

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

OFFICE ENGINEER

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www.dot.ca.gov/hq/esc/oe

*Flex your power!  
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January 10, 2014

11-SD-5, 8-R19.9/R21.2, R0.0/R0.7

11-002704

Project ID 1100000005

NHPI-IMD-005-1(613)E

HPLU-6211(105)E

Addendum No. 4

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN SAN DIEGO COUNTY IN SAN DIEGO ON ROUTE 5 FROM 0.1 MILE SOUTH OF ROUTE 8/5 SEPARATION AND OVERHEAD TO 0.3 MILE NORTH OF TECOLOTE CREEK BRIDGE AND ON ROUTE 8 FROM ROUTE 8/5 SEPARATION AND OVERHEAD TO 0.3 MILE EAST OF MORENA BOULEVARD 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, January 30, 2014, instead of the original date of Thursday, January 16, 2014.

This addendum is being issued to set a new bid opening date as shown herein and revise the project plans, the *Notice to Bidders and Special Provisions*, the *Bid* book, and the Federal Minimum Wages with Modification Number 1 dated 01/10/2014.

Project plan sheets 1, 2, 4, 5, 9-15, 17, 18, 24, 28-30, 34-37, 39, 40, 43, 44, 46-50, 55-59, 62, 63, 67, 72, 73, 78, 83, 84, 90, 91, 94-98, 105-109, 112-115, 118, 120-125, 129, 130-135, 169, 171, 173, 177, 178, 179, 181, and 183 are replaced and attached for substitution for the like-numbered sheets.

Project plan sheets 47a, 61a, 61b, 67a, 67b, 71a, 71b, and 168a are added and attached for addition to the project plans.

Project plan sheets 6, 19, 21, 22, 66, 70, 71, 87, 88, 89, 92, 99, 100-103, 110, 111, 116, 117, 119, 126, 127, 128, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 147, and 162 are deleted.

In the *Notice to Bidders and Special Provisions*, in the "STANDARD PLANS LIST," the following Standard Plans are added :

"D98C, ES-6D, and RSP B11-55."

In the *Notice to Bidders and Special Provisions*, in the "STANDARD PLANS LIST," the following Standard Plans are deleted:

"RSP B3-1A, B11-55, ES-2C, ES-3A, ES-3B, ES-5C, and ES-16B."

11-SD-5, 8-R19.9/R21.2, R0.0/R0.7  
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In the *Notice to Bidders*, the eleventh, twelfth and thirteenth paragraphs are replaced as follows:

"Bids must be on a unit price basis.

Complete the work, excluding plant establishment work, within 310 working days.

Complete the work, including plant establishment work, within 560 working days."

In the *Notice to Bidders*, the fourteenth paragraph is deleted.

In the Special Provisions, Section 1, "GENERAL," is replaced as attached.

In the Special Provisions, Section 8-1.10A, is deleted.

In the Special Provisions, Section 9-1.16C, items fifteen and sixteen in the first paragraph are deleted.

In the Special Provisions, Section 12-3.13C, the following paragraph is added after second paragraph.

"After placing components of a stationary traffic control system for complete connector closure, you must place the impact attenuator vehicle in advance of the work area to protect traffic and workers."

In the Special Provisions, Section 12-4.05B, is replaced as attached.

In the Special Provisions, Section 12-4.05C, is replaced as attached.

In the Special Provisions, Section 12-4.05D, is replaced as attached.

In the Special Provisions, Section 12-4.05E, is replaced as attached.

In the Special Provisions, Section 20, "LANDSCAPE," is replaced as attached.

In the Special Provisions, Section 56-8, "INSTALL SIGN PANEL ON EXISTING STRUCTURE," is added as attached.

In the Special Provisions, Section 59, "PAINTING," is deleted.

In the Special Provisions, Section 86, "ELECTRICAL SYSTEMS," is replaced as attached.

In the *Bid* book, in the "Bid Item List," Items 3, 7, 10, 11, 16, 20, 29, 39, 47-52, 55-57, 62, 73, 77, 79, 80, 87, 89-91, 95, 97, 99, 100, 106, 108-111, 114, 117, 120, 122, 130, 133, 134, 136, 137, 141, 145, and 146 are replaced, Items 167-174 are added and Items 43, 53, 63, 65, 67, 71, 74, 81-83, 102, 119, 142, 143, 162, and 166 are deleted as attached.

Addendum No. 4  
Page 3  
January 10, 2014

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To *Bid* book holders:

In the *Bid* book, pages 3-11 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/11/11-002704](http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/11/11-002704)**

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

# 1 GENERAL

Add to section 1-1.01:

## Bid Items and Applicable Sections

Item code	Item description	Applicable section
026527	NATIVE SOD	20
026528	16-STATION IRRIGATION CONTROLLER (SOLAR)	20
026529	IRRIGATION CONTROLLER ENCLOSURE	20
044479	RANDOM FLUTE TEXTURE	51
026533	ROADSIDE SIGN-ONE POST (WEED CONTROL MAT RUBBER)	56
026896	INSTALL SIGN PANEL ON EXISTING STRUCTURE	56
026534	4" PLASTIC PIPE	64
026535	MINOR CONCRETE (EXPOSED AGGREGATE)	73
026536	ALTERNATIVE CRASH CUSHION	83
026539	CONCRETE BARRIER (TYPE 732B MOD)	83
044480	CONCRETE BARRIER (TYPE 742R)	83
026540	REMOVE TRAFFIC MONITORING STATION	86

Replace "Reserved" in section 12-4.05B with:

<b>Chart no. B1</b>																									
<b>Freeway/Expressway Lane Requirements</b>																									
County: SD							Route/Direction: 8/WB							PM: R0.50 – R0.20											
Closure limits: 0.14 Mi. east of Morena Blvd. UC to 0.17 Mi. west of Morena Blvd. UC																									
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	1	1	1	1	1																				1
Fridays	1	1	1	1	1																				
Saturdays																									
Sundays																									

Legend:

1 Provide at least 1 through freeway lane open in direction of travel

No lane closure allowed, shoulders may be closed

REMARKS:

<b>Chart no. B2</b>																										
<b>Freeway/Expressway Lane Requirements</b>																										
County: SD							Route/Direction: 5/NB							PM: R19.90 – R21.30												
Closure limits: 0.87 Mi. north of Old Town Ave. OC to 0.48 Mi. north of Sea World Dr. 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	1	1	1	1	1																			3	3	2
Fridays	1	1	1	1	1																					
Saturdays				1	1	1	2	3	3	3																
Sundays				1	1	1	2	2	2	3	3												3	2	2	

Legend:

1 Provide at least 1 through freeway lane open in direction of travel

2 Provide at least 2 adjacent through freeway lanes open in direction of travel

3 Provide at least 3 adjacent through freeway lanes open in direction of travel

No lane closure allowed, shoulders may be closed

REMARKS:

Replace "Reserved" in section 12-4.05C with:

Chart no. C1 Complete Freeway/Expressway Closure Hours																											
County: SD					Route/Direction: 5/NB										PM: R19.70 – R20.82												
Closure limits: 0.67 Mi. north of Old Town Ave. OC to Sea World Dr. 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		C	C	C	C	C																				C	
Fridays		C	C	C	C	C																					
Saturdays																											
Sundays																											

Legend:

C Freeway or expressway may be closed completely

No complete freeway or expressway closure is allowed

REMARKS:

No other closure that conflicts with or shares any elements of the following detours will be permitted.  
 This chart is to be used for one (1) time only.  
 This chart is to be used for overhead sign work only.  
 This chart is to be used with chart No. D3 & Chart No. E2.

**Detour NB 5 for the full Freeway closure**  
 Detour NB 5 traffic via northerly on Rte. 5 to NB 5 Conn. to EB 8, thence easterly on Rte. 8 to EB 8 Conn. to NB 163, thence northerly on Rte. 163 to NB 163 Conn. to NB 805, thence northerly on Rte. 805 to NB 805 Conn. to WB 52, thence westerly on Rte. 52 to WB 52 Conn. to NB 5.

**NOTE:** Place a PCMS (Portable Changeable Message Sign) on NB/5 at a location at the discretion of Construction Field Personnel - warning the public of the ramp closure / detour ahead.

**Chart no. C2**  
**Complete Freeway/Expressway Closure Hours**

County: SD	Route/Direction: 8/WB	PM: R0.50 – R0.20																								
Closure limits: 0.14 Mi. east of Morena Blvd. UC to 0.17 Mi. west of Morena Blvd. UC																										
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	C	C	C	C	C																					
Fridays	C	C	C	C	C																					
Saturdays																										
Sundays																										

Legend:

C	Freeway or expressway may be closed completely
	No complete freeway or expressway closure is allowed

**REMARKS:**  
 No other closure that conflicts with or shares any elements of the following detours will be permitted.  
 This chart is to be used for a maximum of four (4) nights.  
 Primary and secondary detours must be used concurrently.

**Primary Detour**  
**Detour WB 8 for the full Freeway closure**  
 Detour WB 8 for the full Freeway closure traffic via westerly on Rte. 8 to WB 8 Conn. to SB 5, thence southerly on Rte. 5 to SB 5 Off-ramp to Old Town Ave., thence easterly on Old Town Ave. to Moore St. /Old Town Ave., thence northerly on Moore St. to NB 5 On-ramp from Moore St. /Old Town Ave., thence northerly on Rte. 5 to NB 5 Conn. to WB 8.

**Secondary Detour**  
**Detour WB 8 for the full Freeway closure**  
 Detour WB 8 for the full Freeway closure traffic via westerly on Rte. 8 to WB 8 Conn. to NB 5, thence northerly on Rte. 5 to NB 5 Off-ramp to Sea World Dr., thence westerly on Sea World Dr. to Sunset Cliffs Blvd. thence westerly on Sunset Cliffs Blvd. to Rte. 8

When the Freeway is closed, place a PCMS (Portable Changeable Message Sign) on WB 8 E. of Hotel Circle N. warning the traffic of the closure ahead.

Replace "Reserved" in section 12-4.05D with:

Chart no. D1 Complete Connector Closure Hours																											
County: SD					Route/Direction: 8/WB										PM: R0.165												
Closure limits: WB Connector to NB 5																											
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		C	C	C	C	C																					
Fridays		C	C	C	C	C																					
Saturdays																											
Sundays					C	C	C	C																			

Legend:

C Connector may be closed completely

No connector closure allowed, shoulders may be closed

REMARKS:

No other closure that conflicts with or shares any elements of the following detour will be permitted. Primary and secondary detours must be used concurrently.

**Primary Detour**  
**Detour WB 8 Connector to NB 5**  
 Detour WB 8 Conn. to NB 5 traffic via westerly on Rte. 8 to WB 8 Conn. to SB 5, thence southerly on Rte. 5 to SB 5 Off-ramp to Old Town Ave., thence easterly on Old Town Ave. to Moore St./Old Town Ave., thence northerly on Moore St. to NB 5 On-ramp from Moore St./Old Town Ave.

**NOTE:** Place a PCMS (Portable Changeable Message Sign) on WB/8 at a location at the discretion of Construction Field Personnel - warning the public of the ramp closure / detour ahead.

**Secondary Detour**  
**Detour WB 8 Connector to NB 5**  
 Detour WB 8 Conn. to NB 5 traffic via westerly on Rte. 8 to WB 8 Off-ramp to Sports Arena Blvd./W. Mission Bay Dr., thence southerly on Sports Arena Blvd. to EB 8 On-ramp from Sports Arena Blvd., thence easterly on Rte. 8 to EB 8 Conn. to SB 5, thence southerly on Rte. 5 to SB 5 Off-ramp to Old Town Ave., thence easterly on Old Town Ave. to Moore St./Old Town Ave., thence northerly on Moore St. to NB 5 On-ramp from Moore St./Old Town Ave.

**NOTE:** Place a PCMS (Portable Changeable Message Sign) on WB/8 at a location at the discretion of Construction Field Personnel - warning the public of the ramp closure / detour ahead.

**Chart no. D2  
Complete Connector Closure Hours**

County: SD	Route/Direction: 8/WB	PM: R0.165																								
Closure limits: WB Connector to NB 5																										
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																										
Fridays																										
Saturdays	C	C	C	C	C	C	C	C	C	C																
Sundays	C	C	C	C	C	C	C	C	C	C																

**Legend:**

- C Connector may be closed completely
- No connector closure allowed, shoulders may be closed

**REMARKS:**

No other closure that conflicts with or shares any elements of the following detour will be permitted. Primary, secondary, and tertiary detours must be used concurrently. This long term closure is allowed to occur six times only.

**Primary Detour**

**Detour WB 8 Connector to NB 5**  
 Detour WB 8 Conn. to NB 5 traffic via westerly on Rte. 8 to WB 8 Conn. to SB 5, thence southerly on Rte. 5 to SB 5 Off-ramp to Old Town Ave., thence easterly on Old Town Ave. to Moore St./Old Town Ave., thence northerly on Moore St. to NB 5 On-ramp from Moore St./Old Town Ave.

**NOTE:** Place a PCMS (Portable Changeable Message Sign) on WB/8 at a location at the discretion of Construction Field Personnel - warning the public of the ramp closure / detour ahead.

**Secondary Detour**

**Detour WB 8 Connector to NB 5**  
 Detour WB 8 Conn. to NB 5 traffic via westerly on Rte. 8 to WB 8 Off-ramp to Sports Arena Blvd./W. Mission Bay Dr., thence southerly on Sports Arena Blvd. to EB 8 On-ramp from Sports Arena Blvd., thence easterly on Rte. 8 to EB 8 Conn. to SB 5, thence southerly on Rte. 5 to SB 5 Off-ramp to Old Town Ave., thence easterly on Old Town Ave. to Moore St./Old Town Ave., thence northerly on Moore St. to NB 5 On-ramp from Moore St./Old Town Ave.

**NOTE:** Place a PCMS (Portable Changeable Message Sign) on WB/8 at a location at the discretion of Construction Field Personnel - warning the public of the ramp closure / detour ahead.

**Tertiary Detour**

**Detour WB 8 Connector to NB 5**  
 Detour WB 8 Conn. to NB 5 traffic via westerly on Rte. 8 to WB 8 Conn. to SB 163, thence southerly on Rte. 163 to SB 163 Conn. to NB 5.

**NOTE:** Place a PCMS (Portable Changeable Message Sign) on WB/8 at a location at the discretion of Construction Field Personnel - warning the public of the ramp closure / detour ahead.

**Chart no. D3  
Complete Connector Closure Hours**

County: SD                      Route/Direction: 8/WB                      PM: R0.165

Closure limits: WB Connector to NB 5

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	C	C	C	C	C																					C
Fridays	C	C	C	C	C																					
Saturdays																										
Sundays																										

**Legend:**

- C Connector may be closed completely
- No connector closure allowed, shoulders may be closed

**REMARKS:**  
 No other closure that conflicts with or shares any elements of the following detour will be permitted.  
 This chart is to be used with chart No. C1.

**Detour WB 8 Connector to NB 5**  
 Detour WB 8 Conn. to NB 5 traffic via westerly on Rte. 8 to WB 8 Conn. to NB 163, thence northerly on Rte. 163 to NB 163 Conn. to NB 805, thence northerly on Rte. 805 to NB 805 Conn to WB 52, thence westerly on Rte. 52 to WB 52 Conn. to NB 5.

**NOTE:** Place a PCMS (Portable Changeable Message Sign) on WB/8 at a location at the discretion of Construction Field Personnel - warning the public of the ramp closure / detour ahead.

Replace "Reserved" in section 12-4.05E with:

Chart no. E1 Complete Ramp Closure Hours/Ramp Lane Requirements																											
County: SD	Route/Direction: 5/NB												PM: 20.663														
													20.974														
Closure limits: NB Off-ramp to Sea World Dr. NB On-ramp from Sea World Dr.																											
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	C	C	C	C	C																			C	C	C	
Fridays	C	C	C	C	C																						
Saturdays					C	C	C	C	C	C	C	C															
Sundays					C	C	C	C	C	C	C	C													C	C	C
Legend:																											
<input type="checkbox"/> C Ramp may be closed completely																											
<input type="checkbox"/> No ramp closure allowed, shoulders may be closed																											
REMARKS:																											
NOTE: When an Off-ramp is closed completely, place a PCMS (Portable Changeable Message Sign) in the direction of travel allowing the traffic the option to use the preceding Off-ramp and warning them of the ramp closure ahead.																											

Chart no. E2 Complete Ramp Closure Hours/Ramp Lane Requirements																										
County: SD	Route/Direction: 5/NB												PM: R19.967													
Closure limits: NB On-ramp from Camino Del Rio																										
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	C	C	C	C	C																					C
Fridays	C	C	C	C	C																					
Saturdays																										
Sundays																										
Legend:																										
<input type="checkbox"/> C Ramp may be closed completely																										
<input type="checkbox"/> No ramp closure allowed, shoulders may be closed																										
REMARKS:																										
This chart is to be used with chart No. C1.																										

**Chart no. E3  
Complete Ramp Closure Hours**

County: SD	Route/Direction: 8/WB	PM: R0.589
		0.990
		1.049
	5/NB	R19.276

Closure limits: WB Off-ramp to NB Morena Blvd.  
 WB On-ramp from Taylor St./Hotel Circle  
 WB Off-ramp to Taylor St./Hotel Circle  
  
 NB On-ramp from Moore St.

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	C	C	C	C	C																			C	C	C
Fridays	C	C	C	C	C																					
Saturdays				C	C	C	C	C	C	C	C															
Sundays				C	C	C	C	C	C	C	C													C	C	C

**Legend:**

- C Ramp may be closed completely
- No ramp closure allowed, shoulders may be closed

**REMARKS:**

NOTE: When an Off-ramp is closed completely, place a PCMS (Portable Changeable Message Sign) in the direction of travel allowing the traffic the option to use the preceding Off-ramp and warning them of the ramp closure ahead.

## 20 LANDSCAPE

### Add to section 20-1.02B:

Pesticides used to control weeds must be limited to the following materials:

Aminopyralid  
Diquat  
Dithiopyr  
Clopyralid MEA  
Fluazifop-P-Butyl  
Flumioxazin  
Glyphosate  
Imazapyr  
Oxyfluorfen (non-odor type)  
Sethoxydim

### Add to section 20-1.02B:

A granular preemergent may be used when applied to areas that will be covered with mulch, excluding plant basins. Granular preemergent must be limited to the following material:

1. Oxadiazon

### Replace section 20-1.03A with:

#### **20-1.03A Progress Inspections**

Progress inspections are intermittently performed by the Engineer at various stages of work during the Contract.

### Add to section 20-1.03C:

Granular preemergent must be applied before the placement of mulch. The preemergent application and mulch placement must be completed in a single area within the same work day.

### Add to section 20-1.03B:

Growth regulators must not be used.

### Replace section 20-3.01C(3) with:

#### **20-3.01C(3) Control and Neutral Conductors Schedule of Values**

Submit a schedule of values for control and neutral conductors. Submit the schedule after the wiring plans and diagrams for the electrical components of the irrigation system, except electrical service, have been authorized.

The unit descriptions shown in the table are the minimum. You may include additional unit descriptions. Include the quantity, value, and amount for those additional unit descriptions.

Use the authorized wiring plan and diagrams to determine the quantities required to complete the work.

No adjustment in compensation is made in the contract lump sum price paid for control and neutral conductors work due to differences between the quantities shown in the schedule of values for control and neutral conductors work and the quantities required to complete the work.

Schedule of Values for Control and Neutral Conductors

Contract no. 11-002704				
Unit description	Unit	Approximate quantity	Value	Amount
__ AWG (UF) conductors (provide size)	LF			
__ AWG (UF) conductors	LF			
__ AWG (UF) conductors	LF			
No. 5 or larger pull box	EA			
Splices	EA			
__ Sprinkler control conduit (provide size)	LF			
__ Sprinkler control conduit	LF			
__ Sprinkler control conduit	LF			

Total \_\_\_\_\_

**Replace the 1st item in the 1st paragraph of section 20-3.02E(1) with:**

- No. 14 AWG or larger.

**Add to section 20-3.02E:**

**20-3.02E(5) Sprinkler Control Conduit**

Sprinkler control conduit must comply with section 20-3.02E(3).

**Replace "Reserved" in section 20-3.02H(3) with:**

Irrigation controller (solar) must be a DIG Corporation, LEIT X Series ambient light solar controller.

You may obtain the specified equipment listed below from:

Hydro-Scape Products, Incorporated  
 5805 Kearny Villa Road  
 San Diego, CA 92123  
 (858) 560-1600

The quoted prices and equipment, not including sales tax and delivery, are as follows:

Equipment Description	Quoted Price	Quantity Each	Extended Price	Controller Identification
LEIT 16 Station X-Series Solar Irrigation Controller, Product No. LEITX16.	\$958.80	1	\$958.80	IC 'E'
Mounting Column, 35-inches in Height, Product No. MCOLXS. Includes Mounting Kit Product No. MKIT-X	\$118.51	1	\$118.51	IC 'E'
LEIT Programming Key, Product No. LEITKEY.	\$23.93	1	\$23.93	IC 'E'

The prices are good until 05/31/2014.

**Replace section 20-3.02I with:**

**20-3.02I Irrigation Controller Enclosures**

Irrigation controller enclosures must be as shown, and comply with section 20-3.02B(4).

Irrigation controller enclosure door handles must allow padlocking in the latched position. The padlock is furnished by the Engineer.

Rain sensors are not required.

**Replace section 20-3.02M(3)(a) with:**

**20-3.02M(3)(a) Plastic Pipe Supply Lines**

Plastic pipe supply line must be PVC pipe that is NSF approved.

Schedule 40 plastic pipe supply line must comply with ASTM D 1785.

Class 315 plastic pipe supply line must comply with ASTM D 2241.

PVC gasketed bell joints must comply with ASTM D 2672, ASTM D2241, ASTM D 3139, and ASTM F 477.

For solvent-cemented type joints, the primer and solvent cement must be made by the same manufacturer. Primer must be used in the solvent-cemented type joints. The primer color must contrast with the color of the pipe and fittings.

Threaded fittings and fittings to be solvent-cemented to plastic pipe supply line must be injection molded PVC, Schedule 40, and comply with ASTM D 2466.

Risers and threaded nipples for irrigation facilities must be Schedule 80, PVC 1120 or PVC 1220 pipe and comply with ASTM D 1785.

Solvent cement and primer for PVC plastic pipe and fittings for supply line must be specifically manufactured for use with rigid PVC plastic pipe and fittings and must be applied separately. Solvent cement must comply with the local Air Quality Management District requirements.

Fittings for supply lines in irrigation conduit must be Schedule 80.

**Replace the 2nd sentence of the 3rd paragraph of section 20-3.02P(2) with:**

Color of drain grate must be sand.

**Replace the 4th paragraph of section 20-3.02P(2) with:**

Pea gravel for filling the drainpipe must have a maximum diameter of 1/2 inch. Pea gravel must be naturally rounded aggregate, clean, washed, dry and free from clay or organic material.

**Add to section 20-3.02R(3)(b):**

Remote control valves must be brass.

**Replace item 6 of paragraph 2 in section 20-3.02R(3)(b) with:**

6. Have an external and internal manual bleed device.

**Add to paragraph 2 of section 20-3.02R(3)(b):**

8. Not have external tubing.
9. Have one-piece solenoids with plunger and spring secured to the solenoid.

**Add to section 20-3.02R(3)(b):**

Valves must be straight pattern as shown.

**Replace the 3rd sentence of the last paragraph in section 20-3.02R(5) with:**

Pipe flanges used to connect plastic or metal pipe to gate valves must be metal.

**Replace the last sentence of the 6th paragraph in section 20-3.02U with:**

Label material must be plate plastic.

**Add to section 20-3.03F(3):**

Plastic pipe supply line mains must be installed not less than 1.5 feet below finished grade measured to the top of the pipe.

**Replace "Reserved" in section 20-3.03H(4)(c) with:**

Install irrigation controller (solar) on a mounting tube per the manufacturer's recommendations and in an irrigation controller enclosure as shown.

**Replace the 5th paragraph of section 20-3.03N with:**

Pipe supply lines on the discharge side of the valve must be tested in conformance with Method B only. Testing by Method A is not allowed.

Pipelines installed by trenching and backfilling and pipelines that are completely visible after installation must be tested by Method B. All other pipelines, including those installed in the ground by methods other than trenching and backfilling must be tested by Method A.

**Add to the 1st paragraph of section 20-7.01B(2):**

4. Native sod

**Add to section 20-7.02C:**

**20-7.02C(6) Native Sod**

Native sod must:

1. Comply with section 20-7.02C(5).
2. Be healthy field grown sod containing not more than 1/2 inch thick thatch.
3. Be not less than 8 months or more than 16 months in age.
4. Be grown on a biodegradable net or mesh.

**Add to section 20-7.03B(2):**

Weeds must be killed within ground cover and native sod areas and within the area extending beyond the outer limits of the ground cover and native sod areas to the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, existing planting, and fences. At those locations where ground cover and native sod areas are 12 feet or more from the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, and fences, the clearing limit must be 6 feet beyond the outer limits of the ground cover and native sod areas.

Weeds must be killed within mulch areas and within the area extending beyond the outer limits of the mulch areas to the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, existing planting and fences. At those locations where mulch areas are 12 feet or more from the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, and fences, the clearing limit must be 6 feet beyond the outer limits of the mulch areas.

Weeds must be killed within 2 feet of the edges of paved shoulders, dikes, curbs, and sidewalks.

**Replace the 1st paragraph in section 20-7.03B(2) with:**

Dispose of weeds killed during the initial roadside clearing.

**Replace the 2nd paragraph in section 20-7.03B(3) with:**

Dispose of weeds killed after initial roadside clearing.

**Add to section 20-7.03C:**

Plants adjacent to drainage ditches must be located so that after construction of the basins, no portion of the basin wall is less than the minimum distance shown for each plant involved.

**Add to section 20-7.03I(1):**

A granular preemergent must be applied to areas to be covered with mulch outside of plant basins.

**Add to section 20-7.03I(11):**

For plants planted within areas watered by an overhead irrigation system, the watering of these plants must occur between the hours of 10:00 PM and 6:00 AM within a maximum of 20 days after the plants have been planted.

**Add to section 20-7.03I:**

**20-7.03I(17) Native Sod**

Comply with section 20-7.03I(14), except that cultivation is not required.

Comply with section 21-1.03N.

Cover the outer edges of native sod with soil so that the roots are not exposed. You may use soil obtained from the adjacent areas.

Native sod areas will not be required to be mowed or trimmed.

**Add to section 20-9.01A:**

The plant establishment period must be Type 2.

**Replace section 20-9.01C(1) with:**

**20-9.01C(1) General**

Submit the following seasonal watering schedules, March through May, June through August, September through October, and November through February, for use during the plant establishment period. Submit the first seasonal watering schedule within 10 days after the start of the plant establishment period. Subsequent seasonal schedules must be submitted within 5 days of the beginning of each seasonal period.

Submit updated watering schedules within 5 business days after any changes have been made to the authorized schedules.

Submit revised watering schedules for each irrigation controller not less than 30 days before completion of the plant establishment period.

**Add to section 20-9.03C:**

Apply slow-release or controlled-release fertilizer to the plants during the 1st week of April, July and September of each year.

**Add to section 20-9.03D:**

Control weeds by:

1. Hand pulling:
  - 1.1. In plant basins and on basin walls
  - 1.2. In native sod areas
2. Killing:
  - 2.1. In mulched areas and ground cover planting areas outside of plant basins
  - 2.2. In planting areas without ground cover plantings or located outside of ground cover areas
  - 2.3. In ground cover planting areas without plant basins

**Add to section 20-9.03I:**

All overhead irrigation must be watered between the hours of 10:00 PM and 6:00 AM.

**Replace the 1st paragraph of section 20-9.03J with:**

Native sod areas are not required to be mowed or trimmed.

**Add to Section 56**

**56-8 INSTALL SIGN PANEL ON EXISTING STRUCTURE**

**56-8.01 GENERAL**

Section 56-8 includes specifications for installing sign panels on existing structures in place.

**56-8.02 MATERIALS**

Not Used

**56-8.03 CONSTRUCTION**

Remove and dispose of existing sign panels.

Install sign panels on existing structure with fastening hardware specified in section 56-2.01B(4).

**56-8.04 PAYMENT**

Payment for furnishing sign panels is not included in the payment for install sign panel on existing structure.

## 86 ELECTRICAL SYSTEMS

### Add to section 86-1.01:

Lighting equipment is included in the following structures:

1. Route 8/5 interchange Bridge No.57-569

### Add to section 86-1.03:

Submit a schedule of values within 15 days after Contract approval.

### Replace "Reserved" in section 86-1.06B with:

Traffic Management System (TMS) elements include, but are not limited to ramp metering (RM) system, communication system, traffic monitoring stations, video image vehicle detection system (VIVDS), microwave vehicle detection system (MVDS), loop detection system, changeable message sign (CMS) system, extinguishable message sign (EMS) system, highway advisory radio (HAR) system, closed circuit television (CCTV) camera system, roadway weather information system (RWIS), visibility sensor, and fiber optic system.

Existing TMS elements, including detection systems, shown and located within the project limits must remain in place and be protected from damage. If the construction activities require existing TMS elements to be nonoperational or off line, and if temporary or portable TMS elements are not shown, the Contractor must provide for temporary or portable TMS elements. The Contractor must receive authorization on the type of temporary or portable TMS elements and installation method.

Before work is performed, the Engineer, the Contractor, and the Department's Traffic Operations Electrical representatives must jointly conduct a pre-construction operational status check of all existing TMS elements and each element's communication status with the Traffic Management Center (TMC), including existing TMS elements not shown and elements that may not be impacted by the Contractor's activities. The Department's Traffic Operations Electrical representatives will certify the TMS elements' location and status, and provide a copy of the certified list of the existing TMS elements within the project limits to the Contractor. The status list will include the operational, defined as having full functionality, and the nonoperational components.

The Contractor must obtain authorization at least 72 hours before interrupting existing TMS elements' communication with the TMC that will result in the elements being nonoperational or off line. The Contractor must notify the Engineer at least 72 hours before starting excavation activities.

Traffic monitoring stations and their associated communication systems, which were verified to be operational during the pre-construction operational status check, must remain operational on freeway/highway mainline at all times, except:

1. For a duration of up to 15 days on any continuous segment of the freeway/highway longer than 3 miles
2. For a duration of up to 60 days on any continuous segment of the freeway/highway shorter than 3 miles

If the construction activities require existing detection systems to be nonoperational or off line for a longer time period or the spacing between traffic monitoring stations is more than the specified criteria above, and temporary or portable detection operations are not shown, the Contractor must provide provisions for temporary or portable detection operations. The Contractor must receive authorization on the type of detection and installation before installing the temporary or portable detection.

If existing TMS elements shown or identified during the pre-construction operational status check, except traffic monitoring stations, are damaged or fail due to the Contractor's activity, where the elements are not fully functional, the Engineer must be notified immediately. If the Contractor is notified by the Engineer that existing TMS elements have been damaged, have failed or are not fully functional due to the Contractor's activity, the damaged or failed TMS elements, excluding structure-related elements, must be repaired or replaced, at the Contractor's expense, within 24 hours. For a structure-related elements, the Contractor must install temporary or portable TMS elements within 24 hours. For nonstructure-related TMS elements, the Engineer may authorize temporary or portable TMS elements for use during the construction activities.

The Contractor must demonstrate that repaired or replaced elements operate in a manner equal to or better than the replaced equipment. If the Contractor fails to perform required repairs or replacement work, the Department may perform the repair or replacement work and the cost will be deducted from monies due to the Contractor.

A TMS element must be considered nonoperational or off line for the duration of time that active communications with the TMC is disrupted, resulting in messages and commands not transmitted from or to the TMS element.

The Contractor must provide provisions for replacing existing TMS elements within the project limits, including detection systems, that were not identified on the plans or during the pre-construction operational status check that became damaged due to the Contractor's activities.

If the pre-construction operational status check identified existing TMS elements, then the Contractor, the Engineer, and the Department's Traffic Operations Electrical representatives must jointly conduct a post construction operational status check of all existing TMS elements and each element's communication status with the TMC. The Department's Traffic Operations Electrical representatives will certify the TMS elements' status and provide a copy of the certified list of the existing TMS elements within the project limits to the Contractor. The status list will include the operational, defined as having full functionality, and the nonoperational components. TMS elements that cease to be functional between pre and post construction status checks must be repaired at the Contractor's expense.

The Engineer will authorize the schedule for final replacement, the replacement methods and the replacement elements, including element types and installation methods before repair or replacement work is performed. The final TMS elements must be new and of equal or better quality than the existing TMS elements.

If no electrical work exists on the project and no TMS elements are identified within the project limits, the pre-construction operational status check is change order work.

Furnishing and installing temporary or portable TMS elements that are not shown, but are required when an existing TMS element becomes nonoperational or off line due to construction activities, is change order work.

Furnishing and installing temporary or portable TMS elements and replacing TMS elements that are not shown nor identified during the pre-construction operational status check and were damaged by construction activities is change order work.

If the Contractor is required to submit provisions for the replacement of TMS elements that were not identified, submitting the provisions is change order work.

**Add to section 86-2.05A:**

Conduit installed underground must be Type 3.

**Add to section 86-2.05B:**

The conduit in a foundation and between a foundation and the nearest pull box must be -Type 3.

**Add to section 86-2.05C:**

If Type 3 conduit is placed in a trench, not in the pavement or under concrete sidewalk, after the bedding material is placed and the conduit is installed, backfill the trench to not less than 4 inches above the conduit with minor concrete under section 90-2, except the concrete must contain not less than 421 pounds of cementitious material per cubic yard. Backfill the remaining trench to finished grade with backfill material.

After conductors have been installed, the ends of the conduits must be sealed with an authorized type of sealing compound.

At those locations where conduit is required to be installed under pavement and underground facilities designated as high priority subsurface installation under Govt Code § 4216 et seq. exist, conduit must be placed by the trenching in pavement method under section 86-2.05C.

The final 2 feet of conduit entering a pull box in a reinforced concrete structure may be Type 4.

**Add to section 86-2.05:**

**86-2.05F FIBERGLASS CONDUIT**

**86-2.05F(1) General**

**86-2.05F(1)(a) Summary**

This work applies when fiberglass conduit is shown at structure installations.

The size and quantity of conduits are shown.

**86-2.05F(1)(b) Submittals**

Not used

**86-2.05F(2) Materials**

**86-2.05F(2)(a) General**

**86-2.05F(2)(a)(1) Not Used**

**86-2.05F(2)(a)(2) Fiberglass Conduit**

**86-2.05F(2)(a)(2)(i) General**

Use fiberglass conduit where conduit is shown installed on bridges.

Purchase all fiberglass conduit and other fiberglass conduit system components from the same manufacturer to ensure component to component compatibility.

**86-2.05F(2)(a)(2)(ii) Materials**

Conduit must be continuously marked with clear, distinctive and permanent markings at intervals not greater than 10 feet. The marking must be in a contrasting color to the conduit color. The height of the marking must be approximately 0.1 inch or larger. Conduit marking information must include, as a minimum, the following information:

1. Nominal Size
2. Schedule
3. Manufacturer Name and Product/Model Number
4. Material Code
5. Plant Identification
6. Production Date
7. Cell Classification

All fiberglass conduit components must be free of defects including delaminations, foreign inclusions, etc. All fiberglass conduit components must be nominally uniform in color, density, and physical properties. Fiberglass conduit must be straight and the ends must be cut square and true.

Fiberglass conduit must be manufactured in nominal 20-foot minimum lengths.

Fiberglass conduit components must include compatible fittings, adapters, expansion joints, and factory bends at nominal radii of 24-inches and 36-inches.

All materials must be manufactured for use at temperatures from -40 to 230°F. All fiberglass conduit components must be manufactured using a homogeneously dispersed UV inhibitor. When exposed to direct diurnal sunlight, the UV inhibitor must prevent the degradation of all physical material properties, except for surface cosmetic appearance. Materials must contain no halogens above trace levels and must be fire resistant.

Fiberglass conduit and components must comply with the specifications in ANSI/NEMA Standards Publication TC 14.

The minimum impact resistance must meet UL 1684A or NEMA TC2002 when tested in accordance with ASTM D2444

For stiffness, the deflection of the inside diameter must not exceed 5 percent when tested per ASTM D 2412.

**86-2.05F(2)(a)(2)(iii) Construction**

Joints must be watertight and withstand a minimum 1000 lbs of pullout tension.

Wrapping tape must be applied to pipe in contact with the earth or concrete and must be a pressure sensitive polyvinyl chloride or polyethylene tape with a minimum thickness of 0.05 inches.

**Replace the 3rd paragraph in section 86-2.06A(2) of the RSS for section 86-2.06 with:**

In a ground or sidewalk area, embed the bottom of a pull box in crushed rock.

**Replace "Reserved" in section 86-2.06B of the RSS for section 86-2.06 with:**

**86-2.06B(1) General**

**86-2.06B(1)(a) Summary**

Section 86-2.06B includes specifications for installing non-traffic-rated pull boxes.

**86-2.06B(1)(b) Submittals**

Before shipping pull boxes to the jobsite, submit a list of materials, Contract number, pull box manufacturer, manufacturer's instructions for pull box installation, and your contact information to METS.

Submit reports for pull box from an NRTL-accredited lab.

**86-2.06B(1)(c) Quality Control and Assurance**

**86-2.06B(1)(c)(i) General**

Pull boxes may be tested by the Department. Deliver pull boxes and covers to METS and allow 30 days for testing. When testing is complete, you will be notified. You must pick up the boxes and covers from the test site and deliver it to the job site.

Any failure of the pull box or the cover that renders the unit noncompliant with these specifications will be a cause for rejection. If the unit is rejected, you must allow 30 days for retesting. Retesting period starts when the replacement pull box is delivered to the test site. You must pay for all retesting costs. Delays resulting from the submittal of noncompliant materials does not relieve you from executing the Contract within the allotted time.

If the pull box submitted for testing does not comply with the specifications, remove the unit from the test site within 5 business days after notification that it is rejected. If the unit is not removed within that period, it may be shipped to you at your expense.

You must pay for all shipping, handling, and transportation costs related to the testing and retesting.

#### **86-2.06B(1)(c)(ii) Functional Testing**

The pull box and cover must be tested under ANSI/SCTE 77, "Specification for Underground Enclosure Integrity."

#### **86-2.06B(1)(c)(iii) Warranty**

Provide a 2-year manufacturer replacement warranty for pull box and cover from the date of installation of the pull box and cover. All warranty documentation must be submitted before installation.

Replacement parts must be provided within 5 business days after receipt of failed pull box, cover, or both at no cost to the Department and must be delivered to the Department's Maintenance Electrical Shop at District 11 Maintenance-Electrical, 7181 Opportunity Road, San Diego, CA 92111, telephone (858) 467-4010.

#### **86-2.06B(2) Materials**

The pull box and cover must comply with ANSI/SCTE 77, "Specification for Underground Enclosure Integrity," for tier 22 load rating and must be gray or brown.

Each pull box cover must have an electronic marker cast inside.

Extension for the pull box must be of the same material as the pull box and attached to the pull box to maintain the minimum combined depths as shown.

Include recesses for a hanger if a transformer or other device must be placed in a pull box.

The bolts, nuts, and washers must be a captive bolt design.

The captive bolt design must be capable of withstanding a torque range of 55 to 60 ft-lb and a minimum pull out strength of 750 lb. Perform the test with the cover in place and the bolts torqued. The pull box and cover must not be damaged while performing the test to the minimum pull out strength.

Stainless steel hardware must have an 18 percent chromium content and an 8 percent nickel content.

Galvanize ferrous metal parts under section 75-1-.05.

Manufacturer's instructions must provide guidance on:

1. Quantity and size of entries that can be made without degrading the strength of the pull box below tier 22 load rating
2. Where side entries cannot be made
3. Acceptable method to be used to create the entry

Tier 22 load rating must be labeled or stenciled by the manufacturer on the inside and outside of the pull box and on the underside of the cover.

#### **86-2.06B(3) Construction**

Do not install pull box in curb ramps or driveways.

A pull box for a post or a pole standard must be located within 5 feet of the standard. Place a pull box adjacent to the back of the curb or edge of the shoulder. If this is impractical, place the pull box in a suitable, protected, and accessible location.

**Add to section 86-2.08A:**

Secure conductors and cables to the projecting end of the conduit in pull boxes.

**Replace the table in the 2nd paragraph of section 86-2.08C with:**

**Insulation Thickness**

Insulation type	Conductor size	Insulation thickness (mils)
USE, RHH, or RHW	No. 14 to No. 10	45
	No. 8 to No. 2	60
THW or TW	No. 14 to No. 10	30
	No. 8	45
	No. 6 to No. 2	60

**Replace the 1st sentence of the 1st paragraph of section 86-2.08E with:**

Signal interconnect cable must be the 6-pair type with stranded tinned copper no. 20 conductors.

**Add to section 86-2.08:**

**86-2.08F CATEGORY 5E CABLE**

**86-2.08F(1) General**

**86-2.08F(1)(a) Summary**

Category 5E cable must be the unshielded, outdoor rated, non-gel filled type, and must meet the requirements of TIA/EIA 568, Category 5E Cable.

**86-2.08F(1)(b) Quality Control and Assurance**

Installed lengths of Category 5E cable must not exceed 328 feet of finished cable. All installations must be certified installations.

**86-2.08F(2) Materials**

Category 5E cable must meet the following:

1. The cable must contain 8 conductors, each of which must be No. 24, minimum, solid bare copper conductors. Each conductor must be insulated with polyolefin, polyethylene, polyvinyl chloride or fluorinated ethylene propylene material.
2. The cable jacket must be rated for a minimum of 300 V and 140°F and must be polyvinyl chloride, polyethylene, polyolefin or fluorinated ethylene propylene. The jacket must be black, gray, or blue. The jacket must be marked as required by NEMA. The jacket must be marked at intervals of not more than 3 feet with the cable identification: manufacturer's name, product identification, number of conductors and conductor size, and voltage and temperature ratings. Cable length markings may be sequentially alternated with the cable identification markings at not more than every other interval.
3. The finished outside diameter of the cable must not exceed 1/2-inch.

**86-2.08F(3) Construction**

The cable run between components must be continuous without splices. A minimum of 3 feet of slack must be provided at each pull box, junction box or vault, and a minimum of 9 feet at each cabinet.

The ends of category 5E cable terminating at controller and telephone demarcation cabinets must be terminated with Type 110 punch down blocks.

**86-2.08F(4) Payment**

Not Used

**Add to section 86-2.08:**

**86-2.08G AIR BLOWN METHOD**

**86-2.08G(1) General**

You may install cable into conduit, ducts or subducts using an "Air Blown Method".

**86-2.08G(1)(a) Summary**

This work includes installing cable into conduit, ducts or subducts with a method that uses a mechanical device combined with a high speed flow of compressed air.

**86-2.08G(1)(b) Definitions**

Not Used

**86-2.08G(1)(c) Submittals**

Submit information on the proposed "Air Blown Method" to the Engineer.

Information submittals must include the following:

1. Project description.
2. List or plan sheet marked to identify the conduits and cables involved
3. Equipment description and specifications.
4. Manufacturer's test data covering the performance of the equipment and cable stress in a typical installation using cable equivalent to cable to be installed on this project.
5. User/Installer Manual for the equipment and installation procedures.

Within 30 days after the approval of the contract, submit 2 copies of the proposed "Air Blown Method" to the Engineer.

Allow 7 days for the Engineer to review the proposed "Air Blown Method".

If the Engineer requires revisions, submit a revised "Air Blown Method" within 5 days of receipt of the Engineer's comments and allow 5 days for the Engineer to review. If agreed to by the Engineer, revisions may be included as attachments in the resubmittal. The Engineer may conditionally approve, in writing, resubmittals that include revisions submitted as attachments, in order to allow construction activities to proceed.

Upon the Engineer's approval of the resubmittal, submit 2 copies of the final document (with approved revisions incorporated) to the Engineer.

**86-2.08G(1)(d) Quality Control and Assurance**

**86-2.08G(1)(d)(1) General**

The submitted "Air Blown Method" must not be used until it has been approved in writing by the Engineer.

**86-2.08G(2) Materials**

**86-2.08G(2)(a) General**

**86-2.08G(2)(a)(1) Physical and Mechanical Requirements**

The cable installation equipment must also have, at minimum, the following features:

1. Controls to regulate the flow rate of compressed air entering the conduit, duct or subduct, and any hydraulic or pneumatic pressure applied to the cable.
2. Safety shutoff valves to disable the system in the event of sudden changes in pneumatic or hydraulic pressure.
3. Measuring device to determine the speed of the cable during installation and the length of the cable installed.

**86-2.08G(3) Construction**

Install cable without exceeding the cable manufacturers' tensile and compressive strength ratings.

Use the mechanical device to provide a pushing force on the cable into the conduit.

**86-2.08G(4) Payment**

Not Used

**Replace the 1st paragraph of section 86-2.09E with:**

Splices must be insulated by "Heat-shrink tubing."

**Delete the 8th paragraph of section 86-2.09E.**

**Replace 1st paragraph of section 86-2.18 with:**

Place numbers (with a reflective sheet background) on the equipment as ordered. A typical material reference at an existing location in the field can be confirmed by the Engineer, or the typical materials can be made available for viewing.

**Delete 2nd sentence of 3rd paragraph of section 86-2.18.**

**Add to the 4th paragraph of section 86-2.18:**

On electroliers, place the numbers on the side nearest the roadway facing approaching traffic at a height up to 8 feet above the base plate.

**Add to section 86-5.01A(1):**

Loop wire must be Type 2.

Loop detector lead-in cable must be Type B.

Slots must be filled with elastomeric sealant or hot-melt rubberized asphalt sealant.

For Type E detector loops, sides of the slot must be vertical and the minimum radius of the slot entering and leaving the circular part of the loop must be 1-1/2 inches. Slot width must be a maximum of 5/8 inch. Loop wire for circular loops must be Type 2. Slots of circular loops must be filled with elastomeric sealant or hot-melt rubberized asphalt sealant.

The depth of the loop sealant above the top of the uppermost loop wire in the sawed slots must be 2 inches, minimum.

Replace section 86-6.01 with:

**86-6.01 LED LUMINAIRES**

**86-6.01A General**

**86-6.01A(1) Summary**

Section 86-6.01 includes specifications for installing LED luminaires.

**86-6.01A(2) Definitions**

**CALiPER:** Commercially Available LED Product Evaluation and Reporting. A U.S. DOE program that individually tests and provides unbiased information on the performance of commercially available LED luminaires and lights.

**correlated color temperature:** Absolute temperature in kelvin of a blackbody whose chromaticity most nearly resembles that of the light source.

**house side lumens:** Lumens from a luminaire directed to light up areas between the fixture and the pole (e.g., sidewalks at intersection or areas off of the shoulders on freeways).

**International Electrotechnical Commission (IEC):** Organization that prepares and publishes international standards for all electrical, electronic and related technologies.

**junction temperature:** Temperature of the electronic junction of the LED device. The junction temperature is critical in determining photometric performance, estimating operational life, and preventing catastrophic failure of the LED.

**L70:** Extrapolated life in hours of the luminaire when the luminous output depreciates 30 percent from initial values.

**LM-79:** Test method from the Illumination Engineering Society of North America (IESNA) specifying test conditions, measurements, and report format for testing solid state lighting devices, including LED luminaires.

**LM-80:** Test method from the IESNA specifying test conditions, measurements, and report format for testing and estimating the long term performance of LEDs for general lighting purposes.

**National Voluntary Laboratory Accreditation Program (NVLAP):** U.S. DOE program that accredits independent testing laboratories to qualify.

**power factor:** Ratio of the real power component to the complex power component.

**street side lumens:** Lumens from a luminaire directed to light up areas between the fixture and the roadway (e.g., traveled ways, freeway lanes).

**surge protection device (SPD):** Subsystem or component that can protect the unit against short duration voltage and current surges.

**total harmonic distortion:** Ratio of the rms value of the sum of the squared individual harmonic amplitudes to the rms value of the fundamental frequency of a complex waveform.

**86-6.01A(3) Submittals**

Submit a sample luminaire to METS for testing after the manufacturer's testing is completed. Include the manufacturer's testing data.

Product submittals must include:

1. LED luminaire checklist.
2. Product specification sheets, including:
  - 2.1. Maximum power in watts.
  - 2.2. Maximum designed junction temperature.
  - 2.3. Heat sink area in square inches.
  - 2.4. Designed junction to ambient thermal resistance calculation with thermal resistance components clearly defined.
  - 2.5. L70 in hours when extrapolated for the average nighttime operating temperature.
3. IES LM-79 and IES LM-80 compliant test reports from a CALiPER-qualified or NVLAP-approved testing laboratory for the specific model submitted.
4. Photometric file based on LM-79 test report.
5. Initial and depreciated isofootcandle diagrams showing the specified minimum illuminance for the particular application. The diagrams must be calibrated to feet and show a 40 by 40 foot grid. The diagrams must be calibrated to the mounting height specified for that particular application. The depreciated isofootcandle diagrams must be calculated at the minimum operational life.
6. Test report showing SPD performance as tested under ANSI/IEEE C62.41.2 and ANSI/IEEE C62.45.
7. Test report showing mechanical vibration test results as tested under California Test 611 or equal.
8. Data sheets from the LED manufacturer that include information on life expectancy based on junction temperature.
9. Data sheets from the power supply manufacturer that include life expectancy information.

Submit documentation of a production QA performed by the luminaire manufacturer that ensures the minimum performance levels of the modules comply with the section 86-6.01 specifications and includes a documented process for resolving problems. Submit documentation as an informational submittal.

Submit warranty documentation as an informational submittal before installing LED luminaires.

#### **86-6.01A(4) Quality Control and Assurance**

##### **86-6.01A(4)(a) General**

The Department may perform random sample testing on the shipments. The Department completes testing within 30 days after delivery to METS. Luminaires are tested under California Test 678. All parameters specified in section 86-6.01 specifications may be tested on the shipment sample. When testing is complete, the Department notifies you. Pick up the equipment from the test site and deliver to the job site.

One sample luminaire must be fitted with a thermistor or thermo-couple temperature sensor. A temperature sensor must be mounted on the LED solder pad as close to the LED as possible. A temperature sensor must be mounted on the power supply case. Light bar or modular systems must have 1 sensor for each module mounted as close to the center of the module as possible. Other configurations must have at least 5 sensors per luminaire. Contact METS for advice on sensor location. Thermocouples must be either Type K or C. Thermistors must be a negative temperature coefficient type with a nominal resistance of 20 k $\Omega$ . The appropriate thermocouple wire must be used. The leads must be a minimum of 6 feet. Documentation must accompany the test unit that details the type of sensor used.

The sample luminaires must be energized for a minimum of 24 hours, at 100 percent on-time duty cycle, at a temperature of +70 degrees F before performing any testing.

The luminaire lighting performance must be depreciated for the minimum operating life by using the LED manufacturer's data or the data from the LM-80 test report, whichever results in a higher lumen depreciation.

Failure of the luminaire that renders the unit noncompliant with section 86-6.01 specifications is cause for rejection. If a unit is rejected, allow 30 days for retesting. The retesting period starts when the replacement luminaire is delivered to the test site.

If a luminaire submitted for testing does not comply with section 86-6.01, remove the unit from METS within 5 business days after notification the unit is rejected. If the unit is not removed within that period, the Department may ship the unit to you and deduct the cost.

**86-6.01A(4)(b) Warranty**

Furnish a 7-year replacement warranty from the manufacturer of the luminaires against any defects or failures. The effective date of the warranty is the date of installation. Furnish replacement luminaires within 10 days after receipt of the failed luminaire. The Department does not pay for the replacement. Deliver replacement luminaires to the following department electrical shop:

Caltrans District 11 Signal Laboratory  
7181 Opportunity Road  
San Diego, CA 92111  
telephone (858) 467-4010

**86-6.01B Materials**

**86-6.01B(1) General**

The luminaire must include an assembly that uses LEDs as the light source. The assembly must include a housing, an LED array, and an electronic driver. The luminaire must:

1. Be UL listed under UL 1598 for luminaires in wet locations or an equivalent standard from a recognized testing laboratory
2. Have a minimum operational life of 63,000 hours
3. Operate at an average operating time of 11.5 hours per night
4. Be designed to operate at an average nighttime operating temperature of 70 degrees F
5. Have an operating temperature range from -40 to +130 degrees F
6. Be defined by the following application:

Application	Replaces
Roadway 1	200 Watt HPS mounted at 34 ft
Roadway 2	310 Watt HPS mounted at 40 ft
Roadway 3	310 Watt HPS mounted at 40 ft with back side control
Roadway 4	400 Watt HPS mounted at 40 ft

The individual LEDs must be connected such that a catastrophic loss or a failure of 1 LED does not result in the loss of more than 20 percent of the luminous output of the luminaire.

**86-6.01B(2) Luminaire Identification**

Each luminaire must have the following identification permanently marked inside the unit and outside of its packaging box:

1. Manufacturer's name
2. Trademark
3. Model no.
4. Serial no.
5. Date of manufacture (month-year)
6. Lot number
7. Contract number
8. Rated voltage
9. Rated wattage
10. Rated power in VA

**86-6.01B(3) Electrical Requirements**

The luminaire must operate from a  $60 \pm 3$  Hz AC power source. The fluctuations of line voltage must have no visible effect on the luminous output. The operating voltage may range from 120 to 480 V(ac). The luminaire must operate over the entire voltage range or the voltage range must be selected from either of the following options:

1. Luminaire must operate over a voltage range of 95 to 277 V(ac). The operating voltages for this option are 120 V(ac) and 240 V(ac).
2. Luminaire must operate over a voltage range of 347 to 480 V(ac). The operating voltage for this option is 480 V(ac).

The power factor of the luminaire must be 0.90 or greater. The total harmonic distortion, current and voltage, induced into an AC power line by a luminaire must not exceed 20 percent. The maximum power consumption allowed for the luminaire must be as shown in the following table:

Application	Maximum consumption (Watts)
Roadway 1	165
Roadway 2	235
Roadway 3	235
Roadway 4	300

**86-6.01B(4) Surge Suppression and Electromagnetic Interference**

The luminaire on-board circuitry must include an SPD to withstand high repetition noise transients caused by utility line switching, nearby lightning strikes, and other interferences. The SPD must protect the luminaire from damage and failure due to transient voltages and currents as defined in Tables 1 and 4 of ANSI/IEEE C64.41.2 for location category C-High. The SPD must comply with UL 1449. The SPD performance must be tested under ANSI/IEEE C62.45 based on ANSI/IEEE C62.41.2 definitions for standard and optional waveforms for location category C-High.

The luminaires and associated on-board circuitry must comply with the Class A emission limits provided in 47 CFR 15, subpart B concerning the emission of electronic noise.

**86-6.01B(5) Compatibility**

The luminaire must be operationally compatible with currently used lighting control systems and photoelectric controls.

**86-6.01B(6) Photometric Requirements**

The luminaire must maintain a minimum illuminance level throughout the minimum operating life. The L70 of the luminaire must be the minimum operating life or greater. The measurements must be calibrated to standard photopic calibrations. The minimum maintained illuminance values measured at a point must be as shown in the following table:

Application	Mounting height (ft)	Minimum maintained illuminance (fc)	Light pattern figure (isofootcandle curve)
Roadway 1	34	0.15	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(82)^2} + \frac{(y - 20)^2}{(52)^2} = 1$ <p>where:  x = direction longitudinal to the roadway  y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 20 feet to the house side of the pattern.</p>
Roadway 2	40	0.2	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(82)^2} + \frac{(y - 20)^2}{(52)^2} = 1$ <p>where:  x = direction longitudinal to the roadway  y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 20 feet to the house side of the pattern.</p>
Roadway 3	40	0.2	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(92)^2} + \frac{(y - 23)^2}{(55)^2} = 1$ <p>for <math>y \geq 0</math> (street side)</p> <p>where:  x = direction longitudinal to the roadway  y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 23 feet to the house side of the pattern.</p>
Roadway 4	40	0.2	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(92)^2} + \frac{(y - 23)^2}{(55)^2} = 1$ <p>where:  x = direction longitudinal to the roadway  y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 23 feet to the house side of the pattern.</p>

The luminaire must have a correlated color temperature range from 3,500 to 6,500 K. The color rendering index must be 65 or greater.

The luminaire must not allow more than:

1. 10 percent of the rated lumens to project above 80 degrees from vertical
2. 2.5 percent of the rated lumens to project above 90 degrees from vertical

#### **86-6.01B(7) Thermal Management**

The passive thermal management of the heat generated by the LEDs must have enough capacity to ensure proper operation of the luminaire over the minimum operation life. The LED maximum junction temperature for the minimum operation life must not exceed 221 degrees F.

The junction-to-ambient thermal resistance must be 95 degrees F per watt or less. The use of fans or other mechanical devices is not allowed. The heat sink material must be aluminum or other material of equal or lower thermal resistance.

The luminaire must contain circuitry that automatically reduces the power to the LEDs to a level that ensures the maximum junction temperature is not exceeded when the ambient outside air temperature is 100 degrees F or greater.

#### **86-6.01B(8) Physical and Mechanical Requirements**

The luminaire must be a single, self-contained device, not requiring job site assembly for installation. The power supply for the luminaire is integral to the unit. The weight of the luminaire must not exceed 35 lb. The maximum effective projected area when viewed from either side or either end must be 1.4 sq ft. The housing color must match a color no. from 26152 to 26440 or from 36231 to 36375, or color no. 36440 of FED-STD-595.

The housing must be fabricated from materials designed to withstand a 3,000-hour salt spray test under ASTM B 117. All aluminum used in housings and brackets must be of a marine grade alloy with less than 0.2 percent copper. All exposed aluminum must be anodized.

Each refractor or lens must be made from UV-inhibited high impact plastic such as acrylic or polycarbonate or heat- and impact-resistant glass and be resistant to scratching. Polymeric materials except lenses of enclosures containing either the power supply or electronic components of the luminaire must be made of UL94VO flame retardant materials. Paint or powder coating of the housing must comply with section 86-2.16. A chromate conversion undercoating must be used underneath a thermoplastic polyester powder coat.

Each housing must be provided with a slip fitter capable of mounting on a 2-inch pipe tenon. This slip fitter must fit on mast arms with outside diameters from 1-5/8 to 2-3/8 inches. The slip fitter must be capable of being adjusted a minimum of  $\pm 5$  degrees from the axis of the tenon in a minimum of five steps: +5, +2.5, 0, -2.5, -5. The clamping brackets of the slip fitter must not bottom out on the housing bosses when adjusted within the designed angular range. No part of the slip fitter mounting brackets on the luminaires must develop a permanent set in excess of 1/32 inch when the two or four 3/8-inch diameter cap screws used for mounting are tightened to 10 ft-lb. Two sets of cap screws may be furnished to allow the slip fitter to be mounted on the pipe tenon in the acceptable range without the cap screws bottoming out in the threaded holes. The cap screws and the clamping brackets must be made of corrosion resistant materials or treated to prevent galvanic reactions and be compatible with the luminaire housing and the mast arm.

The assembly and manufacturing process for the LED luminaire must be designed to ensure internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources. When tested under California Test 611, the luminaire to be mounted horizontally on the mast arm must be capable of withstanding the following cyclic loading for a minimum of 2 million cycles without failure of any luminaire part:

**Cyclic Loading**

Plane	Power supply	Minimum peak acceleration level
Vertical	Installed	3.0 g peak-to-peak sinusoidal loading (same as 1.5 g peak)
Horizontal <sup>a</sup>	Installed	1.5 g peak-to-peak sinusoidal loading (same as 0.75 g peak)

<sup>a</sup>Perpendicular to the direction of the mast arm

The housing must be designed to prevent the buildup of water on top of the housing. Exposed heat sink fins must be oriented to allow water to freely run off of the luminaire and carry dust and other accumulated debris away from the unit. The optical assembly of the luminaire must be protected against dust and moisture intrusion to at least an ANSI/IEC rating of IP66. The power supply enclosure must be protected to at least an ANSI/IEC rating of IP43.

Each mounted luminaire must be furnished with an ANSI C136.10-compliant, locking type photocontrol receptacle and a rain tight shorting cap. The receptacle must comply with section 86-6.11A.

When the components are mounted on a down-opening door, the door must be hinged and secured to the luminaire housing separately from the refractor or flat lens frame. The door must be secured to the housing such that accidental opening is prevented. A safety cable must mechanically connect the door to the housing.

Field wires connected to the luminaire must terminate on a barrier type terminal block secured to the housing. The terminal screws must be captive and equipped with wire grips for conductors up to no. 6. Each terminal position must be clearly identified.

The power supply must be rated for outdoor operation and have at least an ANSI/IEC rating of IP65.

The power supply must be rated for a minimum operational life equal to the minimum operational life of the luminaire or greater.

The power supply case temperature must have a self rise of 77 degrees F or less above ambient temperature in free air with no additional heat sinks.

The power supply must have 2 leads to accept standard 0-10 V(dc). The dimming control must be compatible with IEC 60929. If the control leads are open or the analog control signal is lost, the circuit must default to 100-percent power.

Conductors and terminals must be identified.

**BID ITEM LIST**

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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	090105	TIME-RELATED OVERHEAD (LS)	WDAY	310		
4	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	LUMP SUM	
5	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	LUMP SUM	
6	120159	TEMPORARY TRAFFIC STRIPE (PAINT)	LF	79,700		
7	120199	TRAFFIC PLASTIC DRUM	EA	50		
8	120300	TEMPORARY PAVEMENT MARKER	EA	5,290		
9	128651	PORTABLE CHANGEABLE MESSAGE SIGN (EA)	EA	10		
10	129000	TEMPORARY RAILING (TYPE K)	LF	13,400		
11	129100	TEMPORARY CRASH CUSHION MODULE	EA	120		
12	130100	JOB SITE MANAGEMENT	LS	LUMP SUM	LUMP SUM	
13	130300	PREPARE STORM WATER POLLUTION PREVENTIONPLAN	LS	LUMP SUM	LUMP SUM	
14	130330	STORM WATER ANNUAL REPORT	EA	2	2,000.00	4,000.00
15	130610	TEMPORARY CHECK DAM	LF	660		
16	130620	TEMPORARY DRAINAGE INLET PROTECTION	EA	13		
17	130640	TEMPORARY FIBER ROLL	LF	3,370		
18	130730	STREET SWEEPING	LS	LUMP SUM	LUMP SUM	
19	130900	TEMPORARY CONCRETE WASHOUT	LS	LUMP SUM	LUMP SUM	
20	141000	TEMPORARY FENCE (TYPE ESA)	LF	1,540		

**BID ITEM LIST**  
**11-002704**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
21	141120	TREATED WOOD WASTE	LB	4,630		
22	150100	PUBLIC SAFETY PLAN	LS	LUMP SUM	LUMP SUM	
23	150662	REMOVE METAL BEAM GUARD RAILING	LF	300		
24	150685	REMOVE IRRIGATION FACILITY	LS	LUMP SUM	LUMP SUM	
25	150711	REMOVE PAINTED TRAFFIC STRIPE	LF	45,300		
26	150714	REMOVE THERMOPLASTIC TRAFFIC STRIPE	LF	5,720		
27	150715	REMOVE THERMOPLASTIC PAVEMENT MARKING	SQFT	130		
28	150742	REMOVE ROADSIDE SIGN	EA	6		
29	150757	REMOVE SIGN STRUCTURE (EA)	EA	2		
30	150809	REMOVE CULVERT (LF)	LF	370		
31	150820	REMOVE INLET	EA	2		
32	150870	REMOVE CONCRETE DECK SURFACE	SQFT	3,168		
33	151270	SALVAGE METAL BRIDGE RAILING	LF	2,725		
34	152299	RESET MILEPOST MARKER	EA	1		
35	152320	RESET ROADSIDE SIGN	EA	2		
36	152390	RELOCATE ROADSIDE SIGN	EA	1		
37	153103	COLD PLANE ASPHALT CONCRETE PAVEMENT	SQYD	810		
38	153130	REMOVE CONCRETE CURB (LF)	LF	550		
39	153221	REMOVE CONCRETE BARRIER	LF	640		
40	153225	PREPARE CONCRETE BRIDGE DECK SURFACE	SQFT	3,168		

**BID ITEM LIST**

**11-002704**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
41	153227	FURNISH POLYESTER CONCRETE OVERLAY	CF	132		
42 (F)	153228	PLACE POLYESTER CONCRETE OVERLAY	SQFT	3,168		
43	BLANK					
44	156585	REMOVE CRASH CUSHION	EA	1		
45	157560	BRIDGE REMOVAL (PORTION)	LS	LUMP SUM	LUMP SUM	
46	160102	CLEARING AND GRUBBING (LS)	LS	LUMP SUM	LUMP SUM	
47	190101	ROADWAY EXCAVATION	CY	12,700		
48	190108	ROADWAY EXCAVATION (TYPE Y-2) (AERIALY DEPOSITED LEAD)	CY	3,350		
49 (F)	192037	STRUCTURE EXCAVATION (RETAINING WALL)	CY	469		
50 (F)	192058	STRUCTURE EXCAVATION (TYPE Y-2) (AERIALY DEPOSITED LEAD)	CY	126		
51 (F)	193013	STRUCTURE BACKFILL (RETAINING WALL)	CY	176		
52 (F)	193031	PERVIOUS BACKFILL MATERIAL (RETAINING WALL)	CY	10		
53	BLANK					
54	202004	IRON SULFATE (LB)	LB	12		
55	202011	MULCH	CY	450		
56	202035	FERTILIZER (PACKET)	EA	1,580		
57	204035	PLANT (GROUP A)	EA	1,580		
58	026527	NATIVE SOD	SQFT	20,900		
59	204099	PLANT ESTABLISHMENT WORK	LS	LUMP SUM	LUMP SUM	
60	206400	CHECK AND TEST EXISTING IRRIGATION FACILITIES	LS	LUMP SUM	LUMP SUM	

**BID ITEM LIST**

**11-002704**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
61	206560	CONTROL AND NEUTRAL CONDUCTORS	LS	LUMP SUM	LUMP SUM	
62	206604	1 1/2" ELECTRIC REMOTE CONTROL VALVE	EA	12		
63	BLANK					
64	026528	16-STATION IRRIGATION CONTROLLER (SOLAR)	EA	1		
65	BLANK					
66	026529	IRRIGATION CONTROLLER ENCLOSURE	EA	1		
67	BLANK					
68	208459	SPRINKLER (TYPE A-11)	EA	52		
69	208465	SPRINKLER (TYPE A-5)	EA	41		
70	208466	SPRINKLER (TYPE A-6)	EA	11		
71	BLANK					
72	208480	SPRINKLER (TYPE C-2 MOD)	EA	47		
73	208565	REPLACE VALVE BOX COVER	EA	2		
74	BLANK					
75	208575	2" GATE VALVE	EA	4		
76	208588	3" GATE VALVE	EA	3		
77 (F)	208595	1" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	2,220		
78 (F)	208596	1 1/4" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	1,350		
79 (F)	208597	1 1/2" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	1,225		
80 (F)	208598	2" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	762		

**BID ITEM LIST**  
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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
81	BLANK					
82	BLANK					
83	BLANK					
84	208906	EXTEND 8" CONDUIT	LF	56		
85	210600	COMPOST	SQFT	20,900		
86	210630	INCORPORATE MATERIALS	SQFT	20,900		
87	260203	CLASS 2 AGGREGATE BASE (CY)	CY	4,100		
88	374002	ASPHALTIC EMULSION (FOG SEAL COAT)	TON	0.6		
89	390132	HOT MIX ASPHALT (TYPE A)	TON	3,560		
90	390136	MINOR HOT MIX ASPHALT	TON	47		
91	394074	PLACE HOT MIX ASPHALT DIKE (TYPE C)	LF	170		
92	394076	PLACE HOT MIX ASPHALT DIKE (TYPE E)	LF	1,540		
93	394077	PLACE HOT MIX ASPHALT DIKE (TYPE F)	LF	140		
94	394090	PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)	SQYD	20		
95	401050	JOINTED PLAIN CONCRETE PAVEMENT	CY	3,110		
96	404093	SEAL ISOLATION JOINT	LF	7,740		
97	498052	60" CAST-IN-DRILLED-HOLE CONCRETE PILE (SIGN FOUNDATION)	LF	50		
98 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	CY	210		
99 (F)	510060	STRUCTURAL CONCRETE, RETAINING WALL	CY	172		
100 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	CY	80		

**BID ITEM LIST**  
**11-002704**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
101 (F)	044479	RANDOM FLUTE TEXTURE	SQFT	367		
102	BLANK					
103	BLANK					
104	511106	DRILL AND BOND DOWEL	LF	1,256		
105 (F)	520102	BAR REINFORCING STEEL (BRIDGE)	LB	57,879		
106 (F)	520103	BAR REINFORCING STEEL (RETAINING WALL)	LB	17,354		
107 (F)	530200	STRUCTURAL SHOTCRETE	CY	9		
108 (F)	560218	FURNISH SIGN STRUCTURE (TRUSS)	LB	42,075		
109 (F)	560219	INSTALL SIGN STRUCTURE (TRUSS)	LB	42,075		
110	560244	FURNISH LAMINATED PANEL SIGN (1"-TYPE A)	SQFT	530		
111	560249	FURNISH SINGLE SHEET ALUMINUM SIGN (0.080"-UNFRAMED)	SQFT	130		
112	560251	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-FRAMED)	SQFT	22		
113	560252	FURNISH SINGLE SHEET ALUMINUM SIGN (0.080"-FRAMED)	SQFT	25		
114	566011	ROADSIDE SIGN - ONE POST	EA	5		
115	566012	ROADSIDE SIGN - TWO POST	EA	1		
116	026533	ROADSIDE SIGN-ONE POST (WEED CONTROL MAT RUBBER)	EA	2		
117	568001	INSTALL SIGN (STRAP AND SADDLE BRACKET METHOD)	EA	2		
118	568017	INSTALL ROADSIDE SIGN PANEL ON EXISTING POST	EA	1		
119	BLANK					
120	620140	24" ALTERNATIVE PIPE CULVERT	LF	180		

**BID ITEM LIST**  
**11-002704**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
121	026534	4" PLASTIC PIPE	LF	26		
122	650018	24" REINFORCED CONCRETE PIPE	LF	870		
123	698140	24" ALTERNATIVE PIPE DOWNDRAIN	LF	110		
124	705315	24" ALTERNATIVE FLARED END SECTION	EA	5		
125 (F)	721015	ROCK SLOPE PROTECTION (LIGHT, METHOD B) (CY)	CY	36		
126	721400	CONCRETE (SLOPE PROTECTION)	CY	0.4		
127	729011	ROCK SLOPE PROTECTION FABRIC (CLASS 8)	SQYD	96		
128	730045	MINOR CONCRETE (GUTTER) (CY)	CY	3		
129	026535	MINOR CONCRETE(EXPOSED AGGREGATE)	CY	50		
130 (F)	750001	MISCELLANEOUS IRON AND STEEL	LB	4,935		
131 (F)	750501	MISCELLANEOUS METAL (BRIDGE)	LB	1,380		
132 (F)	750505	BRIDGE DECK DRAINAGE SYSTEM	LB	42,343		
133	820118	GUARD RAILING DELINEATOR	EA	9		
134	832001	METAL BEAM GUARD RAILING	LF	200		
135 (F)	839521	CABLE RAILING	LF	82		
136	839581	END ANCHOR ASSEMBLY (TYPE SFT)	EA	3		
137	839585	ALTERNATIVE FLARED TERMINAL SYSTEM	EA	3		
138	026536	ALTERNATIVE CRASH CUSHION	EA	2		
139	839701	CONCRETE BARRIER (TYPE 60)	LF	70		
140	839704	CONCRETE BARRIER (TYPE 60D)	LF	80		

**BID ITEM LIST**  
**11-002704**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
141	839710	CONCRETE BARRIER (TYPE 60S)	LF	340		
142	BLANK					
143	BLANK					
144 (F)	839720	CONCRETE BARRIER (TYPE 732)	LF	1,639		
145 (F)	839721	CONCRETE BARRIER (TYPE 732A)	LF	30		
146 (F)	026539	CONCRETE BARRIER (TYPE 732B MOD)	LF	527		
147 (F)	044480	CONCRETE BARRIER (TYPE 742R)	LF	1,056		
148	840516	THERMOPLASTIC PAVEMENT MARKING (ENHANCED WET NIGHT VISIBILITY)	SQFT	200		
149	840655	PAINT TRAFFIC STRIPE (1-COAT)	LF	14,600		
150	846001	4" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NIGHT VISIBILITY)	LF	18,500		
151	846004	4" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NIGHT VISIBILITY) (BROKEN 17-7)	LF	650		
152	846005	4" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NIGHT VISIBILITY) (BROKEN 36-12)	LF	30,200		
153	846009	8" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NIGHT VISIBILITY)	LF	3,750		
154	846010	8" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NIGHT VISIBILITY) (BROKEN 12-3)	LF	1,640		
155	850101	PAVEMENT MARKER (NON-REFLECTIVE)	EA	2,570		
156	850111	PAVEMENT MARKER (RETROREFLECTIVE)	EA	1,190		
157	860090	MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION	LS	LUMP SUM	LUMP SUM	
158	860460	LIGHTING AND SIGN ILLUMINATION	LS	LUMP SUM	LUMP SUM	
159	860758	LIGHTING CONDUIT (BRIDGE) (LF)	LF	3,420		
160	026540	REMOVE TRAFFIC MONITORING STATION	LS	LUMP SUM	LUMP SUM	

**BID ITEM LIST****11-002704**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
161	860889	MODIFY TRAFFIC MONITORING STATION	LS	LUMP SUM	LUMP SUM	
162	BLANK					
163	861088	MODIFY RAMP METERING SYSTEM	LS	LUMP SUM	LUMP SUM	
164	BLANK					
165	150202	CORE AND PRESSURE GROUT DOWEL	LF	246		
166	BLANK					
167	150200	CLOSE ACCESS, DECK	EA	5		
168	153530	ACCESS OPENING, DECK	EA	5		
169	200002	ROADSIDE CLEARING	LS	LUMP SUM	LUMP SUM	
170 (F)	208605	2" PLASTIC PIPE (CLASS 315) (SUPPLY LINE)	LF	40		
171 (F)	208607	3" PLASTIC PIPE (CLASS 315) (SUPPLY LINE)	LF	2,300		
172	026896	INSTALL SIGN PANEL ON EXISTING STRUCTURE	SQSF	170		
173	703233	GRATED LINE DRAIN	LF	580		
174	999990	MOBILIZATION	LS	LUMP SUM	LUMP SUM	

**TOTAL BID:****\$**  
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