IDAHO TRANSPORTATION DEPARTMENT

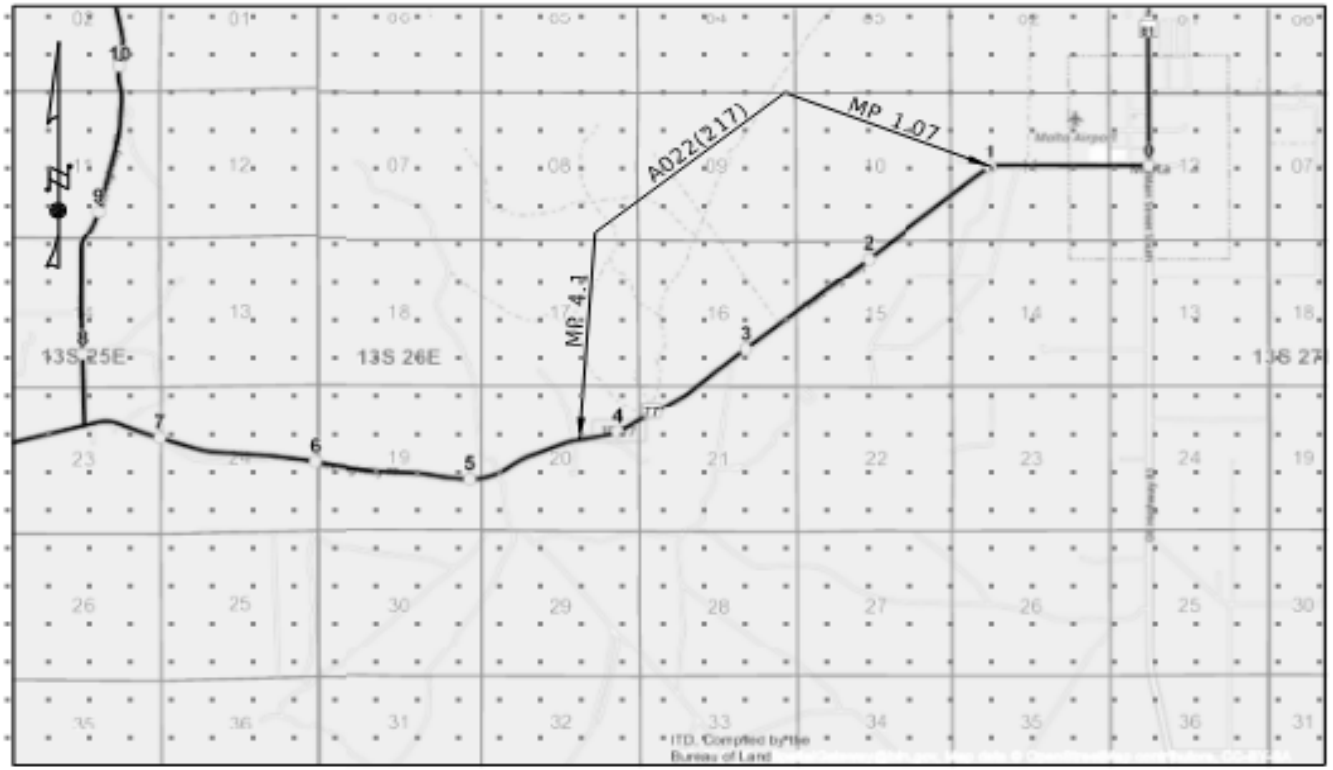
PLAN AND PROFILE OF PROPOSED SH-77

FEDERAL AID PROJECT NO. A022(217)

KEY NO. 22217

CASSIA COUNTY

February 2023



Nibbs Cr to Rice Cr
M.P. 1.07 M.P. 4.1
SEGMENT CODE 002300

DESIGN DESIGNATION

ADT 2027	360
ADT 2047	490
DHV 2027	20
DHV 2047	30
D	60/40%
V	55 MPH
TRUCKS:	
ADT 2027	90
ADT 2047	120
DHV 2027	0
DHV 2047	10

Project Name: SH-77, Nibbs Cr. To Rice Cr. RAP Chipseal

Customer: ITD D4

Supplier: Idaho Asphalt Supply, Inc.

Emulsion: Emulsified Asphalt PMRE

1. **Mix Design:**

Starting RAP Aggregate Application Rate:	**23.6 lbs/yd^2**
Starting PMRE Application Rate:	**0.48 (0.42 to 0.54) gal/yd^2**

Table III: RAP Properties

Binder Content of RAP (ASTM D2172, Method B)			
By Weight of Total Mix (%)		5.49	
By Weight of Dry Aggregate (%)		5.81	
Sieve Size		RAP Gradation	Recovered Aggregate
U.S.	Metric (mm)	% Passing	
1”	25.4	100	100
¾”	17.8	100	100
1/2"	12.5	91	93
3/8”	9.5	81	85
5/16”	8.0	71	76
¼”	6.3	60	69
#4	4.75	53	60
#8	2.36	34	42
#16	1.180	20	30
#30	0.600	11	22
#50	0.300	6	16
#100	0.150	2	11
#200	0.075	1.1	7.8

Table V: RAP Chip Aggregate Gradation

Sieve Size		RAP Chip Gradation	Project Requirements
U.S.	Metric (mm)	% Passing	
1/2"	12.5	100	100
3/8"	9.5	74	40 to 90
5/16"	8.0	48	-
¼"	6.3	19	-
#4	4.75	4	0 to 15
#8	2.36	1	0 to 5
#16	1.180	1	-
#30	0.600	1	-
#50	0.300	1	-
#100	0.150	1	-
#200	0.075	0.3	0 to 3

Gradation

Sieve Size	% Passing	
	Design	Cl-B
½”	100	100
3/8”	40-90	40-90
#4	0-15	0-6
#8	0-5	0-3
#200	0-3	0-2

Fines removed by screening process will be utilized as blotter.

4. Mcleod Mix Design

Based on the gradation in Table V:

M = Medium Particle Size, inches for Chip Seal Agg: **0.320** in

Aggregate Properties (Measured by IAS)

- Flakiness Index (FI): **18%**
- Loose Unit Weight (W): **72.02 lb/ft^3**
- Bulk Specific Gravity (G): **2.446**
- % Absorption (A): **0.42%** (0.0042)

The average least dimension (ALD):

$$H = M/(1.139285 + 0.011506*FI)$$
$$= 0.320/(1.139285 + 0.011506 * 18)$$
$$= \mathbf{0.237} \text{ in}$$

Voids in loose aggregate (V)

$$V = 1-(W/(62.4*G))$$
$$= 1-(72.02/(62.4*2.446))$$
$$= \mathbf{0.528}$$

Contractor RAP Cover Coat QC

Test	Test Method	Frequency	Point of Sampling	Specifications
Moisture Content on RAP	Modified AASHTO T 255 (Constant mass at 140F)	1 test minimum per 400 ton	From stockpile	Cover Coat Aggregate See Modified Gradation Table above.
Gradation on RAP	AASHTO T 27/11	1 test minimum per 400 ton	From stockpile	Provide to Engineer for Information only.
Cleanness Value on RAP	Idaho T-72	1 test minimum per 400 ton	From stockpile	Provide to Engineer for information only.
Asphalt Content and Gradation	AASHTO T 308 & T 30	1 test minimum per 1000 ton	From stockpile	Provide to Engineer for information only.
Fracture Count on Extracted Aggregate	AASHTO T 335	1 test minimum per 1000 ton	From stockpile	Provide to Engineer for information only.

Test Section

- Before starting full production:
- construct an on-site test section that is a minimum of 1000 feet long and a maximum of one distributor load
- field verify the RAP Chip Seal Coat design for spread rate of binder and RAP aggregate in presence of Engineer.
- Adjust rates as necessary to ensure embedment of 50% but not to exceed 70% after brooming

PG3 Pooled Fund Preservation Study

- This project is part of the “PG3 Pooled Fund Preservation Study” which is designed to construct a RAP Chip Seal. The first in the State of Idaho. The contractor should be aware that they may be required to:
- Attend additional preconstruction and pre-work conferences
- Make key field personnel available for up to 8 hours of Just – In-Time training
- Complete additional equipment calibrations, test strips and adjustments immediately prior the start of construction
- Cooperate with investigators during construction of a 500 ft. Test Section(s) that is embedded within the project limits.
- Provide up to seven days’ notice prior to construction of the test section.