FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-7310(1)	2003	116	193

INDEX TO DRAWINGS

General Notes:

1. General:

   A. General Specifications: Hawaii Department of Transportation, Standard Specifications for Road and Bridge Construction, 1994, together with Special Provisions prepared for this contract.

   B. Design Specifications: AASHTO 1998 LRFD Bridge Design Specifications (Second Edition) and its subsequent interim specifications with interim supplements and modifications by the Highways Division, Department of Transportation, State of Hawaii.

   C. The Contractor shall take field measurements and verify field conditions and shall compare such field measurements and conditions with the drawings before commencing the work. Report in writing to the Engineer all inconsistencies or omissions.

   D. The Contractor shall be responsible for methods of construction, workmanship and job safety. The Contractor shall provide temporary shoring and bracing as required for stability of structural members and systems.

   E. Details noted as typical on structural drawings shall apply in all conditions unless specifically shown or noted otherwise.

2. Design Criteria:

   A. Seismic ——— Category B, Acceleration Coefficient=0.18
   B. Basic Wind Speed—— 105 MPH, Exposure B
   C. Earth Pressures

Back fill Slope	Estimated Active Earth Pressure Horizontal (p.c.f.)	Vertical (p.c.f.)
Level	35	0
3.0H: 1.0V	45	22
2.0H: 1.0V	55	27

   D. Allowable Bearing Capacity ——— 4,500 psf
   E. Passive Resistance ——— 375 pcf
   F. Friction Factor ——— 0.55

3. Foundation:

   A. Foundation design is based upon geotechnical investigation by F.G.E., LTD., dated May 8, 1998.

   B. Contractor shall provide for de–watering of excavation from either surface water, ground water or seepage.

   C. Contractor shall provide for design and installation of all cribbing, sheeting, and shoring necessary to preserve excavations and earth banks, and adjacent structures and property from damage.

   D. The bottom of the footing excavations shall be recompacted to at least 95 percent relative compaction as determined by Laboratory Compaction test AASHTO T–180, prior to the placement of concrete and reinforcing steel. Any soft spots encountered in the foundation excavations should be removed and cleaned out to hard natural ground or compacted fill and resulting depression backfilled with structural fill.

   E. Excavations for footings shall be approved by the Soils Engineer prior to placing the concrete and reinforcing. Soils Engineer shall submit letter of compliance to the Engineer.

   F. Excavations shall be properly back filled. Do not place backfill behind retaining walls before concrete has attained full design strength.

   G. Fill and backfill shall consist of:
      a. On site soil.
      b. Excavated tuff, crushed to conform to grading requirements for imported fill.
      c. Imported fill in conformance with section 703.17 of the standard specifications with a CBR greater than 25 when tested in accordance with AASHTO T–193

   H. Fill and backfill shall be placed in uniform lifts of no more than 8 inches in loose thickness, moisture–conditioned to within 3 percent of the optimum moisture content, and uniformly compacted to at least 90 percent but should not exceed 95 percent relative compaction to minimize the lateral earth pressure against the wall.

4. Reinforcing Steel:

   A. Reinforcing steel shall be deformed bars conforming to ASTM A615, grade 60.

   B. Clear concrete coverage for reinforcing bars shall be as follows, unless otherwise noted:
      a. Footing, Grade beams, ETC. Cast against earth ——— 3"
      b. Footing, Grade beams, ETC. Formed and exposed to earth —— 2"
      c. Wall faces exposed to earth or weather ——— 2"

   C. Splices:
      a. Reinforcing steel shall be spliced only where indicated on plans. Provide lap splice length per typical details and schedule, unless otherwise noted.
      b. Mechanical splice connectors shall develop in tension 125 percent of the specified minimum yield strength of reinforcing bars.

   D. Bar bends and hook shall be "standard hooks" in accordance with ACI 318–95.

5. Concrete:

   A. Concrete shall have the following minimum 28 days compressive strengths:
      Grade adjustment walls ——— 3,000 psi
      Culvert ——— 4,000 psi
      Light pole foundation ——— 3,000 psi
      Traffic light foundation ——— 3,000 psi
      Catch Basin ——— 4,000 psi

   B. All inserts, anchor bolts, plates, etc. embedded in concrete shall be hot–dipped galvanized unless otherwise noted.

   C. Conduits, pipes and sleeves passing through a wall not conforming to typical details shall be located and submitted to the engineer for approval.

   D. Construction joints may be located by the contractor and submitted to the engineer for approval. Construction joints shall be made and located as not to impair the strength of the structure and to minimize shrinkage stresses. All construction joints shall be cleaned, laitance removed and wetted. See typical details for specific requirements.

   E. Non–shrink grouts shall be premixed compound consisting of non–metallic aggregate types, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 4,000 psi in 3 days and 7,000 psi in 28 days.

   F. Joint filler shall be ASTM D1751 or ASTM D994; asphalt impregnated fiberboard or felt 1/2 inch thick.

   G. Unless otherwise noted, chamfer all concrete edges 3/4".

6. Structural Steel:

   A. Fabrication and erection of structural steel shall conform to the American Institute of Steel Construction manual of Steel Construction, Ninth Edition.

   B. Steel pipes shall conform to ASTM A53, Grade B.

   C. Welds and welding procedures shall conform to the Structural Welding Code AWS D1.1 of the American Welding Society.

   D. Welding shall be performed by welders prequalified for welding procedures to be used.

   E. Welding electrodes shall be E70XX.

   F. Exposed steel shall be hot–dipped galvanized.

SURVEY PLOTTED BY ____ DATE
DRAWN BY ____ .
TRACED BY ____ .
DESIGNED BY ____ .
QUANTITIES BY ____ .
CHECKED BY ____ .
ORIGINAL PLAN
NOTEBOOK ____ No. ____

KEN KAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 6818–S
HAWAII, U.S.A.
EXPIRATION DATE OF THE LICENSE: 4/30/2004
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

INDEX TO DRAWINGS
GENERAL NOTES

PUULOA ROAD IMPROVEMENTS
Kamehameha Hwy. to Salt Lake Blvd.
Federal Aid Project No. STP–7310(1)

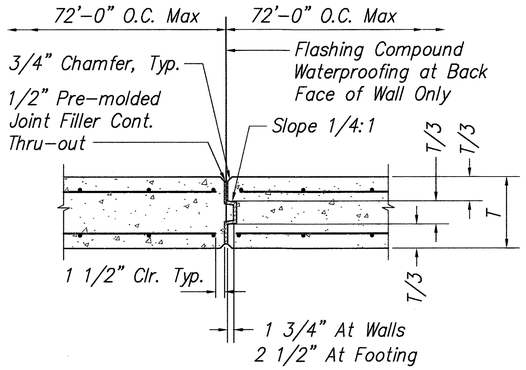
Scale: As shown Date: May 2003

SHEET NO. S1 OF 193 SHEETS

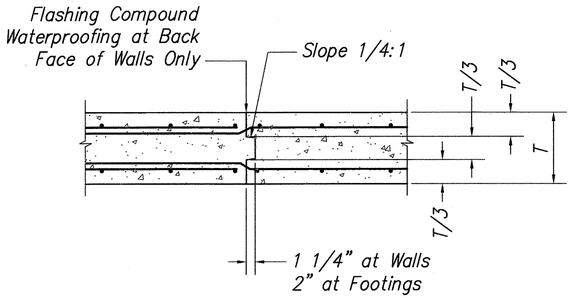
116

2003 7:54:45 AM

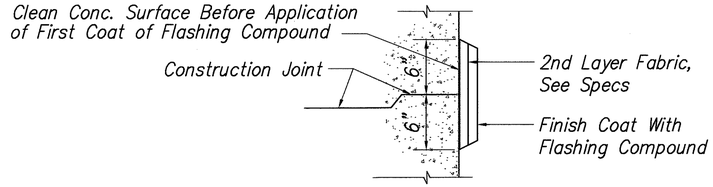
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-7310(1)	2003	117	193



AT EXPANSION JOINT



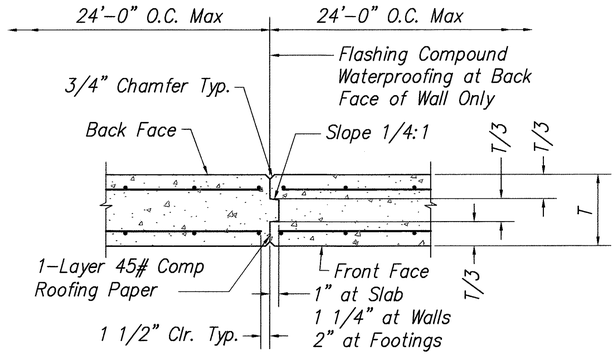
AT CONSTRUCTION JOINT

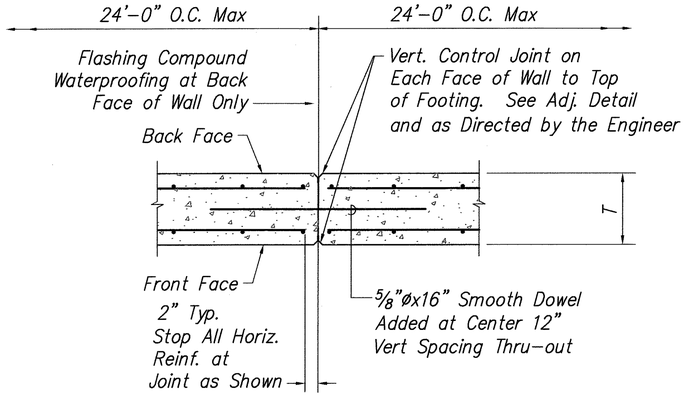


TYPICAL FLASHING COMPOUND WATERPROOFING DETAIL

SCALE: NOT TO SCALE

2 — S2



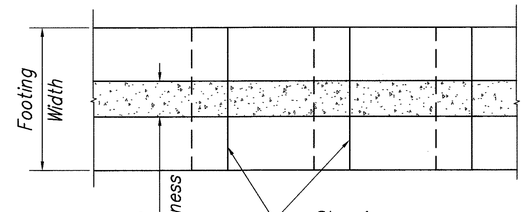


AT CONTRACTION JOINT (Equal Spacing Between Expansion Joints)

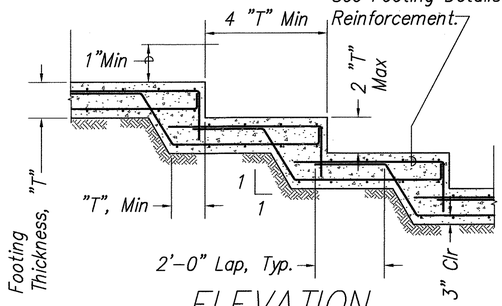
TYPICAL JOINT DETAILS

SCALE: NOT TO SCALE

1 — S2



PLAN



ELEVATION

TYPICAL STEP FOOTING

SCALE: NOT TO SCALE

3 — S2

KEN KAZUO HAYASHIDA
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No. 6818-S
HAWAII, U.S.A.

EXPIRATION DATE OF THE LICENSE 4/30/2004
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAILS

PUULOA ROAD IMPROVEMENTS
Kamehameha Hwy. to Salt Lake Blvd.
Federal Aid Project No. STP-7310(1)

Scale: As shown Date: May 2003

SHEET NO. **S2** OF 193 SHEETS

ORIGINAL PLAN
NOTEBOOK No.
SURVEY PLOTTED BY DATE
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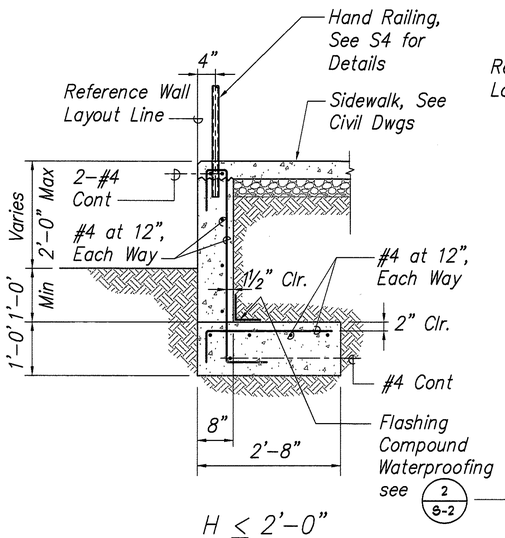
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

2/2003 7:55:37 AM

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-7310(1)	2003	118	193



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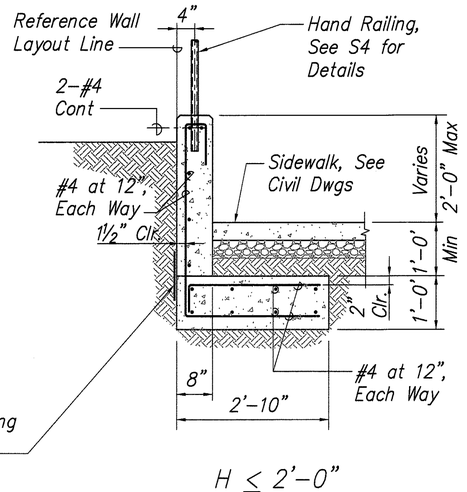

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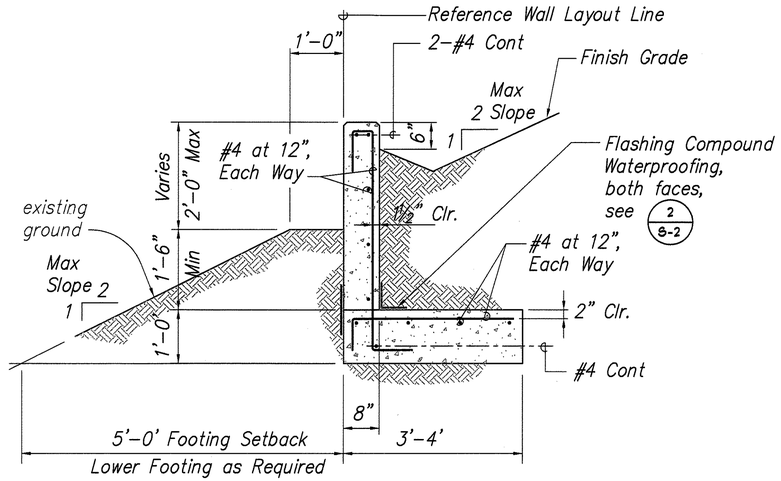

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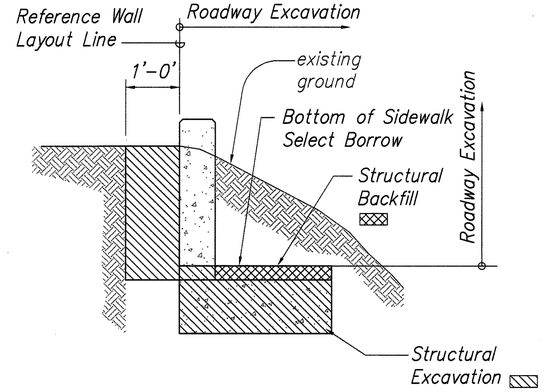

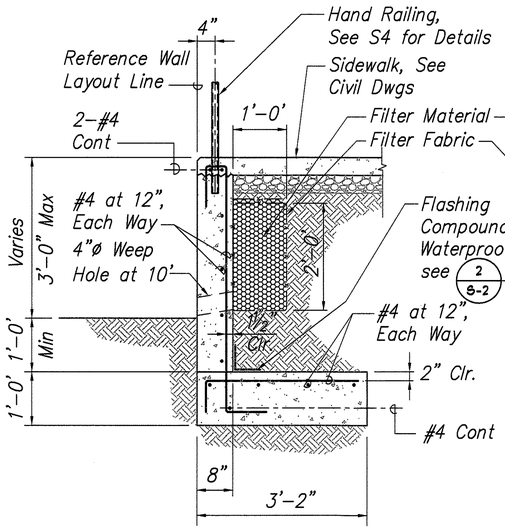

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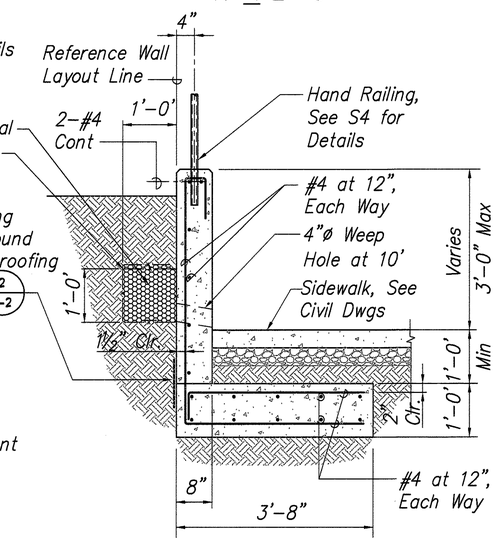

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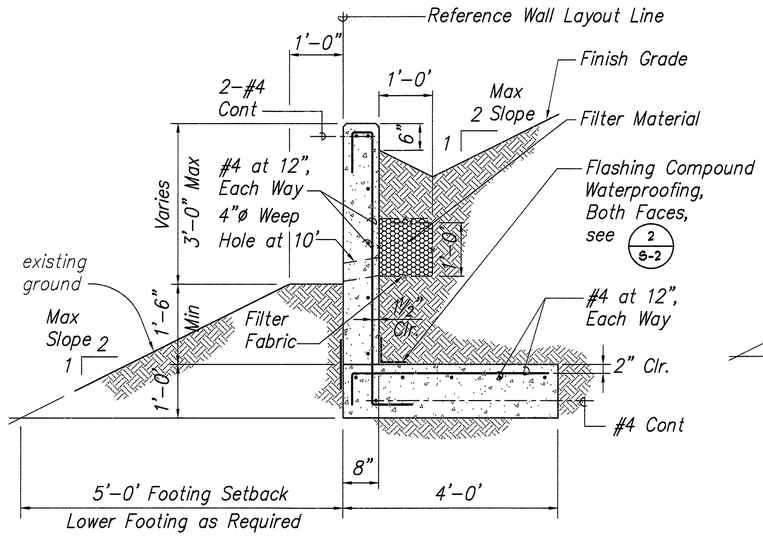

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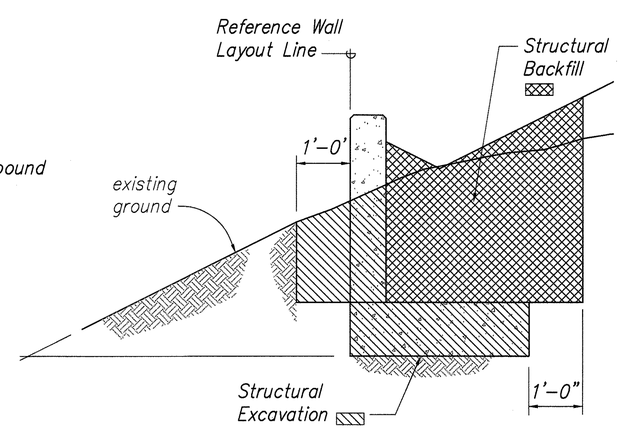


EXCAVATON PAY LIMITS

GRADE ADJUSTMENT WALLS

1 / S3

SCALE: NOT TO SCALE

Notes for Grade Adjustment Walls

1. *Expansion Joints Shall be Constructed at the Locations Required for Concrete Sidewalk and Shall be in Accordance with Specifications Subsection 605.03 – joints.*
2. *All Labor and Materials Required to Permanently Mount the Hand Railing to the Walls Shall be Made Incidental to the Cost of the Handrails.*
3. *All Material and Labor Required to Install the Flashing Compound Waterproofing Shall be Made Incidental to the Cost of the Grade Adjustment Walls.*

ORIGINAL PLAN | NOTEBOOK No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

KEN KAZUO HAYASHIDA LICENSED PROFESSIONAL ENGINEER No. 6518-S HAWAII, U.S.A.

EXPIRATION DATE OF THE LICENSE 4/30/2004
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

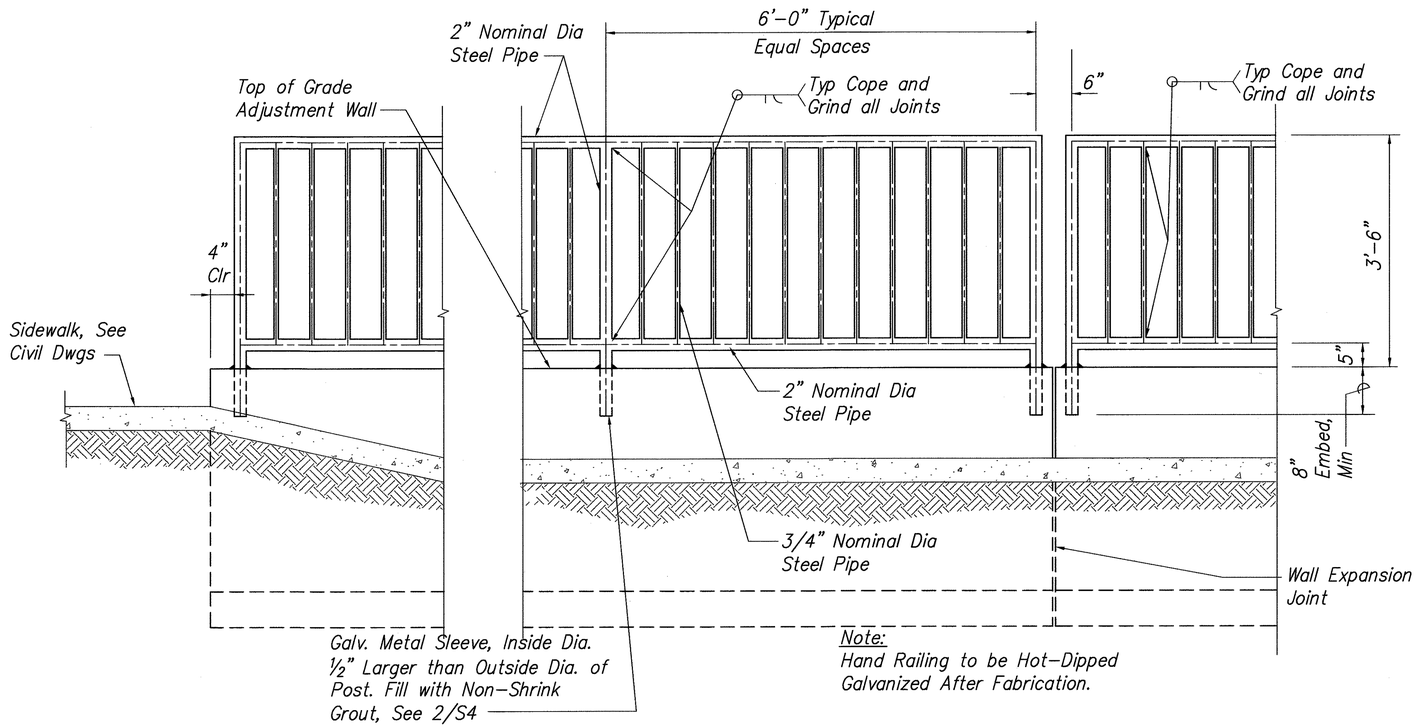
TYPICAL GRADE SEPARATION WALL SECTION AND DETAILS

PUULOA ROAD IMPROVEMENTS
Kamehameha Hwy. to Salt Lake Blvd.
Federal Aid Project No. STP-7310(1)

Scale: As shown Date: May 2003

SHEET NO. S3 OF 193 SHEETS

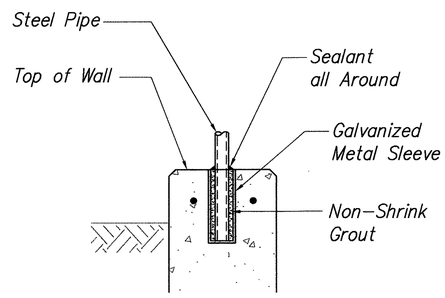
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-7310(1)	2003	119	193



TYPICAL HAND RAILING DETAIL

1 | S4

SCALE: 1" = 1'-0"



Note:
Payment for Sleeves and Grout (Including Installation) to be Made Incidental to the Cost of the Railing.

TYPICAL POST DETAIL

2 | S4 | S4

SCALE: 1 1/2" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTEBOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

KEN KAZUO HAYASHIDA
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No. 6818-S
HAWAII, U.S.A.

EXPIRATION DATE OF THE LICENSE 4/30/2004
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL HAND RAIL DETAILS

PUULOA ROAD IMPROVEMENTS
Kamehameha Hwy. to Salt Lake Blvd.
Federal Aid Project No. STP-7310(1)

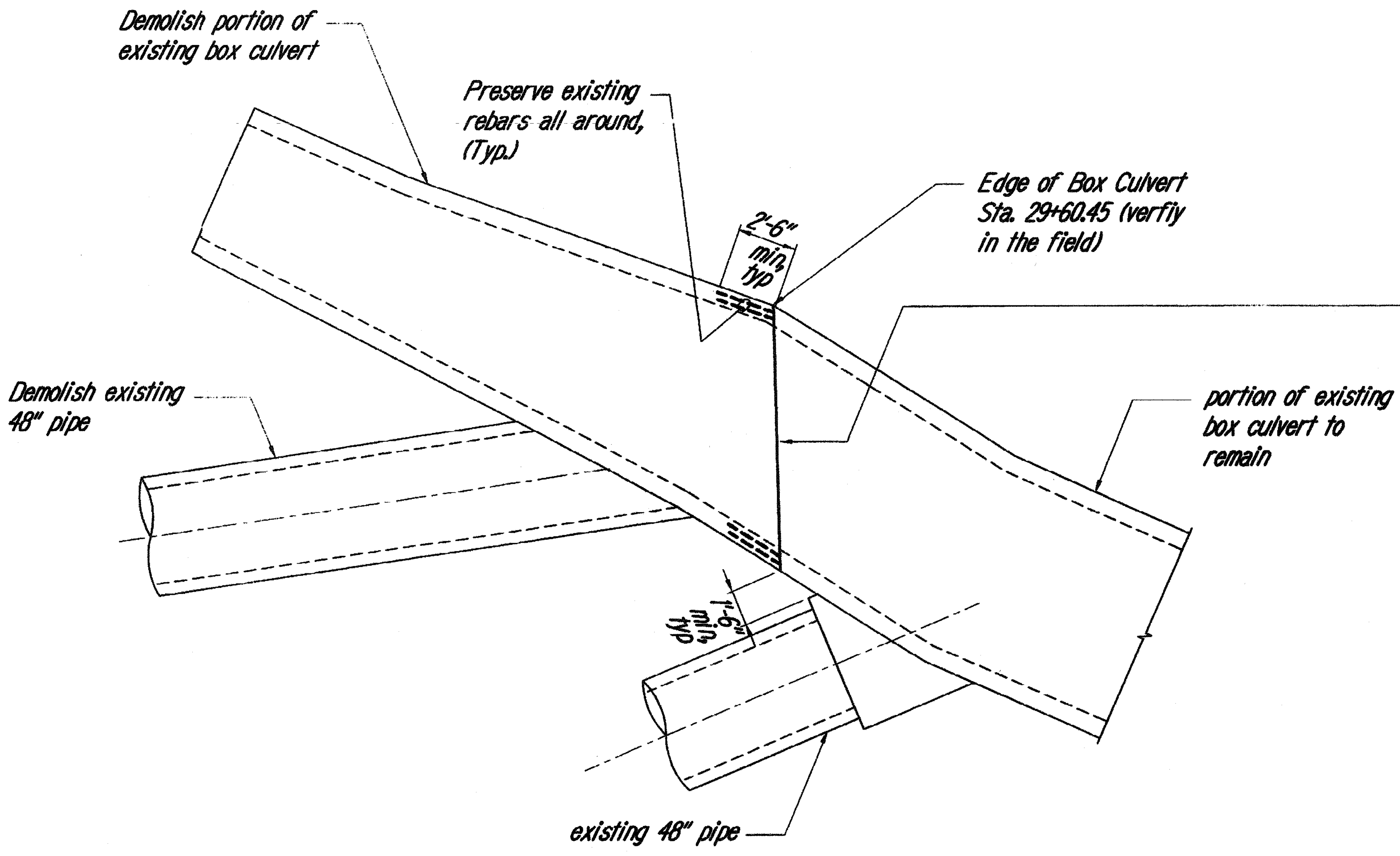
Scale: As shown Date: May 2003

SHEET NO. **S4** OF 193 SHEETS

119

12/2003 7:56:49 AM

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-7310(1)	2003	C.O.120	193

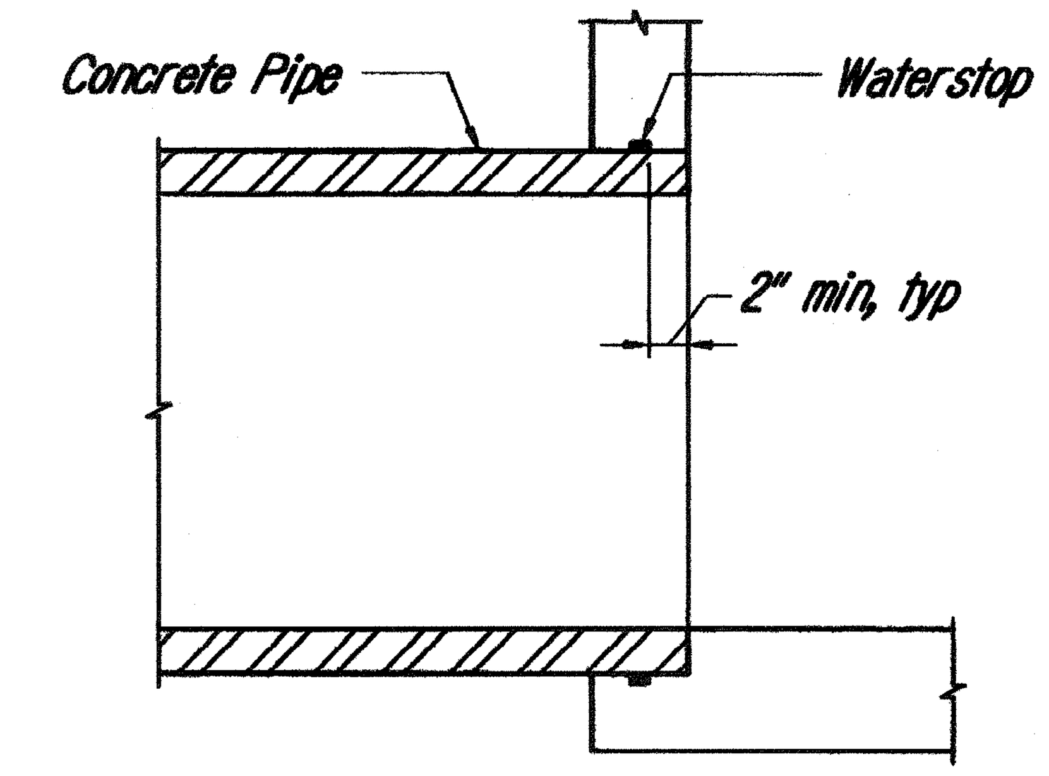


Note:

1. Sawcut inside and outside surfaces (3/4" Deep).
2. Clean and Roughen Existing Concrete Surface, Coat with Bonding Agent Prior to Placing New Concrete. The Bonding Agent Shall be a two Component. Moisture-Insensitive Adhesive, Conforming to ASTM C 881, Class C. Use Type IV, Grade 3 (Non-Sag) of This System in a Neat Form for Vertical or Overhead Bonding and Embedment. Use Type V to Bond Freshly Mixed Concrete to Harden Concrete for All Load Bearing Structural Applications.
3. All concrete shall be removed from the existing rebars. All bond-inhibiting materials shall also be removed from the rebars.

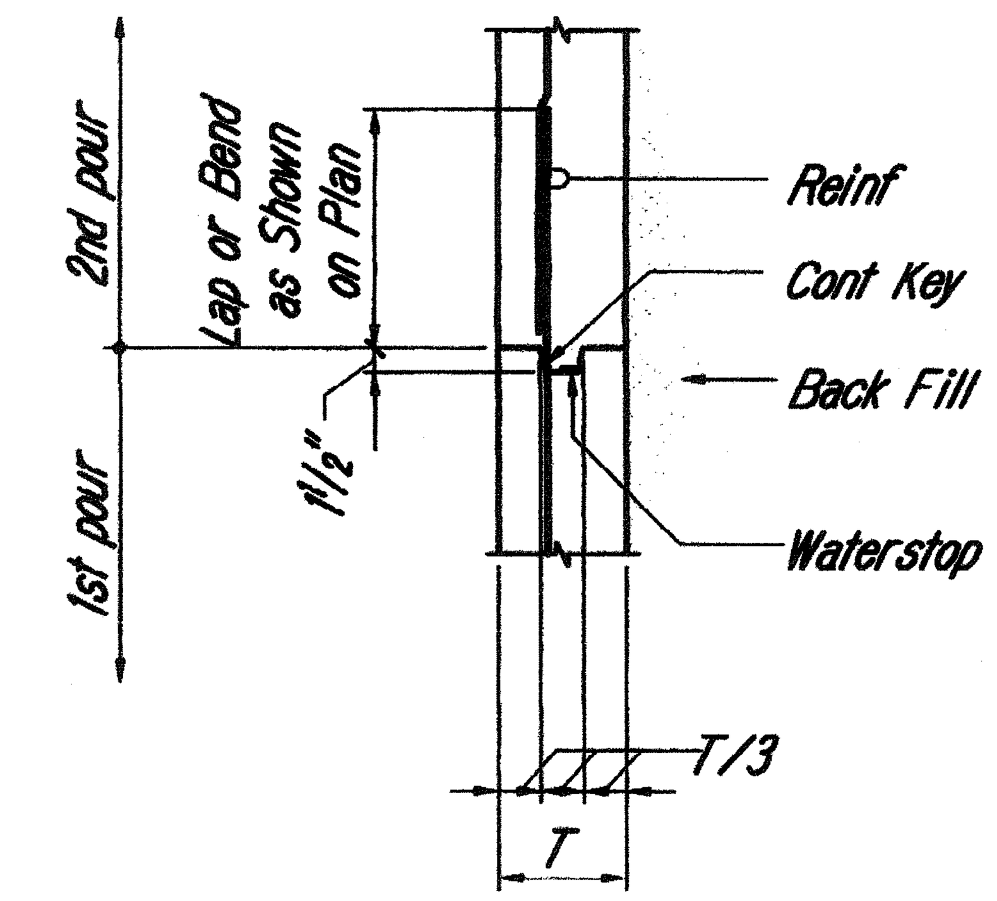
DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



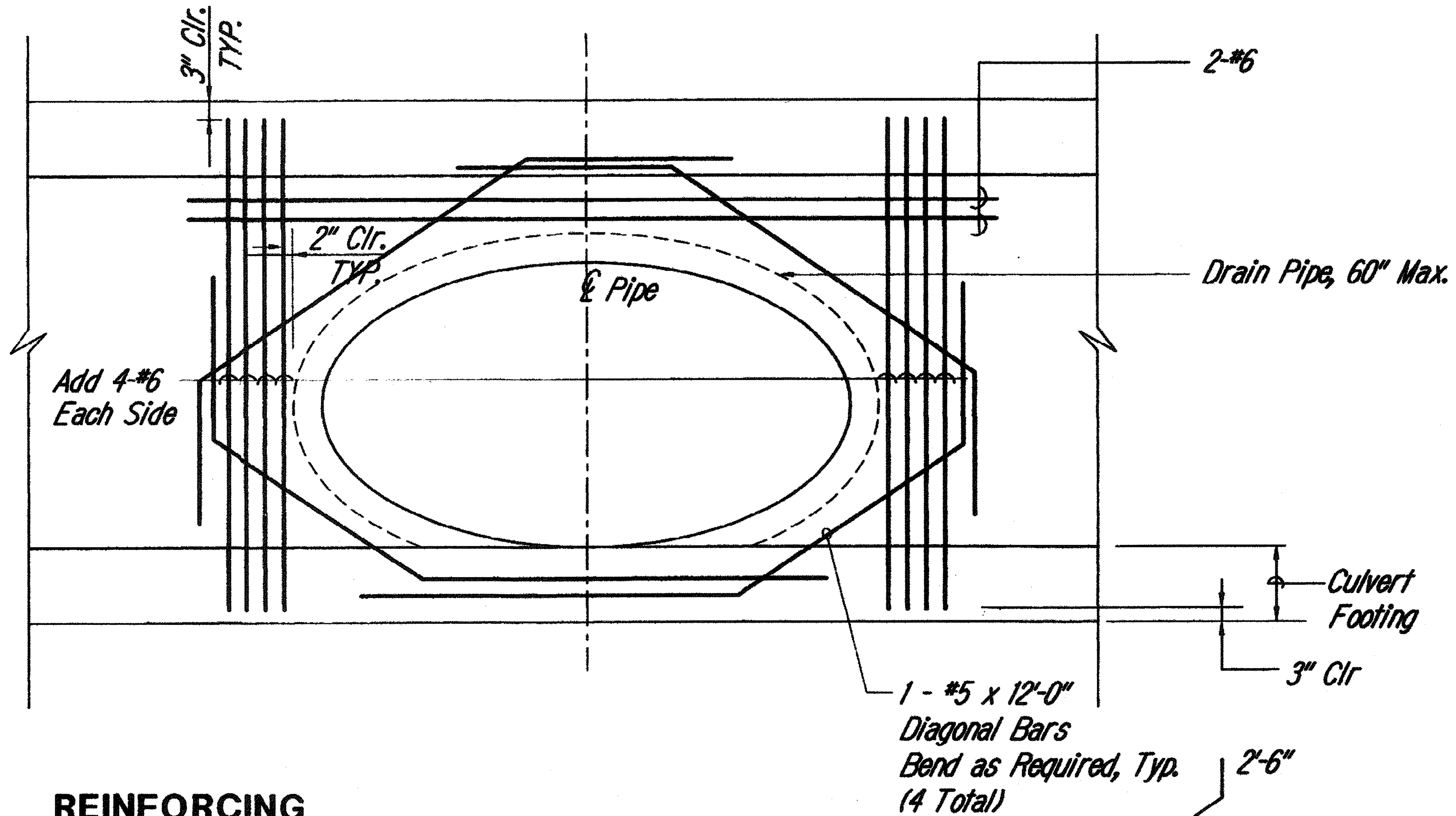
TYPICAL WATERSTOP DETAIL AROUND PIPE OPENING (1 / S5|S5)

Not to Scale



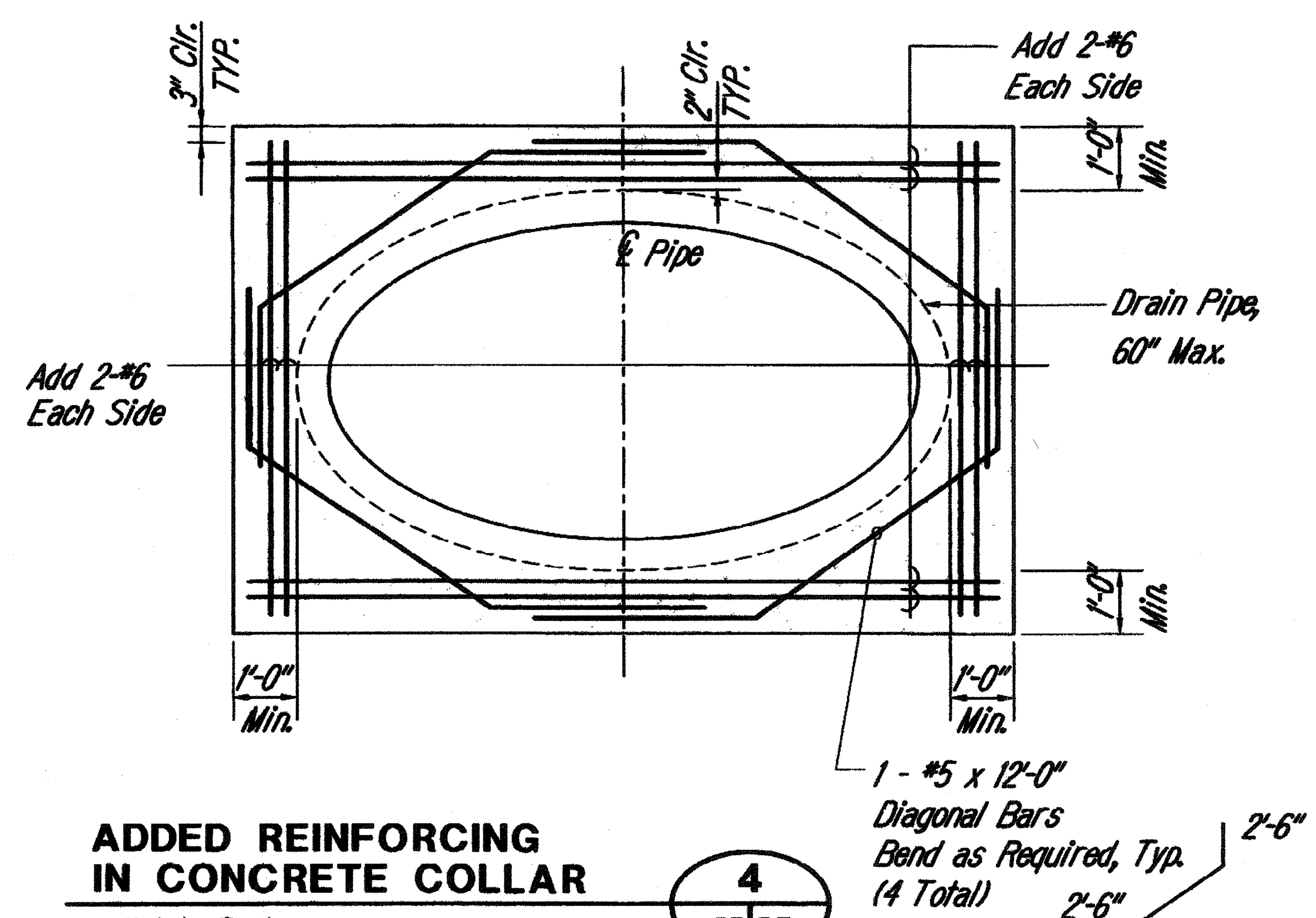
TYPICAL CONSTRUCTION JOINT (2 / S5|S5)

Not to Scale



REINFORCING AT DRAIN PIPE OPENING (3 / S5|S5)

Not to Scale



ADDED REINFORCING IN CONCRETE COLLAR (4 / S5|S5)

Not to Scale

APPROVED

M. [signature] 2/21/08

Chief, Civil Engineering Branch, D.P.P. Date

Symbol	Date	Revision	By	Approved
1	12/21/07	Revised Culvert construction work due to differing field conditions		~~CEB~~

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT PLAN, SECTIONS AND DETAILS-MOKUMOA STREET

PUULOA ROAD IMPROVEMENTS
Kamehameha Hwy. to Salt Lake Blvd.
Federal Aid Project No. STP-7310(1)

Scale: As shown Date: May 2003

KEN KAZUO HAYASHIDA LICENSED PROFESSIONAL ENGINEER No. 6818-S HAWAII, U.S.A.

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SHEET NO. 85 OF 193 SHEETS

C.O. 120

Preserve Existing Rebar all around
12'-0"
2'-6" Min, Typ
#5x at 8"
#4 at 12"
#4 at 6"
2" Clr Typ
#6 at 12"
#9 at 12" (Alternate)
Inv.=0.17 existing
Inv.=-2.04 New 60" Pipe
℄ Pipe
See Detail A Sht. S6 for Reinforcing Around Pipe
9"
Inv.=-2.05 Existing Box Culvert
#6 at 12"
#9 at 12" (Alternate)
3" Clr
S=-0.0008
Inv.=-2.02 Cl Out Existing Box Culvert
#4 at 12"
#4 at 6"
10"
6'-0"
3" Clr
6'-0"
#5x at 8"
45°
4 - #7
#5 at 8"
1'-4"
6" Gravel AASHTO M43 No. 57
SECTION A-A
10'-0" To Match Existing
3'-0" Min (Typ)
9"
9"
#4 at 6"
#6 at 6"
#4 at 12" Each Face
#4 at 12" Each Face
#6 at 12" and #9 at 12", Alternate
6"x6" Chamfer Typ
Construction Joint
#6 at 12" and #9 at 12", Alternate
#4 at 12" Each Face
#6 at 6"
#4 at 12" Each Face
1'-4"
8'-6" To Match Existing
1'-4"
#4 @ 6"
6" Gravel AASHTO M43 No. 57
SECTION THRU WALL 1 S6 S6
Scale: 1/2" = 1'-0"
4-#7x16'-0" Long
Concrete Collar (All Around Pipe)
#5x at 8"
9"
New 60" Dia. Pipe
#6 at 12" and #9 at 12", Alternate
#4 at 12"
4-#7
#5 at 8"
45°
10"
1'-4"
SECTION THRU PIPE 2 S6 S6
Scale: 1/2" = 1'-0"
existing 48" dia pipe
New 60" dia. pipe
3 S6 S6
2 S6 S6
Concrete Collar Around Pipe
1'-6" Min
1 S6 S6
4 S6 S6
New 72" Pipe
1'-0" Min.
1'-0" Min.
A
A
Flow
20'-10"±
23'-3"±
Note:
Contractor to Field Verify All Existing Elevations.
Existing box culvert
New Connection to Box Culvert
PLAN
MOKUMOA ST. CULVERT EXTENSION
SCALE: 1/2" = 1'-0"
APPROVED
M. [signature] 2/21/08
Chief, Civil Engineering Branch, D.P.P. Date
Concrete Collar (All Around Pipe)
1'-0" Min.
Reinf. Not Shown for Clarity
New 60" Dia. Pipe
#5 Dowel With 6" Embedment and Epoxy Grout, Typ Around Collar.
#4x Cont.
1'-0" Min.
1'-0" Min
1'-4"
6"
15" Min
SECTION 3 S6 S6
Scale: 1/2" = 1'-0"
4-#6 Diagonal, Typ
#6 at 6" Each Way Each Face
5 S6 S6
72" Diameter Pipe
SECTION 4 S6 S6
Scale: 1/2" = 1'-0"
Bend #4 at 12" (Longitudinal Steel from Culvert) into End Slab and Cut to Fit. Typ All Around
Varies
See 1 S6 S6 for Rebar
3'-0"
Added #4 at 12"
#6 at 6" Each Way Each Face
1'-0"
72" Dia Pipe
PLAN VIEW BETWEEN CULVERT AND END SLAB 5 S6 S6
Scale: 1/2" = 1'-0"

Symbol	Date	Revision	By	Approved
△	12/21/07	Revised Culvert construction work due to differing field conditions		~~CEB~~

KEN KAZUO HAYASHIDA LICENSED PROFESSIONAL ENGINEER No. 6910-S HAWAII, U.S.A.

EXPIRATION DATE OF THE LICENSE 4/30/2008
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT PLAN, SECTIONS AND DETAILS-MOKUMOA STREET

PUULOA ROAD IMPROVEMENTS
Kamehameha Hwy. to Salt Lake Blvd.
Federal Aid Project No. STP-7310(1)

Scale: As shown | Date: May 2003