



**SUPPLEMENTAL**  
**Project Scope Summary Report**  
**(Capital Preventive Maintenance Program)**  
**to**  
**Request Programming in the 2012 SHOPP**

01-MEN-101 PM 78.4/81.4  
201.121  
01-41540K  
September 2011



**In Mendocino County on Route 101 from 5.3 miles  
north of Brancsomb Road to Rattlesnake Creek  
Bridge (#10-0027).**

*I have reviewed the right of way information contained in this Project Scope Summary Report and the R/W Data Sheet attached hereto, and find the data to be complete, current and accurate:*

*Karen Hawkins*  
for Karen Hawkins  
North Region Division Chief – Right of Way

**APPROVAL RECOMMENDED:**

*Steven D. Blair*  
Steven D. Blair  
Project Manager

*Royal McCarthy*  
Royal McCarthy  
Program Advisor

**APPROVED:**

*Charles C. Fielder*  
Charles C. Fielder  
CHARLES C. FIELDER  
District Director

9/30/2011  
Date

This Project Scope Summary Report has been prepared under the direction of the following Registered Engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

  
\_\_\_\_\_  
JEFFREY L. PIMENTEL, P.E.  
REGISTERED CIVIL ENGINEER

9/27/11  
\_\_\_\_\_  
Date



## 1. INTRODUCTION AND BACKGROUND

### Background:

This Supplemental Project Scope Summary Report (PSSR) serves to update the previously approved PSSR dated April 20, 2009. The Department made a decision to supplement the existing PSSR by adding a CAPM alternative to the project due to the lack of funding for Rehabilitation Projects. A Scope Change Decision Document is included as Attachment A, which outlines the Department's decision to change the scope of the original PSSR and move forward with Alternative 3 as a CAPM. The original items of work not included in Alternative 3 will be initiated as new projects by their respective program managers. The scope of work for Alternative 3 includes placing an asphalt concrete overlay, shoulder backing, installation of shoulder rumble strips, reconstructing metal beam guard rail and replacing pavement delineation.

This project will be funded from the 201.121 program (CAPM Program) and amended into the 2012 SHOPP cycle. The total cost including right of way is \$10,890,000 (2011). A cost estimate is included as Attachment C.

<b>Project Limits</b> [Dist., Co., Rte., PM]	01-MEN-101, PM 74.8/81.4
<b>Capital Costs:</b>	\$10,890,000 (2011)
<b>Right of way Costs:</b>	\$10,000 (2011)
<b>Funding Source:</b>	SHOPP
<b>Number of Alternatives:</b>	3 (including the no build alternative)
<b>Recommended Alternative</b> <b>(for programming and</b> <b>scheduling):</b>	3
<b>Type of Facility</b> <b>(conventional, expressway,</b> <b>freeway):</b>	Conventional Highway/Freeway
<b>Number of Structures:</b>	N/A
<b>Anticipated</b> <b>Environmental</b> <b>Determination/Document:</b>	CE – CEQA CE - NEPA
<b>Legal Description</b>	In Mendocino County on Route 101 from 5.3 miles north of Branscomb Road to Rattlesnake Creek Bridge (#10-0027)

## 2. RECOMMENDATION

It is recommended that the cost associated with Alternative 3 (\$10,890,000 – 2011) be amended into the 2012 SHOPP and proceed with the preparation of the environmental document.

## 3. MATERIALS

A materials recommendation was completed by District 1 Materials and is included as Attachment D. For the purposes of the cost estimate associated with this supplemental PSSR, the 10 Year Design Life of the materials recommendation was selected.

## 4. ALTERNATIVES

### 4A. ALTERNATIVE 1 & 2

Alternatives 1 & 2 are described in the original PSSR dated April 20, 2009.

### 4B. ALTERNATIVE 3

The overlay alternative includes a thorough investigation be made to locate areas of severe pavement failure identified by rutting greater than ½” and/or loose spalling pavement. Dig out and repair the localized failed areas to a depth of 0.33’ (mill & fill with HMA-A) and seal all cracks wider than ¼” by route and seal method. Then place 0.10’ hot mix asphalt (HMA-A), followed by 0.20’ rubberized hot mix asphalt (RHMA-G) and 0.15’ rubberized hot mix asphalt bonded wearing course, open graded.

The scope of work for Alternative 3 includes placing an asphalt concrete overlay, shoulder backing, installation of centerline rumble strips, resetting metal beam guard rail and installing pavement delineation.

### 4C. DESIGN EXCEPTIONS:

Per DIB 81, no design exception fact sheets are needed to document existing non standard features. CAPM projects that are consistent with the scope of intent of the 201.121 program, as presented in the DIB, do not require design exception fact sheets for deviations from mandatory and advisory design standards. CAPM projects are not intended to change existing geometric features.

The subject project will maintain the existing geometric features. No changes are proposed to the cross section.

**4D. ROADSIDE DESIGN AND MANAGEMENT:**

A project under EA 01-46430 is scoped to reconstruct metal beam guard rail within the project limits. Due to the proposed overlay and new metal beam guard rail height standards, the CAPM project will include resetting of metal beam guard rail placed under 01-46430 to meet the current design height standards.

**4E. RIGHT OF WAY ISSUES:**

No work will take place outside of the Right of Way, therefore, a Right of Way Data Sheet was not included in this supplemental PSSR.

**4F. ADA (American with Disabilities Act) Compliance**

No ramp locations were identified within the project limits.

**5. FUNDING/SCHEDULING****5A. FUNDING**

This project will be amended into the 2012 SHOPP.

**5B. PROJECT SUPPORT:**

A Programming Sheet has been prepared for the project and is included as Attachment E.

**5C. PROJECT SCHEDULE:**

<b>Milestones</b>	<b>Delivery Date (Month, Day, Year)</b>
PA & ED	10/1/13
Project PS&E	11/1/14
Right of Way Certification	2/15/15
Ready to List	3/1/15
Approve Contract	10/1/15
Contract Acceptance	10/1/16
End Project	1/1/18

## 6. ATTACHMENTS

- A. Scope Change Decision Document
- B. Typical Section
- C. PSSR Supplemental Cost Estimate
- D. Preliminary Materials Recommendation
- E. Programming Sheet

# **ATTACHMENT A**

## **SCOPE CHANGE DECISION DOCUMENT**

Date: September 26, 2011

File: 01-36291 MEN 101 PM 9.2/R21.1  
01-41540 MEN 101 PM 74.8/81.4  
01-45930 MEN 101 PM 64.7/69.3

## DISTRICT DECISION DOCUMENT

**PROJECT SCOPE CHANGE:** Roadway Rehab. (201.120) to Pavement Preservation (201.121)

The following three projects originally initiated and developed as Resurfacing, Restoration and Rehabilitation (3R) or Resurfacing and Restoration (2R) program projects are being re-scoped to preservation (CAPM) projects:

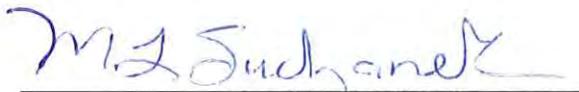
01-36291 Ukiah Men 101 Rehab: 01-MEN-101 PM 9.2/R21.1 - (3R).

01-41540 Laytonville North Rehab: 01-MEN-101 PM 74.8/81.4 - (3R).

01-45930 Laytonville Pavement Rehab: 01-MEN-101 PM 64.7/69.3 – (2R).

This documents the District decision to change the project scope from either a 2R or 3R strategy to a CAPM strategy. While some components of the original scope cannot be accomplished as part of the CAPM strategy, the opportunity to expedite a project to preserve the deteriorating pavement is considered by the District to be in the best interest of the State. These CAPM strategy projects can be delivered within the 2012 SHOPP cycle and thus will be able to utilize available SHOPP funding capacity. The remaining unmet needs, identified in the Rehabilitation strategy - primarily drainage improvements - will be included in our 10 Year SHOPP needs to be accomplished by future funding opportunities.

Approval Recommended:



Mark L. Suchanek  
Deputy District Director  
Maintenance & Operations

Approved:



Charles C. Fielder  
District Director

Date:

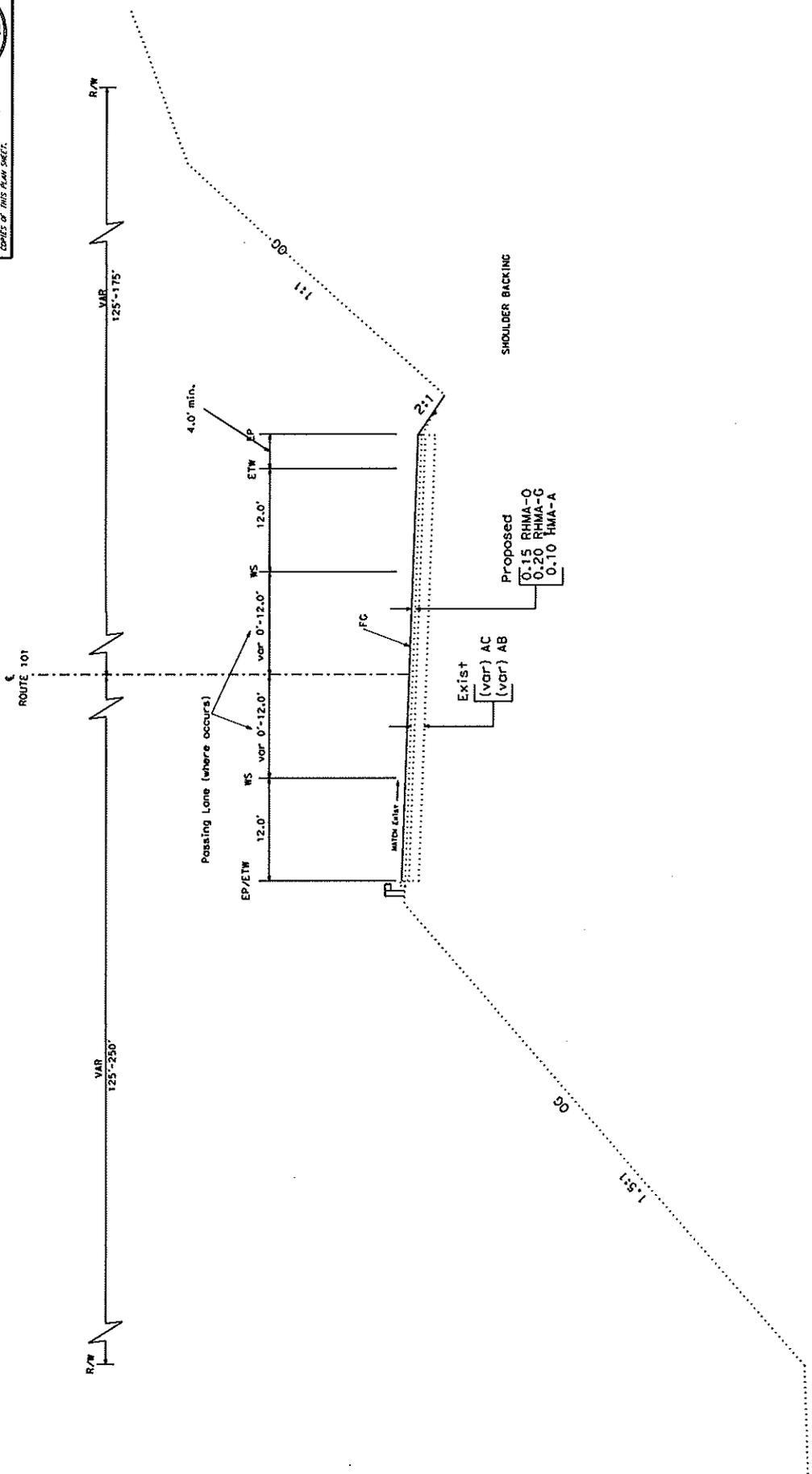
9/27/2011

**ATTACHMENT B**

**TYPICAL SECTIONS**

SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_ SHEETS  
 PROJECT NO. \_\_\_\_\_  
 COUNTY \_\_\_\_\_ ROUTE \_\_\_\_\_  
 REGISTERED CIVIL ENGINEER DATE \_\_\_\_\_  
 PLEASE APPROVAL DATE \_\_\_\_\_  
 I, \_\_\_\_\_ CIVIL ENGINEER  
 DO HEREBY CERTIFY THAT THE DESIGN AND CONSTRUCTION OF THIS PROJECT IS IN ACCORDANCE WITH THE CALIFORNIA ENGINEERING PROFESSIONAL ACT AND THE RULES AND REGULATIONS OF THE BOARD OF PROFESSIONAL ENGINEERS AND SURVEYORS.  
 I HAVE REVIEWED THE PLANS AND SPECIFICATIONS AND AM Satisfied THAT THEY COMPLY WITH THE LAW AND THE PUBLIC INTEREST.

# ATTACHMENT B



# Typical Cross Section

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CALCULATED BY	DESIGNED BY	REVISOR	DATE REVISOR
		CHECKED BY			

BORDER LAST REVISED 4/11/2008

RELATIVE HORIZONTAL SCALE  
1" = 15' HORIZONTAL



ESTIMATE # 14020  
JOB FILE # 14020

CU 00000

EA 000000

DATE PLOTTED 4/11/2008  
DATE PRINTED 4/11/2008

**ATTACHMENT C**

**PSSR SUPPLEMENTAL  
COST ESTIMATE**

Program Code:

## CAPM Cost Estimate

PROJECT DESCRIPTION:

Limits: Men-101-74.8/81.4 PM

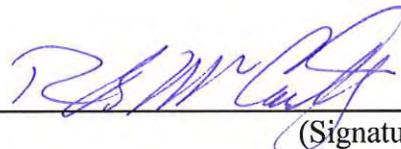
Proposed Improvement (Scope):

This project proposes to rehabilitate 6.6 miles of asphalt surfacing of Route 101 from 5.3 miles north of Branscomb Road to Rattlesnake Creek Bridge #10-27 in Mendocino County.

### SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	<u>\$10,880,000</u>
TOTAL STRUCTURE ITEMS	<u>\$0</u>
SUBTOTAL CONSTRUCTION COSTS	<u>\$10,880,000</u>
TOTAL RIGHT OF WAY ITEMS	<u>\$10,000</u>
TOTAL PROJECT CAPITAL OUTLAY COSTS	<u>\$10,890,000</u>

Reviewed By District Program Manager:

  
\_\_\_\_\_  
(Signature) 27 SEP 2011

Approved By Project Manager:

  
\_\_\_\_\_  
(Signature)

Date:

9-30-11

Phone No.

241-5899

20-Yr RAC

**I. ROADWAY ITEMS**

<u>Section 1 Earthwork</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Item Cost</u>	<u>Section Cost</u>
Subtotal Earthwork:					<u>\$0</u>

Section 2 Pavement Structural Section

	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Item Cost</u>	<u>Section Cost</u>
Cold Plane Asphalt Concrete Pavement	60,000	SQYD	\$1.80	\$108,000	
HMA-A	8,000	TON	\$95	\$760,000	
Rubberized HMA (Type-G)	19,000	TON	\$125	\$2,375,000	
Rubberized HMA (Type-O)	12,000	TON	\$90	\$1,080,000	
Class 2 Aggregate Base	500	CY	\$65	\$33,000	
Class 2 Aggregate Subbase	500	CY	\$40	\$20,000	
Geosynthetic Pavement Interlayer	15,000	SQYD	\$2	\$30,000	
Paving Asphalt (Binder, GPI)	20	TON	\$500	\$10,000	
Tack Coat	20	TON	\$900	\$18,000	
Replace AC Surfacing	1,000	CY	\$275	\$275,000	
Edge Drains	500	FT	\$40	\$20,000	
Centerline Rumblestrip	700	STA	\$20	\$14,000	
Shoulder Backing	2000	CY	\$60	\$120,000	
Subtotal Pavement Structural Section:					<u>\$4,743,000</u>

<u>Section 3 Drainage</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Item Cost</u>	<u>Section Cost</u>
Subtotal Drainage:					<u>\$0</u>

\*Reference sketch showing typical pavement structural section elements of the roadway. Include (if available) T.I., R-Value and date when tests were performed.

NOTE: Extra lines are provided for items not listed, use additional lines as appropriate.

<u>Section 4 Specialty Items</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Item Cost</u>	<u>Section Cost</u>
Highway Planting	0	LS	\$20,000		
Replacement Planting	0	LS	\$50,000		
Erosion Control	0	ACRE	\$50,000		
Water Pollution/Erosion Control	1	LS	\$75,000	\$75,000	
Hazardous Waste Mitigation	1	LS	\$30,000	\$30,000	
Work					

Resident Engineer Office Space	1	LS	\$30,000	\$30,000
Barrier Terminal	22	EA	\$7,000	\$154,000
Reset Metal Beam Guardrail	5,800	FT	\$20	\$116,000
AC (Type B) (for weed barrier)	2,600	SY	\$20	\$52,000
<u>Incentive for QC/QA (4% HMA cost)</u>				\$168,600
			Subtotal Specialty Items:	<u>\$626,000</u>

<u>Section 5 Traffic Items</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Item Cost</u>	<u>Section Cost</u>
Traffic Delineation Items	150,000	FT	\$4	\$600,000	
Roadside Signs (PCMS)	4	EA	\$5,000	\$20,000	
Traffic Control Systems	200	DAY	\$2,000	\$400,000	
Transportation Management Plan	1	LS	\$5,000	\$5,000	
Maintain Traffic	200	DAY	\$1,700	\$340,000	
			Subtotal Specialty Items:		<u>\$1,365,000</u>

TOTAL SECTIONS 1 through 5 \$6,734,000

Time Related Overhead \$202,020

NOTE: Extra lines are provided for items not listed, use additional lines as appropriate.

Section 6 Minor Items Item Cost Section Cost

Subtotal Section 1 thru 5 x 10% = \$706,000  
(5 TO 10%)

TOTAL MINOR ITEMS: \$706,000

Section 7 Roadway Mobilization

Subtotal Section 1 thru 6 x 10% = \$780,000  
(10%)

TOTAL ROADWAY MOBILIZATION: \$780,000  
\$0

Section 8 Roadway Additions

Supplemental Work Subtotal Section 1 thru 6 x 10% = \$802,000  
(5 TO 10%)

Contingencies Subtotal Section 1 thru 6 x 25% = \$1,860,000  
(\*\* %)

TOTAL ROADWAY ADDITIONS: \$2,662,000

TOTAL ROADWAY ITEMS (SECTION 1 through 8) \$10,882,000

Estimate Prepared By: Eric Brunton Phone# : (707) 441-3968 Date: 9/20/2011  
(Print Name)

Estimate Checked By: \_\_\_\_\_ Phone# : \_\_\_\_\_ Date: \_\_\_\_\_  
(Print Name)

\*\* Use appropriate percentage per Chapter 20.

II. STRUCTURES ITEMS (See Section I.4.Roadway Specialty Items for structures cost),  
Retaining Walls

---

---

SUBTOTAL STRUCTURES ITEMS           \$0  
(Sum of Total Cost for Structures)

Railroad Related Costs:

Item	Item Cost
1	
2	
3	

SUBTOTAL RAILROAD ITEMS           \$0

TOTAL STRUCTURES ITEMS           \$0  
(Sum of Structures Items plus Railroad Items)

COMMENTS:

Estimate Prepared By: Eric Brunton Phone# : (707) 441-3934 Date: 9/20/2011  
(Print Name)

NOTE: If appropriate, attach additional pages and backup.

III. RIGHT OF WAY ITEMS

ESCALATED VALUE

- A. Acquisition, including excess lands,  
damages to remainder(s) and Goodwill
- B. Utility Relocation (State share)      1      LS      \$10,000      \$10,000
- C. Relocation Assistance      0      LS
- D. Clearance/Demolition      0      LS
- E. Environmental Mitigation, Permi      Acre
- F. Title and Escrow Fees

TOTAL RIGHT OF WAY ITEMS      \$10,000  
(Escalated Value)

Anticipated Date of Right of Way Certification \_\_\_\_\_  
(Date to which Values are Escalated)

G. Construction Contract Work

Brief Description of Work:

This project proposes to repave 6.6 miles of asphalt surfacing of Route 101 from 5.3 miles north of Branscomb Road to Rattlesnake Creek Bridge #10-27 in Mendocino County.

Right of Way Branch Cost Estimate for Work \*      \$ \_\_\_\_\_

\* This dollar amount is to be included in the Roadway and/or Structures Items of Work, as appropriate. Do not include in Right of Way Items.

COMMENTS:

Estimate Prepared By: Eric Brunton      Phone# : 707-441-3934      Date: 9/20/2011  
(Print Name)

NOTE: If appropriate, attach additional pages and backup.

**ATTACHMENT D**

**PRELIMINARY MATERIALS  
RECOMMENDATION**

State of California

Business, Transportation and Housing Agency

## Memorandum

To: Lena Ashley  
Chief, Design E3

Date: July 31, 2008

Attn: Eric Brunton

File: 01-MEN-101-PM 74.8/81.4  
01-41540K  
3R Project

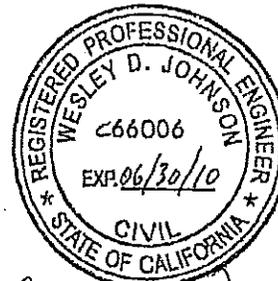
From: DEPARTMENT OF TRANSPORTATION - North Region  
Wesley D. Johnson - North Region, Eureka Materials

*Wesley D. Johnson*  
Subject: PRELIMINARY Materials Recommendation

In response to a request for a Materials Recommendation from Eric Brunton of your office, dated May 13, 2008, the project history files in the Eureka Materials Lab were reviewed for a determination of R-value (resistance to deformation) from previous work adjacent to and within the limits of the project area. Additionally, the files were reviewed for previous recommendations for pipe culverts. Due to the response time requested, no field review or soil sampling was conducted. A review of several projects in the near vicinity revealed R-values ranging from 11 to 86. For the purposes of this report, an assumed R-value of 20 and a Traffic Index of 10.0 (10 year design life), and 11.0 (20 year design life) which were provided by the Office of Traffic Forecasting and Modeling were used for calculation of the structural section. One previous culvert recommendation was located near the limits of this project and is the basis of the Alternative Pipe Culvert recommendation. An updated Materials Recommendation should be requested when this project begins the design phase.

Existing Structural Section

A review of the Materials Laboratory's Structural Section History Files and the "as-built" project files indicate the existing structural section consists of various combinations of AC overlays



*Wesley D. Johnson*

and construction projects through the 6.6 mile length of this project's limits. The upper layer through most of the 6.6 mile length consists of a bonded wearing course, placed in 2006 under EA 01-458704. See Attachment "A" for limits, types, age and thicknesses of existing AC. If existing structural section thicknesses at specific locations are required, please request coring services from this office.

#### Pavement Rehabilitation

This project presents an opportunity for in-place pavement recycling using the "Hot In-Place Recycling" (HIPR) process. Accordingly, alternatives are presented here for rehabilitation using the HIPR process, as well as conventional overlay. Each alternative will work in conjunction with the proposed shoulder widening upgrade. Additionally, options are given for the use of Rubberized Hot Mix Asphalt (RHMA) for each rehabilitation alternative. Per your request, options are given for 10 year and 20 year design life periods.

#### Overlay Recommendation

At this phase of this project, when deflection study data is not yet available, an alternative method must be used to estimate overlay thickness. This overlay recommendation is based on the procedure outlined in the Pavement Technical Note titled: "Alternative Procedure To Estimate Flexible Pavement Rehabilitation Requirements For Project Scoping" as referenced by the Memorandum co-issued by Mark Leja and Steve Takigawa dated November 17, 2006, as it applies to all rehabilitation projects. This procedure is based on a statistical compilation of approximately 2000 overlay designs conducted between 2000 and 2003. For the purpose of estimation for this recommendation, a reliability factor,  $p$  ( $\rho$ ) of 80% was chosen for the selection of overlay thickness. The higher value of  $p$  used, the lower the probability that the project will be under estimated. Conversely, the lower value of  $p$  used, the higher the probability that the project will be over estimated. A reliability value of 80% is recommended pending further data from a deflection study.

#### Overlay Alternative

For areas of existing roadway including mainline and shoulders, the following is recommended: A thorough inspection should be made to locate areas of severe pavement failure identified by rutting greater than 1/2 inch and/or loose spalling pavement. Dig out and repair the localized failed areas to a depth of 0.33 feet (mill & fill with HMA (Type A)) and seal all cracks wider than 1/4 inch by the route and seal method. After repair of the dig outs and cracks, the existing open grade AC and bonded wearing course shall be overlaid with one of the following Overlay Strategies.

10 year overlay strategy (Conventional HMA)

After completing the repair of dig-outs and cracks, overlay the roadway from edge of pavement to edge of pavement with 0.40 feet of HMA-A followed by 0.15 feet of OGFC.

20 year overlay strategy (Conventional HMA)

After completing the repair of dig-outs and cracks, overlay the roadway from edge of pavement to edge of pavement with 0.50 feet of HMA-A followed by 0.15 feet of OGFC.

10 year overlay strategy (Rubberized HMA)

After completing the repair of dig-outs and cracks, overlay the roadway from edge of pavement to edge of pavement with 0.10 feet of HMA-A followed by 0.20 feet of RHMA-G followed by 0.15 feet of RHMA-O.

20 year overlay strategy (Rubberized HMA)

After completing the repair of dig-outs and cracks, overlay the roadway from edge of pavement to edge of pavement with 0.20 feet of HMA-A followed by 0.20 feet of RHMA-G followed by 0.15 feet of RHMA-O.

Hot In-Place Recycle (HIPR) Alternative

Caltrans policy as outlined in Deputy Directive DD-17 Recycling Asphalt Concrete, effective November 17, 1993, states in part: "Caltrans recycles, where feasible, Asphalt Concrete (AC) (Now HMA) for use in highway construction, maintenance and rehabilitation projects utilizing the Department's priority hierarchy." "The priority of recycling AC is established as follows: 1) incorporate into new asphalt concrete." Per the Highway Design Manual, section 110.11(2) Flexible Pavement "Recycling of existing pavement must be considered, in all cases, as an alternative to placing 100 percent new flexible pavement." Additionally, HDM section 617.2 Recycling gives direction for determining, if recycling flexible pavement is appropriate through benefit/cost analysis. As an alternative to the overlay strategies listed above, this project merits consideration of using the Hot In-Place Recycle (HIPR) process. The HIPR process is an on-grade method of pavement surface preservation that consists of softening the existing asphalt pavement with heat, milling or scarifying to a maximum depth of 2 inches, and thoroughly remixing, leveling, and compacting the milled material. A benefit of using the HIPR process is allowing traffic on the HIPR surface prior to completion of the overlay. If the HIPR process is chosen as an alternative, the District Materials Laboratory shall be consulted for further pavement assessment of the existing asphalt concrete matrix to assist with the appropriate mix design.

Prior to performing the HIPR and overlay processes, the existing friction course shall be milled and removed. The existing surface course consists of open graded asphalt concrete (OGAC) from post mile 74.80 to post mile 75.50 (project EA 01-396204) and a bonded wearing course (BWC) from post mile 75.50 to post mile 81.40 (project EA 01-458704).

#### Recommendation for HIPR

The following applies to conventional as well as rubberized overlay options: Grind and remove the existing OGAC and BWC overlays noted above from edge of pavement to edge of pavement through the limits of the project to a depth of 0.08 feet. Conduct the Hot In-Place Recycle process to a maximum depth of 0.15 feet. After the grind and removal, and HIPR processes are complete, select one of the following strategies:

#### 10 year strategy (Conventional HMA)

Overlay the HIPR surface with 0.35 feet of HMA-A, placed in two lifts. Overlay the HMA-A layer with 0.15 feet of OGFC, placed in one lift.

#### 20 year strategy (Conventional HMA)

Overlay the HIPR surface with 0.45 feet of HMA-A, placed in two lifts. Overlay the HMA-A layer with 0.15 feet of OGFC, placed in one lift.

#### 10 year strategy (Rubberized HMA)

Overlay the HIPR surface with 0.20 feet of RHMA-G, placed in one lift. Overlay the RHMA-G layer with 0.15 feet of RHMA-O, placed in one lift.

#### 20 year strategy (Rubberized HMA)

Overlay the HIPR surface with 0.10 feet of HMA-A. Overlay the HMA-A layer with 0.20 feet of RHMA-G, placed in one lift. Overlay the RHMA-G layer with 0.15 feet of RHMA-O, placed in one lift.

#### Notes:

- The train of equipment to perform the HIPR process will require approximately 1.25 to 1.5 lane width of roadway. A constructability assessment should be performed to aid in determining if HIPR is feasible at this location.
- The Life Cycle Cost Analysis (LCCA) should take into consideration that dig-out repairs and crack seal work will not be required if the HIPR process is chosen.

New Structural Sections for Mainline & Shoulders:

10 year strategy (Conventional HMA)

For areas to be widened or repaired, the following 10 year strategies are proposed. Based on an assumed R-value of 20, and a 10 year traffic index of 10.0, the following structural section strategies are recommended for mainline traffic and shoulders. Each strategy is structurally equivalent.

Strategy	OGFC	HMA (Type A)	AB (Class 2)	AS (Class 2)
1	0.15'	0.50'	0.85'	0.75'
2	0.15'	0.50'	1.50'	----
2	0.15'	1.15'	----	----

20 year strategy (Conventional HMA)

For areas to be widened or repaired, the following 20 year strategies are proposed. Based on an assumed R-value of 20, and a 20 year traffic index of 11.0, the following structural section Strategies are recommended for mainline traffic and shoulders. Each strategy is structurally equivalent.

Strategy	OGFC	HMA (Type A)	AB (Class 2)	AS (Class 2)
1	0.15'	0.55'	0.95'	0.85'
2	0.15'	0.55'	1.70'	----
2	0.15'	1.30'	----	----

10 year strategy (Rubberized HMA)

For areas to be widened or repaired, and used in conjunction with a RHMA overlay strategy for mainline, the following 10 year strategies are proposed. Based on an assumed R-value of 20, and a 10 year traffic index of 10.0, the following structural section strategies are recommended for mainline traffic and shoulders. Each strategy is structurally equivalent.

Strategy	RHMA-O	RHMA-G	HMA-A	AB (Class 2)	AS (Class 2)
1	0.15'	0.20'	0.30'	0.85'	0.75'
2	0.15'	0.20'	0.30'	1.50'	----

20 year strategy (Rubberized HMA)

For areas to be widened or repaired, and used in conjunction with a RHMA overlay strategy for mainline, the following 20 year strategies

are proposed. Based on an assumed R-value of 20, and a 20 year traffic index of 11.0, the following structural section strategies are recommended for mainline traffic and shoulders. Each strategy is structurally equivalent.

Strategy	<u>RHMA-O</u>	<u>RHMA-G</u>	<u>HMA-A</u>	<u>AB (Class 2)</u>	<u>AS (Class 2)</u>
1	0.15'	0.20'	0.35'	0.95'	0.85'
2	0.15'	0.20'	0.35'	1.70'	-----

Notes:

- Local or imported borrow used to construct embankment, must meet a minimum R-value of 25 when placed within 4 feet of finished grade.
- For structural sections designed to last 20 years, the strategy to use full depth HMA (Type A) should be considered for special situations only. This would include, but not be limited to, narrow widening, shallow utilities coverage, or reducing traffic control periods due to less overall construction time.
- When a widened shoulder or new structural section is constructed to adjoin an existing structural section, geosynthetic pavement interlayer (GPI) should be placed so that it will overlap the new/existing joint by 2 feet on each side. Placement of the GPI should be as low in the HMA as possible and on the same plane for both the existing structural section and the new structural section. This will help prevent reflective cracking from the underlying joint. Please see Attachment "B" for detail.
- Life Cycle Cost Analysis (LCCA) should take into consideration the difference in shoulder backing quantities due to the difference in profile grade based on the alternative and strategy chosen.
- Due to haul distances from existing hot mix asphalt facilities and the resultant loss of mix temperature, strategies using Rubberized HMA may have to consider mobilization costs for a temporary asphalt production plant on-site or near the project location.

Material Specifications

- Hot Mix Asphalt - Open Graded Friction Course (OGFC) shall conform to Section 39 of the Standard Specifications. See Attachment "C" for a recommendation of grading size versus lift thickness.
- Hot Mix Asphalt (HMA) shall be Type A (HMA-A), conforming to Section 39 of the Standard Specifications. See Attachment "C" for a recommendation of grading size versus lift thickness.

- Rubberized Hot Mix Asphalt, Gap Graded, shall be Type G (RHMA-G), conforming to Section 39 of the Standard Specifications. See Attachment "C" for a recommendation of grading size versus lift thickness.
- Rubberized Hot Mix Asphalt, Open Graded Friction Course, shall be Type O (RHMA-O), conforming to Section 39 of the Standard Specifications. See Attachment "C" for a recommendation of grading size versus lift thickness.
- Paint Binder (Tack Coat): Shall conform to revised Section 39 of the Standard Specifications.
- Asphalt Binder:
 

Conventional HMA: Shall be PG 64-16 for HMA-A and PG 64-16 for OGFC. The estimated percentage of asphalt to be added per dry weight of aggregate is 5.0% for HMA-A and 6.0% for OGFC.

Rubberized HMA: Shall be PG 64-16 for RHMA-G and PG 64-16 for RHMA-O. The estimated percentage of asphalt to be added per dry unit weight of aggregate is 8.0% for RHMA-G and 6.5 % for RHMA-O.
- Aggregate Base (AB): Shall be Class 2, conforming to Section 26 of the Standard Specifications with the following changes: The Durability Index per California Test Method 229 shall be 25 minimum and the minimum loose unit weight per California Test Method 212, Compacted Method (by rodding) shall be 105 lb/ft<sup>3</sup>.
- Aggregate Subbase (AS): Shall be Class 2, conforming to Section 25 of the Standard Specifications.
- Asphalt Concrete Dike: Hot Mix Asphalt used in the construction of dikes shall be Type A, 3/8 inch, conforming to Section 39 of the Standard Specifications. Asphalt binder used in construction of dikes shall conform to the standard special provisions for PG 70-10. Please see Attachment "D" for construction detail for modified dike installation when open graded friction course is placed.
- Shoulder Backing: Shall conform to the requirements within the Standard Special Provisions for shoulder backing, with the following change: The minimum loose unit weight per California Test Method 212, Compacted Method (by rodding) shall be 105 lb/ft<sup>3</sup>.

#### Alternative Pipe Culverts

A review of the Materials Lab project history files revealed information from an adjacent project in the vicinity of this

project's location. The recommendations for Alternative Pipe Culvert contained herein are based solely on historic data from outside the project limits and should be considered conservative for estimation purposes. No soil or water testing was conducted for this recommendation. Alternative pipe culverts estimated for a 50 year service life are shown below:

- Reinforced Concrete Pipe may be used with the following addition to Section 65 of the Standard Specifications: Type II modified or Type IP cement shall be used with a maximum water-to-cement ratio of 0.45.
- 0.138" (10 gage) galvanized, corrugated steel pipe conforming to Section 66 of the Standard Specifications.
- 0.079" (14 gage) galvanized, polymeric sheet coated, corrugated steel pipe conforming to Section 66 of the Standard Specifications.
- Elastic pipe - Shall be high density polyethylene (HDPE), conforming to Section 64 of the Standard Specifications. Reference should be made to durability in Section 854.8 of the Highway Design Manual.

See Attachment "E" or "F" for culvert installation details.

Note:

- Steel pipe down-drains shall conform to Section 69, "Overside Drains" of the Standard Specifications.

If you have any questions, please call me at (707)445-6386 or Dave Waterman at (707)445-6355.

Attachments

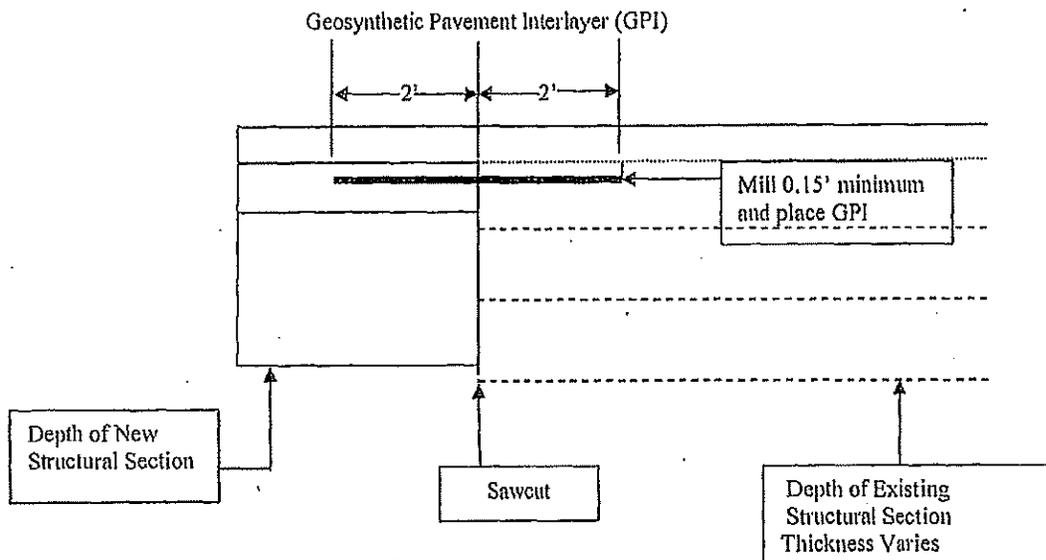
WJ:wj

cc: L. Ashley  
E. Brunton  
S. Blair  
Lab Files

### Attachment B

01-MEN-101 PM 74.80 / 81.40  
01-41540K

### Structural Section and Geosynthetic Pavement Interlayer (GPI) Detail



NO SCALE

## Attachment C

01-MEN-101 PM 74.80 / 81.40  
01-41540K

## Aggregate Size and Layer Thickness

## Hot Mix Asphalt - Type A (HMA-A)

Use the following table to determine the grading:

Lift Thickness Range	Grading
0.08 foot - 0.125 foot	3/8 inch
0.125 foot - 0.20 foot	1/2 inch
0.20 foot and above	3/4 inch

## Rubberized Hot Mix Asphalt - Gap Graded (RHMA-G)

Use the following table to determine the grading:

Lift Thickness Range	Grading
0.125 foot - 0.20 foot	1/2 inch
0.20 foot and greater	3/4 inch

Rubberized Hot Mix Asphalt - Open Graded (RHMA-O)  
and  
Hot Mix Asphalt Open Graded Friction Course (OGFC)

Use the following table to determine the grading

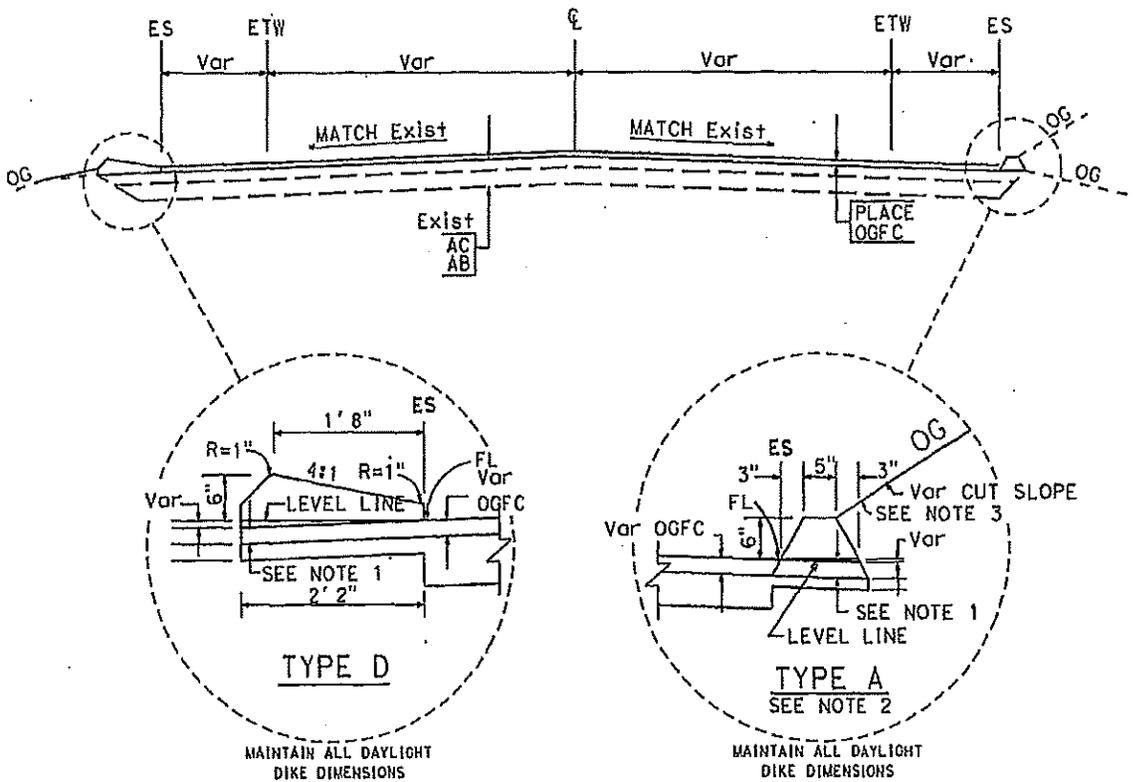
Lift Thickness Range	Grading
0.06 foot - 0.08 foot	3/8 inch
0.08 foot - 0.17 foot	1/2 inch
0.17 foot - 0.25 foot	1 inch **

\*\* Must obtain District Materials Engineer approval.

ATTACHMENT D

01-MEN-101 PM 74.80 / 81.40  
01-41540K

MODIFIED HMA DIKE



HOT MIX ASPHALT DIKE TYPICAL  
WHEN PLACED WITH OGFC

DIKE  
QUANTITIES

TYPE	CUBIC YARDS PER LINEAR FOOT
A	* 0.0135
C	* 0.0038
D	* 0.0293
E	* 0.0130
F	* 0.0066

QUANTITIES BASED  
ON 5% CROSS SLOPE

\* ADJUST QUANTITY TO COMPENSATE  
FOR OGFC DEPTH/HMA DIKE HEIGHT  
EXTENSION

NOTES:

1. THE ADDITIONAL HEIGHT OF DIKE SHALL BE EQUIVALENT TO THE DEPTH OF OGFC.
2. TYPE A DIKE ONLY TO BE USED WHERE RESTRICTIVE SLOPE CONDITIONS DO NOT PROVIDE ENOUGH WIDTH TO USE TYPE D OR TYPE E DIKE.
3. FILL AND COMPACT WITH EXCAVATED MATERIAL TO TOP OF DIKE.

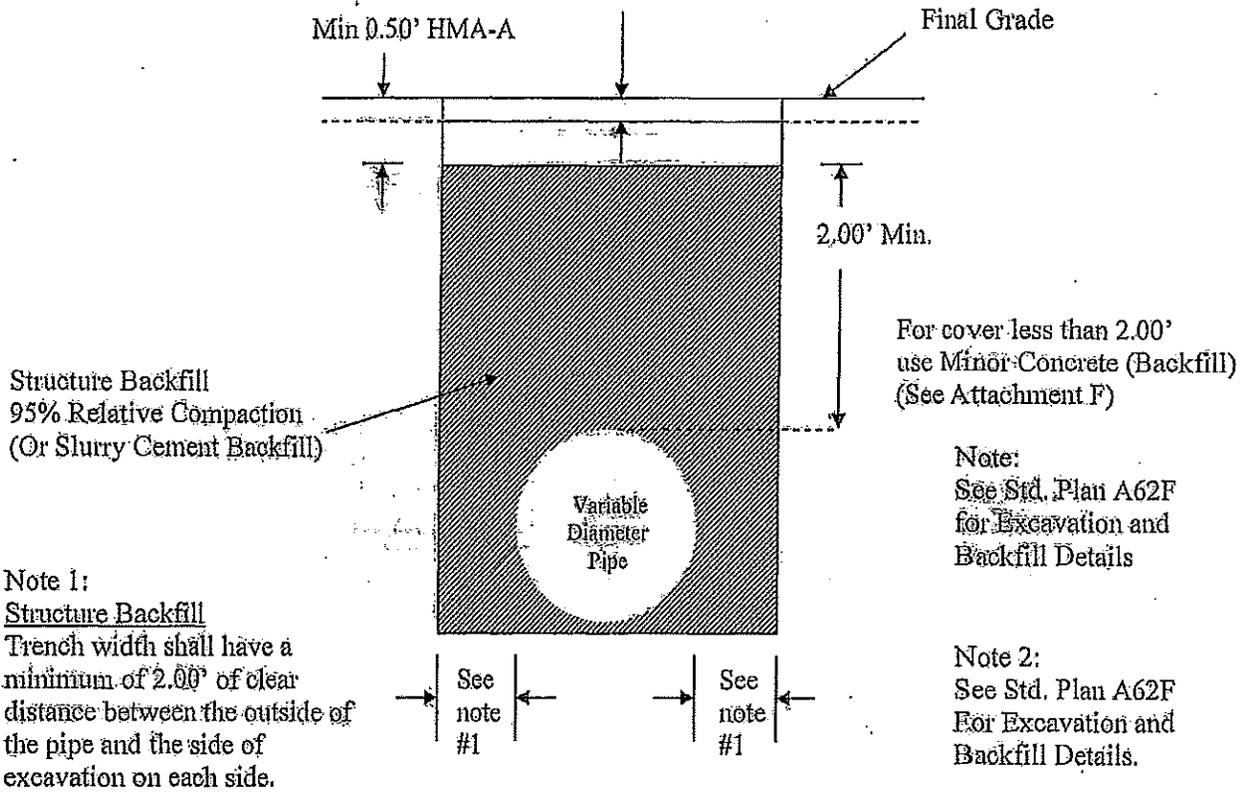
NO SCALE

Attachment E

Structure Backfill, or Slurry Cement Backfill

01-MEN-101 PM 74.80 / 81.40  
01-41540K

New OGRC or RHMA-O Layer  
0.15' (EP to EP)



Note 1:  
Structure Backfill  
Trench width shall have a minimum of 2.00' of clear distance between the outside of the pipe and the side of excavation on each side.

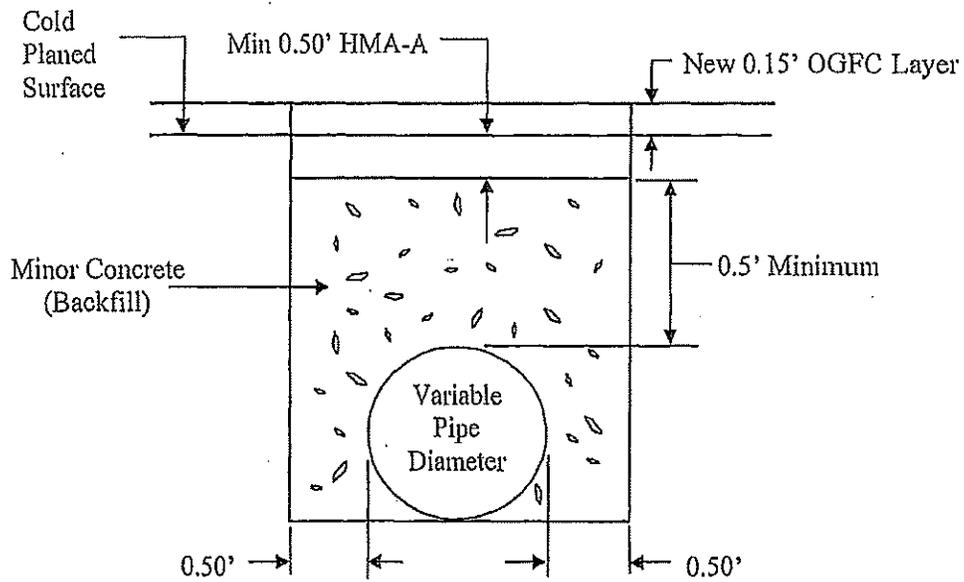
Slurry Cement Backfill  
Trench width shall be a minimum of 0.50' beyond outside edge of pipe and the side of excavation on each side for pipe diameters up to and including 42" or 1.00' for pipes over 42" in diameter. See Standard Specifications 19-3.062

NO SCALE

### Attachment F

01-MEN-101 PM 74.80 / 81.40  
01-41540K

### Minor Concrete (Backfill)



NO SCALE

**ATTACHMENT E**

**PROGRAMMING SHEET**

**PROGRAMMING SHEET - 2011/2012**

EA: 01-41540      Project Manager: Steven Blair      Date: 10/04/2011  
 Proj Name: Laytonville North Rehab      Co-Rte-PM: MEN-101- 074.8/ 081.4      Type: SHOPP

**PROJECT SCHEDULE**

MILESTONE		DATE (STATUS)
Begin Environmental Document	M020	10/01/2012 (T)
Begin Project Report	M040	07/01/2012 (T)
Circulate Environmental Document (DED)	M120	08/01/2013 (T)
Project Approval & Environmental Document (PA&ED)	M200	10/01/2013 (T)
District Submits Bridge Site Data to Structures	M221	
Right of Way Maps	M224	10/01/2013 (T)
Regular Right of Way	M225	02/01/2014 (T)
District Plans, Specifications & Estimates to DOE	M377	09/01/2014 (T)
Draft Structures Plans, Specifications & Estimates	M378	
District Plans, Specifications & Estimates (PS&E)	M380	11/01/2014 (T)
Right of Way Certification	M410	02/15/2015 (T)
Ready to List (RTL)	M460	03/01/2015 (T)
Headquarters Advertise (HQ AD)	M480	06/15/2015 (T)
Approve Construction Contract	M500	10/01/2015 (T)
Contract Acceptance (CCA)	M600	10/01/2016 (T)
End Project	M800	01/11/2018 (T)

ESTIMATE	DATE	AMOUNT
ROADWAY	09/20/11	\$ 10880
BRIDGE		\$ 0
Subtotal Const		\$ 10880
RIGHT OF WAY	10/14/08	\$ 10
MITIGATION		\$ 0
Subtotal RW		\$ 10
GRAND TOTAL		\$ 10890

EXISTING PROGRAMMING	
PAED	\$
PS&E	\$
RW - Sup	\$
RW - Cap	\$
Const - Sup	\$
Const - Cap	\$

\*Does not apply to RW Capital + Not Escalated ++ Only Escalated to 1 year into Future

**PROJECT COSTS BY SB45 CATEGORY**

CAPITAL COST ESTIMATE (Escalation Factor)	Prior Yrs+	11/12+	12/13 (3.5%)	13/14 (3.5%)	14/15 (3.5%)	15/16 (3.5%)	Future++ (3.5%)	Total
Right of Way		10						\$ 10
Construction					12062			\$ 12,063
<b>CAPITAL COSTS TOTAL</b>								<b>\$ 12,073</b>
SUPPORT COSTS (Escalation Factor)			(1.5%)	(1.5%)	(1.5%)	(1.5%)	(1.5%)	Sup/Cap
PAED	35	35	920	386				\$ 1,377 11.40%
PS&E				790	333	33		\$ 1,156 9.57%
Right of Way				99	86	23	34	\$ 242 2.00%
Construction						2134	989	\$ 3,122 25.86%
<b>SUPPORT COSTS TOTAL</b>								<b>\$ 5,896 48.84%</b>
<b>TOTAL PROJECT COSTS</b>								<b>\$ 17,969</b>

**PROJECT SUPPORT IN PYS**

	Prior Yrs	11/12	12/13	13/14	14/15	15/16	Future	Total	PY %
Environmental	0.08	0.08	4.98	2.91	1.19	2.04	1.33	12.61	29.21%
Design	0.00	0.00	0.67	2.19	0.16	0.02	0.01	3.05	7.07%
Engineering Services	0.01	0.01	0.55	0.59	0.33	0.53	0.23	2.25	5.21%
Surveys	0.00	0.00	0.08	0.63	0.04	0.24	0.13	1.12	2.59%
Right of Way	0.01	0.01	0.11	0.65	0.69	0.12	0.16	1.75	4.05%
Traffic	0.00	0.00	0.22	0.42	0.12	0.12	0.05	0.93	2.15%
Construction	0.00	0.00	0.00	0.13	0.11	9.95	4.31	14.50	33.59%
Project Management	0.08	0.08	0.09	0.09	0.11	0.06	0.07	0.58	1.34%
District Units*	0.03	0.03	0.66	0.71	0.36	0.51	0.38	2.68	6.21%
Subtotal Dist/Region Resources	0.21	0.21	7.36	8.32	3.11	13.59	6.67	39.47	91.43%
59-DES Project Development	0.00	0.00	0.01	0.06	0.03	0.36	0.14	0.60	1.39%
59-DES Structures Foundation	0.01	0.01	0.07	0.85	0.13	0.33	0.12	1.52	3.52%
59-Office Engineer	0.00	0.00	0.00	0.00	0.06	0.06	0.00	0.12	0.28%
59-DES Project Management	0.04	0.04	0.04	0.04	0.03	0.02	0.01	0.22	0.51%
59-DES Construction	0.00	0.00	0.02	0.00	0.02	0.85	0.35	1.24	2.87%
59-DES Other Units**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Subtotal DES Resources	0.05	0.05	0.14	0.95	0.27	1.62	0.62	3.70	8.57%
<b>TOTAL PYS</b>	<b>0.26</b>	<b>0.26</b>	<b>7.60</b>	<b>9.27</b>	<b>3.38</b>	<b>16.21</b>	<b>7.29</b>	<b>43.17</b>	

\*Admin, PIng, Maintenance

\*\*DES Admin, DES PIng, DES Maintenance

HRS/PYS = 1758

Comments: