



September 9, 1957

NOTICE TO BIDDERSCOLORADO PROJECT NO. F 005-3(11)

It is recommended that bidders on this project go over the plan details with one of the following field representatives of this Department:

Construction Engineer - Mr. F. O. Stearns  
Denver, Colorado

Resident Engineer - Mr. R. C. Hopper  
Idaho Springs, Colorado  
Home Phone 493

January 17, 1957

MINIMUM WAGES  
(Third District)

The minimum wage paid to all Skilled Labor employed on this contract shall be One Dollar and Ten Cents (\$1.10) per hour.

The minimum wage paid to all Intermediate Labor employed on this contract shall be Seventy Cents (\$0.70) per hour.

The minimum wage paid to all Unskilled Labor employed on this contract shall be Fifty Cents (\$0.50) per hour.

When Federal Aid funds are involved, the contractor shall conform to the provisions of the Federal Fair Labor Standards Act of 1938, as amended.

When Federal Aid Interstate funds are involved, the contractor shall conform to the provisions of the Davis-Bacon Act of 1931, as amended, and the Federal Fair Labor Standards Act of 1938, as amended.

When the respective minimum rates for any particular craft differ, the higher minimum rate will govern.

March 28, 1947

RENTAL OF TEAMS AND TRUCKS

The minimum rental for hired teams employed on this contract shall be twenty (20) cents per hour per head. The minimum rental shall include harness and double-trees, but shall be exclusive of all other equipment furnished for the work.

The minimum rental for hired trucks of not more than one and one-half ( $1\frac{1}{2}$ ) tons rated capacity, trucks to be in good condition and equipped with dump bodies, shall be seventy-five (75) cents per hour. The proposed minimum rental rate for hired trucks of more than one and one-half ( $1\frac{1}{2}$ ) tons rated capacity must be submitted by the Contractor to the Department for consideration at the time contract is awarded.

Suitable local teams shall be used insofar as available.

September 9, 1957

COMMENCEMENT AND COMPLETION OF WORK  
AND LIQUIDATED DAMAGES FOR  
COLORADO PROJECT NO. F 005-3(11)

The Contractor on this project shall commence work under his contract on or before the tenth (10th) day following the date of the contract unless such time for beginning the work shall be changed by the Chief Engineer, and shall fully complete all work thereunder within Two Hundred Seventy (270) calendar days from and including the date of contract, or from and including such later date as may be designated in writing by the Engineer.

The amount of liquidated damages to be paid as provided in Paragraph 8.7, "Failure to Complete Work on Time" of the Specifications shall be \$75.00 per day.

September 9, 1957

REMOVAL OF MANHOLES

COLORADO PROJECT NO. F 005-3(11)

DESCRIPTION AND REQUIREMENTS:

Where called for on plans, manholes on sewer lines are to have the ring and cover removed and the manhole shall be broken down or filled. Wherever sewer lines are to remain in service, care shall be used in removing manholes to prevent any interference with the operation of the sewers. Any holes resulting from removal of manholes shall be backfilled and compacted to bring the ground surface into conformity with surrounding terrain. Damage to sewer lines to remain in place shall be repaired by the Contractor at his expense.

Manhole rings and covers shall be salvaged and disposed of as directed by the Engineer.

BASIS OF PAYMENT:

This item shall be paid for at the contract unit price each for "Removal of Manholes," which price shall be full compensation for removing the manholes as described; for all repairs, excavation, backfilling, hauling, materials, labor, equipment, tools, supplies and work incidental to completion of the item.

June 23, 1955

PLUG CULVERTS

DESCRIPTION AND REQUIREMENTS:

This item shall consist of filling in the ends of concrete or masonry culverts and/or crushing the ends of C.M.P. culverts to be left in place at locations indicated on plans. Culvert ends are to be sufficiently filled and crushed to prevent any future settlement of embankment over the ends of abandoned structures. Where headwalls are encountered, they are to be broken down enough to enable the culvert end to be crushed.

BASIS OF PAYMENT:

This item shall be paid for at the contract unit price each for "Plug Culverts," which price shall be full compensation for filling in with earth both ends of culverts, crushing ends of culverts, breaking headwalls and for all excavation, labor, tools, equipment, supplies and work incidental thereto.

August 26, 1948

REV. OF ITEM 11  
REMOVAL OF BRIDGES

This item shall conform to the requirements of Item 11 of the Standard Specifications except for the following modifications:

Steel trusses shall be dismantled at original field connections where possible. In no case shall the removed sections consist of more than two (2) panels of any one truss.

All costs incidental to the foregoing requirements shall be included in the original contract prices for the project.

ITEM 14EXCAVATION FOR STRUCTURES14.1 DESCRIPTION:

14.1.1 Excavation for structures shall consist of the excavation and removal of all material of whatever nature encountered, necessary for the construction of foundations and substructures of the structures listed on the Plans. It shall include the construction complete in place of all temporary cribs, cofferdams, caissons, etc., which may be necessary for the execution of the work. It shall also include the subsequent removal of the cofferdams and cribs and the disposal of the surplus excavation materials in the roadway embankments or as directed by the Engineer.

14.1.2 The removal of old structures is not included herein, but is covered by Item 11 of these Specifications.

14.1.3 The elevation of the bottom of footings as shown on the Plans shall be considered as approximate only and the Engineer may order in writing such changes in dimensions or elevations of footings as may be necessary to secure a satisfactory foundation.

14.2 CLASSIFICATION:

14.2.1 Excavation for structures shall be classified as "Rock Excavation (Str.)," "Common Excavation (Str.)," and "Unclassified Structural Excavation." The distinction between "Rock" and "Common" shall be as prescribed in classification for "Roadway and Drainage Excavation," Paragraph 13.2. All excavation classified as "Unclassified Structural Excavation," on the Plans, will remain under that classification in all cases.

14.2.2 Excavation for culverts shall be as required under Item 45 of these Specifications. Where portions of culverts are not bedded in the original ground, excavation for structures shall be measured and paid for in embankment material. Embankments shall be built up and thoroughly compacted to a point one-half (1/2) the diameter above the proposed flow line of the pipe and the trench for the pipe shall then be excavated through the constructed embankment. The embankment shall be constructed in accordance with Item 15 of the Specifications.

14.3 CONSTRUCTION METHODS:

14.3.1 Foundations shall be excavated according to the outline of the footings as shown on the Plans or as established by the Engineer and shall be of sufficient size to permit the placing of the footings with full horizontal bed.

14.3.2 Excavation in rock or other hard foundation material shall be cut to a firm surface, either level, stepped, or serrated, cleaned of all loose material, and all seams shall be cleaned out and filled with concrete, mortar or grout, as directed by the Engineer.

(Continued)

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ITEM 14EXCAVATION FOR STRUCTURES

14.3.3 When a structure is to rest on an excavated surface other than rock, special care shall be taken not to disturb the bottom of the excavation and the final removal of the foundation material to grade shall be made just before the structure or concrete is to be placed. The final six (6) inches in depth shall be done by hand labor methods. The natural ground adjacent to the footings shall not be disturbed without the permission of the Engineer.

14.3.4 Cofferdams or cribs for foundation construction shall, in general, be carried well below the bottom of the footings and shall be well braced and as watertight as practicable. The interior dimensions of cofferdams shall be such as to give sufficient clearance for the construction of forms, thorough inspection, and to permit pumping outside of the forms. Cofferdams or cribs which become tilted or moved out of line during the process of sinking, shall be righted or enlarged so as to provide the necessary clearance.

14.3.5 When conditions are encountered, which, in the opinion of the Engineer, render it impracticable to unwater the foundation before placing concrete, he may require a concrete foundation seal of such dimensions as may be necessary to be constructed below the designed footing depth and poured under still water by tremie or other approved method. Such concrete shall be proportioned as specified under Item 46 for Class "A" Concrete with the addition of ten (10) per cent of cement above that normally used. When ordered by the Engineer, after the concrete has set sufficiently, the cofferdam shall be pumped out for purposes of inspection. When weighted cribs are employed and the weight is utilized to partially overcome the hydrostatic pressure acting against the bottom of the foundation seal, special anchorage, such as dowels or keys, shall be provided to transfer the entire weight of the crib into the foundation seal. When a foundation seal is placed under water, the cofferdam shall be vented or ported at low water level.

14.3.6 Cofferdams shall be constructed so as to protect green concrete against damage from a sudden rising of the stream and to prevent damage to the foundation by erosion. No timber or bracing shall be left in the cofferdams or cribs in such a way as to extend into the substructure without written permission from the Engineer.

14.3.7 Unless otherwise provided, cofferdams and cribs, with all sheeting and bracing, shall be removed by the Contractor after the completion of the substructure, in such a manner as not to disturb or mar the finished structure.

14.3.8 Pumping from the interior of any foundation enclosure shall be done in such manner as to preclude the possibility of any portion of the concrete materials being carried away. No pumping will be permitted during the placing of concrete, or for a period of at least twenty-four (24) hours thereafter, unless it be done from a suitable sump separated from the concrete work by a watertight wall.

14.3.9 After each excavation is completed, the Contractor shall notify the Engineer, and no concrete or other materials shall be placed until after the Engineer has approved the depth of the excavation and the character of the foundation material.

(Continued)

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ITEM 14EXCAVATION FOR STRUCTURES

14.3.10 When unsatisfactory foundation material is encountered in the excavation for culvert pipes, siphons, concrete box or slab culverts, the foundation material shall be excavated a minimum of six (6) inches below grade and backfilled with "Structure Backfill" material, as described under Item 16 and as designated on Plans or as directed by the Engineer.

14.3.11 Where the Contractor, for his own convenience, excavates beyond the limits required for structural excavation, the excess excavation and the backfill thereof shall be at the Contractor's expense.

14.3.12 Backfilling around culverts, siphons, abutments, wing walls, piers and areas inaccessible to rollers shall be compacted by mechanical tamping devices or other approved means as provided under Item 16 of the Specifications. Fill around structures shall be deposited on both sides to approximately the same elevation at the same time and compacted to a density satisfactory to the Engineer.

14.3.13 Special precautions shall be taken to prevent any wedging action against a structure and the slope bounding the excavation for bridge abutments and wing walls shall be destroyed by stepping or serrating to prevent wedge action.

14.3.14 "Structure Backfill" material and placement thereof, together with any required mechanical tamping shall be as described under Item 16.

14.4 METHOD OF MEASUREMENT:

14.4.1 The total yardage of structural excavation to be paid for under this item shall be the volume in cubic yards as calculated in accordance with the following:

1. Circular and box culverts, siphons, side drains and other pipes.

A profile will be made along center line of the structure to extend one (1) foot beyond either end of structure. End of structure, as used, is defined to include wing walls, metal aprons, concrete end sections and headwalls. The area between original ground and the bottom of trench as excavated between limits of this profile will then be determined. The volume of structural excavation will then be calculated by multiplying this area by the dimension of the outside diameter of circular structures or the outside width of box structures, measured in feet, plus two (2) feet.

Division boxes, diversion boxes, and other miscellaneous structures shall be handled in the manner proposed for box culverts by establishing the center line through the long axis of the structure and running the profile to a point one (1) foot outside the neat line of the structure. The balance of the computation would then be handled as prescribed for a box culvert.

(Continued)

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ITEM 14  
EXCAVATION FOR STRUCTURES

2. Bridges.

The quantity of structural excavation for bridges will not be measured, but will be the quantities shown on Plans. Exception will be when changes are ordered in accordance with Paragraph 14.1.3. When changes are ordered by the Engineer, volume will be measured and added to or subtracted from plan quantities.

14.4.2 The depth of excavation for structures, where roadway cross-section is in fill, shall be between the bottom of the footings as excavated and the original ground surfaced as profiled by the Engineer. The depth of excavation for structures where the roadway cross-section is in cut, or where channel changes or channel improvements are indicated, shall be between the bottom of the footings as excavated, and the typical cross-section of the cut, channel change or channel improvement, as though the excavation for the cut, channel change or channel improvement had been completed. The volume of yardage included within the roadway cross-section and cross-sections of channel changes or channel improvements shall be measured and paid for as provided under Item 13, "Roadway and Drainage Excavation."

14.4.3 Trenches for underdrains of all types, and trenches required for installation of multiple plate culverts shall be measured to neat lines indicated by details on Plans or required by Specifications for the respective items.

14.4.4 In case portions of old bridge substructures coincide with structural excavation prisms as outlined herein, the substructure material removed within this prism to a point three (3) feet below the ground line or stream bed at that point shall be paid for as provided under Item 11, "Removal of Bridges, Structures and Obstructions" of the Specifications. Substructure material occurring within the said structural excavation prisms below this three (3) foot depth, shall be paid for as structural excavation. The yardage of structural excavation so calculated, completed and accepted, will be included in the measurement and no other allowance for measurement of removed structures nor of cofferdams or caissons shall be included.

14.4.5 In the event that it is found necessary to carry any of the footings more than three (3) feet below the depths shown on the Plans, the excavation down to an elevation three (3) feet below that shown on the original Plans shall be performed at the original prices bid, as provided above; material excavated more than three (3) feet below the original elevation shown on the Plans, shall be paid for under supplemental agreement as Extra Work as provided in Paragraph 4.5.

(Continued)

June 15, 1956

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ITEM 14EXCAVATION FOR STRUCTURES14.5 BASIS OF PAYMENT:

The yardage of excavation for structures determined and classified as provided above shall be paid for at the contract unit prices per cubic yard for "Rock Excavation (Str.)," "Common Excavation (Str.," or "Unclassified Structural Excavation," as the case may be, which prices and payments shall be full compensation for the excavation, removal and disposal of all materials and obstructions encountered, for the construction of cribs, cofferdams, and caissons, for pumping, for all grout and mortar used in filling seams in foundations, and for the removal of cofferdams and temporary cribs, except bridge substructures above three (3) foot depth which will be paid for under Item 11 of the Specifications, and for all labor, equipment, tools and incidentals necessary to complete the item. Concrete used in concrete seals as ordered in writing by the Engineer shall be paid for as specified under Item 46. Structure Backfill together with incidental mechanical tamping will be paid for in accordance with Item 16 of the Specifications.

REVISION OF ITEM 17

WETTING AND COMPACTION

This item shall conform to the requirements of Item 17 of the Standard Specifications except for the following:

Paragraph 17.2.5.5 is revised to the following:

17.2.5.5 Rubber tired rollers shall be furnished in combinations of one (1) unit and two (2) units as required to best accomplish the degree of compaction and densities required. Each unit shall be of the double axle type, equipped with pneumatic tires of equal size and type. The rear tires shall be staggered with relation to the front tires. The space between the side walls of adjacent tires shall be such that the tracking pattern of the front and rear tires overlap each other by a minimum of one (1) inch at adjacent edges. The rolling width of the unit shall be not less than sixty (60) inches exclusive of the power unit. The roller shall be so constructed that the contact pressure is uniformly distributed among all of the tires and the tires shall be inflated to maintain the air pressure in the several tires within a total tolerance of five (5) pounds per square inch. The roller shall be so constructed that the total weight of the roller can be varied to produce an operating weight per tire of between one thousand (1,000) and two thousand (2,000) pounds. The operating weight of the roller shall be as ordered by the Engineer.

Paragraph 17.3.3 is revised to the following:

17.3.3 The time to be paid for rolling with either of the two (2) types of flat wheel rollers shall be the total number of hours that such rollers are actually used as ordered by the Engineer; provided that in any one-half ( $\frac{1}{2}$ ) shift of four (4) hours, no payment of less than four (4) hours will be made, unless the rollers are inoperative due to slow or discontinuous placement of materials, breakdown of rolling equipment or other causes determined to be the Contractor's responsibility.

Paragraph 17.3.5 is added as follows:

17.3.5 The time to be paid for rolling with rubber tired rollers shall be measured as the sum of the number of hours that each one (1) unit roller or two (2) unit roller, as the case may be, and as described in Paragraph 17.2.5.5, is actually used for rolling materials on the project as ordered by the Engineer; provided that in any one-half ( $\frac{1}{2}$ ) shift of four (4) hours, no payment of less than four (4) hours will be made, unless the rollers are inoperative due to slow or discontinuous placement of materials, breakdown of rolling equipment or other causes determined to be the Contractor's responsibility.

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REVISION OF ITEM 17WETTING AND COMPACTION

Paragraph 17.4.2 is revised to the following:

17.4.2 Rolling with flat wheel rollers, as limited in Paragraph 17.3.3 will be paid for at the contract unit price per hour for "Rolling with Flat Wheel Roller (Tandem)" or "Rolling with Flat Wheel Roller (Three (3) Wheel)" which price shall include all fuels, supplies, repairs and maintenance for the rollers complete with power, operators and all labor and other work incidental thereto.

Paragraph 17.4.6 is added as follows:

17.4.6 Rolling with rubber tired rollers shall be paid for at the contract unit price per hour for "Rolling with Rubber Tired Roller (One (1) Unit)" or "Rolling with Rubber Tired Roller (Two (2) Unit)" as limited in Paragraph 17.3.5, which price shall include all fuel, supplies, repairs and maintenance for rollers complete with power equipment operators and all labor and other work incidental to the item.

All costs incidental to the foregoing requirements are to be included in the original contract prices for Item 17.

ITEM 26X - DETOUR SURFACING1. DESCRIPTION:

This item shall consist of furnishing and placing one course of approved material in accordance with these specifications and in conformity with the typical cross section shown on plans.

2. MATERIALS:

This material shall be substantially a pit run gravel obtained from approved sources.

All material shall be of such size that it will pass a screen with openings one and one-half ( $1\frac{1}{2}$ ) inches square, and not more than twenty (20) per cent shall pass a No. 200 sieve.

Material shall be manipulated after placement on road to consolidate with subgrade materials into a dense unyielding surface. Discing and processing with blades will be required if necessary to produce this result. Oversize material may be bladed to the shoulder slopes.

3. CONSTRUCTION METHODS:

Approved material shall be bladed over the roadway to conform with width and quantity as shown on the typical section. Ruts and irregularities formed in the surface shall be immediately corrected by blading by the Contractor.

4. METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

The quantity to be paid for under this item shall be the number of cubic yards measured in its original position by the method of average end areas; of all detour surfacing completed and accepted in accordance with the foregoing paragraphs. Wagon or truck measurement volumes may be substituted for the above if material is secured from commercial sources.

This material will be paid for at the contract unit price per cubic yard for "Detour Surfacing" complete in place, which price shall be full compensation for furnishing, all hauling, screening, compacting, development and stripping of pits, all crushing, floating, and finishing, disposing of rejected material and for all labor, tools, equipment, supplies, materials and work incidental thereto.

REVISION OF ITEMS29 AND 30ASPHALT AND ASPHALTIC MATERIALS

This item shall conform to the requirements of Items 29 and 30 of the Standard Specifications except for the following.

Paragraph 29.2.6 is revised to the following:

29.2.6 The Department reserves the right to secure samples for testing from any or all tank cars or truck transports upon arrival at the project. Shipments made by truck will be pre-sampled from the conveyance by the supplier at the refinery. The sample together with Certificate of Compliance, completed by the refinery, shall accompany the truck transport to point of delivery. At least one sample for each five transport shipments shall be secured by the Engineer for testing by the Central Laboratory. For tank car shipments the Engineer shall sample every other tank car arriving on the project for testing by the Central Laboratory. In case such tests reveal significant divergence from refinery certification, the Department reserves the right to reject all paving materials and mixtures incorporating the non-specification material. The Contractor will be held responsible for the quality of the asphaltic material until confirming tests have been made, regardless of refinery certification.

Paragraph 30.2.7 is revised to the following:

30.2.7 The Department reserves the right to secure samples for testing from any or all tank cars or truck transports upon arrival at the project. Shipments made by truck will be pre-sampled from the conveyance by the supplier at the refinery. The sample together with Certificate of Compliance, completed by the refinery, shall accompany the truck transport to point of delivery. At least one sample for each five transport shipments shall be secured by the Engineer for testing by the Central Laboratory. For tank car shipments the Engineer shall sample every other tank car arriving on the project for testing by the Central Laboratory. In case such tests reveal significant divergence from refinery certification, the Department reserves the right to reject all paving materials and mixtures incorporating the non-specification material. The Contractor will be held responsible for the quality of the asphaltic material until confirming tests have been made, regardless of refinery certification.

All costs incidental to the foregoing requirements shall be included in the original contract prices for Items 29 and 30.

REV. OF ITEM 29PAVING ASPHALT

Table 29-1 of the Standard Specifications is revised to include 100-120 Penetration Grade.

<u>Test Designation</u>	<u>A.A.S.H.O. Test Method</u>	<u>100-120</u>
Flash Point, Cl. Open Cup, °F. Min. ....	T 48	425
Penetration of Orig. Sample at 77° F. ....	T 49	100-120
Loss on Heating 5 Hr. at 325° F., per cent Maximum	T 47	2
Penetration after Loss on Heating, per cent of Orig. Min. ....	T 49	70
Ductility at 77° F., Cm., Min. ....	T 51	100
Solubility in CCl <sub>4</sub> , per cent Min. ....	T 45	99.5
Cliffens Spot Test .....	* T 102	Neg.

\* The naphtha solvent shall contain not more than ten (10) per cent Xylene by volume.

March 27, 1948

REVISION OF ITEM 30  
PRIME COAT

DESCRIPTION AND REQUIREMENTS:

A prime coat of Asphaltic Road Material, MC, shall be applied to the detour surfacing, as indicated on plans. The quantity of asphaltic material thus applied, grade of oil, and the time of application shall be as ordered by the engineer.

BASIS OF PAYMENT:

This item shall be paid for as provided in Item 30 of the Specifications.

September 9, 1957

REVISION OF ITEM 32PLANT MIXED ASPHALTIC SURFACINGCOLORADO PROJECT NO. F 005-3(11)

This item shall conform with the requirements of Item 32 of the Standard Specifications, except for the following:

1. The following requirements are added to Paragraph 32.2.2.2 of the Specifications:

Grading C mineral aggregate for the processed mat shall meet the following gradation requirements:

Passing a sieve with 3/4-inch square openings.....	100%
Passing a No. 4 sieve.....	30% to 60%
Passing a No. 10 sieve.....	20% to 45%
Passing a No. 200 sieve.....	6% to 12%

At least fifty (50) per cent of the material retained on the No. 4 sieve shall be a product resulting from crushing material larger than one (1) inch.

2. Source of mineral aggregate is not designated. This material may be obtained from any source producing material complying with the above specification requirements. The Contractor shall make his own arrangements with owners of materials. The material for mineral aggregate proposed for use must be approved by the Department of Highways Laboratory. Contractors may submit samples of the material, through the Engineer, to the Laboratory for tests without cost. All samples of materials submitted to Laboratory for testing must be in the Laboratory at least seven (7) days prior to the time of actual use on the project.

Stripping of pits and overhaul on materials will not be paid for as separate items. The contract unit price per ton for Item 32ax, complete in place, shall include the cost of all stripping and hauling.

3. The last sentence of Paragraph 32.3.3.3 of the Specifications is revised to the following:

"The asphaltic cement shall be separately heated in tanks designed to secure uniform heating of the entire contents and shall be brought to a temperature of Two Hundred (200) Degrees Fahrenheit to Three Hundred and Fifty (350) Degrees Fahrenheit. All material heated above Three Hundred and Fifty (350) Degrees Fahrenheit either before or during the mixing with the mineral aggregate, shall be rejected."

(Continued)

September 9, 1957

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REVISION OF ITEM 32PLANT MIXED ASPHALTIC SURFACINGCOLORADO PROJECT NO. F 005-3(11)

"The aggregate shall be heated to a temperature at which the specific asphalt used will have a Saybolt Furol Viscosity of 75-150 seconds. The Central Laboratory will furnish the temperature at which the asphalt supplied on the contract will have viscosities within this range. The mixture of asphaltic cement and mineral aggregate shall be delivered at place of use on road at a temperature of not less than Two Hundred (200) Degrees Fahrenheit, and shall be laid only upon a base which is clean, reasonably dry and only when weather conditions are suitable."

4. Ample stability of the Plant Mixed Asphaltic Surfacing shall be obtained at ninety-six (96) per cent of Laboratory compacted density. In order to achieve this result the Contractor shall be required to begin rolling at the time ordered by the Engineer, and rolling shall be continued until ordered stopped by the Engineer.

Compaction of Plant Mixed Asphaltic Surfacing materials shall be as required by the Standard Specifications and foregoing requirements except that Contractor may use any type of rolling equipment providing he obtains the necessary minimum compaction requirements. Furnishing rollers and rolling will not be paid for separately but shall be included in the cost of Item 32ax.

5. 100 to 120 penetration Paving Asphalt, conforming to requirements of Item 29 of these Special Provisions, shall be used in the Plant Mixed Asphaltic Surfacing used on this project. The quantity of Paving Asphalt required to form the mix shall be determined by the Engineer at time of application. Paving Asphalt will not be paid for as a separate item but shall be included in the cost of Item 32ax.

All costs incidental to the foregoing requirements shall be included in the original contract unit price for Item 32ax.

September 9, 1957

SOURCE OF MATERIALS

COLORADO PROJECT NO. F 005-3(11)

The Department estimates that Detour Surfacing and Structure Backfill for this project are available from the pit indicated on Sheet No. 11 and on Title Sheet of Plans.

The Department holds option on material from this pit. This material will be available to the Contractor at no cost.

The amount of materials required from this pit is subject to change by the Engineer to meet requirements encountered during construction.

The Contractor shall use the pit designated in plans unless he receives written permission from the Engineer to use other sources for materials.

If permission is granted for use of other sources, the Contractor shall make his own arrangements with property owner for the use of materials.

All pits are to be excavated and backsloped uniformly and left in a neat, leveled condition, with adequate drainage provided.

The Contractor shall be required to follow strictly all of the terms and conditions of any option for materials which is procured by the Department and which he exercises for the purpose of the fulfillment of the contract or supplements thereto. Copy of the option procured by the Department is included in these Special Provisions.

All material taken from roadway cuts and paid for as Structure Backfill will be excluded from payment as "Unclassified Excavation."

The cost of the foregoing requirements shall be included in the original contract unit prices for the project.



September 9, 1957

F 005-3(11)

 COLORADO PROJECT NO. F-005-3(9)
PIT NO. 1
 LOCATION NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 31, T.3 S,  
R. 72 W.
COUNTY Clear CreekRIDER ON OPTION TO BUY MATERIAL

WHEREAS, on the 5th day of January, 1956,  
 an agreement was entered into between C. M. Lyon, Silver Spruce Gold  
Mining Company of 13455 West Colfax, Rt. 4, Box 144, Golden,  
Colorado in Jefferson County,  
 Colorado, party of the first part, and the Colorado Department of  
 Highways, party of the second part, as an option for the use of material,  
 both parties hereby agree to extend the expiration date of said agreement  
 to the 31st day of December 1958.

None of the other terms or conditions of the said agreement are in  
 any way whatsoever affected by the extension of this option.

Silver Spruce Gold Mining Company

/s/ C.M. Lyon, Pres.  
 Party of the First Part  
 P. O. Address \_\_\_\_\_

COLORADO DEPARTMENT OF HIGHWAYS

MARK U. WATROUS  
 Chief Engineer

By /s/ Glen Mc Eldowney  
 Assistant District Engineer

September 10, 1954

REVISION OF ITEM 42  
TIMBER BRIDGES

This Item shall conform to the requirements of Item 42 of the Standard Specifications except for the following:

Paragraph 42.2.9 is revised to the following:

42.2.9 All timber furnished under these specifications, except when inspection is arranged for by the Engineer, shall be covered by a certificate of inspection issued by the West Coast Lumbermen's Association, Pacific Lumbermen's Inspection Bureau, Southern Pine Association, or by any other inspection agency approved by the Engineer. Each piece so inspected shall be marked with a mark indicating such inspection, and the destination of material or job for which it is intended shall be clearly shown on said certificate.

All costs incidental to the above requirements shall be included in the contract unit price bid for Item 42.

May 25, 1956

ITEM 46 - CONCRETE

This item shall conform to the requirements of Item 46 of Standard Specifications and shall include the following:

46.2.7 Air-entrained Concrete:

46.2.7.2 When the Contractor plans to furnish air-entraining admixtures which have been previously approved by the Department, he will be required to furnish two (2) copies of a certificate to the Engineer stating the material proposed for use on the project is identical to that previously furnished.

46.2.7.3 For air-entraining admixtures which have not been previously approved by the Department, the Contractor will be required to furnish two (2) copies of a certificate to the Engineer from a recognized laboratory stating that the material proposed for use on the project is in conformity with the requirements of A.A.S.H.O. Specification M-154.

46.2.7.4 A "recognized" laboratory is any State Highway, Bureau of Public Roads, or cement and concrete laboratory regularly inspected by the Cement Reference Laboratory of the National Bureau of Standards.

46.2.10 Retarding Agent:

46.2.10.1 The Contractor will be permitted to use an approved retarding agent in bridge deck concrete. Purpose of retarding agent is to retain workability of concrete for a longer period of time, which may aid finishing operations.

46.3.10.6 The following shall be added to Paragraph 46.3.10.6:

"Unless otherwise specified on plans, ordinary surface finish shall be applied to all exposed surfaces of concrete arch and box culverts, headwalls, inlet boxes, paving drains and irrigation structures."

All costs incidental to the foregoing requirements shall be included in the original contract unit price for Item 46.

May 18, 1955

REV. OF ITEM 53

CORRUGATED METAL CULVERT PIPE

This item shall conform to the requirements of Item 53 of the Standard Specifications except for the following:

For culverts to be placed in less than 30 foot fills, preformed elliptical pipe having 5% elongation will be an acceptable alternate for "Strutting of Culverts" as required by Section 53.3.3 of the Standard Specifications.

September 9, 1957

REV. OF ITEM 57

MULTIPLE PLATE CORRUGATED METAL PIPE CULVERTS

This item shall conform to the requirements of Item 57 of the Standard Specifications except for the following:

Preformed elliptical multiple plate corrugated metal pipe culverts having 5% elongation will be an acceptable alternate for "Strutting" as required by Section 57.3.3 of the Standard Specifications.

April 17, 1956

REVISION OF ITEM 61  
STEEL PILING

Steel piling on this project shall conform to the requirements of Item 61 of the Standard Specifications except as modified below:

Paragraph 61.1 is revised to read as follows:

61.1 DESCRIPTION: This item shall consist of furnishing and driving structural steel shapes or closed end steel pipe piles of the type and dimensions shown on the plans. The steel pipe piles shall be filled with concrete. All work performed under this item shall conform to the lines, grades, dimensions and notes shown on the plans and shall be in accordance with the Standard Specifications, as modified by these Special Provisions.

Paragraph 61.2 is replaced by the following:

61.2 MATERIALS:

61.2.1 Structural steel shapes used in piling shall conform to the requirements of Item 41 and 48 of the Specifications.

61.2.2 All steel pipe piles shall be closed end shells, detailed or described on the plans. The steel used in the piling shall meet the requirements of A.S.T.M. Specification A 252 Grade 2.

61.2.3 All concrete placed in pipe piles shall conform to the requirements of Item 46 for Class "A" Concrete.

Paragraph 61.3.1 is replaced by the following:

61.3.1 PILE LENGTHS:

61.3.1 Minimum length of piling to be ordered shall be the driving lengths shown on plans except that driving lengths of over 40 feet shall be ordered in 30 to 50 foot lengths. All cuts at splices are to be made normal to the longitudinal axis of the pile. The cut-off portion may be driven to start the next pile or it may be welded to previously driven piling to provide necessary extension length. All welds shall be 100% penetration butt welds. Penetration from one side only will be permissible. They may be made either on the ground, before the driving starts, or may be made at the leads to extend piles already partially driven.

61.3.1.1 When test piles are required on plans, the Contractor shall not order the general run piling until after the test piles have been driven. The Engineer will determine final lengths of pile required from bearing values developed during the driving of the test piles.

(Continued)

April 17, 1956

- 2 -

REVISION OF ITEM 61  
STEEL PILING

Paragraph 61.3.3.1 is replaced by the following:

61.3.3.1 Gravity hammers will not be allowed in the driving of steel piling. Steam hammers of approved weight and type may be used and must be able to develop an energy per blow, at each full stroke of the piston, of not less than fifteen thousand (15,000) foot pounds. Combustion type pile hammers developing a minimum driving force of twelve thousand (12,000) foot pounds may be used in lieu of the steam hammer. All pile drivers shall be provided with adequate leads which will insure proper position for the pile in place.

A cast steel driving head shall be used for driving steel piles. A steel driving head properly designed to support the rim of the shell and distribute the hammer blow, provided with a satisfactory cushion block, shall be used in the driving of steel pipe piles. In case the pile top folds, corrugates, or is otherwise damaged under the impact of the hammer blow, the Contractor will be required to cut off the damaged portion. When steel pipe piles are being used, the Contractor shall provide a suitable device for lighting the inside of the pipe for inspection. When the pile is completely in place, any water or foreign substance shall be removed and the shell then filled with concrete.

Paragraphs 61.4 and 61.5 are replaced by the following:

61.4 METHOD OF MEASUREMENT:

61.4.1 The quantity to be paid for under this item shall be the number of linear feet of steel piles or steel pipe piles, as the case may be, including test piles driven in place and accepted, and remaining in place as part of the permanent structure.

61.4.2 The length of pile cut-off to be paid for will be restricted to those random lengths of piling less than six (6) feet in total length which result from cutting off the tops of driven piles. The length measured shall be taken to the nearest foot. Where piling is driven within one (1) foot of the elevation of cut-off, the butt end which is damaged in driving operations, shall be included in the length measured for payment as piling actually placed.

61.5 BASIS OF PAYMENT:

61.5.1 The quantity determined as provided in Paragraph 61.4 shall be paid for at the contract unit price per linear foot for "Steel Piling" or "Steel Pipe Piling," as the case may be, complete in place, which price and payment shall be full compensation for furnishing, hauling, driving, cutting-off, finishing, the repair of damage, replacement of materials damaged, concrete for filling steel pipe piling, and for all material, labor, equipment, supplies, tools and work necessary to complete the item. Swaybracing, pile head caps, or any steel parts fastened to the piles in the completed structure will be paid for under Item 48

(Continued)

- 3 -

REVISION OF ITEM 61  
STEEL PILING

or other appropriate items of these Specifications. Payment shall not be made for any piles driven out of place, or any imperfect piles, or for piles which are damaged in handling or driving, if such injury or misdriving is determined to be the Contractor's responsibility.

61.5.2 The portion of piles, six (6) feet or less in length, which have been cut off and not driven as described above, will be paid for at the actual unit bid price less twenty (20) per cent and shall become the property of the Contractor. Lengths over six (6) feet will be handled in the manner provided in Paragraph 9.3.1 of the Specifications.

61.5.3 It is the intent of this Specification to reduce waste in steel piling items to a minimum by utilizing all material in an efficient manner. For that reason, splices will be paid for in addition to the prices paid per linear foot for the several types of piling. An additional payment equal to the price of two (2) linear feet of piling will be made for each welded splice. If piling is cut and welded, for the Contractor's convenience, no additional payment will be made for the weld.

61.5.4 Where jetting, blasting or other work not covered above is authorized to obtain the specified penetration of piling, the methods to be used and the basis of payment shall be determined as provided under Paragraph 4.5 of the Specifications.

October 31, 1955

REV. OF ITEM 63GROUTED RUBBLE SLOPE AND DITCH PAVING

This item shall conform to the requirements of Item 63 of the Standard Specifications except for the following modifications:

Paragraphs 63.4 and 63.5 of the Standard Specifications are hereby deleted and the following substituted:

63.4 METHOD OF MEASUREMENT:

63.4.1 The yardage to be paid for shall be the number of cubic yards of Grouted Rubble Slope and Ditch Paving complete in place and accepted.

63.4.2 The prismatic formula as described in Section 1, Paragraph 17 of the Standard Specifications, shall be used in computing the volume.

63.5 BASIS OF PAYMENT:

The yardage determined as provided above shall be paid for at the contract unit price per cubic yard for "Grouted Rubble Slope and Ditch Paving" which price and payment shall be full compensation for furnishing, hauling and placing the stone, including the necessary backfilling, and for all labor, equipment, tools, supplies and incidentals necessary to complete the item, except Structural Excavation.

September 9, 1957

REVISION OF ITEM 78  
COLORADO PROJECT NO. F 005-3(11)

This item shall conform to the requirements of Item 78 of the Standard Specifications.

Paragraphs 78.4.1 and 78.5.2 shall be revised to include "Walk Gates (Chain Link)" and "Chain Link Wire Mesh Fence (9 Ft.)."

September 9, 1957

REV. OF ITEM 90

ELECTRICAL CONDUIT WITH JUNCTION BOXES

This item shall conform to the requirements of the Standard Specifications for Item 90, with the following changes and additions:

The nominal inside diameter of the conduit shall be as shown on plans.

In all cases where the distance from the end of the conduit to a junction box, or the distance between junction boxes, is more than one hundred (100) feet, a No. 9 iron wire shall be placed in the conduit as it is laid, and left there for cable pulling purposes.

The junction boxes shall be of galvanized steel, eight (8) inches square and five (5) inches deep, with weatherproof covers fastened with Allen head screws. Knockouts in the sides, backs and covers shall be provided as required. The knockouts in the sides shall be centered one and three-fourths (1 3/4) inches from the back and two (2) inches from the corner.

The cost of the foregoing requirements shall be included in the original contract unit price for Item 90.

September 9, 1957

ITEM 122 - 6" PLASTIC PIPE

COLORADO PROJECT NO. F 005-3(11)

DESCRIPTION:

This item shall consist of supplying and installing 6" Plastic Pipe, complete with all connections and fittings in accordance with these specifications, at location shown on the plans or designated by the Engineer.

MATERIALS:

The pipe and fittings shall be Carlon, Type LC-600 or a suitable equivalent, approved by the Engineer. Solvent welding materials used in making joints and installing fittings shall be as supplied and recommended by the manufacturer.

CONSTRUCTION METHODS:

All joints, fittings and laying of the pipe shall be done in accordance with the manufacturer's recommendations. After installation, the pipe shall be thoroughly checked for leaks. Any leaking joints shall be cut out and a new coupling installed.

Backfilling shall be done during the coolest part of the day, and special care shall be taken that the backfill material shall include no large clods or stones that may damage the pipe.

BASIS OF PAYMENT:

This item shall be paid for at the contract unit price per linear foot for "6" Plastic Pipe," complete in place, which price and payment shall be full compensation for supplying and installing the pipe complete with all necessary fittings, for all hauling, labor, materials, equipment, tools, supplies and work incidental thereto except Structure Backfill and Structural Excavation which will be paid for under appropriate items.

June 7, 1955

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AFFIDAVIT RELATIVE TO COLLUSION

The Contractor on this project will be required to conform with the requirements of Section 17(b) of the 1954 Federal Highway Act regarding contracts and as described in the paragraph below.

"Section 17(b) of the Federal-Aid Highway Act of 1954 requires as a condition precedent to approval by the Commissioner of Public Roads of the contract for this work that the Contractor file a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with such contract. This sworn statement shall be in the form of an affidavit executed and sworn to by the successful bidder before such persons as are authorized by the laws of the State to administer oaths. The original of such sworn statement shall be filed with the State Highway Department prior to the award of the contract."

Affidavit forms are available from this Department.

CONSTRUCTION ACROSS NATIONAL FOREST LAND  
(REQUIREMENTS OF FOREST USE PERMIT)

In all places where this project traverses National Forest Land, the Contractor shall do his work in accordance with the following requirements:

1. Trees or shrubbery on National Forest Land may be removed or destroyed only after the forest officer in charge has approved, and had marked or otherwise designated that which may be removed or destroyed. Merchantable timber cut must be paid for by the Contractor. Trees, shrubs and other plants may be planted in such manner and in such places about the premises as may be approved by the forest officer in charge.
2. The Contractor shall maintain the improvements and premises to standard of repair, orderliness, neatness, sanitation and safety acceptable to the forest officer in charge.
3. The Contractor shall comply with the regulations of the Department of Agriculture and all Federal, State, County, and municipal laws, ordinances, or regulations which are applicable to the area.
4. The Contractor shall take all reasonable precautions to prevent and suppress forest fires. No material shall be disposed of by burning in open fires during the closed season established by law or regulation without a written permit from the forest officer in charge or his authorized agent.
5. The Contractor shall fully repair all damage, other than ordinary wear and tear, to national forest roads and trails caused by construction operations in the exercise of the privilege granted by Forest Use Permit.
6. The Contractor shall take all reasonable precautions to avoid damage to property and resources of the United States, and diligently to undertake suppression action in the event of fire resulting from the exercise of the privileges herein granted.
7. Any Forest Service improvements, such as entrance portals, fences, camp ground or picnic units, barriers, etc., if disturbed, will be replaced at no expense to the Forest Service.
8. The Contractor shall not discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and shall include in all subcontracts a provision imposing a like obligation on subcontractors.
9. All use of construction equipment will be confined to the clearing or right of way, unless otherwise agreed to by the Forest Supervisor or his representative.
10. All material pits will have the top soil stripped off at the beginning of the work, and replaced and spread over the bared area at its conclusion.
11. The temporary use and occupancy of the premises and improvements herein described may not be sublet by the Contractor to third parties without the prior written approval of the forest supervisor and the Contractor shall continue to be responsible for compliance with all conditions of Forest Use Permit by persons to whom such premises may be sublet.
12. None of the conditions of Forest Use Permit as set forth herein can be varied or modified, except with the written consent of the Forest Supervisor.
13. All costs incidental to the foregoing requirements shall be included in the original contract unit prices for the project.

September 2, 1948

COOPERATION OF CONTRACTORS

The attention of the Contractor is invited to the fact that the Department anticipates construction activities adjacent to and within the limits of this project in addition to the work under this contract. The Contractor for this project will be required to arrange his work so that no delay to other construction work within the limits of the project will result. The Contractor will at all times be required to cooperate with other construction agencies in the moving of their equipment over or around this project.

All cost incidental to these conditions shall be included in the original contract unit prices for this project.

March 13, 1953

DISPOSAL OF OIL PROCESSED SURFACING

The present oil processed surfacing in proposed construction areas lying below the elevation of the base of proposed surfacing course shall be thoroughly plowed, broken up and mixed with an equal thickness of the underlying soil. This material shall then be consolidated in accordance with the specifications for Embankments. Where the present oil processed surfacing lies above the elevation of the base of proposed surfacing course, the oil processing shall be thoroughly plowed and broken up, and removed to embankment areas to be consolidated with other embankment materials. All oil processed surfacing shall be broken into pieces with a maximum dimension of six (6) inches.

Consolidation of oil processed surfacing shall be in conformity with requirements of Items 13, 15 and 17 of the Standard Specifications.

The cost of plowing, breaking and mixing of oil processed material with underlying soil will not be paid for as a separate item but shall be considered as subsidiary work pertaining to construction of subgrade, and shall be included in the original contract prices for the project.

Wetting and compaction required after completion of the plowing, breaking and mixing of oil processed surfacing will be paid for as provided under Item 17 of the Standard Specifications.

April 26, 1955

EXEMPTION FROM TON-MILE TAXES

Publicly owned vehicles and Contractor's vehicles operating within the confines of construction projects are exempted from the payment of ton-mile taxes under Senate Bill 213 of the Fortieth General Assembly in its First Regular Session.

The confines of this project as exempted under Senate Bill 213 are defined as including all sources of earthen or mineral aggregates and water for use on this project, and the connecting roads or areas between the project and such sources.

PROTECTION OF UTILITIES

The Contractor's attention is directed to the fact that utilities encroach on the construction of this project, and also to the importance of protecting all public utilities encountered on this project. These may include telephone, telegraph and power lines, water lines, sewer lines, gas lines, railroad tracks, and other overhead and underground utilities.

Before any excavation is begun in the vicinity of water lines, railroad tracks or structures, sewer lines, gas lines or telephone conduits, each utility company concerned must be notified in advance of such excavation, and such excavation shall not be made until an authorized representative of the utility company concerned is on the ground.

The Contractor shall be held liable for all damages to any and all public utilities encountered on the project, which damages are due to the Contractor's operations. Such damages shall include all physical damages to utilities and also all damages due to interruption of service of such utilities, when such damages and interruptions are caused by Contractor's operations.

Where alterations or moving of utilities is not required to permit construction of new highway improvement, the Contractor shall take such measure as the Engineer may direct in properly protecting these utilities throughout his construction operations and shall cooperate at all times with the proper authorities and/or owners in maintaining service of railroads, conduits, pole lines, transmission lines, pipe lines, sewers, etc., affected by this project.

The cost of damages due to Contractor's operation or cost of protecting utilities where alteration or moving is not required to permit construction of highway improvement shall be included in the original contract prices for the project.

Should any pipe lines, water lines or gas mains, electrical conduits, sewer pipes, overhead wiring, telephone lines, telegraph lines, power lines, or any other such utilities, not specifically mentioned and provided for elsewhere as a part of this contract, have to be moved, repaired, reconditioned or revised due to the road construction or moved temporarily to permit construction of project, the party or parties owning or operating such utilities shall perform the actual work of moving, repairing, reconditioning, or revising such utilities. The cost of this work shall be borne by the utility companies involved, unless other agreements are reached with the Department.

September 9, 1957

PROVISIONS FOR TRAFFIC DURING CONSTRUCTIONCOLORADO PROJECT NO. F 005-3(11)

The detour for this project lies along the present traveled road except where detours are designated on plans. At all places on the project where the new work lies along the present traveled road, the Contractor shall, at his own expense, prosecute construction in such manner that traffic may readily pass over the road. Also, the Contractor shall maintain in safe condition and at his own expense all temporary approaches to and crossings of intersecting roads.

Where designated on plans, traffic will be served by detour roadways in accordance with plan details. Through traffic will be required to use these detours throughout construction. The Contractor will be required to cooperate with the Department in order that the highway will not be closed to local traffic. Local traffic shall be adequately provided for at the Contractor's expense.

During and after surfacing operations, weather conditions and traffic may require wetting and rolling to conserve the fine material, preserve the evenness of the surface and abate the dust nuisance and traffic hazard. The Contractor will be required to do this wetting and rolling as ordered by the Engineer, all such work being paid for at the contract prices for the items involved.

The Contractor shall prosecute construction in such manner that any detours that cross Clear Creek will be removed by May 1, 1958 in order to prevent any flood damage by high water.

Before proceeding with construction, the Contractor must obtain from the Engineer written approval of the proposed methods of handling traffic during construction.

SALES TAX REFUND ON CONSTRUCTION MATERIALS

Pursuant to the law and regulations of the Department of Revenue, it is the policy of the Department of Highways to make claim for refund of all State sales and use taxes paid on materials purchased for and incorporated in highways and structures constructed under this contract.

Claim will be made for sales and use taxes paid on the following materials which are incorporated in this project:

- Structural and Reinforcing Steel
- Bituminous Materials
- Cement
- Premixed Concrete
- Culvert and Underdrain Pipe
- Lumber
- Piling
- Fencing
- Commercial Aggregates
- Cribbing
- Guard Fence
- Manholes (Rings, Covers, Etc.)
- Gratings and Frames
- All other materials not listed above, actually incorporated in the completed work.

The Contractor or his sub-contractors will be required to file with the Engineer upon completion of this project, if completion time allowed under this contract is 300 calendar days or less, a certificate (Form DR-513), as attached hereto, stating that he has paid State sales and use taxes on tangible property built into the road and structures under this contract. If the completion time allowed under this contract is in excess of 300 calendar days, the Contractor or his sub-contractors will be required to file appropriate DR-513 Forms with the Engineer at nine (9) month intervals during the course of the contract.

Additional copies of Form DR-513 are available from the Resident Engineer, District Offices and the Denver Headquarters Office.

CONTRACTOR'S CERTIFICATE

STATE OF COLORADO )  
 ) ss  
COUNTY OF \_\_\_\_\_ )

I, \_\_\_\_\_, of lawful age, being first duly sworn, depose and state: That I am the \_\_\_\_\_ of the \_\_\_\_\_ (Title) \_\_\_\_\_, contractor for the construction of a Highway, Structures, Tunnel, Buildings, Etc., for Colorado Department of Highways, in the County of \_\_\_\_\_, State of Colorado; Project No. \_\_\_\_\_, located between \_\_\_\_\_ and \_\_\_\_\_.

That sales and use tax in the amount of \$ \_\_\_\_\_, which said Department of Highways seeks to have refunded, was paid by said contractor, or his sub-contractor, between the dates of \_\_\_\_\_, 19\_\_\_\_, and \_\_\_\_\_, 19\_\_\_\_; that the tangible personal property upon which said tax was paid was built into the above-mentioned Project No. \_\_\_\_\_.

Affiant further states that the books, records and other substantiating evidence of payment of said taxes are located and kept at \_\_\_\_\_ (Office Address) \_\_\_\_\_, in said County and State; and that the same are open to inspection by the Colorado Department of Revenue.

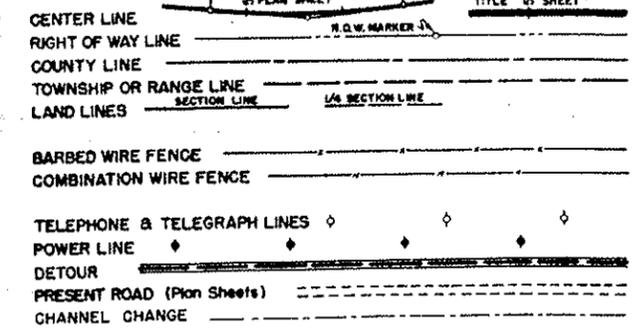
\_\_\_\_\_  
Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_.  
My commission expires \_\_\_\_\_.

\_\_\_\_\_  
Notary Public

# COLORADO DEPARTMENT OF HIGHWAYS

## PLAN AND PROFILE OF PROPOSED FEDERAL AID PROJECT NO. F 005-3 (II) STATE HIGHWAY NO. 2 CLEAR CREEK COUNTY

### CONVENTIONAL SIGNS

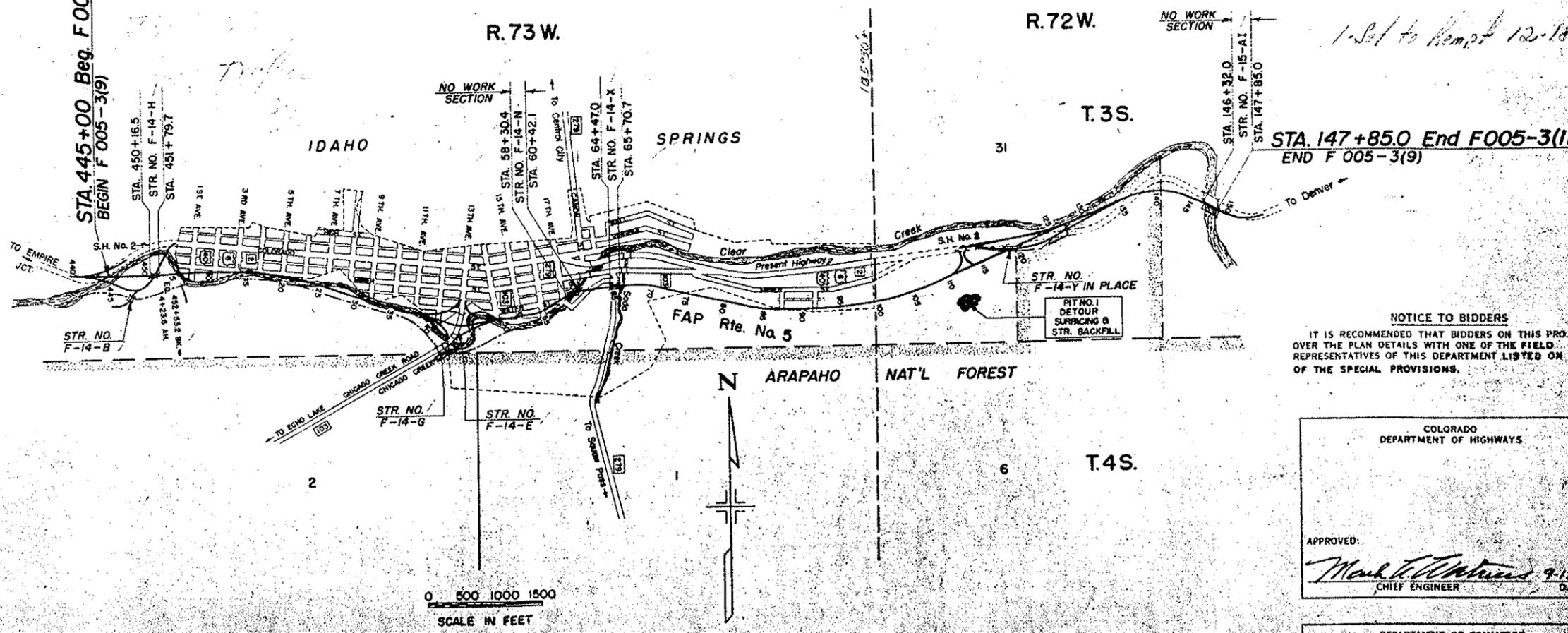


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  - 5. GENERAL NOTES, TABULATION OF LENGTH AND DESIGN AND-RIGHT OF WAY MARKERS.
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24a  
25a  
25b } DETAILS OF STR. NO. F-14-B, STA. 7+ ON "Y" LINE.

### SCALES OF ORIGINAL DRAWINGS

ON PLAN. 1 IN. = 50 FT.  
ON PROFILE. 1 IN. = 50 FT. HORIZONTAL  
1 IN. = 5 FT. EXCEPT SHEET NO. 71 = 10 FT.  
GRADE LINE ON PROFILE IS SHOWN AS GRADE OF FINISHED ROAD  
GROSS LENGTH OF PROJECT 15,154.3 FT. = 2.870 MI.  
NET LENGTH OF PROJECT 14,789.6 FT. = 2.801 MI.



*R.C. Hepper, Resident Engr.*  
*Z.H. Lindermilk, Inc., Contractor*  
1957-1958

*1-Set to Rempt 12-18*

STA. 147+85.0 End F005-3(II)  
END F 005-3(9)

**NOTICE TO BIDDERS**  
IT IS RECOMMENDED THAT BIDDERS ON THIS PROJECT OVER THE PLAN DETAILS WITH ONE OF THE FIELD REPRESENTATIVES OF THIS DEPARTMENT LISTED ON OF THE SPECIAL PROVISIONS.

COLORADO  
DEPARTMENT OF HIGHWAYS

APPROVED:  
*Mark T. Williams*  
CHIEF ENGINEER

DEPARTMENT OF COMMERCE  
BUREAU OF PUBLIC ROADS

APPROVED:  
DIVISION ENGINEER

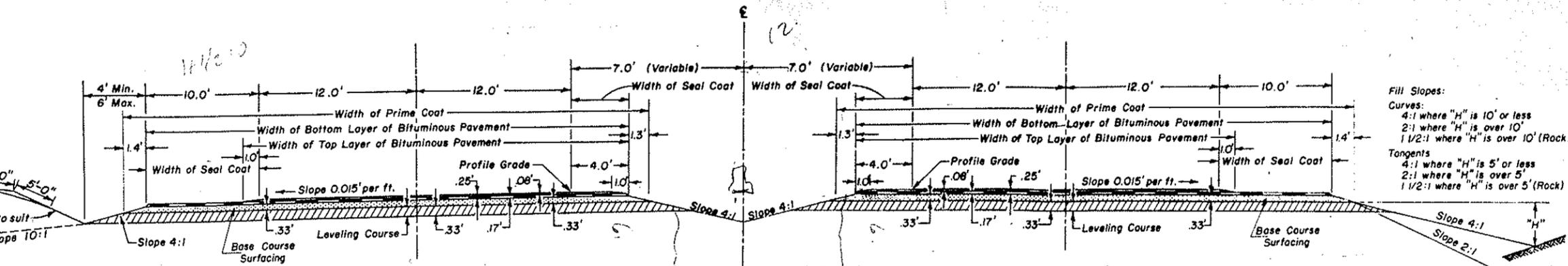
# TYPICAL CROSS SECTION OF IMPROVEMENT

## TABULATION OF TYPICAL SECTIONS

STATION	SECTION	MEDIAN WIDTH
445+00 — 52+54.4	A	14'
52+54.4 — 57+44.0	Transition A to B	Variable
57+44.0 — 97+27.0	B	* 6'
97+27.0 — 112+37.0	B	Variable
112+37.0 — 120+50.0	B	* 12'
120+50.0 — 135+04.1	A	14'
135+04.1 — 146+19.0 Bk.	A	Variable
146+07.1 Ah — 147+85.0	A	30'

\* Face to face of Median Curb

NOTE: All work above Sub-grade is for Future Construction.



SECTION A

Fill Slopes:  
Curves:  
4:1 where "H" is 10' or less  
2:1 where "H" is over 10'  
1 1/2:1 where "H" is over 10' (Rock)  
Tangents:  
4:1 where "H" is 5' or less  
2:1 where "H" is over 5'  
1 1/2:1 where "H" is over 5' (Rock)

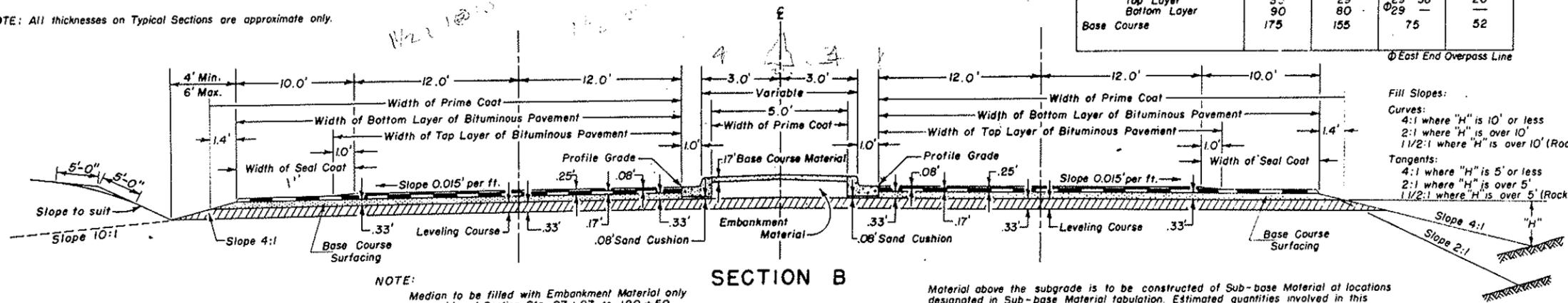
NOTE: Bottom Layer of Bituminous Surfacing shall be completed for full width before Top Layer of Bituminous Surfacing is placed. Paving joints in Top Layer will overlap min. 1 ft. over joints in Bottom Layer.

NOTE: All thicknesses on Typical Sections are approximate only.

Approximate 7" compacted thickness of Gravel or Crushed Rock Surfacing shall be placed in separate courses at the following rates per 100 lin. ft. of roadway

	SECTION A	SECTION B	FRONTAGE ROADS	RAMPS
Bituminous Pavement Top Layer	33	29	29	38
Bottom Layer	90	80	29	26
Base Course	175	155	75	52

ϕ East End Overpass Line



SECTION B

Fill Slopes:  
Curves:  
4:1 where "H" is 10' or less  
2:1 where "H" is over 10'  
1 1/2:1 where "H" is over 10' (Rock)  
Tangents:  
4:1 where "H" is 5' or less  
2:1 where "H" is over 5'  
1 1/2:1 where "H" is over 5' (Rock)

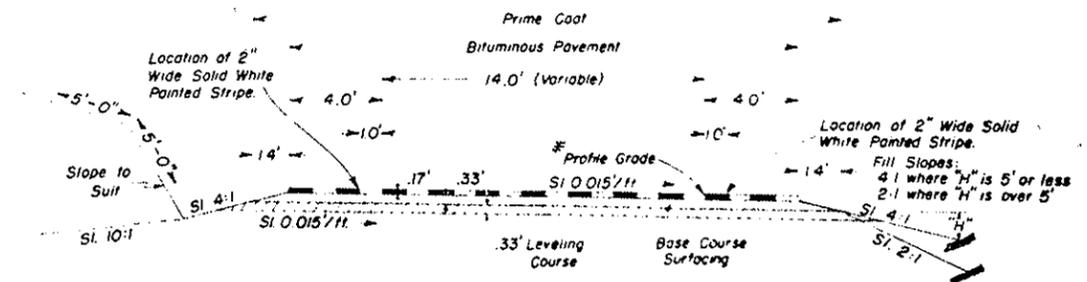
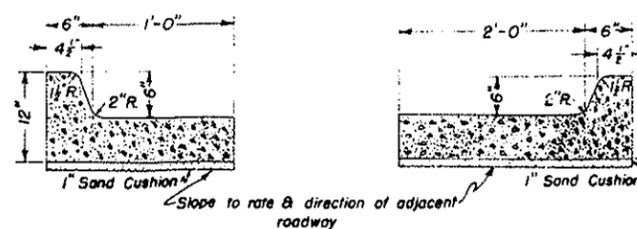
NOTE: Median to be filled with Embankment Material only over widened Section Sta. 97+27 to 120+50

Material above the subgrade is to be constructed of Sub-base Material at locations designated in Sub-base Material tabulation. Estimated quantities involved in this operation and thickness of material required are tabulated in the Sub-base Material plan.

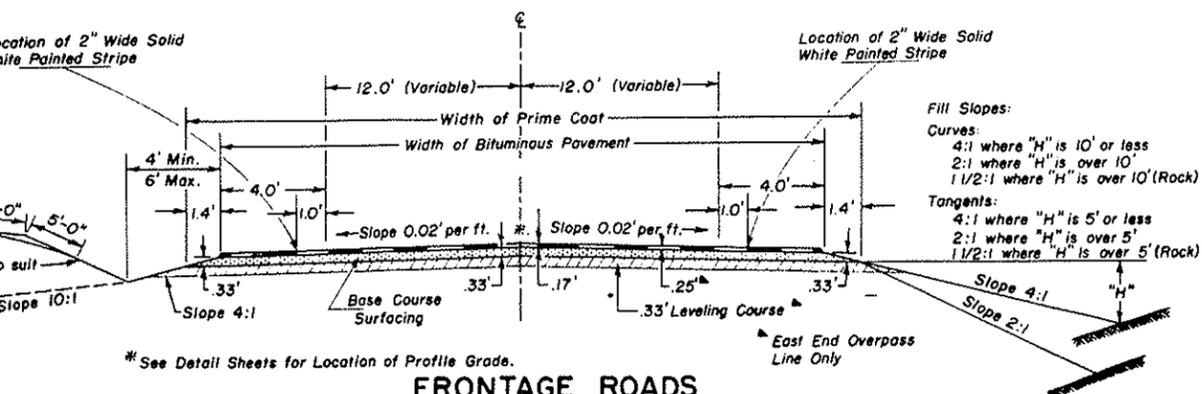
NOTE: See Standard M-2-EM for Details of Cut Slope Treatment, Flaring and Widening.

## RAMP

## DETAILS OF CONCRETE COMBINATION CURB AND GUTTER (FUTURE CONSTR.)



\* This section for Ramps on Rt side of Project. This section shall be opposite hand for Ramps on Lt, except "X" line ramp which will be as above, but with Profile Grade on Lt.



## FRONTAGE ROADS S.H. 103 & EAST END O'PASS LINE

NOTE: Excavation or Borrow below 4:1 slope and/or 10:1 slope will not be permitted.

The depth and width of the side ditch shall be varied where necessary in order to provide proper drainage and/or entrance to drainage structures. Top Course Surfacing shall be applied in two (2) layers on East End Overpass Line.

## SURFACING PLAN

*It is estimated that Sub-Base Material and Surfacing for this project are available in the vicinity of the pit indicated in the following tabulations.*

*Alteration of the Sub-Base or Surfacing Plan, as here outlined, will be allowed only on written permission from the Department.*

MATERIAL TO BE PLACED	SOURCE	TONS USED				OVERHAUL - TON MILES			
		OUTSIDE IDAHO SPRINGS		INSIDE IDAHO SPRINGS		OUTSIDE IDAHO SPRINGS		INSIDE IDAHO SPRINGS	
		PLANT MIXED	* BASE COURSE	PLANT MIXED	* BASE COURSE	PLANT MIXED	BASE COURSE	PLANT MIXED	BASE COURSE
<i>Approach to Project</i>		756	1046			1746	2414		
<i>Intersection Ramps Sta. 441+ - 452+</i>		659	1224			1456	2705		
445+00 - 450+16.5	Lyons Pit	636	909			1411	2016		
451+79.69 - 452+53.2 Bk		91	130			184	277		
4+23.6 Ah - 5+60.9		169	242	971	1389	657	511	1965	2810
5+60.9 - 13+50		3192	4568			5435	7778		
13+50 - 39+45	SW 1/4, Sec. 31								
Mt Evans Overpass, Ramps & Road Approach with Accel & Decel Lanes Sta. 52+	T35, R72 W								
				915	1648			1237	2228
39+45 - 55+76	Route of Haul 400' from Sta. 112+37			2006	2871			2613	3739
55+76 - 58+40				288	410			324	461
60+32.5 - 64+47				452	643			462	657
65+70.7 - 74+63				973	1383			852	1210
74+63 - 87+25		1376	956			924	1313		
87+25 - 99+98.91				1380	1975			599	851
99+98.91 - 112+37						261	371		
112+37 - 120+50			1750	1919			136	193	
120+50 - 146+19.0 Bk		886	1260						
146+07.1 Ah - 146+32.0						944	1424		
Intersection Ramps & Approaches Accel & Decel Lanes, Overpass & Frontage Road Sta. 111+ to 145+		2995	4519						
120+50 - 146+19.0 Bk		3159	4520			1454	2138		
146+07.1 Ah - 146+32.0		31	44			25	32		
Approach to Project Estimated for Bridge Widening Estimated for Raised Median		415	598			342	493	91	117
		66	287	88	161	111	81		
From List of Structures		57	148	436	2134	111	289	145	2316
<b>PROJECT TOTAL</b>		<b>15,838</b>	<b>23,370</b>	<b>7,518</b>	<b>12,614</b>	<b>14,945</b>	<b>22,035</b>	<b>8,788</b>	<b>14,389</b>

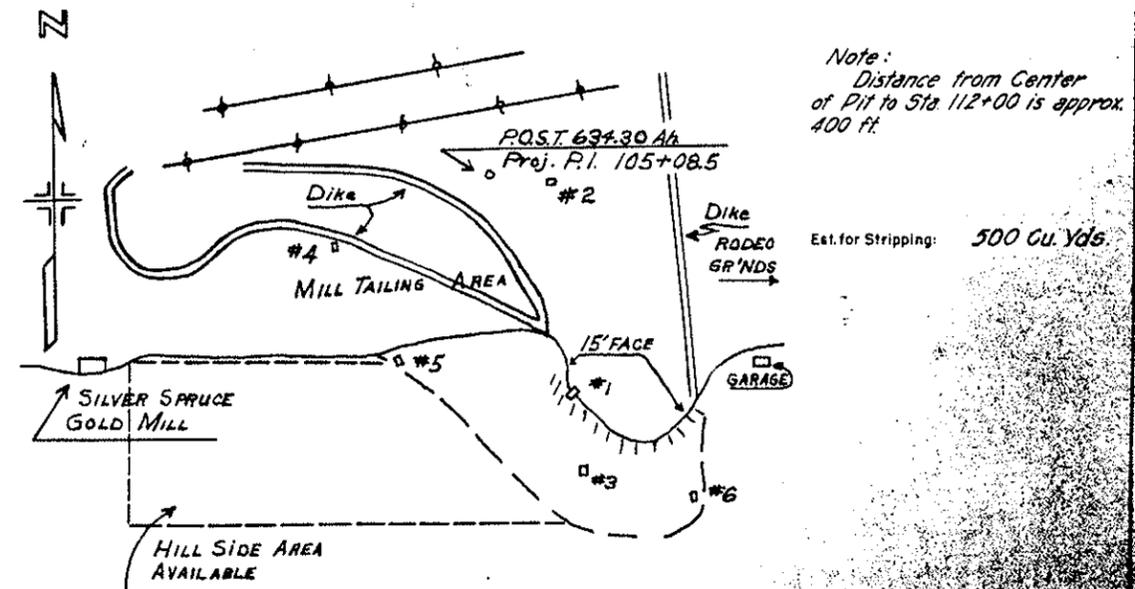
\* Grading "C"

## SUB BASE PLAN

MATERIAL TO BE PLACED	SOURCE	THICKNESS	QUANTITY TONS		OVERHAUL TON MILES	
			OUTSIDE IDAHO SPGS.	INSIDE IDAHO SPGS.	OUTSIDE IDAHO SPGS.	INSIDE IDAHO SPGS.
			Approach to Project	4"	809	
445+00 - 450+16.5	4"	951		2110		
451+79.69 - 452+53.2 Bk	4"	136		290		
442+ - 447+ (Ramp Rt)	4"	348		782		
4+23.6 Ah - 5+60.9	Lyons Pit	4"	253		334	
5+60.9 - 13+50	SW 1/4, Sec. 31	4"	477	1452	2938	
13+50 - 39+45		4"		8130		
Mt Evans Interch. Ramps		4"		1276	1774	
39+45 - 55+76	T35, R72 W	4"		2260	2907	
55+76 - 58+40		4"		468	526	
60+32.5 - 64+47.0		4"		734	750	
65+70.7 - 74+63	Route of Haul 400' from Sta. 112+37	4"		1580	1383	
74+63 - 87+25		4"	2234	1499		
87+25 - 97+27		4"		1774	810	
97+27 - 99+98.91		4"		452	152	
99+98.91 - 112+37		4"	2056		397	
112+37 - 120+50		4"	350		207	
West Bound Ramp & Overpass Line		4"	1150		153	
120+50 - 146+19.0 Bk		4"	4723		2235	
146+07.1 Ah - 146+32.0		4"	46		33	
Approach to Project Estimated for Corr. Irreg. in Subgrade		4"	783		646	
			2021	1000	1896	
<b>SUB-TOTAL</b>			<b>22,226</b>	<b>10,996</b>	<b>20,860</b>	
<b>PROJECT TOTAL</b>			<b>33,222</b>		<b>33,224</b>	

Δ Leveling Course

**PIT NO. 1**  
 DETOUR SURFACING & STRUCTURE BACKFILL  
 LOCATION: S.W. 1/4, SEC. 31, T. 35., R. 27 W.  
 OWNER: C. M. LYONS  
 AVAILABLE: 160,000 CU. YDS.



### TABULATION OF CONCRETE COMBINATION CURB & GUTTER

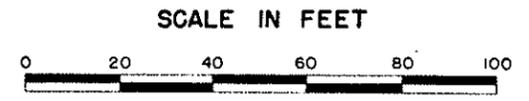
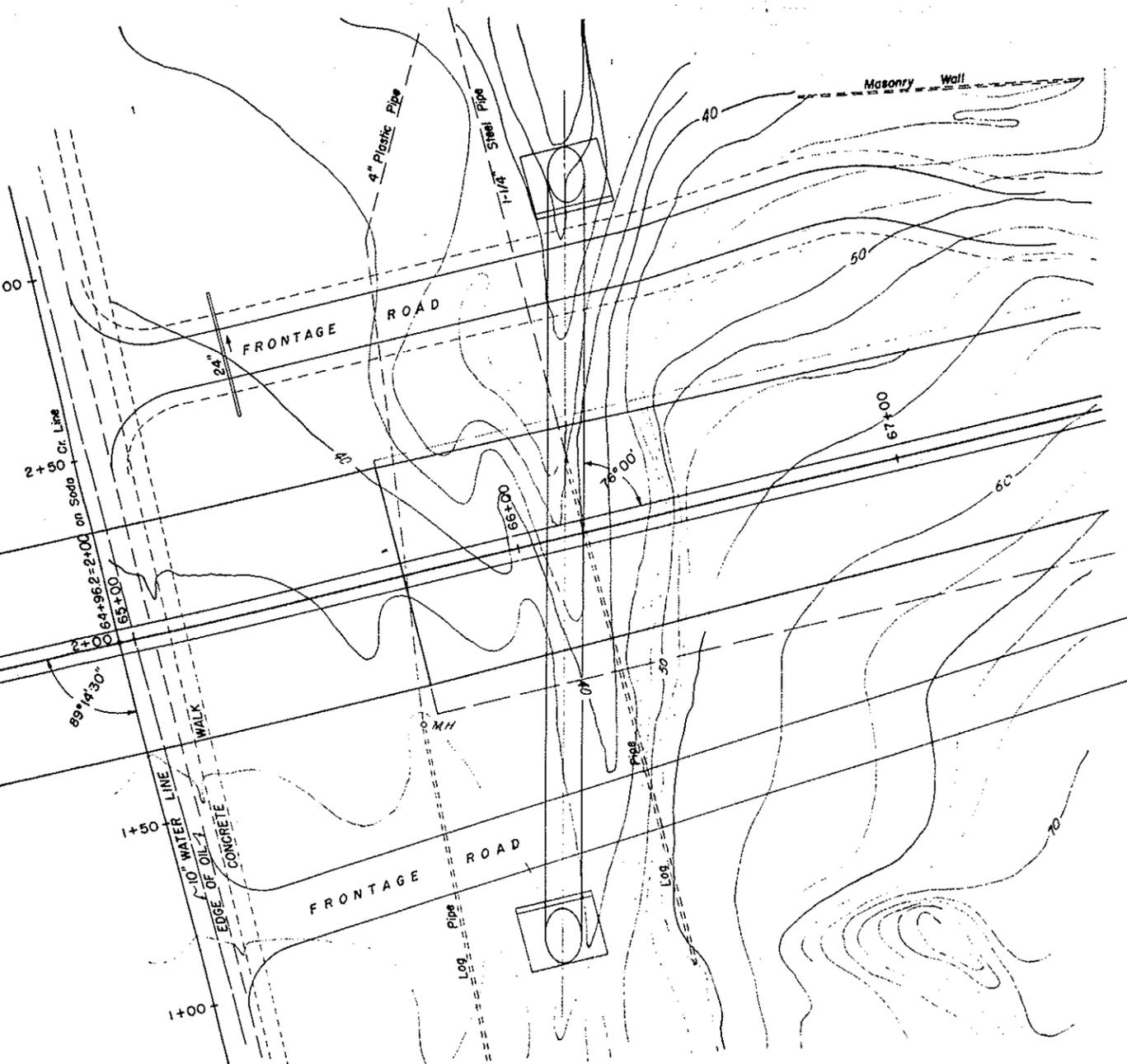
STATION	SIDE	CURB & GUTTER		SAND CUSHION CU. YDS.
		1' GUTTER LIN. FT.	2' GUTTER LIN. FT.	
ISLAND STA. 448+	Rt.		420	
ISLAND STA. 452+	Lt.	10		
ISLANDS STA. 42+	Rt.	208		
ISLAND STA. 44+	Lt.	9		
54+992 to 58+304	Rt. & Lt.	677		
60+42.1 to 64+47.0	Rt. & Lt.	866		
65+70.7 to 120+50	Rt. & Lt.	10,960		
<b>ENTIRE PROJECT</b>		<b>12,909</b>	<b>420</b>	<b>63</b>

### LOG OF PIT

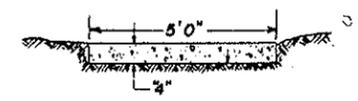
TEST NO.	DEPTH FT.	DESCRIPTION OF TEST HOLE MATERIAL
1	0.0 - 18.0	Disintegrated granite and boulders.
2	0.0 - 2.0	Sand fill, white, mill tailings pond.
2-A	2.0 - 6.0	Mill tailings wet, possible acid content.
2-B	6.0+	Creek bottom boulders.
3	0.0 - 7.0	Dark brown sandy loam & rock (2" to 18")
4	0.0 - 5.0	Mill tailings & rock, dry, in dike.
5	0.0 - 1.0	Sand fill, white.
5-A	1.0 - 5.0	Dark brown, sandy loam & rock (2" to 24").
5-B	5.0 - 6.0	Light brown disintegrated granite & rock, surface elevation 6' lower than No. 3.
6	0.0 - 5.0	Similar to No. 3.
6-A	5.0 - 11.0	Similar to No. 5-B.

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	F 005-3 (11)	12	

# LAYOUT OF 120" X 203' MULTIPLE PLATE CULVERT STA. 66+13

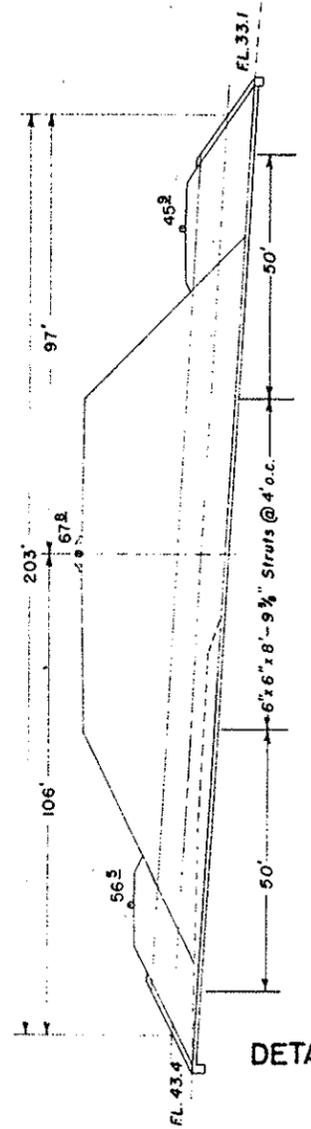


TYPICAL SECTION OF SIDEWALK



On this Structure the longitudinal joints shall be secured with a sufficient number of bolts of adequate strength to develop a joint which will be effective to an ultimate strength of 50,000 lbs/linear foot in shear-tension. In no case, however, shall there be less than four, nor more than eight bolts per linear foot of seam. The number of bolts provided and used shall be identical on all longitudinal joints and over the entire length of each joint. The design as shown is based on a section modulus of .0732 per inch of horizontal projection for No. 10 gage plates and 0.1450 for No. 1 gage plates. Pipes of alternate design having a section modulus equivalent to or greater than that shown above, may be used after approval by the Department, provided that no plate less than No. 10 gage will be used above the invert and that all invert plates shall be No. 1 gage. Arrangement of plates and strutting diagram are shown on Std. M-113-B.

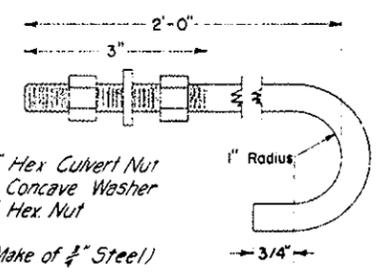
PROFILE



Beginning 50' back from the Top Ends of the pipe, the length of Struts shall be reduced uniformly from 8'-9 1/2" to 8'-6"

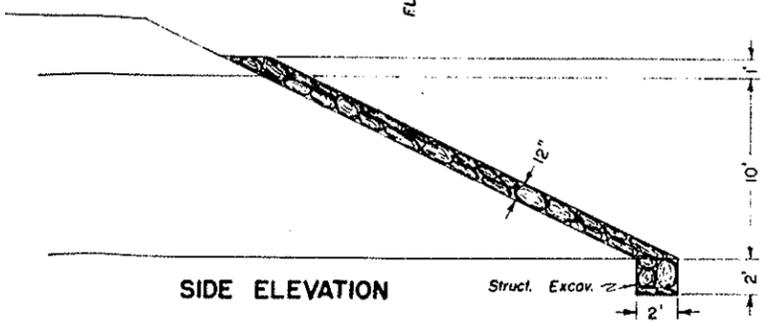
Compression Caps to be 6"X6"X22" thruout  
Upper Sills to be 6"X6" thruout  
Lower Sill to be 6"X6" thruout

DETAIL OF ANCHOR

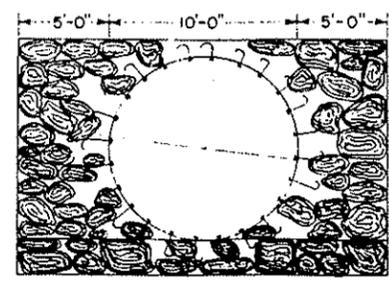


4.4 Anchor bolts to be set approx 2' O.C.  
Anchors to be furnished with pipe and cost of anchor to be included in unit bid price per lin ft. of pipe.

DETAIL OF GROUTED RUBBLE SLOPE & DITCH PAVING



SIDE ELEVATION



END ELEVATION

Note:  
Rt End to be Mitered 1 1/2:1 and Lt End to be Mitered 1 1/2:1. Axis of pipe to be Skewed 76° Lt. of Roadway Centerline.

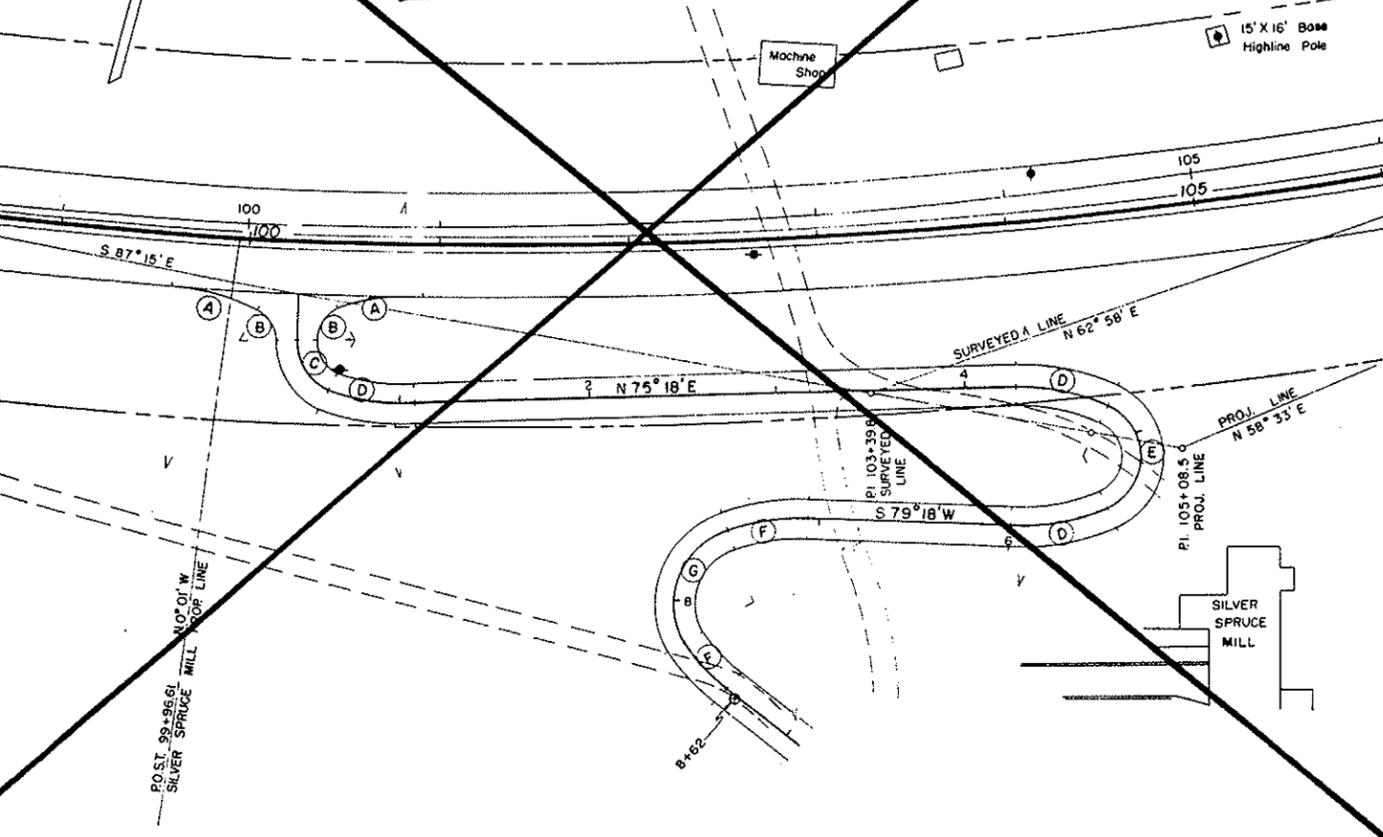
30 Cu Yds Grouted Rubble Slope & Ditch Paving reqd.

FED. ROAD DIST. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	FO05-3(II)	13	

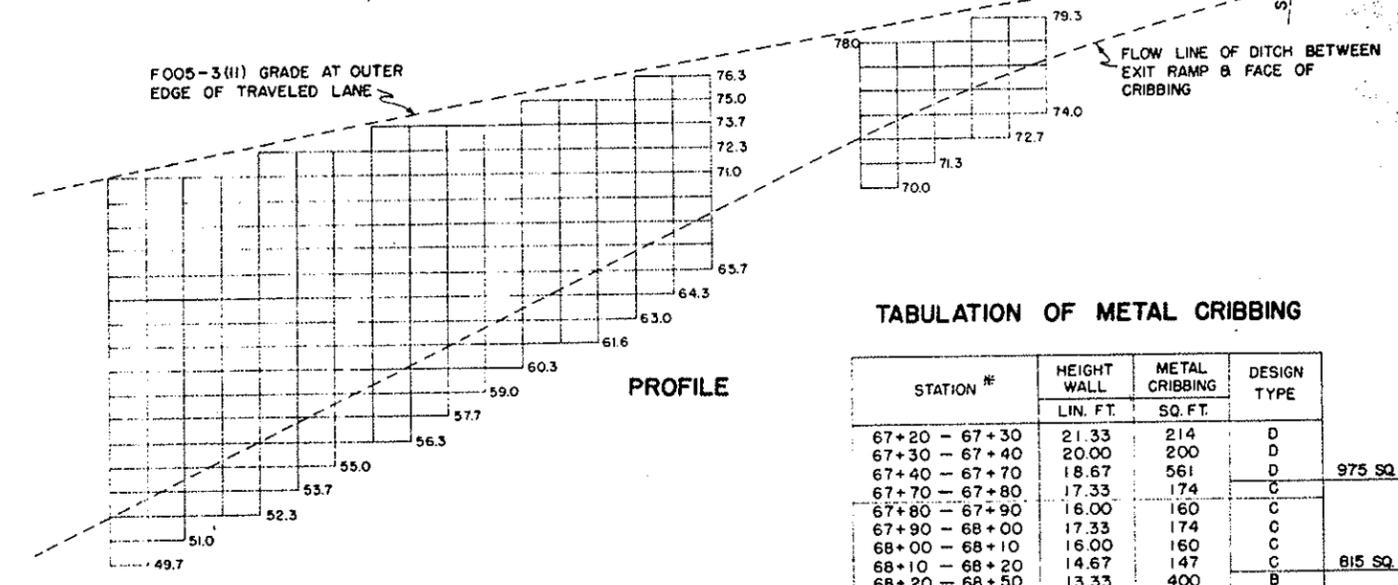
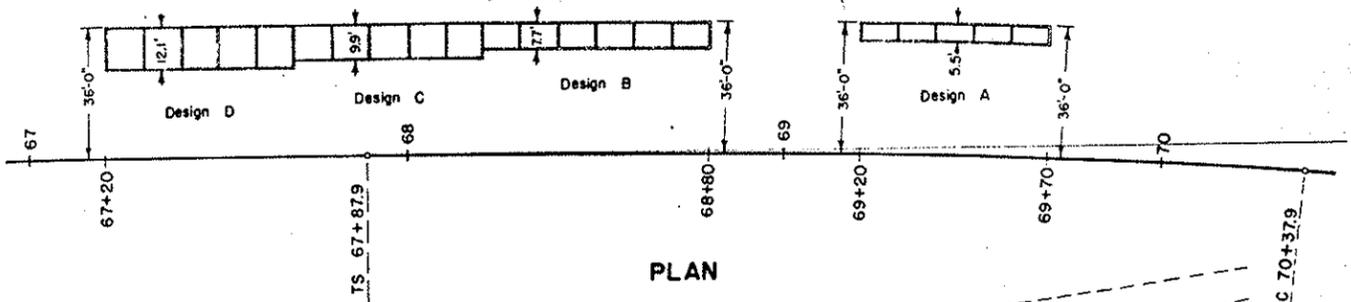
**DETAILS OF MINE ACCESS ROAD STA. 100+**

**TABULATION OF CURVE DATA**

CURVE	Δ	D	T	L	R
A	27°00'	52°54'			100.0'
B	63°00'	152°00'			20.0'
C	63°00'	191°00'	58.9'	33.0'	30.0'
D	27°00'	52°54'	26.1'	51.0'	110.0'
E	130°00'	191°00'	17.7'		30.0'
F	21°45'	52°05'	21.1'	41.8'	110.0'
G	101°30'	143°15'	32.7'	70.9'	40.0'



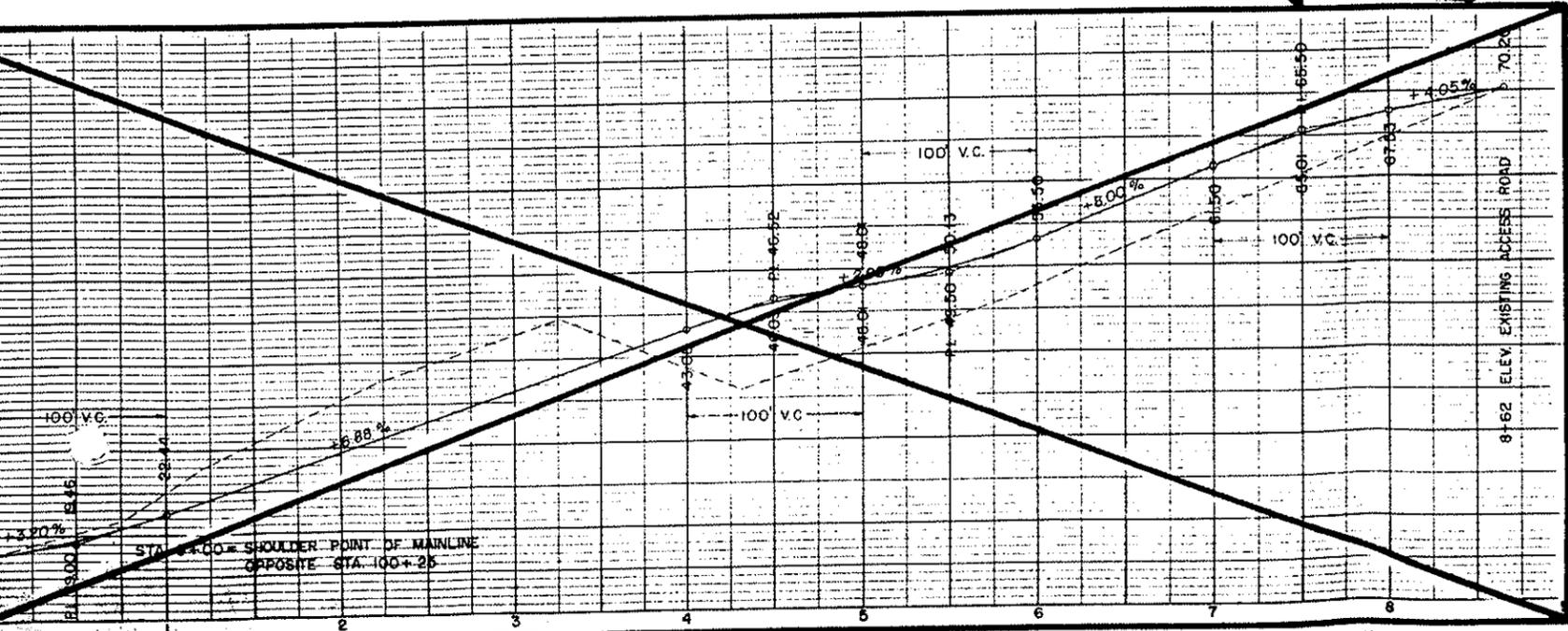
**DETAILS OF METAL CRIBBING STA. 67+ TO 69+**



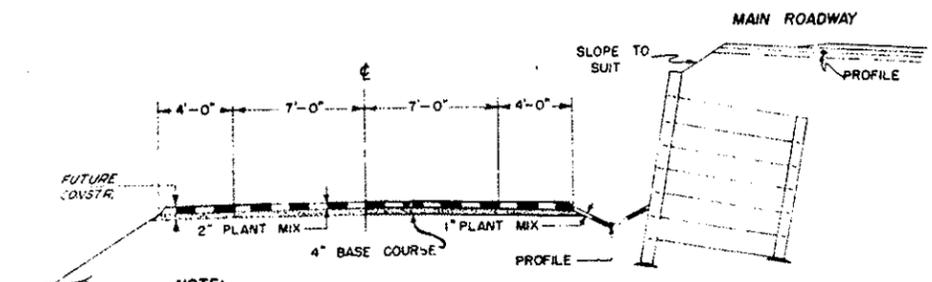
**TABULATION OF METAL CRIBBING**

STATION #	HEIGHT WALL	METAL CRIBBING	DESIGN TYPE	
	LIN. FT.	SQ. FT.		
67+20 - 67+30	21.33	214	D	
67+30 - 67+40	20.00	200	D	975 SQ. FT.
67+40 - 67+70	18.67	561	D	
67+70 - 67+80	17.33	174	C	
67+80 - 67+90	16.00	160	C	
67+90 - 68+00	17.33	174	C	
68+00 - 68+10	16.00	160	C	815 SQ. FT.
68+10 - 68+20	14.67	147	C	
68+20 - 68+50	13.33	400	B	
68+50 - 68+70	12.00	240	B	
68+70 - 68+80	10.67	107	B	747 SQ. FT.
69+20 - 69+30	8.00	80	A	
69+30 - 69+40	6.67	67	A	
69+40 - 69+50	5.33	54	A	
69+50 - 69+60	6.67	67	A	
69+60 - 69+70	5.33	54	A	322 SQ. FT.

\* Stations are approximate and Metal Cribbing shall be located to suit field conditions.

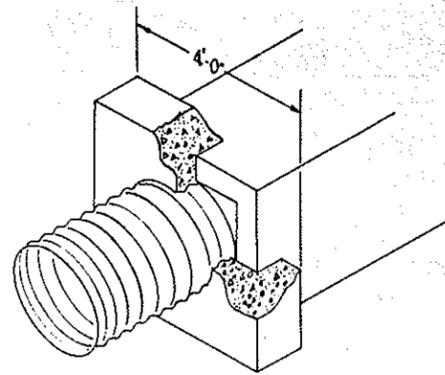
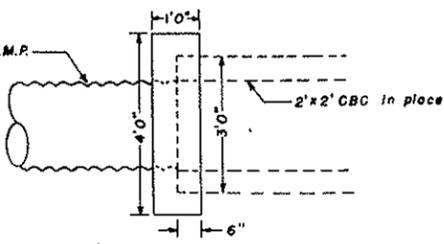


**TYPICAL SECTION**

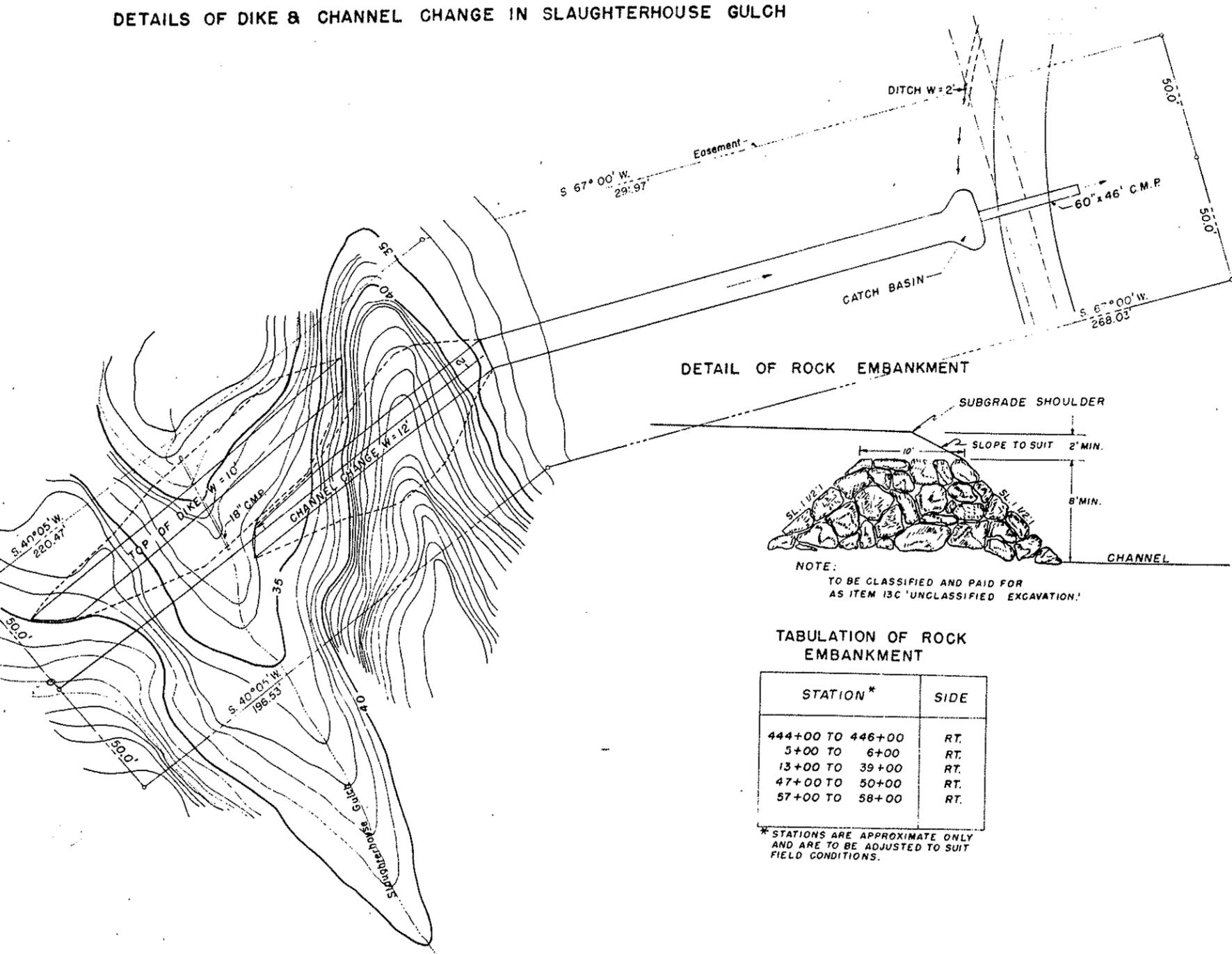


NOTE:  
See Standard M-130-A for details of Construction of Bin Type Metal Cribbing.

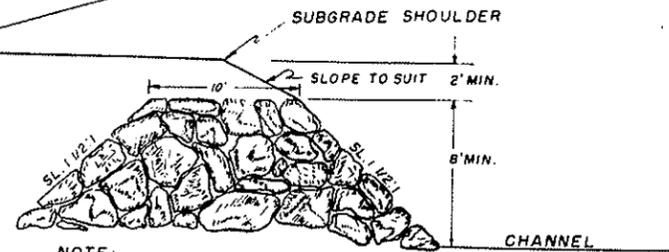
**DETAILS OF CONCRETE CONNECTING BLOCK STA. 87+ & 98+**



**DETAILS OF DIKE & CHANNEL CHANGE IN SLAUGHTERHOUSE GULCH**



**DETAIL OF ROCK EMBANKMENT**



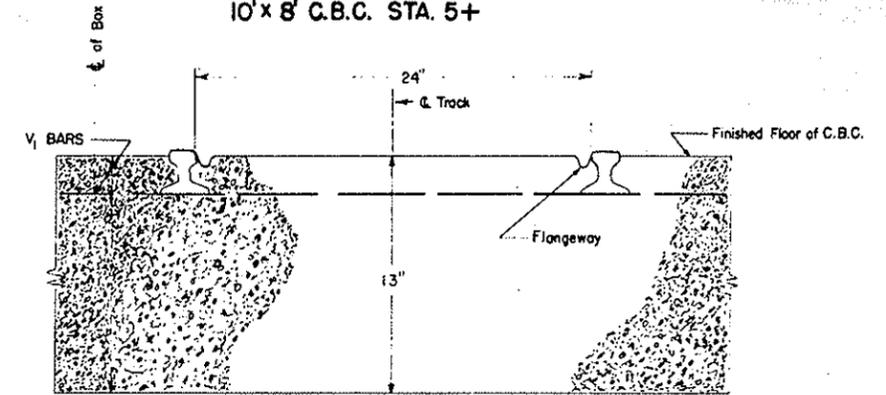
NOTE:  
TO BE CLASSIFIED AND PAID FOR  
AS ITEM 13C 'UNCLASSIFIED EXCAVATION'

**TABULATION OF ROCK EMBANKMENT**

STATION*	SIDE
444+00 TO 446+00	RT.
5+00 TO 6+00	RT.
13+00 TO 39+00	RT.
47+00 TO 50+00	RT.
57+00 TO 58+00	RT.

\* STATIONS ARE APPROXIMATE ONLY  
AND ARE TO BE ADJUSTED TO SUIT  
FIELD CONDITIONS.

**DETAIL OF RAIL INSTALLATION 10'x 8' C.B.C. STA. 5+**



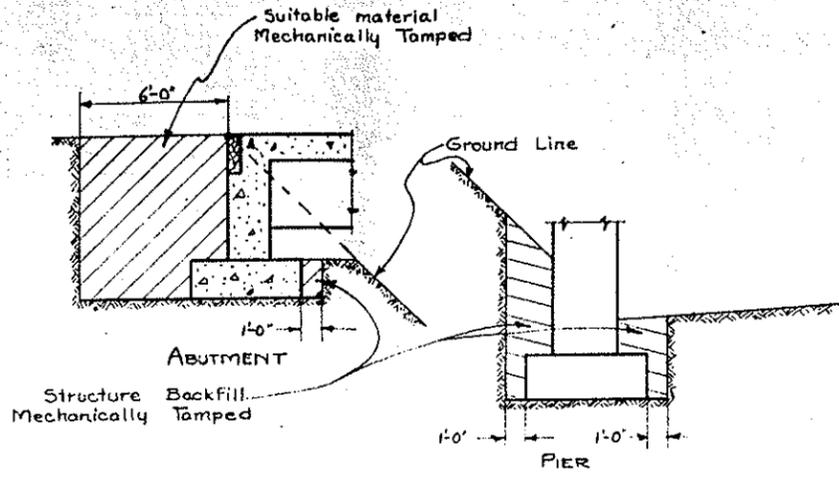
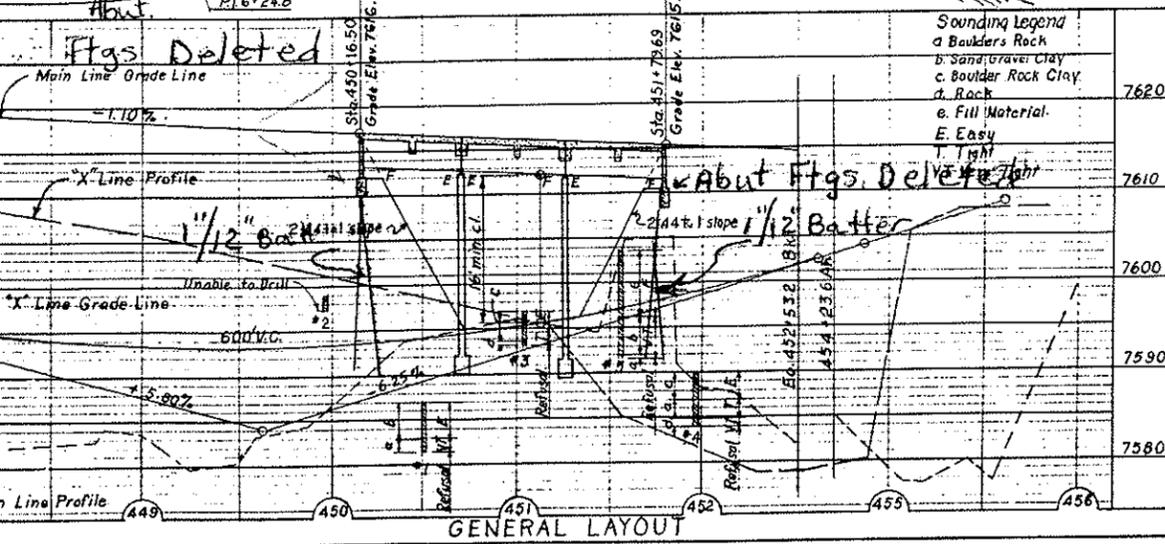
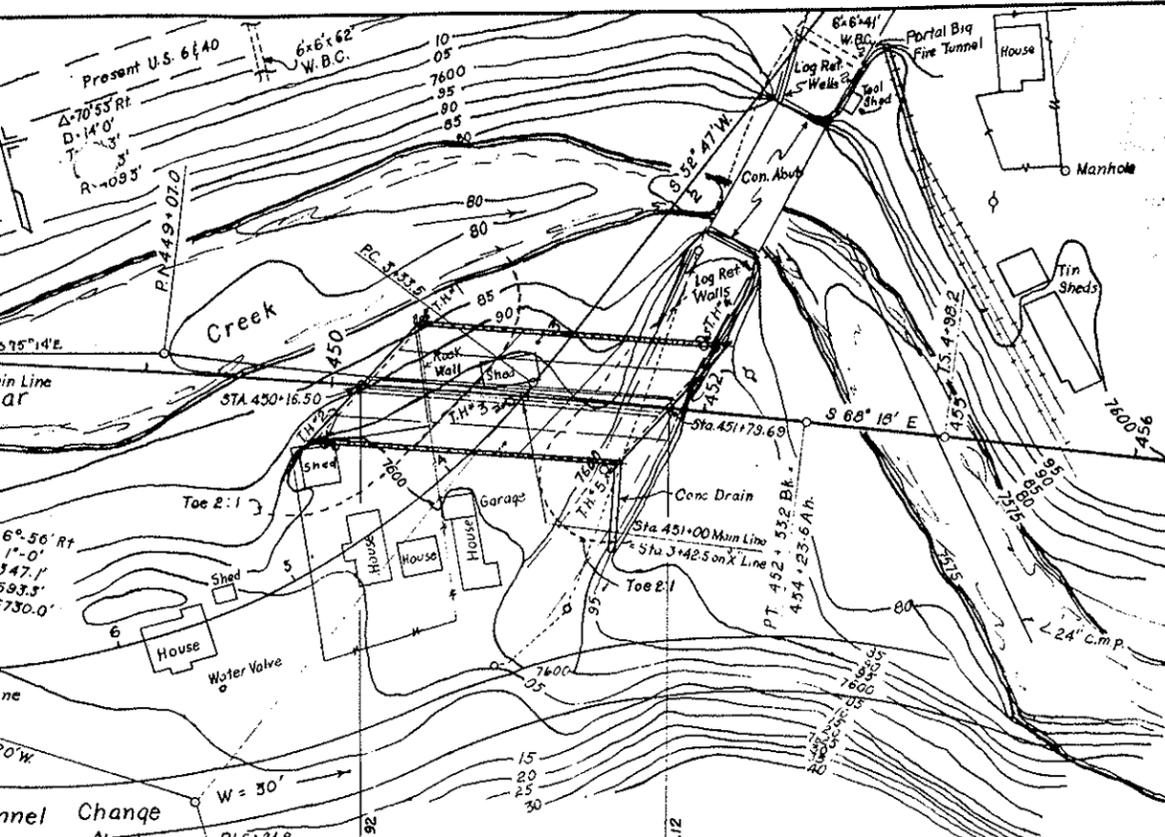
NOTE: Two sets of tracks to be laid 3'-9" center to center thru the box.

NOTE: Base of rail shall be welded to every third V1 Bar.

NOTE:  
For details of Box see  
Std. M-50-A & M-50-AW.

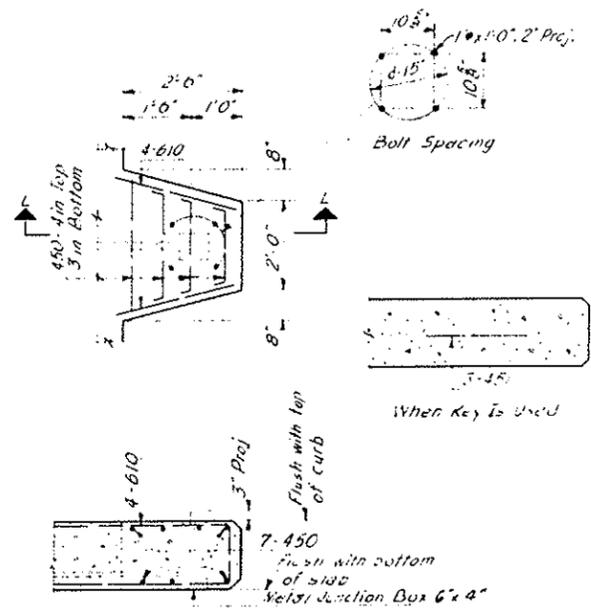
Revision: Added Light Bracket M.E.R. -12-23-57 & conduit

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-005-3(11)	15	



All material that is to be mechanically tamped shall be placed in horizontal layers not more than 6 inches in depth and tamped before the next layer is placed.

STRUCTURE BACKFILL AND MECHANICAL TAMPING DIAGRAMS



SECTION L-L

NOTE: Abut. #1 & #4 Footing LIGHT BRACKET DETAIL Deleted and Replaced with 12" H Piling. For Piling Length See Page 26 Major Structure Book

NOTE: It is estimated that Structure Backfill is available within Free Haul Limits of the Structure.

SUMMARY OF QUANTITIES

Description	Unit	Superstr.	Abut. #1	Pier #2	Pier #3	Abut. #4	Total
Rock Excavation (Str)	Cu.Yds.						5
Common Excavation (Str)	Cu.Yds.		177	60	65	178	480
Structure Backfill (Class I)	Cu.Yds.		58	40	45	57	200
Mechanical Tamping	Hours		6	4	5	6	21
Treated Bridge Timber	Mft. bm.		444			444	888
Class "A" Concrete	Cu.Yds.	575	57	51.4	51.6	60	795
Reinforcing Steel (Includes 1% for Overrun)	Lbs.	157180	1780	9560	9840	1745	180905
Structural Steel (Includes 1/2% for Paint)	Lbs.	13000	625	2845	1325	625	18,220
Sheet Copper (32 oz.)	Lbs.		92				92
1/2" Expansion Joint Material Type I	Sq.ft.	126					126
3/4" Expansion Joint Material Type I	Sq.ft.	84					84
1" Expansion Joint Material Type I	Sq.ft.	84					84
1/2" Electrical Conduit With Junction Boxes	Lin.Ft.	340					340

\* Includes 14,260' Handrail Steel.  
 \* Concrete quantities for Abutment 4 includes 4 Cu. Yds. for the concrete drain.  
 Δ Expansion Joint Material shall be according to A.A.S.H.O. designation M-153-54 and of the type shown and shall be included in the bid price of Class "A" Concrete.

GENERAL NOTES

ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO DEPARTMENT OF HIGHWAYS APPLICABLE TO THE PROJECT.  
 ALL CONCRETE SHALL BE CLASS "A" AND AIR ENTRAINMENT AS SPECIFIED.  
 ALL CONCRETE SURFACES EXPOSED TO NORMAL VIEW BY HIGHWAY TRAFFIC, INCLUDING WIND SURFACES, SHALL BE FINISHED TO A CLASS "A" FINISH.  
 CONCRETE CURBS, FLOOR SLABS AND CURBS SHALL BE FORMED MONOLITHICALLY.  
 FORMS FOR CONCRETE SURFACES EXPOSED TO THE FINISHED WORK SHALL BE CONSTRUCTED OF SHEEP LAP OR TONGUE AND GROOVE LUMBER 3" S UNLESS FACED WITH PANEL BOARD.  
 FOOTINGS IN ROCK SHALL BE POURED OUT TO ROCK AND NOT FORMED.  
 SOUNDINGS AND DEPTH OF FOOTING SHOWN ARE IN ACCORDANCE WITH THE BEST AVAILABLE DATA AND WHEN DIFFERENT CONDITIONS ARE ENCOUNTERED THE BRIDGE ENGINEER WILL INSPECT AND DETERMINE IF REDESIGN IS NECESSARY.  
 ALL REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A 305 S07 OR THE LATEST REVISION THEREOF AND SHALL BE INTERMEDIATE GRADE STEEL OF A DEFORMED TYPE. EACH BAR SHALL BE TAGGED WITH THE NUMBER DESIGNATION AND THE STATION NUMBER OF THE PROJECT.  
 SECONDARY BARS, WHEN SPICED SHALL LAP 20 DIAMETERS OF THE BAR. DIMENSIONS FOR REINFORCING STEEL NOT SHOWN AS CLEAR SHALL BE TO THE CENTER LINE OF THE BAR.  
 ALL STRUCTURAL STEEL SHALL BE PAINTED ONE SHOP COAT OF ZINC CHROMATE AND TWO FIELD COATS OF ALUMINUM UNLESS OTHERWISE NOTED EXCEPT THE UNEXPOSED PORTION OF STEEL PILING NEED NOT BE PAINTED.  
 HANDRAIL BOLTS SHALL HAVE HEX. HEADS, NUTS AND LOCK WASHERS UNLESS OTHERWISE SPECIFIED AND ALL BOLTS, EXCEPT AS NOTED ARE 1/2" DIA. AND SHALL BE POWER DRIVEN.  
 WHEN TREATED TIMBER OR PILING IS SHOWN ON THE DRAWING THE PRESERVATIVE FOR TREATMENT SHALL BE CRODOTE OIL.  
 WHEN EXCAVATING FOR FOOTINGS THE FINAL ONE FOOT IN DEPTH SHALL BE DONE BY HAND LABOR METHODS.  
 PRIMARY BARS SHALL NOT BE SPICED EXCEPT BY PERMISSION OF THE ENGINEER.  
 WHEN PRIMARY BARS ARE SPICED THEY SHALL LAP 34 DIAMETERS FOR BARS NEAR TOP OF BEAMS AND GIRDERS HAVING MORE THAN 12 INCHES OF CONCRETE UNDER THE BARS AND 20 DIAMETERS FOR BARS NEAR BOTTOM OF MEMBERS.

LOADING DATA

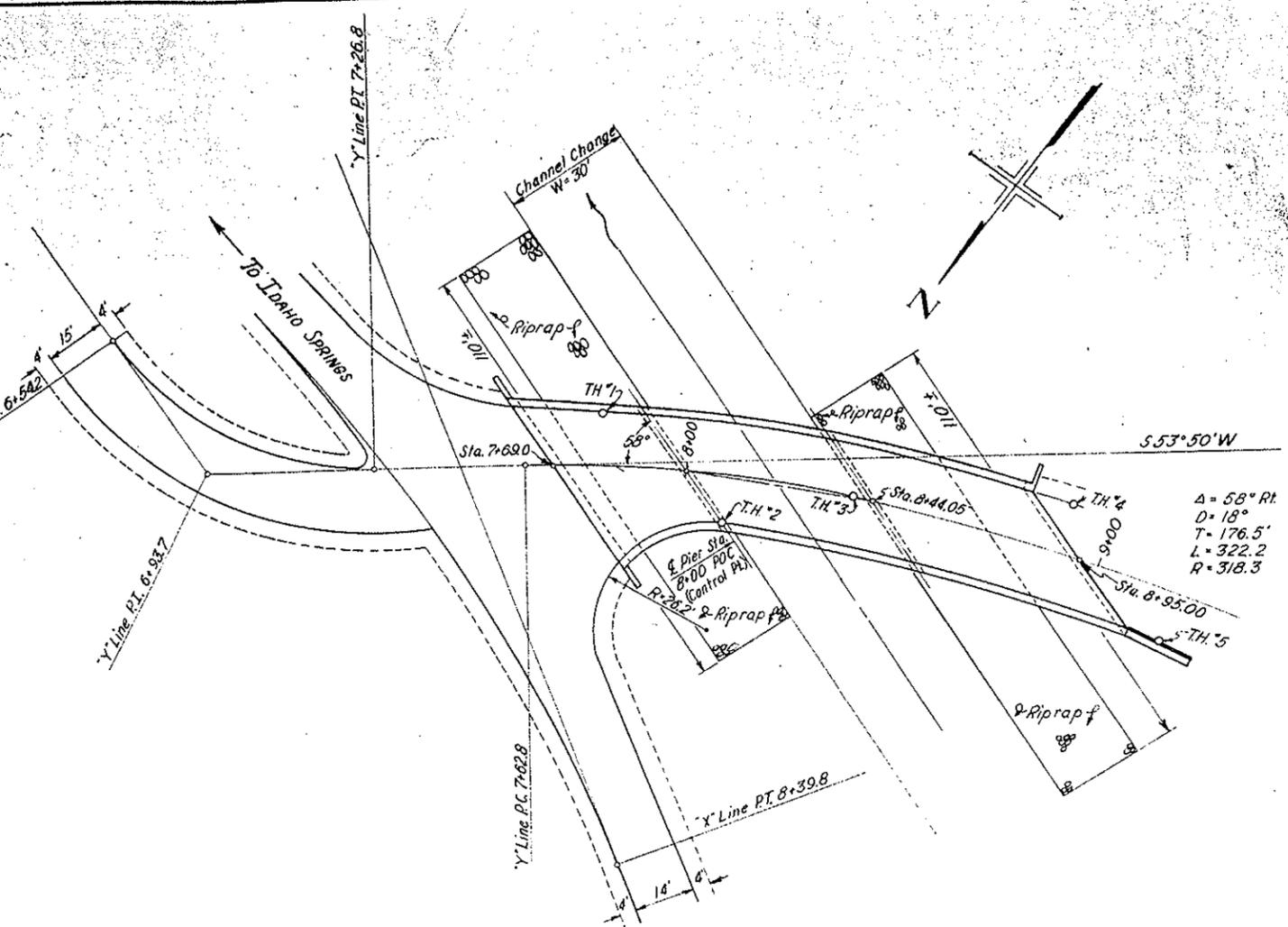
LIVE LOAD - A A S.H.O. (H20-44)  
 DEAD LOAD ASSUMES 15 LBS. PER SQ. FT. ADDITIONAL WEARING SURFACE WHICH INCLUDES THE 1/2 INCH CONCRETE MONOLITHIC WEARING SURFACE SHOWN.

DESIGNING DATA

A A S.H.O. 1951 UNIT STRESSES, EXCEPT AS NOTED.  
 Reinforcing Steel fs - 20000 lbs. per sq. in.  
 Structural Steel fs - 18000 lbs. per sq. in.  
 fc - 1200 lbs. per sq. in.  
 n - 10

**COLORADO DEPARTMENT OF HIGHWAYS**  
**CONCRETE SLAB & GIRDER BRIDGE**  
 3 SPANS @ 53'-0"  
 30' ROADWAY 2' CURBS 55° SKEW  
**GENERAL LAYOUT SUMMARY & NOTES**  
 Across Eastbound Connection through Idaho Springs  
 Sta. 450+16.50 to 451+78.63  
 Near Idaho Springs Sec. 35 T. 35 S. R. 73M  
 Designed by E.H.W. Approved by A.A.S.H.O.  
 Made by E.M.C. Bridge Engineer  
 Checked by Date: Aug. 31, 1956

Revised Spans 1 & 3, Added Riprap 12-4-57 - M.E.P.

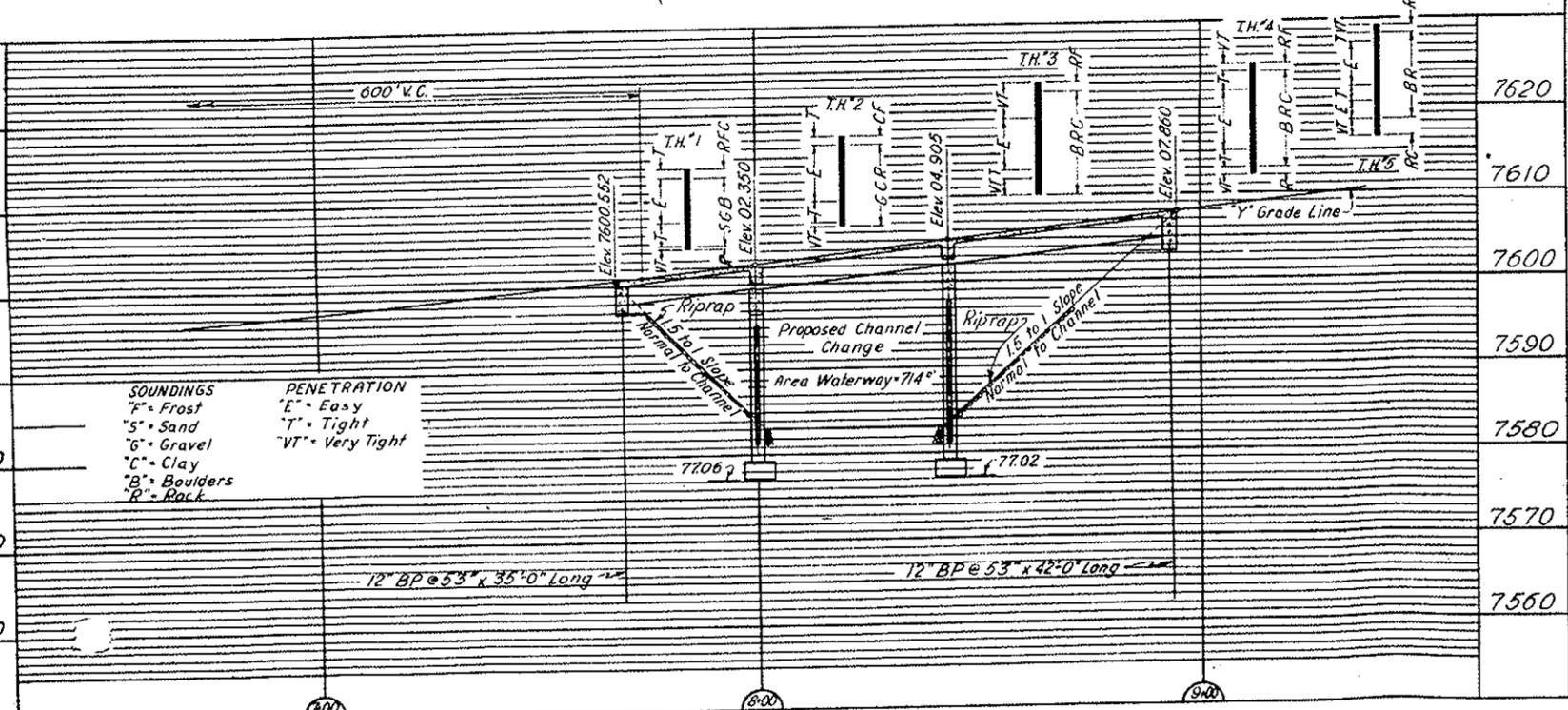


### SUMMARY OF QUANTITIES

Item	Description	Unit	Super Structure	Abut. No. 1	Pier No. 2	Pier No. 3	Abut. No. 4	Total
14g	Common Excavation (Structural)	Cu. Yd.		60	42	46	62	210
16a	Structural Backfill (Class 1)	Cu. Yd.		8	30	31	11	80
16c	Mechanical Tamping	Hc.		1	3	3	1	8
18a	Station Yard Overhaul	Sta. Yd.						
18b	Yard Mile Overhaul	Yd. Mi.						
42b	Treated Bridge Timber	MFTm.	0.177					0.177
46a	Class "A" Concrete	Cu. Yd.	157.7	131	32.8	35.3	19.1	258
47	Reinforcing Steel (Includes 1/2% for overrun)	Lb.	43,910	1,150	4,290	4,660	1,170	55,180
48	Structural Steel (Includes 1/2% for paint)	Lb.	10,430	580	490	550	290	12,340
61a	Steel Piling (12" BP @ 53")	Lin. Ft.		140			126	266
67a	Riprap (1'-6" Thick)	Cu. Yd.		173			173	346
89a	Drain Pipe (4" x 1'-6" Concrete Floor)	Each	2					2
②	1/2" Expansion Joint Material (Type III)	Sq. Ft.					12	12

- ① Includes 11,300 lb. of handrail steel.
- ② Expansion Joint Material shall be in accordance to A.A.S.H.O. specification M-153-54 and of the type shown and shall be included in the bid price for Item 46a.

Constructed As Per Plans



GENERAL LAYOUT

#### GENERAL NOTES

ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO DEPARTMENT OF HIGHWAYS APPLICABLE TO THE PROJECT.

ALL CONCRETE SHALL BE CLASS "A" AND AIR ENTRAINMENT AS SPECIFIED.

SURFACES MARKED WITH THE SYMBOL "F" AS SHOWN ON SHEET NO. 1 SHALL RECEIVE CLASS 2 SURFACE FINISH.

CONCRETE GIRDERS AND FLOOR SLAB SHALL BE POURED MONOLITHICALLY.

FORMS FOR CONCRETE SURFACES EXPOSED IN THE FINISHED WORK SHALL BE CONSTRUCTED OF SHIP LAP OR TONGUE AND GROOVE LUMBER 1 1/2 UNLESS FACED WITH PANEL BOARD.

FOOTINGS IN ROCK SHALL BE POURED OUT TO ROCK AND NOT FORMED.

SOUNDINGS AND DEPTH OF FOOTING SHOWN ARE IN ACCORDANCE WITH THE BEST AVAILABLE DATA AND WHEN DIFFERENT CONDITIONS ARE ENCOUNTERED THE BRIDGE ENGINEER WILL INSPECT AND DETERMINE IF REDESIGN IS NECESSARY.

ALL REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A 305.307 OR THE LATEST REVISION THEREOF AND SHALL BE INTERMEDIATE GRADE STEEL OF A DIFORMED TYPE. EACH BAR SHALL BE TAGGED WITH THE NUMBER DESIGNATION AND THE STATION NUMBER OF THE PROJECT. PRIMARY BARS SHALL NOT BE SPLICED AND SECONDARY BARS WITH SPLICES SHALL LAP 30 DIAMETERS OF THE BAR. DIMENSIONS FOR REINFORCING STEEL NOT SHOWN AS CLEAR SHALL BE TO THE CENTER LINE OF THE BAR.

ALL STRUCTURAL STEEL SHALL BE PAINTED ONE SHOT COAT OF ZINC CHROMATE AND TWO FIELD COATS OF ALUMINUM UNLESS OTHERWISE NOTED EXCEPT THE UNEXPOSED PORTION OF STEEL PILING NEED NOT BE PAINTED.

HANDRAIL BOLTS SHALL HAVE HEX HEADS, NUTS, AND LOCK WASHERS UNLESS OTHERWISE SPECIFIED AND ALL RIVETS, EXCEPT AS NOTED AS 1" DIA. AND SHALL BE POWER DRIVEN.

WHEN TREATED TIMBER OR PILING IS SHOWN ON THE DRAWING THE PRESERVATIVE FOR TREATMENT SHALL BE CREOSOTE OIL.

WHEN EXCAVATING FOR FOOTINGS THE FINAL ONE FOOT IN DEPTH SHALL BE DONE BY HAND LABOR METHODS.

IF BY PERMISSION OF THE ENGINEER PRIMARY BARS ARE SPLICED, THEY SHALL LAP 28 DIAMETERS, FOR BARS NEAR TOP OF BEAMS AND GIRDERS HAVING MORE THAN 12 INCHES OF CONCRETE UNDER THE BARS AND 17 DIAMETERS FOR BARS NEAR BOTTOM OF MEMBERS.

#### LOADING DATA

LIVE LOAD - A.A.S.H.O. HB 20 - 44  
 DEAD LOAD ASSUMES 15 LBS. PER SQ. FT. ADDITIONAL WEARING SURFACE WHICH INCLUDES THE 1/2 INCH CONCRETE MONOLITHIC WEARING SURFACE SHOWN.

#### DESIGNING DATA

A.A.S.H.O. 1933 UNIT STRESSES, EXCEPT AS NOTED.

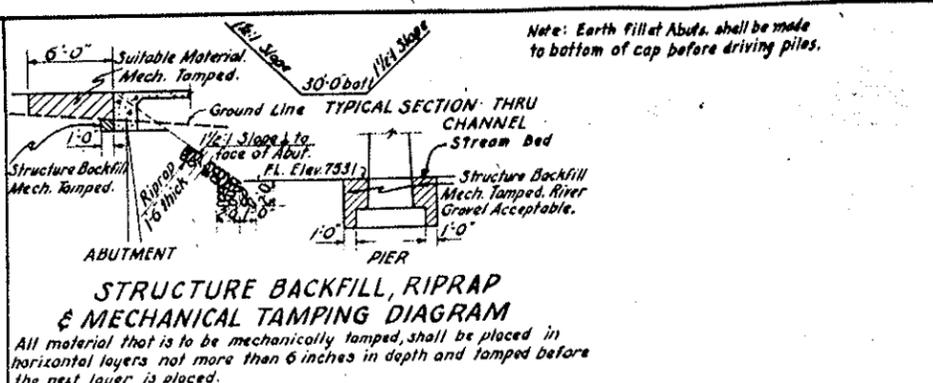
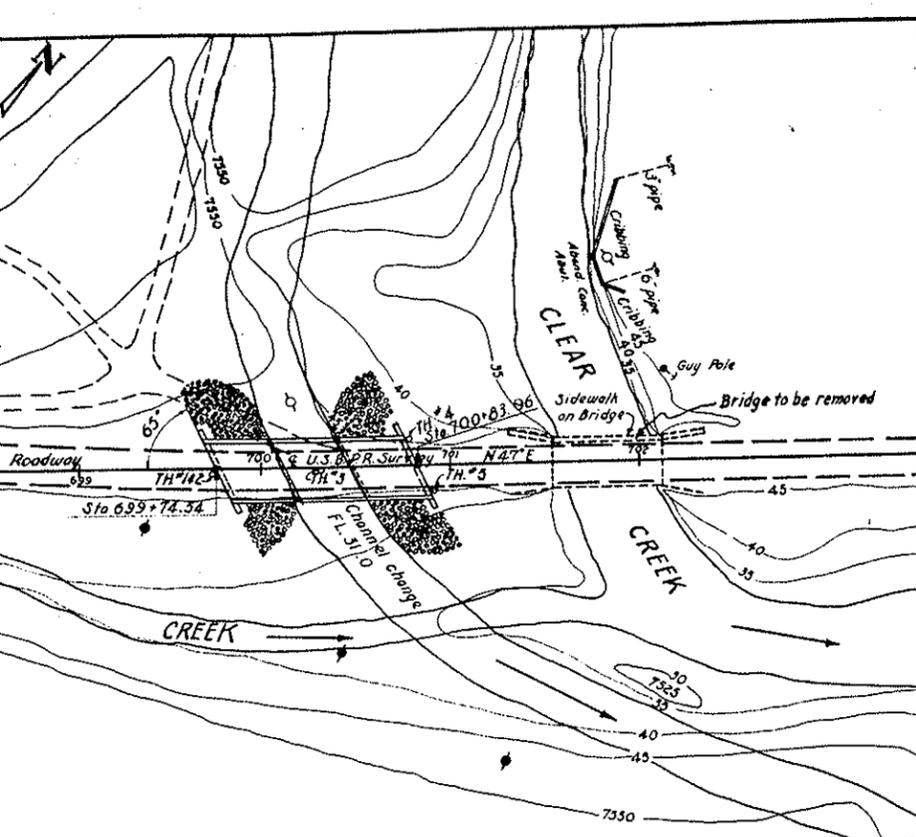
Reinforcing Steel fs - 20000 lbs. per sq. in.  
 Structural Steel fs - 18000 lbs. per sq. in.  
 fc - 1200 lbs. per sq. in.  
 n = 10

**COLORADO**  
**DEPARTMENT OF HIGHWAYS**

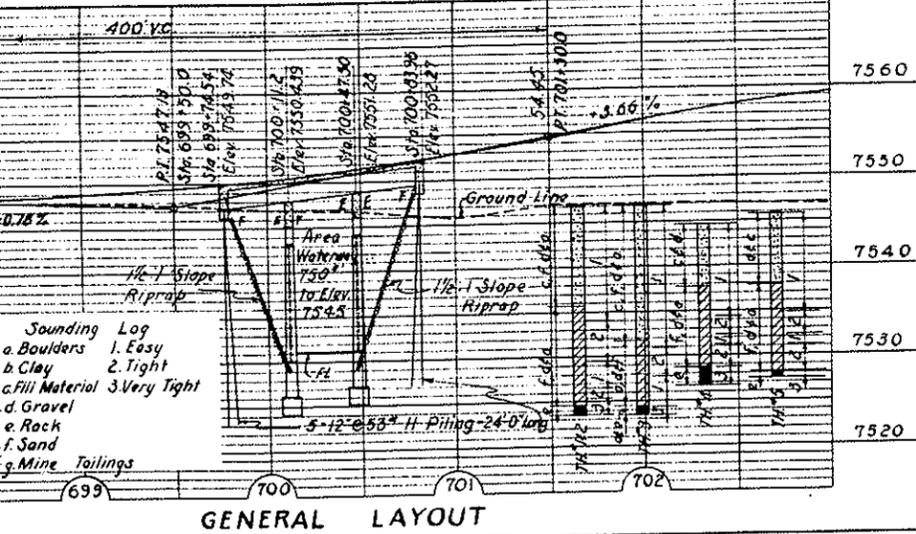
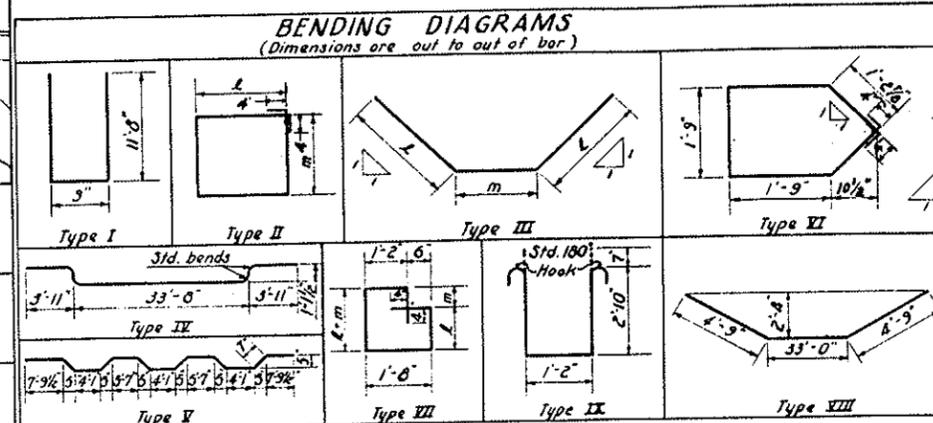
**3 SPAN CONCRETE SLAB & GIRDER**  
**BRIDGE, 24'-0" ROADWAY 2'-0" CURBS**  
**58° SKEW TO TANGENT**  
**SUMMARY OF QUANTITIES**  
**GENERAL LAYOUT**

Across Clear Creek  
 Sta. 7+680 to 8+950  
 Near Idaho Springs Sec. 35 T. 38 R. 73N

Designed by H.W.D. Approved by *[Signature]*  
 Made by M.E.P. Bridge Engineer  
 Checked by *[Signature]* Date: Jan 10, 1958



Constructed As Per Plans



Description	Unit	Superstructure	Abut. No. 1	Pier No. 2	Pier No. 3	Abut. No. 4	Total
Common Excavation (Str.)	Cu. Yd.		13	42	31		86
Rock Excavation (Str.)	Cu. Yd.				3		3
Structure Backfill (Class I)	Cu. Yd.		3	31	25		59
Mechanical Tamping	Hour		4	3	3		15
Roofed Bridge Timber	Mft. Dm.		0.199			0.199	0.398
Class "A" Concrete	Cu. Yd.	180.8	13.3	34.3	34.3	13.3	276
Reinforcing Steel (+1% Overrun)	Lb.	46075	1675	5325	5270	1670	60,015
Structural Steel (+1/2% for Point)	Lb.	9454	693	430	590	693	11,880
2" H Piling @ 53'-24'-0" Long	Lin. Ft.		120			120	240
Riprap (1'-0" thick)	Cu. Yd.					203	406
Sheet Copper (32 oz.)	Lb.	10					10
Drain Pipe (Cont. Floor, 4" x 2'-0")	Each						12
Expn. Jt. Mat'l. (Type I)	Sq. Ft.						95
6a. Galv. Sheet metal	Sq. Ft.						9

It is estimated that Structure Backfill is available within Free Haul Limits of the Structure.

Mark	Size	No.	Req'd Length	Type	Dimensions
425	1/2"	4	9'-3"	Str.	
426	1/2"	2	11'-0"	Str.	
427	1/2"	6	8'-6"	Str.	
428	1/2"	4	20'-3"	Str.	
429	1/2"	4	21'-3"	Str.	
430	1/2"	28	11'-5"	Str.	2'11" x 0'-9"
431	1/2"	8	13'-3"	Str.	1'-8" x 4'-7"
432	1/2"	20	4'-8"	Str.	
433	1/2"	4	4'-4"	Str.	
434	1/2"	4	3'-10"	Str.	
805	1"	2	55'-7"	Str.	
806	1"	2	41'-7"	Str.	
901	1 1/8"	4	41'-7"	Str.	

Mark	Size	No.	Req'd Length	Type	Dimensions
420	1/2"	28	11'-6"	Str.	2'11" x 0'-10"
421	1/2"	8	13'-1"	Str.	1'-8" x 4'-6"
422	1/2"	20	4'-7"	Str.	
423	1/2"	4	4'-3"	Str.	
424	1/2"	4	3'-9"	Str.	
425	1/2"	4	9'-3"	Str.	
426	1/2"	2	11'-0"	Str.	
427	1/2"	6	8'-6"	Str.	
428	1/2"	4	28'-3"	Str.	
429	1/2"	4	21'-3"	Str.	
805	1"	2	55'-7"	Str.	
806	1"	2	41'-7"	Str.	
901	1 1/8"	4	41'-7"	Str.	

660 Lin. Ft. 1/2" @ 0.668 Lbs./Lin. Ft. = 574 Lbs.
194 Lin. Ft. 1" @ 2.670 Lbs./Lin. Ft. = 518 Lbs.
166 Lin. Ft. 1 1/8" @ 3.40 Lbs./Lin. Ft. = 564 Lbs.
Plus 1% Overrun = 19 Lbs.
Total = 1675 Lbs.

858 Lin. Ft. 1/2" @ 0.668 Lbs./Lin. Ft. = 573 Lbs.
194 Lin. Ft. 1" @ 2.670 Lbs./Lin. Ft. = 518 Lbs.
166 Lin. Ft. 1 1/8" @ 3.40 Lbs./Lin. Ft. = 564 Lbs.
Plus 1% Overrun = 15 Lbs.
Total = 1670 Lbs.

Revised Steel Piling D.J.S 7-10-57

Mark	Size	No.	Req'd Length	Type	Dimensions
401	1/2"	18	7'-8"	Str.	1'-9" x 1'-9"
402	1/2"	22	24'-1"	I	
403	1/2"	22	24'-0"	Str.	
404	1/2"	18	8'-4"	Str.	
501	3/8"	56	6'-2"	Str.	
503	3/8"	31	11'-4"	Str.	2'-3" x 3'-1"
504	3/8"	6	11'-0"	Str.	4'-6" x 2'-0"
701	3/8"	3	25'-0"	Str.	
801	1"	16	21'-6"	Str.	
1001	1 1/4"	14	36'-9"	Str.	

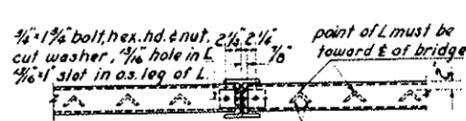
Mark	Size	No.	Req'd Length	Type	Dimensions
401	1/2"	18	7'-8"	Str.	1'-9" x 1'-9"
402	1/2"	22	24'-1"	I	
403	1/2"	22	24'-0"	Str.	
404	1/2"	18	8'-4"	Str.	
501	3/8"	56	6'-2"	Str.	
503	3/8"	31	11'-4"	Str.	2'-3" x 3'-1"
504	3/8"	6	11'-0"	Str.	4'-6" x 2'-0"
701	3/8"	3	25'-0"	Str.	
801	1"	16	21'-6"	Str.	
802	1"	8	2'-6"	Str.	
1001	1 1/4"	14	36'-9"	Str.	

1346 Lin. Ft. 1/2" @ 0.668 Lbs./Lin. Ft. = 899 Lbs.
989 Lin. Ft. 3/8" @ 1.043 Lbs./Lin. Ft. = 1032 Lbs.
75 Lin. Ft. 3/8" @ 2.044 Lbs./Lin. Ft. = 153 Lbs.
364 Lin. Ft. 1" @ 2.670 Lbs./Lin. Ft. = 972 Lbs.
515 Lin. Ft. 1 1/4" @ 4.303 Lbs./Lin. Ft. = 2216 Lbs.
Plus 1% Overrun = 53 Lbs.
Total = 5325 Lbs.

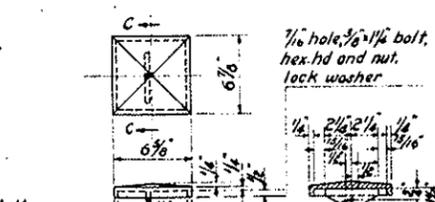
Mark	Size	No.	Req'd Length	Type	Dimensions
410	1/2"	32	36'-4"	Str.	
411	1/2"	67	35'-9"	Str.	
412	1/2"	102	35'-10"	Str.	
440	1/2"	120	5'-6"	Str.	1'-11" x 0'-6"
441	1/2"	3-2	0'-9"		
442	1/2"	8	8'-0"	Str.	1'-11" x 0'-6"
443	1/2"	5-2	1'-9"		
444	1/2"	48	3'-10"	Str.	1'-1" x 0'-6"
510	3/8"	93	41'-6"	Str.	
511	3/8"	93	43'-9"	Str.	
512	3/8"	94	42'-6"	Str.	
520	3/8"	112	8'-0"	Str.	
601	3/4"	8	41'-6"	Str.	
602	3/4"	8	42'-6"	Str.	
1101	3/4"	32	36'-4"	Str.	
1102	3/4"	16	35'-10"	Str.	
1103	3/4"	24	29'-0"	Str.	
1104	3/4"	24	23'-0"	Str.	
1105	3/4"	24	12'-6"	Str.	

8157 Lin. Ft. 1/2" @ 0.668 Lbs./Lin. Ft. = 5449 Lbs.
20819 Lin. Ft. 3/8" @ 1.043 Lbs./Lin. Ft. = 21714 Lbs.
672 Lin. Ft. 3/8" @ 1.502 Lbs./Lin. Ft. = 1009 Lbs.
3284 Lin. Ft. 1" @ 2.313 Lbs./Lin. Ft. = 17448 Lbs.
Plus 1% Overrun = 455 Lbs.
Total = 46075 Lbs.

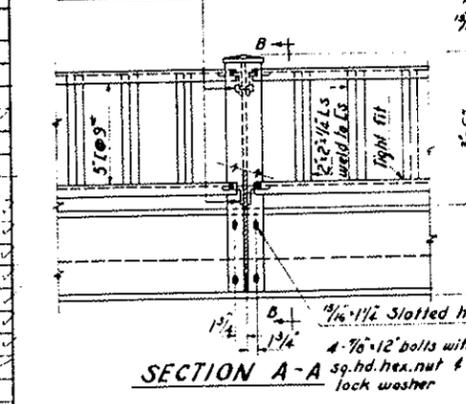
1346 Lin. Ft. 1/2" @ 0.668 Lbs./Lin. Ft. = 899 Lbs.
989 Lin. Ft. 3/8" @ 1.043 Lbs./Lin. Ft. = 1032 Lbs.
75 Lin. Ft. 3/8" @ 2.044 Lbs./Lin. Ft. = 153 Lbs.
364 Lin. Ft. 1" @ 2.670 Lbs./Lin. Ft. = 972 Lbs.
515 Lin. Ft. 1 1/4" @ 4.303 Lbs./Lin. Ft. = 2216 Lbs.
Plus 1% Overrun = 53 Lbs.
Total = 5325 Lbs.



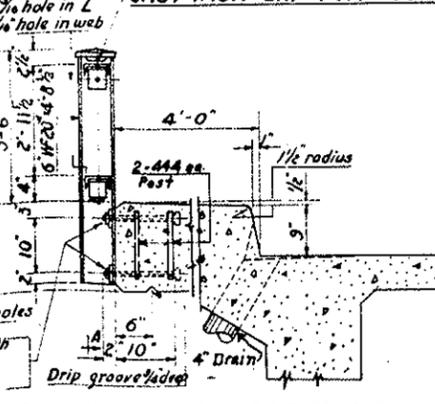
PLAN WITHOUT CAP



CAST IRON CAP FOR POST



STEEL HANDRAIL & SAFETY CURB DETAIL



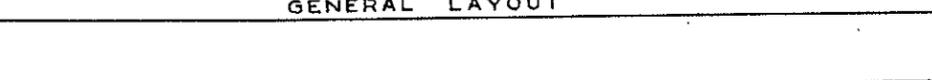
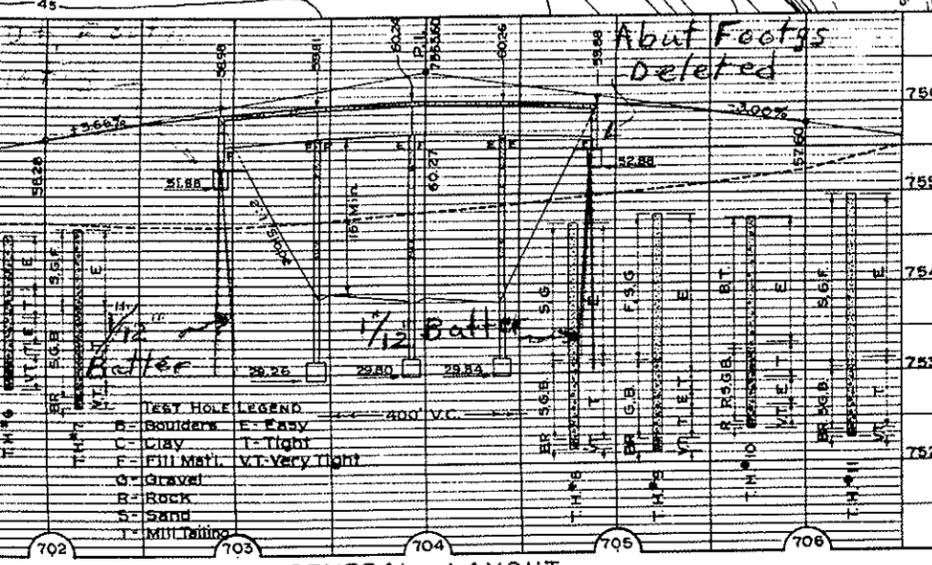
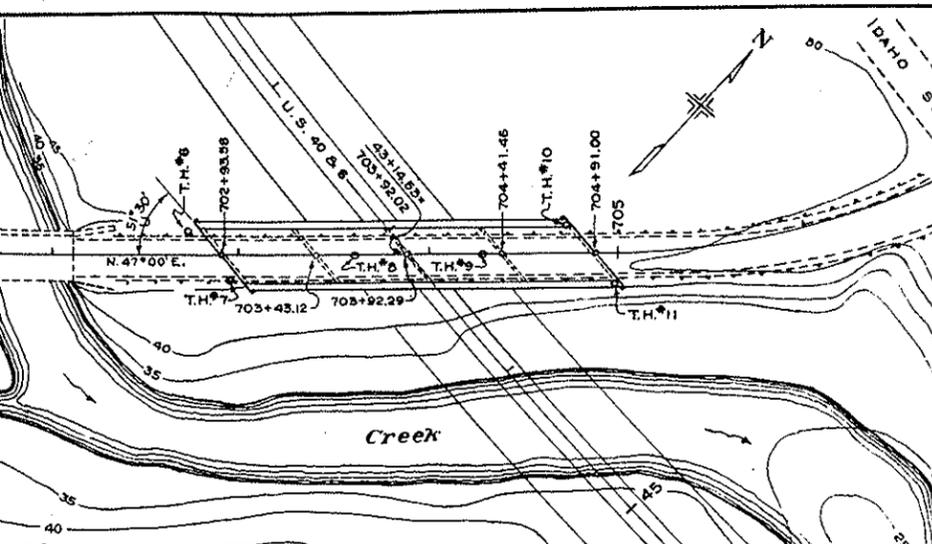
SECTION B-B

GENERAL NOTES  
 ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO DEPARTMENT OF HIGHWAYS APPLICABLE TO THE PROJECT.  
 ALL CONCRETE SHALL BE CLASS "A" AND AIR ENTRAINMENT AS SPECIFIED.  
 ALL CONCRETE SURFACES EXPOSED TO NORMAL VIEW BY HIGHWAY TRAFFIC SHALL RECEIVE CLASS "T" SURFACE FINISH. FINISHING SHALL RECEIVE ORDINARY SURFACE FINISH.  
 CONCRETE GIRDERS, FLOOR SLABS AND CURBS SHALL BE FORMED MONOLITHICALLY.  
 FORMS FOR CONCRETE SURFACES EXPOSED TO THE FINISHED WORK SHALL BE CONSTRUCTED OF SHIP LAP OR TONGUE AND GROOVE LUMBER 2" x 4" UNLESS FACED WITH PANEL BOARD.  
 FOOTINGS IN ROCK SHALL BE POURED OUT TO ROCK AND NOT FORMED.  
 SOUNDINGS AND DEPTH OF FOOTING SHOWN ARE IN ACCORDANCE WITH THE BEST AVAILABLE DATA AND WHEN DIFFERENT CONDITIONS ARE ENCOUNTERED THE BRIDGE ENGINEER WILL INSPECT AND DETERMINE IF REDSIGN IS NECESSARY.  
 ALL REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A 305 SET OF THE LATEST REVISION THEREOF AND SHALL BE INTERMEDIATE GRADE STEEL OF A DEFORMED TYPE. EACH BAR SHALL BE TAGGED WITH THE NUMBER DESIGNATION AND THE STATION NUMBER OF THE PROJECT.  
 PRIMARY BARS SHALL NOT BE SPLICED AND SECONDARY BARS WHEN SPLICED SHALL LAP 20 DIAMETERS OF THE BAR. DIMENSIONS FOR REINFORCING STEEL NOT SHOWN AS CLEAR SHALL BE TO THE CENTER LINE OF THE BAR.  
 ALL STRUCTURAL STEEL SHALL BE PAINTED ONE SHOP COAT OF ZINC CHROMATE AND TWO FIELD COATS OF ALUMINUM UNLESS OTHERWISE NOTED EXCEPT THE UNEXPOSED PORTION OF STEEL PILING NEED NOT BE PAINTED.  
 HANDRAIL BOLTS SHALL HAVE HEX HEADS, NUTS AND LOCK WASHERS UNLESS OTHERWISE SPECIFIED AND ALL RIVETS, EXCEPT AS NOTED ARE 1" DIA. AND SHALL BE POWER DRIVEN.  
 WHEN TREATED TIMBER OF PILING IS SHOWN ON THE DRAWING THE PRESERVATIVE FOR TREATMENT SHALL BE CREOSOTE OIL.  
 WHEN EXCAVATING FOR FOOTINGS THE FINAL ONE FOOT IN DEPTH SHALL BE DONE BY HAND LABOR METHODS.  
 DUE TO THE PRESENCE OF BOULDERS AS SHOWN BY THE SOUNDINGS, IT IS OUR OPINION, STEEL PIPE PILING CANNOT BE DRIVEN SUCCESSFULLY, AND THEREFORE SHALL NOT BE USED AS AN ALTERNATE.  
 PRIMARY BARS SHALL NOT BE SPLICED EXCEPT BY PERMISSION OF THE ENGINEER.  
 WHEN PRIMARY BARS ARE SPLICED THEY SHALL LAP 20 DIAMETERS FOR BARS NEAR TOP OF BEAMS AND GIRDERS HAVING MORE THAN 12 INCHES OF CONCRETE UNDER THE BARS AND 20 DIAMETERS FOR BARS NEAR BOTTOM OF MEMBERS.

LOADING DATA  
 LIVE LOAD A 5 S 10 (H20-316-40)  
 DEAD LOAD ASSUMES 15 LBS PER SQ FT ADDITIONAL WEARING SURFACE WHICH INCLUDES THE 1/2" INCH CONCRETE MONOLITHIC WEARING SURFACE SHOWN

DESIGNING DATA  
 A 5 S 10 (H20-316-40) UNIT STRESSES EXCEPT AS NOTED  
 Reinforcing Steel fs 20000 lbs per sq in  
 Structural Steel fs 18000 lbs per sq in  
 fc 1200 lbs per sq in  
 n 10

**COLORADO DEPARTMENT OF HIGHWAYS**  
 3 SPANS @ 35'-0" CONCRETE SLAB & GIRDER BRIDGE, 30'-0" ROADWAY, 4'-0" CURBS 65° SKEW - GENERAL LAYOUT, SUMMARY OF QUANTITIES, BAR LIST, HANDRAIL & BACKFILL DIAGRAMS  
 Across Clear Creek  
 Sta 699+74.54 to 700+83.96  
 Near Idaho Spgs. Sec 36 T. 55 R. 73 W  
 Designed by E.F.S. Approved by E.H. Newcomer  
 Made by J.L.G. Bridge Engineer  
 Checked by Date: Aug. 21, 1956



SUMMARY OF QUANTITIES								
DESCRIPTION	UNIT	SUPERSTR.	ABUT. 1	PIER 2	PIER 3	PIER 4	ABUT. 5	TOTAL
Unclassified Excavation	Cu. Yd.							1380
Common Excavation (Str.)	Cu. Yd.		27	62	55	55	27	226
Structure Backfill (Class I)	Cu. Yd.			49	44	44		137
Mechanical Tamping	Hour		8	5	5	5	8	31
Class "A" Concrete	Cu. Yd.	391	47.6	36.2	35.8	35.7	45.7	592
Reinforcing Steel (1% added for Overrun)	Lbs.	96305	2540	7125	7125	7075	2535	122705
Structural Steel (1/2% added for Paint)	Lbs.	17080	740	420	420	830	740	20230
Sheet Copper (32 oz.)	Lbs.	19						19
Inlet Grating (Subway Type)	Each	2						2
Treated Bridge Timber	M. Ft. Dm.	154						154
Electrical Conduit with Junction Boxes	L. Ft.	269						269
Expn. Jt. Mat'l. Type III	Sq. Ft.		20					20
Expn. Jt. Mat'l. Type I	Sq. Ft.		168					168

Expn. Jt. Mat'l. shall be included in the bid price of class "A" Concrete and shall be in accordance with the AASHTO designation M153-54 and of the type shown.

Structural Steel includes 17,580# of handrail Steel.

It is estimated that Structure Backfill is available within Free Haul Limits of the Structure.

120 lb. for Slope Drains

BAR LIST (SUPERSTRUCTURE)						
Mark	Size	No.	Length	Type	Dimensions	
					l	m
450	1/2"	336	2'-11"	III	0'-4"	1'-5"
451	1/2"	330	6'-5"	I	2'-3"	0'-7 1/2"
452	1/2"	120	24'-11"	Str.		
453	1/2"	244	30'-0"	Str.		
454	1/2"	122	19'-4"	Str.		
455	1/2"	122	19'-6"	Str.		
456	1/2"	96	3'-10"	I	1'-1"	0'-6"
520	3/8"	784	8'-11"	V		
521	3/8"	66	33'-6"	VI		
522	3/8"	62	37'-6"	Str.		
523	3/8"	62	39'-10"	VII		
524			36'-7"			
to	3/8"	2ea.	by 1 5/8" to	Str.		
545			5'-11 1/2"			
546			37'-9"			
to	3/8"	2ea.	by 1 5/8" to	VIII		
567			7'-11 1/2"			
568	3/8"	2	36'-11 1/2"	IX	35'-11 1/2"	4'-6"
569	3/8"	2	35'-6"	IX	34'-6"	3'-0 1/2"
570	3/8"	2	34'-0 1/2"	IX	33'-0 1/2"	1'-7"
571	3/8"	2	32'-5"	X	31'-7"	5'-1 1/2"
572	3/8"	2	30'-11 1/2"	X	30'-11 1/2"	3'-8"
573	3/8"	2	29'-6"	X	28'-8"	2'-2 1/2"
574	3/8"	2	28'-0 1/2"	X	27'-2 1/2"	0'-9"
575	3/8"	2	26'-5"	XI	25'-9"	4'-3 1/2"
576	3/8"	2	24'-11 1/2"	XI	24'-3 1/2"	2'-10"
577	3/8"	2	23'-6"	XI	22'-10"	1'-4 1/2"
578	3/8"	2	21'-10 1/2"	XII	21'-4 1/2"	4'-11"
579	3/8"	2	20'-5"	XII	19'-11"	3'-5 1/2"
580	3/8"	2	18'-11 1/2"	XII	18'-5 1/2"	2'-0"
581			16'-10 1/2"			
to	3/8"	4ea.	by 1 5/8" to	Str.		
588			6'-8"			
590			36'-3"			
to	3/8"	2ea.	by 1 5/8" to	Str.		
5111			5'-7 1/2"			
5112			37'-5"			
to	3/8"	2ea.	by 1 5/8" to	VIII		
5133			6'-9 1/2"			
5134	3/8"	2	36'-6"	IX	35'-6"	4'-0 1/2"
5135	3/8"	2	35'-0 1/2"	IX	34'-0 1/2"	2'-7"
5136	3/8"	2	33'-7"	IX	32'-7"	1'-1 1/2"
5137	3/8"	2	31'-11 1/2"	X	31'-1 1/2"	4'-8"
5138	3/8"	2	30'-6"	X	29'-8"	3'-2 1/2"
5139	3/8"	2	29'-0 1/2"	X	28'-2 1/2"	1'-9"
5140	3/8"	2	27'-5"	XI	26'-9"	5'-3 1/2"
5141	3/8"	2	25'-11 1/2"	XI	25'-3 1/2"	3'-10"
5142	3/8"	2	24'-6"	XI	23'-10"	2'-4 1/2"
5143	3/8"	2	23'-0 1/2"	XI	22'-4 1/2"	0'-11"
5144	3/8"	2	21'-5"	XII	20'-11"	4'-5 1/2"
5145	3/8"	2	19'-11 1/2"	XII	19'-5 1/2"	3'-0"
5146	3/8"	2	18'-6"	XII	18'-0"	1'-6 1/2"
5147			16'-5 1/2"			
to	3/8"	4ea.	by 1 5/8" to	Str.		
5154			6'-3"			
5155			37'-2"			
to	3/8"	4ea.	by 1 5/8" to	Str.		
5176			6'-6 1/2"			
5177			38'-4"			
to	3/8"	4ea.	by 1 5/8" to	VIII		
5198			7'-8 1/2"			
5199	3/8"	4	37'-5"	IX	36'-5"	4'-11 1/2"
5200	3/8"	4	35'-11 1/2"	IX	34'-11 1/2"	3'-6"
5201	3/8"	4	34'-6"	IX	33'-6"	2'-0 1/2"
5202	3/8"	4	33'-0 1/2"	IX	32'-0 1/2"	0'-7"
5203	3/8"	4	31'-5"	X	30'-7"	4'-1 1/2"
5204	3/8"	4	29'-11 1/2"	X	29'-1 1/2"	2'-8"
5205	3/8"	4	28'-6"	X	27'-8"	1'-2 1/2"
5206	3/8"	4	26'-10 1/2"	XI	26'-2 1/2"	4'-9"
5207	3/8"	4	25'-5"	XI	24'-9"	3'-3 1/2"
5208	3/8"	4	23'-11 1/2"	XI	23'-3 1/2"	1'-10"
5209	3/8"	4	22'-4"	XII	21'-10"	5'-4 1/2"
5210	3/8"	4	20'-10 1/2"	XII	20'-4 1/2"	3'-11"
5211	3/8"	4	19'-5"	XII	18'-11"	2'-5 1/2"
5212			17'-5 1/2"			
to	3/8"	8ea.	by 1 5/8" to	Str.		

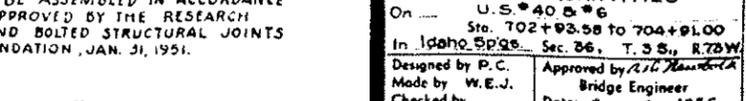
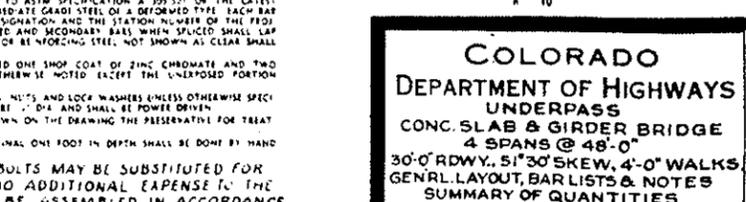
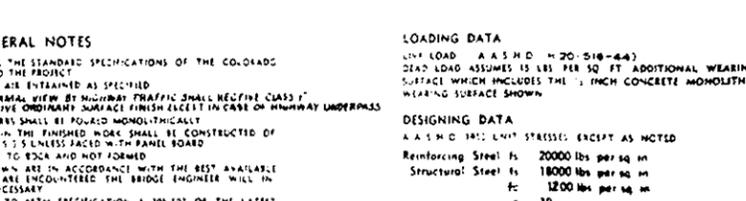
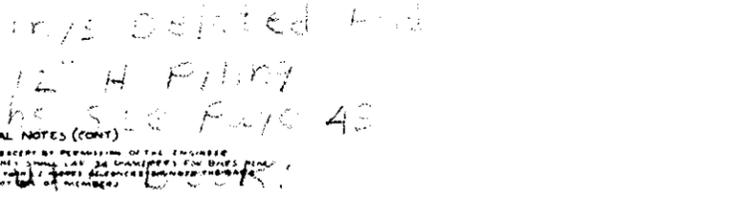
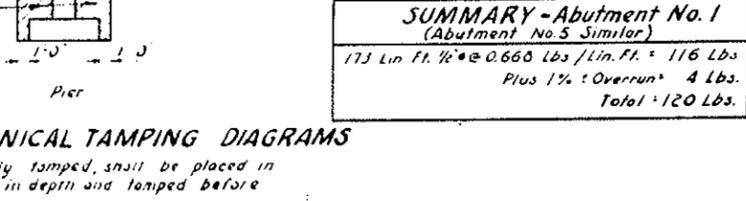
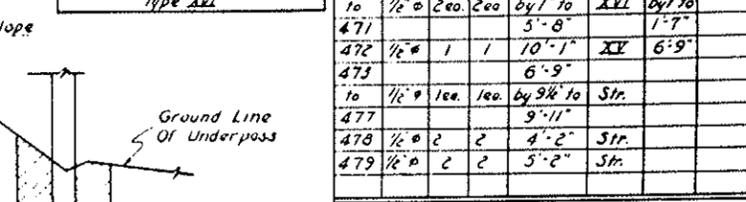
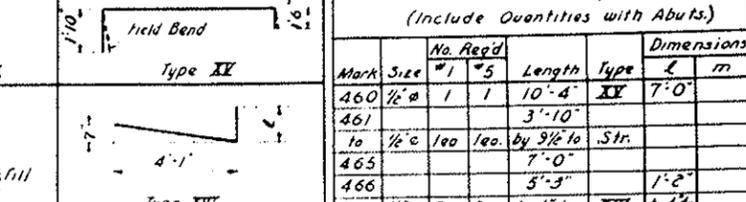
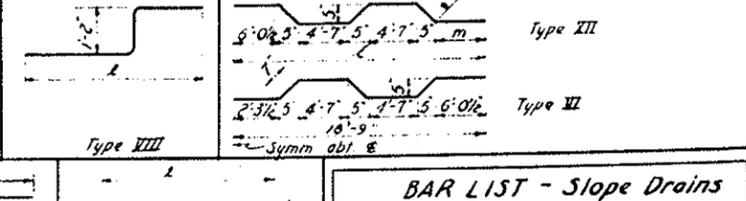
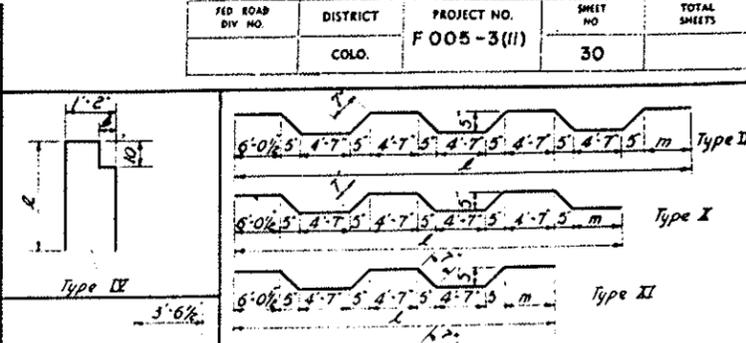
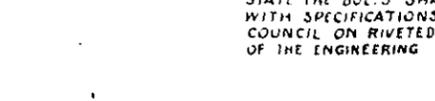
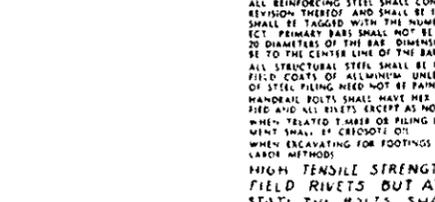
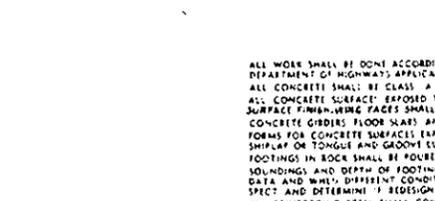
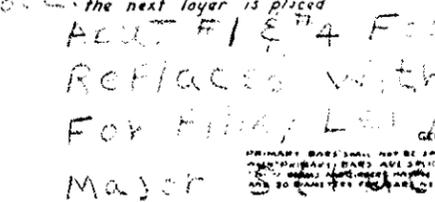
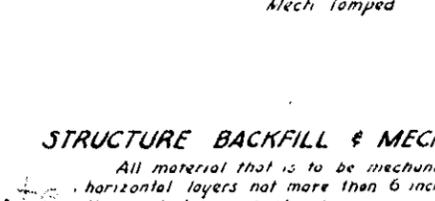
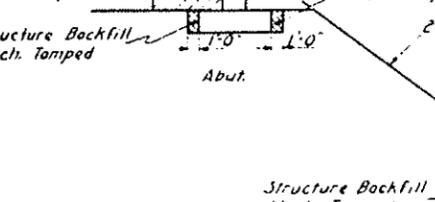
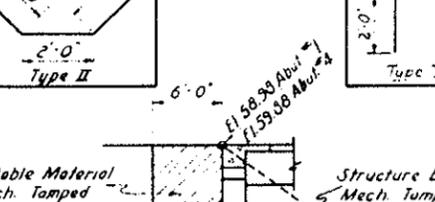
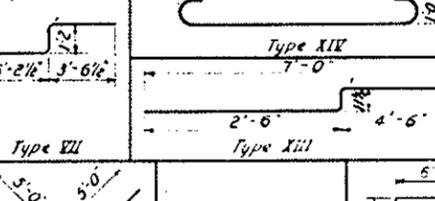
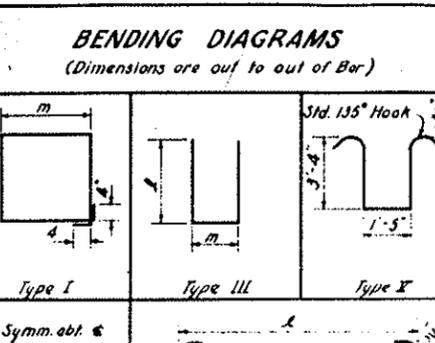
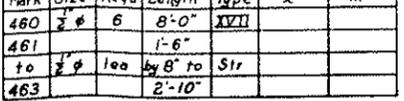
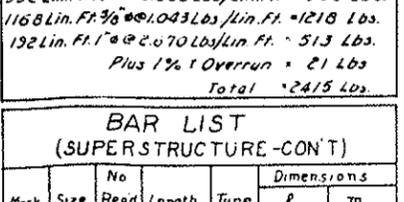
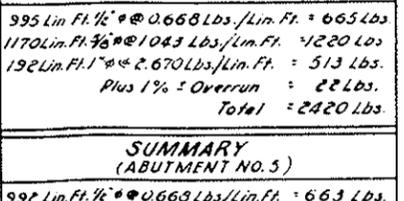
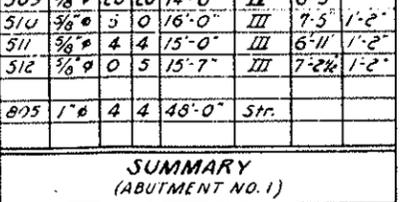
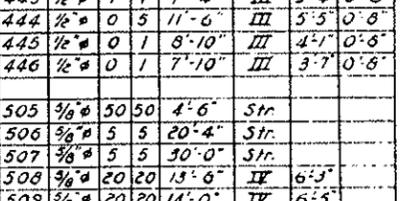
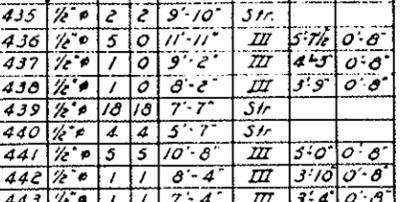
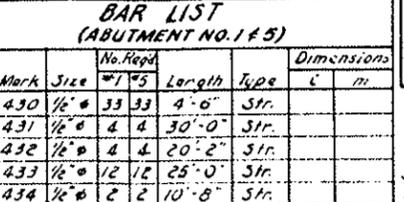
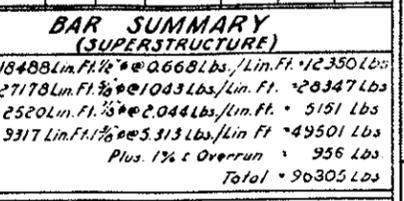
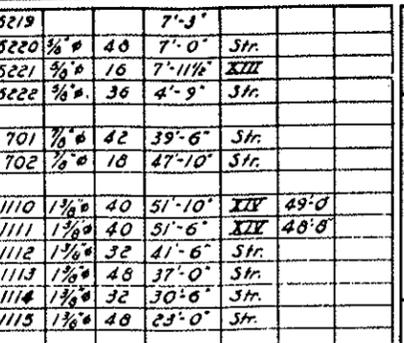
BAR LIST (SUPERSTRUCTURE)						
Mark	Size	No.	Length	Type	Dimensions	
					l	m
5219			7'-3"			
5220	3/8"	40	7'-0"	Str.		
5221	3/8"	16	7'-11 1/2"	XIII		
5222	3/8"	36	4'-9"	Str.		
701	1/2"	42	39'-6"	Str.		
702	1/2"	18	47'-10"	Str.		
1110	1 1/8"	40	51'-10"	XIV	49'-0"	
1111	1 1/8"	40	51'-6"	XIV	48'-8"	
1112	1 1/8"	32	41'-6"	Str.		
1113	1 1/8"	48	37'-0"	Str.		
1114	1 1/8"	32	30'-6"	Str.		
1115	1 1/8"	48	23'-0"	Str.		

BAR LIST (ABUTMENT NO. 1 & 5)						
Mark	Size	No.	Length	Type	Dimensions	
					l	m
430	1/2"	33	4'-6"	Str.		
431	1/2"	4	30'-0"	Str.		
432	1/2"	4	20'-2"	Str.		
433	1/2"	12	25'-0"	Str.		
434	1/2"	2	10'-8"	Str.		
435	1/2"	2	9'-10"	Str.		
436	1/2"	5	11'-11"	III	5'-7 1/2"	0'-8"
437	1/2"	1	9'-2"	III	4'-5"	0'-8"
438	1/2"	1	8'-2"	III	3'-9"	0'-8"
439	1/2"	18	7'-7"	Str.		
440	1/2"	4	5'-7"	Str.		
441	1/2"	5	10'-8"	III	5'-0"	0'-8"
442	1/2"	1	8'-4"	III	3'-10"	0'-8"
443	1/2"	1	7'-4"	III	3'-4"	0'-8"
444	1/2"	0	11'-6"	III	5'-5"	0'-8"
445	1/2"	0	8'-10"	III	4'-1"	0'-8"
446	1/2"	0	7'-10"	III	3'-7"	0'-8"
505	3/8"	50	4'-6"	Str.		
506	3/8"	5	20'-4"	Str.		
507	3/8"	5	30'-0"	Str.		
508	3/8"	20	13'-6"	IX	6'-3"	
509	3/8"	20	14'-0"	IX	6'-5"	
510	3/8"	5	16'-0"	III	7'-5"	1'-2"
511	3/8"	4	15'-0"	III	6'-11"	1'-2"
512	3/8"	0	15'-7"	III	7'-2 1/2"	1'-2"
875	1"	4	48'-0"	Str.		

SUMMARY (ABUTMENT NO. 1)						
Lin. Ft.	1/2"	3/8"	1"	1 1/8"	1 1/2"	Total
995	Lin. Ft.	1/2"	0.668	Lbs./Lin. Ft.	665	Lbs.
1170	Lin. Ft.	3/8"	1.043	Lbs./Lin. Ft.	1220	Lbs.
192	Lin. Ft.	1"	2.670	Lbs./Lin. Ft.	513	Lbs.
				Plus 1% Overrun	22	Lbs.
				Total	2420	Lbs.

SUMMARY (ABUTMENT NO. 5)						
Lin. Ft.	1/2"	3/8"	1"	1 1/8"	1 1/2"	Total
992	Lin. Ft.	1/2"	0.668	Lbs./Lin. Ft.	663	Lbs.
1168	Lin. Ft.	3/8"	1.043	Lbs./Lin. Ft.	1218	Lbs.
192	Lin. Ft.	1"	2.670	Lbs./Lin. Ft.	513	Lbs.
				Plus 1% Overrun	21	Lbs.
				Total	2415	Lbs.

BAR LIST (SUPERSTRUCTURE-CONT)						
Mark	Size	No.	Length	Type	Dimensions	
					l	m
460	3/8"	6	8'-0"	XVII		
461			1'-6"			
to	3/8"	1ea.	by 8" to	Str.		
463			2'-10"			



STRUCTURE NO. F-14-E

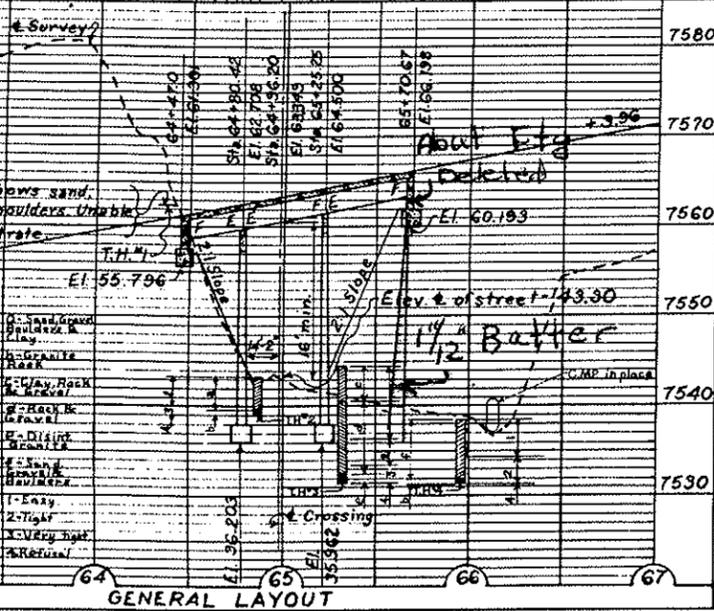
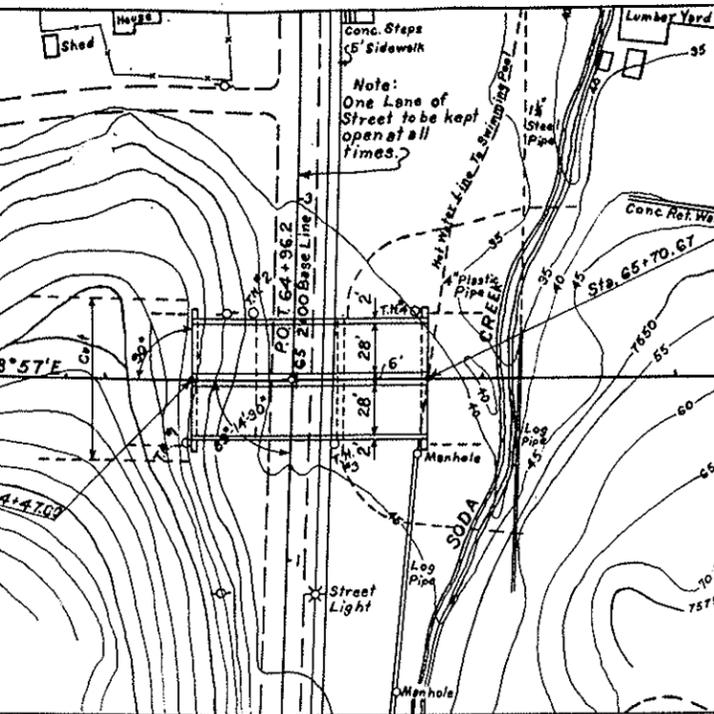
LOADING DATA  
 LIVE LOAD - A.A.S.H.O. #20 (516-44)  
 DEAD LOAD ASSUMES 15 LBS PER SQ. FT. ADDITIONAL WEARING SURFACE WHICH INCLUDES THE 1 INCH CONCRETE MONOLITHIC WEARING SURFACE SHOWN.

DESIGNING DATA  
 A.A.S.H.O. #11: LIMIT STRESSES, EXCEPT AS NOTED  
 Reinforcing Steel Is: 20000 lbs per sq in  
 Structural Steel Is: 18000 lbs per sq in  
 Concrete: 3000 lbs per sq in  
 # 10

GENERAL NOTES  
 ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE CO. ROAD DEPARTMENT OF HIGHWAYS, APPLICABLE TO THE PROJECT.  
 ALL CONCRETE SHALL BE CLASS A AND AIR ENTRAINMENT AS SPECIFIED.  
 ALL CONCRETE SURFACE EXPOSED TO NORMAL VIEW BY HIGHWAY TRAFFIC SHALL RECEIVE CLASS 1 FINISH.  
 CONCRETE FINISHING SHALL RECEIVE ORDINARY SURFACE FINISH EXCEPT IN CASE OF HIGHWAY UNDERPASS CONCRETE GIRDERS FLOOR SLABS AND CURBS SHALL BE FINISHED MONOLITHICALLY.  
 FORMS FOR CONCRETE SURFACE EXPOSED TO THE FINISHED WORK SHALL BE CONSTRUCTED OF SHEEP LAP OR TONGUE AND GROOVE LUMBER 2" S UNLESS FACED WITH PANEL BOARD.  
 FOOTINGS IN ROCK SHALL BE FOLDED OUT TO ROCK AND NOT FORWARDED.  
 SOUNDINGS AND DEPTH OF FOOTINGS SHOWN ARE IN ACCORDANCE WITH THE BEST AVAILABLE DATA AND WHEN DIFFERENT CONDITIONS ARE ENCOUNTERED THE BRIDGE ENGINEER WILL IN SPEC. AND DETERMINE THE DESIGN IS NECESSARY.  
 ALL REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A 305 (57) ON THE LATEST REVISION THEREOF AND SHALL BE INTERMEDIATE GRADE STEEL OF A DEFORMED TYPE. EACH BAR SHALL BE TAGGED WITH THE NUMBER REVISION AND THE STATION NUMBER OF THE PROJECT. PRIMARY BARS SHALL NOT BE SPICED AND SECONDARY BARS WHEN SPICED SHALL LAP 20 DIAMETERS OF THE BAR DIMENSIONS FOR REINFORCING STEEL, NOT SHOWN AS CLEAR SHALL BE TO THE CENTER LINE OF THE BAR.  
 ALL STRUCTURAL STEEL SHALL BE PAINTED ONE SHOP COAT OF ZINC CHROMATE AND TWO FIELD COATS OF ALUMINUM UNLESS OTHERWISE NOTED EXCEPT THE UNEXPOSED PORTION OF STEEL PILING NEED NOT BE PAINTED.  
 HANDRAIL BOLTS SHALL HAVE HEX HEADS, NUTS AND LOCK WASHERS UNLESS OTHERWISE SPECIFIED AND ALL RIVETS EXCEPT AS NOTED ARE 1/2" DIA AND SHALL BE POWER DRIVEN WHEN RELATED TO BRIDGE OR PILING IS SHOWN ON THE DRAWING THE PRESERVATIVE FOR TREATMENT SHALL BE CROCODOL OIL.  
 WHEN EXCAVATING FOR FOOTINGS THE FINAL ONE FOOT IN DEPTH SHALL BE DONE BY HAND LABOR METHODS.  
 HIGH TENSILE STRENGTH BOLTS MAY BE SUBSTITUTED FOR FIELD RIVETS BUT AT NO ADDITIONAL EXPENSE TO THE STATE. THE BOLTS SHALL BE ASSEMBLED IN ACCORDANCE WITH SPECIFICATIONS APPROVED BY THE RESEARCH COUNCIL ON RIVETED AND BOLTED STRUCTURAL JOINTS OF THE ENGINEERING FOUNDATION, JAN. 31, 1951.

BAR LIST - Slope Drains (Include Quantities with Abuts.)						
Mark	Size	No.	Length	Type	Dimensions	
					l	m
460	1/2"	1	10'-4"	IX	7'-0"	
461			3'-10"			
to	1/2"	1ea.	by 9 1/2" to	Str.		
465			7'-0"			
466			5'-3"			
to	1/2"	2ea.	2ea.	by 1" to	XVI	by 1" to

FED. ROAD DIV. NO.	DISTRICT	PROJECT NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F-005-3(II)	35	



Mark	Size	No. Reqd.	Length	Type	Dimensions
431	1/2"	172	196	8'-2 1/2"	I 2'-9" (1.6 1/4)
432	1/2"	4	4	7'-3"	I 1'-9 1/4" 1'-8 1/4"
450	1/2"	4	4	10'-3"	I 2'-5 1/4" 2'-5 1/4"
451	1/2"	4	4	10'-5"	I 2'-5 3/4" 2'-9 3/4"
452	1/2"	4	4	10'-7"	I 2'-6 1/4" 2'-6 1/4"
521	3/8"	72		6'-6"	Str.
522	3/8"	80		6'-10"	Str.
611	3/4"	12	12	10'-0"	X
711	3/8"	32		22'-0"	Str.
712	3/8"	16		19'-0"	Str.
713	3/8"	16		8'-0"	Str.
714	3/8"	32		24'-0"	Str.
715	3/8"	16		21'-0"	Str.
716	3/8"	16		10'-0"	Str.
801	1"	16		3'-0"	Str.
802	1"	6	6	12'-6"	Str.
901	1 1/8"	12	12	30'-8"	Str.
902	1 1/8"	16	4	11'-3"	Str.
903	1 1/8"	6	6	19'-0"	Str.
1011	1 1/4"	12		11'-3"	Str.

2077 lin. ft. 1/2" @ 0.6687 lin. ft. = 1387 lbs.
468 lin. ft. 3/8" @ 1.0437 lin. ft. = 488 lbs.
120 lin. ft. 3/4" @ 1.5027 lin. ft. = 180 lbs.
1136 lin. ft. 1/8" @ 2.0447 lin. ft. = 2322 lbs.
75 lin. ft. 1" @ 2.677 lin. ft. = 200 lbs.
662 lin. ft. 1 1/8" @ 3.47 lin. ft. = 2251 lbs.
Plus 1% Overrun = 67 lbs.
<b>Total = 6895 lbs.</b>

2358 lin. ft. 1/2" @ 0.6687 lin. ft. = 1575 lbs.
547 lin. ft. 3/8" @ 1.0437 lin. ft. = 571 lbs.
120 lin. ft. 3/4" @ 1.5027 lin. ft. = 180 lbs.
1264 lin. ft. 1/8" @ 2.0447 lin. ft. = 2589 lbs.
123 lin. ft. 1" @ 2.677 lin. ft. = 328 lbs.
527 lin. ft. 1 1/8" @ 3.47 lin. ft. = 1792 lbs.
135 lin. ft. 1 1/4" @ 4.3087 lin. ft. = 581 lbs.
Plus 1% Overrun = 74 lbs.
<b>Total = 7685 lbs.</b>

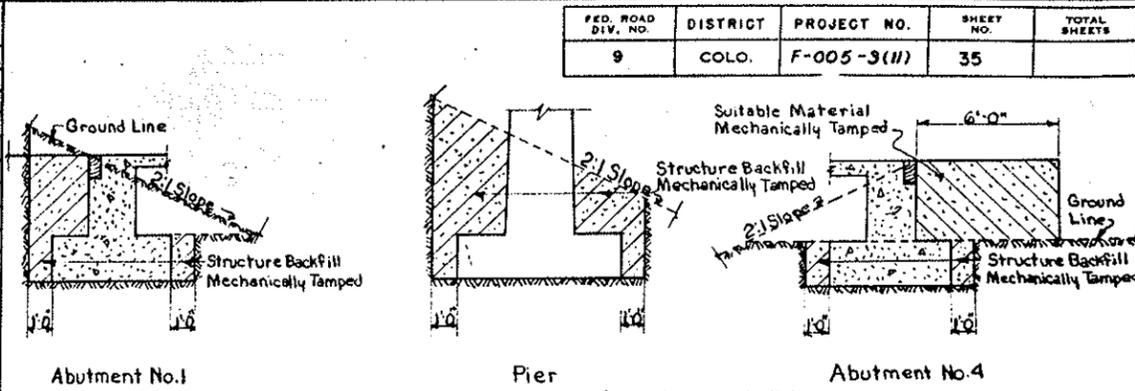
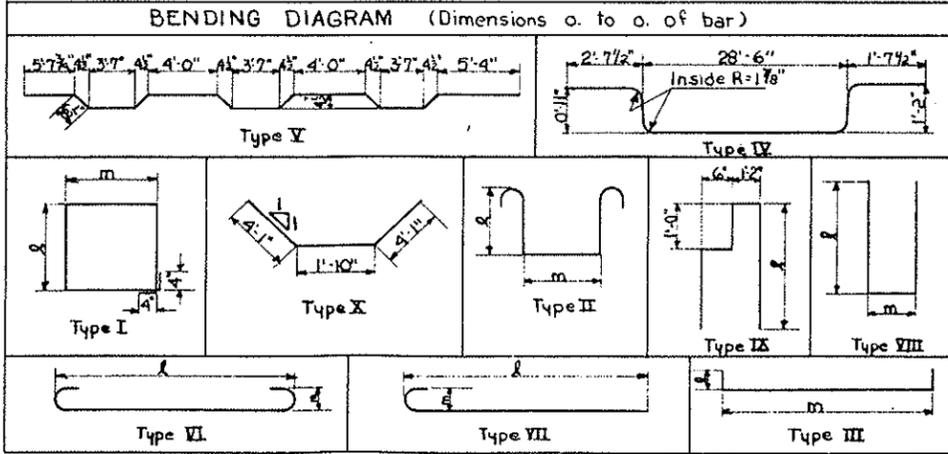
Mark	Size	No. Reqd.	Length	Type	Dimensions
401	1/2"	116	32'-5"	Str.	
402	1/2"	464	22'-9"	Str.	
403	1/2"	212	4'-10"	Str.	
404	1/2"	52	4'-2"	I	1'-1" 0'-8"
405	1/2"	966	8'-9"	II	2'-5" 1'-5 1/2"
406	1/2"	706	8'-1"	II	2'-1" 1'-5 1/2"
407	1/2"	336	2'-0 1/2"	III	0'-3 1/2" 1'-5 1/2"
408	1/2"	210	4'-11"	I	1'-7" 0'-6 1/2"
409	1/2"	42	4'-5"	I	1'-4" 0'-6 1/2"
501	3/8"	212	32'-0"	Str.	
502	3/8"	212	24'-6"	IV	
503	3/8"	208	33'-0"	V	
701	3/8"	24	26'-4"	Str.	
1101	1 3/8"	80	41'-6"	Str.	
1102	1 3/8"	24	32'-0"	Str.	
1103	1 3/8"	36	25'-6"	Str.	
1104	1 3/8"	8	33'-6"	Str.	
1105	1 3/8"	12	26'-6"	Str.	
1106	1 3/8"	40	34'-5"	VII	33'-0" 1'-0 1/2"
1107	1 3/8"	16	28'-0"	Str.	
1108	1 3/8"	24	23'-6"	Str.	
1109	1 3/8"	40	46'-5"	VII	45'-0" 1'-0 1/2"
1110	1 3/8"	40	47'-2"	VI	44'-4" 1'-0 1/2"

31621 lin. ft. 1/2" @ 0.6687 lin. ft. = 21123 lbs.
20962 lin. ft. 3/8" @ 1.0437 lin. ft. = 21863 lbs.
632 lin. ft. 3/4" @ 2.0447 lin. ft. = 1292 lbs.
11724 lin. ft. 1/8" @ 5.3377 lin. ft. = 62290 lbs.
Plus 1% Overrun = 1067 lbs.
<b>Total = 107,635 lbs.</b>

Mark	Size	No. Reqd.	Length	Type	Dimensions
411	1/2"	14	14	32'-8"	Str.
412	1/2"	10		11'-4"	VIII 4'-10" 1'-8"
413	1/2"	56		9'-10"	IX 4'-1"
414	1/2"	10		12'-4"	VIII 5'-4" 1'-8"
415	1/2"	56		10'-10"	IX 4'-7"
416	1/2"	4	4	2'-6"	Str.
417	1/2"	16	16	5'-0"	Str.
418	1/2"	2ea.	2ea.	6'-0"	2'-8"
421	1/2"	2ea.	2ea.	9'-0"	VIII 6'-0" 0'-8"
511	3/8"	50	50	4'-6"	Str.
601	3/4"	6	6	32'-8"	Str.
811	1"	4	4	32'-8"	Str.

1271 lin. ft. 1/2" @ 0.6687 lin. ft. = 849 lbs.
225 lin. ft. 3/8" @ 1.0437 lin. ft. = 235 lbs.
196 lin. ft. 3/4" @ 1.5027 lin. ft. = 294 lbs.
131 lin. ft. 1" @ 2.677 lin. ft. = 350 lbs.
Plus 1% Overrun = 17 lbs.
<b>Total = 1745 lbs.</b>

1337 lin. ft. 1/2" @ 0.6687 lin. ft. = 893 lbs.
225 lin. ft. 3/8" @ 1.0437 lin. ft. = 235 lbs.
196 lin. ft. 3/4" @ 1.5027 lin. ft. = 294 lbs.
131 lin. ft. 1" @ 2.677 lin. ft. = 350 lbs.
Plus 1% Overrun = 18 lbs.
<b>Total = 1790 lbs.</b>



All material that is to be mechanically tamped, shall be placed in horizontal layers not more than 6 inches in depth and tamped before the next layer is placed.

**STRUCTURE BACKFILL MECHANICAL TAMPING DIAGRAMS**

*Note:* Abut. # 4 Deleted and replaced with 12" H Piling. For Piling Length see Page 30 Major Structure Book

Description	Unit	Superstructure	Abut. No. 1	Pier No. 2	Pier No. 3	Abut. No. 4	Total
Rock Excavation (Str.)	Cu. Yd.		99	128	109		336
Common Excavation (Str.)	Cu. Yd.					34	34
Structure Backfill (Class X)	Cu. Yd.		52	96	87	11	246
Mechanical Tamping	Hr.		5	10	9	7	31
Bed Bridge Timber	Mft. bm.		0.324			0.324	0.648
"A" Concrete	Cu. Yd.	356.5	41.0	46.4	49.5	43.6	537.0
Reinforcing Steel (includes 1% Overrun)	Lb.	107635	1745	6895	7685	1790	125750
Structural Steel (includes 1% for Paint)	Lb.	9540	550	640	320	550	11,600
Galvanized Sheet Metal	Sq. Ft.			14	7		21
Copper (32 oz.)	Lb.	29					29
Expansion Material (Type I)	Sq. Ft.	70	14			15	99
Expansion Material (Type II)	Sq. Ft.	67					67
Expansion Joint Material (Type I)	Sq. Ft.	67					67

NOTE: It is estimated that Structure Backfill is available within Free Haul Limits of the Structure.

**GENERAL NOTES (CONTINUED)**

ALL REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A 305-307 OR THE LATEST REVISION THEREOF, AND SHALL BE INTERMEDIATE GRADE STEEL OF A DEFORMED TYPE.

EACH BAR SHALL BE TAGGED WITH THE NUMBER DESIGNATION AND THE STATION NUMBER OF THE PROJECT.

PRIMARY BARS SHALL NOT BE SPICED EXCEPT BY PERMISSION OF THE ENGINEER. SECONDARY BARS WHEN SPICED SHALL LAP 20 DIAMETERS OF THE BAR.

WHEN PRIMARY BARS ARE SPICED THEY SHALL LAP 34 DIAMETERS FOR BARS NEAR TOP OF BEAMS AND GIRDERS HAVING MORE THAN 12 INCHES OF CONCRETE UNDER THE BARS AND 20 DIAMETERS FOR BARS NEAR BOTTOM OF MEMBERS. DIMENSIONS FROM EDGE OF CONCRETE TO REINFORCING STEEL SHALL BE TO CENTER LINE OF BAR UNLESS MARKED CLEAR (CL). EXPANSION JOINT MATERIAL SHALL BE ACCORDING TO A.A.S.H.O. SPECIFICATION M-183-54 AND OF THE TYPE SHOWN.

ALL STRUCTURAL STEEL SHALL BE PAINTED ONE SHOP COAT OF ZINC CHROMATE AND TWO FIELD COATS OF ALUMINUM.

HANDRAIL BOLTS SHALL HAVE HEX HEADS, NUTS, AND LOCK WASHERS, UNLESS OTHERWISE SPECIFIED.

WHEN EXCAVATING FOR FOOTINGS THE FINAL ONE FOOT IN DEPTH SHALL BE DONE BY HAND LABOR METHODS.

**GENERAL NOTES**

ALL WORK SHALL BE DONE ACCORDING TO THE STANDARD SPECIFICATIONS OF THE COLORADO DEPARTMENT OF HIGHWAYS APPLICABLE TO THE PROJECT.

ALL CONCRETE SHALL BE CLASS "A".

FORMS FOR CONCRETE SURFACES EXPOSED IN THE FINISHED WORK SHALL BE CONSTRUCTED OF SHIPLAP OR TONGUE AND GROOVE LUMBER S3S UNLESS FACED WITH PANEL BOARD.

CONCRETE GIRDERS FLOOR SLABS AND CURB SHALL BE POURED MONOLITHICALLY. FOOTINGS IN ROCK SHALL BE POURED OUT TO THE ROCK AND NOT FORMED.

ALL CONCRETE SURFACES EXPOSED TO NORMAL VIEW BY HIGHWAY TRAFFIC SHALL RECEIVE CLASS "I" SURFACE FINISH. WIND FACES SHALL RECEIVE CLASS "I" SURFACE FINISH.

SPACING AND DEPTH OF FOOTINGS SHOWN ARE ACCORDING TO THE BEST AVAILABLE DATA. IF ESSENTIALLY DIFFERENT CONDITIONS ARE ENCOUNTERED THE BRIDGE ENGINEER WILL INSPECT AND DETERMINE IF REDESIGN IS NECESSARY.

**LOADING DATA.**  
LIVE LOAD A A 3 H O. (H-20-S16-44)  
DEAD LOAD ASSUMES 10 LBS PER SQ. FT. ADDITION  
AL WEARING SURFACE WHICH INCLUDES THE 1/2 INCH  
CONCRETE MONOLITHIC WEARING SURFACE SHOWN.

**DESIGNING DATA.**  
A.A.S.H.O. 1955 UNIT STRESSES, EXCEPT AS NOTED  
f<sub>c</sub> = 2000 lbs. per sq. in.  
Reinforcing Steel - f<sub>s</sub> = 20000 lbs. per sq. in.  
Structural Steel - f<sub>s</sub> = 18000 lbs. per sq. in.  
n = 10

**COLORADO**  
DEPARTMENT OF HIGHWAYS  
3 SPAN (32', 44', 44') CONCRETE  
SLAB & GIRDER BRIDGE  
2-28'-0" ROADWAYS-6' MEDIAN  
**GENERAL LAYOUT & SUMMARY**  
Over City Street  
Sta. 64+7.00 to 65+70.67  
In Idaho Springs, Sec. T. 35 S. 73 N.

Designed by E. C. Approved by J. L. G. Bridge Engineer  
Made by J. L. G. Checked by Date: Aug. 31, 1956

Original Scale 1"=50'

# DETAILS OF INTERSECTION STA. 451+

TABULATION OF CURVE DATA

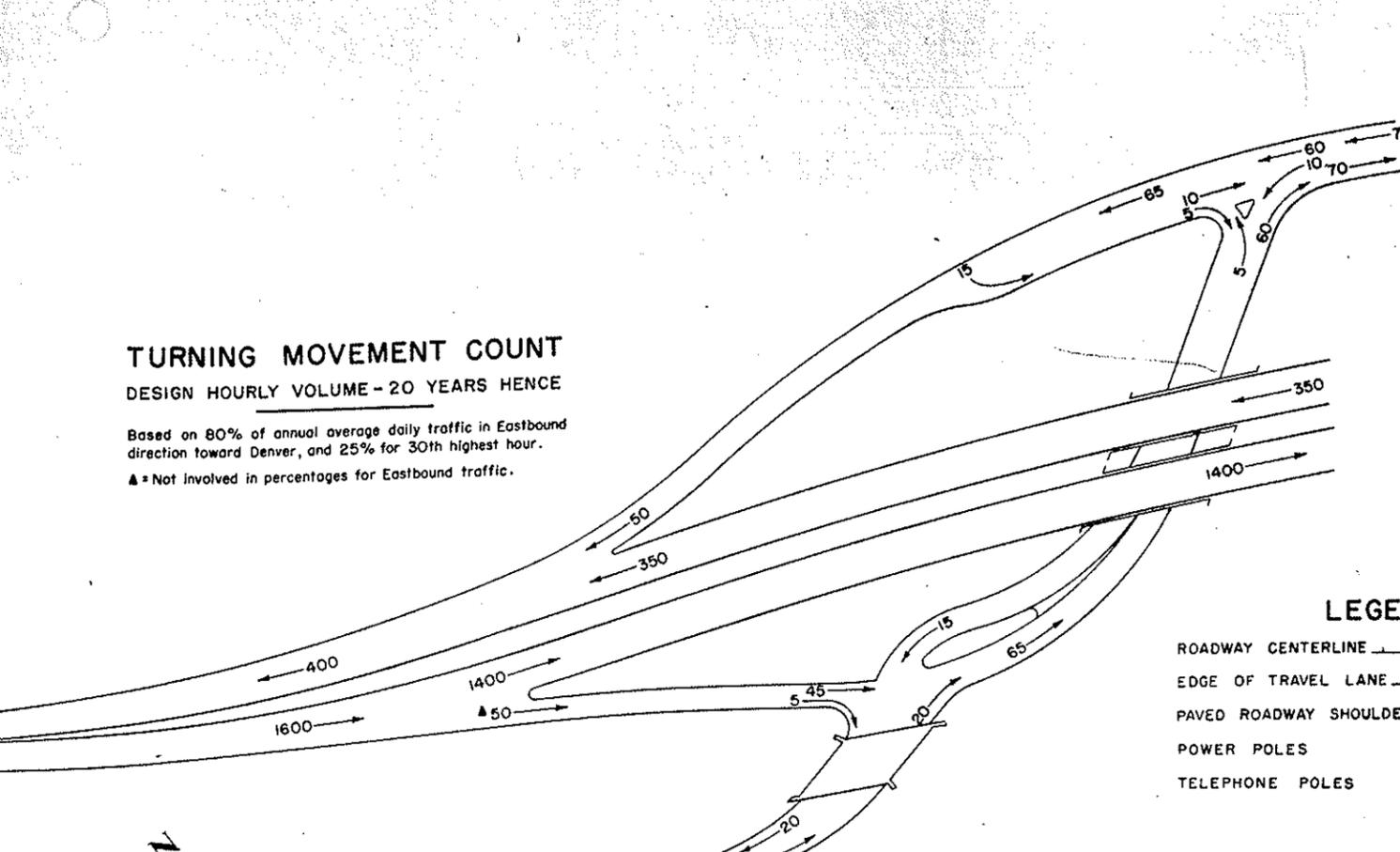
CURVE	Δ	D	T	L	R
A	17°29' LT	2°30'	352.4	699.3	2292.0
B	6°56' RT	1°00'	347.1	693.3	5730.0
C	70°53' RT	14°00'	291.3	506.3	409.3
D	56°33' RT	18°00'	171.2	314.2	318.3
E	58°00' RT	18°00'	176.5	322.2	318.3
F	11°00' LT	2°00'	275.9	550.0	2865.0
G	23°00' RT	8°00'	145.9	287.5	716.3
H					90.0
J	21°47'	57°18'	19.2	38.0	100.0
K	94°26'	191°00'	32.4	49.4	30.0
L	55°30'	76°24'	39.5	72.6	75.0
M	47°00'	25°00'	99.7	188.0	229.2
N	33°00'	95°30'	17.8	34.6	60.0
P					26.2
a					1.0
b					3.0

## TURNING MOVEMENT COUNT

DESIGN HOURLY VOLUME - 20 YEARS HENCE

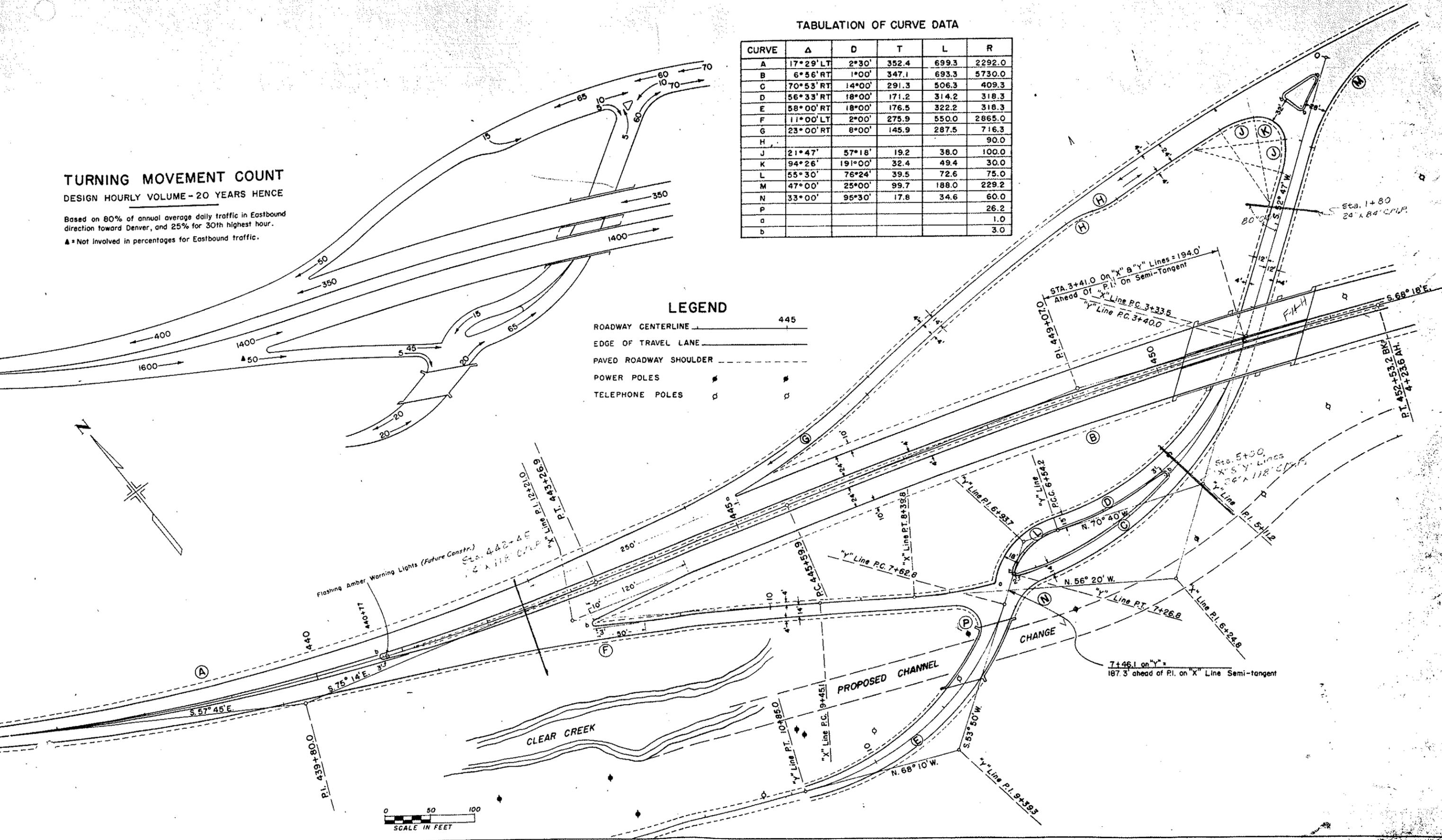
Based on 80% of annual average daily traffic in Eastbound direction toward Denver, and 25% for 30th highest hour.

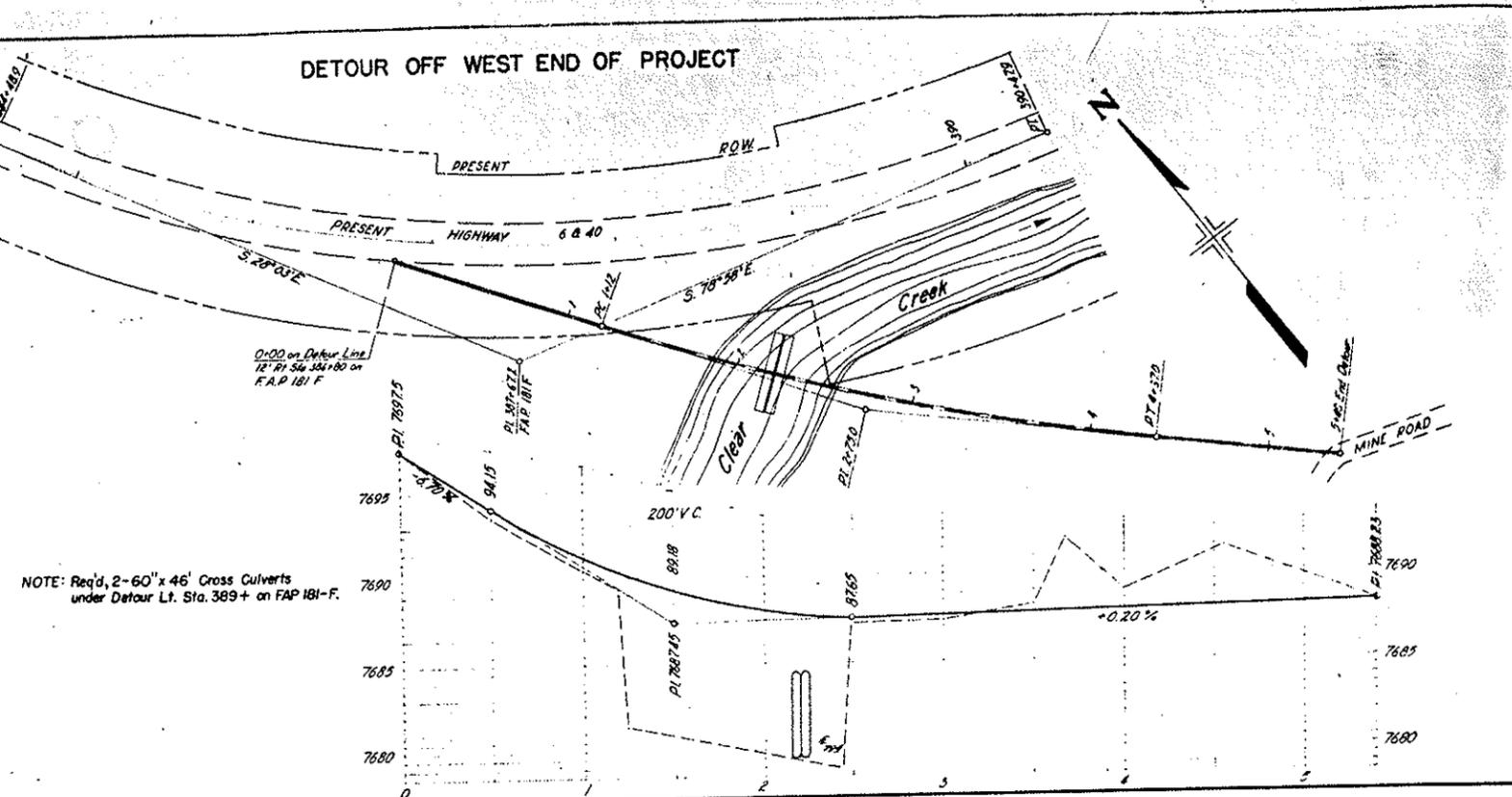
▲ = Not involved in percentages for Eastbound traffic.



## LEGEND

- ROADWAY CENTERLINE ——— 445
- EDGE OF TRAVEL LANE ——— 445
- PAVED ROADWAY SHOULDER - - - - - 445
- POWER POLES ⚡ ⚡
- TELEPHONE POLES Ⓟ Ⓟ

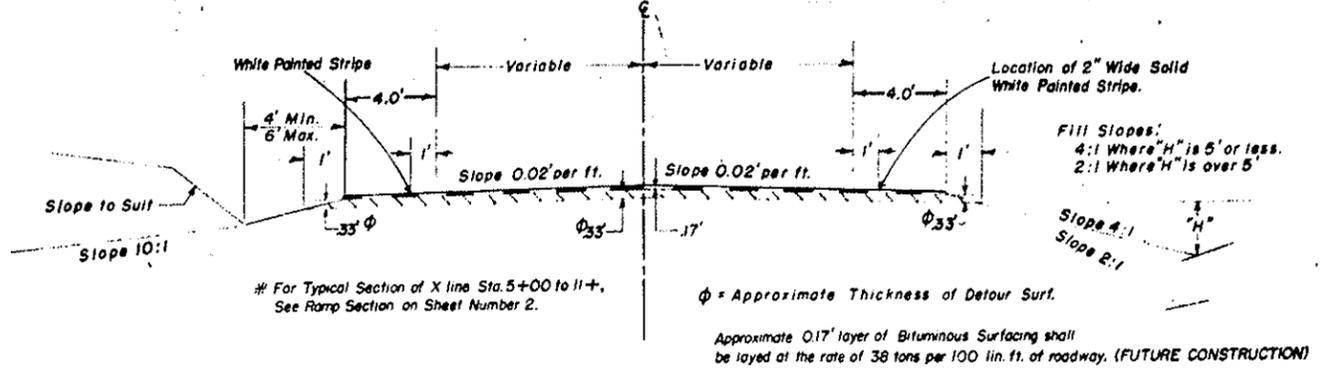




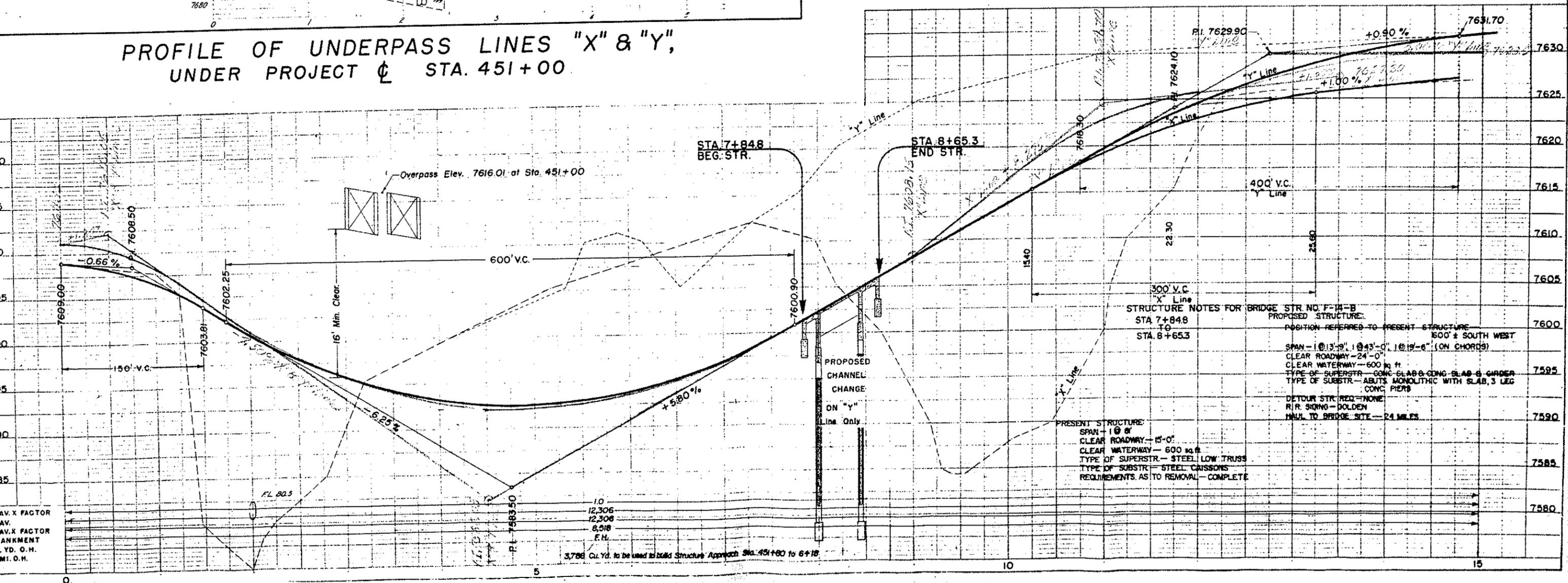
FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 005-3(11)	60	

Original Scale 1"=50'

### TYPICAL CROSS SECTION OF "X" & "Y" LINES (STA. 0+00 TO 5+00)



### PROFILE OF UNDERPASS LINES "X" & "Y", UNDER PROJECT @ STA. 451+00



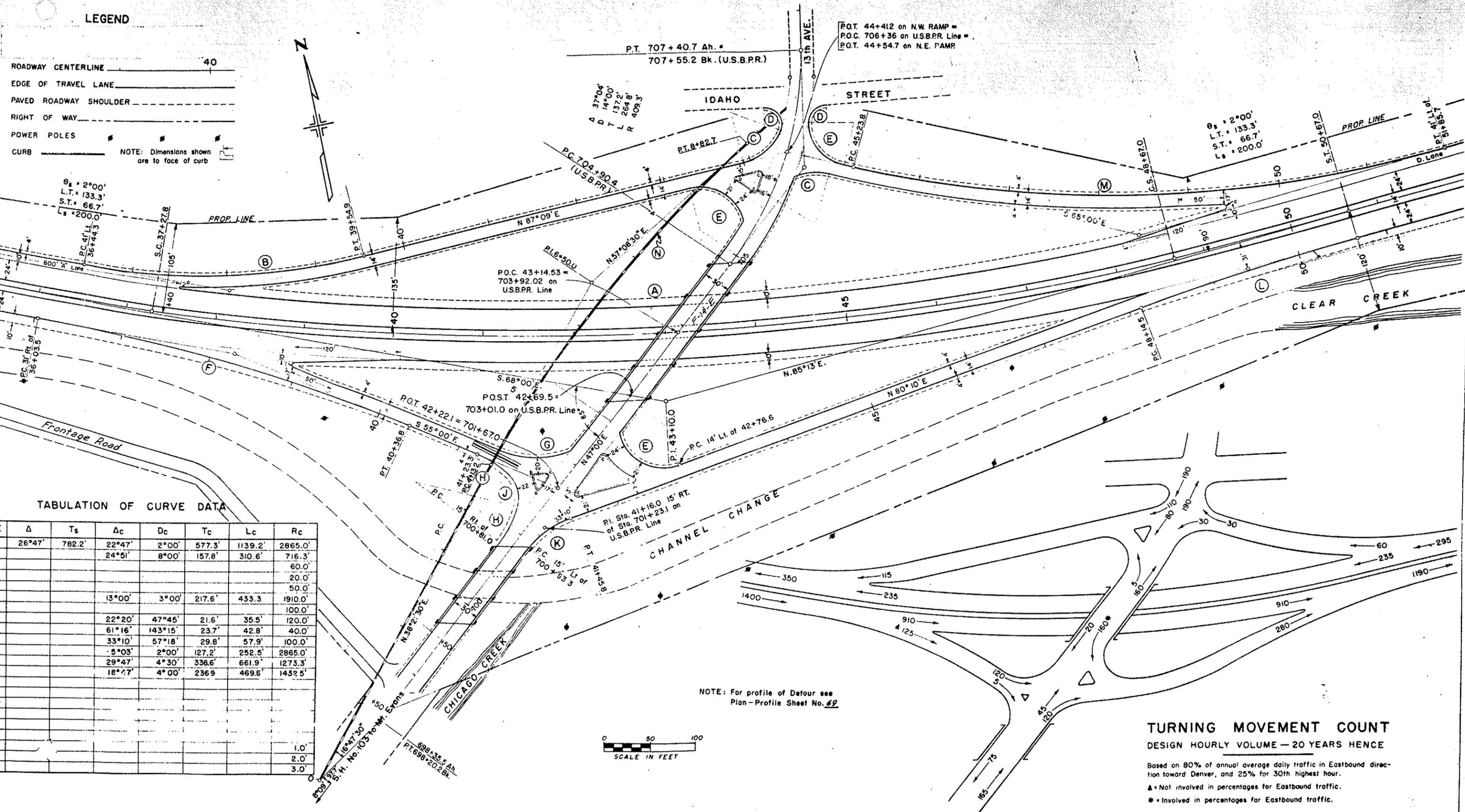
Original Scale 1"=50'

# DETAILS OF INTERSECTION, STA. 43+

### LEGEND

- ROADWAY CENTERLINE  40
- EDGE OF TRAVEL LANE
- PAVED ROADWAY SHOULDER
- RIGHT OF WAY
- POWER POLES
- CURB

NOTE: Dimensions shown are to face of curb



TABULATION OF CURVE DATA

Δ	Ts	Δc	Dc	Tc	Lc	Rc
26°47'	782.2'	22°47'	2°00'	577.3'	1139.2'	2865.0'
		24°51'	8°00'	157.8'	310.6'	716.3'
						60.0'
						20.0'
						50.0'
		13°00'	3°00'	217.6'	433.3'	1910.0'
						100.0'
		22°20'	47°45'	21.6'	35.5'	120.0'
		61°16'	143°15'	23.7'	42.8'	40.0'
		33°10'	57°18'	29.8'	57.9'	100.0'
		5°03'	2°00'	127.2'	252.5'	2865.0'
		29°47'	4°30'	338.6'	661.9'	1273.3'
		18°47'	4°00'	236.9'	469.6'	1432.5'
						1.0'
						2.0'
						3.0'

NOTE: For profile of Detour see Plan-Profile Sheet No. 62



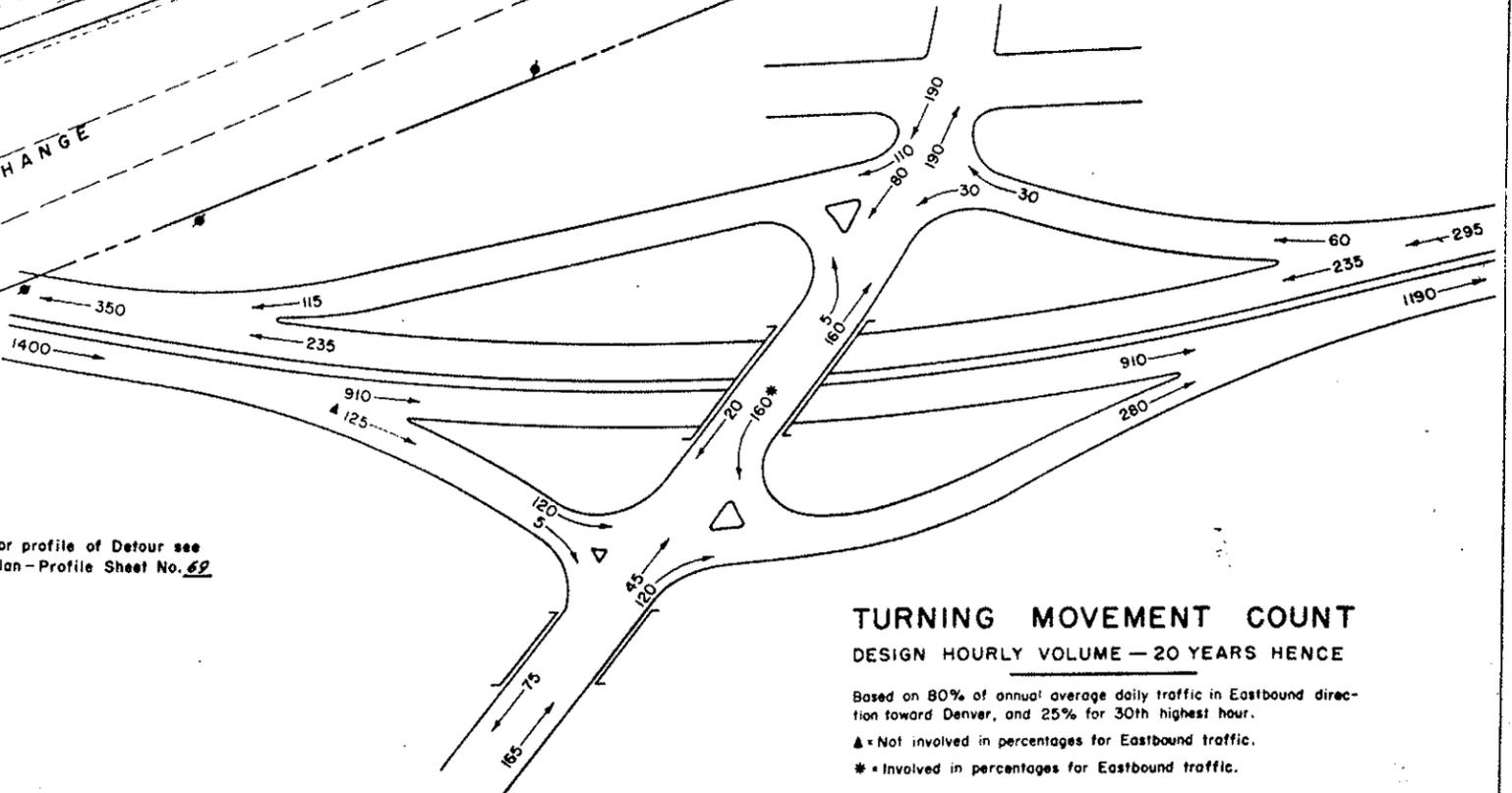
### TURNING MOVEMENT COUNT

DESIGN HOURLY VOLUME - 20 YEARS HENCE

Based on 80% of annual average daily traffic in Eastbound direction toward Denver, and 25% for 30th highest hour.

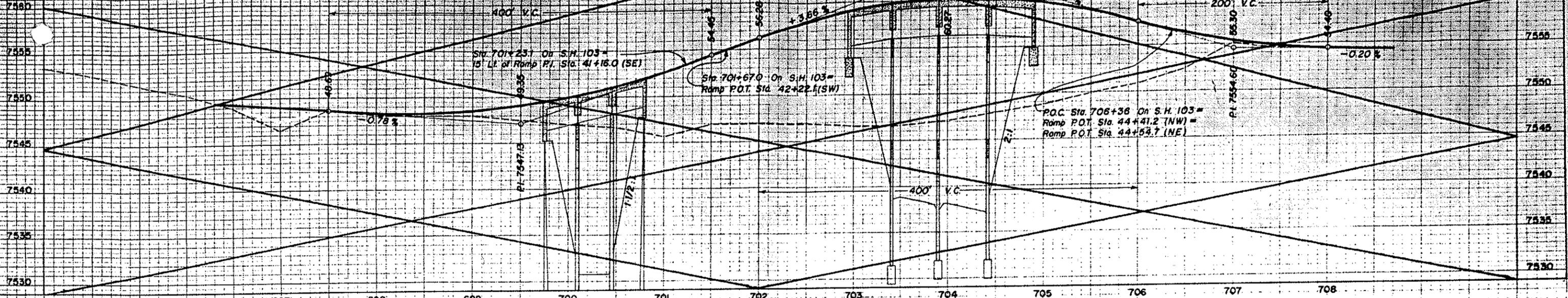
▲ = Not involved in percentages for Eastbound traffic.

\* = Involved in percentages for Eastbound traffic.

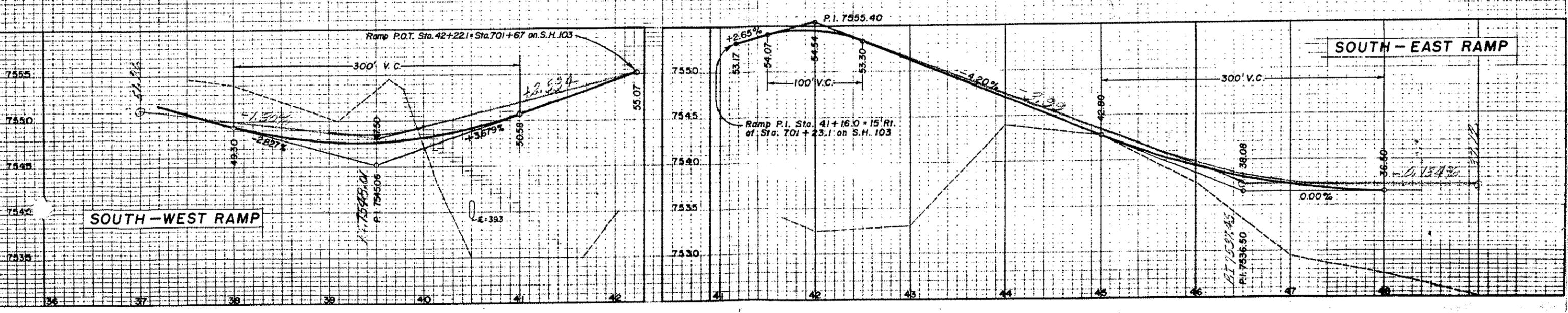
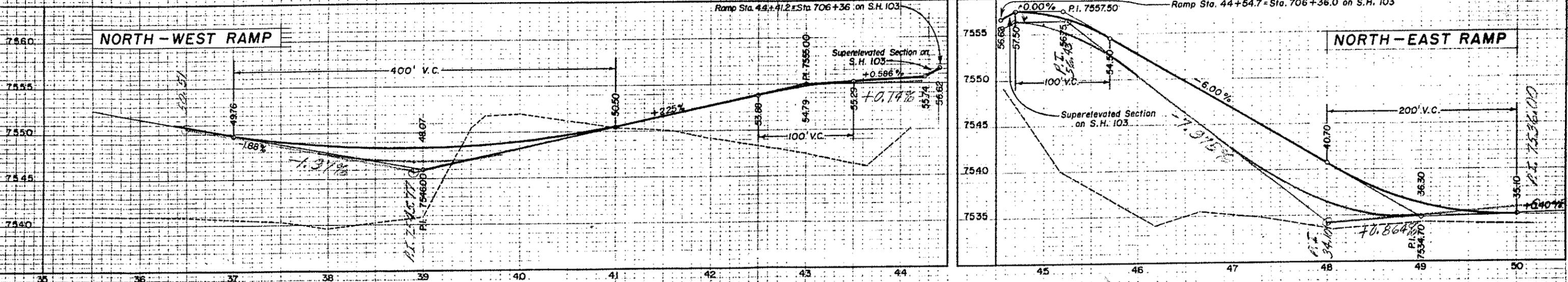


# PROFILE OF S.H. 103 CROSSING PROJECT Q AT STA. 43+

FED. ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 005-3(II)	62	



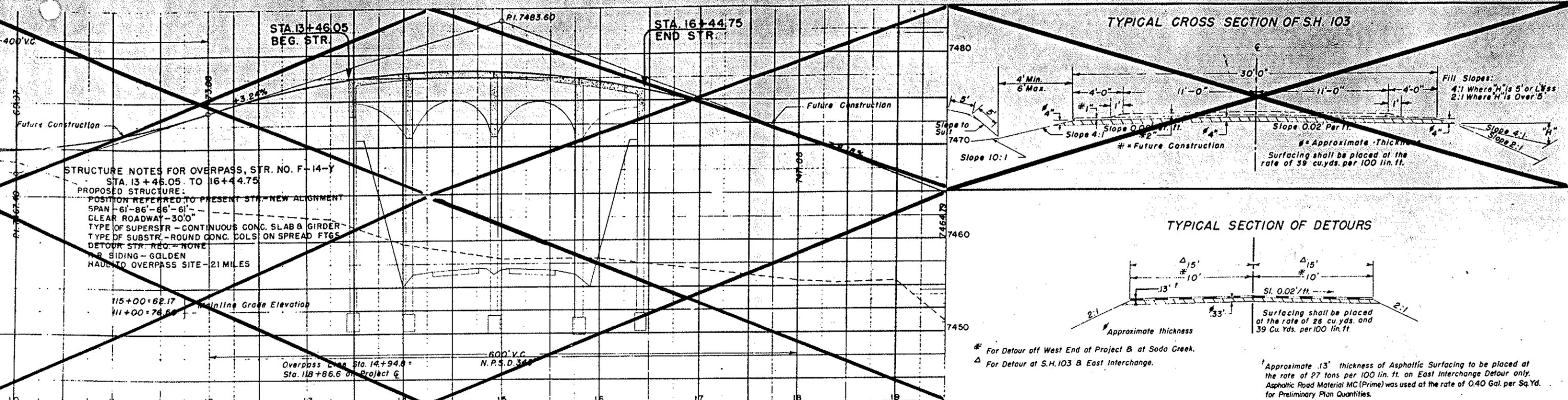
## PROFILES OF INTERSECTION RAMPS, STA. 43+



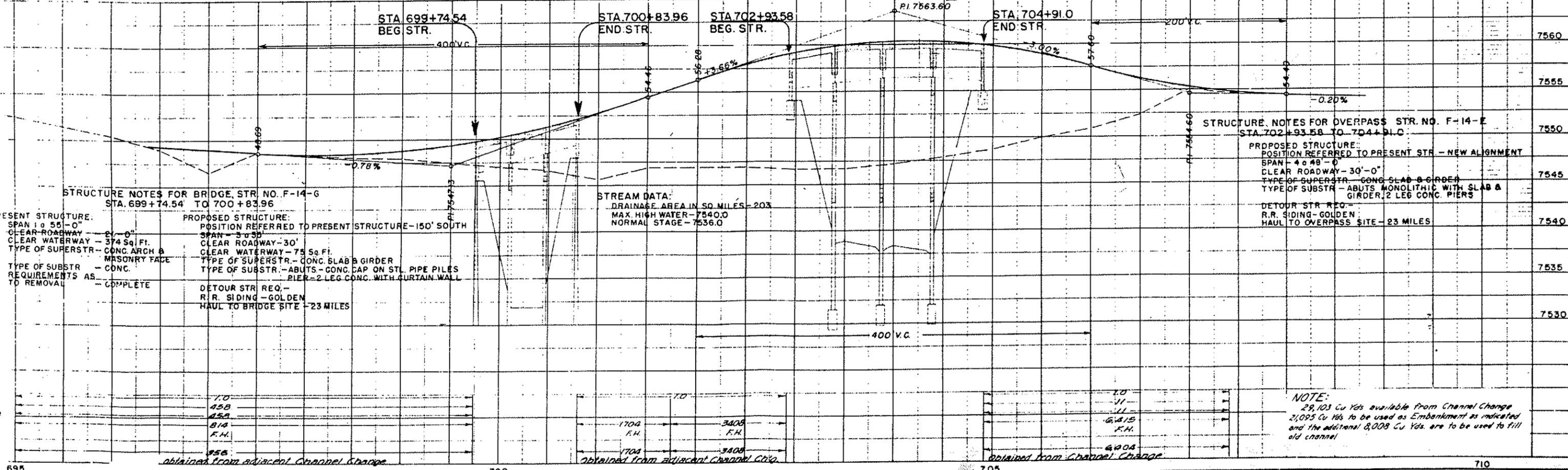
# PROFILE OF OVERPASS LINE, CROSSING PROJECT Q AT STA. 118+

FED. ROAD DIST. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 005-3(11)	63	

Original Scale 1"=50'



# PROFILE OF S.H. 103 CROSSING PROJECT Q AT STA. 43+



**NOTE:**  
29,103 Cu Yds available from Channel Change  
21,093 Cu Yds to be used as Embankment as indicated  
and the additional 8,008 Cu Yds. are to be used to fill  
old channel

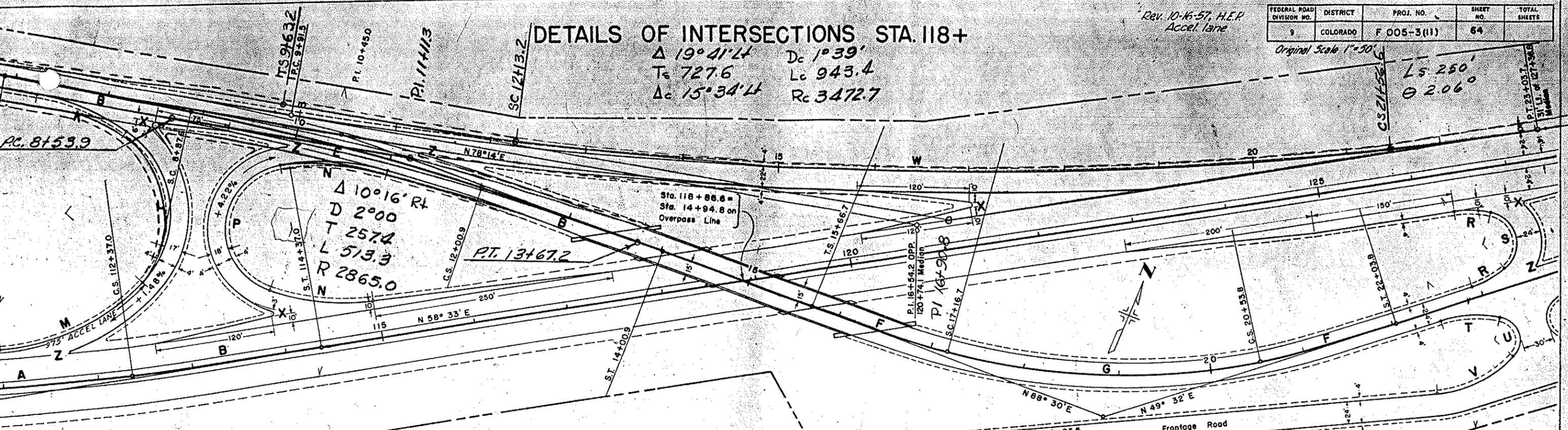
Rev. 10-16-57, H.E.P.  
Accel. lane

FEDERAL ROAD DIVISION NO.	DISTRICT	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLORADO	F 005-3(11)	64	

### DETAILS OF INTERSECTIONS STA. 118+

$\Delta 19^{\circ}41'44''$   $D_c 1^{\circ}39'$   
 $T_c 727.6$   $L_c 943.4$   
 $\Delta_c 15^{\circ}34'44''$   $R_c 3472.7$

Original Scale 1"=50'



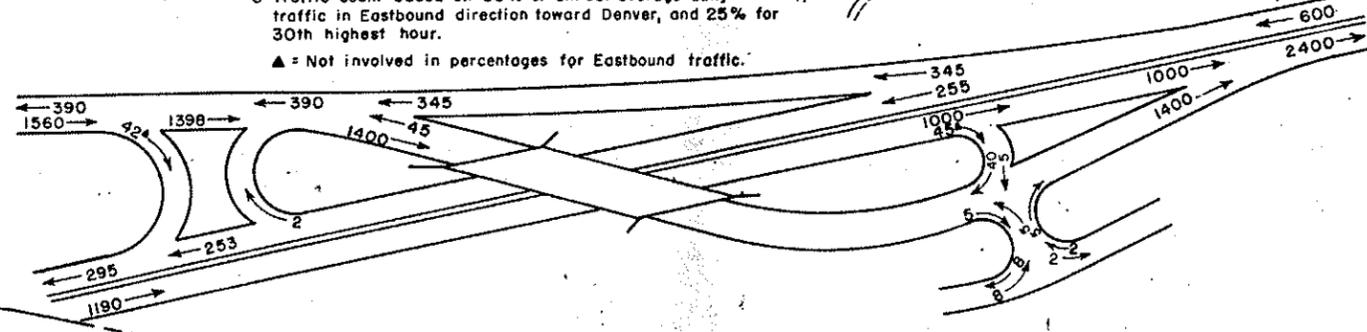
### LEGEND

- ROADWAY CENTERLINE ——— 115
- EDGE OF TRAVEL LANE ———
- PAVED ROADWAY SHOULDER - - - - -
- RIGHT OF WAY ———

### TURNING MOVEMENT COUNT

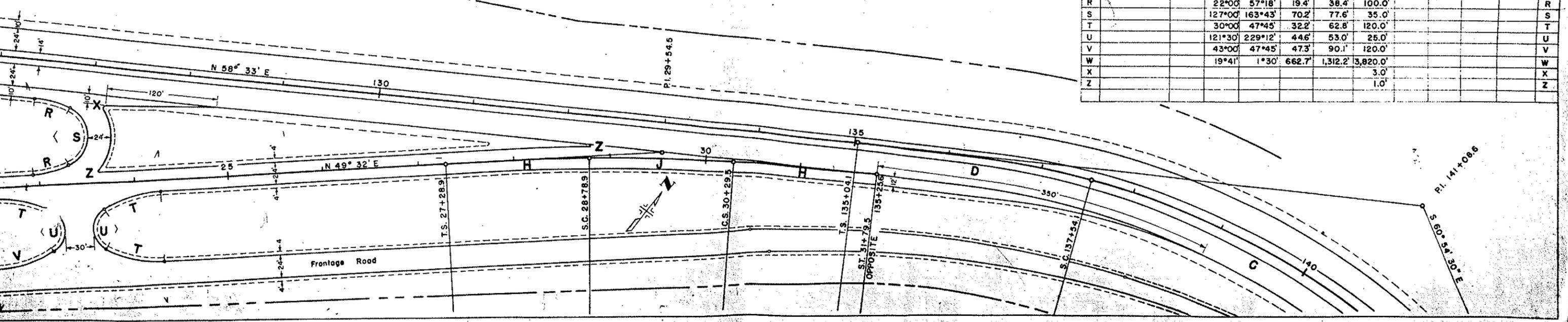
DESIGN HOURLY VOLUME  $\phi$  - 20 YEARS HENCE

- $\phi$  Traffic count based on 80% of annual average daily traffic in Eastbound direction toward Denver, and 25% for 30th highest hour.
- $\Delta$  Not involved in percentages for Eastbound traffic.



### TABULATION OF CURVE DATA

	$\Delta$		$T_s$	$\Delta_c$	$D_c$	$T_c$	$L_c$	$R_c$	$\theta$	$L_s$	LT	ST	
A	34°12'	LT	981.5'	30°12'	2°00'	773.0'	1,510.0'	2,865.0'					A
B									2°00'	200.0'	133.3'	66.7'	B
C	60°32'30"	RT	604.5'	43°02'30"	7°00'	322.8'	614.9'	818.6'					C
D									8°45'	250.0'	166.9'	83.5'	D
E	10°16'	RT	357.4'	6°16'	2°00'	156.9'	313.3'	2,865.0'					E
F									6°00'	150.0'	100.1'	50.1'	F
G	38°58'	LT	328.8'	26°58'	8°00'	171.7'	337.1'	716.3'					G
H									2°15'	150.0'	100.0'	50.0'	H
J	9°01'	RT	225.6'	4°31'	3°00'	75.3'	150.6'	1,910.0'					J
K				25°30'	24°55'	52.0'	102.3'	230.0'					K
L				97°30'	52°05'	125.4'	187.2'	110.0'					L
M				43°00'	24°55'	90.6'	172.6'	230.0'					M
N				27°30'	24°55'	56.3'	110.4'	230.0'					N
P				150°00'	81°52'	261.2'	183.2'	70.0'					P
R				22°00'	57°18'	19.4'	38.4'	100.0'					R
S				127°00'	163°43'	70.2'	77.6'	35.0'					S
T				30°00'	47°45'	32.2'	62.8'	120.0'					T
U				121°30'	229°12'	44.6'	53.0'	25.0'					U
V				43°00'	47°45'	47.3'	90.1'	120.0'					V
W				19°41'	1°30'	662.7'	1,312.2'	3,820.0'					W
X								3.0'					X
Z								1.0'					Z



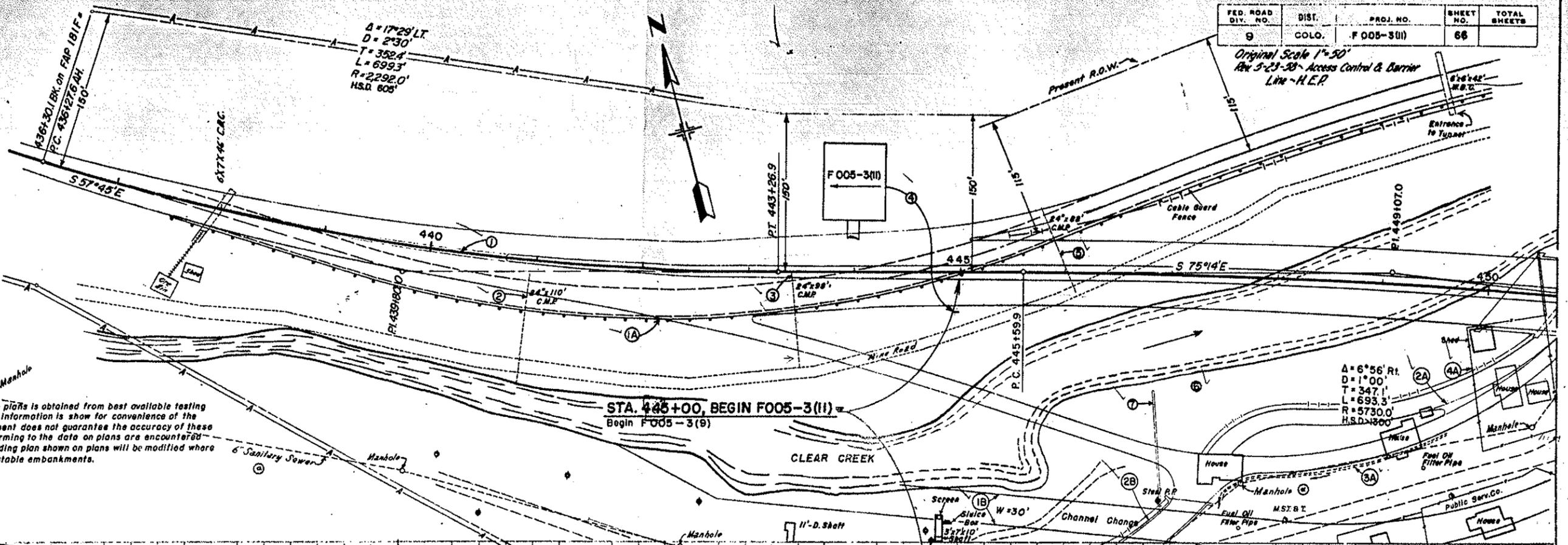


Franklin  
DISTRICT CONSTRUCTION ENGINEER

© Rev. 11-4-65 C.K.M.

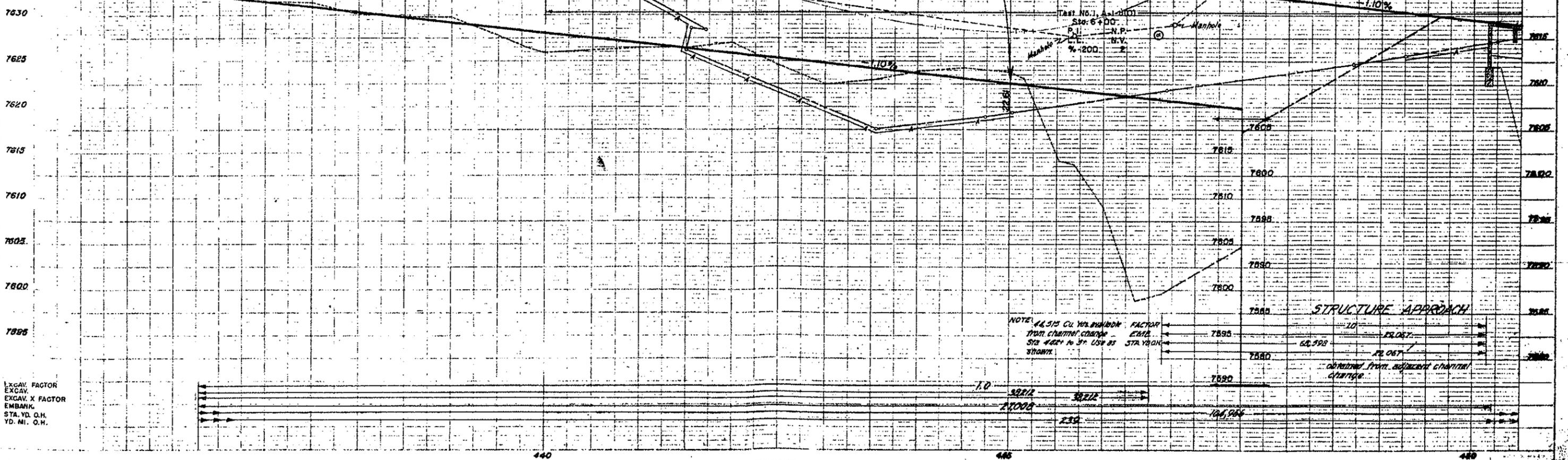
FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 005-3(II)	66	

Original Scale 1"=50'  
Rev. 5-23-58 - Access Control & Barrier  
Line - H.E.P.



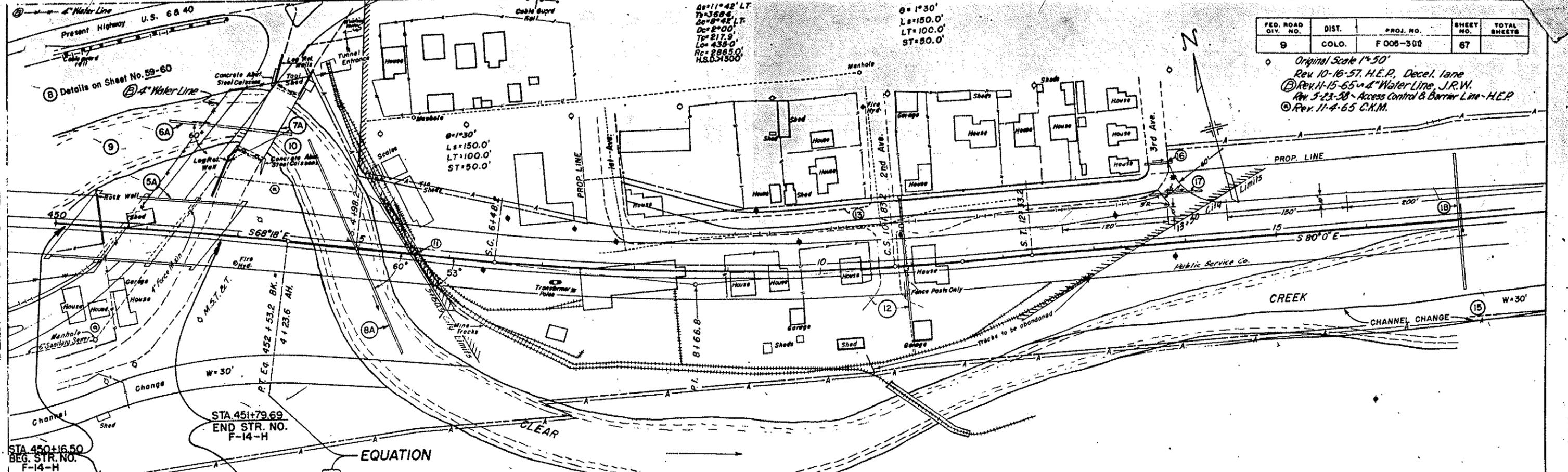
NOTE:  
Soil data shown on the plans is obtained from best available testing laboratory information. This information is shown for convenience of the Contractor and the Department does not guarantee the accuracy of these tests. If materials not conforming to the data on plans are encountered during construction the grading plan shown on plans will be modified where necessary to secure dense stable embankments.

STA. 445+00, BEGIN F005-3(II)  
Begin F005-3(9)



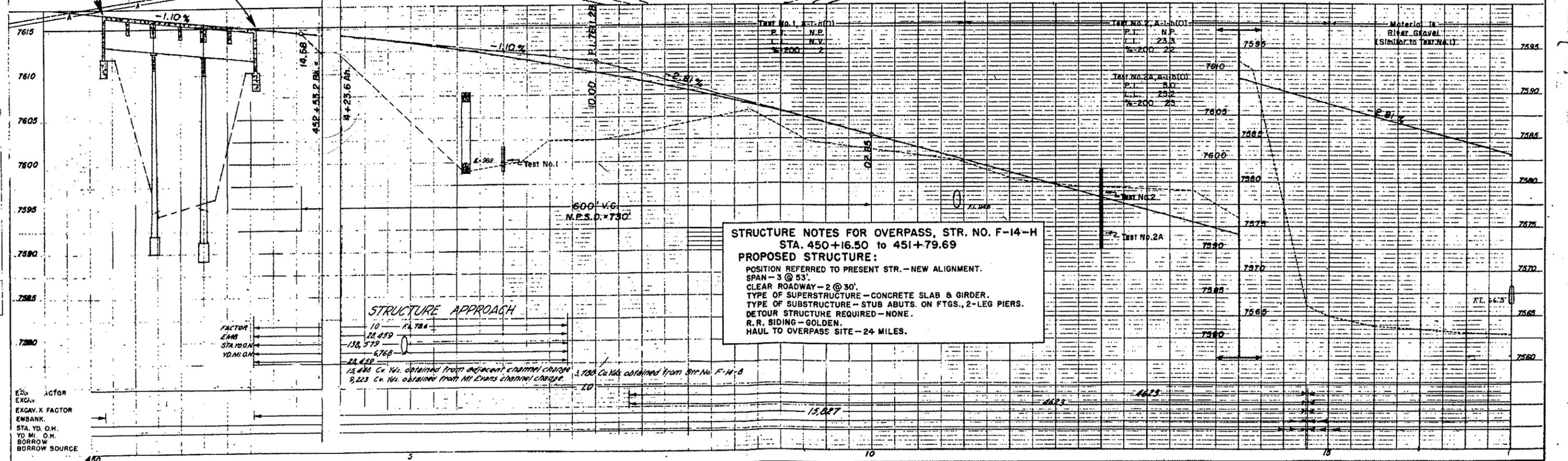
EXCAV. FACTOR  
EXCAV. X FACTOR  
EMBANK.  
STA. YD. O.H.  
YD. MI. O.H.

1-6600d 11-10-65



FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 006-300	67	

Original Scale 1"=50'  
 Rev 10-16-57 H.E.P., Decel. lane  
 Rev 11-15-65 J.R.W. Water Line  
 Rev 3-23-58 Access Control & Barrier Line - H.E.P.  
 Rev 11-4-65 C.K.M.



EMB. FACTOR  
 EXCAV. X FACTOR  
 EMBANK.  
 STA. YD. O.M.  
 YD. MI. O.M.  
 BORROW SOURCE

**STRUCTURE NOTES FOR OVERPASS, STR. NO. F-14-H**  
 STA. 450+16.50 to 451+79.69  
**PROPOSED STRUCTURE:**  
 POSITION REFERRED TO PRESENT STR. - NEW ALIGNMENT.  
 SPAN - 3 @ 53'.  
 CLEAR ROADWAY - 2 @ 30'.  
 TYPE OF SUPERSTRUCTURE - CONCRETE SLAB & GIRDER.  
 TYPE OF SUBSTRUCTURE - STUB ABUTS. ON FTGS., 2-LEG PIERS.  
 DETOUR STRUCTURE REQUIRED - NONE.  
 R.R. SIDING - GOLDEN.  
 HAUL TO OVERPASS SITE - 24 MILES.

STRUCTURE APPROACH

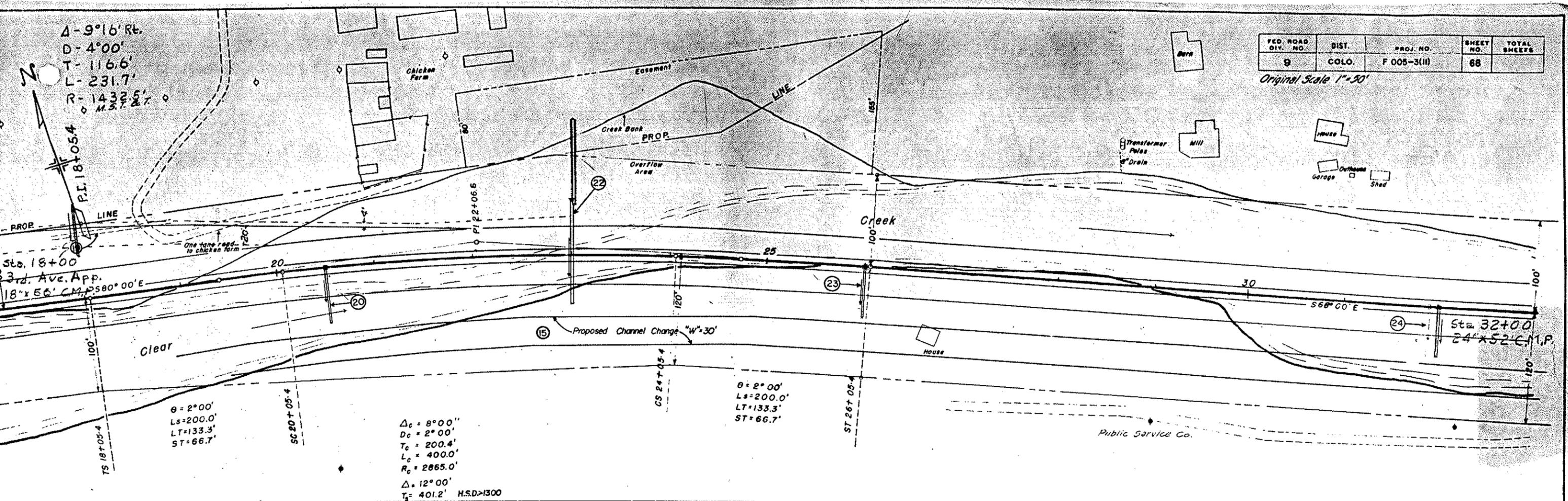
FACTOR  
 EMB.  
 STA. YD. O.M.  
 YD. MI. O.M.

13,440 Cu Yds. obtained from adjacent channel change  
 9,223 Cu Yds. obtained from Mt Evans channel change  
 3,700 Cu Yds. obtained from Site No. F-14-B

$\Delta = 9^\circ 16' R$   
 $D = 4' 00''$   
 $T = 116.6'$   
 $L = 231.7'$   
 $R = 1432.5'$   
 M.S.T. 27

FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 005-3(II)	68	

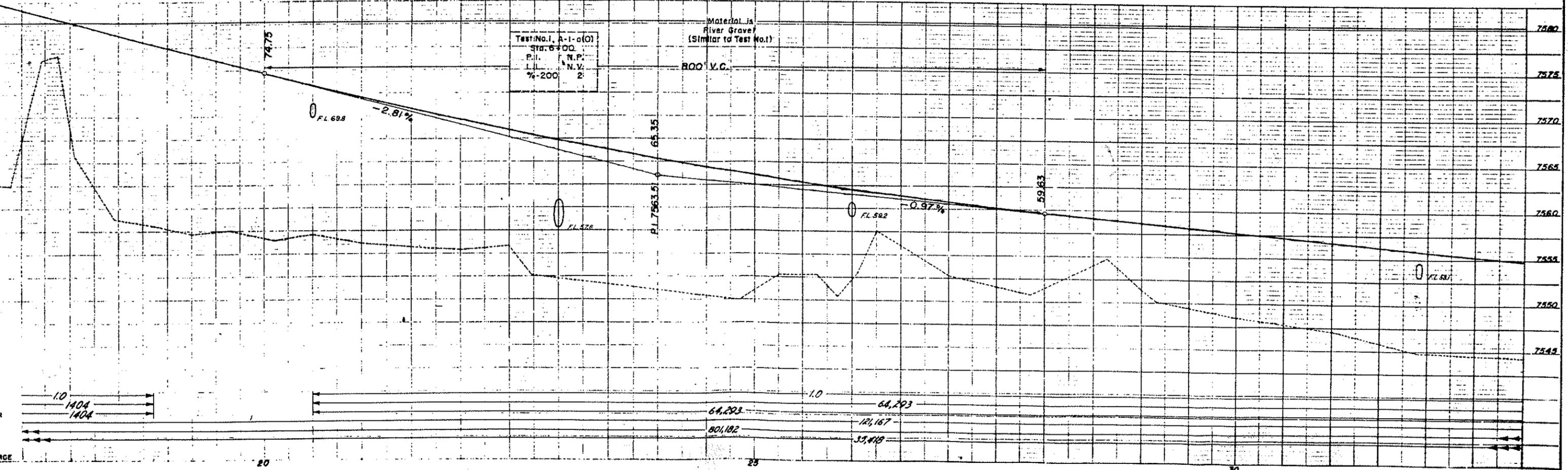
Original Scale 1" = 50'



$\theta = 2^\circ 00'$   
 $L_s = 200.0'$   
 $LT = 133.3'$   
 $ST = 66.7'$

$\Delta_c = 8^\circ 00''$   
 $D_c = 2^\circ 00''$   
 $T_c = 200.4'$   
 $L_c = 400.0'$   
 $R_c = 2665.0'$

$\Delta = 12^\circ 00'$   
 $T = 401.2'$  H.S.D. > 1300







FED. ROAD DIST. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F.005-3(II)	70	

Original Scale 1"=50'  
 Rev. 5-23-58 - Access Control & Barrier Line - H.E.P.  
 Rev. 1-8-59 - Barrier Line - H.E.P.

PROJ. LINE  
 $\theta = 2^{\circ}00'$   
 $LT = 133.3'$   
 $ST = 66.7'$   
 $L_s = 200'$

PROJ. LINE  
 $\theta = 4^{\circ}00'$   
 $L_s = 200.0'$   
 $LT = 133.4'$   
 $ST = 66.7'$

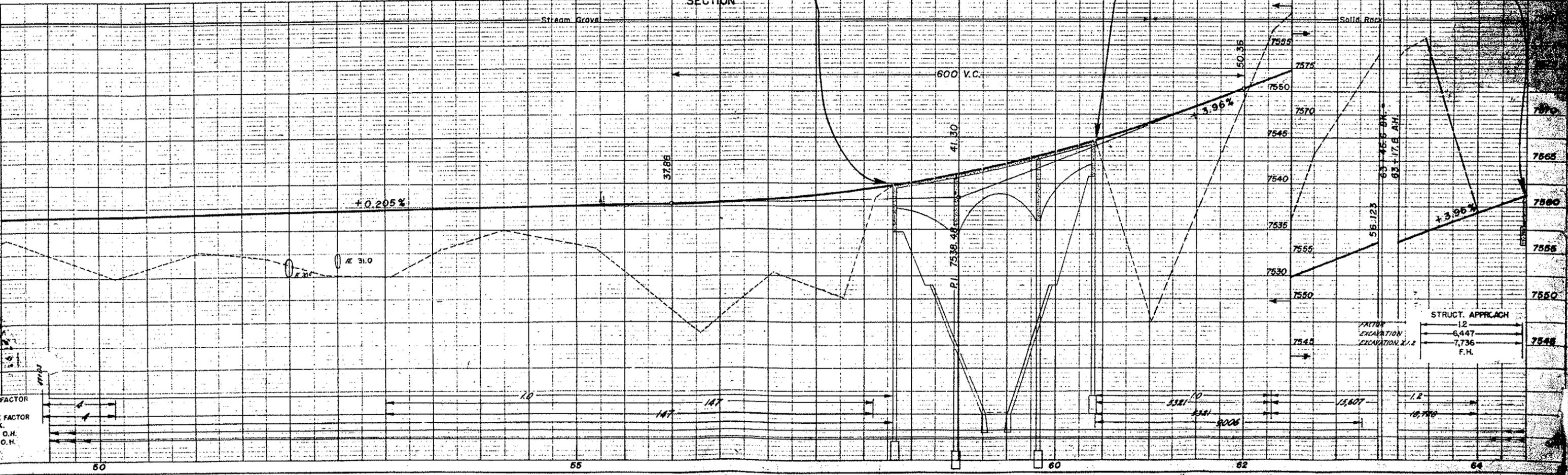
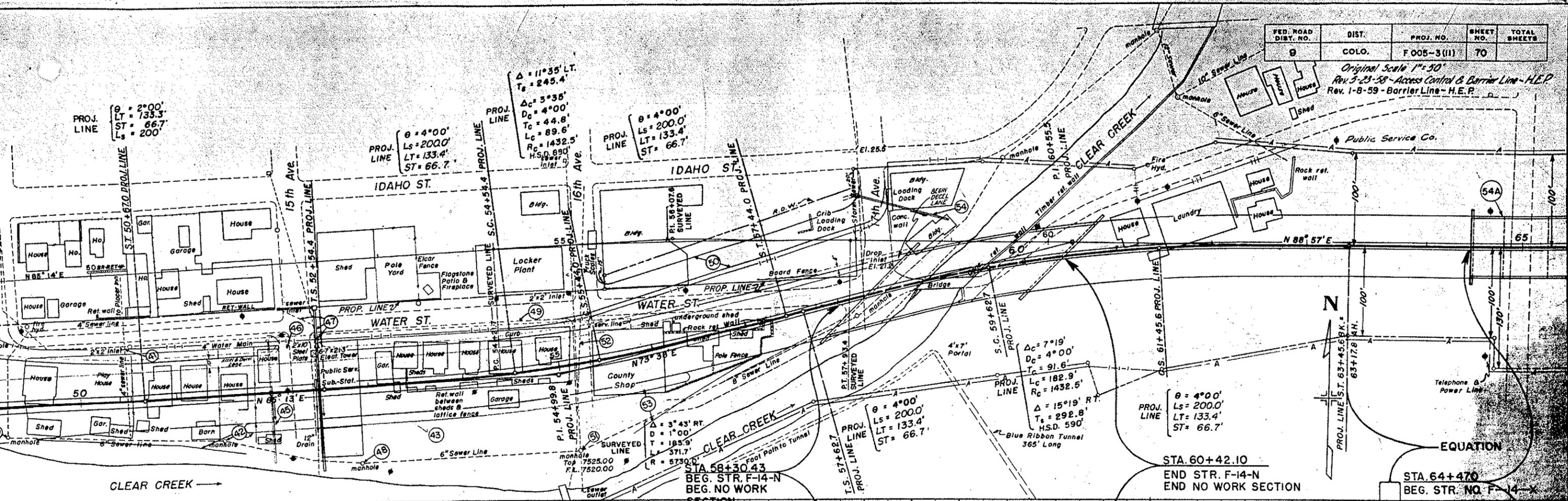
PROJ. LINE  
 $\Delta = 11^{\circ}35' LT$   
 $T_s = 245.4'$   
 $\Delta_c = 3^{\circ}35'$   
 $D_c = 4^{\circ}00'$   
 $T_c = 44.8'$   
 $L_c = 89.6'$   
 $R_c = 1432.5'$   
 $H.S.D. 890'$

PROJ. LINE  
 $\theta = 4^{\circ}00'$   
 $L_s = 200.0'$   
 $LT = 133.4'$   
 $ST = 66.7'$

PROJ. LINE  
 $\theta = 4^{\circ}00'$   
 $L_s = 200.0'$   
 $LT = 133.4'$   
 $ST = 66.7'$

PROJ. LINE  
 $\theta = 4^{\circ}00'$   
 $L_s = 200.0'$   
 $LT = 133.4'$   
 $ST = 66.7'$

PROJ. LINE  
 $\Delta_c = 7^{\circ}19'$   
 $D_c = 4^{\circ}00'$   
 $T_c = 91.6'$   
 $L_c = 182.9'$   
 $R_c = 1432.5'$   
 $\Delta = 15^{\circ}19' RT$   
 $T_s = 292.8'$   
 $H.S.D. 590'$   
 Blue Ribbon Tunnel  
 365' Long



FED. ROAD DIST. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 005-3(11)	70	

Original Scale 1"=50'

PROJ. LINE  
 $\theta = 2^{\circ}00'$   
 $L_s = 133.3'$   
 $ST = 66.7'$   
 $L_c = 200'$

PROJ. LINE  
 $\theta = 4^{\circ}00'$   
 $L_s = 200.0'$   
 $LT = 133.4'$   
 $ST = 66.7'$

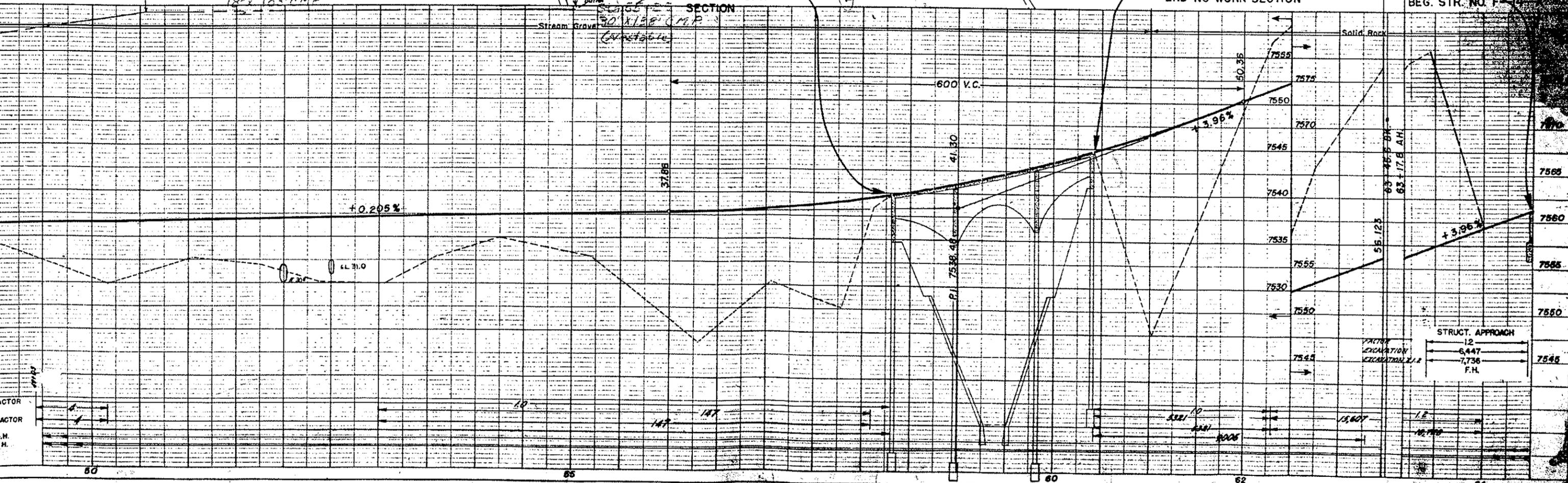
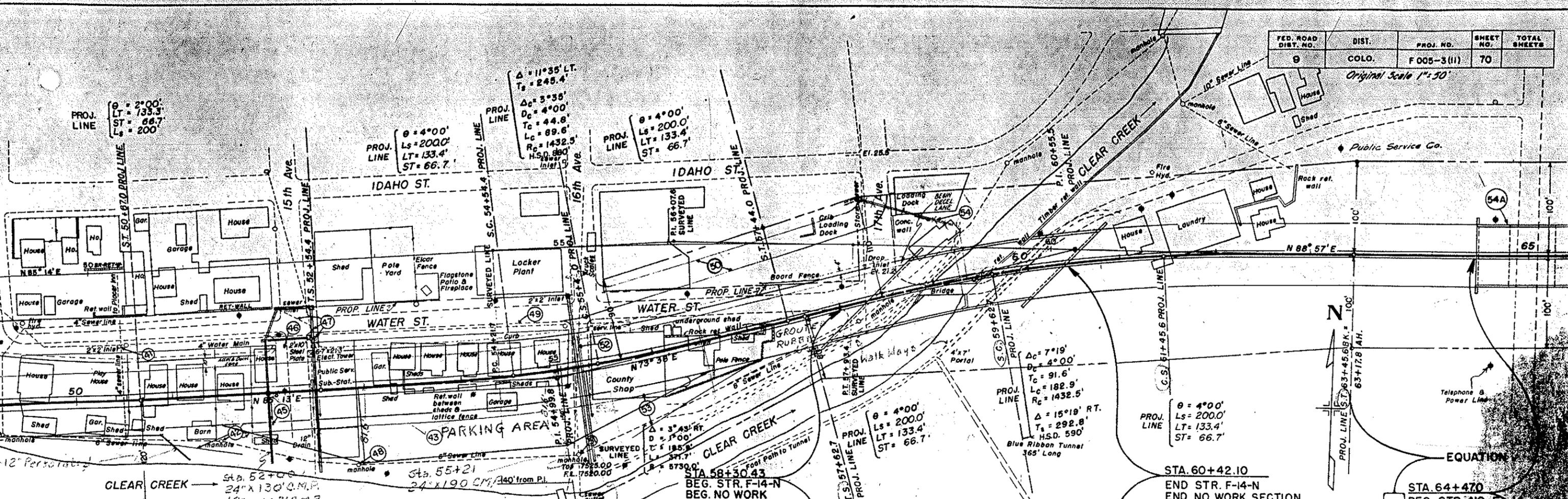
PROJ. LINE  
 $\Delta = 11^{\circ}35' LT$   
 $T_s = 245.4'$   
 $D_c = 5^{\circ}35'$   
 $D_c = 4^{\circ}00'$   
 $T_c = 44.6'$   
 $L_c = 89.6'$   
 $R_c = 1432.5'$   
 $H.S.D. 880'$

PROJ. LINE  
 $\theta = 4^{\circ}00'$   
 $L_s = 200.0'$   
 $LT = 133.4'$   
 $ST = 66.7'$

PROJ. LINE  
 $\Delta = 7^{\circ}19'$   
 $D_c = 4^{\circ}00'$   
 $T_c = 91.6'$   
 $L_c = 182.9'$   
 $R_c = 1432.5'$

PROJ. LINE  
 $\theta = 4^{\circ}00'$   
 $L_s = 200.0'$   
 $LT = 133.4'$   
 $ST = 66.7'$

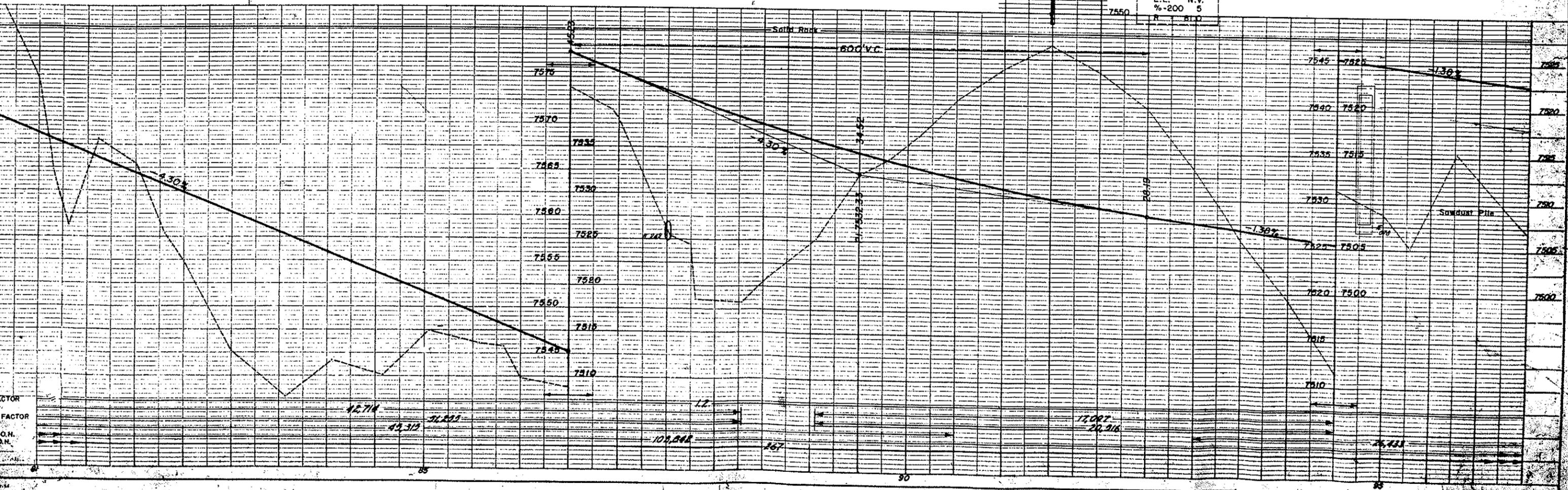
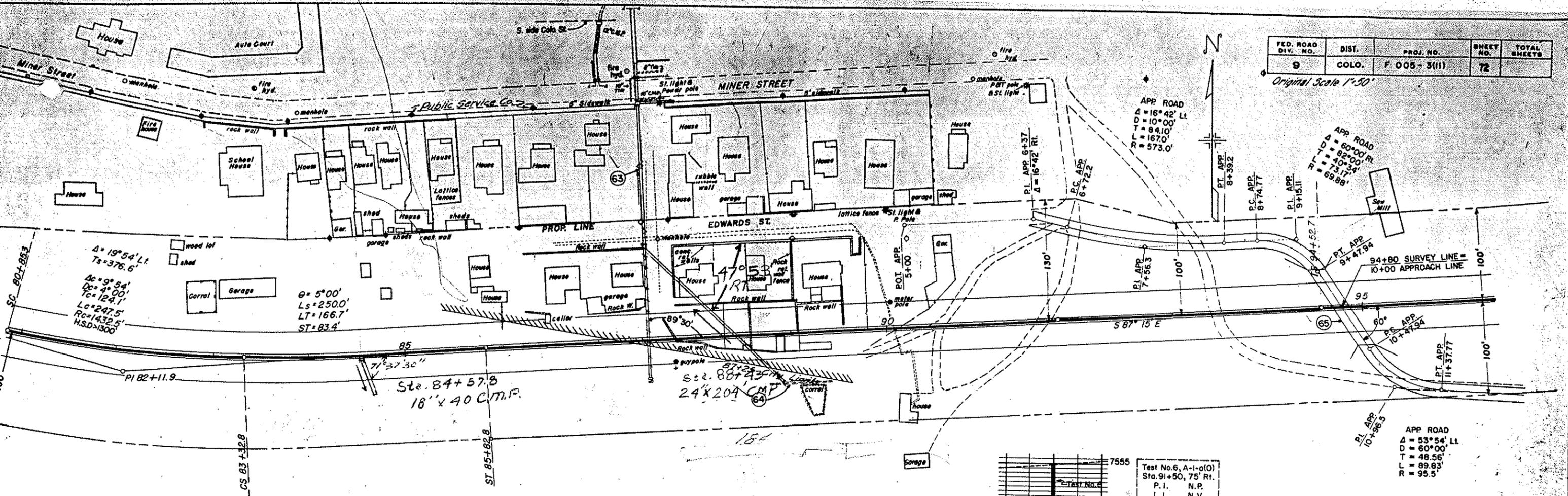
PROJ. LINE  
 $\theta = 4^{\circ}00'$   
 $L_s = 200.0'$   
 $LT = 133.4'$   
 $ST = 66.7'$





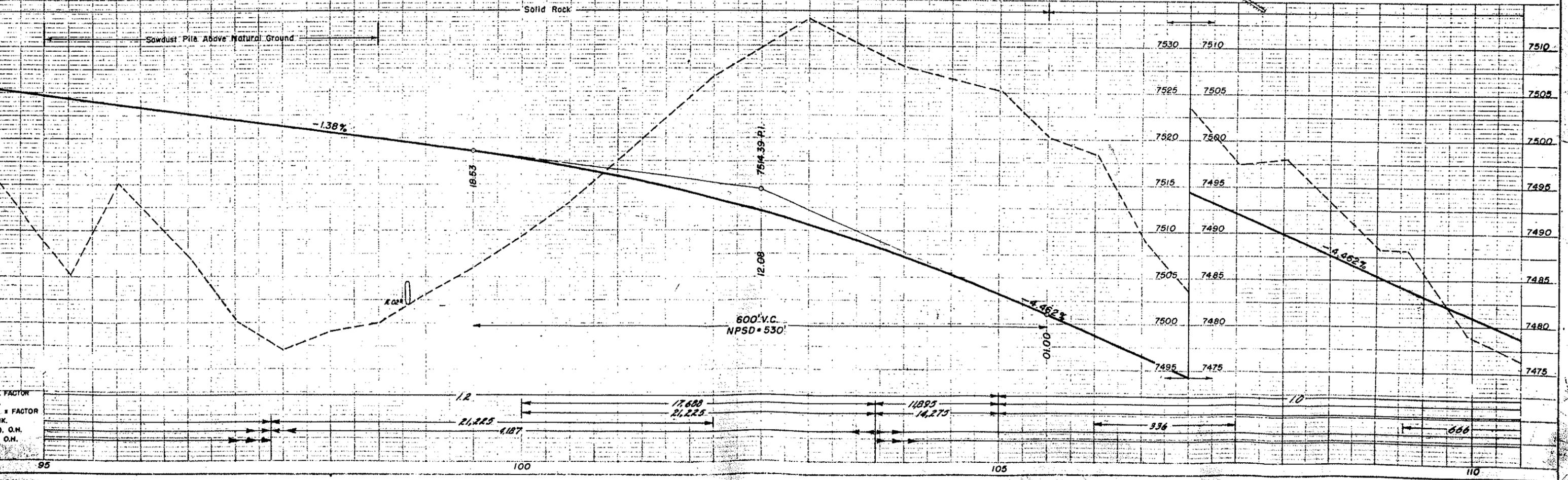
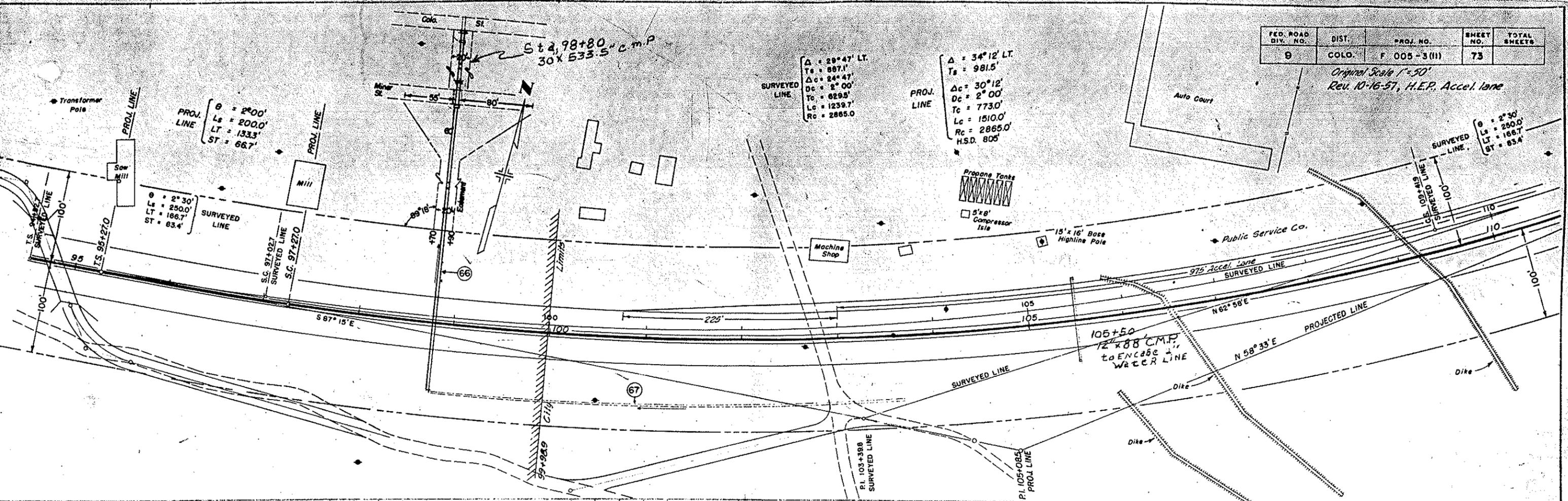
FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 005-3(11)	72	

Original Scale 1"=50'



FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 005-3(II)	73	

Original Scale 1"=50'  
 Rev. 10-16-57, H.E.P. Accel. lane

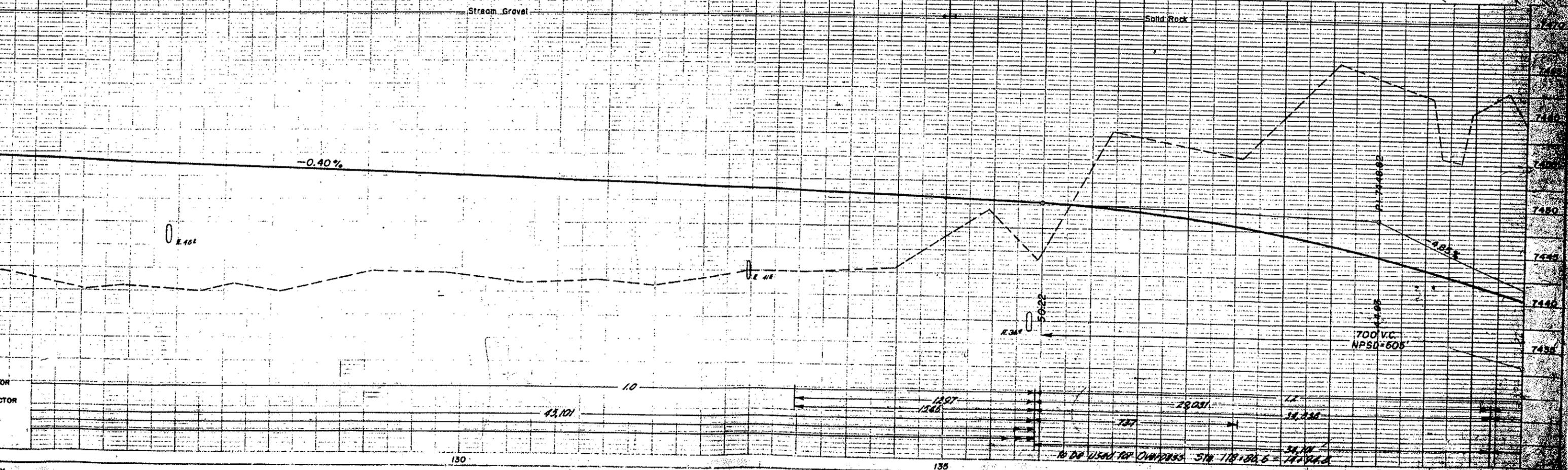
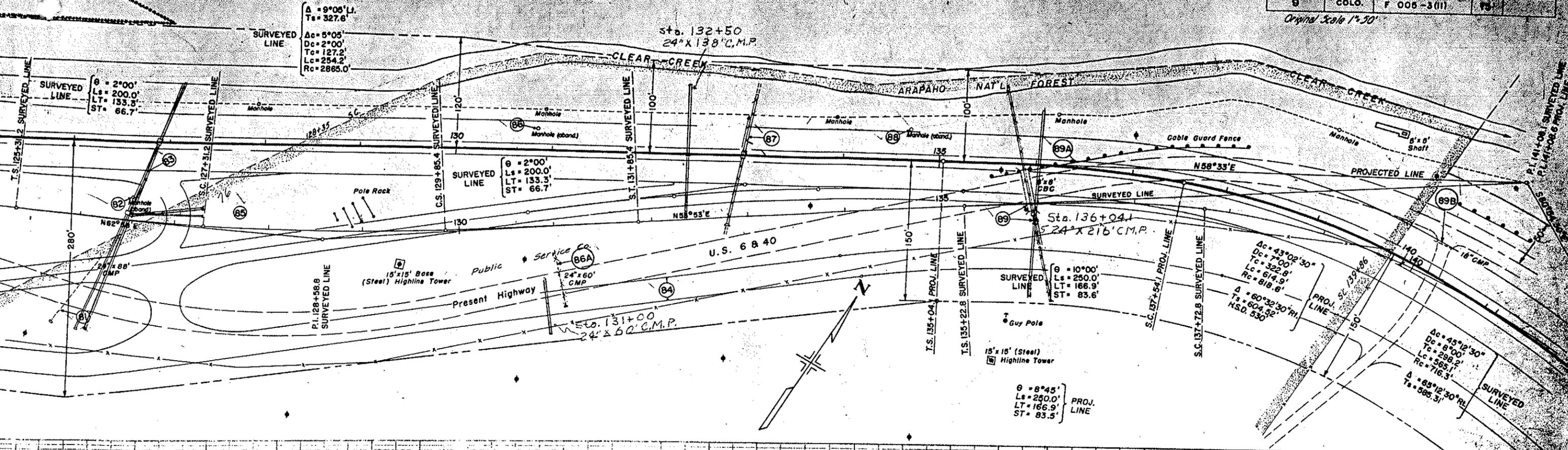


FACTOR  
 FACTOR  
 K.  
 O.H.  
 O.H.



FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 006-3(II)	75	

Original Scale 1"=50'

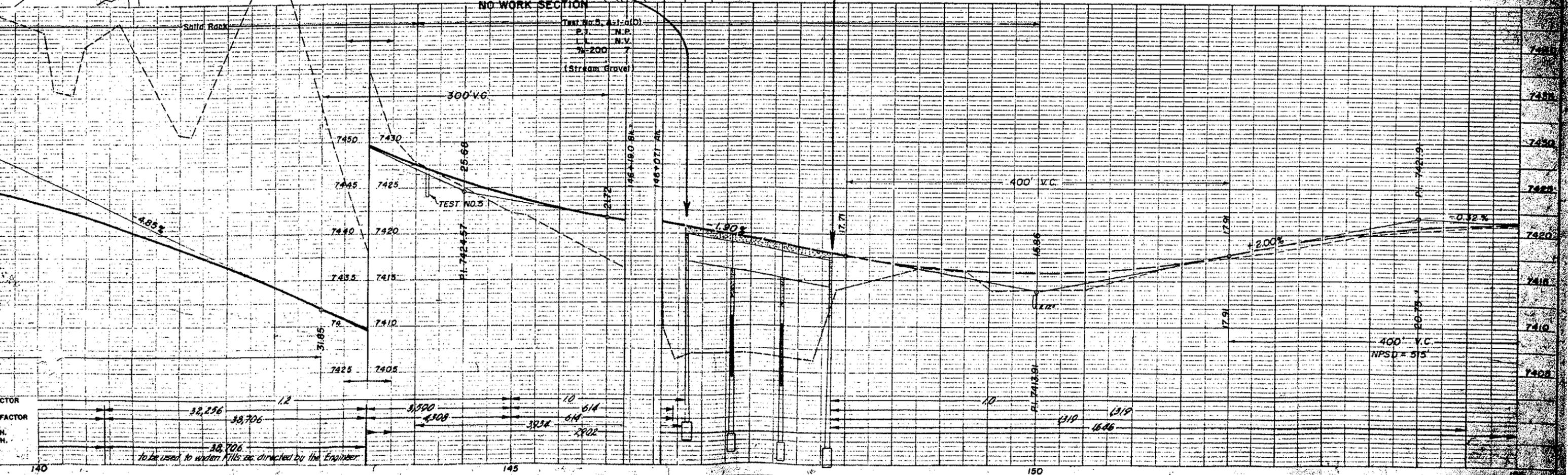
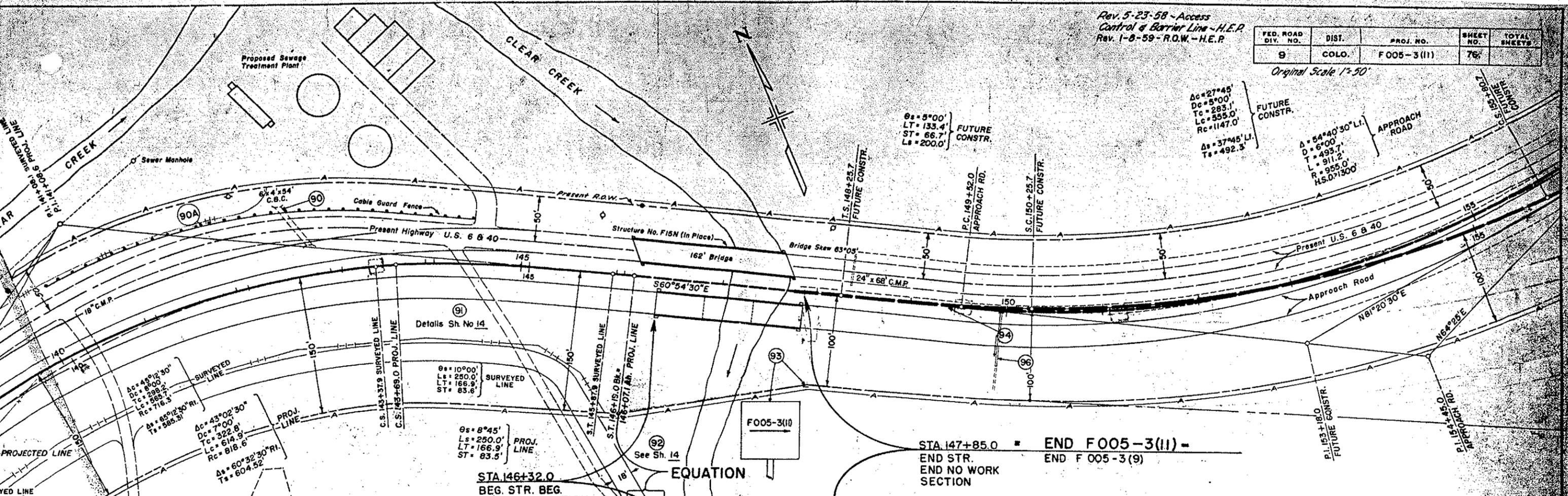


NOT TO BE USED FOR CONSTRUCTION 5/18/88 5/18/88

Rev. 5-23-58 - Access  
Control & Barrier Line - H.E.P.  
Rev. 1-8-59 - R.O.W. - H.E.P.

FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F 005-3(11)	76	

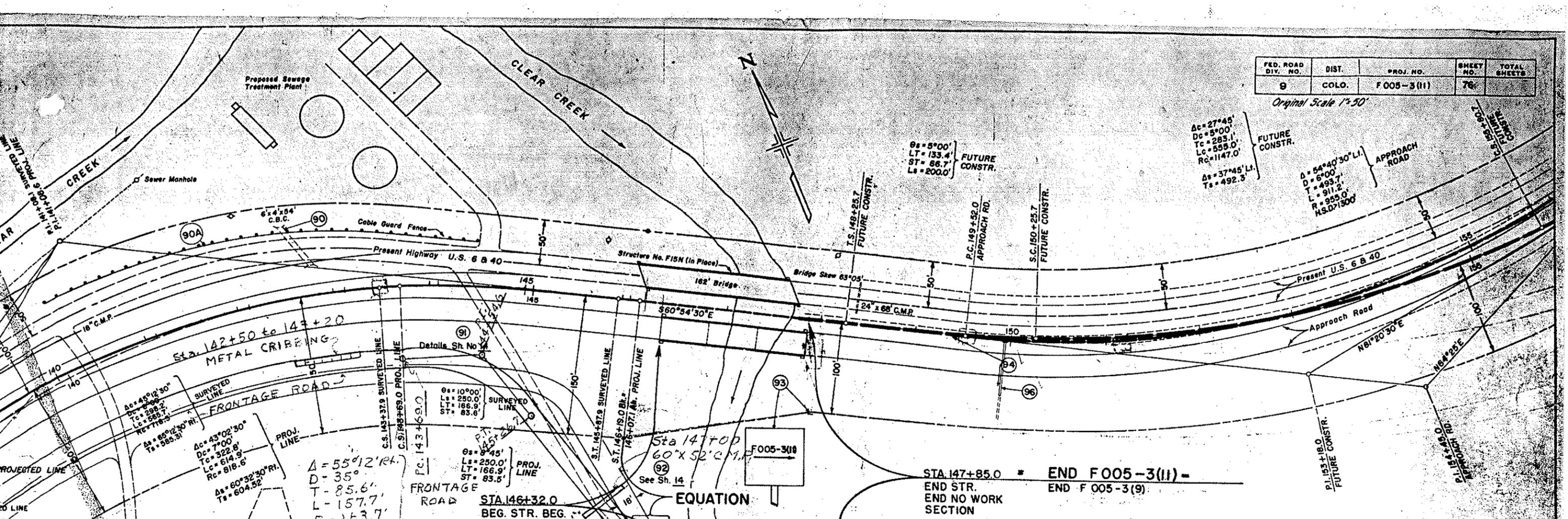
Original Scale 1"=50'



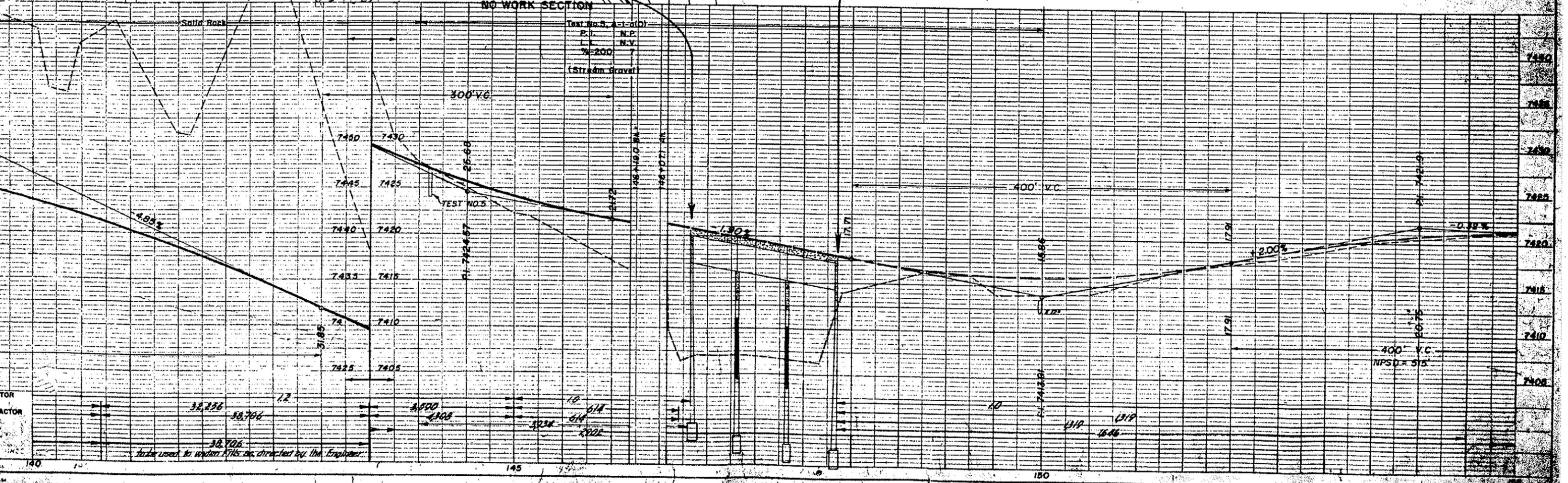
to be used to widen files as directed by the Engineer.

FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F005-3(11)	76	

Original Scale 1"=50'



STA 147+85.0 \* END F005-3(11) -  
 END STR. END NO WORK SECTION  
 END F 005-3(9)



To be used to locate Kolls as directed by the Engineer.

FED. ROAD DIV. NO.	DIST.	PROJ. NO.	SHEET NO.	TOTAL SHEETS
9	COLO.	F008-3 (11)	77	

Original Scale 1"=50'

