DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
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Flex your power!
Be energy efficient!

August 23, 2013

11-SD-11, 905 - 0.0/1.6,R9.9/R10.7
11-056324
Project ID 1100020519

Addendum No. 2

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN SAN DIEGO COUNTY IN AND NEAR SAN DIEGO ON ROUTE 11 FROM ROUTE 11/905 SEPARATION TO ENRICO FERMI DRIVE AND ON ROUTE 905 FROM 0.1 MILE EAST OF LA MEDIA ROAD UNDERCROSSING TO 0.2 MILE WEST OF AIRWAY ROAD UNDERCROSSING.

Submit bids for this work with the understanding and full consideration of this addendum. The revisions declared in this addendum are an essential part of the contract.

Bids for this work will be opened on Thursday, September 5, 2013.

This addendum is being issued to revise the project plans, the *Notice to Bidders and Special Provisions*, the *Bid* book, and the *Information Handout*.

Project plan sheets 81, 264, 266, 268, 272, 274, 278, 282, 286, 288, 314, 322, 325, 326, 385, 444, 445, 503, 519, 522, 557, 564, 567, 568, 598, and 618 are replaced and attached for substitution for the like-numbered sheets.

Project plan sheet 448 is deleted.

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In the Special Provisions, Section 2-1.06B is replaced as follows:

"The Department makes the following supplemental project information available:

Supplemental Project Information

Means	Description
Included in the *Information Handout*	Geotechnical Design Report, Dated May 13, 2013 Geotechnical Design Report for MSE Walls, Dated November 15, 2012 Foundation Report for E905-E11/RTE 905 Connector Separation, Dated September 26, 2012 Foundation Report for Route 11/125 Separation (Right Bridge), Dated September 17, 2012 Foundation Report for Route 11/125 Separation (Left Bridge), Dated September 17, 2012 Foundation Report for Sanyo Avenue UC, Dated August 8, 2012 Foundation Report for W11-W905 Connector, Dated October 16, 2012 District 11 Materials Design Report, Dated January 4, 2012 Corrosion Study, Dated August 3, 2012 Underground Classification Numbers: C062-073-13T, & C063-073-13T, Dated November 14, 2012 Otay Water District Water Availability Letter, Dated May 23, 2012 Approved Materials List for Wastewater, Dated April 2012 Initial Site Assessment, Dated November 2010 Potential Available Material From Property Owners
Available as specified in the *Standard Specifications*	Design Cross Sections
Included with the project plans	Log of Test Borings"

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In the Special Provisions, Section 5-1.20D is replaced as follows:

5-1.20D OCCUPIED IMPROVEMENTS WITHIN THE RIGHT OF WAY

"Occupied improvements are within the right-of-way at:

1. Parcels No. 34803, 34805, 34806, 34807, 34818
2. Parcels No. 34804, 34808"

The parcels listed in subparagraph 1 above will be vacated and available by July 2014.

The parcels listed in subparagraph 2 above will be vacated and available by August 2014.

Do not take any action that will result in unnecessary inconvenience or disproportionate injury to or that is coercive in nature to the occupants of the improvements."

In the Special Provisions, Section 5-1.36D is replaced as attached.

In the Special Provisions, Section 8-1.09 the table in the table is replaced with the following:

"Within the following limits; on the "LMR" line from station 43+26.09 to station 60+18.06, on the "WB" line from station 638+00 to station 650+28.53, on"LMD1A" line from station 53+00 to station 58+84.04, on the"EB" line from station 632+00 to station 650+60.32, on the "A" line from station 24+17.37 to 34+00 construct all structures work including removal of falsework, all grading work, all drainage work, all structural section work and storm water pollution prevention plan work."

In the Special Provisions, Section 12-4.02A the first table following the seventh paragraph is replaced as follows:

"Sanyo Avenue UC
Bridge #57-1226, Route 11, PM 0.9
Sanyo Avenue

	Number	Width (feet)	Height (feet)
Vehicle openings	2	24	15
Pedestrian openings	1	5	15

	Location	Spacing
Falsework pavement lighting	R and L	30 staggered 1/2 space

NOTE:
R = Right side of traffic
L = Left side of traffic
C = Centered overhead"

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In the Special Provisions, Section 12-3.18 is replaced as attached.

In the Special Provisions, Section 12-4.05H Chart no. H3 is replaced as attached.

In the Special Provisions, Section 14-6.02 14-6.02C(5) is replaced as follows:

"Implement the following protection measures:

1. All clearing of vegetation will take place September 1 through January 31, which is outside of the bird nesting season.
2. If construction activities occur during the nesting season (February 1 through August 31), a pre-construction survey will be conducted by a qualified Biologist provided by the State for this project to ensure no nesting birds are present within the proposed work area. During the bird nesting season the Contractor shall notify the Engineer in writing 15 working days prior to beginning work disturbing the ground, vegetation, or trees. The notification shall include the timing and order of work to be performed. The Contractor shall not begin work without written authorization from the Engineer.
3. For burrowing owls, a pre-construction survey to identify active burrows within the proposed work area and 250 feet beyond the work area would be conducted no more than 3 days prior to initiation of construction by the Biologist.
4. If evidence of bird nesting is discovered during the nesting season, the Contractor shall immediately notify the Engineer. The bird nesting area shall be designated as an Environmentally Sensitive Area (ESA). The Biologist will determine the nesting boundary limits."

In the Special Provisions, Section 19 is replaced as attached.

In the Special Provisions, Section 25 is replaced as attached.

In the Special Provisions, Section 47 is replaced as attached.

In the Special Provisions, Section 77 is replaced as attached.

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In the *Information Handout* "Potential Available Material From Property Owners" is added as attached.

In the *Bid* book, in the "Bid Item List," Items 11, 12, 36, 57, 61, 110, 111, 191, 199 are replaced, Items 210, 211, 212 and 213 are added and Items 41, 62 and 209 are deleted as attached.

To *Bid* book holders:

In the *Bid* book, pages 3, 4, 5, 6, 8, 12, and 13 of the "Bid Item List" are replaced as attached. The attached Bid Item List is to be used in the bid.

Inquiries or questions in regard to this addendum must be communicated as a bidder inquiry and must be made as noted in the *Notice to Bidders* section of the *Notice to Bidders and Special Provisions*.

Indicate receipt of this addendum by filling in the number of this addendum in the space provided on the signature page of the *Bid* book.

Submit bids in the *Bid* book you now possess. Holders who have already mailed their book will be contacted to arrange for the return of their book.

Inform subcontractors and suppliers as necessary.

This addendum, attachments and the modified wage rates are available for the Contractors' download on the Web site:

http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/11/11-056324

If you are not a *Bid* book holder, but request a book to bid on this project, you must comply with the requirements of this letter before submitting your bid.

Sincerely,

LAURIE BERMAN
District Director

Attachments

Add to section 5-1.36D:

No construction is permitted within 75 feet of either side of the existing Calpeak overhead electrical alignment located between Station 25+00 and Station 28+00 ("A" Line) before February, 1 2014 until Calpeak Electric relocates their overhead facility.

Contractor Arranged Time for Utility Relocation

Installation of the utilities shown in the following table requires coordination with your activities. Make the necessary arrangements with the utility company through the Engineer and submit a schedule:

1. Verified by a representative of the utility company
2. Allowing the time shown for notifying the utility owner and time to complete the work

The duration of the work in the schedule must equal or exceed the number of Notification Days (N days) and Working Days (W days) for the utility owner to complete their work:

Notification Days is the minimum number of calendar days written notice the Engineer provides the owner that the site will be ready for utility work.

Type of Utility	Utility Work Description	Utility Owner & Address	Location of Utility	Utility N/W Days
Otay Water District 10" ACP & 18" CCP Water line	Pothole existing facility	Otay Water District 2554 Sweetwater Springs Boulevard Spring Valley, CA 91978	"A" Line Sta 45+75 Lt 75', Sta 52+10 Lt 150', Sta 52+10 Rt 200'.	21/10
ATT underground	Relocate in Sanyo Rd	7337 Trade Street, #5686 San Diego, CA 92121	"A" Line Sta 39+20	56/20
SDGE electric underground	Relocate in Sanyo Rd	6875 Consolidated Way San Diego, CA 92121-2602	"A" Line Sta 39+15	56/20
SDGE gas underground	Relocate in Sanyo Rd	6875 Consolidated Way San Diego, CA 92121-2602	"A" Line Sta 39+10	56/20

Utilities Requiring Coordination with Contractor's Construction Operation

Installation of the listed utility facilities will require coordination with your construction operations. Make the necessary arrangements with the utility company through the Engineer and submit a schedule:

1. Verified by a representative of the utility company
2. Allowing the time shown for notifying the utility owner and time to complete the work

The duration of the work in the schedule must equal or exceed the number of Notification Days (N days) and Working Days (W days) for the utility owner to complete their work:

Notification Days is the minimum number of calendar days written notice the Engineer provides the owner that the site will be ready for utility work.

Type of Utility	Utility Work Description	Utility Owner & Address	Location of Utility	Utility N/W Days
Otay Water District 12" ACP Water Line	Temporary re-route water service lines, add inline valves, Remove/Cap 12" ACP.	Otay Water District 2554 Sweetwater Springs Boulevard Spring Valley, CA 91978	"A" Line Sta 38+95	21/25
Otay Water District 12" ACP Water Line	Temporary re-route water service lines, Replace 12" ACP.	Otay Water District 2554 Sweetwater Springs Boulevard Spring Valley, CA 91978	"A" Line Sta 38+95	21/25

The utilities shown in the following table will not be rearranged. The utilities may interfere with pile driving, drilling activities, substructure work, or other construction or other work. Work within 20-feet of the listed utility facilities will require coordination with your construction operations. Make the necessary arrangements with the utility company through the Engineer and submit a schedule:

1. Verified by a representative of the utility company
2. Allowing the time shown for notifying the utility owner and time to complete the work

The duration of the work in the schedule must equal or exceed the number of Notification Days (N days) and Working Days (W days) for the utility owner to complete their work:

Notification Days is the minimum number of calendar days written notice the Engineer provides the owner that the site will be ready for utility work.

Type of Utility	Utility Work Description	Utility Owner & Address	Location of Utility	Utility N/W Days
SDGE 30" Gas Line	Confer with Owner	SDGE 6875 Consolidated Way San Diego, CA 92121-2602	"SNY" Line Sta 307+94	42/15
SDGE 30" Gas Line	Confer with Owner	SDGE 6875 Consolidated Way San Diego, CA 92121-2602	"SNY" Line Sta 309+63	42/15

Site Preparation by Contractor

Installation of the listed utility facilities will require listed site preparation operations be completed by you first.

Make the necessary arrangements with the utility company through the Engineer and submit a schedule:

1. Verified by a representative of the utility company
2. Allowing the time shown for notifying the utility owner and time to complete the work

The duration of the work in the schedule must equal or exceed the number of Notification Days (N days) and Working Days (W days) for the utility owner to complete their work:

Notification Days is the minimum number of calendar days written notice the Engineer provides the owner that the site will be ready for utility work. The Utility Working Days begin when the site preparation requirements have been completed and required notification provided.

Site Preparation Type	Site Preparation Work
(A)	Sewer Relocation & Drainage Installation

Utility Work by Owners

Site Preparation Type (by Contractor)	Type of Utility	Utility Owner & Address	Location of Utility	Utility Work Description	Utility N/W Days
(A)	10" ACP Water line	Otay Water District 2554 Sweetwater Springs Boulevard Spring Valley, CA 91978	"A" Line Sta 38+85 to 45+80	10" ACP Removal	21/15
(A)	10" ACP Water line	Otay Water District 2554 Sweetwater Springs Boulevard Spring Valley, CA 91978	"A" Line Sta 45+80 to 52+10	New 10" PVC Installation	21/25
(A)	18" CCP Water line	Otay Water District 2554 Sweetwater Springs Boulevard Spring Valley, CA 91978	"A" Line Sta 52+10	Remove 18" CCP. Replace with New 18"CML&C in 32" Steel Casing	21/35
(A)	12" ACP Water Line	Otay Water District 2554 Sweetwater Springs Boulevard Spring Valley, CA 91978	"A" Line Sta 38+95	Replace 12" ACP.	21/25

Add section 12-3:

12-3.18 ALTERNATIVE TEMPORARY CRASH CUSHION SYSTEM

12-3.18A General

12-3.18A(1) Summary

This section includes specifications for installing and maintaining alternative temporary crash cushion system as shown under the manufacturer's installation instructions and these special provisions.

The allowable alternatives for temporary crash cushion must consist of one of the following National Cooperative Highway Research Program (NCHRP) Report 350, Test Level 3 devices, or a Department-approved equal.

12-3.18C Submittals

Submit to the engineer a certificate of compliance and a copy of the manufacturer's installation instructions for the alternative temporary crash cushion.

12-3.18D Materials

An alternative temporary crash cushion must be one of the following:

1. TYPE SMART - SCI100GM - Non-Gating, re-directive impact attenuator manufactured by SCI Products Inc., and must include items detailed for Quadguard CZ crash cushion shown on the manufacturer plans and installation instructions. The SCI 100GM crash cushion can be obtained from the distributor, D&M Traffic Services, 845 Reed Street, Santa Clara, CA 95050, telephone (408) 436-1127.
2. TYPE TAU II - Non-Gating, redirective impact attenuator manufactured by Barrier Systems, Inc., and must include items detailed for Type TAU-II crash cushion shown on the manufacturer plans and installation instructions. The TAU-II crash cushion can be obtained from the distributor, Statewide Safety & Signs,13755 Blaisdell Place, Poway, CA 92064 , telephone (800) 559-7080.
3. TYPE QUADGUARD CZ - Non-Gating, re-directive impact attenuator manufactured by Energy Absorption, Inc., and must include items detailed for Quadguard CZ crash cushion shown on the manufacturer plans and installation instructions. The Quadguard CZ can be obtained from the distributor, National Trench Safety LLC, 1421 N. Baxter Street, Anaheim, CA 92806, telephone (714) 491-7393.
4. TYPE ADIEM-350 - Gating, re-directive capability (beginning length of need at 15 feet from nose) manufactured by Trinity Highway Products, LLC, and must include the items detailed for crash cushion (Type ADIEM 350) shown on the manufacturer plans and installation instructions. You can obtain the crash cushion (Type ADIEM 350) from the supplier, C&W Construction Specialties, Inc., 2419 Palma Drive, Ventura, CA 93003, telephone (805) 642-0204.
5. TYPE ABORB - 350 - Gating, non-redirective crash cushion manufactured by Barrier Systems, and must include items detailed for the temporary crash cushion (Type Absorb 350) shown on the manufacturers plans and installation instructions. The Absorb 350 can be obtained from the distributor, Statewide Safety & Signs, 522 Lindon lane, Nipomo, CA 93444, telephone (805) 929-5070, fax (805) 929-5786.
6. TYPE ACZ -350 - Gating, non-redirective crash cushion manufactured by Energy Absorption, must include items detailed for Type ACZ -350 shown on the manufacturer plans and installation instructions. The ACZ - 350 can be obtained from the distributor, National Trench Safety LLC, 1421 N. Baxter Street, Anaheim, CA 92608, telephone (714) 491-7393, fax (714) 7397.

12-3.18E Construction

The alternative temporary crash cushion must be installed in conformance with the manufacturer's installation instructions.

Concrete anchorage devices for attaching alternative temporary crash cushion to the base slab is limited to those provided by the manufacturer.

Concrete anchor slab when required must comply with section 51, except the strength is to be 4,000 psi at 28 days.

Roadway excavation if required must comply with section 19-2.

After installing the temporary crash cushion, dispose of surplus excavated material in a uniform manner along the adjacent roadway where designated by the Engineer.

12-3.18F Payment

Not used

Chart no. H3
Road Lane Requirements

County: SD	Route/Direction: NB/SB Sanyo Ave.	PM:

Closure Description: At SR-11 OC

From hour to hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Fridays	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Saturdays	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sundays	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Legend:

X Street may be closed

REMARKS:
This chart shall be used (3) three times only, each time for a period of one month, and may be used consecutively.

No other closure that conflicts with or shares any elements of the following detour will be permitted.

Allow access to Local traffic.

All side streets within this closure may be closed

Detour NB Sanyo Ave. Full Closure @ SR-11 OC
Detour NB Sanyo Ave. full closure traffic at SR-11 OC via northerly on Sanyo Ave./Heinrich Hertz Dr. to Airway Rd., thence easterly on Airway Rd. to Enrico Fermi Dr., thence northerly on Enrico Fermi Dr. to Otay Mesa Rd., thence westerly on Otay Mesa Rd. to Sanyo Ave.

Detour SB Sanyo Ave. Full Closure @ SR-11 OC
Detour EB Otay Mesa Rd. to SB Sanyo Ave. full closure traffic at SR-11 OC via easterly on Otay Mesa Rd. to Enrico Fermi Dr., thence southerly on Enrico Fermi Dr. to Airway Rd., thence westerly on Airway Rd. to Sanyo Ave.

NOTE: Place Ground Mounted Signs on EB & WB Airway Rd, NB & SB Sanyo Ave., and EB & WB Otay Mesa Rd. at locations at the discretion of Construction Field Personnel – warning the public of the closure / detour ahead.

19 EARTHWORK

Add to section 19-2.03A:

Stock piles within 150 feet of bridge abutments must be excavated to the toe of stock pile, placed back per section 19-5.

Where shown on the plans to scarify, loosen material to the depth required and recompact under section 19-5.

Add to section 19-2.04:

Compensation for scarifynig and recompacting material is included in the unit price paid for Roadway Excavation and no additional compensation is allowed.

Add to section 19-3.03B(1):

Notify and allow at least 14 days for the Engineer to accept the completed excavation before doing any work on spread footings at the following locations:

Bridge name and number	Abutment number
Route 11/125 Separation Bridge #57-1227R	1 and 2
Route 11/125 Separation Bridge #57-1227L	1 and 2
E905-E11/Rte 905 Connection Separation Bridge #57-1229G	1 and 5

Add to section 19-3.04:

Pervious backfill material placed within the limits of payment for bridges is paid for as structure backfill (bridge).

Replace section 19-6.03B with:

19-6.03B Subsidence

You may compact the ground surface on which an embankment is to be constructed before placing embankment material.

If the compaction results in an average subsidence exceeding 0.25 foot, the Engineer measures the ground surface after compaction. Allow time for the Engineer to measure the area before placing embankment material.

A quantity of 98,882 cubic yards of embankment will be added to the computed embankment quantity for the anticipated effect of subsidence.

If you do not agree with this specified quantity, you may submit a plan for measuring subsidence. The plan must include complete details of the measuring devices and their installation.

If the plan for measuring subsidence is authorized, install and maintain the subsidence-measuring devices.

The Engineer takes readings as needed to determine the progress of subsidence. Provide assistance as needed.

If the Engineer finds that a device has been damaged, that device will not be used for determining subsidence in the area the device represents. The subsidence for that area is considered as zero regardless of the subsidence measured at other areas.

Subsidence is considered as zero at:

1. Intersection of the side slope and end slope at structures with the ground line as established by the original cross-sections
1. Points on the cross-sections 50 feet beyond the start and end of the area with subsidence-measuring devices, unless the Engineer agrees otherwise

The additional quantity of material for embankment work due to subsidence is determined by the average-end-area method from the original measurements and the final measurements, including zero subsidence at specified areas.

After final measurements are made, remove detachable elements of the subsidence-measuring devices.

Add to section 19-6.03D:

Settlement periods are required for embankments at the earth retaining structures as shown in the following table:

Earth retaining structure number	Surcharge height (feet)	Settlement period (days)
MSE Wall 1, 57E0128	0	30
MSE Wall 2, 57E0129	0	30

Settlement periods are required for embankments at the earth retaining structures after the earth retaining structures are constructed.

The first paragraph of section 19-6.03D do not apply to earth retaining structure embankments.

Add to section 19-6.04:

If an ordered change increases the quantity of excavation or decreases the quantity of embankment so that surplus excavation has to be disposed of, disposing of the surplus material is change order work.

If an ordered change either increases or decreases the quantity of borrow required to complete the planned embankments, the Department pays for:

1. Cost of supplying borrow to the site as change order work for a decrease in excavation that results in increased borrow.
2. Increase in embankment that requires an increase in borrow at the bid item price for embankment, as change order work, or at the price of $0.50 per cubic yard. Agree with the Engineer on your payment method.
3. Increase in excavation that results in a decrease in borrow at the bid item price for excavation, but you must pay the Department the estimated cost of furnishing the quantity of the decrease in borrow, computed as though the work were done on a force account basis. Payment to the Department is deducted from sums due or that may become due you.
4. Decrease in embankment that results in a decrease in borrow by reducing the quantity of embankment.

The quantity of embankment is computed based on planned or authorized cross sections for embankment and the measured ground surface. The Department does not adjust the quantity of embankment if subsidence or consolidation occurs after placing embankment material has begun.

Replace the 2nd and 3rd paragraph of section 19-7.04 with:

Quantities of roadway excavation, structure excavation, and ditch excavation used in constructing the embankment will be adjusted by multiplying by a grading factor. This grading factor is determined by the Engineer. The Department does not adjust payment if the grading factor determined by the Engineer does not equal the actual grading factor.

25 AGGREGATE SUBBASES

Add to section 25-1.02A:

Aggregate for Class 4 AS may include processed glass. Place AS with glass only where the AS will be permanently covered.

Replace "Reserved" in section 25-1.02C with:

When tested under California Test 202, aggregate for Class 4 AS must comply with the grading requirements for the sieve sizes shown in the following table:

Aggregate Grading

Sieve size	Percentage passing	
	Operating range	Contract compliance
6 inch	100	100
3 inch	90-100	87-100
No. 4	35-100	30-100
No. 30	0-60	0-65
No. 200	0-20	0-23

Aggregate for Class 4 AS must comply with the quality requirements shown in the following table:

Aggregate Quality

Property	California Test	Operating range	Contract compliance
Sand equivalent (min)	217	25	22
Resistance (R-value)(min)	301		60

If the aggregate grading test results, sand equivalent test results, or both comply with contract compliance requirements but not operating range requirements, you may continue placing AS for the remainder of the work day. Do not place additional AS until you demonstrate to the Engineer the AS to be placed complies with the operating range requirements.

If the aggregate grading test results, sand equivalent tests results, or both do not comply with contract compliance requirements, remove the AS or request a payment deduction. If your request is authorized, $2.00/cu yd is deducted for each noncompliant test result. An aggregate grading and a sand equivalent test represents up to (1) 500 cu yd or (2) 1 day's production if less than 500 cu yd.

Instead of Class 4 AS, you may place Class 2 AS under the aggregate grading and quality requirements in section 25-1.02A. If you place Class 2 AS, do not use Class 4 AS without authorization.

Replace "Reserved" in section 25-1.02D with:

Obtain material for Class 5 AS from material found onsite or any commercial location.

When tested under California Test 202, aggregate for Class 5 AS must comply with the grading requirements for the sieve sizes shown in the following table:

Aggregate Grading

Sieve size	Percentage passing
6"	100

Class 5 AS must have a minimum resistance (R-value) of 10 and a maximum plasticity index (PI) of 12.

Material with Sand Equivalent of 15 or more will be accepted in lieu of the R-value and PI requirements.

Add to section 25-1.04:

If excavated material is used for Class 5 AS, quantities are not deducted from excavation bid items and stockpiling or handling the material is not paid for. The payment quantity of Class 5 AS is the actual quantity placed and does not include excess material used in embankments or placed within the right-of-way.

47 EARTH RETAINING SYSTEMS

Add to section 47-2.01A:

You may use an alternative earth retaining system for the mechanically stabilized embankment at locations A or B. The alternative system must comply with section 47-6.

Replace the 2nd paragraph of section 47-2.01A with:

Concrete panels must be PC concrete panels and comply with section 51.

Add to section 47-6.01A:

The alternative earth retaining system must be one of the systems shown in the following table:

Proprietary earth retaining system	Web site/e-mail	Address	Telephone no.
Reinforced Earth – 5 ft cruciform	http://www.reinforcedearth.com	THE REINFORCED EARTH COMPANY 1660 HOTEL CIR N STE 304 SAN DIEGO CA 92108-2803	(619) 688-2400
Reinforced Earth – 5 ft square	http://www.reinforcedearth.com	THE REINFORCED EARTH COMPANY 1660 HOTEL CIR N STE 304 SAN DIEGO CA 92108-2803	(619) 688-2400
Retained Earth	http://www.reinforcedearth.com	THE REINFORCED EARTH COMPANY 1660 HOTEL CIR N STE 304 SAN DIEGO CA 92108-2803	(619) 688-2400
MSE Plus – 5 ft square	http://www.mseplus.com	SSL 4740 SCOTTS VALLEY DR STE E 209 SCOTTS VALLEY CA 95066-4240	(831) 430-9300
MSE Plus – 5 by 6 ft	http://www.mseplus.com	SSL 4740 SCOTTS VALLEY DR STE E 209 SCOTTS VALLEY CA 95066-4240	(831) 430-9300

Replace "Reserved" in section 77 with:

77-1 GENERAL

77-1.01 GENERAL

77-1.01A Summary

Section 77-1 includes general specifications for constructing local infrastructure.

Notify the Engineer at least 10 days before starting utility work.

77-1.01B Submittals

Submit a complete set of CADD plot as-built drawings within 30 days of installation. As-built drawings must be 24 by 36 inches in size and on 3 mils minimum thickness mylar paper. Text must be a minimum nominal height of 5/32. Redlines must show appurtenance location by station and offset, size and show those items abondoned. Each sheet must be wet stamped and signed by the responsible engineer.

77-1.02 MATERIALS

Not used

77-1.03 CONSTRUCTION

Not Used

77-1.04 PAYMENT

Not Used

77-2 SEWER

77-2.01 GENERAL

77-2.01A Summary

Section 77-2 includes specifications for performing sewer work.

Existing services are to remain operational until the Engineer determines they are no longer needed.

77-2.01B Sewage Spill Response

Call the City of San Diego 24 hour emergency notification number at (619) 515-3525, the County of San Diego Emergency Operations Center 'Station M' at (858) 565-5255 and act immediately to control a sewage spill. Take all appropriate steps to contain it according to the sewage spill response plan and flow diversion plan. Immediately notify the Engineer, City of San Diego, and County of San Diego representatives and report project name, location, Contractor name, Project Engineer and Resident Engineer's names.

The Engineer may institute further corrective actions to fully comply with existing laws, ordinances, codes, orders or other pertinent regulations. You are responsible for all costs incurred for the corrective action including mitigation measures or habitat restoration, and obtaining after-the-fact permits if necessary, in any environmentally sensitive area. These permits include those from the City of San Diego Planning and Development Review Department, California Coastal Commission, U. S. Army Corps of Engineers, the California Department of Fish and Game, and all relevant agencies.

You are responsible for paying any fines assessed from a sewage spill.

77-2.01C Submittals

77-2.01C(1) General

Not Used

77-2.01C(2) Sewage Spill Response

Within 5 days from spill occurrence, submit a report to the agency and a copy to the Engineer as an informational submittal describing the following information:

1. Location of the spill
2. Nature and estimated volume
3. Date and time
4. Duration
5. Cause
6. Type of remedial efforts or clean up measures taken, including erosion control measures
7. Date and time of implementation
8. Corrective or preventive actions taken to avoid further spills
9. Equipment used in spill response
10. Environmentally-sensitive habitat, if any, impacted
11. Results of any necessary monitoring
12. List of who was notified at the County, City, date and time you were notified of the spill, date and time you arrived on site

77-2.01C(3) Testing

Submit test results signed by the supervisor performing the work.

77-2.01C(4) Materials

Submit product data for the manhole PVC liner. Product data includes physical and chemical resistance properties, details and dimensions. Submit shop drawings showing installation procedures, dimensions, location and types of joints or weld strips. Show returns, corners, joins and coverage.

Submit product data for the manhole polyurethane coating, including application procedures and surface preparation requirements.

Submit product data for manhole epoxy lining coating.

For the cathodic protection system and joint bonding, submit product data for:

1. Wire and cable
2. Copper sulfate reference electrodes
3. Test stations
4. Conduit
5. Exothermic weld molds and charges
6. Wax tape system
7. Plastic warning tape
8. Sacrificial anodes

A corrosion technician must submit a written report certifying the cathodic protection system is in compliance with the specifications. The report must indicate each measurement made and its recorded value. Submit a report of the theoretical resistance and measured pipe resistance, including all calculations, within 7 days of completing the tests.

77-2.01C(5) Supercritical Flow Shop Drawing

A shop drawing must be prepared when the change in grade of the inlet and outlet pipes is greater than 10 percent, or the potential for a hydraulic jump, at a manhole. The shop drawings must then be submitted. The shop drawing must show the use of vertical curves upstream of a manhole before it reaches the manhole to provide a gradual transition from supercritical flow to sub-critical flow. The minimum horizontal length of vertical curves must be no less than 40 feet and may be computed by using the following formula:

$L = (S1 - S2)/R$

Where:

L = Minimum horizontal length of vertical curve (not less than 40 feet)
S1 & S2 = Slopes of beginning and ending tangents to the vertical curve expressed in feet per foot
R = Minimum rate of change of slope (feet/foot), as determined by the pipe manufacturer's specifications

77-2.01C(6) Sewage Spill Prevention and Response Plan

A sewage spill prevention and response plan must be developed and submitted before starting construction. Allow 30-days for review. Comply with the City of San Diego policy of "Zero Spills". The plan will apply to any construction related sewage spill. The plan must include the following:

1. Identify any nearby environmentally sensitive area including waterways, channels, catch basins, and entrance to existing underground storm drains.
2. Make arrangements for an emergency response unit stationed at or near the site comprised of emergency response equipment and trained personnel to be immediately dispatched in case of a sewage spill. This includes field biologist, archaeologist, or both in an environmentally sensitive area such.
3. Develop an emergency notification procedure, which includes an emergency response team with telephone numbers and arrangements for backup personnel and equipment. The emergency response unit must be able to dispatch to the site 24 hours a day 7 days a week. Designate primary and secondary representatives, their respective phone numbers, pager numbers, and mobile phone numbers. These representatives must be accessible and available at all times to respond immediately to any sewer spill event.
4. Identify any property owners who may be affected including County and City of San Diego Parks and Recreation Department.

77-2.01C(7) Sewer Flow Diversion Plan

Submit a sewer flow diversion plan at least 15 days before beginning flow diversion. No deviation from the diversion plan will be allowed without authorization. Flow diversion must comply with City of San Diego "Zero Spills" policy. The diversion plan must indicate the sequence of diversion operations and other activities that will maintain wastewater service during construction. Include an emergency response plan indicating the procedures, equipment, and activities to be implemented if an emergency shutdown or failure of the flow diversion equipment occurs.

Submit maintenance procedures and schedule with your flow diversion plan.

Submit your monitoring procedure as part of the flow diversion plan. Include frequency for continuously monitoring flow levels downstream and upstream of the flow diversion to detect any possible failure that may cause a sewage backup and spill.

77-2.01C(8) CCTV Inspection Plan

Submit a CCTV inspection plan including equipment used.

77-2.01D Quality Control and Assurance

77-2.01D(1) General

Field and shop welders must be certified and comply with AWS D1.1. Welders must be qualified under the AWS standard qualification procedures. A currently certified AWS welding inspector must be responsible for quality control acceptance of materials and workmanship.

Corrosion technician must be certified by the National Association of Corrosion Engineers.

Installation of epoxy protective lining system must be by personnel trained and qualified by the lining system manufacturer. You must provide manufacturer's certifications.

Fusion technician must be qualified by the pipe supplier to install fusible PVC pipes. Qualifications must be current as of the actual date of fusion performance.

77-2.01D(2) Leakage Test

Use an air test to test for leakage after laying, backfilling and compacting sewer line.

The test section must be pressurized to 3.5 psi and must be held above 3.0 psi for not less than 5 minutes. Add air as needed to keep pressure above 3.0 psi.

If groundwater is above the pipe being tested, increase the air pressure to 0.43 psi for each foot the water table is above the invert of the pipe.

Use a pressure gauge with minimum divisions of 0.10 psi and an accuracy of 0.04 psi. Testing reports must certify accuracy and show annual calibration of the gauge.

At the end of the 5 minute saturation period, the pressure must be 3.0 psi minimum and begin the same lapse required for air pressure drop. A section of pipe has failed the test if the pressure drops more than 0.5 psi in less than the time shown in the following

1. Minimum time allowed is 283 seconds for pipe diameter of 10-inch. Time is calculated as L (feet) x 1.187.
2. Minimum time allowed is 340 seconds for pipe diameter of 12-inch. Time is calculated as L (feet) x 1.709.
3. Minimum time allowed is 425 seconds for pipe diameter of 15-inch. Time is calculated as L (feet) x 2.671.

Test each section of pipe between manholes, including the manholes. Guard against sudden expulsion of a poorly installed plug or a plug that is partially deflated.

77-2.01D(3) Alignment, Grade and Deflection Test

Grade and alignment must comply with Standard Specifications for Public Works Construction(SSPWC) § 306-1.2.2 and 306-1.2.12.

Perform deflection tests 30 days or more after backfill is placed and compacted. Inspect the pipe for offsets and clear obstructions before testing.

Mandrel for field testing must be a rigid, nonadjustable, odd-numbering-leg (nine legs minimum) mandrel having an effective length not less than shown in the table:

Nominal Pipe Size (in)	Pipe Material	Minimum Mandrel Diameter (in)
10	PVC-ASTM D3034 (SDR 35)	9.405
12	PVC-ASTM D3034 (SDR 26)	10.961
15	PVC-ASTM D3034 (SDR 35)	13.849

77-2.01D(4) Manhole Epoxy Lining Test

Spark test cured manhole epoxy lining for pinholes under SSPWC §500-2.4.2. Pinhole repair must comply with SSPWC §500-2.4.5.

77-2.01D(5) Cathodic Protection Test

The cathodic protection system must be tested by a corrosion engineer.

In the presence of the Engineer, measure the resistance of sections of pipe that have been installed.

Measure resistance by the linear resistance method. Impress a direct current from one end of the test section to the other, of test station to test station. A voltage drop is measured for several different current levels.

The measured resistance is calculated using the equation:

R=dV/I
where
R = measured Resistance (mV)
dV = voltage drop between the test span
I = Corresponding current

Measure the resistance for at least 3 different current levels.

Acceptance is a comparison between the measured resistance from the field test data and the theoretical resistance. The theoretical resistance must consider the pipe length and wall thickness and the resistance of the bond wires. The measured resistance must not exceed the theoretical resistance by more than 130 percent to determine electrical continuity.

Cathodic protection system tests include:

1. Isolation of protected metal from electrical conduit, piping for water and sewage, fuel island vents, steel buildings, or other metals. If the same potential is measured from a stationary copper-copper sulphate half cell to any foreign structure as to the protected structure, the protected structure must be deemed to be metallically connected to the foreign structure and the installation must be deemed unacceptable.
2. Anode current.
3. Polarized potential: An instant-off potential of less than 850 millivolts must be deemed to indicate an unacceptable installation. The instant-off potential must be the voltage between the protected structure and a copper-copper sulphate half cell measured after the immediate shift that occurs when anode current is interrupted, but before any further current decay.
4. Anode potential: The anode open-circuit potential must be at least 95 percent of the value listed in the manufacturer's published data for the type of anode furnished.
5. Measurement of all native potentials.
6. Measurement of all anode open circuit anode potentials.
7. Measurement of all on and instant off potentials.

77-2.02 MATERIALS

77-2.02A General

For materials not specified on the "Approved Materials List for Wastewater" in the Information Handout, requirements are specified in section 77.

Additional requirements for materials on the "Approved Materials List for Wastewater" in the Information Handout, may be described in section 77.

77-2.02B Welded Steel Pipe Casing

77-2.02B(1) General

Welded steel pipe casing must comply with section 70-3.02A

77-2.02B(2) Backfill

Structure backfill must meet the following requirements:

1. Use imported granular material with maximum sand equivalent value of 30 per ASTM D2419
2. Have a coefficient of uniformity of at least 3
3. Have no more than 10 percent by volume of clay
4. Have the following gradation:

Sieve size	Percentage passing
1"	100
3/4"	90-100
No. 4	50-95
No. 30	25-45
No. 200	3-9

77-2.02B(3) Imported Borrow

Imported borrow must comply with section 19-7.02C and must be delivered not less than 10 days before intended use.

77-2.02B(4) Sand Bedding

Sand bedding must comply with section 19-3.02E(2) and have a pH within the range of 6.0–8.5, a resistivity of 2,000 ohm-cm, or greater, and a soluble sulfate content of 500 ppm or less.

Bedding material must have a sand equivalent of not less than 50 and an expansion coefficient of not more than 0.5 of 1 percent if saturated with water.

77-2.02B(5) Warning Tape

Warning tape must be an inert, non-metallic plastic film formulated for prolonged underground use that will not degrade if exposed to alkalis, acids, and other destructive substances commonly found in soil. It must be puncture-resistant and must have an elongation of 2 times its original length before parting.

Warning tape must be colored to identify the type of utility intended for clarification. For sewer lines, the printed message must read "CAUTION: SEWERLINE BURIED BELOW" and tape color must be green.

Ink used to print messages must be permanently fixed to tape and must be black in color with message printed continuously throughout, at approximately 12-inch intervals.

Warning tape must be a minimum of 6 inches wide and 0.004-feet thick pressure sensitive adhesive.

77-2.02B(6) Filter Fabric

Filter fabric must comply with section 88-1.02B.

77-2.02B(7) Casing Spacers and Seals

Use bolt-on style with shell made in 2 sections of Type 304 stainless steel. Connecting flanges must be ribbed. Line shell with PVC liner 0.090-inch thick with 85-90 durometer. Use 18-8 stainless steel nuts and bolts.

Runners must be constructed of ultra high molecular weight polymer. Runners must be supported by risers made of Type 304 stainless steel. Weld supports to shell and passivate the welds.

Casing spacers must be one of the following:

1. Cascade Waterworks Mfg. Co
2. Pipeline Seal and Insulator Inc
3. Advanced Products and Systems

Use snug fitting 1/8-inch thick synthetic rubber casing seals. Casing seals must be 1 piece with no field seams. Pipe attachment bands and hardware and casing outside diameter must be minimum Type 304 stainless steel.

77-2.02C PVC Sewer Pipe

77-2.02C(1) General

PVC sewer pipe must be push-on type elastomeric gasket joint and comply with ASTM D3212.

The gasket must be polyurethane or synthetic rubber with equal or greater resistance to solvency, chemicals or biological attack and must comply with ASTM standards. Fittings for 12-inch sewer line must comply with ASTM D3034, SDR-26; or ASTM F789. Fittings for 10-inch sewer line must comply with ASTM D3034, SDR-35; or ASTM F789. Fitting for 15-inch sewer pipe must comply with ASTM D3034, SDR-35; or ASTM F789.

77-2.02C(2) Backfill

Structure backfill for sewer line must comply with section 19-3.02B except the gradation of pipe zone backfill must be 3/4-inch crushed rock.

77-2.02C(3) Imported Borrow

Imported borrow must comply with section 77-2.02B(3).

77-2.02C(4) Sand Bedding

Sand bedding must comply with section 77-2.02B(4).

77-2.02C(5) Warning Tape

Warning tape must comply with section 77-2.02B(5).

77-2.02C(6) Filter Fabric

Filter fabric must comply with section 77-2.02B(6).

77-2.02D Sewer Manhole

77-2.02D(1) General

Sewer manhole must comply with the following:

1. Shaft sections must be manufactured in accordance with ASTM C478-95a and be 1300 pounds per vertical foot.
2. Reinforcing steel must be in accordance with ASTM A82, ASTM A185, ASTM A496 and ASTM A615.
3. Total circumferential reinforcement steel area must be at least 0.0025 times the inside diameter in inches.
4. Steel cage must be placed in the center third of manhole wall thickness.
5. Loading criteria must conform with AASHTO H20.
6. Concrete compressive strength must be 4500 PSI at 28 days.
7. Steel reinforcing yield strength must be 60,000 psi in accordance with ASTM A615.

77-2.02D(2) Plastic Liner

PVC liner for manhole must comply with SSPWC section 210-2 and:

1. Must be white.
2. Material used in joint strips and plain sheets of plastic liner must be identical to material used in sheets with locking extensions.
3. PVC liner must be impermeable to sewage gasses and liquids and nonconductive to bacterial or fungus growth.

77-2.02D(3) Manhole Riser Joints

Polymer mortar products must be one of the following:

Material	Manufacturer
490 Epoxy Putty	Engard Coatings, Huntington Beach, CA
Sikadur 31 Hi-Mod Gel	Sika Corporation, Santa Fe Springs, CA
Sikadur 32 Hi-Mod Gel	Sika Corporation, Santa Fe Springs, CA
CS-102 Butyl Gaskets (rope form)	Concrete Sealants, New Carlisle, OH

77-2.02D(4) Polyurethane And Epoxy Protective Lining System

Apply polyurethane and epoxy protective lining system to manhole numbers 1–3.

Lining system must comply with SSPWC section 500-2.7. Coating must be cream colored.

The manhole base must be primed with epoxy and lined with a 100-mil dry film thickness of 100 percent solids elastomeric polyurethane with a minimum Shore D hardness of 55.

Furnish a minimum of 2 plugs per manhole for applied thickness verification.

77-2.02D(5) Epoxy Protective Lining System

Apply epoxy protective lining system to manhole numbers 4–9.

Epoxy protective lining system must comply with SSWPC section 500-2.8 except it must have a shore D hardness of 88.

The lining must be 100 percent solids, moisture tolerant epoxy, capable of spray application to 5 mils thickness, in 1 continuous coat.

The lining must completely bond to the concrete. Color must be light blue.

77-2.02D(6) Exterior Waterproofing

Waterproof exterior walls of manholes with a coal-tar emulsion water proofing agent. The coal-tar emulsion must be applied in at least 2 coats for a total dry film thickness of 25–35 mils.

77-2.02E Locking Cast Iron Manhole Cover

Cast iron manhole frame and cover must comply with the SSWPC section 206-3.3. Include a locking device.

77-2.02F Locking Composite Manhole Cover

Composite manhole frame and cover must be fabricated from fiber reinforced polymer containing 45–70 percent of fiber reinforcement bonded with thermoset resin matrix.

The 36-inch cover must weigh no more than 90 pounds and frame no more than 70 pounds. Load carrying capacity must meet AASHTO M306-05 H-20 & H-25 traffic requirements of 50,000 pounds, with 100,000 pounds ultimate load bearing. Composite material must resist corrosion in aggressive environments. Manhole cover must have locking mechanism and security bolt. Cover must be marked "COUNTY OF SAN DIEGO" and "SEWER", "AASHTO M306-05" and country of origin.

77-2.02G Cathodic Protection

77-2.02G(1) General

Not Used

77-2.02G(2) Cold Applied Fast-Drying Mastic

Cold applied-fast drying mastic must be one of the following:

1. Koppers bitumastic 50 or 505
2. Tnemec 40-h-413, tape-coat TC mastic
3. 3M Scotch Clad 244

The minimum coating thickness must be 0.025 inch.

77-2.03 CONSTRUCTION

77-2.03A General

Compaction must comply with section 19-3.03E(1).

When backfilling the trench for the sewer pipe:

1. Hand dig and use hand directional mechanical tampers for compaction within 3-feet of a public facility.
2. Provide at least 1 foot of backfill on the top of the sewer pipe before using a hydro hammer
3. Provide at least 3 feet of backfill on the tip of the sewer pipe before allowing wheel loads on the trench

Immediately discontinue backfilling if pipe settlement occurs. Correct settled portions of the trench and backfill as directed by the Engineer.

Do not damage existing improvements, interrupt existing services and/or facility operations which may cause a sewage spill. Any utility and/or improvement which is damaged must be immediately repaired at your expense.

Sewer system is to be cleaned by a sewer scrubbing "ball" from manhole to manhole after leakage test, backfilling, manholes raised to final grade, paving, and construction activities have been completed.

77-2.03B Sewer Flow Diversion

Inspect and maintain the diversion system daily, including the back-up system. Maintain a log of all inspection, maintenance and repair records and provide copies to the Engineer upon request.

Maintain a log of the monitoring and provide daily copies to the Engineer.

Size the flow diversion system to handle peak flow and include a 100 percent backup in the flow diversion system. Provide temporary means to maintain and handle the sewage flow in the existing system during construction. Utilize the flow diversion system to mitigate any additional wet weather flows, perform maintenance and repairs on the flow diversion system as needed, and maintain the backup system in working order.

If the diversion system requires pumping, each pump, including the backup pumps, must be a complete unit with its own suction and discharge piping. Operate the backup flow diversion system for a minimum of 25 percent of the total diversion time on a weekly basis. The backup flow diversion system must be fully installed, operational, and ready for immediate use. Hydraulically test the diversion system with clean water before wastewater flow diversion. Demonstrate to the Engineer that both the primary and backup flow diversion systems are fully functional and adequate, and certify the same, in writing.

Provide 1 dedicated fuel tank for every single pump/generator, when fuel/generator driven pumps are used. Provide an emergency standby power generator, when electric power driven pumps are used. Provide a fuel level indicator outside each fuel tank. Continuously monitor while in use, the fuel level in the tanks and ensure that the fuel level does not drop below a level equivalent of 2 hours of continuous flow diversion system operation. Protect the fuel supply from contamination. This includes fuel line water traps, fuel line filters, and protecting fuel stores from precipitation. Monitor all hoses and repair leaks immediately.

77-2.03C Remove Sewer Manhole

Remove manhole where shown under section 15-2.02 and SSPWC section 306-5.

77-2.03D Welded Steel Pipe Casings

Steel casing sections must be jointed by full-circumference butt welding in the field and have banding straps on end seals. All joints must be full penetration butt welds in accordance with AWWA C206, AWS D1.1.

Carrier pipe must be pushed into the casing using casing spacers.

Upstream and downstream elevations of the carrier pipe must be verified before installing the end seals.

Install spacers as shown.

Line and coat steel casing for trench installation with liquid epoxy paint complying with AWWA C210. Apply 3 coats to a minimum thickness of 16 mils. Repair damaged coatings.

77-2.03E PVC Sewer Line

77-2.03E(1) General

The tolerance of each sewer line must be plus or minus 1-inch in line, and plus or minus 1/4-inch in grade from the location and elevation shown.

Lay sewer line without break upgrade from structure to structure, with the socket ends of the pipe upgrade. Use 3/4-inch gradation crushed rock for bedding material. Bring the backfill material up to the pipe spring line after joint assembly. Place the backfill material on each side of the pipe and extend a minimum of 1-foot above the top of the pipe.

Compaction for pipes must be accomplished after the sheeting or shoring has been removed from the bedding zone. Alternate methods of pipe bedding which are recommended by the pipe manufacturer may be used if authorized by the Engineer.

Pipe must be off-loaded, loaded, installed, handled, stored and stacked according to the pipe manufacturer's recommendations. Comply with minimum recommended bend radius and maximum safe pull force for the pipe.

Pipe must be homogeneous throughout and free of visible cracks, holes, foreign material, blisters, or other visible deleterious faults.

Joints for PVC sewer pipe must be Bell & Spigot configuration as shown. The joint assembly must be a push-on assembly in which the lubricated spigot end is inserted under the rubber gasket.

Connections to existing pipe must use a transition coupling and have zero differential settlement.

Warning tape must be used on all underground piping including cathodic protection wiring systems and tracer wire brought into and out of access ports.

Warning tape must be placed at the top of the pipe zone 12-inch above and centered over the utility intended for identification.

Plug sewer main stub by installing water tight PVC sewer plug at location shown.

77-2.03E(2) Fusible PVC Sewer line

Fusible PVC pipe lengths must be assembled in the field with butt-fused joints at the location shown. The fusion technician must follow the pipe supplier's recommendations.

Use only appropriately sized and outfitted fusion machines approved by the pipe supplier for the fusion process. This includes requirements for safety, maintenance, and operation with modifications for PVC. Where fusible PVC pipe is installed by pulling in tension, do not exceed the recommended maximum safe pulling force established by the pipe supplier. Pipe supplier's procedures must be followed at all times during fusion operations.

Each fusion joint must be recorded and logged by an approved electronic monitoring device (data logger), connected to the fusion machine, using a current version of the pipe supplier's recommended and compatible software.

77-2.03E(3) Tracer Wire

Install tracer wire on all buried sewer lines except where steel casing is used.

Place wire on the top centerline of the pipe and run continuously along the entire length of pipe prior to placement of trench backfill. Wire must be mechanically and electrically continuous throughout the pipeline.

Secure tracer wire to the pipe at 6-foot intervals with plastic adhesive tape, duct tape or plastic tie straps. The wire may alternately be secured to the pipe by looping the tracer wire around itself such that tracer wire remains continuous atop the pipe during back fill operations.

Install tracer wire access ports as shown. In addition, tracer wire may terminate within CP test boxes or at intervals of not more than 1,000-feet.

Extend tracer wire into the access ports and terminate with a coiled 24-inch length of wire. All tracer wire not attached to piping must be installed, without splices, within a conduit at a minimum depth of 24 inches.

Avoid splices in tracer wire. If necessary, splices must be made using wire connectors.

You must test tracer wire for electrical continuity in the presence of the Engineer before the installation of any paving over pipelines or appurtenances. Testing must be accomplished using a device capable of detecting improper connections or ground fault interruptions.

77-2.03F Sewer Manhole

77-2.03F(1) General

Construct new sewer manhole, cleanout, and connections as follows:

1. All joints must be sealed using flexible gasket material.
2. Cure all concrete for 10 days and protect from damage. If manhole is located in pavement area, do not adjust to final grade until pavement is complete.
3. Apply polyurethane and epoxy protective lining systems.
4. Construct PVC liner.
5. Shape the inside of the manhole base where new connection is made and the new manhole to conform to the size and shape of the lower portion of the manhole inlets and outlets. Cover concrete base with epoxy coating.
6. No carrier pipe can project more than 2-inches into a manhole. Do not build the bell of a pipe into the manhole base.
7. Test installed pipe to ensure that vertical deflection of plastic pipe does not exceed maximum allowable deflection. Maximum allowable deflection is governed by stated mandrel requirements and are nominally 5 percent.
8. Uncover any over-deflected pipe and reinstall. Remove damaged pipe from site and install new pipe.

77-2.03F(2) Epoxy Lining Coating

Installers must be trained by the manufacturer.

When a PVC liner plate is within a structure and the epoxy lining coating is required to interface with the PVC liner plate, coating tie-in procedures according to the manufacture's recommendations.

77-2.03F(3) Polyurethane Coating

Installers must be trained by the manufacturer.

Protect all exposed concrete mortar surface inside new sewer manholes with polyurethane coating. Coating thickness must be 100 mils minimum for new concrete and 125 mils for existing or repair concrete. Installed coating must be free from porosity.

77-2.03F(4) Manhole Riser Joints

Install polymer mortar at all manhole riser joints to create water tight joints to resist infiltration.

Mortar must be mixed to comply with manufacturer's recommendations and must not exceed 5 parts sand to 1 part polymer.

Surface must be free from dust, loose aggregate, oil, grease, or other contaminants.

77-2.03F(5) Connect Sewer line to Manhole

Place a 2-foot PVC length of pipe of the same inside diameter as the adjoining pipe at the inlet and outlet to each manhole or structure. Use one of the following methods, as shown:

1. Directly cast a manhole coupling into the manhole base. Provide rubber-O-ring gasket in the coupling.
2. Stretch a rubber-O-ring gasket around the pipe to serve as a water stop when cast into the structure wall.

Connect sewer casing to manhole as shown.

77-2.03F(6) Sewer Manhole PVC Liner

PVC liner field welded joints must comply with SSPWC section 210-2.3.5.

Permanently attach liner to the concrete by T-lock mechanism. Do not use adhesive bond except where shown.

Continuously heat weld joints between individual sheets or sections of PVC liner using welding strips of the same kind and equivalent thickness as the liner material except for integral extension ribs.

77-2.03G Cast Iron Manhole Cover

Install locking cast iron manhole cover at manhole numbers 1–3.

77-2.03H Composite Manhole Cover

Install locking composite manhole cover at manhole numbers 4–9.

77-2.03I Cathodic Protection System

Remove the impervious wrapping around the cloth bag of packaged anode immediately before installing the anode.

Install the anode using the following sequence:

1. After the anode hole is drilled, 20 gallons of water must be added and allowed to sit for 1 hour.
2. The anode will be soaked in water for 30 minutes before it is lowered into the hole.
3. Care shall be taken to ensure that the anode is never lifted, supported, transported, or handled by the Lead wire.
4. All anodes must be lowered into hole by using a sling or rope.
5. Add an additional 15 gallons of water to cover the top of the anode before filling the hole.
6. The open circuit potential of the high potential magnesium anode must measure between 1.65–1.75 volts.
7. Notify the Engineer 3 business days in advance, to witness the installation and testing of the anodes.

The packaged anode must be wetted thoroughly before backfilling. Backfill material placed to 12 inches above the anode must be native soil, free from aggregate larger than 1/2-inch in size.

Conductors must be connected to pipes by fusion welding. Connection to the lift post must be located to remain visible. All other connections must be insulated watertight after inspection.

Fusion weld connection to steel surface must be made of molten copper produced by exothermic reaction following ignition of a mixture of copper oxide and aluminum flowing into weld cavity of a properly fitting graphite mold.

Each pipe conductor must connect only 1 pipe to a terminal on the terminal board in the anode test box except where otherwise shown.

Pipe conductors must have 12 inches slack at pipe connections and 24 inches slack at the anode test box.

Conductors must be direct buried and located safely from construction activities.

All metals connected to the cathodic protection system, except plastic-coated pipes, must be tape-wrapped. Cathodically protected metals must be isolated from all other metals.

Wire-to-metal connections must be made by the exothermic "Cadweld" welding process. Weld alloy must be used for steel pipe. You are responsible for determining the manufacturer's recommended weld charge size for metallic surfaces and type of lining.

Weld caps must be primed and capped.

Do not deform cable. Remove only enough insulation from the cable to allow for the exothermic weld. The wire is to be held at a 30-degree angle to the surface during welding. Only 1 wire can be attached with each weld.

Remove all coating, dirt, grime and grease from the metal structure by wire brushing. Clean the structure to a bright, shiny surface free of all serious pits and flaws by using a file. The surface area of the structure must be absolutely dry.

After the weld has cooled, test the weld with a 2-pound hammer while pulling firmly on the wire. Clean, re-weld and re-test all unsound welds. Remove all weld slag.

Apply cold applied fast-drying mastic under Mil. Spec. Mil-C-18480B. The area to be coated must be clean and completely dry. Apply a primer specifically intended for use with an elastomeric weld cap. Apply the weld cap and a bituminous mastic coating material to all exposed areas around the cap per the manufacturer's recommendations. Overlap the structure coating by a minimum of 3 inches.

Repair coatings in the field per the coating manufacturer's recommendations. All coating repairs must be authorized by the Engineer.

77-2.01K Closed Circuit Television Inspection

Closed Circuit Television Inspection must comply with City of San Diego Standard Specifications for Public Works Contracts section 306-9.

77-2.03L Abandon Sewer Manhole

Abandon manhole where shown under section 15-2.05 and SSPWC section 306-5.

The upper portion of the manhole must be removed to a depth of at least 3.5-feet below grade and the bottom must be perforated or broken. The remaining portion must be backfilled with controlled low strength material per SSPWC, section 201-6.

77-2.03M Abandon Sewer Line

Abandon sewer line where shown under section 15-2.05 and SSPWC section 306-5.

The entire pipe segment must be fully grouted with saturated sand for the entire length. Pipe segments greater than 100-feet must be grouted using a temporary vertical sleeve bored from ground surface. The downstream end must be exposed and allowed to expel water. The last 12 inches of the end must be plugged with slurry cement backfill after 3 days.

77-2.03N Remove Sewer Line

Remove sewer line where shown under section 15-2.02 and SSPWC section 306-5.

The entire pipe segment must be removed.

77-2.04 PAYMENT

BID ITEM LIST

11-056324

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
1	070030	LEAD COMPLIANCE PLAN	LS	LUMP SUM	LUMP SUM	
2	080050	PROGRESS SCHEDULE (CRITICAL PATH METHOD)	LS	LUMP SUM	LUMP SUM	
3	090100	TIME-RELATED OVERHEAD (WDAY)	WDAY	460		
4	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	LUMP SUM	
5	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	LUMP SUM	
6	120120	TYPE III BARRICADE	EA	63		
7	120140	BARRICADE (LEFT IN PLACE)	EA	44		
8	120166	CHANNELIZER (SURFACE MOUNTED) (LEFT IN PLACE)	EA	59		
9	120199	TRAFFIC PLASTIC DRUM	EA	78		
10	128651	PORTABLE CHANGEABLE MESSAGE SIGN (EA)	EA	4		
11	129000	TEMPORARY RAILING (TYPE K)	LF	11,500		
12	026055	ALTERNATIVE TEMPORARY CRASH CUSHION SYSTEM	EA	5		
13	130100	JOB SITE MANAGEMENT	LS	LUMP SUM	LUMP SUM	
14	130300	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM	LUMP SUM	
15	130310	RAIN EVENT ACTION PLAN	EA	43	500.00	21,500.00
16	130320	STORM WATER SAMPLING AND ANALYSIS DAY	EA	13		
17	130330	STORM WATER ANNUAL REPORT	EA	3	2,000.00	6,000.00
18	130505	MOVE-IN/MOVE-OUT (TEMPORARY EROSION CONTROL)	EA	6		
19	130530	TEMPORARY HYDRAULIC MULCH (BONDED FIBER MATRIX)	SQFT	3,990,000		
20	130610	TEMPORARY CHECK DAM	LF	3,250		

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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
21	130620	TEMPORARY DRAINAGE INLET PROTECTION	EA	180		
22	130640	TEMPORARY FIBER ROLL	LF	103,000		
23	130710	TEMPORARY CONSTRUCTION ENTRANCE	EA	9		
24	130730	STREET SWEEPING	LS	LUMP SUM	LUMP SUM	
25	130900	TEMPORARY CONCRETE WASHOUT	LS	LUMP SUM	LUMP SUM	
26	141120	TREATED WOOD WASTE	LB	12,400		
27	150204	ABANDON CULVERT (LF)	LF	1,780		
28	150221	ABANDON INLET	EA	2		
29	026056	ABANDON 10" SEWER	LF	960		
30	026057	ABANDON 12" SEWER	LF	700		
31	026058	ABANDON SEWER MANHOLE	EA	5		
32	150305	OBLITERATE SURFACING	SQYD	4,810		
33	150605	REMOVE FENCE	LF	3,400		
34	150620	REMOVE GATE	EA	5		
35	150662	REMOVE METAL BEAM GUARD RAILING	LF	2,100		
36	150711	REMOVE PAINTED TRAFFIC STRIPE	LF	33,700		
37	150715	REMOVE THERMOPLASTIC PAVEMENT MARKING	SQFT	42		
38	150742	REMOVE ROADSIDE SIGN	EA	3		
39	150757	REMOVE SIGN STRUCTURE (EA)	EA	2		
40	150771	REMOVE ASPHALT CONCRETE DIKE	LF	310		

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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
41	BLANK					
42	150809	REMOVE CULVERT (LF)	LF	1,410		
43	150824	REMOVE SEWER MANHOLE	EA	1		
44	150841	REMOVE SEWER PIPE	LF	61		
45	150857	REMOVE ASPHALT CONCRETE SURFACING	SQYD	8,860		
46	026059	REMOVE BOLLARD	EA	5		
47	152356	RELOCATE IRRIGATION FACILITIES	EA	1		
48	152390	RELOCATE ROADSIDE SIGN	EA	1		
49	152641	MODIFY SIGN STRUCTURE	EA	1		
50	153120	REMOVE CONCRETE (LF)	LF	65		
51	153121	REMOVE CONCRETE (CY)	CY	2,390		
52	026060	REMOVE ROCK SLOPE PROTECTION	CY	2,470		
53	026061	REMOVE GUARD HOUSE	LS	LUMP SUM	LUMP SUM	
54	155232	SAND BACKFILL	CY	180		
55	160102	CLEARING AND GRUBBING (LS)	LS	LUMP SUM	LUMP SUM	
56	170101	DEVELOP WATER SUPPLY	LS	LUMP SUM	LUMP SUM	
57	190101	ROADWAY EXCAVATION	CY	1,100,000		
58 (F)	192003	STRUCTURE EXCAVATION (BRIDGE)	CY	6,630		
59 (F)	193003	STRUCTURE BACKFILL (BRIDGE)	CY	6,455		
60	026062	SLURRY CEMENT BACKFILL	CY	44		

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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
61	194001	DITCH EXCAVATION	CY	4,740		
62	BLANK					
63	200002	ROADSIDE CLEARING	LS	LUMP SUM	LUMP SUM	
64	026063	NATIVE SOD	SQFT	49,400		
65	204099	PLANT ESTABLISHMENT WORK	LS	LUMP SUM	LUMP SUM	
66	026064	TRUCK WATERING	LS	LUMP SUM	LUMP SUM	
67 (F)	208029	4" SUPPLY LINE (BRIDGE)	LF	240		
68	208739	10" CORRUGATED HIGH DENSITY POLYETHYLENE PIPE CONDUIT	LF	690		
69	208907	EXTEND 10" CONDUIT	LF	12		
70	210010	MOVE-IN/MOVE-OUT (EROSION CONTROL)	EA	4		
71	026065	CHECK DAM	LF	170		
72	210250	EROSION CONTROL (BONDED FIBER MATRIX) (SQFT)	SQFT	2,420,000		
73	210360	COMPOST SOCK	LF	97,100		
74	210600	COMPOST	SQFT	2,470,000		
75	210630	INCORPORATE MATERIALS	SQFT	2,470,000		
76	250401	CLASS 4 AGGREGATE SUBBASE	CY	38,800		
77	250501	CLASS 5 AGGREGATE SUBBASE	CY	585,000		
78	260203	CLASS 2 AGGREGATE BASE (CY)	CY	34,200		
79	374002	ASPHALTIC EMULSION (FOG SEAL COAT)	TON	7		
80	390131	HOT MIX ASPHALT	TON	25,300		

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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
101 (F)	510090	STRUCTURAL CONCRETE, BOX CULVERT	CY	6,501		
102 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	CY	706		
103 (F)	511064	FRACTURED RIB TEXTURE	SQFT	2,859		
104 (F)	044378	FRACTURED RIB TEXTURE (MODIFIED)	SQFT	2,177		
105	519088	JOINT SEAL (MR 1")	LF	230		
106	519097	JOINT SEAL ASSEMBLY (MR 5")	LF	80		
107	519100	JOINT SEAL (MR 2")	LF	448		
108 (F)	520102	BAR REINFORCING STEEL (BRIDGE)	LB	1,842,529		
109 (F)	520107	BAR REINFORCING STEEL (BOX CULVERT)	LB	1,302,118		
110 (F)	560218	FURNISH SIGN STRUCTURE (TRUSS)	LB	171,000		
111 (F)	560219	INSTALL SIGN STRUCTURE (TRUSS)	LB	171,000		
112	026066	INSTALL SIGN PANEL ON EXISTING STRUCTURE	SQFT	730		
113	560244	FURNISH LAMINATED PANEL SIGN (1"-TYPE A)	SQFT	2,530		
114	560248	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-UNFRAMED)	SQFT	210		
115	560249	FURNISH SINGLE SHEET ALUMINUM SIGN (0.080"-UNFRAMED)	SQFT	260		
116	560251	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-FRAMED)	SQFT	77		
117	560252	FURNISH SINGLE SHEET ALUMINUM SIGN (0.080"-FRAMED)	SQFT	90		
118	026067	ROADSIDE SIGN - ONE POST (WEED CONTROL MAT RUBBER)	EA	5		
119	566011	ROADSIDE SIGN - ONE POST	EA	27		
120	566012	ROADSIDE SIGN - TWO POST	EA	3		

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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
181	839585	ALTERNATIVE FLARED TERMINAL SYSTEM	EA	14		
182	839700	CONCRETE BARRIER (TYPE 60F)	LF	33		
183	839701	CONCRETE BARRIER (TYPE 60)	LF	6,830		
184 (F)	839702	CONCRETE BARRIER (TYPE 60A)	LF	172		
185	839712	CONCRETE BARRIER (TYPE 60SC)	LF	310		
186	026087	CONCRETE BARRIER (TYPE 60 MOD)	LF	36		
187 (F)	839725	CONCRETE BARRIER (TYPE 736)	LF	4,213		
188 (F)	839735	CONCRETE BARRIER (TYPE 742)	LF	1,411		
189	840516	THERMOPLASTIC PAVEMENT MARKING (ENHANCED WET NIGHT VISIBILITY)	SQFT	320		
190	840655	PAINT TRAFFIC STRIPE (1-COAT)	LF	14,300		
191	840656	PAINT TRAFFIC STRIPE (2-COAT)	LF	42,600		
192	840666	PAINT PAVEMENT MARKING (2-COAT)	SQFT	5,530		
193	846001	4" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NIGHT VISIBILITY)	LF	37,000		
194	846004	4" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NIGHT VISIBILITY) (BROKEN 17-7)	LF	1,550		
195	846005	4" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NIGHT VISIBILITY) (BROKEN 36-12)	LF	15,300		
196	846009	8" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NIGHT VISIBILITY)	LF	4,860		
197	846010	8" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NIGHT VISIBILITY) (BROKEN 12-3)	LF	910		
198	850101	PAVEMENT MARKER (NON-REFLECTIVE)	EA	3,460		
199	850111	PAVEMENT MARKER (RETROREFLECTIVE)	EA	2,200		
200	860090	MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION	LS	LUMP SUM	LUMP SUM	

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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
201	860407	LIGHTING (PARKING LOT)	LS	LUMP SUM	LUMP SUM	
202	860460	LIGHTING AND SIGN ILLUMINATION	LS	LUMP SUM	LUMP SUM	
203	860774	SPRINKLER CONTROL CONDUIT (BRIDGE) (LF)	LF	250		
204	860797	ELECTRIC SERVICE (IRRIGATION)	LS	LUMP SUM	LUMP SUM	
205	860931	TRAFFIC MONITORING STATION (LOCATION 1)	LS	LUMP SUM	LUMP SUM	
206	860932	TRAFFIC MONITORING STATION (LOCATION 2)	LS	LUMP SUM	LUMP SUM	
207	860990	CLOSED CIRCUIT TELEVISION SYSTEM	LS	LUMP SUM	LUMP SUM	
208	861100	RAMP METERING SYSTEM	LS	LUMP SUM	LUMP SUM	
209	BLANK					
210	129100	TEMPORARY CRASH CUSHION MODULE	EA	98		
211	198050	EMBANKMENT	CY	1,050,000		
212 (F)	520120	HEADED BAR REINFORCEMENT	EA	80		
213	999990	MOBILIZATION	LS	LUMP SUM	LUMP SUM	

TOTAL BID: **$** _____

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