 31 23 33 – Trenching and Backfilling.
- E. Structural Fill: Soil materials approved by the Geotechnical Consultant and used to raise existing grades.
- F. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material $\frac{3}{4}$ -cubic yards or more in volume that when tested by an independent geotechnical testing agency, according to ASTM D 1586, exceeds a standard penetration resistance of 100 blows/2-inches.
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man made stationary features constructed above or below grade.
- H. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, base or topsoil materials.
- I. Unsuitable Material: Any soil material that is not suitable for a specific use on the Project. The Geotechnical Consultant will determine if a soil material is unsuitable.
- J. Utilities: onsite underground pipes, conduits, ducts and cables.

1.6 SUBMITTALS

- A. Follow submittal procedures outlined in Division 1.
- B. Submit material certificates signed by the material producer and the Contractor, certifying that that each material item complies with, or exceeds the specified requirements.
- C. Shoring Drawings: All shoring and re-shoring drawings are to be prepared by, signed, and sealed by a Professional Engineer registered in the State of California.

1.7 QUALITY ASSURANCE

- A. Conform all work and materials to the recommendations or requirements of the Geotechnical Report and meet the approval of the Geotechnical Consultant.

- B. Conform all work to the appropriate portion(s) of Caltrans Standard Specifications, Section 17 and 19.
- C. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D 1557.
- D. Perform excavation, filling, compaction and related earthwork under the observation of the Geotechnical Consultant. Materials placed without approval of the Geotechnical Consultant will be presumed to be defective and, at the discretion of the Geotechnical Consultant, shall be removed and replaced at no cost to the Owner. Notify the Geotechnical Consultant at least 24-hours prior to commencement of earthwork and at least 48 hours prior to testing.
- E. The Geotechnical Consultant will perform observations and tests required to enable him to form an opinion of the acceptability of the Project earthwork. Correct earthwork that, in the opinion of the Geotechnical Consultant, does not meet the requirements of these Technical Specifications and the Geotechnical Report.
- F. Upon completion of the construction work, certify that all compacted fills and foundations are in place at the correct locations, and have been constructed in accordance with sound construction practice. In addition, certify that the materials used are of the types, quality and quantity required by these Technical Specifications and the Geotechnical Report. The Contractor shall be responsible for the stability of all fills and backfills constructed by his forces and shall replace portions that in the opinion of the Geotechnical Consultant have been displaced or are otherwise unsatisfactory due to the Contractor's operations.
- G. Finish soil grade tolerance at completion of grading:
 - 1. Building and paved areas: +0.05 feet.
 - 2. Landscape areas: ± 0.10 feet.
 - 3. Cut or fill slopes: ± 0.50 feet.

1.8 PROJECT CONDITIONS

- A. Promptly notify the Owner of surface or subsurface conditions differing from those disclosed in the Geotechnical Report. First notify the Owner verbally to permit verification and extent of condition and then in writing. No claim for conditions differing from those anticipated in the Contract Documents and disclosed in the Geotechnical Report will be allowed unless the Contractor has notified the Owner in writing of differing conditions prior to the Contractor starting work on affected items.
- B. Protect open excavations, trenches, and the like with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.
- C. Prevent erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.
- D. Temporarily stockpile fill material in an orderly and safe manner and in a location approved by the Owner.
- E. Provide dust and noise control in conformance with Division 1 General Requirements.
- F. Environmental Requirements: When unfavorable weather conditions necessitate interrupting earthwork operation, areas shall be prepared by compaction of surface and grading to avoid

collection of water. Provide adequate temporary drainage to prevent erosion. After interruption, compaction specified in last layer shall be re-established before resuming work.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from on-site excavations.
- B. Obtain approval of on-site soil materials and borrow materials to be used for structural fill or structural backfill from the Geotechnical Consultant.
- C. On-Site Structural Fill and Structural Backfill: Soil or soil-rock mixture from on site excavations, free from organic matter or other deleterious substances. On-site structural fill and backfill shall not contain rocks or rock fragments over 3 inches in greatest dimension, shall have a liquid limit of less than 45, a plasticity index of less than 25, and shall be free of organic content. In addition, the fill should contain 10 to 25 percent of fines (particles passing the No. 200 sieve).
- D. Imported Structural Fill and Structural Backfill: Conform to the requirements of on-site structural fill. Material shall also be a non-expansive and predominantly granular soil or soil-rock mixture with plasticity index of 15 or less in accordance with ASTM D 4318 and an R-Value of 25 or greater.

PART 3 - EXECUTION

3.1 GENERAL

- A. Conform to Section 19, Earthwork, Caltrans Standard Specifications as modified by the Contract Documents.
- B. Placement and compaction of material by flooding, ponding, or jetting will not be permitted.
- C. The use of explosives will not be permitted.

3.2 CONTROL OF WATER AND DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding the site and surrounding area. Provide dewatering equipment necessary to drain and keep excavations and site free from water.
- B. Dewater during backfilling operation so that groundwater is maintained a least one foot below level of compaction effort.
- C. Obtain the Geotechnical Consultant's approval for proposed control of water and dewatering methods.
- D. Protect subgrades from softening, undermining, washout and damage by rain or water accumulation.
- E. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations.
- F. Maintain dewatering system in place until dewatering is no longer required.

3.3 WET WEATHER CONDITIONS

- A. Do not prepare subgrade, place or compact soil materials if above optimum moisture content.
- B. If the Geotechnical Consultant allows work to continue during wet weather conditions, conform to supplemental recommendations provided by the Geotechnical Consultant.

3.4 BRACING AND SHORING

- A. Conform to California and Federal OSHA requirements.
- B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the facility being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.
- C. Be solely responsible for all bracing and shoring and, if requested by the Owner, submit details and calculations to the Owner. The Owner may forward the submittal to the Geotechnical Consultant, the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations related to the proposed facility shall precede a response to the submittal by the Owner.
- D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the position or operation of the facility being constructed or adjacent utilities and facilities.

3.5 EXCAVATION

- A. Excavate earth and rock to lines and grades shown on drawings and to the neat dimensions indicated on the Plans, required herein or as required to satisfactorily compact backfill.
- B. Remove and dispose of large rocks, pieces of concrete and other obstructions encountered during excavation.
- C. Where forming is required, excavate only as much material as necessary to permit placing and removing forms.
- D. Provide supports, shoring and sheet piles required to support the sides of excavations or for protection of adjacent existing improvements.

3.6 REMOVAL OF EXISTING FILLS AND UNSUITABLE MATERIAL

- A. Over-excavate areas of existing fills and other unsuitable material encountered during mass grading as directed by the Geotechnical Consultant.
- B. Compensation for increased removal widths and depths that are not required by the Geotechnical Consultant will not be considered, except when such increase is necessary for protection of life and property as determined by and approved by the Owner.
- C. The Geotechnical Consultant will provide written approval for each excavation prior to placement of fill. Allow adequate time after excavation and before filling for the Geotechnical Consultant's review and written approval and, if necessary, time for the Owner to conduct as built survey prior to placing fill. Basis for calculating the quantity of material excavated or placed may be the difference between the grading shown on the Plan and an as built survey of the grading.

3.7 GRADING

- A. Uniformly grade the Project to the elevations shown on plans.
- B. Finish ditches, gutters and swales to the sections, lines and grades indicated and to permit proper surface drainage.
- C. Round tops and bottoms of slopes as indicated or to blend with existing contours.

3.8 SUBGRADE PREPARATION

- A. Install underground utilities and service connections prior to final preparation of subgrade and placement of base materials for final surface facilities. Extend services so that final surface facilities are not disturbed when service connections are made.
- B. Prepare subgrades under paved areas, curbs, gutters, walks, structures, other surface facilities and areas to receive structural fill.
- C. Prepare subgrades for paved areas, curbs and gutters by plowing or scarifying surface at least 6 inches below final subgrade elevations and 5-feet beyond edge of pavement unless specified otherwise by the Geotechnical Consultant. Uniformly moisture condition to obtain optimum moisture contents. Break clods and condition surface by harrowing or dry rolling. Remove boulders, hard ribs and solid rock. Prepare earth uniform for full depth and width of subgrade.
- D. Protect utilities from damage during compaction of subgrades and until placement of final pavements or other surface facilities.
- E. Obtain the Geotechnical Consultant's approval of subgrades prior to placing pavement.

3.9 PLACEMENT OF STRUCTURAL FILL

- A. Obtain the Geotechnical Consultant's approval of surface to receive structural fill prior to placement of structural fill material.
- B. Place structural fill on prepared subgrade.
- C. Spread structural fill material in uniform lifts not more than 8-inches in un-compacted thickness and compact.
- D. Place structural fill material to suitable elevations above grade to provide for anticipated settlement and shrinkage.
- E. Overbuild fill slopes, as required by the Geotechnical Consultant, to obtain required compaction. Remove excess material to lines and grades indicated.
- F. Do not drop fill on structures. Do not backfill around, against or upon concrete or masonry structures until structure has attained sufficient strength to withstand loads imposed and the horizontal structural system had been installed.

3.10 KEYWAYS AND BENCHES

- A. Provide keyways as indicated for fill slopes steeper than 6 horizontal to 1 vertical. Extend keyway 5-foot minimum into competent, undisturbed soil or 3-foot minimum into competent, undisturbed rock as directed by the Geotechnical Consultant.
- B. Place subsurface drains in bottom of keyway in conformance with Section 33 46 00 – Subdrainage.

- C. Bench subgrade as indicated above toe of fill.
- D. Place subsurface drains at benches every 20 vertical feet or as directed by the Geotechnical Consultant.

3.11 COMPACTION AND TESTING

- A. Do not compact by ponding, flooding or jetting.
- B. Compact soils at optimum water content. Aerate material if it is too wet. Add water to material if it is too dry. Thoroughly mix lifts before compaction to ensure uniform moisture distribution.
- C. Perform compaction using rollers, pneumatic or vibratory compactors or other equipment and mechanical methods approved by the Geotechnical Consultant.
- D. Compaction requirements:
 - 1. Compact structural fills less than 5-feet thick to 90 percent compaction.
 - 2. Compact structural fill 5-feet thick or greater to 95 percent compaction.
 - 3. Compact the upper 6 inches of subgrade soils beneath pavements, curbs and gutters to 88 to 93 percent compaction. Extend compaction 5-feet beyond pavement edges unless specified otherwise by the Geotechnical Consultant.
 - 4. Compact the upper 6-inches of subgrade soils under walks, structures and areas to receive structural fill to 88 to 93 percent compaction.

3.12 DISPOSAL

- A. Lawfully dispose of all unsuitable and excess or surplus material off-site at no cost to the Owner.

END OF SECTION

SECTION 31 23 33 – TRENCHING AND BACKFILLING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Excavation, bedding, and backfill for underground storm drain, sanitary sewer, and water piping and associated structures.

1.2 SECTION EXCLUDES

- A. Drainage fill material and placement around subdrains. See Section 33 46 00 – Subdrainage.
- B. Trenching and backfill for other utilities such as underground HVAC piping, electrical conduit, telephone conduit, gas piping, cable TV conduit, etc.

1.3 RELATED SECTIONS

- A. Section 31 23 00 – Excavation and Fill
- B. Section 33 10 00 – Water Utilities
- C. Section 33 30 00 – Sanitary Sewerage
- D. Section 33 46 00 – Subdrainage
- E. Section 33 40 00 – Storm Drainage

1.4 RELATED DOCUMENTS

- A. Geotechnical Report.
- B. ASTM:
 - 1. C 33, Specification for Concrete Aggregates.
 - 2. C 150, Specification for Portland Cement.
 - 3. C 260, Specification for Air-Entraining Admixtures for Concrete.
 - 4. C 618, Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
 - 5. D 1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - 6. D 2321, Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
 - 7. D 2487, Classification of Soils for Engineering Purposes.
 - 8. D 3740, Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
 - 9. E 329, Specification for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
 - 10. E 548, Guide for General Criteria Used for Evaluating Laboratory Competence.

- C. California Administrative Code, Title 24, Part 2 - Basic Building Regulations, Chapter 24, Excavations, Foundations, and Retaining Walls.
- D. Caltrans Standard Specifications:
 - 1. Section 19, Earthwork.
 - 2. Section 26, Aggregate Bases.
 - 3. Section 68, Subsurface Drains.
 - 4. Section 88, Engineering Fabrics.
- E. CAL/OSHA, Title 8.

1.5 DEFINITIONS

- A. AC: Asphalt Concrete.
- B. ASTM: American Society for Testing and Materials.
- C. Bedding: Material from bottom of trench to bottom of pipe.
- D. CDF: Controlled Density Fill.
- E. DIP: Ductile Iron Pipe.
- F. Initial Backfill: Material from bottom of pipe to 12-inches above top of pipe.
- G. PCC: Portland Cement Concrete.
- H. RCP: Reinforced Concrete Pipe.
- I. Springline of Pipe: Imaginary line on surface of pipe at a vertical distance of $\frac{1}{2}$ the outside diameter measured from the top or bottom of the pipe.
- J. Subsequent Backfill: Material from 12-inches above top of pipe to subgrade of surface material or subgrade of surface facility or to finish grade.
- K. Trench Excavation: Removal of material encountered above subgrade elevations and within horizontal trench dimensions.
 - 1. Authorized Trench Over-Excavation: Excavation below trench subgrade elevations or beyond indicated horizontal trench dimensions as shown on plans or authorized by the Geotechnical Consultant.
 - 2. Unauthorized Trench Over-Excavation: Excavation below trench subgrade elevations or beyond indicated horizontal trench dimensions without authorization by the Geotechnical Consultant. Unauthorized excavation shall be without additional compensation.
- L. Utility Structures:
 - 1. Storm drainage manholes, catch basins, drop inlets, curb inlets, vaults, etc.
 - 2. Sanitary sewer manholes, vaults, etc.
 - 3. Water vaults, etc.

1.6 SUBMITTALS

- A. Follow submittal procedures outlined in Division 1.
- B. Product Data:
 - 1. Grading and quality characteristics showing compliance with requirements for the Work.
 - 2. Certify that material meets requirements of the Project.
- C. Samples:
 - 1. If required by the Geotechnical Consultant, provide 40-pound samples of all imported trench bedding and backfill material sealed in airtight containers, tagged with source locations and suppliers of each proposed material. Do not import materials to Project without written approval of the Geotechnical Consultant.
 - 2. Provide materials from same source throughout work. Change of source requires approval of the Geotechnical Consultant and the Owner.

1.7 QUALITY ASSURANCE

- A. Conform all work and materials to the recommendations or requirements of the Geotechnical Report and meet the approval of the Geotechnical Consultant.
- B. Conform all work to the appropriate portion(s) of the Caltrans Standard Specifications, Section 19.
- C. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D 1557.
- D. The Geotechnical Consultant will perform observations and tests required to enable him to form an opinion of the acceptability of the trench backfill. Correct the trench backfill that, in the opinion of the Geotechnical Consultant, does not meet the requirements of these Technical Specifications and the Geotechnical Report.

1.8 PROJECT CONDITIONS

- A. Promptly notify the Owner of surface or subsurface conditions differing from those disclosed in the Geotechnical Report. First notify the Owner verbally to permit verification and extent of condition and then in writing. No claim for conditions differing from those anticipated in the Contract Documents and disclosed in the Geotechnical Report will be allowed unless Contractor has notified the Owner in writing of differing conditions prior to contractor starting work on affected items.
- B. Protect open, trenches, and utility structure excavations with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.
- C. Stockpile on-site and imported backfill material temporarily in an orderly and safe manner.
- D. Provide dust and noise control in conformance with Section 02000, Supplemental General Requirements for Civil Improvements.

PART 2 - PRODUCTS

2.1 PIPE BEDDING AND INITIAL BACKFILL

- A. ASTM D 2321, Class IA, IB or II.
 - 1. Clean and free of clay, silt or organic matter.
- B. Class 2 Aggregate Base: Conform to Section 26 of Caltrans Standard Specifications, ¾-inch maximum.

2.2 WARNING TAPE

- A. See Section 33 10 00 – Water Utilities.

2.3 SUBSEQUENT BACKFILL

- A. Conform to on-site or imported structural backfill in Section 31 23 00 – Excavation and Fill.
- B. Class 2 Aggregate Base: Conform to Section 26 of Caltrans Standard Specifications, ¾-inch maximum.

2.4 CONTROLLED DENSITY FILL (CDF) (IN TRENCHES)

- A. Provide non-structural CDF, from bottom of trench to finish subgrade of subbase or base material, that can be excavated by hand and produce unconfined compressive 28-day strengths from 50-psi to a maximum of 150-psi. Provide aggregate no larger than 3/8-inch top size. The 3/8-inch aggregate shall not comprise more than 30% of the total aggregate content.
- B. Cement: Conform to the standards as set forth in ASTM C-150, Type II Cement.
- C. Fly Ash: Conform to the standards as set forth in ASTM C-618, for Class F pozzolan. Do not inhibit the entrainment of air with the fly ash.
- D. Air Entraining Agent: Conform to the standards as set forth in ASTM C-260.
- E. Aggregates need not meet the standards as set forth in ASTM C-33. Any aggregate, producing performances characteristics described herein will be accepted for consideration. The amount of material passing a #200 sieve shall not exceed 12% and no plastic fines shall be present.
- F. Provide CDF that is a mixture of cement, Class F pozzolan, aggregate, air entraining agent and water. CDF shall be batched by a ready mixed concrete plant and delivered to the job site by means of transit mixing trucks.
- G. The Contractor shall determine the actual mix proportions of the controlled density fill to meet job site conditions, minimum and maximum strengths, and unit weight. Entrained air content shall be a minimum of 4.0%. The actual entrained air content shall be established for each job with the materials and aggregates to be used to meet the placing and unit weight requirements. Entrained air content may be as high as 20% for fluidity requirements.
- H. Mix design shall meet the Geotechnical Consultant's approval.

2.5 CONCRETE STRUCTURE BEDDING AND BACKFILL

- A. Precast Structures: Same materials to the same heights as specified for pipe bedding and backfill, or other material approved by the Geotechnical Consultant.
- B. Poured-in-Place Structures:
 - 1. Bedding: Bedding shall meet the approval of the Geotechnical Consultant. In general, bedding is not required, pour bases against undisturbed native earth in cut areas and against engineered fill compacted to 90% relative compaction in embankment areas.
 - 2. Side Backfill: On-site or imported structural fill meeting the requirements given in Section 31 23 00 – Excavation and Fill.

2.6 FILTER FABRIC

- A. Filter Fabric:
 - 1. Filter Fabric: Section 88-1.03 of Caltrans Standard Specifications.
 - 2. Mirifi 140N (Mirifi Inc., Charlotte, NC) (Tel. 800-438-1855) or equal.

PART 3 - EXECUTION

3.1 TRENCHING AND EXCAVATION

- A. Existing PCC or AC Areas: Cut PCC or AC to full depth at a minimum distance of 12-inches beyond the edge of the trench.
- B. Excavate by hand or machine. For gravity systems begin excavation at the outlet end and proceed upstream. Excavate sides of the trench parallel and equal distant from the centerline of the pipe. Hand trim excavation. Remove loose matter.
- C. Excavation Depth for Bedding: Minimum of 4-inches below bottom of pipe or as otherwise allowed or required by the Geotechnical Consultant, except that bedding is not required for nominal pipe diameters of 2-inches or less.
- D. Excavation Width at Springline of Pipe:
 - 1. Up to a nominal pipe diameter of 24-inches: Minimum of twice the outside pipe diameter, or as otherwise allowed or required by the Geotechnical Consultant.
 - 2. Nominal pipe diameter of 30-inches through 36-inches: Minimum of the outside pipe diameter plus 2-feet, or as otherwise allowed or required by the Geotechnical Consultant.
 - 3. Nominal pipe diameter of 42-inches through 60-inches: Minimum of the outside pipe diameter plus 3-feet, or as otherwise allowed or required by the Geotechnical Consultant.
- E. Over-Excavations: Backfill trenches that have been excavated below bedding design subgrade, with approved bedding material.
- F. Comply with the Owner's limitations on the amount of trench that is opened or partially opened at any one time. Do not leave trenches open overnight without the approval of the Owner.
- G. Where forming is required, excavate only as much material as necessary to permit placing and removal of forms.

- H. Bottoms of trenches will be subject to testing by Geotechnical Consultant. Correct deficiencies as directed by the Geotechnical Consultant.
- I. Grade bottom of trench to provide uniform thickness of bedding material and to provide uniform bearing and support for pipe along entire length. Remove stones to avoid point bearing.

3.2 CONTROL OF WATER AND DEWATERING

- A. Be solely responsible for dewatering trenches and excavations and subsequent control of ground and surface water. Provide and maintain such pumps or other equipment as may be necessary to control ground water and seepage to the satisfaction of the Geotechnical Consultant and the Owner until backfilling is completed.
- B. Dewater during backfilling operation so that groundwater is maintained a least one foot below level of compaction effort.
- C. Obtain the Geotechnical Consultant's approval for proposed control of water and dewatering methods.
- D. Reroute surface water runoff away from open trenches and excavations. Do not allow water to accumulate in trenches and excavations.
- E. Maintain dewatering system in place until dewatering is no longer required.

3.3 BRACING AND SHORING

- A. Conform to California and Federal OSHA requirements.
- B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the pipes and appurtenances being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.
- C. Be solely responsible for all bracing and shoring and, if requested by the Owner, submit details and calculations to the Owner. The Owner may forward the submittal to the Geotechnical Consultant, the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations in trench section or around structures shall precede a response to the submittal by the Owner.
- D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the line, grade, or backfill compaction or operation of the utility being installed or adjacent utilities and facilities.

3.4 PIPE BEDDING

- A. Obtain approval of bedding material from the Geotechnical Consultant.
- B. Accurately shape bedding material to the line and grade called for on the Plans. Carefully place and compact bedding material to the elevation of the bottom of the pipe in layers not exceeding 8-inches in loose thickness. Compact bedding material at optimum water content to 90% relative compaction unless specified otherwise on the Plans or by the Geotechnical Consultant. Compact by pneumatic

tampers or other mechanical means approved by the Geotechnical Consultant. Jetting or ponding of bedding material will not be permitted.

- C. Upon completion of bedding operations, and prior to the installation of pipe, notify the Geotechnical Consultant, who will inspect the bedding layer. Do not commence pipe laying until the Geotechnical Consultant has approved the bedding.

3.5 WARNING TAPE

- A. Install in accordance with Section 33 10 00 – Water Utilities.

3.6 BACKFILLING

- A. Obtain approval of backfill material from Geotechnical Consultant.
- B. Bring initial backfill up simultaneously on both sides of the pipe, so as to prevent any displacement of the pipe from its true alignment. Carefully place and compact initial backfill material to an elevation of 12-inches above the top of the pipe in layers not exceeding 8-inches in loose thickness. Compact bedding material at optimum water content to 90% relative compaction unless specified otherwise on the Plans or by the Geotechnical Consultant. Compact by pneumatic tampers or other mechanical means approved by the Geotechnical Consultant. Jetting or ponding of initial backfill material will not be permitted.
- C. Bring subsequent backfill to subgrade or finish grade as indicated. Carefully place and compact subsequent backfill material to the proper elevation in layers not exceeding 8-inches in loose thickness. Compact bedding material at optimum water content to 90% relative compaction, except that the upper 36-inches in areas subject to vehicular traffic shall be compacted to at least 95% relative compaction, unless specified otherwise on the Plans or by the Geotechnical Consultant. Compact by pneumatic tampers or other mechanical means approved by the Geotechnical Consultant. Jetting or ponding of subsequent backfill material will not be permitted.
- D. Do not use compaction equipment or methods that produce horizontal or vertical earth pressures that may cause excessive pipe displacement or damage the pipe.
- E. Utility backfill shall be inspected and tested by the Geotechnical Consultant during placement. Cooperate with the Geotechnical Consultant and provide working space for such tests in operations. Backfill not compacted in accordance with these specifications shall be re-compacted or removed as necessary and replaced to meet the specified requirements, to the satisfaction of the Geotechnical Consultant and the Owner prior to proceeding with the Project.

3.7 CLEANUP

- A. Upon completion of utility earthwork all lines, manholes catch basins, inlets, water meter boxes and other structures shall be thoroughly cleaned of dirt, rubbish, debris and obstructions of any kind to the satisfaction of the Owner.
- B. See Section 01 74 00 – Cleaning and Waste Management for further cleanup requirements.

END OF SECTION

SECTION 31 25 00 - EROSION AND SEDIMENTATION CONTROL

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This Section pertains to the provisions for the control of erosion in the construction area and in stockpile areas including seeding, hydro-mulching, sediment barriers, fiber rolls, and temporary gravel construction entrance/exit.
- B. Contractor is responsible for meeting all local, state and federal regulations regarding erosion control including the applicable provisions of the National Pollution Discharge Elimination System (NPDES) regulations from the Federal Clean Water Act.

1.2 RELATED DOCUMENTS

- A. Provisions established in General and Supplementary Conditions of the Contract, Division 1 - General Requirements, and the Drawings are collectively applicable to this Section.
- B. Geotechnical study performed by Cornerstone Earth Group dated May 28, 2014.
- C. Storm Water Pollution Prevention Plan for Colma Town Hall Renovation and Addition.

PART 2 – PRODUCTS

2.1 SEDIMENT BARRIERS AND TRAPS

- A. As indicated on the drawings.

2.2 FIBER ROLLS

- A. As indicated on the drawings.

2.3 TEMPORARY CONSTRUCTION ENTRANCE

- A. As indicated on the drawings.

PART 3 – EXECUTION

3.1 GENERAL

- A. Contractor shall keep disturbed areas to a minimum required to adequately perform the work. At all times the Contractor shall maintain the site in such a manner that minimizes erosion of the site. The execution of work under this section shall be in conformance with the NPDES rulings and the site Storm Water Pollution Prevention Plan.

3.2 FILL AND CUT SLOPES

- A. Fill slopes in all cases shall be no steeper than those approved by the Geotechnical Engineer.
- B. When cut slopes exceed 2:1 for depths over 3 feet, proper bracing and shoring per OSHA requirements shall be used and maintained.

- C. For temporary slopes, cut or fill, between 1:1 and 10:1, erosion protection shall be provided by other method as approved by the Geotechnical Engineer.
- D. Fill exposed aggregate base from demolition with class II aggregate base as needed to maintain positive drainage from existing site infrastructure.

3.3 EROSION CONTROL BARRIERS

- A. Erosion control barriers shall be provided at intervals along swales and ditches as shown on the drawings and as necessary to meet the requirements of the Storm Water Pollution Prevention Plan.
- B. The barriers shall be fiber rolls as shown the plans or other approved barrier material. Place barriers as shown on the drawings and details and as needed.
- C. Barriers shall be maintained in good working condition and replaced when damaged.
- D. Erosion control mats shall be overlaid on top of exposed aggregate base after demolition of asphalt surface.

END OF SECTION

SECTION 31 31 19 – VEGETATION CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Application of soil sterilant on subgrades for roadways, driveways, parking areas, walks, paths, trails and any other site improvements called for on the plans.

1.2 RELATED SECTIONS

- A. Section 31 23 00 – Excavation and Fill.

1.3 RELATED DOCUMENTS

- A. CAL/OSHA, Title 8.

1.4 SUBMITTALS

- A. Follow submittal procedures outlined in Section 01 33 00 – Submittal Procedures.

PART 2 - PRODUCTS

2.1 SOIL STERILANT

- A. Commercial chemical for weed control, registered by EPA. Provide granular, liquid or wet-able powder form.

PART 3 - EXECUTION

3.1 SOIL STERILIZATION

- A. Apply soil sterilant to areas indicated, such as beneath asphalt concrete pavement, brick pavement, concrete pavement and at grade concrete slabs, including sidewalks, curbs and gutters. Also where indicated apply soil sterilant below expansion and control joints and at areas where pipes, ducts or other features penetrate slabs.
- B. Apply soil sterilant uniformly and at the rates recommended by the manufacturer.
- C. Apply soil sterilant to prepared subgrade, or after installation of aggregate base as recommended by the manufacturer.

3.2 DISPOSAL

- A. Lawfully dispose of all unsuitable and excess or surplus material off-site at no cost to the Owner.

END OF SECTION

SECTION 32 11 00 – BASE COURSES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Aggregate base.

1.2 RELATED SECTIONS

- A. Section 31 23 00 – Excavation and Fill
- B. Section 32 12 00 – Flexible Paving
- C. Section 32 13 00 – Rigid Paving

1.3 RELATED DOCUMENTS

- A. Geotechnical Report.
- B. ASTM:
 - 1. D 3740, Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
 - 2. E 329, Specification for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
 - 3. E 548, Guide for General Criteria Used for Evaluating Laboratory Competence.
- C. Caltrans Standard Specifications:
 - 1. Section 24, Lime Stabilization.
 - 2. Section 25, Aggregate Subbases.
 - 3. Section 26, Aggregate Bases.
 - 4. Section 27, Cement Treated Bases.

1.4 DEFINITIONS

- A. Geotechnical Testing Agency: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock definition testing, as documented according to ASTM D 3740 and ASTM E 548.
- B. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material $\frac{3}{4}$ -cubic yards or more in volume that when tested by an independent geotechnical testing agency, according to ASTM D 1586, exceeds a standard penetration resistance of 100 blows/2-inches.
- C. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man made stationary features constructed above or below grade.
- D. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, base or topsoil materials.

1.5 SUBMITTALS

- A. Follow submittal procedures outlined in Division 1.
- B. Submit material certificates signed by the material producer and the Contractor, certifying that that each material item complies with, or exceeds the specified requirements.

1.6 QUALITY ASSURANCE

- A. Conform all work and materials to the recommendations or requirements of the Geotechnical Report and meet the approval of the Geotechnical Consultant.
- B. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D 1557.
- C. Perform installation of base materials under the observation of the Geotechnical Consultant. Materials placed without approval of the Geotechnical Consultant will be presumed to be defective and, at the discretion of the Geotechnical Consultant, shall be removed and replaced at no cost to the Owner. Notify the Geotechnical Consultant at least 24-hours prior to commencement of base material installation and at least 48 hours prior to testing.
- D. Do not mix or place cement treated base when the temperature is below 36 degrees F or when the ground is frozen.
- E. Finish surface of material to be stabilized prior to lime treatment shall be as specified in Section 24-1.04 of Caltrans Standard Specifications.
- F. Finish surface of the stabilized material after lime treatment shall be as specified in Section 24-1.08 of Caltrans Standard Specifications.
- G. Finish surface of cement treated base shall be as specified in Section 27 of Caltrans Standard Specifications.
- H. Do not project the finish surface of aggregate subbase above the design subgrade.
- I. Finish grade tolerance at completion of base installation: +0.05 feet.

1.7 PROJECT CONDITIONS

- A. Protect open excavations, trenches, and the like with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.
- B. Temporarily stockpile material in an orderly and safe manner and in a location approved by the Owner.
- C. Provide dust and noise control in conformance with Division 1 General Requirements.

PART 2 - PRODUCTS

2.1 AGGREGATE BASE

- A. Material: Caltrans Standard Specification Section 26.
 - 1. Class 2, 3/4-inch Maximum: Section 26-1.02A.

PART 3 - EXECUTION

3.1 GENERAL

- A. Placement and compaction of material by flooding, ponding, or jetting will not be permitted.

3.2 WET WEATHER CONDITIONS

- A. Do not place or compact subgrade if above optimum moisture content.
- B. If the Geotechnical Consultant allows work to continue during wet weather conditions, conform to supplemental recommendations provided by the Geotechnical Consultant.

3.3 AGGREGATE BASE

- A. Watering, Spreading and Compacting: Section 26-1.035, 26-1.04 and 26-1.05 of Caltrans Standard Specifications.

3.4 DISPOSAL

- A. Lawfully dispose of all unsuitable and excess or surplus material off-site at no cost to the Owner.

END OF SECTION

SECTION 33 05 13 – MANHOLE GRADE ADJUSTMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Adjusting manholes, valves, monument covers and other structures to grade.

1.2 RELATED SECTIONS

- A. Section 32 05 23 – Cement and Concrete for Exterior Civil Improvements
- B. Section 32 12 00 – Flexible Paving
- C. Section 32 13 00 – Rigid Paving
- D. Section 33 05 16 – Utility Structures

1.3 DEFINITIONS

- A. ASTM: American Society for Testing Materials.

1.4 SUBMITTALS

- A. Follow submittal procedures outlined in Division 1.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 ADJUSTING MANHOLES, VALVES, MONUMENT COVERS AND OTHER STRUCTURES TO GRADE

- A. Remove pavement, using vertical cuts, as needed to remove frame and provide for concrete collar. Do not damage adjacent pavement.
 - 1. Circular Covers: Cut circle with radius 6 inches larger than cover and concentric with cover.
 - 2. Rectangular Covers: Cut rectangle 6 inches larger than cover on all sides.
- B. Install grade rings or blocking as needed to raise cover to finish grade.
- C. Pour concrete collar:
 - 1. Bottom of Collar: Top of existing collar or 6 inches below top of proposed collar, whichever is at a higher elevation.
 - 2. Top of Collar: Bottom of existing asphalt pavement.
 - 3. Apply tack coat to all exposed surfaces.
 - 4. Fill excavation with asphaltic concrete and, while still hot, compact flush with adjacent surface.

SECTION 33 05 16 – UTILITY STRUCTURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Manhole structures for gravity storm drain and sanitary sewer utilities.

1.2 RELATED SECTIONS

- A. Section 31 23 33 – Trenching and Backfilling.
- B. Section 33 30 00 – Sanitary Sewerage Utilities.
- C. Section 33 40 00 – Storm Drainage Utilities.
- D. Section 32 05 23 – Cement and Concrete for Exterior Civil Improvements.

1.3 RELATED DOCUMENTS

- A. AASHTO:
 - 1. M 199: Precast Reinforced Concrete Manhole Sections.
- B. ASTM:
 - 1. A 615/A615M: Deformed and Billet-Steel Bars for Concrete Reinforcement.
 - 2. C 478: Precast Reinforced Concrete Manhole Sections.
 - 3. C 1244: Test Method for Concrete Sewer Manholes by Negative Air Pressure (Vacuum) Test.
- C. Caltrans Caltrans Standard Specifications.
 - 1. Section 51, Concrete Structures.
 - 2. Section 75, Miscellaneous Metal.

1.4 DEFINITIONS

- A. AASHTO: American Association of State Highway and Transportation Officials.
- B. ASTM: American Society for Testing Materials.

1.5 SUBMITTALS

- A. Follow submittal procedures outlined in Section 01 33 00 – Submittal Procedures.
- B. Product data for the following:
 - 1. Cleanout plugs or caps.
- C. Shop drawings: Include plans, elevations, details and attachments for the following:
 - 1. Precast concrete manholes, frames and covers.

- 2. Precast concrete clean out boxes and box covers.
- D. Design Mix Reports and Calculations: For each class of cast-in-place concrete.
- E. Field Test Reports: Indicate and interpret test results for compliance with performance.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Handle precast concrete manholes according to manufacturer's written instructions.
- B. Protect imported bedding and backfill material from contamination by other materials.

PART 2 - PRODUCTS

2.1 CLEANOUTS

- A. Piping: Same as sanitary sewer line if possible.
- B. Top Cap: Threaded and of same material as piping if possible.
- C. Box Size: As required to provide access and allow easy removal and reinstallation of cap.
- D. Box Types:
 - 1. Non-Traffic Areas: Portland cement concrete box and box cover, light duty.
 - 2. Traffic Areas: Portland cement concrete box and box cover or steel or cast iron cover, heavy duty, both box and cover to be rated for AASHTO H20 loading.
- E. Box Cover Markings: "S.D." for storm drain cleanouts, "S.S." for sanitary sewer cleanouts, unless otherwise specified.
- F. Available Manufacturers: Subject to compliance with requirements, box manufacturers offering products that may be incorporated into the Project include, but are not limited to the following:
 - 1. Associated Concrete Products, Inc. (Santa Ana, California) (Tel. 714-557-7470).
 - 2. Brooks Products Inc. (El Monte, California) (Tel. 818-443-3017).
 - 3. Christy Concrete Products, Inc. (Fremont, California) (Tel. 800-486 7070).

2.2 MANHOLES

- A. General: Size, shape, configuration, depth, etc. of manhole and frame and cover shall be as indicated.
- B. Portland Cement Concrete and Reinforcing:
 - 1. Cast-In-Place Portion: Use Class A Concrete per Caltrans Standard Specification Section 90, and ASTM A615 Grade 60 reinforcing steel bars.
 - 2. Precast Portion: ASTM C 478. Rate for AASHTO H20 loading in traffic areas.
- C. Frames and Covers: As indicated and in accordance with Caltrans Standard Specification Section 75-1.02.

- D. Steps: ASTM C 478 or AASHTO M 199. Manufacture from deformed, ½-inch steel reinforcement rod complying with ASTM A 615 and encased in polypropylene complying with ASTM D4101. Include pattern designed to prevent lateral slippage off step. Acceptable manufacturer is Hanson Concrete Products, (Milpitas, CA) (Tel 408-262-1091) or equal.
- E. Force Main Piping Access Openings:
 - 1. General: As indicated.

2.3 JOINT SEALANT FOR STRUCTURES AND MANHOLES

- A. Mortar: Caltrans Standard Specification Section 51-1.135.
 - 1. Use to seal around pipes at connections to structures and manholes. Also use to seal joints between precast sections of structures and manholes.
- B. Gaskets: Preformed flexible rubber or plastic gasket.
 - 1. Rubber Gaskets: ASTM C443.
 - 2. Plastic Gaskets: Federal Specification SS-S-00210 (GSA-FSS), Type I, Rope Form; or alternate standard which may exist. Acceptable material is "Ram-Nek," as manufactured by the K. T. Snyder Company (Houston TX), or equal.

PART 3 - EXECUTION

3.1 CLEANOUT INSTALLATION

- A. General: Install as indicated.

3.2 MANHOLE INSTALLATION

- A. General: Install as indicated.

3.3 TESTING OF MANHOLES ON GRAVITY LINES

- A. At the option of the Contractor, either the following hydrostatic or vacuum test shall be performed.
- B. Hydrostatic Test:
 - 1. Insert inflatable plugs in all sewer inlets and outlets.
 - 2. Fill the manhole with water to a point six inches below the base of the manhole frame.
 - 3. Maintain the water at this point for one hour to allow time for absorption.
 - 4. Begin one-hour test period. Measure the amount of water added in one-hour period to maintain the water level at six inches below the base of the manhole frame. Do not allow water level to drop more than 25% of the manhole depth.
 - 5. Determine the allowable leakage by the following formula.

$$L=0.0002 \times D \times H^{1/2}$$

L = Allowable leakage, gallons per minute.

3.2 INSTALLATION TOLERANCES

A. Adjust Covers:

1. Compacted surface: Up to 0.01 foot higher, and no lower, than adjacent pavement.
2. Do not create ponding.

END OF SECTION

D = Depth of manhole from top to bottom, feet.

H = Head of water in feet as measured from the surface of the water in the manhole to the sewer line invert or to the prevailing ground water surface outside the manhole. The lesser height governs.

6. If the leakage exceeds the allowable, determine the cause, take remedial action and re-test the manhole. If the leakage is less than the allowable and leaks are observed, repair the leaks.

C. Vacuum Test:

1. General: Test in accordance with ASTM C 1244.
2. Test prior to backfilling around the manhole.
3. Test Preparation: Plug all lift holes and pipes entering or exiting the manhole.
4. Place test head inside the top section of the manhole's cone section and inflate in accordance with the manufacturer's instructions.
5. Draw a vacuum of 10-inches of mercury and shut the pump off.
6. With the valve closed, the time for the vacuum to drop 9-inches shall be measured.
7. The manhole shall pass the test if the time is greater than 60 seconds for a 48-inch diameter manhole, 75 seconds for a 60-inch diameter manhole and 90 seconds for a 72-inch diameter manhole.
8. If the manhole fails the initial test, make necessary repairs with a non-shrink grout while the vacuum is still being drawn. Retest until a satisfactory test is obtained.

END OF SECTION

SECTION 33 10 00 – WATER UTILITIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Site water distribution system for domestic and fire protection services up to 5 feet of any on-site building being served.
- B. Domestic water and fire protection water transmission or distribution system within a roadway or street right-of-way.

1.2 RELATED SECTIONS

- A. Section 31 23 33 – Trenching and Backfilling
- B. Section 32 05 23 – Cement and Concrete for Exterior Civil Improvements

1.3 RELATED DOCUMENTS

- A. ASTM:
 - 1. A 536: Specification for Ductile Iron Castings.
 - 2. B 88: Specifications for Seamless Copper Water Tube.
 - 3. D 1785: Specifications for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
 - 4. D 2564: Specifications for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
- B. AWWA:
 - 1. C104: Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
 - 2. C105: Polyethylene Encasement for Ductile-Iron Pipe Systems.
 - 3. C110: Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (76 mm Through 1,219 mm) for Water.
 - 4. C111: Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 - 5. C115: Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
 - 6. C150: Thickness Design of Ductile Iron Pipe.
 - 7. C151: Ductile-Iron Pipe, Centrifugally Cast, for Water.
 - 8. C153: Ductile- Iron Compact Fittings for Water Service.
 - 9. C200: Steel Water Pipe-6 In. (150 mm) and larger.
 - 10. C203: Coal-Tar Protective Coatings and Linings for Steel Water Pipelines-Enamel and Tape-Hot Applied.
 - 11. C205: Cement-Mortar Protective Lining and Coating for Steel Water Pipe- 4 In. and Larger-Shop Applied.

12. C207: Steel Pipe Flanges for Waterworks Service-Sizes 4 In. Through 144 In. (100 mm Through 3,600 mm).
13. C208: Dimensions for Fabricated Steel Water Pipe Fittings.
14. C209: Cold Applied Tape Coatings for the Exterior of Special Sections, Connections and Fittings for Steel Water Pipelines.
15. C210: Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.
16. C213: Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.
17. C214: Tape Coating Systems for the Exterior of Steel Water Pipelines.
18. C218: Coating the Exterior of Aboveground Steel Water Pipelines and Fittings.
19. C219: Bolted, Sleeve-type Couplings for Plain-End Pipe.
20. C500: Metal-Seated Gate Valves for Water Supply Service.
21. C502: Dry-Barrel Fire Hydrants.
22. C503: Wet Barrel Fire Hydrants.
23. C504: Rubber Seated Butterfly Valves.
24. C507: Ball Valves 6 In. Through 8 In. (150 mm Through 1,200 mm).
25. C508: Swing-check Valves for Waterworks Service, 2 In. (50mm) Through 24 In. (600 mm) NPS.
26. C509: Resilient-Seated Gate Valves for Water Supply Service.
27. C510: Double Check Valve Backflow-Prevention Assembly.
28. C511: Reduced-Pressure Principle Backflow-Prevention Assembly.
29. C512: Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service.
30. C550: Protective Epoxy Interior Coatings for Valves and Hydrants.
31. C600: Installation of Ductile-Iron Water Mains and Their Appurtenances.
32. C605: Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings.
33. C606: Grooved and Shouldered Joints.
34. C651: Disinfecting Water Mains.
35. C800: Underground Service Line Valves and Fittings.
36. C900: Polyvinyl Chloride (PVC) Pressure Pipe and Fittings, 4 In. Through 12 In. (100mm Through 300mm) for Water Distribution.
37. C901: Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13mm) Through 3 In. (76mm) for Water Service.
38. C905: Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. Through 48 In. (350 mm Through 1,200 mm) for Water Transmission and Distribution.

- 39. C906: Polyethylene (PE) Pressure Pipe and Fittings, 4 In. (100 mm) through 63 In (1,575 mm), for Water Distribution and Transmission.
- 40. C907: Polyvinyl Chloride (PVC) Pressure Fittings for Water – 4 In. through 8 In. (100 mm Through 200 mm).
- 41. C908: PVC Self-Tapping Saddle Tees for Use on PVC Pipe.
- 42. M11: Steel Pipe - A Guide for Design and Installation.
- 43. M23: PVC Pipe – Design and Installation.
- 44. M41: Ductile-Iron Pipe and Fittings.

1.4 DEFINITIONS

- A. AASHTO: American Association of State Highway and Transportation Officials.
- B. ASTM: American Society for Testing Materials.
- C. AWWA: American Waterworks Association
- D. DI: Ductile iron.
- E. DIP: Ductile iron pipe.
- F. FM: Factory Mutual.
- G. NFPA: National Fire Protection Association.
- H. NSF: National Sanitation Foundation.
- I. PCC: Portland cement concrete.
- J. PE: Polyethylene.
- K. PVC: Polyvinyl Chloride.
- L. UL: Underwriters Laboratory.

1.5 SYSTEM PERFORMANCE REQUIREMENTS

- A. Minimum Internal Pressures: As indicated on plans.
- B. External Load: Earth load indicated by depth of cover plus AASHTO H20 live load unless indicated otherwise.

1.6 SUBMITTALS

- A. Follow submittal procedures outlined in Division 1.
- B. Product Data: For the following:
 - 1. Piping materials and fittings.
 - 2. Pipe couplings.
 - 3. Flexible pipe fittings.

4. Restrained pipe fittings.
 5. High deflection fittings/ball joints.
 6. Expansion joints.
 7. Flexible expansion joints.
 8. Gate valves.
 9. Butterfly valves.
 10. Check valves.
 11. Air and vacuum relief valves.
 12. Blow-off valves.
 13. Pressure reducing valves.
 14. Pressure sustaining valves.
 15. Ball valves.
 16. Fire hydrants.
 17. Post indicator valves.
 18. Fire department connections.
 19. Backflow preventers.
 20. Precast valve boxes and box covers.
- C. Shop drawings: Include plans, elevations, details and attachments.
1. Precast and cast in-place vaults and covers.
 2. Wiring diagrams for alarm devices.
- D. Field test reports: Indicate and interpret test results for compliance with the Project requirements.

1.7 QUALITY ASSURANCE

- A. Comply with requirements of utility supplying water. Do not operate existing valves or tap existing piping without written permission and/or presence of utility company representative.
- B. Comply with the following requirements and standards:
1. NSF 61: "Drinking Water System Components-Health Effects" for materials for potable water.
 2. NFPA 24: "Installation of Private Fire Service Mains and Their Appurtenances" for materials, installations, tests, flushing, and valve and hydrant supervision.
 3. NFPA 70: "National Electric Code" for electrical connections between wiring and electrically operated devices.
- C. Provide listing/approval stamp, label, or other marking on piping and specialties made to a specified standard.

1.8 MATERIAL DELIVERY, STORAGE AND HANDLING

- A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:
 - 1. Ensure that valves are dry and internally protected against rust and corrosion.
 - 2. Protect valves against damage to threaded ends and flange faces.
 - 3. Set Valves in best position for handling. Set valves closed to prevent rattling.
- B. Deliver piping with factory-applied end-caps. Maintain end-caps through shipping, storage and handling to prevent pipe end damage and to prevent entrance of dirt, debris and moisture.
- C. Handling: Use slings to handle valves and fire hydrants whose size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.
- D. During Storage: Use precautions for valves, including fire hydrants according to the following.
 - 1. Do not remove end protectors, unless necessary for inspection, then reinstall for storage.
 - 2. Protection from Weather: Store indoors and maintain temperature higher than ambient dew-point temperature. Store indoors and maintain temperature higher than ambient dew point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- E. Do not store plastic pipe and fittings in direct sunlight.
- F. Protect pipe, fittings, flanges, seals and specialties from moisture, dirt and damage.
- G. Protect linings and coatings from damage.
- H. Handle precast boxes, vaults and other precast structures according to manufacturer's written instructions.
- I. Protect imported bedding and backfill material from contamination by other materials.

1.9 COORDINATION

- A. Coordinate connection to existing water mains with water utility supplying water.
- B. Coordinate piping materials, sizes, entry locations, and pressure requirements with building domestic water distribution piping and fire protection piping.

PART 2 PRODUCTS

2.1 SMALL-SIZE SERVICE PIPES

- A. Copper Pipe: Sizes ¾-inch through 2-inch.
 - 1. Pipe and Fittings: ASTM B 88, Type K, seamless water tube, annealed.
 - 2. Joints: Restrain by couplings.
- B. PVC Pipe: Sizes 1/8-inch through 3 inch.
 - 1. Pipe and Fittings: ASTM D 1785, Schedule 40

2. Joints: Restrain with solvent cement. Do not use threaded pipe.
3. Solvent Cement: ASTM D2564.

2.2 LARGE-SIZE SERVICE AND DISTRIBUTION PIPES

- A. DIP: Sizes 4-inch through 48-inch.
 1. Pipe: AWWA C150 and C151 (Specify Thickness Class 50, 51, 52, 53...).
 2. Fittings
 - a. Standard: AWWA C110, sizes 4-inch through 48-inch.
 - b. Compact: AWWA C153, sizes 4-inch through 24-inch.
 3. Pipe and Fitting Lining: Cement Mortar, AWWA C104.
 4. Pipe and Fitting Coating: Asphaltic, AWWA C151 or C115.
 5. Exterior Soil Corrosion Protection for Pipe and Fittings: Polyethylene encasement, AWWA C105.
 6. Restrained Joints:
 - a. Flanged Joint: AWWA C115.
 - b. Push-On Bell and Spigot Joint: AWWA C111 with "Field Lok Gasket," sizes 4-inch through 24-inch; "TR Flex," sizes 4-inch through 64-inch; both by U. S. Pipe (Birmingham AL) (Tel.205-254-7442) or approved equal. "Megalug" restraint harness, Ebaa Iron (Eastland TX) (Tel 800-443-1716) or approved equal.
 - c. Mechanical Joint: AWWA C111 with "Mega Lug," sizes 3-inch through 48-inch. Ebaa Iron (Eastland TX) (Tel 800-443-1716) or approved equal.
 7. Couplings:
 - a. Plain End Pipe to Plain End Pipe: Ductile iron or steel bolted couplings, manufacturer's shop coating with low alloy steel bolts and nuts. Steel couplings to conform to AWWA C219. Smith-Blair, Inc, (Texarkana, AR) (Tel. 501-773-5127), Dresser (Bradford, PA) (Tel.-814-368-3131) or approved equal.
 - b. Plain End Pipe to Flanged Pipe: 1) Ductile iron or steel bolted flanged coupling adapters, manufacturer's shop coating with low alloy steel bolts and nuts. Steel flanged couplings to conform to AWWA C219. Smith-Blair, Inc, (Texarkana, AR) (Tel. 501-773-5127), Dresser (Bradford, PA) (Tel.-814-368-3131) or approved equal; or 2) restrained flange adapter, "Megaflange," sizes 3-inch through 36 inch, Ebaa Iron (Eastland TX) (Tel 800-443-1716) or approved equal.
- B. PVC Pipe: Sizes 4-inch through 48-inch (Specify Pressure Class 305(200psi), 235 (150psi)).
 1. Pipe:
 - a. 4-inch through 12-inch: AWWA C900.
 - b. 14-inch through 48-inch: AWWA C905.
 2. Fittings: DI conforming to 2.02.A.2 above.

3. Restrained Joints:
 - a. Push-On Bell and Spigot Joint: Harness assembly as manufactured by Ebaa Iron (Eastland, Tx) (Tel. 800-433-1716) or approved equal.
 - b. Mechanical Joint: AWWA C111 with “Mega Lug,” sizes 3-inch through 48-inch. Ebaa Iron (Eastland TX) (Tel 800-443-1716) or approved equal.
4. Steel or Ductile Iron Couplings:
 - a. Plain End Pipe to Plain End Pipe: Ductile iron or steel bolted couplings, manufacturer’s shop coating with low alloy steel bolts and nuts. Steel couplings to conform to AWWA C219. Smith-Blair, Inc, (Texarkana, AR) (Tel. 501-773-5127), Dresser (Bradford, PA) (Tel.-814-368-3131) or approved equal.
 - b. Plain End Pipe to DI or Steel Flanged Pipe: Ductile iron or steel bolted flanged coupling adapters, manufacturer’s shop coating with low alloy steel bolts and nuts. Steel flanged couplings to conform to AWWA C219. Smith-Blair, Inc, (Texarkana, AR) (Tel. 501-773-5127), Dresser (Bradford, PA) (Tel.-814-368-3131) or approved equal.
5. PVC Couplings
 - a. Unrestrained Plain End to Plain End Pipe: AWWA C900, as manufactured by CertainTeed (Valley Forge, PA) (Tel. 610 341-6820) or approved equal.
 - b. Restrained Plain End to Plain End Pipe: AWWA C900, “Certa-Lock” as manufactured by CertainTeed (Valley Forge, PA) (Tel. 610 341-6820) or approved equal.

2.3 GATE VALVES

- A. Provide on lines 10-inch and smaller.
- B. Valves, 3-Inch through 20-Inch: AWWA C509, resilient-seated, non-rising stem, gray or ductile-iron body and bonnet, with bronze or gray or ductile-iron gate, bronze stem and square stem operating nut unless noted otherwise. All bolts, nuts and washers, except operating nut, shall be stainless steel. Stem operating nut to be 2-inches square and open counter-clockwise. Stem extensions shall be installed to bring the stem operating nut to within 2-feet of finish grade where the depth from finish grade to the stem operating nut exceeds 4-feet. Equip valves in pump stations and other interior or vault installations with hand-wheels. Provide protective epoxy interior and exterior coating according to AWWA C550 and manufacturer’s recommendations.
- C. Service Line Valves and Fittings, 2-Inch and Smaller: AWWA C800
- D. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:
 1. Mueller Company (Decatur, IL) (Tel.800-423-1323).
 2. M&H Valve Company (Anniston, AL) (Tel. 205-237-3521).
 3. Crane Company (New York, NY).
- E. Valve Box and Cover: 9-inch minimum diameter PCC box with extensions of length required for depth of bury of valve, and cast iron or ductile iron cover with lettering “WATER”. Both the box and the cover shall be rated for AASHTO H20 loading.

2.4 SWING CHECK VALVES

- A. Valves 2-Inch through 24-Inch: AWWA C508, details as indicated.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:
 - 1. Mueller Company (Decatur, IL) (Tel.800-423-1323).
 - 2. M&H Valve Company (Anniston, AL) (Tel. 205-237-3521).

2.5 SERVICE CONNECTIONS AND WATER METERS

- A. Service connections and water meter details and boxes as indicated.

2.6 FIRE HYDRANTS

- A. Wet Barrel: AWWA C503, details as indicated.
- B. Dry Barrel: AWWA C502, details as indicated.

2.7 REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER

- A. Provide as indicated and as required by State or local agency.
- B. General: AWWA C511, with OS gate valve on inlet and outlet, and strainer on inlet. Include test cocks and pressure-differential relief valve with ASME A112.1.2 air gap fitting located between 2 positive-seating check valves for continuous-pressure application.
- C. Body:
 - 1. 2-Inch and Smaller: Bronze with threaded ends.
 - 2. 2-1/2-Inch and Larger: Bronze, cast iron steel, or stainless steel with flanged ends.
- D. Interior Lining: AWWA C550, epoxy coating for cast iron or steel bodies.
- E. Interior Components: Corrosion-resistant materials.
- F. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:
 - 1. Cla-Val Company (Newport Beach, CA) (Tel. 714-548-2201).
 - 2. Ames Company (Woodland, CA) (Tel. 916-666-2493).
 - 3. Febco, CMB Industries, Inc. (Fresno, CA) (Tel. 559-252-0791).
 - 4. Hersey Products, Inc. (Dedham, MA) (Tel. 617-326-9400).

2.8 DOUBLE CHECK DETECTOR ASSEMBLY

- A. FM approved or UL listed, with OS&Y gate valve on inlet and outlet, and strainer on inlet. Include two positive-seating check valves and test cocks, and bypass with displacement-type water meter, valves, and double-check backflow preventer, for continuous pressure application.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:

1. Cla-Val Company (Newport Beach, CA) (Tel. 714-548-2201).
2. Ames Company (Woodland, CA) (Tel. 916-666-2493).
3. Febco, CMB Industries, Inc. (Fresno, CA) (Tel. 559-252-0791).
4. Hersey Products, Inc. (Dedham, MA) (Tel. 617-326-9400).

2.9 POST INDICATOR VALVE

A. General: UL 789, FM approved, vertical-type, cast-iron body with operating wrench extension rod, and adjustable cast-iron barrel of length required for depth of bury of valve. Review fire department connection with agency having jurisdiction. Check hose threads and all sizes with fire department.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:

1. Mueller Co. (Decatur, IL) (Tel.800-423-1323).
2. Clow Corporation (Oskaloosa, IA).

2.10 FIRE DEPARTMENT CONNECTION

A. Exposed, Freestanding Fire Department Connection: UL 405, cast brass body with threaded inlets according to NFPA 1963 and matching local fire department hose threads and threaded bottom outlet. Include lugged caps, gaskets and chains; lugged swivel connections and drop clapper for each hose-connection inlet; 18-inch high brass sleeve; and round escutcheon plate. Four 2-1/2-inch NPS inlets and 6-inch NPS outlet.

2.11 UNDERGROUND VAULTS/PITS

- A. General: Portland cement concrete, precast or cast-in-place as indicated.
- B. Portland Cement Concrete and Reinforcing Steel: Section 32 05 23 – Cement and Concrete for Exterior Improvements.
- C. Access Openings: As indicated.
- D. External Load: Earth load plus AASHTO H20 live load if located in traffic area.

2.12 TRACER WIRE

A. General: Minimum #12 AWG stranded copper wire with blue THW, THWN, or THHN rated insulation.

2.13 WARNING TAPE

A. General: Non-detectable 3-inch warning tape made of solid blue film with continuously printed black-letter message reading "CAUTION—WATER LINE BURIED BELOW."

2.14 PCC THRUST BLOCKS

- A. Portland Cement Concrete and Reinforcing Steel: Section 32 05 23 – Concrete for Civil Improvements.

PART 3 EXECUTION

3.1 PIPE INSTALLATION

- A. General: Install pipe, fittings, and appurtenances utilizing best practices, manufacturer's instructions, and in accordance with the following:
 - 1. DIP: AWWA M41 and AWWAC600.
 - 2. PVC pipe: AWWA M23 and AWWA C605.
 - 3. Steel Pipe: AWWA M11.
- B. Pipe Depth and Trench Configuration: Conform to elevations, profiles and typical trench section(s) indicated.
- C. Excavation, Bedding, Backfill, and Compaction: Section 31 23 33 – Trenching and Backfilling.
- D. Handling: Carefully handle during loading, hauling, unloading and placing operations to avoid breakage or damage. Use strap type slings for lifting and placing; no chains or hooks will be permitted. Comply with manufacturer's recommendations.
- E. Laying: Before lowering pipe into the trench, remove all stakes, debris, loose rock and other hard materials from the bottom of the trench. Lay accurately in conformance with lines and grades indicated. Lay pipe on a bed of bedding material specified and prepared by handwork, dug true to grade. Furnish firm bearing for pipe throughout it's entire length with bell holes provided at the ends of each pipe length of sufficient size to permit making up the particular type of joint being used. Adjust pipe to line and grade by scraping away or filling and tamping material under the body of the pipe for the entire pipe length and not by blocking or wedging. After final positioning, hold pipe in place in trench with backfill material placed equally on both sides of the pipe at as many locations as required to hold the pipe section in place.
- F. Curved Alignment: When necessary to conform to the alignment specifically indicated, lay pipe on a curved alignment by means of asymmetrical closure of joints or bending of the pipe barrel. If necessary, use shorter than the standard lengths of pipe to achieve curvature specified. Do not exceed the recommendations of the pipe manufacture for deflections at the joints or pipe bending.
- G. Closure: Close open ends of pipes and appurtenance openings at the end of each days work or when work is not in progress.

3.2 CONNECTING TO EXISTING MAINS

- A. Pressure Tap Connections: Perform in accordance with the requirements of the owner of the system being tapped. Maintain a positive pressure flow from the main being tapped to the tapping device to flush plastic chips, metal ribbons, etc. into the tapping devise and not into the pipe being tapped.
- B. Other Connections: As indicated and in accordance with the requirements of the owner of the line being connected to.

3.3 ANCHORAGE INSTALLATION

- A. Mechanically Restrained Joints: Install where indicated for lengths indicated in accordance with manufacturer's instructions.
- B. PCC Thrust Blocks: Install where required and as indicated. Bearing area indicated is to be against undisturbed earth. Allow a minimum of 24-hours curing time before introducing water into the pipeline and allow a minimum of 7-days curing time before pressure testing.

3.4 VALVE INSTALLATION

- A. Install all valves in accordance with the manufacturer's instructions and the following:
 - 1. General:
 - a. Gate Valves: Appendix A of AWWA C509.
 - b. Butterfly Valves: Appendix A of AWWA C504.
 - 2. Joints:
 - a. Valves on DI, PE and PVC Pipe: Mechanical joint valves for buried locations. Flanged-end valves for installation in vaults/pits.
 - b. Valves on Steel Pipe: As indicated for buried locations. Flanged-end valves for installation in vaults/pits.

3.5 SERVICE CONNECTIONS INSTALLATION

- A. Install as indicated and in accordance with the requirements of the owner of the system.

3.6 WATER METER INSTALLATION

- A. Install as indicated and in accordance with the requirements of the owner of the system.

3.7 FIRE HYDRANT INSTALLATION

- A. Install as indicated and in accordance with the requirements of the owner of the system and the fire department.

3.8 REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER INSTALLATION

- A. Install as indicated and in accordance with the requirements of the owner of the system and the local health department requirements.

3.9 DOUBLE CHECK DETECTOR ASSEMBLY INSTALLATION

- A. Install as indicated and in accordance with the requirements of the owner of the system and the fire department.

3.10 POST INDICATOR VALVE INSTALLATION

- A. Install as indicated and in accordance with the requirements of the owner of the system and the fire department.

3.11 FIRE DEPARTMENT CONNECTION INSTALLATION

- A. Install as indicated and in accordance with the requirements of the owner of the system and the fire department.

3.12 UNDERGROUND VAULT/PIT INSTALLATION

- A. Install as indicated.
- B. Excavation and Backfill: Section 31 23 33 – Trenching and Backfilling.

3.13 TRACER WIRE INSTALLATION

- A. Install on trench bottom under the vertical projection of the pipe to protect it in all installations.
- B. Form a mechanically and electrically continuous line throughout the pipeline, extending to the nearest valve or other pipeline appurtenance designated by the owner of the system or the Owner. Extend the wire up the outside of the valve box/riser and cut a hole that is 8-inches from the top, extend a 12-inch wire lead to the inside of the box. At other pipeline appurtenances, designated by the owner of the system or the Owner, terminate the 12-inch wire lead inside the enclosure.
- C. Splice wire with a splicing device consisting of and electro-tin plated seamless copper sleeve conductor. Install as recommended by the manufacturer. Wrap splices and damaged insulation with electrician's tape.

3.14 WARNING TAPE INSTALLATION

- A. Install tape approximately 1-foot above and along the centerline of the pipe.
- B. Where tape is not continuous, lap tape ends a minimum of 2-feet.

3.15 HYDROSTATIC PRESSURE AND LEAKAGE TEST

- A. General:
 - 1. Provide all necessary materials and equipment, including water.
 - 2. Backfill all trenches sufficient to hold pipe firmly in position.
 - 3. Allow time for thrust blocks to cure prior to testing.
 - 4. Flush all pipes prior to testing to remove all foreign material.
 - 5. Perform pressure and leakage test concurrently.
 - 6. Test pressure: See Subsection titled "System Performance Requirements."
 - 7. Apply test pressure by means of a pump connected to the pipe.
 - 8. Base test pressure on the elevation of the lowest point in the line.
 - 9. Fill each closed valve section or bulk-headed section slowly. Expel air from section being tested by means of permanent air vents installed at high points or by means of temporary corporation cocks installed at such points. Remove and plug the temporary corporation cocks at the conclusion of the test.

10. Allow water to stand in the pipe for 24 hours before test pressure is applied.
 11. Allow the system to stabilize at the test pressure before conducting the leakage test.
 12. Do not operate valves in either the opening or closing direction at differential pressures above the valves rated pressure.
 13. Maintain test pressure as specified for type of pipe being tested.
 14. Pressure Test: Examine any exposed pipe, fittings, valves, hydrants and joints during the test, if no leaks are observed the section of line has passed the pressure test. If leaks are observed, repair any damaged or defective pipe, fittings, valves, or hydrants, and repeat the pressure test.
 15. Leakage Test: Perform as specified hereafter for the type of pipe being installed.
- B. DIP Leakage Test: Perform in accordance with AWWA C600. Selected requirements of AWWA C600 are repeated as follows:
1. Maintain the test pressure, +/- 5 psi, for a minimum of two hours.
 2. No piping will be accepted if the leakage is greater than that determined by the following formula:
 3. $L = (S \times D \times P^{1/2})/133,200$
 4. L = Allowable leakage, gallons per hour.
 5. S = Length of pipe tested, feet.
 6. D = Nominal diameter of pipe, inches.
 7. P = Average test pressure during the leakage test, pounds per square inch (gauge).
- C. PE Pipe Leakage Test:
1. Apply the test pressure and allow the pipe to stand, without makeup pressure, for sufficient time to allow for diametric expansion or pipe stretching to stabilize, approximately two to three hours.
 2. After the above stabilization has occurred, return the section being tested to the test pressure. Hold the test pressure for one to three hours. If the pressure in the test section drops, and it is determined the drop may be the result of expansion resulting from increasing temperature, a limited amount of additional water may be added to bring the pressure back to the test pressure. Allowable amounts of make-up water, to compensate for expansion due to increasing temperature, are as shown in the following table. Make-up water is only allowed during this final test period and not during the initial stabilization described in the previous paragraph. If the additional water added is less than the allowable shown in the table and there are no visual leaks or significant pressure drops, the tested section passes the test.

Nominal Pipe Size (in.)	Allowance for Expansion (U.S. Gals./100 Feet of Pipe)		
	1-Hour Test	2-Hour Test	3-Hour Test
3	0.10	0.15	0.25
4	0.13	0.25	0.40
6	0.30	0.60	0.90
8	0.50	1.0	1.50
10	0.75	1.3	2.1
11	1.0	2.0	3.0
12	1.1	2.3	3.4
14	1.4	2.8	4.2
16	1.7	3.3	5.0
18	2.2	4.3	6.5
20	2.8	5.5	8.0
22	3.5	7.0	10.5
24	4.5	8.9	13.3
28	5.5	11.1	16.8
32	7.0	14.3	21.5
36	9.0	18.0	27.0
40	11.0	22.0	33.0
48	15.0	27.0	43.0

D. PVC Pipe Leakage Test: Perform in accordance with AWWA M23. Selected requirements of AWWA M23 are repeated as follows:

1. Maintain the test pressure, +/- 5 psi, for a minimum of two hours.
2. No piping will be accepted if the leakage is greater than that determined by the following formula:

$$L = (N \times D \times P^{1/2}) / 7,400$$

L = Allowable leakage, gallons per hour.

N = Number of joints in the length of the pipeline tested.

D = Nominal diameter of pipe, inches.

P = Average test pressure during the leakage test, pounds per square inch (gauge).

E. Cement Mortar Lined and Coated Steel Pipe Leakage Test: Perform in accordance with AWWA M11. Selected requirements of AWWA M11 are repeated as follows:

1. Maintain the test pressure, +/- 5 psi, for a minimum of two hours.
2. There shall be no significant leakage for pipe with welded joints or mechanical couplings.
3. For pipe joined with O-ring rubber gaskets, a leakage of 25 gallons per inch of diameter per mile per 24-hours is allowed.

3.16 DISINFECTION

A. All New Pipelines shall be disinfected in accordance with one of the three methods specified in AWWA C651 and the following:

1. Disinfect after pressure and leakage test have been performed and accepted.

2. The method used shall be at the Contractor's option, unless specified by the owner of the water system.
3. Engage the services of a commercial testing laboratory, approved by the owner of the water system, to perform the bacteriological tests specified in Section 5.1 of AWWA C651. Direct the testing laboratory to send the original report of the bacteriological testing to the owner of the water system. Should the laboratory report show that any sample taken was not acceptable, repeat the sterilization process shall until a satisfactory sterilization is accomplished.
4. Lawfully dispose of the chlorinated water.

END OF SECTION

SECTION 33 40 00 – STORM DRAINAGE UTILITIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Roadway and/or site storm drainage up to 5-feet of any on-site building.

1.2 RELATED SECTIONS

- A. Section 31 23 33 – Trenching and Backfilling
- B. Section 32 05 23 – Cement and Concrete for Exterior Civil Improvements
- C. Section 33 46 00 – Subdrainage

1.3 RELATED DOCUMENTS

A. AASHTO:

- 1. M 252: Corrugated Polyethylene Drainage Tubing.
- 2. M 294: Corrugated Polyethylene Pipe, 12 to 24-inch Diameter.

B. ASTM:

- 1. A 74: Cast Iron Soil Pipe and Fittings.
- 2. A 615/A615M: Deformed and Billet-Steel Bars for Concrete Reinforcement.
- 3. C 443: Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
- 4. C 564: Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
- 5. C 1173: Flexible Transition Couplings for Underground Piping Systems.
- 6. D 1785: Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
- 7. D 2235: Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and fittings.
- 8. D 2321: Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.
- 9. D 2564: Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
- 10. D 2751: Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
- 11. D 3034: Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- 12. D 4101: Specifications for Propylene Injection and Extrusion Materials.
- 13. F 477: Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- 14. F 656: Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings.

15. F 679: Specification for Poly(Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings.

16. F-1336: Poly(Vinyl Chloride) (PVC) Gasket Sewer Fittings.

C. AWWA:

1. C104: Cement Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

2. C105: Polyethylene Encasement for Ductile-Iron Pipe Systems.

3. C110: Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (76 mm Through 1,219 mm) for Water.

4. C111: Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

5. C150: Thickness design of Ductile Iron Pipe.

6. C151: Ductile-Iron Pipe, Centrifugally Cast, for Water.

7. C153: Ductile-Iron Compact Fittings for Water Service.

8. M41: Ductile Iron Pipe and Fittings.

D. Caltrans Standard Specifications:

1. Section 65, Reinforced Concrete Pipe.

2. Section 66, Corrugated Metal Pipe.

3. Section 70. Miscellaneous Facilities.

4. Section 72, Slope Protection.

E. Caltrans Standard Plans:

1. Plan D94A: Metal and Plastic Flared End Sections.

2. Plan D94B: Concrete Flared End Sections.

3. Plan D97A: Corrugated Metal Pipe Coupling Details No.1, Annular Coupling Band Bar and Strap and Angle Connection.

4. Plan D97B: Corrugated Metal Pipe Coupling Details No. 2, Hat Band Coupler and Flange Details.

5. Plan D97C: Corrugated Metal Pipe Coupling Details No. 3, Helical and Universal Couplers.

6. Plan D97D: Corrugated Metal Pipe Coupling Details No. 4, Hugger Coupling Bands.

7. Plan D97E: Corrugated Metal Pipe Coupling Details No. 5, Standard Joint.

8. Plan D97F: Corrugated Metal Pipe Coupling Details No. 6, Positive Joint.

9. Plan D97G: Corrugated Metal Pipe Coupling Details No. 7, Positive Joints and Downdrains.

10. Plan D98A: Slotted Corrugated Steel Pipe Drain Details.

11. Plan D98B: Slotted Corrugated Steel Pipe Drain Details.

1.4 DEFINITIONS

- A. AASHTO: American Association of State Highway and Transportation Officials.
- B. ABS: Acrylonitrile-butadiene-styrene.
- C. ASTM: American Society for Testing Materials.
- D. AWWA: American Water Works Association.
- E. CMP: Corrugated metal pipe.
- F. DIP: Ductile iron pipe.
- G. HDPE: High-density polyethylene.
- H. NPS: Nominal pipe size.
- I. PE: Polyethylene.
- J. PVC: Polyvinyl chloride.
- K. RCP: Reinforced concrete pipe.

1.5 SUBMITTALS

- A. Follow submittal procedures outlined in Division 1.
- B. Product Data Shop Drawings, Etc.: For the following:
 - 1. Piping materials and fittings.
 - 2. Special pipe couplings.
 - 3. Polymer-concrete, channel drainage systems (trench drains).
 - 4. Joint sealants.
 - 5. Plastic area drains.
 - 6. Precast concrete catch basins, inlets, curb inlets, and area drains, including frames and grates.
 - 7. Concrete, metal and plastic flared end sections.
- C. Design Mix Reports and Calculations: For each class of cast in place concrete.
- D. Field Test Reports: Indicate and interpret test results for compliance with performance.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Do not store plastic structures, pipe and fittings in direct sunlight.
- B. Protect pipe, fittings, and seals from dirt and damage.
- C. Handle precast concrete pipe and other precast structures according to manufacturer's written instructions.
- D. Protect imported bedding and backfill material from contamination by other materials.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Reinforced Concrete Pipe: Designated by Class, rubber gasketed joints.
 - 1. Circular Reinforced Concrete Pipe: Caltrans Standard Specification Section 65-1.02A(1). Class III.
 - 2. Oval shaped (Elliptical) Reinforced Concrete Pipe: Caltrans Standard Specification Section 65-1.02B. Class HE-III and VE-III.
 - 3. Reinforced Concrete Pipe Arch: Caltrans Standard Specification Section 65-1.02C.
 - 4. Rubber Gasketed Joints: Caltrans Standard Specification Section 65-1.06.
- B. PVC Pipe and Fittings, 4-Inch and Larger
 - 1. Pipe:
 - a. 4-inch through 15-inch: ASTM D 3034, SDR 26. Bell and spigot joints.
 - 2. Fittings:
 - a. 4-inch through 27-inch: ASTM F 1336.
 - 3. Joint Gasket: Elastomeric seal, ASTM F 477.

2.2 SPECIAL PIPE COUPLINGS

- A. Plastic, Cast Iron and Ductile Iron Pipe: ASTM C 1173, rubber or elastomeric sleeve and band assembly fabricated to match outside diameters of pipes to be joined.
- B. Reinforced Concrete Pipe: Portland cement concrete collar as indicated.
- C. Section 32 05 23 – Cement and Concrete for Exterior Improvements

2.3 CURB INLETS, CATCH BASINS, DROP INLETS, AREA DRAINS, ETC.

- A. General: Size, shape, configuration, depth, etc. of structure and frame, grate, or cover shall be as indicated.
- B. Section 32 05 23 – Cement and Concrete for Exterior Improvements
- C. Precast Structure: Rate for AASHTO H20 loading in traffic areas.
- D. Steps: ASTM C 478 or AASHTO M 199. Manufacture from deformed, ½-inch steel reinforcement rod complying with ASTM A 615 and encased in polypropylene complying with ASTM D4101. Include pattern designed to prevent lateral slippage off step. Acceptable manufacturer is Hanson Concrete Products, (Milpitas, CA) (Tel 408-262-1091).
- E. Frames, Grates and Covers: Caltrans Standard Specification Section 75-1.02, 75-1.03 and 75-1.05.
 - 1. Galvanize steel frames, grates and covers.
 - 2. Grates and covers shall be non-rocking.
 - 3. Rate for AASHTO H20 loading in traffic areas.

2.4 MANHOLES AND CLEANOUTS

- A. See Section 33 05 16 – Utility Structures.

2.5 POLYMER-CONCRETE TRENCH DRAINS

- A. General: Modular system of precast, polymer-concrete channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling. Include number of units required to form total length required.
- B. Include the following components:
 - 1. Channel Sections: Interlocking-joint, precast modular units with end caps. Inside width as indicated with deep, rounded bottom, with built in slope or flat invert as indicated and outlets in number, sizes, and locations indicated. Include extension sections necessary for required depth.
 - 2. Frame and Grate: Gray iron, ductile iron or galvanized steel as indicated. Where drain is located in traffic areas, rate for AASHTO H20 loading.
- C. Locking Mechanism: Manufacturer's standard device for securing grates to channel sections.
- D. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:
 - 1. "Polydrain" by ABT Inc. (Troutman, NC) (Tel 704-528-9806).
 - 2. "ACO Drain" by ACO Polymer Products Inc. (Chardon, OH) (Tel. 800-543-4764).

PART 3 - EXECUTION

3.1 PIPE INSTALLATION

- A. General: Install pipe, fittings, and appurtenances utilizing best practices, manufacturer's instructions, and in accordance with Section 6 and 7 of ASTM D 2321 for plastic pipe, Caltrans Standard Specification Section 65-1.07 for reinforced concrete pipe, Caltrans Standard Specification Sections 66-1.045 and 66-105 for corrugated metal pipe and chapter 11.3.3 of AWWA M41 for cast iron and ductile iron pipe.
- B. Pipe Depth and Trench Configuration: Conform to typical trench section(s) indicated.
- C. Excavation, Bedding, Backfill, and Compaction: Section 31 23 33 – Trenching and Backfilling.
- D. Handling: Carefully handle during loading, hauling, unloading and placing operations to avoid breakage or damage. Use strap type slings for lifting and placing; no chains or hooks will be permitted. Comply with manufacturer's recommendations.
- E. Laying: Before lowering pipe into the trench, remove all stakes, debris, loose rock and other hard materials from the bottom of the trench. Lay accurately in conformance with lines and grades indicated. Start laying the pipeline at the low end and proceed upstream. Lay bell and spigot pipe with the bell end facing upstream. Lay pipe on a bed prepared by handwork, dug true to grade. Furnish firm bearing for pipe throughout its entire length with bell holes provided at the ends of each pipe length of sufficient size to permit making up the particular type of joint being used. Adjust pipe to line and grade by scraping away or filling and tamping material under the body of the pipe for the entire pipe length and not by blocking or wedging. After final positioning, hold pipe in place in trench

with backfill material placed equally on both sides of the pipe at as many locations as required to hold the pipe section in place.

- F. Curved Alignment: When necessary to conform to the alignment specifically indicated, lay pipe on a curved alignment by means of asymmetrical closure of joints or bending of the pipe barrel. Use shorter lengths of pipe than the standard length if necessary to achieve curvature specified. Do not exceed the recommendations of the pipe manufacture for deflections at the joints or pipe bending.
- G. Closure: Close open ends of pipes and appurtenance openings at the end of each days' work or when work is not in progress.

3.2 INSTALLATION OF PIPE ANCHORS

- A. Install at location, configuration and details shown on the Plans.

3.3 SPECIAL PIPE COUPLINGS

- A. General: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
- B. Installation: Per manufacturer's instructions.

3.4 INSTALLATION OF CURB INLETS, CATCH BASINS, DROP INLETS, AREA DRAINS, ETC.

- A. Excavation, Bedding, Backfill, and Compaction: Section 31 23 33 – Trenching and Backfilling.
- B. Poured in Place Structures: Install as indicated and Caltrans Standard Specification Section 51.
 - 1. Shape bottoms to convey flows as indicated.
- C. Precast Structures: Install as indicated.
 - 1. Seal all joints and pipe entrances and exits.
 - 2. Place concrete in bottom and shape to convey flows as indicated.

3.5 POLYMER-CONCRETE TRENCH DRAIN INSTALLATION

- A. Excavation, Bedding, Backfill, and Compaction: Section 31 23 33 – Trenching and Backfilling.
- B. Install: As indicated and in accordance with the manufacturer's instructions.

3.6 CONCRETE OR PLASTIC FLARED END SECTION INSTALLATION

- A. Install: As indicated.

3.7 TESTING

- A. Do not enclose, cover, or put into service before inspection and approval.
- B. Test completed piping systems according to authorities having jurisdiction.
- C. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours advance notice.

- D. Submit separate reports for each test.
- E. Where authorities having jurisdiction do not have published procedures, perform tests in accordance with latest edition of the Uniform Plumbing Code (UPC) Section 1109.0, Testing.
- F. Leaks and loss in test pressure constitute defects that must be repaired.
- G. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

END OF SECTION

SECTION 33 46 00- SUBDRAINAGE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Subdrains in trenches and subdrains or prefabricated composite drainage panels at walls or foundations.
- B. Sand-Swale filters in parking lot areas.

1.2 RELATED SECTIONS

- A. Section 31 23 33 – Trenching and Backfilling
- B. Section 33 05 16 – Utility Structures
- C. Section 33 40 00 – Storm Drainage Utilities

1.3 RELATED DOCUMENTS

- A. AASHTO:
 - 1. M 252: Corrugated Polyethylene Drainage Tubing.
 - 2. M 278: Class PS 50 Polyvinyl Chloride (PVC) Pipe.
 - 3. M 288: Geotextiles Used for Subsurface Drainage Purposes.
 - 4. M 294: Corrugated Polyethylene Pipe, 12- to 24-in. Diameter.
- B. ASTM:
 - 1. C 1173: Specifications for Flexible Transition Couplings for Underground Piping System.
 - 2. D 448: Classification for Sizes of Aggregate for Road and Bridge Construction.
 - 3. D 1621: Test Method for Compressive Properties of Rigid Cellular Plastics.
 - 4. D 1785: Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
 - 5. D 2235: Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and fittings.
 - 6. D 2321: Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
 - 7. D 2564: Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
 - 8. D 2729: Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
 - 9. D 2751: Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
 - 10. D 3034: Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
 - 11. D 4716: Test Method for Constant Head Hydraulic Transmissivity (in-Plane Flow) of Geotextiles and Geotextile Related Products.

12. F 477: Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
13. F 656: Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
14. F-1336: Poly(Vinyl Chloride) (PVC) Gasket Sewer Fittings.

C. Caltrans Standard Specifications:

1. Section 68-Subsurface Drains
2. Section 88-Engineering Fabrics

1.4 DEFINITIONS

- A. AASHTO: American Association of State Highway and Transportation Officials.
- B. ABS: Acrylonitrile-Butadiene-Styrene.
- C. AWWA: American Water Works Association.
- D. ABS: Acrylonitrile-butadiene-styrene.
- E. HDPE: High-density polyethylene.
- F. PE: Polyethylene.
- G. PVC: Polyvinyl Chloride.

1.5 SUBMITTALS

- A. Follow submittal procedures outlined in Division 1.
- B. Product data for the following:
 1. Perforated pipe and fittings.
 2. Solid pipe and fittings.
 3. Prefabricated composite drainage panels.
 4. Geotextile fabrics.
- C. Samples:
 1. Drainage Fill.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Do not store plastic structures, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe-fittings, and seals from dirt and damage.
- C. Protect permeable material from contamination by other materials.

PART 2 - PRODUCTS

2.1 PERFORATED WALL AND SOLID WALL PIPE

- A. PVC pipe and Fittings: Smaller than 4-inch, ASTM D1785, Schedule 40. Solvent cement joints.
 - 1. Solvent Cement: ASTM D 2564. Include primer according to ASTM F656.
 - 2. Perforation Size, Location, and Spacing: ASTM D 2729.
- B. PVC Pipe and Fittings:
 - 1. Pipe: 4-inch through 15-inch, ASTM D 3034, SDR 35. Bell and spigot joints.
 - 2. Perforation Size, Location, and Spacing: ASTM D 2729.
 - 3. Fittings: ASTM F 1336.
 - 4. Joint Gasket: Elastomeric seal, ASTM F 477.

2.2 SPECIAL PIPE COUPLINGS

- A. Description: ASTM C 1173. Rubber or elastomeric sleeve and band assembly fabricated to match outside diameters of pipes to be joined.

2.3 CLEANOUTS

- A. See 33 05 16 – Utility Structures.

2.4 PREFABRICATED COMPOSITE DRAINAGE PANELS

- A. Description: Prefabricated composite panels, 36 to 60-inches wide and manufactured with geotextile facing laminated to molded drainage core.
- B. Drainage Core: Three-dimensional, non-biodegradable, molded Polypropylene or Polystyrene.
 - 1. Minimum Compressive Strength: 10,000-lbf./sq. ft. when tested according to ASTM D 1621.
 - 2. Minimum Flow Rate: 7 gpm per foot at hydraulic gradient of 0.1 and compressive stress of 25 psig when tested according to ASTM D 4716.
- C. Geotextile: Non-woven needle-punched geotextile, manufactured for subsurface drainage, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with the following properties determined according to AASHTO M 288.
 - 1. Survivability Class: 2.
 - 2. Apparent Opening Size: No. 60 sieve maximum.
 - 3. Permittivity: 0.2 per second, minimum.
- D. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:
 - 1. American Wick Drain Corporation (Matthews, NC).
 - 2. Mirafi Inc. (Charlotte, NC) (Tel. 800-438-1855).

3. Multi-Flow (Prinsburg, MN) (Tel. 800978-8007).
4. Phillips Fibers Corporation (Greenville, SC) (Tel. 800-845-5737).

2.5 SUBDRAIN MATERIAL FOR KEYWAYS

- A. Caltrans Permeable Material: Conform to Section 68-1.025 of Caltrans Standard Specifications.
 1. Class 2

2.6 SUBDRAIN MATERIAL FOR STORMWATER TREATMENT AREAS

- A. Washed, open graded crushed stone, or crushed or uncrushed gravel.
 1. 100 percent passing 1-inch sieve
 2. 82 percent passing ¾-inch sieve
 3. 2 percent passing ½-inch sieve
 4. 1 percent passing 3/8-inch seive
- B. Sand: Conform to Section 19-3.025B of Caltrans Standard Specifications.

2.7 FILTER FABRIC

- A. When required, use filter fabric for encasing permeable material around subdrains.
 1. Caltrans Filter Fabric: Section 88-1.03 of Caltrans Standard Specifications.
 2. Mirafi 140N (Mirafi Inc., Charlotte, NC) (Tel. 800-438-1855) or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and areas for suitable conditions where subdrainage systems are to be installed.
- B. Install only after unsatisfactory conditions have been corrected.

3.2 PIPING APPLICATIONS

- A. Refer to Plans for location, size, and material designation for individual subdrains.

3.3 INSTALLATION OF PERFORATED PORTIONS OF SUBDRAINS

- A. Excavation: Section 6 of ASTM D 2321 and as indicated.
- B. Subdrain Bedding: Place supporting layer of drainage fill over compacted subgrade to compacted depth indicated. If drainage fill requires encasement in filter fabric, lay filter fabric in trench and overlap trench sides before installing drainage fill.
- C. Piping Installation: Install pipe in accordance with Section 7 of ASTM D 2321. Install piping beginning at low point of system, true to grades and alignment indicated, with unbroken continuity of invert. Excavate recesses for bottoms of bell ends of pipe. Lay pipe with bells facing upslope and

with spigot end centered fully into adjacent bell. Bed piping with full pipe bearing in drainage fill material. Lay perforated pipe with perforations down. Install gaskets, seals, sleeves, and couplings in accordance with manufacturers written instructions. Use increasers, reducers, and couplings made for different sizes of materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.

- D. Initial Subdrain Backfill: After installing drainage piping, add drainage fill up to top of pipe to perform tests.
- E. Testing Subdrain: After installing drainage fill to top of pipe, test drain piping with water to ensure free flow before backfilling with drainage fill. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.
- F. Subsequent Subdrain Backfill: After satisfactory testing, cover piping with drainage fill to width and height indicated. Place drainage fill in layers not exceeding 3 inches in loose depth; compact each layer placed. If filter fabric is required complete the filter fabric encasement by bringing fabric to top and closing the encasement.
- G. Fill to Grade: Place native fill material over compacted drainage fill to thickness indicated. Place material in loose-depth layers not exceeding 6 inches. Thoroughly compact each layer. Fill to finish elevations unless otherwise specified on the plans.

3.4 INSTALLATION OF NON-PERFORATED PORTIONS OF SUBDRAINS

- A. Conform to Section 31 23 33 – Trenching and Backfilling, and Section 33 46 00 – Storm Drainage Utilities.

3.5 PREFABRICATED COMPOSITE DRAINAGE PANELS

- A. Coordinate placement with other drainage materials.
- B. Install prefabricated drainage panels in accordance with manufacturer's instructions.
- C. Place perforated drainage pipe at base of footing and attach to composite drainage panels in accordance with the manufacturer's instructions.

3.6 JOINING PIPE

- A. Join ABS and PVC pipe and fittings with elastomeric seals according to ASTM D 2321 or solvent cement.
- B. Special pipe couplings: Join piping made of different materials and dimensions with special couplings made for this application. Use couplings that are compatible with and that fit both pipe materials and dimensions.

3.7 CLEANING

- A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION

PLANS AND DRAWINGS

THE FOLLOWING PLANS AND DRAWINGS ARE INCORPORATED HEREIN BY REFERENCE AS IF SET FORTH IN THEIR ENTIRETY:

1. COLMA TOWN HALL - Mass Grading and Site Improvements Package

Dated: October 23, 2015

(Pages 1-10 listed below).

a) GENERAL:

GD-000 INDEX & GENERAL NOTES
GD-001 BEST MANAGEMENT PRACTICES PLAN

b) CIVIL:

C-100 TITLE SHEET, NOTES, LEGEND, AND ABBREVIATIONS
C-101 EXISTING CONDITIONS
C-200 EXCAVATION AND SITE UTILITY DEMOLITION PLAN
C-300 GRADING, DRAINAGE AND UTILITY PLAN

c) ARCHITECTURAL:

AX-100 SITE DEMOLITION PLAN
AX-101 LEVEL 0 BID SCHEDULE # 1 AND BID SCHEDULE #2
AX-200 CONCRETE WALL SECTIONS AND DETAILS, FOR BIDDING PURPOSES ONLY.

d) ATTACHMENT 0 – 1941 BUILDING UNDERPINNING EXHIBIT – FOR REFERENCE ONLY

2. EXHIBITS:

ATTACHMENT 1 – SOLIS REPORT

ATTACHMENT 2 – SELECTIVE DEMOLITION PACKAGE – FOR REFERENCE ONLY

PLANS AND DRAWINGS