

COMP.

WMA

WILSON
& COMPANY

LOC.

FILE 90-809

CK.

PROJ Shooks Run

SHEET 19

DATE

December 17, 1992

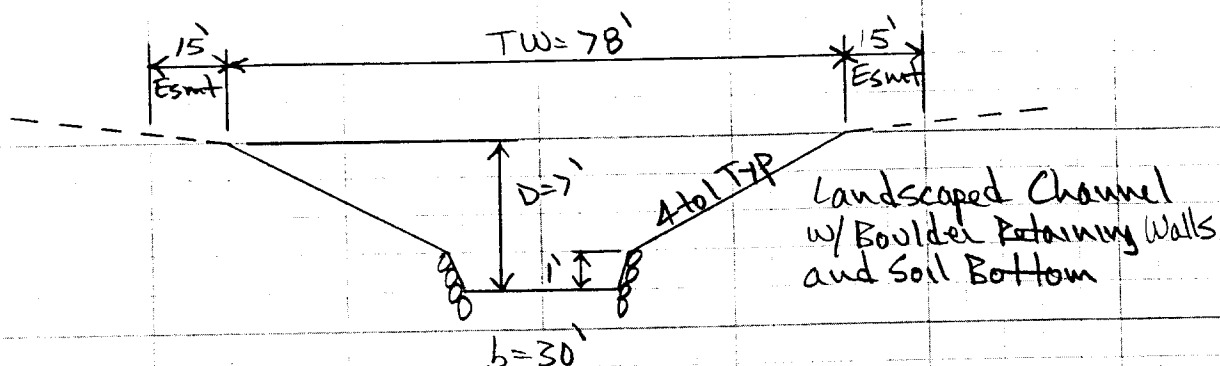
SUBJ.

Soft-Lined

OF

Alternative w/ Detention

Sta. 216+95 to Sta. 218+30 - New open Channel between Paseo Road and Jefferson Street



$$Q_{100} = 1110 \text{ cfs} \quad S_{\text{PRO}} = 0.17\% \pm$$

$$d = 5' \Rightarrow v = \left(\frac{1.49}{0.050} \right) \left(\frac{214}{65} \right)^{2/3} (0.007)^{1/2} = 5.5 \text{ fps} \Rightarrow Q = (5.5)(214) = 1175 \text{ cfs}$$

$$\text{Freeboard} = 1.0 + (0.025)(5.5)(5)^{1/3} = 1.2 \Rightarrow \text{Use } 2' \quad D_{\text{min}} = 5 + 2 = 7'$$

$$F = \frac{5.5}{\sqrt{(32.2)(5)}} = 0.43 \Rightarrow \text{Subcritical}$$

Sta. 218+30 to Sta. 219+10 - Replace Culvert at Jefferson Street

3 - 10' x 5' RCBS

$$Q_{100} = 1110 \text{ cfs} \quad L = 80' \quad S_{\text{PRO}} = 0.17\% \pm \quad \text{AHW} = 14.0 - 07.5 = 6.5'$$

$$\text{Inlet Control} \Rightarrow Q/b = \frac{1110}{30} = 37 \quad \text{HW/D} = 1.1 \quad \text{HW} = (1.1)(5) = 5.5'$$

$$\text{Outlet Control} \Rightarrow H = 1.2' \quad H_0 = 5' \quad L S_0 = (80)(0.007) = 0.6'$$

$$\text{HW} = 1.2 + 5 - 0.6 = 5.6'$$

COMP.

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LOC.

FILE 90-809

CK.

PROJ. Shooks Run

SHEET 20

DATE

December 17, 1992

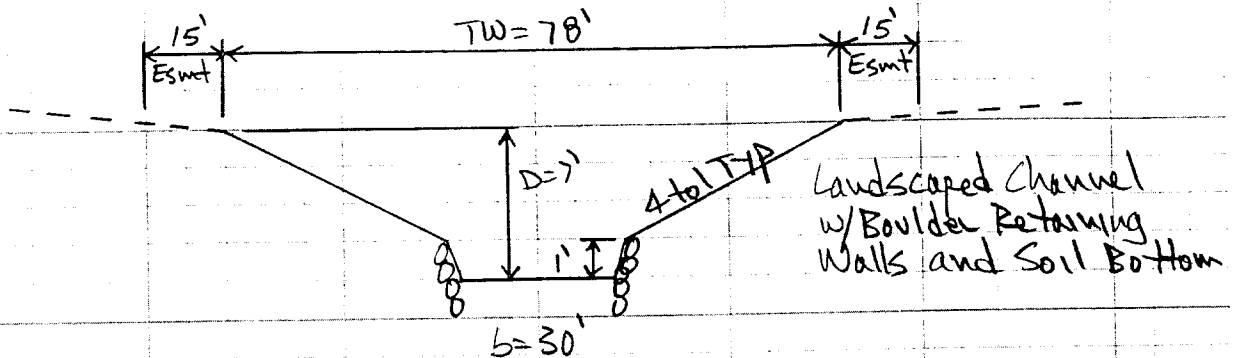
SUBJ.

Soft-Lined

OF

Alternative w/ Detention

Sta 219+10 to Sta 222+50 - New Open Channel Between Jefferson Street and Madison Street



$$Q_{100} = 1110 \text{ cfs} \quad S_{PRD} = 1.2\%$$

$$d = 4.5' \Rightarrow v = \left(\frac{1.49}{0.050} \times \frac{184}{61} \right)^{2/3} (0.012)^{1/2} = 6.8 \text{ fps} \Rightarrow Q = (6.8)(184) = 1250 \text{ cfs}$$

$$\text{Freeboard} = 1.0 + (0.025)(6.8)(4.5)^{1/3} = 1.3 \Rightarrow \text{Use } 2' \quad D_{\min} = 4.5 + 2 = 6.5$$

$$F = \frac{6.8}{\sqrt{(32.2)(4.5)}} = 0.56 \Rightarrow \text{Subcritical}$$

Sta. 222+50 to Sta. 223+30 - Replace Culvert at Madison Street

3-10' x 5' RCB

$$Q_{100} = 1110 \text{ cfs} \quad L = 80' \quad S_{PRD} = 1.2\% \pm \quad \text{AHW} = 20.0 - 12.4 = 7.6'$$

$$\text{Inlet Control} \Rightarrow Q/b = \frac{1110}{30} = 37 \quad \text{HW/D} = 1.1 \quad \text{HW} = (1.1)(5) = 5.5'$$

$$\text{Outlet Control} \Rightarrow H = 1.2' \quad H_0 = 4.5' \quad L S_0 = (80)(0.012) = 1.0'$$

$$\text{HW} = 1.2 + 4.5 - 1.0 = 4.7'$$

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LOC.

FILE 90-809

PROJ.

Shooks Run

SHEET 21

SUBJ.

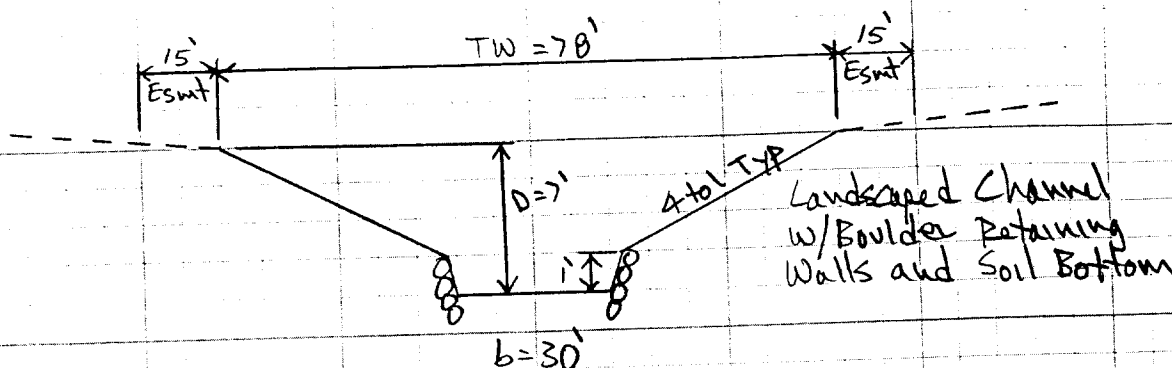
Soft-Lined

OF

Alternative w/ Detention

DATE December 17, 1992

Sta. 223+30 to Sta. 226+25 - New Open Channel between Madison Street and Monroe Street



$$Q_{100} = 1110 \text{ cfs}$$

$$S_{PRD} = 1.2\% \pm$$

$$d = 4.5' \Rightarrow V = \left(\frac{1.49}{0.050} \right) \left(\frac{184}{61} \right)^{2/3} (0.012)^{1/2} = 6.8 \text{ fps} \Rightarrow Q = (6.8)(184) = 1250 \text{ cfs}$$

$$\text{Freeboard} = 1.0 + (0.025)(6.8)(4.5)^{1/3} = 1.3 \Rightarrow \text{Use } 2' \quad D_{min} = 4.5 + 2 = 6.5$$

$$F = \frac{6.8}{\sqrt{32.2(4.5)}} = 0.56 \Rightarrow \text{Subcritical}$$

Sta 226+25 to 227+05 - Replace Culvert at Monroe Street

3-10' x 5' PCB

$$Q_{100} = 1110 \text{ cfs}$$

$$L = 80'$$

$$S_{PRD} = 1.2\% \pm$$

$$A.H.W. = 23.5 - 16.7 = 6.8'$$

$$\text{Inlet Control} \Rightarrow Q/b = \frac{1110}{30} = 37$$

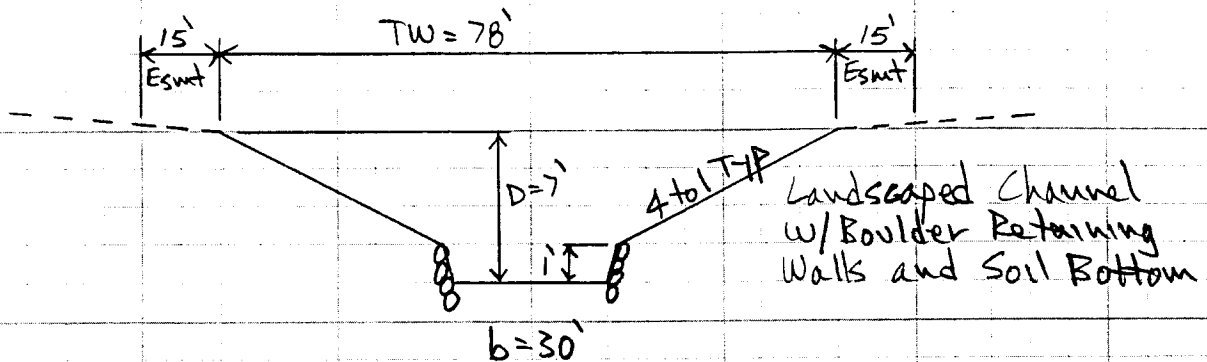
$$H_w/D = 1.1$$

$$H_w = (1.1)(5) = 5.5'$$

$$\text{Outlet Control} \Rightarrow H = 1.2' \quad H_0 = 4.5' \quad L S_0 = (80)(0.012) = 1.0'$$

$$H.W. = 1.2 + 4.5 - 1.0 = 4.7'$$

Sta. 227+05 to Sta. 229+10 - New Open Channel between Monroe Street and Jackson Street



$$Q_{100} = 1110 \text{ cfs}$$

$$S_{PPO} = 1.2\% \pm$$

$$d = 4.5' \Rightarrow v = \left(\frac{1.49}{0.050} \right) \left(\frac{184}{61} \right)^{2/3} (0.012)^{1/2} = 6.8 \text{ fps} \Rightarrow Q = (6.8)(184) = 1250 \text{ cfs}$$

$$\text{Freeboard} = 1.0 + (0.025)(6.8)(4.5)^{1/3} = 1.3 \Rightarrow \text{Use } 2' \quad D_{\min} = 4.5 + 2 = 6.5'$$

$$F = \frac{6.8}{\sqrt{(32.2)(4.5)}} = 0.56 \Rightarrow \text{Subcritical}$$

Sta. 229+10 to Sta. 234+15 - Replace Culvert at Jackson Street / LaSalle Street

3 - 10' x 5' RCB

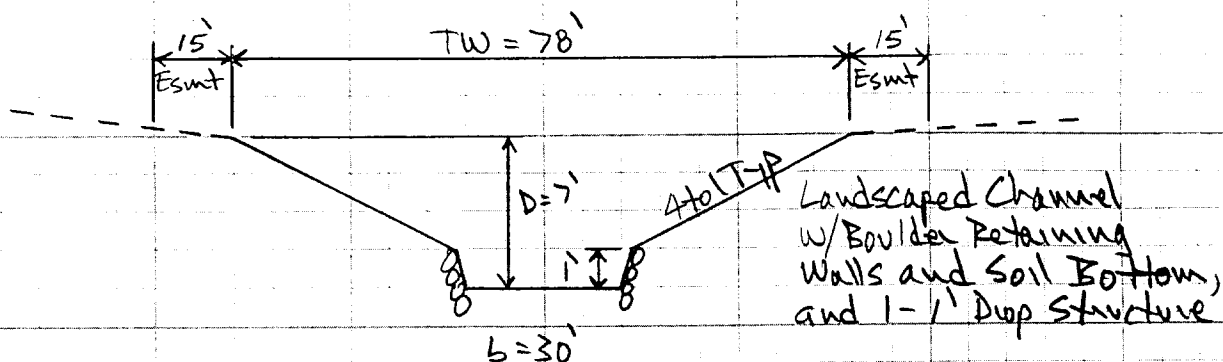
$$Q_{100} = 1110 \text{ cfs} \quad L = 445' \quad S_{PPO} = 1.2\% \pm \quad \text{AHW} = 31.5 - 25.0 = 6.5'$$

$$\text{Inlet Control} \Rightarrow Q/b = \frac{1110}{30} = 37 \quad \text{HW/D} = 1.1 \quad \text{HW} = (1.1)(5) = 5.5'$$

$$\text{Outlet Control} \Rightarrow H = 1.9' \quad H_0 = 4.5' \quad L S_0 = (445)(0.012) = 5.3'$$

$$\text{HW} = 1.9 + 4.5 - 5.3 = 1.1'$$

Sta. 234+15 to Sta 235+40 - New open channel between LaSalle Street and Pedestrian Path



$$Q_{100} = 1070 \text{ cfs} \quad S_{\text{PRD}} = 1.2\% \pm$$

$$d = 4.5' \Rightarrow V = \left(\frac{1.49}{0.050} \right) \left(\frac{184}{61} \right)^{2/3} (0.012)^{1/2} = 6.8 \text{ fps} \Rightarrow Q = (6.8)(184) = 1250 \text{ cfs}$$

$$\text{Freeboard} = 1.0 + (0.025)(6.8)(4.5)^{3/2} = 1.3 \Rightarrow \text{Use } 2' \quad D_{\text{min}} = 4.5 + 2 = 6.5'$$

$$F = \frac{6.8}{\sqrt{(32.2)(4.5)}} = 0.56 \Rightarrow \text{Subcritical}$$

Sta. 235+40 to Sta. 235+90 - Replace Culvert at Pedestrian Path

3 - 10' x 5' PCB

$$Q_{100} = 1070 \text{ cfs} \quad L = 50' \quad S_{\text{PRD}} = 2.2\% \pm \quad \text{AHW} = 35.6 - 28.6 = 6.8'$$

$$\text{Inlet Control} \Rightarrow Q/b = \frac{1070}{30} = 36 \quad \text{HW}/D = 1.1 \quad \text{HW} = (1.1)(5) = 5.5'$$

$$\text{Outlet Control} \Rightarrow H = 1.1' \quad H_0 = 4.5' \quad LS_0 = (50)(0.022) = 1.1'$$

$$\text{HW} = 1.1 + 4.5 - 1.1 = 4.5'$$

COMP.

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LOC.

FILE 90-809

CK.

PROJ Shooks Run

SHEET 24

DATE

December 17, 1992

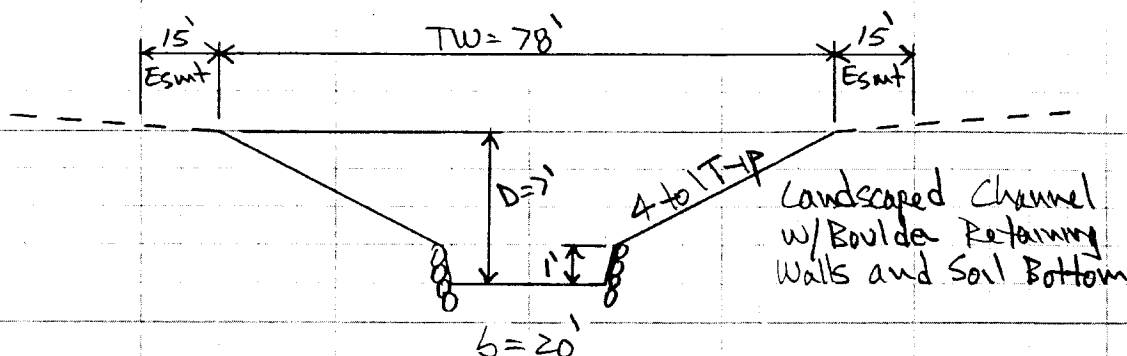
SUBJ.

Soft-Lined

OF

Alternative w/ Detention

Sta. 235+90 to Sta. 236+20 - New Open Channel between Pedestrian Path and C.R.I.P. Railroad



$$Q_{100} = 1070 \text{ cfs} \quad S_{PFD} = 1.20\% \pm$$

$$d = 5.0' \Rightarrow v = \left(\frac{1.49}{0.050} \right) \left(\frac{164}{55} \right)^{2/3} (0.012)^{1/2} = 6.8 \text{ fps} \Rightarrow Q = (6.8)(164) = 1115 \text{ cfs}$$

$$\text{Freeboard} = 1.0 + (0.025)(6.8)(5.0)^{1/3} = 1.3 \Rightarrow \text{Use } 2' \quad D_{\min} = 5 + 2 = 7'$$

$$F = \frac{6.8}{\sqrt{(32.2 \times 5.0)}} = 0.54 \Rightarrow \text{Subcritical}$$

Sta. 236+20 to Sta. 236+75 - Replace Culvert at C.R.I.P. Railroad

2-9' x 5' PCB

$$Q_{100} = 1070 \text{ cfs} \quad L = 55' \quad S_{PFD} = 2.20\% \quad \text{AHW} = 40.1 - 30.6 = 9.5'$$

$$\text{Inlet Control} \Rightarrow Q/b = \frac{1070}{18} = 59 \quad \text{HW}/D = 1.8 \quad \text{HW} = (1.8)(5) = 9.0$$

$$\text{Outlet Control} \Rightarrow H = 3.0' \quad H_0 = 5.0' \quad LS_0 = (55)(0.022) = 1.2'$$

$$\text{HW} = 3.0 + 5.0 - 1.2 = 6.8'$$

COMP.

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LOC.

FILE 90-809

CK.

PROJ. Shooks Run

SHEET 25

DATE

December 17, 1992

SUBJ. Soft-Lined

OF

Alternative w/ Detention

Templeton Gap Road at Van Buren Channel - Replace Culvert

2-11' x 6' RCB

$$Q_{100} = 1460 \text{ cfs}$$

$$L = 100'$$

$$S_{EX} = 0.6\%$$

$$A+HW = 40.1 - 30.3 = 9.8'$$

$$\text{Inlet Control} \Rightarrow Q/b = \frac{1460}{22} = 66 \quad HW/D = 1.5 \quad HW = (1.5)(6) = 9.0'$$

$$\text{Outlet Control} \Rightarrow H = 2.6' \quad D_c = 5.1' \quad H_0 = \frac{6 + 5.1}{2} = 5.6'$$

$$L S_0 = (100)(0.006) = 0.6' \quad HW = 2.6 + 5.6 - 0.6 = 7.6'$$

**E. SOFT-LINED CHANNEL SIDE-SLOPES
ONLY IMPROVEMENT
WITH CROSSING MAINTENANCE
ALTERNATIVE HYDRAULIC CALCULATIONS**

COMP.

WILSON

WILSON
& COMPANY

LOC.

FILE 90-809

CK.

PROJ. Shooks Run

SHEET 1

DATE December 18, 1992

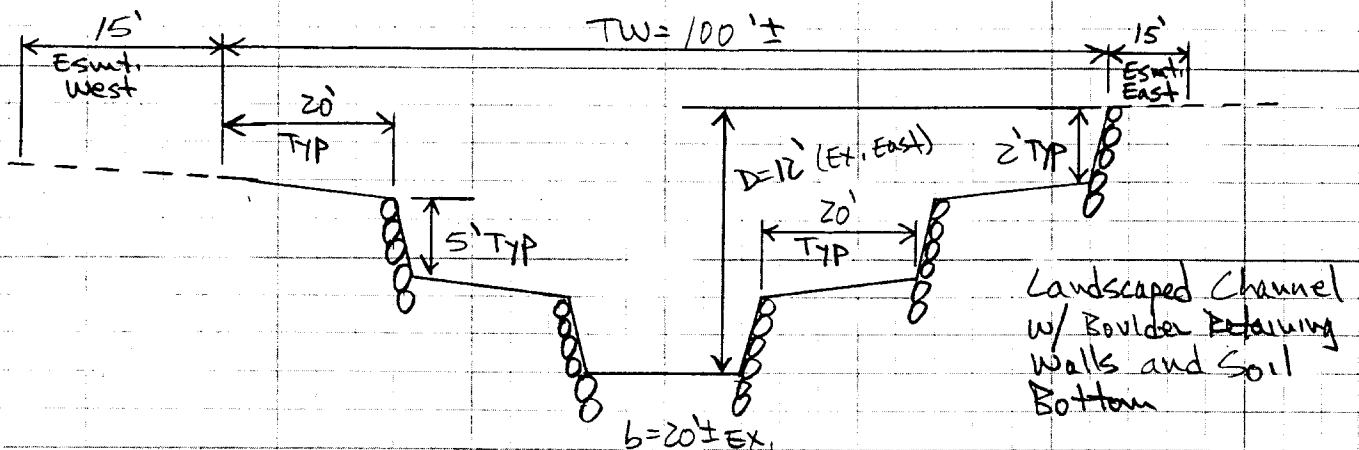
SUBJ.

Soft-Lined

OF

Alternative w/Side Slope
Improvements OnlySOFT-LINED ALTERNATIVE w/SIDE SLOPE IMPROVEMENTS ONLY

(No designed hydraulic improvements)

Sta. 0+25 to Sta. 9+75 - New open Channel between Fountain Creek
confluence and Las Vegas StreetSta. 9+75 to Sta. 10+80 - Exist bridge and dissipator at Las Vegas
Street

⇒ Maintenance Only

COMP.

WWD

**WILSON
& COMPANY**

LOC.

FILE 90-809

CK.

PROJ. Shooks Run

SHEET

2

DATE

December 18, 1992

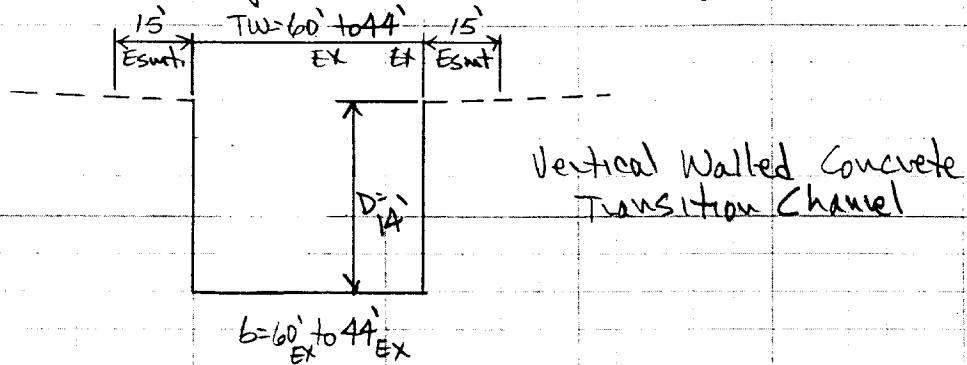
SUBJ.

Soft-Lined

OF

Alternative w/ Side Slope
Improvements Only

Sta. 10+80 to Sta. 11+20 - EXIST Concrete transition channel between
Las Vegas Street and A.T.S.F. & D.R.G.W. Railroad



Sta. 11+20 to 11+65 - Existing Culvert for A.T.S.F. & D.R.G.W. Railroad

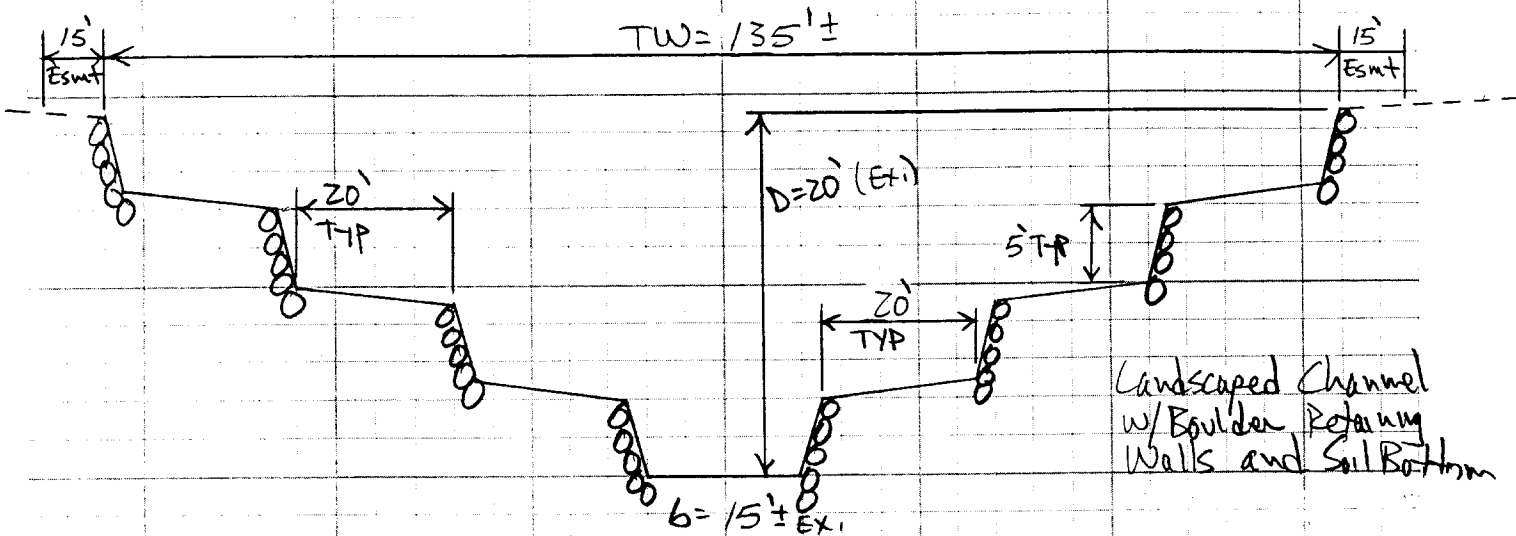
⇒ Maintenance Only

COMP. WMD
CK.
DATE December 18, 1992

**WILSON
& COMPANY**

LOC. FILE 90-809
PROJ. Shooks Run SHEET 3
SUBJ. Soft-Lined OF
Alternative w/Side Slope
Improvements Only

Sta. 11+65 to Sta. 15+60 - New open Channel between A.T.S.F. & D.R.G.W. Railroad
and abandoned railroad



Sta. 15+60 to 16+20 - Existing culvert for abandoned railroad

⇒ Maintenance Only

COMP.

WILSON

WILSON
& COMPANY

LOC.

FILE 90-809

CK.

PROJ. Shooks Run

SHEET 4

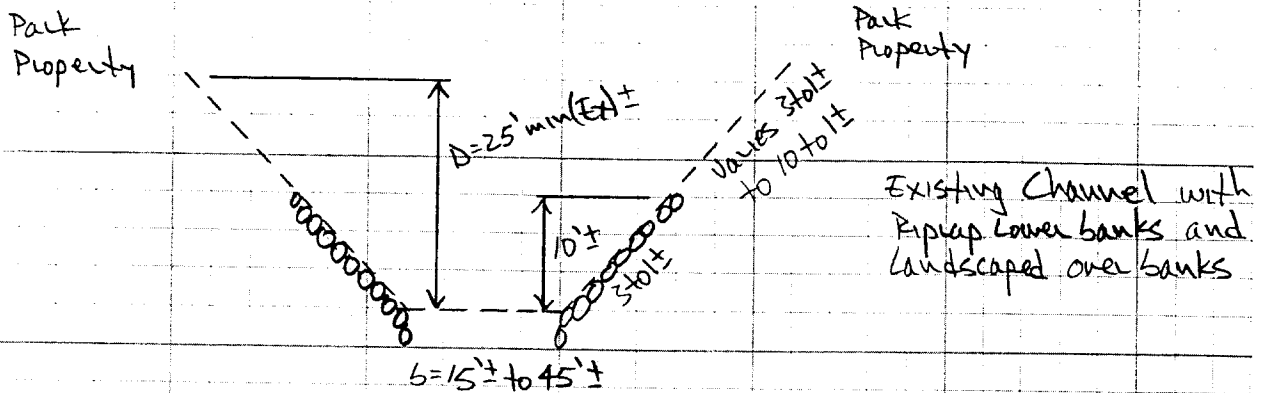
DATE December 18, 1992

SUBJ. Soft-Lined

OF

Alternative w/ Side Slope
Improvements Only

Sta. 16+20 to Sta. 24+00 - Remove undesirable vegetation and debris
from floodplain between abandoned railroad
and Fountain Boulevard



Sta. 24+00 to Sta. 25+50 - Exist Culvert at Fountain Boulevard

$\Rightarrow$ Maintenance Only

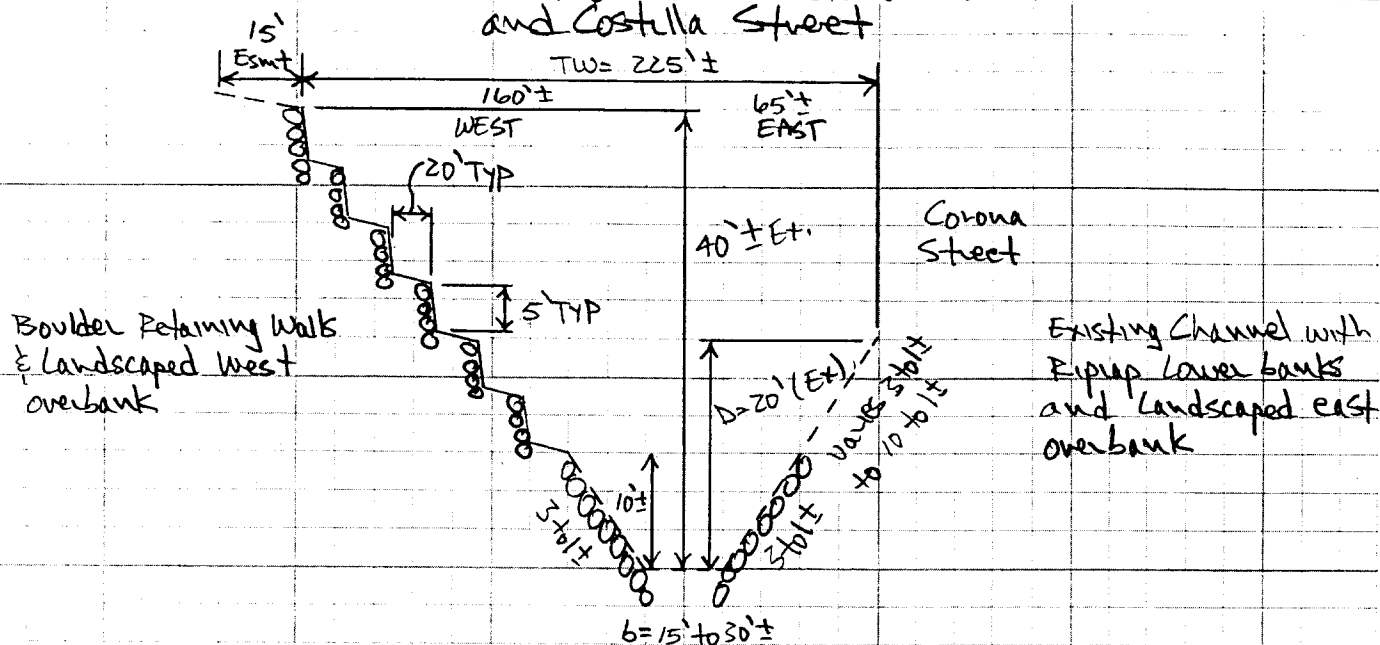
DATE December 18, 1992

SUBJ. Soft-Lined

OF

Alternative w/ Side Slope
Improvements Only

Sta. 25+50 to Sta. 48+65 - Remove undesirable vegetation and debris from floodplain and reduce slope of west overbank between Fountain Boulevard and Costilla Street



Sta. 48+65 to Sta. 50+65 - Exist culvert at Costilla Street

⇒ Maintenance Only

COMP

WMA

WILSON
& COMPANY

LOC.

FILE 70-809

CK.

PROJ. Shooks Run

SHEET 7

DATE December 18, 1992

SUBJ. Soft-Lined

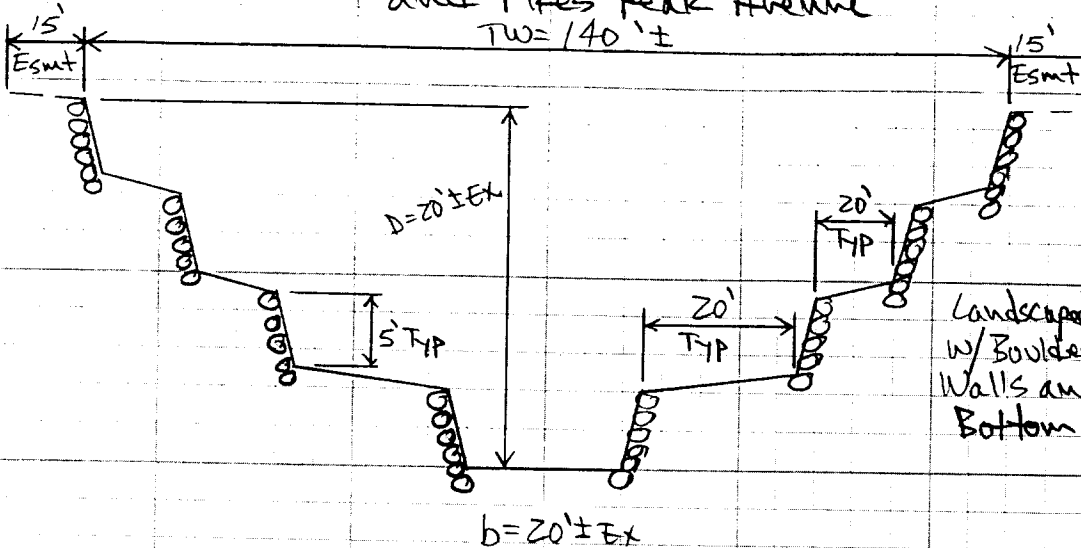
OF

Alternative w/ Side Slope
Improvements Only

Sta. 72+80 to Sta. 76+80

- New open channel between El Paso Street
and Pikes Peak Avenue

TW = 140' ±

Sta. 76+80 to Sta. 85+60 - Exist culverts at Pikes Peak Avenue / El Paso
Street and at Kiowa Street

⇒ Maintenance Only

COMP.

WJF

WILSON
& COMPANY

LOC.

FILE 90-809

CK.

PROJ. Shooks Run

SHEET 10

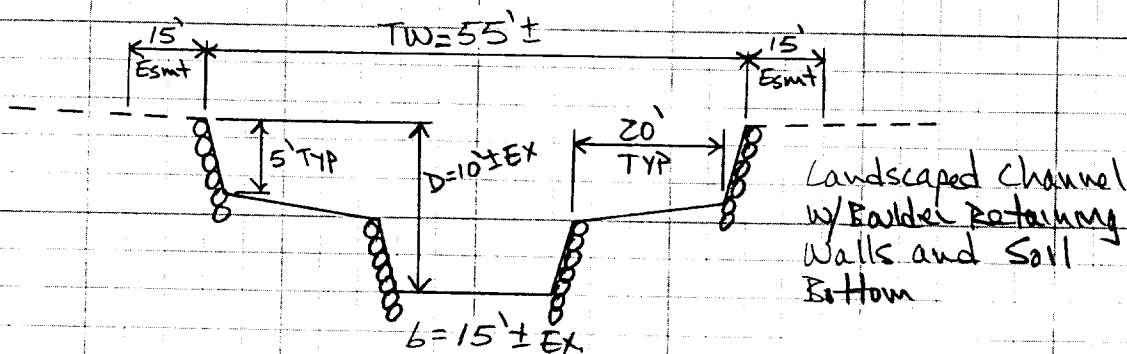
DATE December 18, 1992

SUBJ. Soft-Lined

OF

Alternative w/ Side Slope
Improvements OnlySta. 98+10 to Sta. 106+30 - Exist Culvert at Platte Avenue / School Athletic Field

⇒ Maintenance Only

Sta. 106+30 to Sta. 112+35 - New open channel between Boulder Street and St. Vrain Street

COMP.

CK.

DATE December 18, 1992

**WILSON
& COMPANY**

LOC.

FILE 9D-809

PROJ. Shooks Run

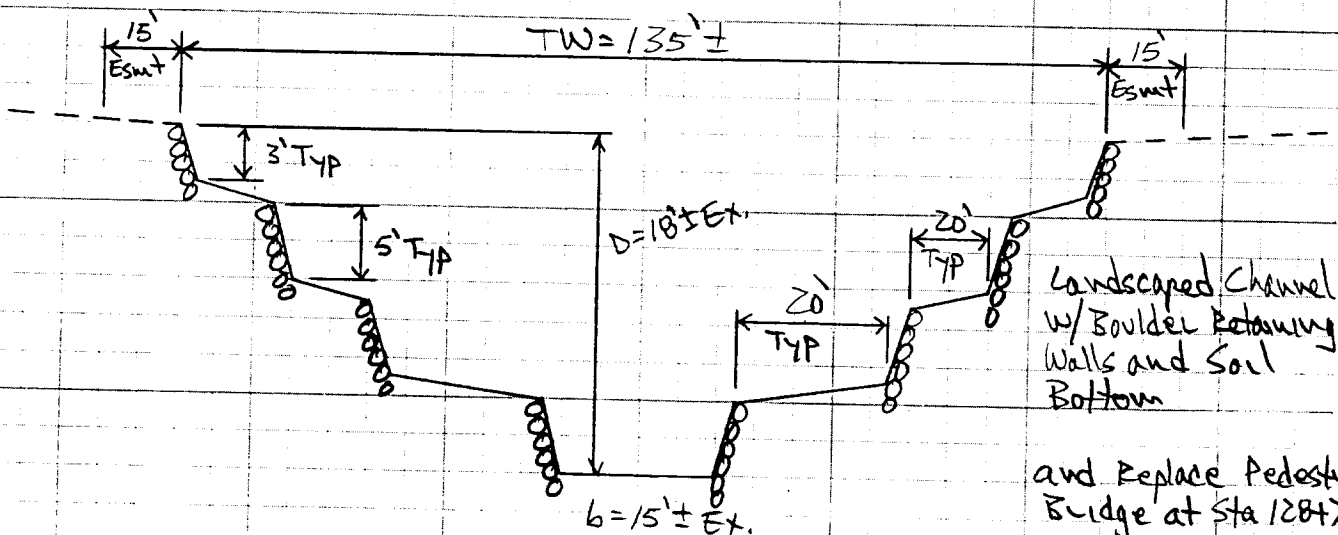
SHEET 12

SUBJ. Soft-Lined

OF

Alternative w/ Side Slope
Improvements OnlySta 117+75 to Sta 119+80 - Exist Culvert at Willamette Street

⇒ Maintenance Only

Sta 119+80 to Sta 135+15 - New open channel between Willamette Street and Cache La Poudre Street

COMP.

WILSON

WILSON
& COMPANY

LOC.

FILE 90-809

CK.

PROJ. Shooks Run

SHEET 13

DATE December 18, 1992

SUBJ. Soft-Lined

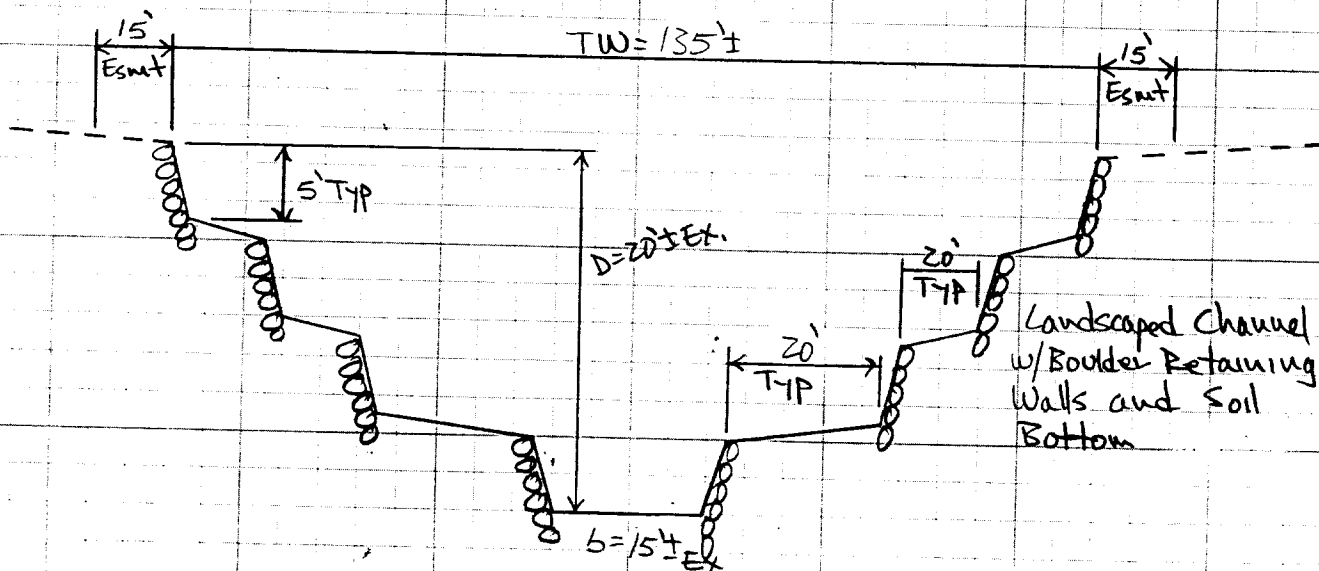
OF

Alternative w/ Side Slope
Improvements Only

Sta. 135+15 to Sta. 137+05 - Exist Culvert at Cache La Poudre Street

=> Maintenance Only

Sta. 137+05 to Sta. 152+45 - New open channel between Cache La Poudre Street and Vintah Street



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DATE December 18, 1992

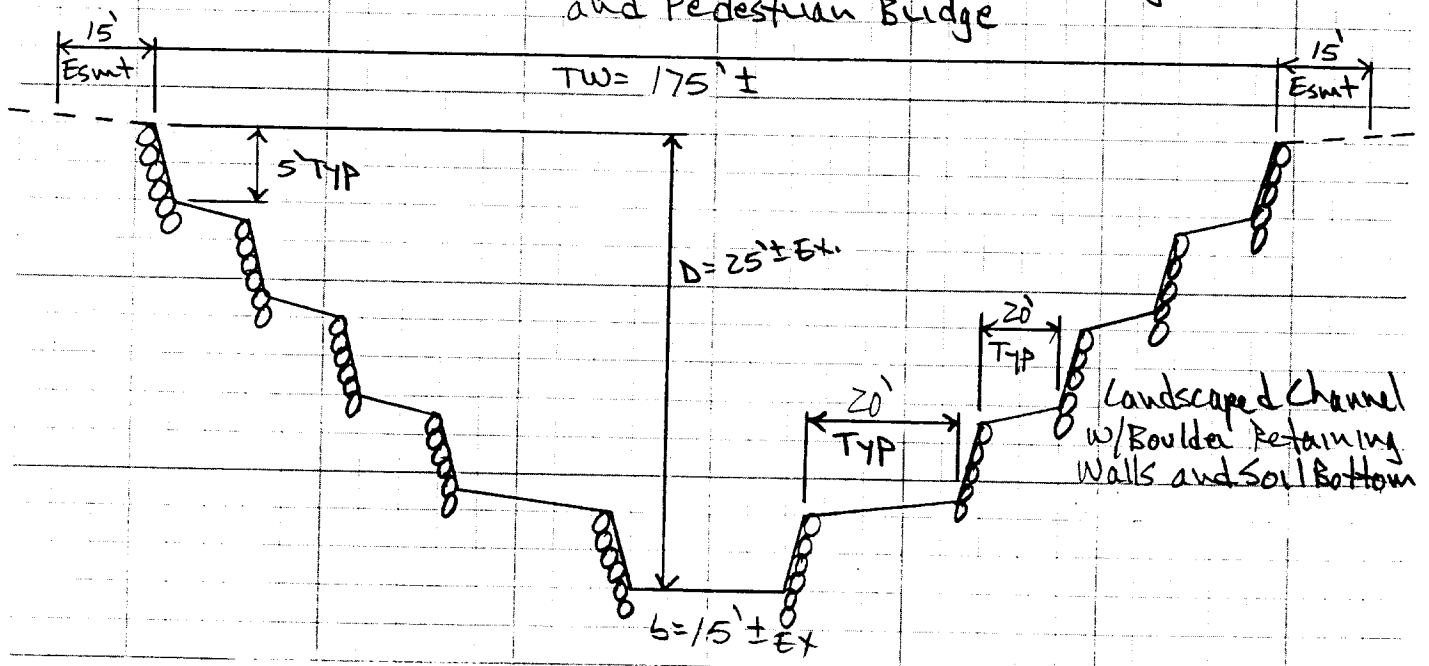
**WILSON
& COMPANY**

LOC. FILE 90-809
PROJ. Shooks Run SHEET 15
SUBJ. Soft-Lined OF
Alternative w/ Side Slope
Improvements Only

Sta. 157+55 to Sta. 158+40 - Exist Culvert at San Miguel Street

⇒ Maintenance Only

Sta. 158+40 to Sta. 167+35 - New Open Channel between San Miguel Street and Pedestrian Bridge



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& COMPANY

LOC.

FILE 90-809

CK.

PROJ. Shooks Run

SHEET 16

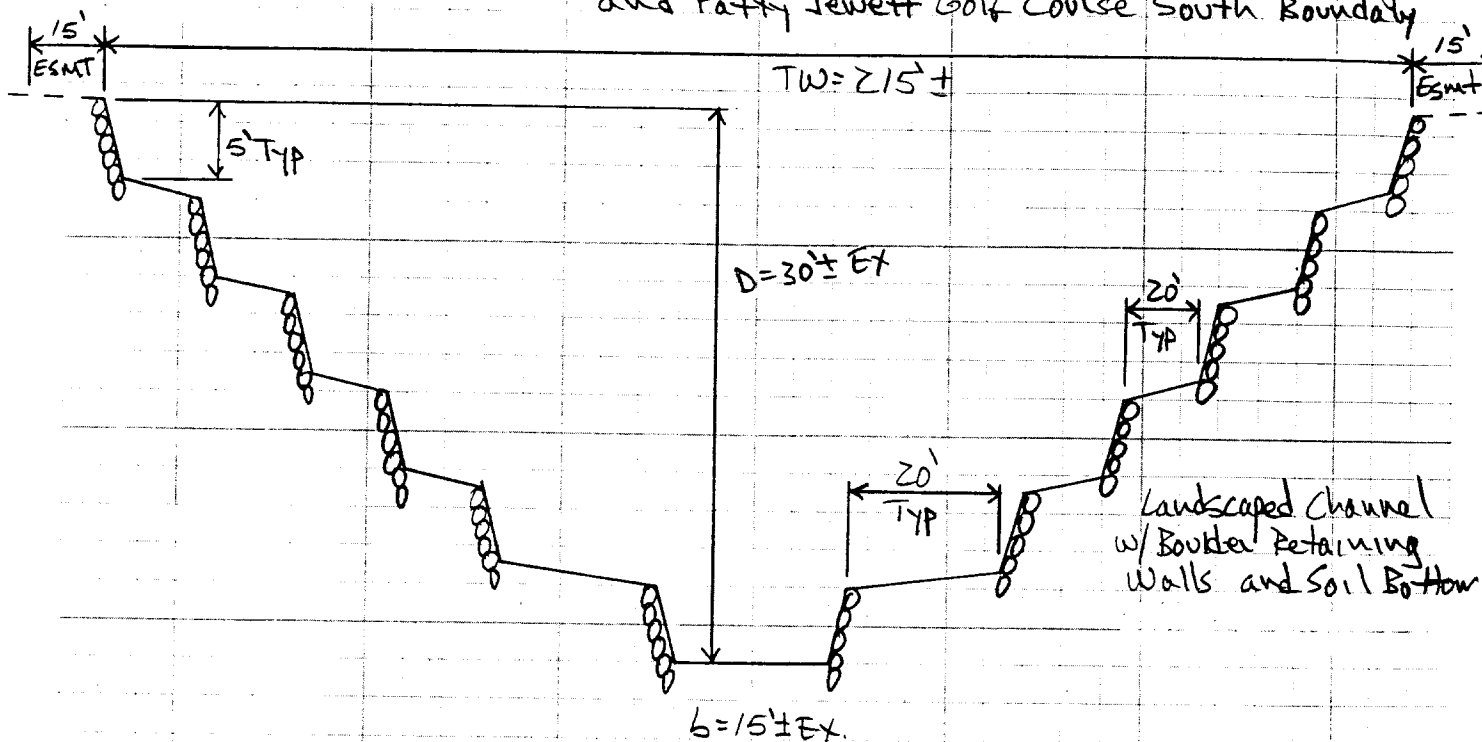
DATE

December 18, 1992

SUBJ.

Soft-lined

OF

Alternative w/ Side Slope
Improvements OnlySta 167+35 - Replace Pedestrian BridgeSta 167+35 to Sta 176+25 - New open channel between Pedestrian Bridge
and Patty Jewett Golf Course South Boundary

COMP.

**WILSON
& COMPANY**

LOC.

FILE 90-809

CK.

PROJ. Shooks Run

SHEET 17

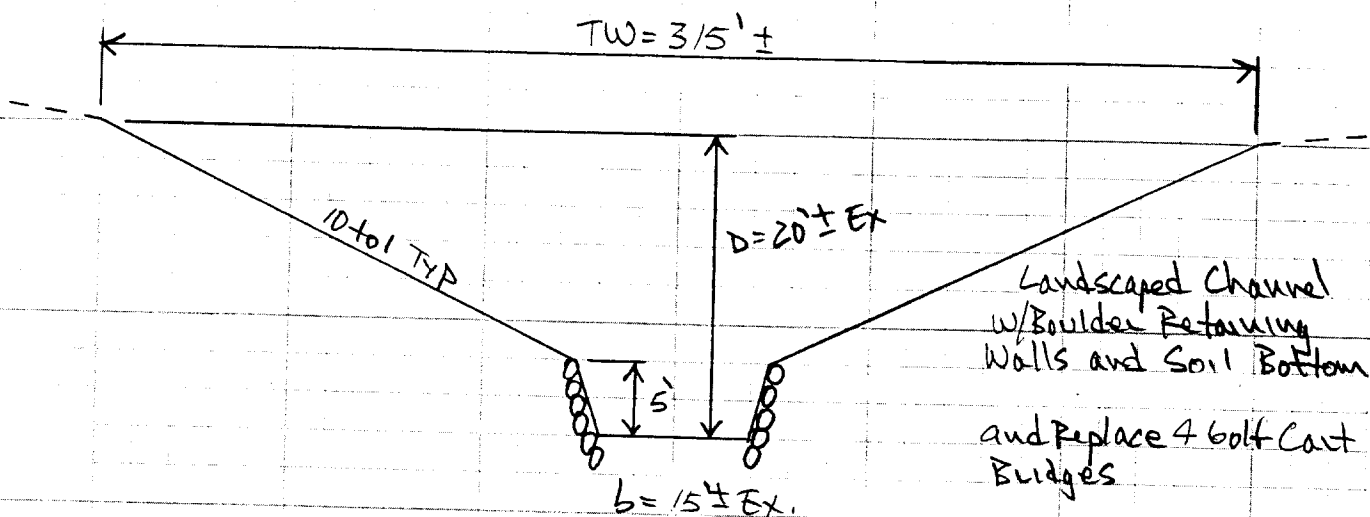
DATE December 18, 1992

SUBJ. Soft-Lined

OF

Alternative w/ Side Slope
Improvements Only

Sta. 176+25 to Sta. 189+05 - New open channel between Patty Jewett
Golf Course South Boundary and Espanola
Street



Sta. 189+05 to Sta. 190+85 - Exist. Culvert at Espanola Street

⇒ Maintenance Only

COMP.

WHD

CK.

DATE

December 18, 1992

WILSON
& COMPANY
ENGINEERS &
ARCHITECTS

LOC.

FILE 70-809

PROJ.

Shooks Run

SHEET

18

SUBJ.

Landscaped

OF

Alternative w/ Side Slope
Improvements Only

Sta. 190+85 to Sta 198+45 - Existing Open Channel between Espanola Street
and End of Existing Channel Lining

⇒ Maintenance Only

Sta. 198+45 to Sta 216+40 - Existing open Channel between End of Existing
Lining and Paseo Road

⇒ Maintenance Only

Sta. 216+40 to Sta 216+95 - Exist Culvert at Paseo Road

⇒ Maintenance Only

COMP.

WMA

WILSON
& COMPANY

LOC.

FILE 90-809

CK.

PROJ Shooks Run

SHEET 20

DATE

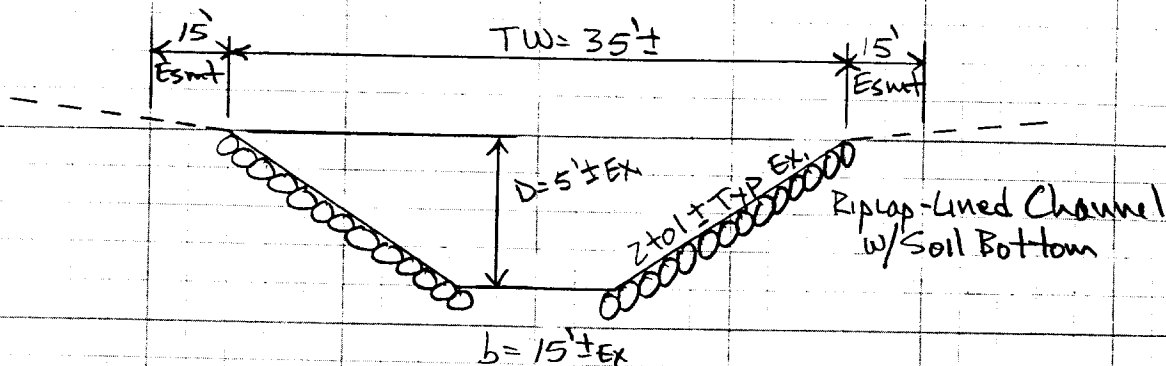
December 18, 1992

SUBJ. Soft-Lined

OF

Alternative w/ Side Slope
Improvements Only

Sta. 219+10 to Sta 222+50 - New open Channel between Jefferson
Street and Madison Street



Sta. 222+50 to Sta. 223+30 - Exist. Culvert at Madison Street

⇒ Maintenance Only

COMP.

WMA

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& COMPANY

LOC.

FILE 90-809

CK.

PROJ Shooks Run

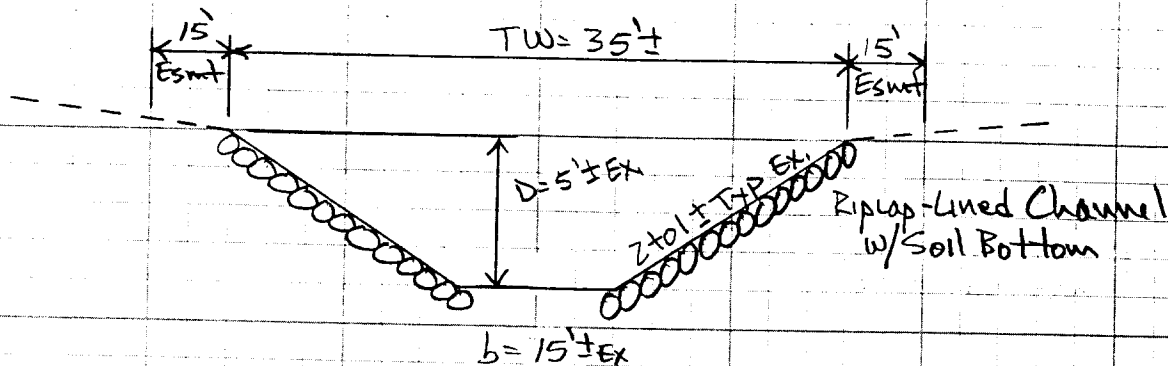
SHEET 21

DATE

December 18, 1992

SUBJ. Soft-Lined

OF

Alternative w/ Side Slope
Improvements OnlySta. 223+30 to Sta 226+25 - New open Channel between Madison Street
and Monroe Street

Sta. 226+25 to Sta. 227+05 - EXIST. Culvert at Monroe Street

⇒ Maintenance Only

COMP.

WMA

WILSON
& COMPANY

LOC.

FILE 90-809

CK.

PROJ Shooks Run

SHEET 22

DATE

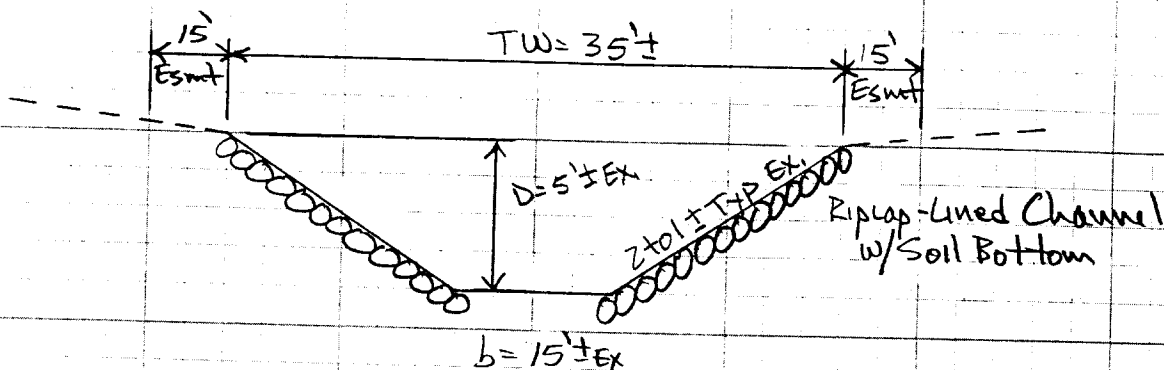
December 18, 1992

SUBJ. Soft-Lined

OF

Alternative w/ Side Slope
Improvements Only

Sta. 227+05 to Sta. 229+70 - New open channel between Monroe Street
to Jackson Street



Sta. 229+70 to Sta. 234+15 - EXIST. Culvert at Jackson Street / La Salle Street

⇒ Maintenance Only

COMP.

WMA

WILSON
& COMPANY

LOC.

FILE 90-809

CK.

PROJ. Shooks Run

SHEET 23

DATE

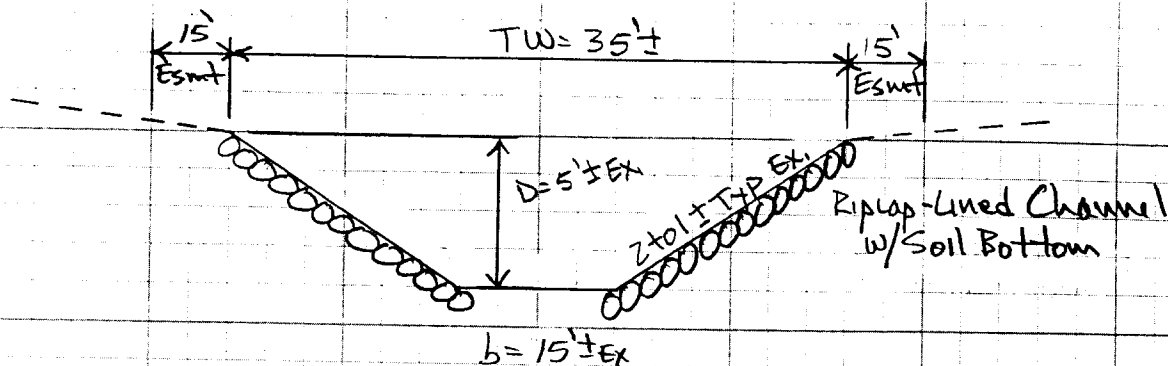
December 18, 1992

SUBJ. Soft-Lined

OF

Alternative w/ Side Slope
Improvements Only

Sta. 234+15 to Sta. 235+40 - New Open Channel between LaSalle Street
and Pedestrian Path



Sta. 235+40 to Sta. 235+90 - EXIST. Culvert at Pedestrian Path

⇒ Maintenance Only

COMP.

WMA

WILSON
& COMPANY

LOC.

FILE 90-809

CK.

PROJ. Shooks Run

SHEET 24

DATE

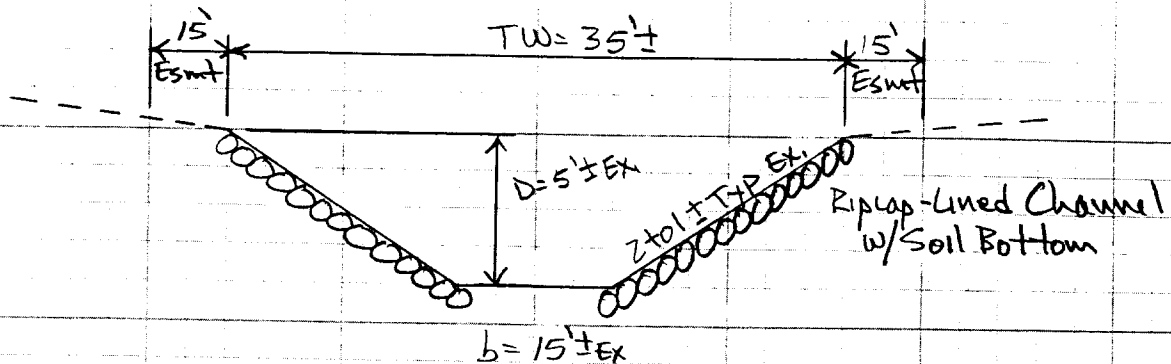
December 18, 1992

SUBJ. Soft-Lined

OF

Alternative w/ Side Slope
Improvements Only

Sta. 235+90 to Sta. 236+20 - New Open Channel between Pedestrian Path
and C.R.I.P. Railroad



Sta. 236+20 to Sta. 236+75 - EXIST. Culvert at C.R.I.P. Railroad

⇒ Maintenance Only

Templeton Gap Road at Van Buren Channel - EXIST Culvert

⇒ Maintenance Only

**F. ESTIMATE OF PROBABLE CONSTRUCTION COSTS
FOR PROACTIVE MAINTENANCE PROGRAM
ALTERNATIVE**

OMP.

**WILSON
& COMPANY**

LOC.

FILE

90-809

CK.

PROJ.

Shooks Run

SHEET

1

DATE February 24, 1993

SUBJ.

Estimate of Probable OF
Construction Costs - ProactiveESTIMATE OF PROBABLE CONSTRUCTION COSTS - PROACTIVE MAINTENANCE
ALTERNATIVEReach 1 - Fountain Creek to Abandoned RailroadSta. 0+25 to Sta. 9+75 - Maintenance
of open channel between Fountain Creek
and Las Vegas StreetSelective clearing $(100)(950)/43560 = 2.2 \text{ Ac} @ \$5000 = \$11,000$ Earthwork $-(2)(20)(950)/27 = 1500 \text{ CY} @ \$4 = \$6,000$ Selective Riprap $-(2.2)(500) = 1100 \text{ CY} @ \$50 = \$55,000$ Selective landscaping $- 2.2 \text{ Ac} @ \$10000 = \$22,000$ 4" Thick Asphalt Path $-(15)(950)/9 = 1600 \text{ SY} @ \$6 = \$10,000$ R.O.W. Acquisition (Commercial/Industrial - Mostly in Floodplain) $- 2.2 \text{ Ac} @ \$25000 = \$55,000$

\$159,000

+ 20% Engr, Admin, & Cont

\$32,000

\$191,000 $\Rightarrow$ Use \$195,000Sta. 9+75 to Sta. 10+80 - Maintenance of Bridge and Dissipator at Las Vegas Street

Clean Exist Bridge & Dissipator - L.S. - \$2,500

Embankment Riprap $-(2)(50)(20)(2)/27 = 150 \text{ CY} @ \$50 = \$7,500$

\$10,000

+ 20% Engr, Admin & Cont

\$2,000

\$12,000 $\Rightarrow$ Use \$15,000

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DATE February 24, 1993

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FILE 90-809

PROJ. Shooks Run

SHEET 2

SUBJ. Estimate of Probable
Construction Costs - ProactiveSta 10+80 to Sta 11+20 - Maintenance of concrete transition channel between
Las Vegas Street and A.T.S.F. & D.R.G.W. Railroad

Watertight M+ Covers = 2 Ea @ \$500 = \$1,000

\$1,000

+20% Eng., Admin & Cont \$ 500

\$1,500 $\Rightarrow$ Use \$5,000Sta. 11+65 to Sta. 15+60 - Maintenance
of open channel between A.T.S.F. & D.R.G.W.
Railroad and Abandoned RailroadSelective Clearing - $(100)(395)/43560 = 0.9 \text{ Ac} @ \$5000 = \$4,500$ Earthwork - $(2)[(120)(395)]/27 = 500 \text{ CY} @ \$4 = \$4,000$ Selective Riprap - $(0.9)(500) = 450 \text{ CY} @ \$50 = \$22,500$ Selective Landscaping - $0.9 \text{ Ac} @ \$10,000 = \$9,000$ 4" Thick Asp Path - $(15)(395)/9 = 675 \text{ SY} @ \$6 = \$4,500$ R.O.W. Acquisition (Commercial/Industrial - Mostly Inside Flood plain) - $0.9 \text{ Ac} @ \$25,000 = \$22,500$

\$65,000

+20% Eng., Admin & Cont \$13,000

\$78,000 $\Rightarrow$ Use \$80,000REACH 1 TOTAL - \$295,000

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PROJ. Shooks Run

SHEET 3

DATE February 24, 1993

SUBJ. Estimate of Probable OF
Construction Costs - ProactiveReach 2 - Abandoned Railroad to Costilla Street

Sta. 16+20 to Sta. 24+00 - ^{Maintenance} of existing channel between Abandoned Railroad and Fountain Boulevard

Selective Clearing - $(100 \pm)(780)/43560 = 1.8 AC @ \$5000 = \$9,000$

Asp Path - $(15)(500 \pm)/9 = 850 SY @ \$6 = \$5,500$

\$14,500

+20% Eng, Admin, & Cont \$3,000

\$17,500 $\Rightarrow$ Use \$20,000

Sta. 24+00 to Sta. 25+50 - ^{Maintenance} of Culverts at Fountain Boulevard

Clean Exist. Culverts - L.S. = \$5,000

Stucc Conc - Invert Lining - $(20)(150)(1)/27 = 115 CY @ \$275 = \$32,000$

Embankment Riprap - $(2)(200)(30)(2)/27 = 900 CY @ \$50 = \$45,000$

Guardrail - $(2)(75) = 150 LF @ \$15 = \$2,500$

\$84,500

+20% Eng, Admin & Cont \$17,000

\$101,500 $\Rightarrow$ Use \$105,000

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SHEET

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DATE

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SUBJ.

Estimate of Probable OF
Construction Costs - Proactive

Maintenance
Sta. 25+50 to Sta. 48+65 - of Channel between Fountain Boulevard and
Costilla Street

Selective Clearing - $(100)(23/5)/43560 = 5.3 \text{ AC} @ \$5000 = \$26,500$

Selective Rmp - $(100)(150)(3)/27 = 1675 \text{ CY} @ \$50 = \$84,000$

Selective Landscaping - $5.3 \text{ AC} @ \$10000 = \$55,000$

R.O.W. Acquisition (Commercial/Industrial - Mostly Inside Floodplain) $(0.15)(5.3) = 2.7 \text{ AC} @ \$25000 = \$67,500$

\$233,000

+ 20% Eng., Admin & Cont

\$47,000

⇒ Use \$280,000

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Shocks Run

SHEET

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SUB

Estimate of Probable
Construction Cost - Proactive

Sta. 48+65 to Sta 50+65 - Maintenance of culvert at Costilla Street

Clean Exist Culvert - L.S. = \$2,500

Stave Conc - Invert Lining - $(20 \times 200) / 27 = 148$

#d walls - $(1 \times 22) \times (0.09) = 2$

Wings - $(7' \text{ Ave H} - 25' L) = (2 \times 25) \times (0.46) = 23$

175 CY @ \$275 = \$48,500

Embankment Piping - $(1) \times (500) \times (30 \times 2) / 27 = 1125 \text{ CY} @ \$50 = \$56,500$

Guardrail - $(2 \times 22) + (4 \times 25) = 144 \text{ LF} @ \$15 = \$2,500$

\$110,000

+ 20% Eng, Admin & Cont

\$22,000

\$132,000 $\Rightarrow$ Use \$135,000

BEACH 2 TOTAL - \$540,000

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PROJ Shooks Run

SHEET 6

DATE February 24, 1993

SUBJ Estimate of Probable
Construction Costs - ProactiveReach 3 - Costilla Street to Boulder StreetSta 50+65 to Sta 71+55 - Maintenance
of open channel between Costilla Street
and El Paso Street (South)Selective Clearing - $(75)(2090)/43560 = 3.6 \text{ Ac} @ \$5000 = \$18,000$ Earthwork - $(2)(20)(2090)/27 = 3000 \text{ CY} @ \$4 = \$12,000$ Selective Pulp - $(3.6)(500) = 1800 \text{ CY} @ \$50 = \$90,000$ Selective Landscaping - $3.6 \text{ Ac} @ \$10000 = \$36,000$ Asp Path - $(15)(2090)/9 = 3500 \text{ SY} @ \$6 = \$21,000$ R.O.W. Acquisition - (Commercial/Industrial - Mostly Inside Floodplain) - $3.6 \text{ Ac} @ \$25,000 = \$90,000$ Partial Residential Lots - 3 Each @ $\$5000 = \$15,000$ $\$282,000$

+ 20% Eng, Admin & Cont

 $\$56,500$ $\$338,500 \Rightarrow \underline{\underline{\text{Use } \$340,000}}$

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SHEET

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SUB.

Estimate of Probable
Construction Costs - Proactive

Sta 71+55 to Sta 72+80 - Maintenance of Culvert at El Paso Street (South)

Clean Exist Culvert - L.S. - \$2,500

Struct Conc - Invert Lining - $(20)(125)(1)/27 = 93$

Hd walls - $(1)(22)(0.09) = 2$

Wings - $(7' \text{ Arch} - 25') = (2)(25)(0.46) = 23$

120 CY @ \$275 = \$33,000

Embankment Eriup - $(2)(200)(30)(2)/27 = 900 \text{ CY} @ \$50 = \$45,000$

Guardrail - $(2)(22) + (4)(25) = 144 \text{ LF} @ \$15 = \$2,500$

\$83,000

+20% Eng, Admin & Cont

\$17,000

⇒ Use \$100,000

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PROJ. Shooks Run

SHEET 8

DATE February 24, 1993

SUBJ. Estimate of Probable of
Construction Costs - Proactive

Sta. 72+80 to Sta 76+80 - Maintenance
of open channel between El Paso Street (South)
and Pikes Peak Avenue

Selective Clearing - $(75 \times 400) / 43560 = 0.7 \text{ Ac} @ \$5000 = \$3,500$

Earthwork - $(2 \times 20 \times 400) / 27 = 500 \text{ CY} @ \$4 = \$2,000$

Selective Pulp - $(0.7 \times 500) = 350 \text{ CY} @ \$50 = \$17,500$

Selective Landscaping 0.7 Ac @ \$10,000 = \$7,000

Asp Path - $(15 \times 400) / 4 = 700 \text{ SY} @ \$6 = \$4,500$

R.O.W. Acquisition (Commercial/Industrial - Mostly Inside Floodplain) - 0.7 Ac @ \$25,000 = \$17,500

\$52,000

+20% Eng, Admin, & Cont

\$10,500

\$62,500 $\Rightarrow$ Use \$65,000

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Shocks Run

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SUB.

Estimate of Probable
Construction Cost - Proactive

Sta. 76+80 to Sta 85+60 - Maintenance of Culvert at Pikes Peak Avenue / El Paso Street
(North)

Clean Exist Culvert - L.S. - \$5,000

Structural Conc - Invert Lining - $[(20)(175) + (30)(190)](11/27) = 341$

Hd walls - $(1)(24)(0.09) = 2$

Wings - $(7' Ave H - 25' L) = (2)(25)(0.46) = 23$

370 CY @ \$275 = \$102,000

Embankment Riprap - $(1)(300)(30)(2/27) = 675 CY @ \$50 = \$34,000$

Guardrail - $(1)(22) + (2)(25) = 72 LF @ \$15 = \$1,000$

\$142,000

+ 20% Eng, Admin & Cont \$28,500

\$170,500 $\Rightarrow$ Use \$170,000

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PROJ Shooks Run

SHEET 10

SUBJ Estimate of Probable

Construction Costs - Proactive

⇒ Maintenance of Culvert at Kiowa Street

Clean Exist Culvert - L.S. = \$2,500

Structural Conc. - Invert Lining - $(20 \times 150 \times 1) / 27 = 111$ Hdwalks - $(2) / (22 \times 0.09) = 4$ Wings - $(7' \text{ Ave H} - 25' \text{ L}) = (4) / (25 \times 0.46) = 46$

16.5 CY @ \$275 = \$45,500

Embankment Piping - $(2) / (175) (30 \times 2) / 27 = 77.5 \text{ CY} @ \$50 = \$39,000$ Guardrail - $(2) / (22) + (4) / (25) = 144 \text{ LF} @ \$15 = \$2,500$

\$89,500

+ 20% Eng, Admin & Cont

\$18,000

\$107,500 ⇒ Use \$110,000Sta. 85+60 to Sta. 89+95 - Maintenance of channel between Kiowa Street and Bijou StreetSelective Cleaning - $(75) (435) / 43560 = 0.7 \text{ Ac} @ \$5000 = \$3,500$ Earthwork - $(2) (20) (435) / 27 = 1000 \text{ CY} @ \$4 = \$4,000$ Selective Piping - $(0.7) / (500) = 350 \text{ CY} @ \$50 = \$17,500$

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SHEET 11

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SUBJ. Estimate of Probable
Construction Costs - Proactive

Selective Landscaping

 $0.7 \text{ Ac} @ \$10,000 = \$7,000$ Asp Path - $(15)(435)/9 = 725 \text{ SY} @ \$6 = \$4,500$ R.O.W. Acquisition - (Commercial/Industrial - Mostly Inside Flood plain) $0.5 \text{ Ac} @ \$25,000 = \$12,500$ Partial Residential Lots - 5 Each @ $\$5,000 = \$25,000$ \$74,000

+ 20% Eng., Admin & Cont

\$15,000 $\$89,000 \Rightarrow \underline{\underline{\text{Use } \$90,000}}$

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SHEET

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DATE

March 2, 1993

SUBJ.

Estimate of Probable
Construction Costs - ProactiveSta 89+45 to Sta 94+50 - Maintenance of Culvert at Bijou Street

Clean Exist Culvert - L.S. = \$5,000

Earthwork - $(2)(20)(300)/27 = 500 \text{ CY} @ \$4 = \$2,000$ Structural Conc - Invert Lining - $(20)(455)(1)/27 = 337$ Hd walls - $(2)(22)(0.09) = 4$ Wings - $(7' \text{ Ave H} - 25' \text{ L}) = (4)(25)(0.46) = 46$ $390 \text{ CY} @ \$275 = \$107,500$ Embankment Pulp - $(2)(150)(30)(2)/27 = 675 \text{ CY} @ \$50 = \$34,000$ Guardrail - $(2)(22) + (4)(25) = 144 \text{ LF} @ \$15 = \$2,500$ Asp Path - $(15)(300)/9 = 500 \text{ SY} @ \$6 = \$3,000$

\$154,000

+ 2000 Eng, Admin & Cont

\$31,000

=> Use \$185,000Sta. 94+50 to Sta 98+10 - Maintenance
of open channel between Bijou Street and
Platte AvenueSelective Clearing - $(50)(360)/43560 = 0.4 \text{ Ac} @ \$5,000 = \$2,000$ Selective Pulp - $(0.4)(500) = 200 \text{ CY} @ \$50 = \$10,000$

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SUBJ. Estimate of Probable of
Construction Costs - Proactive

Selective Landscaping - 0.2 Ac @ \$10000 = \$2,000

\$14,000

+20% Eng, Admin & Cont \$3,000

\$17,000 $\Rightarrow$ Use \$20,000

Sta 98+10 to Sta 106+30 - Maintenance
of Culvert at Platte Avenue / School
Athletic Field and Bridge at Boulder Street

Clean Exis. Culvert - & Bridge - L.S. = \$5,000

Earthwork - $(2 \times 20)(600) / 27 = 1000 \text{ CY} @ \$4 = \$4,000$ Struct Conc - Invert Lining - $[(20 \times 600) + (40 \times 100)](1) / 27 = 595 \text{ CY} @ \$275 = \$164,000$ Embankment Riprap - $(2)(50)(30)(2) / 27 = 675 \text{ CY} @ \$50 = \$34,000$

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PROJ. Shooks Run

SHEET 14

SUBJ.

Estimate of Probable
Construction Costs - Proactive

Guardrail - $(1)(22) + (2)(40) + (4)(25) = 202 \text{ LF} @ \$15 = \$3,000$

Landscaping - $(40)(500)/43560 = 0.5 \text{ Ac} @ \$35000 = \$17,500$

Asp Path - $(15)(500)/9 = 850 \text{ SY} @ \$6 = \$5,000$

R.O.W. Acquisition - (School - Inside Floodplain) - $(55)(500)/43560 = 0.6 \text{ Ac} @ \$25,000 = \$15,000$

\$247,500

+ 20% Engr, Admin, & Cont

\$49,500

\$297,000 $\Rightarrow$ Use \$300,000

REACH 3 - TOTAL - \$1,380,000

Reach 4 - Boulder Street to Cache La Poudre Street

Sta. 106+30 to Sta 112+35 - ^{Maintenance} of open channel between Boulder Street and St. Vrain Street

Selective Clearing - $(75)(605)/43560 = 1.0 \text{ Ac} @ \$5000 = \$5,000$

Earthwork - $(2)(20)(605)/27 = 1000 \text{ CY} @ \$4 = \$4,000$

Selective Riprap - $(1.0)(500) = 500 \text{ CY} @ \$50 = \$25,000$

Selective Landscaping - $1.0 \text{ Ac} @ \$10000 = \$10,000$

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SHEET 15

SUBJ. Estimate of Probable OF
Construction Costs - ProactiveAsp Path - $(15)(605)/9 = 1000 \text{ SY} @ \$6 = \$6,000$

\$50,000

+ 20% Eng., Admin. & Cont

\$10,000

 $\Rightarrow$ Use \$60,000Sta 112+35 to Sta 113+40 - Maintenance of culvert at St. Vrain Street

Clean Exist Culvert - L.S. = \$2,500

Stucc Conc - Invert Lining - $(20)(105)(1)/27 = 78$ Hd walls - $(2)(22)(0.09) = 4$ Wings - $(7' \text{ Ave H} - 25' L) = (4)(25)(0.46) = 46$ $130 \text{ CY} @ \$275 = \$36,000$ Embankment & prop - $(2)(100)(30)(2)/27 = 450 \text{ CY} @ \$50 = \$22,500$ Guardrail - $(2)(22) + (4)(25) = 144 \text{ LF} @ \$15 = \$2,500$

\$63,500

+ 20% Eng., Admin. & Cont

\$13,000

 $\$76,500 \Rightarrow$ Use \$80,000

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SUBJ.

Estimate of Probable
Construction Costs - Proactive

Sta. 113+40 to Sta 117+75 - Maintenance
of open channel between St Urain Street
and Willamette Street

Selective Clearing - $(75)(435)/43560 = 0.7 \text{ Ac} @ \$5000 = \$3,500$

Earthwork - $(2)(20)(435)/27 = 1000 \text{ CY} @ \$4 = \$4,000$

Selective Pickup - $(0.7)(500) = 350 \text{ CY} @ \$50 = \$17,500$

Selective Landscaping - $0.7 \text{ Ac} @ \$10000 = \$7,000$

Asp Path - $(15)(435)/9 = 725 \text{ SY} @ \$6 = \$4,500$

\$36,500

+20% Eng, Admin & Cont

\$7,500

\$44,000 $\Rightarrow$ Use \$45,000

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Shocks Run

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SUBJ.

Estimate of Partial
Construction Costs - Proactive

Sta 117+75 to Sta 119+80 - Maintenance of Culvert at Willamette Street

Clean Exist Culvert - L.S. - \$2,500

Struct Conc - Invert Lining - $(20 \times 205)(1)/27 = 155 \text{ CY} @ \$275 = \$43,000$

Embankment Prop - $(2)(125)(30)(2)/27 = 550 \text{ CY} @ \$50 = \$27,500$

Guardrail - $(2)(22) + (4)(25) = 144 \text{ LF} @ \$15 = \$2,500$

\$75,500

+ 20% Engr, Admin, & Cont

\$15,500

\$91,000 $\Rightarrow$ Use \$95,000

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PROJ. Shook's Run

SHEET 18

DATE

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SUBJ. Estimate of Probable of
Construction Costs - Proactive

Sta. 119+80 to Sta 135+15 - Maintenance of Open Channel between Willamette Street and Cache La Poudre Street.

Selective Clearing - $(75)(1535)/43560 = 2.6 \text{ Ac} @ \$5000 = \$13,000$

Selective Pulp - $(2.6)(500) = 1300 \text{ CY} @ \$50 = \$65,000$

Selective Landscaping - $2.6 \text{ Ac} @ \$10000 = \$26,000$

\$104,000

+20% Eng, Admin & Cont

\$21,000

=> Use \$125,000

Sta. 135+15 to Sta. 137+05 - Maintenance of Culvert at Cache La Poudre

Clean Exist Culvert - $LS_1 = \$2,500$

Stucc Conc - Invert Lining - $(20)(190)(1)/27 = 141$

Hd walls - $(2)(22)(0.09) = 4$

Wings - $(7' \text{ Ave H} - 25' \text{ L}) = (4)(25)(0.46) = 46$

$195 \text{ CY} @ \$275 = \$54,000$

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PROJ. Shocks RunSHEET 19

DATE

March 2, 1993SUBJ. Estimate of Probable OFConstruction Costs - Protective

Embankment Riprap - $(2)(150)(30)(2)/27 = 675 \text{ CY} @ \$50 = \$34,000$

Guardrail - $(2)(22) + (4)(25) = 144 \text{ LF} @ \$15 = \$2,500$

\$43,000

+200% Eng, Admin, & Cont

\$19,000

\$112,000 $\Rightarrow$ Use \$115,000

REACH 4 TOTAL - \$520,000

Reach 5 - Cache La Poudre Street to Patty Jewett Golf Course

Sta. 137+05 to Sta. 152+45 - ^{Maintenance} of open channel between Cache La Poudre Street and Uintah Street

Selective Clearing - $(75)(1540)/43560 = 2.7 \text{ AC} @ \$5000 = \$13,500$

Earthwork - $(2)(20)(1540)/27 = 2500 \text{ CY} @ \$4 = \$10,000$

Selective Riprap - $(2.7)(500) = 1350 \text{ CY} @ \$50 = \$67,500$

Selective Landscaping - $2.7 \text{ AC} @ \$10000 = \$27,000$

Asp Path - $(15)(1540)/9 = 2575 \text{ SY} @ \$6 = \$15,500$

R.O.W. Acquisition - (Commercial/Industrial - Mostly Inside Floodplain) - $0.7 \text{ AC} @ \$25000 = \$17,500$

Partial Residential Lots - 10 Each @ $\$5000 = \$50,000$

\$201,000

+200% Eng, Admin & Cont

\$40,500

\$241,500 $\Rightarrow$ Use \$245,000

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SUBJ. Estimate of Probable OF
Construction Costs - ProactiveSta 152+45 to Sta 153+55 - Maintenance of Vintah Street Culvert

Clean Exist Culvert - L.S. = \$2,500

Struct Conc - Invert Lining - $(20)(150)(1)/27 = 111$ Hd walls - $(1)(22)(0.09) = 2$ Wings - $(7' \text{ Ave H} - 25' L) = (2)(25)(0.46) = 23$

140 CY @ \$275 = \$38,500

Embankment Pickup - $(2)(125)(30)(2)/27 = 575 \text{ CY} @ \$50 = \$29,000$ Guardrail - $(2)(22) + (4)(25) = 144 \text{ LFT} @ \$15 = \$2,500$

\$72,500

+20% Eng, Admin & Cont

\$14,500

\$87,000 $\Rightarrow$ Use \$90,000

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SHEET

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SUBJ. Estimate of Probable

Construction Costs - Proactive

Sta 153+55 to Sta 157+55 - Maintenance of open channel between Uintah Street and San Miguel Street

Selective Cleaning - $(75 \times 400) / 43560 = 0.7 \text{ Ac} @ \$5000 = \$3,500$

Earthwork - $(2 \times 20 \times 400) / 27 = 1000 \text{ CY} @ \$4 = \$4,000$

Selective Riprap - $(0.7 \times 500) = 350 \text{ CY} @ \$50 = \$17,500$

Selective Landscaping - $0.7 \text{ Ac} @ \$10000 = \$7,000$

Asp Path - $(15 \times 400) / 9 = 675 \text{ SY} @ \$6 = \$4,000$

P.O.W. Acquisition - Partial Residential Lots - 5 Each @ \$5000 = \$25,000

\$61,000

+ 20% Eng, Admin & Cont

\$12,500

\$73,500 $\Rightarrow$ Use \$75,000

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SUBJ

Estimate of Probable of
Construction Cost - Proactive

Sta. 157+55 to Sta 158+40 - Maintenance of Culvert at San Miguel

Clean Exist Culvert - L.S. - \$2,500

Struct Conc-Invert Lining - $(20)/(85 \times 1)/27 = 63$

Adwalls - $(2)/(22)(0.09) = 4$

Wings - $(7' \text{ Arch} - 25' L) = (4)(25)(0.46) = 46$

115CY @ \$275 = \$32,000

Embankment Riprap - $(2)/(125)(30)(2)/27 = 575 \text{ CY} @ \$50 = \$29,000$

Guardrail - $(2)/(22) + (4)/(25) = 144 \text{ LF} @ \$15 = \$2,500$

\$66,000

+ 20% Eng, Admin & Cont \$13,500

\$79,500 $\Rightarrow$ Use \$80,000

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SUBJ.

Estimate of Probable
Construction Costs - Proactive

Sta 158+40 to Sta 167+35 - Maintenance
of open channel between San Miguel Street
and Pedestrian Bridge

Selective Clearing - $(75 \times 895) / 43560 = 1.5 \text{ Ac} @ \$5000 = \$7,500$

Earthwork - $(2 \times 20 \times 895) / 27 = 1500 \text{ CY} @ \$4 = \$6,000$

Selective Riprap - $(1.5 \times 500) = 750 \text{ CY} @ \$50 = \$37,500$

Selective Landscaping - $1.5 \text{ Ac} @ \$10000 = \$15,000$

Asp Path - $(15 \times 895) / 9 = 1500 \text{ SY} @ \$6 = \$9,000$

R.O.W. Acquisition -

Partial Residential Lot - 12 Each @ \$5000 = \$60,000

School - Mostly Inside Floodplain - 0.3 Ac @ \$25,000 = \$7,500

\$142,500

+ 20% Eng, Admin, & Cont

\$28,500

\$171,000 $\Rightarrow$ Use \$175,000

Sta 167+35 to Sta 176+25 - Maintenance
of open channel between Pedestrian Bridge
and Patty Jewett Golf Course South Boundary

Selective Clearing - $(75 \times 890) / 43560 = 1.5 \text{ Ac} @ \$5000 = \$7,500$

Earthwork - $(2 \times 20 \times 890) / 27 = 1500 \text{ CY} @ \$4 = \$6,000$

Selective Riprap - $(1.5 \times 500) = 750 \text{ CY} @ \$50 = \$37,500$

Selective Landscaping - $1.5 \text{ Ac} @ \$10000 = \$15,000$

Asp Path - $(15 \times 1050) / 9 = 1750 \text{ SY} @ \$6 = \$10,500$

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SHEET 24

DATE March 2, 1993

SUBJ. Estimate of Probable OF
Construction Costs - ProactiveR.O.W. Acquisition-

- Partial Residential Lots - 10 Each @ \$5,000 = \$50,000
 - School - Mostly Inside Floodplain - 0.6 Ac @ \$25,000 = \$15,000

\$141,500

+ 20% Eng., Admin., & Cont

\$28,500

⇒ Use \$170,000REACH 5 TOTAL - \$835,000REACH 6 - Patty Jewett Golf Course

Sta 176+25 to Sta 189+05 - Maintenance of open channel between Patty Jewett
 Golf Course South Boundary and Espanola Street

Selective Clearing - $(50)(1280)/43560 = 1.5 \text{ Ac} @ \$5000 = \$7,500$ Selective Pickup - $(1.5)(500) = 750 \text{ CY} @ \$50 = \$37,500$

30' Wide Drop Structure - 1 Each @ \$20,000 = \$20,000

Selective Landscaping - 1.5 Ac @ \$10,000 = \$15,000

\$80,000

+ 20% Eng., Admin. & Cont

\$16,000

\$96,000 ⇒ Use \$100,000

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CK.
DATE March 2, 1993

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& COMPANY
ENGINEERS &
ARCHITECTS

LOC.
FILE 90-804
PROJ. Shooks Run SHEET 25
SUBJ. Estimate of Probable OF
Construction Costs - Proactive

Sta. 189+05 to Sta 189+85 - Maintenance of Culvert at Espanola Street

Struct Conc - Hdwall's - $(1)(14)(0.09) = 1$

Wings - $(1) \text{ 'Arc' } - 25' L = (2)(25)(0.46) = 23$

$25 \text{ CY} @ \$275 = \$7,000$

Embankment R. prop - $(2)(200)(30)(2)/27 = 900 \text{ CY} @ \$50 = \$45,000$

Guardrail - $(1)/14 + (2)(25) = 64 \text{ LF} @ \$15 = \$1,000$

$\$53,000$

+ 20% Eng, Admin, & Cont

$\$11,000$

$\$64,000 \Rightarrow \underline{\underline{\text{Use } \$65,000}}$

Sta. 190+85 to Sta 198+45 - Maintenance of open channel between Espanola Street and End of Existing Channel Lining

Repair Exist Conc Lining - $(10)(\frac{760}{100}) = 80 \text{ CY} @ \$375 = \$30,000$

$\$30,000$

+ 20% Eng, Admin & Cont

$\$6,000$

$\$36,000 \Rightarrow \underline{\underline{\text{Use } \$40,000}}$

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ARCHITECTS

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FILE 90-809

PROJ. Shooks Run

SHEET 26

SUBJ. Estimate of Probable OF
Construction Costs - Proactive

Sta 198+45 to Sta 216+40 - Maintenance of open channel between End of Existing Channel Lining and Paseo Road

Selective Clearing - $(50)(260)/43560 = 0.3 \text{ AC} @ \$5000 = \$1,500$

Selective R.pup - $(0.3)(500) = 150 \text{ CY} @ \$50 = \$7,500$

Selective Landscaping - $0.3 \text{ AC} @ \$10,000 = \$3,000$

\$12,000

+20% Engr, Admin & Cont \$2,500

\$14,500 $\Rightarrow$ Use \$15,000

REACH 6 TOTAL - \$220,000

REACH 7 - Paseo Road to Van Buren Channel Diversion

Sta 216+40 to Sta 216+45 - Maintenance of Culvert at Paseo Road

Clean Exist Culvert - L.S. = \$2,500

Stucc Conc - Hdwalls - $(2)(23)(0.09) = 4$

Wings - $(5' \text{ Ave H} - 20' \text{ L}) = (4)/(20)(0.34) = 29$

$35 \text{ CY} @ \$275 = \$10,000$

Embankment R.prap - $(2)(100)(20)(2)/27 = 300 \text{ CY} @ \$50 = \$15,000$

Guardrail - $(2)(23) + (4)/(20) = 126 \text{ LF} @ \$15 = \$2,000$

\$29,500

+20% Engr, Admin & Cont \$6,000

\$35,500 $\Rightarrow$ Use \$35,000

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PROJ. Shooks Run

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SUBJ. Estimate of Probable
Construction Costs - Proactive

Sta 216+95 to Sta 218+30 - Maintenance
of open channel between Paseo Road
and Jefferson Street

Selective Clearing - $(25)(135)/43560 = 0.1 \text{ Ac} @ \$5000 = \$500$

Earthwork - $(2)(20)(135)/27 = 500 \text{ CY} @ \$4 = \$2000$

Selective Riprap - $(0.1)(500) = 50 \text{ CY} @ \$50 = \$2,500$

Selective Landscaping - $0.1 \text{ Ac} @ \$10000 = \$1,000$

Asp Path - $(15)(135)/9 = 225 \text{ SY} @ \$6 = \$1,500$

R.O.W. Acquisition -

Partial Residential Lot - 3 Each @ $\$5000 = \$15,000$

\$22,500

+ 20% Eng., Admin. & Cont

\$4,500

$\$27,000 \Rightarrow \underline{\underline{\text{Use } \$30,000}}$

Sta. 218+30 to 219+10 - Maintenance of culvert at Jefferson Street

Clean Exist Culvert - L.S. = $\$1,000$

Embankment Riprap - $(2)(50)(20)(2)/27 = 150 \text{ CY} @ \$50 = \$7,500$

Guardrail - $(2)(22) + (4)(10) = 84 \text{ LF} @ \$15 = \$1,500$

\$10,000

+ 20% Eng., Admin. & Cont

\$2,000

$\$12,000 \Rightarrow \underline{\underline{\text{Use } \$15,000}}$

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PROJ. Shooks Run

SHEET 28

DATE March 2, 1993

SUBJ. Estimate of Probable OF
Construction Costs - Proactive

Maintenance

Sta 219+10 to 222+50 - of open channel between Jefferson Street
and Madison Street

Selective Clearing - $(25)(340)/43560 = 0.2 \text{ Ac} @ \$5000 = \$1,000$

Earthwork - $(2)(20)(340)/27 = 500 \text{ CY} @ \$4 = \$2,000$

Selective Riprap - $(0.2)(500) = 100 \text{ CY} @ \$50 = \$5,000$

Selective Landscaping - $0.2 \text{ Ac} @ \$10000 = \$2,000$

Asp Path - $(15)(340)/9 = 575 \text{ SY} @ \$6 = \$3,500$

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PROJ. Shooks Run

SHEET 29

DATE

March 2, 1993

SUBJ. Estimate of Probable of
Construction Costs - ProactiveR.O.W Acquisition - Partial Residential Lots - 2 Each @ \$5000 = \$10,000

\$23,500

+ 20% Eng, Admin, & Cont

\$5,000\$28,500 $\Rightarrow$ Use \$30,000Sta. 222+50 to 223+30 - Maintenance of culvert at Madison Street

Clean Exist Culvert - C.S. = \$1,000

Embankment Riprap - $(2)(50)(20)(2)/27 = 150 \text{ CY} @ \$50 = \$7,500$ Guardrail - $(2)(22) + (4)(10) = 84 \text{ LF} @ \$15 = \underline{\$1,500}$

\$10,000

+ 20% Eng, Admin & Cont

\$2,000\$12,000 $\Rightarrow$ Use \$15,000

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PROJ. Shooks Run

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SUBJ. Estimate of Probable
Construction Costs - Proactive

Sta 223+30 to Sta 226+25 - Maintenance
of open channel between Madison Street and
Monroe Street

Selective Clearing - $(25 \times 295) / 43560 = 0.2 \text{ Ac} @ \$5000 = \$1,000$

Earthwork - $(2)(20)(295) / 27 = 500 \text{ CY} @ \$4 = \$2,000$

Selective Riprap - $(0.2)(500) = 100 \text{ CY} @ \$50 = \$5,000$

Selective Landscaping - $0.2 \text{ Ac} @ \$10000 = \$2,000$

Asp Path - $(15 \times 295) / 9 = 500 \text{ SY} @ \$6 = \$3,000$

R.O.W. Acquisition -

- Partial Residential Lots - 6 Each @ \$5000 = \$30,000

\$43,000

+ 2000 Eng L, Admin, & Cont

\$9,000

\$52,000 $\Rightarrow$ Use \$55,000

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FILE

90-809

PROJ.

Shocks Run

SHEET

31

SUBJ.

Estimate of Probable
Construction Costs - Proactive

Sta 226+25 to Sta 227+05 - Maintenance of Culvert at Monroe Street

Clean Exist Culvert - L.S. - \$1,000

Embankment Riprap - $(2)(50)(20)(2)/27 = 150 \text{ CY} @ \$50 = \$7,500$

Guardrail - $(2)(22) + (4)(10) = 84 \text{ LF} @ \$15 = \$1,500$

\$10,000

+20% Eng, Admin & Cont

\$2,000

\$12,000 $\Rightarrow$ Use \$15,000

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FILE 90-809

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PROJ. Shooks Run

SHEET 32

DATE

March 2, 1993

SUBJ. Estimate of Probable OF
Construction Costs - Proactive

Sta. 227+05 to Sta. 229+70 - ^{Maintenance} of open channel between Monroe Street and Jackson Street

Selective Clearing $(25)(265)/43560 = 0.12 \text{ AC} @ \$5000 = \$1,000$

Earthwork $-(2)(20)(265) = 500 \text{ CY} @ \$4 = \$2,000$

Selective Pulp $-(0.12)(500) = 100 \text{ CY} @ \$50 = \$5,000$

Selective Landscaping $- 0.12 \text{ AC} @ \$10,000 = \$2,000$

Asp Path $-(15)(265)/9 = 450 \text{ SY} @ \$6 = \$3,000$

R.O.W. Acquisition -

- Partial Residential Properties - 6 Each @ \$5000 = \$30,000

\$43,000

+ 20% Eng., Admin., & Cont

\$ 9,000

\$52,000 $\Rightarrow$ Use \$55,000

Sta. 229+70 to Sta 234+15 - Maintenance of culvert at Jackson Street / LaSalle Street

Clean Exist Culvert - \$2,500

Embankment Pulp $-(2)(50)(20)(2)/27 = 150 \text{ CY} @ \$50 = \$7,500$

Guardrail $-(2)(22) + (4)(10) = 84 \text{ LF} @ \$15 = \$1,500$

\$11,500

+ 20% Eng., Admin., & Cont

\$ 2,500

\$14,000 $\Rightarrow$ Use \$15,000

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FILE 90-809

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PROJ. Shooks Run

SHEET 33

DATE

March 2, 1993

SUBJ. Estimate of Probable

OF

Construction Costs - Proactive

Sta. 234+15 to Sta 235+40 - Maintenance
of open channel between LaSalle Street
and Pedestrian Path

Selective
Clearing - $(25)(125)/43560 = 0.1 \text{ AC} @ \$5000 = \$500$

Earthwork - $(2)(20)(125)/27 = 500 \text{ CY} @ \$4 = \$2,000$

Selective Excavation - $(0.1)(500) = 50 \text{ CY} @ \$50 = \$2,500$

Selective Landscaping - $0.1 \text{ AC} @ \$10,000 = \$1,000$

Asp Path - $(15)(125)/9 = 200 \text{ SY} @ \$6 = \$1,500$

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PROJ.

Shooks Run

SHEET 34

DATE

March 2, 1993

SUBJ.

Estimate of Probable OF
Construction Costs - Proactive

R.O.W. Acquisition - Partial Residential Lots - 2 Each @ \$5000 = \$10,000
\$17,500

+ 20% Eng, Admin, & Cont

\$ 3,500

\$21,000 $\Rightarrow$ Use \$25,000

Sta 235+40 to Sta 235+90 - Maintenance of existing Pedestrian Path -

clean Exst Culvert - \$500

Struc Conc - Hd walls - $(2)(11)(0.09) = 2$

Wings - $(5' \text{ Ave H} - 20' C) = (4)(20)(0.36) = 29$

35 CY @ \$275 = \$10,000

Embankment Prop - $(2)(50)(20)(2)/27 = 150 \text{ CY} @ \$50 = \$7,500$

Guardrail - $(2)(11) + (4)(20) = 102 \text{ LF} @ \$15 = \$1,500$

\$19,500

+ 20% Eng, Admin & Cont

\$ 4,000

\$23,500 $\Rightarrow$ Use \$25,000

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PROJ. Shooks Run

SHEET 35

DATE March 2, 1993

SUBJ. Estimate of Probable
Construction Costs - Proactive

Sta 235+90 to Sta 236+20 - Maintenance
of open channel between Pedestrian Path
and C. R. I. P. Railroad

Earthwork - $(2)(20)(50)/27 = 100 \text{ CY} @ \$4 = \$500$

Asphalt Path - $(15)(50)/9 = 100 \text{ SY} @ \$6 = \$1,000$

$\$1,500$

+ 20% Eng, Admin & Cont

$\$500$

$\$2,000 \Rightarrow \underline{\underline{\text{Use } \$5,000}}$

Sta. 236+20 to Sta 236+75 - Maintenance of Culvert at C. R. I. P. Railroad

Clean Exist Culvert - L.S. = $\$1,000$

Struct Conc - Hd walls - $(1)(22)(0.09) = 2$

D/S Wings - $(5' \text{ Ave H} - 20' L) = (2)(20)(0.36) = 14$

$20 \text{ CY} @ \$275 = \$5,500$

Embankment Prop - $(1)(50)(20)(2)/27 = 75 \text{ CY} @ \$50 = \$4,000$

Guardrail - $(1)(22) + (2)(20) = 62 \text{ LF} @ \$15 = \$1,000$

$\$11,500$

+ 20% Eng, Admin & Cont

$\$2,500$

$\$14,000 \Rightarrow \underline{\underline{\text{Use } \$15,000}}$

COMP. WMA
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DATE March 2, 1993

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LOC. _____ FILE 90-809
PROJ. Shooks Run SHEET 36
SUBJ. Estimate of Probable OF
Construction Costs - Proactive

Templeton Gap Road at Van Buren Channel - Maintenance of Culvert

Embankment Riprap - $(2)(50)(20)(2)/27 = 150 \text{ CY} @ \$50 = \$7,500$

Guardrail - $(2)(17) + (4)(25) = 134 \text{ LF} @ \$15 = \$2,000$

\$9,500

+20% Eng, Admin, & Cont

\$2,000

$\$11,500 \Rightarrow$ Use \$15,000

REACH 7 TOTAL - \$350,000

ALTERNATIVE TOTAL - \$4,140,000

**G. ESTIMATE OF PROBABLE CONSTRUCTION COSTS
FOR SOFT-LINED FULL IMPROVEMENT
ALTERNATIVE**

COMP.

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& COMPANY

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FILE 90-809

CK.

PROJ.

Shooks Run

SHEET

1

DATE

January 29, 1993

SUBJ.

Estimate of Probable
Construction Costs - Soft-LinedESTIMATE OF PROBABLE CONSTRUCTION COSTS - SOFT-LINED ALTERNATIVEReach 1 - Fountain Creek to Abandoned RailroadSta. 0+25 to Sta. 9+75 - New open channel between Fountain Creek
and Las Vegas StreetClearing - $(240)(950)/43560 = 5.2 \text{ Ac} @ \$20000 = \$104,000$ Earthwork - $(0.6)(1500)(950)/27 = 32000 \text{ CY} @ \$4 = \$128,000$ 5' High Rock Retaining Wall - $[(2)(3)+1](950) = 6650 \text{ LF} @ \$100 = \$665,000$ Landscaping - $5.2 \text{ Ac} @ \$35000 = \$1,820,000$ 4" Thick Asphalt Path - $(15)(950)/9 = 1600 \text{ SY} @ \$6 = \$9,600$ R.O.W. Acquisition (Commercial/Industrial - Mostly in Floodplain) - $5.2 \text{ Ac} @ \$25000 = \$1,300,000$ Relocate Mobile Homes - 8 Each @ $\$2000 = \$16,000$

\$1,235,000

+ 20% Engr, Admin, E&C = \$247,000\$1,482,000 $\Rightarrow$ Use \$1,485,000Sta. 9+75 to Sta. 10+80 - Replace Exist. Bridge and Dissipator at Las Vegas
Street w/ 5-12' X 10' RCB and DissipatorRemove Exist Bridge and Dissipator - L.S. = $\$50,000$ Struct. Excav. - $(35)(105)(13)/27 = 2000 \text{ CY} @ \$6 = \$12,000$ Struct. Back - $[(10)(105)(12) + (75)(70)(1)]/27 = 1000 \text{ CY} @ \$7 = \$7,000$

COMP.

WJA

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FILE 90-809

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PROJ Shooks Run

SHEET 2

DATE

January 29, 1993

SUBJ Estimate of Probable
Construction Costs - Soft Lined

$$\text{Bedding} - (75)(0.5)(105)/27 = 200 \text{ CY} @ \$15 = \$3,000$$

$$\text{Struc. Conc.} - 5-12' \times 10' \text{ RCB} - [(5)(1.99) - (4)(12)(1)/27](70) = 572$$

$$\text{Hd Walls} - (2)(66)(0.09) = 12$$

$$\text{D/S Wings} - (10' \text{ Ave H} - 40' \text{ L}) - (2)(40)(0.61) = 49$$

$$\text{Dissipator Floor} - (64)(40)(1)/27 = 95$$

$$\text{Dissipator Blocks} - (40)(0.5) = 20$$

$$750 \text{ CY} @ \$275 = \$206,500$$

$$\text{Riprap} - (65)(50)(3)/27 = 375 \text{ CY} @ \$40 = \$15,000$$

$$\text{Curb and Gutter} - (2)(85) = 170 \text{ LF} @ \$8 = \$1,500$$

$$\text{Sidewalk} - (2)(4)(85)/9 = 75 \text{ SY} @ \$17 = \$1,500$$

$$\text{Guardrail} - (2)(66) + (2)(40) = 212 \text{ LF} @ \$50 = \$11,000$$

$$8' \text{ Thick Asp Pmnt Replmt} - (85)(66)/9 = 575 \text{ SY} @ \$12 = \$7,000$$

$$\$314,500$$

$$+ 20\% \text{ Eng., Admin. \& Cont. } \$63,000$$

$$\$377,500 \Rightarrow \text{Use } \$380,000$$

Sta. 10+80 to Sta. 11+20 - Replace concrete transition channel between
Las Vegas Street and A.T.S.F. & D.R.G.W. Railroad

$$\text{Remove Exst Walks} - (2)(10)(40) = 800 \text{ SF} @ \$5 = \$4,000$$

$$\text{Remove Exst Conc. Pmnt} - (42)(40)/9 = 200 \text{ SY} @ \$10 = \$2,000$$

$$\text{Struc Excav} - \left(\frac{10+35}{2}\right)(15)(40)/27 = 500 \text{ CY} @ \$6 = \$3,000$$

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FILE 90-809

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PROJ. Shooks Run

SHEET 3

DATE February 1, 1993

SUBJ. Estimate of Probable OF
Construction Costs - Soft-Lined

$$\text{Stucc Back} - (10)(15)(40)/27 = 500 \text{ CY} @ \$7 = \$3,500$$

$$\text{Bedding} - \left(\frac{75+55}{2} \right) (0.5)(40)/27 = 100 \text{ CY} @ \$15 = \$1,500$$

$$\text{Stucc Conc} - \left[(2)(14) + \left(\frac{44+64}{2} \right) \right] (1)(40)/27 = 125 \text{ CY} @ \$275 = \$34,500$$

$$\text{Fence Replant} - (2)(40) = 80 \text{ LF} @ \$5 = \$500$$

$$\text{Watertight M.H. Covers} = 2 \text{ Ea} @ \$500 = \$1,000$$

#50,000

$$+200\% \text{ Engr, Admin \& Cont} \quad \$10,000$$

$$\Rightarrow \text{Use } \$60,000$$

Sta. 11+65 to Sta. 15+60 - New open channel between A.T.S.F. & D.R.G.W.
Railroad and Abandoned Railroad

$$\text{Clearing} - (255)(395)/43560 = 2.3 \text{ Ac} @ \$20000 = \$46,000$$

$$\text{Earthwork} - 0.8 [(3000)(395)]/27 = 35500 \text{ CY} @ \$4 = \$142,000$$

$$5' \text{ High Rock Retaining Wall} - (2)(4)(395) = 3160 \text{ LF} @ \$100 = \$316,000$$

$$45' \text{ Wide Drop Structure} - 1 \text{ Each} @ \$25,000 = \$25,000$$

$$\text{Landscaping} - 2.3 \text{ Ac} @ \$35000 = \$80,500$$

$$4" \text{ Thick Asp Path} - (15)(395)/9 = 6755 \text{ Y} @ \$6 = \$4,500$$

$$\text{R.O.W. Acquisition (Commercial/Industrial - Mostly Outside Floodplain)} - 2.3 \text{ Ac} @ \$50000 = \$115,000$$

#729,000

$$+200\% \text{ Engr, Admin \& Cont} \quad \$146,000$$

$$\Rightarrow \text{Use } \$875,000$$

REACH 1 TOTAL - \$2,800,000

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FILE 70-809

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PROJ. Shooks Run

SHEET 4

DATE February 1, 1993

SUBJ. Estimate of Probable OF
Construction Costs - Soft-LinedReach 2 - Abandoned Railroad to Costilla StreetSta. 16+20 to Sta. 24+00 - Clear existing channel between Abandoned Railroad and Fountain BoulevardCleaning - $(100 \pm)(780)/43560 = 1.8 \text{ AC} @ \$20000 = \$36,000$ Asp Path - $(15)(500 \pm)/9 = 850 \text{ SY} @ \$6 = \$5,500$

\$4,500

+20% Eng., Admin., & Cont. \$8,500

Use $\Rightarrow$ \$50,000Sta. 24+00 to Sta. 25+50 - Replace Culverts at Fountain Boulevard w/ 4-12' x 10' PCB

Remove Exst. Culverts - L.S. = \$65,000

Struct. Excav - $[(65)(150)(13) + (25)(150)(12)]/27 = 6500 \text{ CY} @ \$6 = \$39,000$ Struct. Back - $[(10)(150)(12) + (65)(150)(1)]/27 = 1000 \text{ CY} @ \$7 = \$7,000$ Embankment - $(65)(150)(12)/27 = 4500 \text{ CY} @ \$4 = \$18,000$ Bedding - $(65)(150)(0.5)/27 = 200 \text{ CY} @ \$15 = \$3,000$ Struct. Conc - 4-12' x 10' PCB - $[(4)(1.99) - (3)(12)(1)/27](150) = 994$ Hd walls - $(2)(53)(0.09) = 10$ Wings (7' Ave H - 25' L) - $(4)(25)(0.46) = 46$

1050 CY @ \$275 = \$289,000

Wrap - $(115)(100)(3)/27 = 1275 \text{ CY} @ \$40 = \$51,000$ Curb and Gutter - $(2)(75) = 150 \text{ LF} @ \$8 = \$1,500$

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FILE 90-809

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PROJ Shooks Run

SHEET 5

DATE February 1, 1993

SUBJ Estimate of Possible OF

Construction Costs - Soft-lined

Sidewalk - $(4)(75)/9 = 50 \text{ SY} @ \$17 = \$1,000$ Guardrail - $(2)(75) = 150 \text{ LF} @ \$15 = \$2,500$ Asp Pavmt Replmt - $(75)(72)/9 = 600 \text{ SY} @ \$12 = \$7,500$

\$484,500

+20% Engr, Admin & Cont

\$97,000

\$581,500 $\Rightarrow$ Use \$585,000Sta. 25+50 to Sta. 48+65 - Clear Channel and Stabilize West Bank between Fountain Boulevard and Castilla StreetClearing - $(150 \pm)(2315)/43560 = 8.0 \text{ AC} @ \$20,000 = \$160,000$ Earthwork - $(0.7)(2100)(2315)/27 = 126,000 \text{ CY} @ \$4 = \$504,000$ 5' High Rock Retaining Wall - $(6)(2315) = 13,890 \text{ LF} @ \$100 = \$1,389,000$ Landscaping - $(150)(2315)/43560 = 8.0 \text{ AC} @ \$35,000 = \$280,000$ R.O.W. Acquisition (Commercial/Industrial - Mostly outside Floodplain) - $8.0 \text{ AC} @ \$50,000 = \$400,000$ Commercial/Industrial Building - $2500 \text{ SF} @ \$35 = \$87,500$ Remove Commercial Building - Small - 1 Each @ $\$20,000 = \$20,000$

\$2,840,500

+20% Engr, Admin & Cont

\$568,000

\$3,408,500 $\Rightarrow$ Use \$3,410,000

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LOC.

FILE 90-809

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PROJ. Shooks Run

SHEET 6

DATE February 1, 1993

SUBJ. Estimate of Probable OF
Construction Costs - Soft Lined

Sta. 48+65 to Sta. 50+65 - Replace Culvert at Costilla Street w/ 4-10'x10'PCB

Remove Exist. Culvert - L.S. = \$35,000

Stave, Excav - $[(55 \times 200 \times 10) + (35 \times (200 \times 12))] / 27 = 7500 \text{ CY} @ \$6 = \$45,000$ Stave, Back - $[(10 \times 200 \times 12) + (55 \times (200 \times 1))] / 27 = 1500 \text{ CY} @ \$7 = \$10,500$ Embankment - $(55 \times (200 \times 9)) / 27 = 4000 \text{ CY} @ \$4 = \$16,000$ Bedding - $(55 \times 200 \times 0.5) / 27 = 300 \text{ CY} @ \$15 = \$4,500$ Stave Conc - 4-10'x10'PCB - $[(4 \times 1.82) - (3 \times 12 \times 1) / 27] (200) = 1189$ Hd walls - $(2 \times 45) (0.09) = 8$ Wings (7' Ave H - 25' L) = $(4 \times 25) (0.46) = 46$ $1245 \text{ CY} @ \$275 = \$342,500$ Riprap - $(105 \times 100 \times 3) / 27 = 1175 \text{ CY} @ \$40 = \$47,000$ Curb and Gutter - $(2 \times 65) = 130 \text{ LF} @ \$8 = \$1,000$ Sidewalk - $(2 \times 4 \times 65) / 9 = 50 \text{ SY} @ \$17 = \$1,000$ Guardrail - $(2 \times 45) + (4 \times 25) = 190 \text{ LF} @ \$15 = \$3,000$ Asp Pmnt Replmt - $(65 \times 56) / 9 = 425 \text{ SY} @ \$12 = \$5,500$ Conc. Pmnt Replmt - $(65 \times 80 \pm) / 9 = 600 \text{ SY} @ \$40 = \$24,000$

\$535,000

+ 20% Eng, Admin, & Cont \$107,000

\$642,000 $\Rightarrow$ Use \$645,000REACH $\geq$ TOTAL - \$4,690,000

COMP.

WJ

WILSON
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LOC.

FILE 90-809

CK.

PROJ. Shooks Run

SHEET

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DATE

February 1, 1993

SUBJ. Estimate of Probable OF
Construction Costs - Soft-LinedReach 3 - Costilla Street to Boulder StreetSta 50+65 to Sta 71+55 - New open channel between Costilla Street and El Paso Street (South)Clearing - $(150)(2090)/43560 = 7.2 \text{ Ac} @ \$20000 = \$144,000$ Remove Exist Conc Retaining Wall - $(8)(400) = 3200 \text{ SF} @ \$5 = \$16,000$ Earthwork - $(0.8)(4300)(2090)/27 = 266500 \text{ CY} @ \$4 = \$1,066,000$ 5' High Rock Retaining Wall - $(6+4)(2090) = 20900 \text{ LF} @ \$100 = \$2,090,000$ 50' Wide Drop Structure - 2 Each @ $\$25000 = \$50,000$ Landscaping - $(300)(2090)/43560 = 14.4 \text{ Ac} @ \$35000 = \$504,000$ Reconst. 8" Aerial San Sewer Crossing - $150 \text{ LF} @ \$150 = \$22,500$ Reconst. 18" Aerial San Sewer Crossing - $50 \text{ LF} @ \$200 = \$10,000$ Asp Path - $(15)(2090)/9 = 3500 \text{ SY} @ \$6 = \$21,000$ R.O.W. Acquisition - (Commercial/Industrial - Mostly Outside Floodplain) - $13.8 \text{ Ac} @ \$50000 = \$690,000$ Commercial/Industrial Buildings - $72500 \text{ SF} @ \$35 = \$2,537,500$ Residences - 3 Each @ $\$75000 = \$225,000$ Remove Commercial/Industrial Buildings - Large - 4 Each @ $\$50000 = \$200,000$ Small - 7 Each @ $\$20000 = \$140,000$ Remove Residences - 3 Each @ $\$10000 = \$30,000$

\$7,746,000

+ 20% Eng, Admin, & Cont

\$1,549,500

\$9,295,500 $\Rightarrow$ Use \$9,295,000

COMP.

WJF

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FILE 90-809

CK.

PROJ. Shooks Run

SHEET 8

DATE

February 1, 1993

SUBJ. Estimate of Probable OF

Construction Costs - Soft-Lined

Sta 71+55 to Sta 72+80 - Replace Culvert at El Paso Street (South)
w/ 5-14' x 10' PCB

Remove Exist Culvert - C.S. - \$20,000

Struc. Excav - $[(85)(125)(1) + (65)(12)(125)] / 27 = 4000 \text{ CY} @ \$6 = \$24,000$

Struc Back - $[(10)(125)(12) + (85)(125)(1)] / 27 = 1000 \text{ CY} @ \$7 = \$7,000$

Bedding - $(85)(125)(0.5) / 27 = 200 \text{ CY} @ \$15 = \$3,000$

Structural Conc - 5-14' x 10' PCB - $[(5)(227) - (4)(12)(1) / 27](125) = 1197$

Hd walls - $(2)(76)(0.09) = 14$

Wings - $(7' \text{ Ave H} - 25' \text{ L}) = (4)(25)(0.46) = 46$

$1260 \text{ CY} @ \$275 = \$346,500$

Pip up - $(75)(50)(3) / 27 = 425 \text{ CY} @ \$40 = \$17,000$

Curb and Gutter - $(2)(95) = 190 \text{ LF} @ \$8 = \$1,500$

Sidewalk - $(2)(4)(95) / 9 = 100 \text{ SY} @ \$17 = \$2,000$

Guardrail - $(2)(76) + (4)(25) = 252 \text{ LF} @ \$15 = \$4,000$

Asp Pmnt Replmt - $(95)(30) / 9 = 325 \text{ SY} @ \$12 = \$4,000$

\$429,000

+20% Eng, Admin, & Cont

\$86,000

⇒ Use

\$515,000

COMP.

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FILE 70-809

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PROJ. Shooks Run

SHEET 9

DATE

February 2, 1993

SUBJ. Estimate of Probable of

Construction Costs - Soft-Lined

Sta. 72+80 to Sta 76+80 - New open channel between El Paso Street (South) and Pikes Peak Avenue

Clearing - $(100)(400)/43560 = 0.9 \text{ Ac} @ \$20000 = \$18,000$

Remove Exst Conc. Retain Wall - $(6)(125) = 750 \text{ SF} @ \$5 = \$4,000$

Earthwork - $(0.8)(3500)(400)/27 = 41500 \text{ CY} @ \$4 = \$166,000$

5' High Rock Retain Wall - $(2)(4)(400) = 3200 \text{ LF} @ \$100 = \$320,000$

Landscaping - $(280)(400)/43560 = 2.6 \text{ Ac} @ \$35000 = \$91,000$

Asp Path - $(15)(400)/9 = 700 \text{ SY} @ \$6 = \$4,500$

R.O.W. Acquisition (Commercial/Industrial - Mostly Outside Floodplain) - $2.6 \text{ Ac} @ \$50000 = \$130,000$

Commercial/Industrial Buildings - $15350 \text{ SF} @ \$35 = \$537,500$

Remove Commercial/Industrial Buildings - Large - 1 Each @ $\$50000 = \$50,000$

Small - 2 Each @ $\$20000 = \$40,000$

$\$1,361,000$

+20% Eng., Admin., & Cont

$\$272,500$

$\$1,633,500 \Rightarrow \text{Use } \$1,635,000$

Sta. 76+80 to Sta. 85+60 - Replace Culvert at Pikes Peak Avenue / El Paso Street (North) w/ 5-14' X 10' RCB

Remove Exst Culvert - L.S. - $\$150,000$

Struct Excav - $[(85)(8)(175) + (65)(14)(175) + (85)(7)(285) + (65)(12)(285)$

$+ (85)(7)(190) + (55)(21)(190)] / 27 = 37500 \text{ CY} @ \$6 = \$225,000$

Struct Back - $[(10)(650)(12) + (85)(650)(1)] / 27 = 5000 \text{ CY} @ \$7 = \$35,000$

Embankment - $(85)(650)(9) / 27 = 18500 \text{ CY} @ \$4 = \$74,000$

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SUBJ. Estimate of Probable
Construction Costs - Soft-Lined

$$\text{Bedding} - (85)(650)(0.5)/27 = 1000 \text{ CY} @ \$15 = \$15,000$$

$$\text{Structural Conc} - 5-14' \times 10' \text{ PCB} - [(5)(2.27) - (4)(12)(1)/27](650) = 6222$$

$$\text{Hdwalks} - (2)(76)(0.09) = 14$$

$$\text{Wings} - (7' \text{ Avert} - 25' \text{ L}) = (4)(25)(0.46) = 46$$

$$6282 \text{ CY} @ \$275 = \$1,727,500$$

$$\text{Piprap} - (75)(50)(3)/27 = 425 \text{ CY} @ \$40 = \$17,000$$

$$\text{Curb and Gutter} - (4)(95) = 380 \text{ LF} @ \$8 = \$3,000$$

$$\text{Sidewalk} - [(4)(4)(95) + (8)(95)]/9 = 250 \text{ SY} @ \$17 = \$4,500$$

$$\text{Guardrail} - (2)(76) + (4)(25) = 252 \text{ LF} @ \$15 = \$4,000$$

$$\text{Asp Pmnt Replmt} - [(95)(60) + (95)(32)]/9 = 975 \text{ SY} @ \$12 = \$12,000$$

$$\text{Landscaping} - (140)(375)/43560 \times 1.2 \text{ Ac} @ \$35000 = \$42,000$$

$$\text{Asp Path} - (15)(375)/9 = 625 \text{ SY} @ \$6 = \$4,000$$

$$\text{R.O.W Acquisition} - (\text{Commercial Industrial} - \text{Mostly Inside Floodplain}) - 1.1 \text{ Ac} @ \$25000 = \$27,500$$

$$\text{Residence} - 1 \text{ Each} @ \$75000 = \$75,000$$

$$\text{Remove Residence} - 1 \text{ Each} @ \$10000 = \$10,000$$

$$\$2,425,500$$

+ 20% Eng., Admin., & Cont

$$\$485,000$$

$$\$2,910,500 \Rightarrow \underline{\underline{\text{Use } \$2,910,000}}$$

⇒ Replace Culvert at Kiowa Street w/ 4-14' x 10' PCB

$$\text{Remove Exist Culvert} - \text{L.S.} = \$25,000$$

$$\text{Stue Excav} - [(70)(3)(150) + (50)(14)(150)]/27 = 5000 \text{ CY} @ \$6 = \$30,000$$

$$\text{Stue Back} - [(10)(150)(12) + (70)(150)(1)]/27 = 1000 \text{ CY} @ \$7 = \$7,000$$

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PROJ. Shooks Run

SHEET 11

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February 2, 1993

SUBJ Estimate of Probable

Constructions - Soft-Lined

$$\text{Embankment} - (70)(150)(4)/27 = 1500 \text{ CY} @ \$4 = \$6,000$$

$$\text{Bedding} - (70)(150)(0.5)/27 = 200 \text{ CY} @ \$15 = \$3,000$$

$$\text{Structural Conc} - 4 - 14' \times 10' \text{ RCB} - [(4)(2.27) - (3)(12)(1)/27] 150 = 1162$$

$$\text{Hd walls} - (2)(61)(0.09) = 11$$

$$\text{Wings} - (7' \text{ Ave H} - 25' \text{ L}) = (4)(25)(0.46) = 46$$

$$1220 \text{ CY} @ \$275 = \$335,500$$

$$\text{Riprap} - (70)(50)(3)/27 = 400 \text{ CY} @ \$40 = \$16,000$$

$$\text{Cul and Gutter} - (2)(80) = 160 \text{ LF} @ \$8 = \$1,500$$

$$\text{Sidewalk} - (2)(4)(80)/9 = 75 \text{ SY} @ \$17 = \$1,500$$

$$\text{Guardrail} - (2)(61) + (4)(25) = 222 \text{ LF} @ \$15 = \$3,500$$

$$\text{Asp Pmnt Replmt} - (80)(60)/9 = 550 \text{ SY} @ \$12 = \$6,500$$

$$\$435,500$$

$$+ 20\% \text{ Engr, Admin, \& Cont} \quad \$87,000$$

$$\$522,500 \Rightarrow \underline{\underline{\text{Use } \$525,000}}$$

Sta. 85+60 to Sta. 89+95 - New open channel between Kiowa Street and Bijou Street

$$\text{Clearing} - (100)(435)/43560 = 1.0 \text{ Ac} @ \$20,000 = \$20,000$$

$$\text{Remove Exst Conc. Retain Wall} - (15)(365) = 5475 \text{ SF} @ \$5 = \$27,500$$

$$\text{Earthwork} - (0.8)(1950)(435)/27 = 25500 \text{ CY} @ \$4 = \$102,000$$

$$5' \text{ High Rock Retain Wall} - (2)(3)(435) = 2610 \text{ LF} @ \$100 = \$261,000$$

$$50' \text{ wide Drop Structure} - 1 \text{ Each} @ \$25,000 = \$25,000$$

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SHEET 12

DATE

February 2, 1993

SUBJ.

Estimate of Probable
Construction Costs - Soft-Lined

Landscaping - $(220)(435)/43560 = 2.2 \text{ Ac} @ \$35000 = \$77,000$

Asp Path - $(15)(435)/9 = 725 \text{ SY} @ \$6 = \$4,500$

R.O.W. Acquisition - (Commercial/Industrial - Mostly outside Flood plain) $0.9 \text{ Ac} @ \$50000 = \$45,000$

Commercial/Industrial Buildings - $11500 \text{ SF} @ \$35 = \$402,500$

Residences - 5 Each $@ \$75000 = \$375,000$

Remove Commercial/Industrial Buildings - Large - 2 Each $@ \$50000 = \$100,000$

- Small - 1 Each $@ \$20000 = \$20,000$

Remove Residences - 5 Each $@ \$10000 = \$50,000$

$\$1,509,500$

+20% Eng'y Admin, & Cont

$\$302,000$

$\$1,811,500 \Rightarrow \underline{\underline{\text{Use } \$1,815,000}}$

Sta. 89+95 to Sta. 94+50 - Replace Culvert at B. Jon Street w/ 4-14'x10' PCB

Remove Exist Culvert - L.S. - $\$75,000$

Stave Excav - $[(70)(3)(455) + (50)(12)(455)]/27 = 14000 \text{ CY} @ \$6 = \$84,000$

Stave Back - $[(10)(455)(12) + (70)(455)(1)]/27 = 3500 \text{ CY} @ \$7 = \$24,500$

Embankment - $(70)(455)(2)/27 = 2500 \text{ CY} @ \$4 = \$10,000$

Bedding - $(70)(455)(0.5)/27 = 600 \text{ CY} @ \$15 = \$9,000$

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SUBJ. Estimate of Probable OF
Construction Costs - Soft-Lined

$$\text{Structural Conc} - 4 - 14' \times 10' \text{ RCB} - [(4)(2.27) - (3)(12)(1)/27](435) = 3370$$

$$\text{Hd walls} - (2)(61)(0.09) = 11$$

$$\text{Wings} - (7' \text{ Ave H} - 25') = (4)(25)(0.46) = 46$$

$$3430 \text{ CY} @ \$275 = \$943,500$$

$$\text{Riprap} - (60)(50)(3)/27 = 350 \text{ CY} @ \$40 = \$14,000$$

$$\text{Curb and Gutter} - (80)(4) = 320 \text{ LF} @ \$8 = \$2,500$$

$$\text{Sidewalk} - (4)(4)(80)/9 = 150 \text{ SY} @ \$17 = \$2,500$$

$$\text{Guardrail} - (2)(61) + (4)(25) = 222 \text{ LF} @ \$15 = \$3,500$$

$$\text{Asp. Pmnt Replmt} - [(80)(24) + (80)(56)]/9 = 725 \text{ SY} @ \$12 = \$9,000$$

$$\text{Landscaping} - (110)(300)/43560 = 0.8 \text{ Ac} @ \$35,000 = \$28,000$$

$$\text{Asp Path} - (15)(300)/9 = 500 \text{ SY} @ \$6 = \$3,000$$

$$\text{R.O.W. Acquisition} - \text{Residence} - 1 \text{ Each} @ \$75,000 = \$75,000$$

$$- \text{Partial Residential Property} - 1 \text{ Each} @ \$5,000 = \$5,000$$

$$\text{Remove Residence} - 1 \text{ Each} @ \$10,000 = \$10,000$$

$$\$1,298,500$$

+20% Eng., Admin., & Cont

$$\$260,000$$

$$\$1,558,500 \Rightarrow \text{Use } \$1,560,000$$

Sta. 94+50 to Sta 98+10 - New open channel between Bijou Street and
Platte Avenue

$$\text{Clearing} - (50)(360)/43560 = 0.4 \text{ Ac} @ \$20,000 = \$8,000$$

$$\text{Earthwork} - (0.9)(1625)(360)/27 = 19,500 \text{ CY} @ \$4 = \$78,000$$

$$5' \text{ High Rock Retain Wall} - (3)(360) = 1080 \text{ LF} @ \$100 = \$108,000$$

$$50' \text{ Wide Drop Structure} - 1 \text{ Each} @ \$25,000 = \$25,000$$

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February 2, 1993

SUBJ. Estimate of Probable OF
Construction Costs - Soft-LinedLandscaping - $(185)(360)/43560 = 1.5 \text{ Ac} @ \$35000 = \$52,500$ R.O.W. Acquisition - Residences - 7 Each @ $\$75000 = \$525,000$ Remove Residences - 7 Each @ $\$10000 = \$70,000$ $\$866,500$

+20% Eng, Admin, & Cont

 $\$173,500$ $\Rightarrow \underline{\underline{\text{Use } \$1,040,000}}$ Sta 98+10 to Sta 106+30 - Replace Culvert at Platte Avenue / School
Athletic Field and Bridge at Boulder Street
w/ 4-12' X 10' PCBRemove Exst. Culvert & Bridge - L.S. = $\$140,000$ Remove Exst Conc Retain Wall - $(2)(65)(7) = 925 \text{ SF} @ \$5 = \$5,000$ Stave Excav - $[(65)(8)(600) + (45)(13)(600) + (25)(17)(100)]/27 = 26500 \text{ CY} @ \$6 = \$159,000$ Stave Back - $[(110)(12)(700) + (65)(11)(700)]/27 = 5000 \text{ CY} @ \$7 = \$35,000$ Embankment - $[(65)(8)(600) + (65)(4)(100)]/27 = 12500 \text{ CY} @ \$4 = \$50,000$ Bedding - $(65)(700)(0.5)/27 = 850 \text{ CY} @ \$15 = \$13,000$ Structural Concrete - 4-12' X 10' PCB - $[(4)(1.99) - (3)(12)(1)/27](700) = 4639$ Adwalls - $(2)(53)(0.09) = 10$ Wings - $(7' \text{ Ave H} - 25' L) = (4)(25)(0.46) = 46$ $4695 \text{ CY} @ \$275 = \$1,291,500$ Riprap - $(55)(50)(3)/27 = 300 \text{ CY} @ \$40 = \$12,000$

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FILE 90-809

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PROJ. Shooks Run

SHEET 15

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February 2, 1993

SUBJ. Estimate of Probable
Construction Costs - Soft-LinedCurb and Gutter - $(75)(4) = 300 \text{ LF} @ \$8 = \$2,500$ Sidewalk - $(4)(4)(75)/9 = 150 \text{ SY} @ \$17 = \$2,500$ Guardrail - $(2)(53) + (4)(25) = 206 \text{ LF} @ \$15 = \$3,000$ Retain Wall Replmt - $(7' \pm H) = (2)(0.51)(65) = 70 \text{ CY} @ \$275 = \$19,500$ Asp Punt Replmt - $[(75)(96) + (75)(60)]/9 = 1300 \text{ SY} @ \$12 = \$16,000$ Landscaping - $(110)(500)/43560 = 1.3 \text{ Ac} @ \$35000 = \$45,500$ Asp Path - $(15)(500)/9 = 850 \text{ SY} @ \$6 = \$5,000$ R.O.W. Acquisition - (School - Inside Floodplain) - $1.3 \text{ Ac} @ \$25000 = \$32,500$

\$1,832,000

+ 20% Eng, Admin, & Cont

\$ 366,500

\$2,198,500 $\Rightarrow$ Use \$2,200,000REACH 3 - TOTAL - \$21,495,000Reach 4 - Boulder Street to Cache La Poudre StreetSta. 106+30 to Sta. 112+35 - New open channel between Boulder Street and St. Vrain StreetClearing - $(150)(605)/43560 = 2.1 \text{ Ac} @ \$20000 = \$42,000$ Earthwork - $(0.8)(1250)(605)/27 = 22500 \text{ CY} @ \$4 = \$90,000$ 5' High Rock Retain Wall - $(2)(2)(605) = 2420 \text{ LF} @ \$100 = \$242,000$ Landscaping - $(230)(605)/43560 = 3.2 \text{ Ac} @ \$35000 = \$112,000$ Asp Path - $(15)(605)/9 = 1000 \text{ SY} @ \$6 = \$6,000$

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FILE 90-809

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PROJ. Shooks Run

SHEET 16

DATE

February 2, 1993

SUBJ. Estimate of Probable of
Construction Costs - Soft-Lined

R.O.W. Acquisition - Residences - 6 Each @ \$75,000 = \$450,000
 - Partial Residential Lots - 7 Each @ \$5,000 = \$35,000
 Remove Residences - 6 Each @ \$10,000 = \$60,000

\$1,037,000

+ 20% Eng, Admin, & Cont

\$ 207,500

\$1,244,500 $\Rightarrow$ Use \$1,245,000

Sta. 112+35 to Sta. 113+40 - Replace Culvert at St. Vrain Street w/ 4-10'x10' PCB

Remove Exist Culvert - L.S. = \$20,000

Stave Excav - $[(55)(1)(105) + (35)(4)(105)] / 27 = 2500 \text{ CY} @ \$6 = \$15,000$ Stave Back - $[(10)(105)(12) + (55)(1)(105)] / 27 = 750 \text{ CY} @ \$7 = \$5,500$ Embankment - $[(55)(2)(105)] / 27 = 500 \text{ CY} @ \$4 = \$2,000$ Bedding - $(55)(105)(0.5) / 27 = 100 \text{ CY} @ \$15 = \$1,500$ Stave Conc - 4-10'x10' PCB - $[(4)(1.82) - (3)(12)(1) / 27](105) = 624$ Hd walks - $(2)(45)(0.09) = 8$ Wings - (7' Ave H - 25' L) = $(4)(25)(0.46) = 46$

680 CY @ \$275 = \$187,000

Riprap - $(50)(50)(3) / 27 = 275 \text{ CY} @ \$40 = \$11,000$ Curb and Gutter - $(65)(2) = 130 \text{ LF} @ \$8 = \$1,000$ Sidewalk - $(2)(4)(65) / 9 = 75 \text{ SY} @ \$17 = \$1,500$

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SHEET 17

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February 2, 1993

SUBJ. Estimate of Probable
Construction Costs - Soft-Lined

$$\text{Guardrail} - (2)(45) + (4)(25) = 190 \text{ LF} @ \$15 = \$3,000$$

$$\text{Asp Pmnt Replmt} - (65)(50)/9 = 375 \text{ SY} @ \$12 = \$4,500$$

$$\$252,000$$

$$+20\% \text{ Eng, Admin, \& Cont} \quad \$50,500$$

$$\$302,500 \Rightarrow \text{Use } \$305,000$$

Sta. 113+40 to Sta. 117+75 - New open channel between St. Union Street and Willamette Street

$$\text{Clearing} - (150)(435)/43560 = 1.5 \text{ Ac} @ \$20,000 = \$30,000$$

$$\text{Earthwork} - (0.8)(1670)(435)/27 = 21500 \text{ CY} @ \$4 = \$86,000$$

$$5' \text{ High Rock Retain Wall} - (2)(2.4)(435) = 2088 \text{ LF} @ \$100 = \$209,000$$

$$\text{Landscaping} - (265)(435)/43560 = 2.6 \text{ Ac} @ \$35,000 = \$91,000$$

$$\text{Replace Double Tennis Court} - \text{L.S.} = \$75,000$$

$$\text{Asp Path} - (15)(435)/9 = 725 \text{ SY} @ \$6 = \$4,500$$

$$\text{R.O.W. Acquisition - Residences} - 5 \text{ Each} @ \$75,000 = \$375,000$$

$$\text{Partial Residential Lots} - 3 \text{ Each} @ \$5,000 = \$15,000$$

$$\text{Remove Residences} - 5 \text{ Each} @ \$10,000 = \$50,000$$

$$\$935,500$$

$$+20\% \text{ Eng, Admin, \& Cont} \quad \$187,000$$

$$\$1,122,500 \Rightarrow \text{Use } \$1,125,000$$

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FILE 90-809

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PRO. Shooks Run

SHEET 18

DATE

February 3, 1993

SUBJ. Estimate of Probable OF

Construction Costs - Soft-Lined

Sta. 117+75 to Sta 119+80 - Replace culvert at Willamette Street
w/ 3-10' X 10' PCB

Remove Exist Culvert - L.S. = \$35,000

Shut Excav - $[(45)(6)(205) + (25)(15)(205)]/27 = 5000 \text{ CY} @ \$6 = \$30,000$

Shut Back - $[(10)(205)(12) + (45)(205)(1)]/27 = 1500 \text{ CY} @ \$7 = \$10,500$

Embankment $(45)(8)(205)/27 = 3000 \text{ CY} @ \$4 = \$12,000$

Bedding - $(45)(205)(0.5)/27 = 175 \text{ CY} @ \$15 = \$3,000$

Structural Conc - 3-10' X 10' PCB - $[(3)(0.82) - (2)(12)(1)/27](205) = 937$

Hd walls - $(2)(34)(0.09) = 6$

Wings - $(7' \text{ Ave H} - 25' \text{ L}) - (4)(25)(0.46) = 46$

$990 \text{ CY} @ \$275 = \$272,500$

Riprap - $(45)(50)(3)/27 = 250 \text{ CY} @ \$40 = \$10,000$

Curb and Gutter - $(4)(55) = 220 \text{ LF} @ \$8 = \$2,000$

Sidewalk - $(2)(4)(55)/9 = 50 \text{ SY} @ \$17 = \$1,000$

Guardrail - $(2)(34) + (4)(25) = 168 \text{ LF} @ \$15 = \$2,500$

Asp Pmt Replmt - $(2)(55)(26)/9 = 325 \text{ SY} @ \$12 = \$4,000$

$\$382,500$

+ 20% Engr, Admin, & Cont

$\$76,500$

$\$459,000 \Rightarrow \underline{\underline{\text{Use } \$460,000}}$

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FILE 90-809

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PROJ. Shakes Run

SHEET 19

DATE

February 2, 1993

SUBJ. Estimate of Probable OF

Construction Costs - Soft-Lined

Sta. 119+80 to Sta 135+15 - New Open Channel between Willamette Street and Cache La Poudre Street

Clearing - $(150)(1535)/43560 = 5.3 \text{ Ac} @ \$20000 = \$106,000$

Earthwork - $(0.7)(2370)(1535)/27 = 94,500 \text{ CY} @ \$4 = \$378,000$

5' High Rock Retain Wall - $(2)(3.6)(1535) = 11052 \text{ LFC} @ \$100 = \$1,105,500$

35' Wide Drop Structure - 1 Each @ \$20000 = \$20,000

Landscaping - $(245)(1535)/43560 = 8.6 \text{ Ac} @ \$35000 = \$301,000$

Replace Pedestrian Bridge - $(215)(8) = 1720 \text{ SF} @ \$60 = \$103,500$

R.O.W. Acquisition - Residences - 5 Each @ \$75000 = \$375,000

- Partial Residential Lots - 3 Each @ \$5000 = \$15,000

Remove Residences - 5 Each @ \$10000 = \$50,000

\$2,454,000

+ 20% Eng., Admin., & Cont \$ 491,000

⇒ Use \$2,945,000

Sta. 135+15 to Sta. 137+05 - Replace Culvert at Cache La Poudre w/ 3-10'X10'RCB

Remove Exist Culvert - LS₁ = \$30,000

Struct Excav - $[(45)(2)(190) + (25)(14)(190)]/27 = 3000 \text{ CY} @ \$6 = \$18,000$

Struct Back - $[(10)(190)(12) + (45)(1)(190)]/27 = 1500 \text{ CY} @ \$7 = \$10,500$

Embankment - $[(45)(3)(190)]/27 = 1000 \text{ CY} @ \$4 = \$4,000$

Bedding - $(45)(190)(0.5)/27 = 150 \text{ CY} @ \$15 = \$2,500$

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SUBJ. Estimate of Probable
Construction Costs - Soft-Lined

$$\text{Structural Conc} - 3-10' \times 10' \text{ RCB} - [(3)(1.82) - (2)(12)(1)/27](190) = 869$$

$$\text{Hdwalls} - (2)(34)(0.09) = 6$$

$$\text{Wings} - (7' \text{ Ave H} - 25') = (4)(25)(0.46) = 46$$

$$925 \text{ CY} @ \$275 = \$254,500$$

$$\text{Riprap} - (35)(50)(3)/27 = 200 \text{ CY} @ \$40 = \$8,000$$

$$\text{Curb and Gutter} - (2)(55) = 110 \text{ LF} @ \$8 = \$1,000$$

$$\text{Sidewalk} - (2)(4)(55)/9 = 50 \text{ SY} @ \$17 = \$1,000$$

$$\text{Guardrail} - (2)(34) + (4)(25) = 168 \text{ LF} @ \$15 = \$2,500$$

$$\text{Asp Pmnt Replmt} - (55)(32)/9 = 200 \text{ SY} @ \$12 = \$2,500$$

$$\text{R.O.W. Acquisition} - \text{Partial Residential Lots} - 2 \text{ Each} @ \$5,000 = \$10,000$$

$$\$344,500$$

$$+ 20\% \text{ Eng, Admin, \& Cont}$$

$$\$69,000$$

$$\$413,500 \Rightarrow \text{Use } \$415,000$$

$\Rightarrow$ Replace Exist Pedestrian Bridge over Cache La Poudre Culvert Crossing

$$\text{Remove Exist Bridge} - \text{L.S.} = \$20,000$$

$$\text{Struct Excav} - (2)(10)(25 \pm) \left(\frac{60+20}{2} \right) / 27 = 1000 \text{ CY} @ \$6 = \$6,000$$

$$\text{Struct Back} - (2)(10)(25 \pm) \left(\frac{60+20}{2} \right) / 27 = 1000 \text{ CY} @ \$7 = \$7,000$$

$$\text{Struct Conc} - (2)(3)(25 \pm) \left(\frac{60+20}{2} \right) / 27 = 225 \text{ CY} @ \$275 = \$62,000$$

$$\text{Reset Twin Tee} - \text{L.S.} - \$2,000$$

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FILE 90-809

CK.

PROJ. Shooks Run

SHEET 21

DATE February 3, 1993

SUBJ. Estimate of Probable OF
Construction Costs - Soft-LinedSidewalk - $(2)(15)(25)/9 = 100 \text{ CY} @ \$17 = \$2,000$ Fence - $(4)(25) = 100 \text{ LF} @ \$7 = \$1,000$

\$100,000

+ 200% Eng., Admin., & Cont. \$20,000

 $\Rightarrow$ Use \$120,000REACH 4 TOTAL - \$6,615,000Reach 5 - Cache La Poudre Street to Patty Jewett Golf CourseSta. 137+05 to Sta. 152+45 - New open channel between Cache La Poudre
Street and Uintah StreetClearing - $(125)(1540)/43560 = 4.4 \text{ Ac} @ \$20,000 = \$88,000$ Earthwork - $(0.7)(2800)(1540)/27 = 112,000 \text{ CY} @ \$4 = \$448,000$ 5' High Rock Retain Wall - $(2)(4)(1540) = 12320 \text{ LF} @ \$100 = \$1,232,000$

35' Wide Drop Structure - 1 Each @ \$20,000 = \$20,000

Landscaping - $(245)(1540)/43560 = 8.7 \text{ Ac} @ \$35,000 = \$304,500$ Asp Path - $(15)(1540)/9 = 2575 \text{ SY} @ \$6 = \$15,500$

R.O.W. Acquisition - (Commercial/Industrial - Mostly outside Floodplain) - 2.4 Ac @ \$50,000 = \$120,000

Residences - 10 Each @ \$75,000 = \$750,000

Residential Lots - 7 Each @ \$20,000 = \$140,000

Partial Residential Lots - 6 Each @ \$5,000 = \$30,000

Apartments (10 Unit Small) - L.S. - \$150,000

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PROJ. Shoos Run

SHEET 22

DATE

February 3, 1993

SUBJ. Estimate of Probable
Construction Costs - Soft-Lined

Remove Residences - 10 Each @ \$10,000 = \$100,000

Remove Apartment Bldg - 1 Each @ \$50,000 = \$50,000

\$3,348,000

+ 20% Eng., Admin., & Cont

\$ 689,500

\$4,137,500 $\Rightarrow$ Use \$4,140,000Sta. 152+45 to Sta. 153+55 - Replace Vintah Street Culvert w/ 2-14'x10'PCB

Remove Exist Culvert - L.S. = \$20,000

Stucc Excav - $[(40)(11)(150) + (20)(13)(150)] / 27 = 4000 \text{ CY} @ \$6 = \$24,000$ Stucc Back - $[(10)(150)(12) + (40)(150)(1)] / 27 = 1000 \text{ CY} @ \$7 = \$7,000$ Embankment - $(40)(150)(11) / 27 = 2500 \text{ CY} @ \$4 = \$10,000$ Bedding - $(40)(150)(0.5) / 27 = 125 \text{ CY} @ \$15 = \$2,000$ Stucc Conc - 2-14'x10'PCB - $[(2)(2.27) - (1)(12)(1) / 27] / 150 = 614$ Hd walls - $(2)(31)(0.09) = 6$ Wings - (7' Ave H - 25' L) = $(4)(25)(0.46) = 46$

670 CY @ \$275 = \$184,500

Piprap - $(35)(50)(3) / 27 = 200 \text{ CY} @ \$40 = \$8,000$ Curb and Gutter - $(2)(50) = 100 \text{ LFC} @ \$8 = \$1,000$ Sidewalk - $(2)(4)(50) / 9 = 50 \text{ SY} @ \$17 = \$1,000$

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PROJ. Shoos Run

SHEET 23

SUBJ.

Estimate of Probable
Construction Costs - Soft-Lined

$$\text{Guardrail} - (2)(31) + (4)(25) = 162 \text{ LF} @ \$15 = \$2,500$$

$$\text{Asp Pmnt Replmt} - (50)(26)/9 = 150 \text{ SY} @ \$12 = \$2,000$$

\$262,000

+20% Engr, Admin, & Cont

\$ 52,500

\$ 314,500 $\Rightarrow$ Use \$315,000

Sta 153+55 to Sta 154+55 - New open channel between Uintah Street and San Miguel Street

$$\text{Clearing} - (125)(400)/43560 = 1.1 \text{ AC} @ \$20,000 = \$22,000$$

$$\text{Earthwork} - (0.7)(2700)(400)/27 = 28,000 \text{ CY} @ \$4 = \$112,000$$

$$\text{5' High Rock Retain Wall} - (2)(4)(400) = 3200 \text{ LF} @ \$100 = \$320,000$$

$$\text{30' Wide Drop Structure} - 1 \text{ Each} @ \$20,000 = \$20,000$$

$$\text{Landscaping} - (240)(400)/43560 = 2.2 \text{ AC} @ \$35,000 = \$77,000$$

$$\text{Asp Path} - (15)(400)/9 = 675 \text{ SY} @ \$6 = \$4,000$$

$$\text{P.O.W. Acquisition - Residences} - 2 \text{ Each} @ \$75,000 = \$150,000$$

$$\text{Partial Residential Lot} - 1 \text{ Each} @ \$5,000 = \$5,000$$

$$\text{Apartments (8 Unit - Medium)} - \text{L.S.} - \$160,000$$

$$\text{Apartments (12 Unit - Large)} - \text{L.S.} - \$300,000$$

$$\text{Remove Residences} - 2 \text{ Each} @ \$10,000 = \$20,000$$

$$\text{Remove Apartment Bldg} - 3 \text{ Each} @ \$50,000 = \$150,000$$

\$1,340,000

+20% Engr, Admin, & Cont

\$ 268,000

\$1,608,000 $\Rightarrow$ Use \$1,610,000

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FILE 90-809

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PROJ. Shooks Run

SHEET 24

DATE

February 3, 1993

SUBJ. Estimate of Probable OF
Construction Costs - Soft-Lined

Sta 157+55 to Sta 158+40 - Replace Culvert at San Miguel Street
w/ 2-14' x 10' RCB

Remove Exist Culvert - L.S. - \$15,000

Stave Excav - $[(40 \times 8)(85) + (20 \times 13)(85)] / 27 = 2000 \text{ CY} @ \$6 = \$12,000$

Stave Back - $[(10 \times 85)(12) + (40 \times 85)(1)] / 27 = 500 \text{ CY} @ \$7 = \$3,500$

Embankment - $(40 \times 85)(8) / 27 = 1000 \text{ CY} @ \$4 = \$4,000$

Bedding - $(40 \times 85)(0.5) / 27 = 75 \text{ CY} @ \$15 = \$1,500$

Stave Conc - 2-14' x 10' RCB - $[(2)(227) - (1)(12)(1) / 27](85) = 348$

Hd walls - $(2)(31)(0.09) = 6$

Wings - $(2' \text{ Ave H} - 25' \text{ L}) - (4)(25)(0.46) = 46$

$400 \text{ CY} @ \$275 = \$110,000$

Pipe - $(30)(50)(3) / 27 = 175 \text{ CY} @ \$40 = \$7,000$

Culband Gutter - $(2)(50) = 100 \text{ LF} @ \$8 = \$1,000$

Sidewalk - $(2)(4 \times 50) / 9 = 50 \text{ SY} @ \$17 = \$1,000$

Guardrail - $(2)(31) + (4)(25) = 162 \text{ LF} @ \$15 = \$2,500$

Asp Punt Replant - $(50 \times 36) / 9 = 200 \text{ SY} @ \$12 = \$2,500$

\$160,000

+20% Eng, Admin, & Cont

\$32,000

\$192,000 $\Rightarrow$ Use \$195,000

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PROJ. Sharks Run

SHEET 25

DATE February 3, 1993

SUBJ. Estimate of Probable OF
Construction Costs - Soft-Lined

Sta 158+40 to Sta 167+35 - New open channel between San Miguel Street and Pedestrian Bridge

Clearing - $(125)(895)/43560 = 2.6 \text{ Ac} @ \$20000 = \$52,000$

Earthwork - $(0.7)(3950)(895)/27 = 92000 \text{ CY} @ \$4 = \$368,000$

5' High Rock Retain Wall - $(2)(5)(895) = 8950 \text{ LF} @ \$100 = \$895,000$

30' Wide Drop Structure - 2 Each @ \$20000 = \$40,000

Landscaping - $(280)(895)/43560 = 5.8 \text{ Ac} @ \$35000 = \$203,000$

Asp Path - $(15)(895)/9 = 1500 \text{ SY} @ \$6 = \$9,000$

R.O.W. Acquisition - Residences - 12 Each @ \$75000 = \$900,000

Partial Residential Lot - 6 Each @ \$5000 = \$30,000

School - Mostly outside Floodplain - 1.0 Ac @ \$50,000 = \$50,000

Remove Residences - 12 Each @ \$10,000 = \$120,000

\$2,667,000

+ 20% Eng., Admin., & Cont

\$533,500

\$3,200,500 $\Rightarrow$ Use \$3,200,000

Sta 167+35 to Sta 176+25 - New open channel between Pedestrian Bridge and Patty Jenett Golf Course South Boundary

Clearing - $(150)(890)/43560 = 3.1 \text{ Ac} @ \$20000 = \$62,000$

Earthwork - $(0.7)(5400)(890)/27 = 124500 \text{ CY} @ \$4 = \$498,000$

5' High Rock Retain Wall - $(2)(6)(890) = 10680 \text{ LF} @ \$100 = \$1,068,000$

30' Wide Drop Structure - 2 Each @ \$20000 = \$40,000

Landscaping - $(320)(890)/43560 = 6.5 \text{ Ac} @ \$35000 = \$227,500$

Asp Path - $(15)(1050)/9 = 1750 \text{ SY} @ \$6 = \$10,500$

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February 3, 1993

PROJ. Shooks Run

SHEET 26

SUBJ. Estimate of Probable
Construction Costs - Soft-Lined

Replace Pedestrian Bridge (8) (270) = 2160 SF @ \$80 = \$173,000

R.O.W. Acquisition - Residences - 6 Each @ \$7500 = \$450,000

- Partial Residential Lots - 4 Each @ \$5000 = \$20,000

- School - Mostly outside floodplain - 2.3 Ac @ \$50,000 = \$110,000

Remove Residences - 6 Each @ \$10000 = \$60,000

\$2,719,000

+ 20% Eng., Admin., & Cont

\$ 544,000

\$3,263,000 $\Rightarrow$ Use \$3,265,000REACH 5 TOTAL - \$12,725,000REACH 6 - Patty Jewett Golf CourseSta 176+25 to Sta 189+05 - New open channel between Patty Jewett
Golf Course South Boundary and Espanola Street

Clearing - (100)(1280)/43560 = 2.9 Ac @ \$20000 = \$58,000

Earthwork - (0.7)(2850)(1280)/27 = 94500 CY @ \$4 = \$378,000

5' High Rock Retaining Wall - (2)(1)(1280) = 2560 @ \$100 = \$256,000

30' Wide Drop Structure - 3 Each @ \$20000 = \$60,000

Reset Exist Golf Cart Bridge - 4 Each @ \$10000 = \$40,000

Landscaping - (360)(1280)/43560 = 10.6 Ac @ \$35000 = \$371,000

\$1,163,000

+ 20% Eng., Admin., & Cont

\$ 232,500

\$1,395,500 $\Rightarrow$ Use \$1,400,000

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Shocks Run

SHEET 27

DATE

February 3, 1993

SUBJ. Estimate of Probable OF

Construction Costs - Soft-Lined

Sta. 189+05 to Sta 190+85 - Replace Culvert at Espanda Street
w/ 3-12' X 10' RCB

Remove Exist Culvert - L.S. = \$45,000

Struct Excav - $[(50)(3)(180) + (35)(10)(180)] / 27 = 3500 \text{ CY} @ \$6 = \$21,000$

Struct Back - $[(10)(180)(12) + (50)(180)(1)] / 27 = 1500 \text{ CY} @ \$7 = \$10,500$

Bedding - $(50)(0.5)(180) / 27 = 175 \text{ CY} @ \$15 = \$3,000$

Struct Conc - 3-12' X 10' RCB = $[(3)(1.99) - (2)(12)(1) / 27](180) = 915$

sidewalks - $(2)(40)(0.09) = 7$

Wings - $(7' \text{ Ave H} - 25' \text{ L}) = (4)(25)(0.46) = 46$

$970 \text{ CY} @ \$275 = \$267,000$

Riprap - $(40)(50)(3) / 27 = 225 \text{ CY} @ \$40 = \$9,000$

Guardrail - $(2)(40) + (4)(25) = 180 \text{ LF} @ \$15 = \$3,000$

Asp Punt Replmt - $(60)(24) / 9 = 175 \text{ SY} @ \$12 = \$2,500$

\$361,000

+20% Engr, Admin, & Cont

\$72,500

\$433,500 $\Rightarrow$ Use \$435,000

Sta 190+85 to Sta 198+45 - New open channel between Espanda Street and End of Existing Channel Lining

Remove Conc Punt - $[(8.5)(2) + 10](760) / 9 = 2300 \text{ SY} @ \$10 = \$23,000$

Earthwork - $(0.8)(960)(760) / 27 = 22,000 \text{ CY} @ \$4 = \$88,000$

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PROJ. Shooks Run

SHEET 28

DATE

February 3, 1993

SUBJ. Estimate of Proposed

Construction Costs - Soft-Lined

5' High Rock Retain Wall - $(2)(0.4)(760) = 608 \text{ LF} @ \$100 = \$61,000$ 30' Wide Drop Structure - 1 Each @ $\$20,000 = \$20,000$ Reset Exist Golf Cart Budge - 4 Each @ $\$10,000 = \$40,000$ Landscaping - $(300)(760)/43560 = 5.2 \text{ Ac} @ \$35,000 = \$182,000$ $\$414,000$

+20% Eng, Admin, & Cont

 $\$83,000$ $\$497,000 \Rightarrow \underline{\underline{\text{Use } \$500,000}}$ Sta. 198+45 to Sta. 216+40 - New open channel between End of Existing
Channel Lining and Paseo RoadClearing - $(75)(260)/43560 = 0.4 \text{ Ac} @ \$20,000 = \$8,000$ Earthwork - $(0.7)(430)(1795)/27 = 20000 \text{ CY} @ \$4 = \$80,000$ 5' High Rock Retain Wall - $(2)(0.2)(1795) = 718 \text{ LF} @ \$100 = \$72,000$ Reset Exist Golf Cart Budge - 1 Each @ $\$10,000 = \$10,000$ Replace Golf Cart Budge - $(8)(30) = 240 \text{ SF} @ \$70 = \$17,000$ Landscaping - $(160)(1795)/43560 = 6.6 \text{ Ac} @ \$35,000 = \$231,000$ $\$418,000$

+20% Eng, Admin, & Cont.

 $\$84,000$ $\$502,000 \Rightarrow \underline{\underline{\text{Use } \$505,000}}$ 2 EACH 6 TOTAL - \$2,840,000

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FILE 90-809

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PROJ. Shocks Run

SHEET 29

DATE February 3, 1993

SUBJ. Estimate of Probable OF
Construction Costs - Soft LinedReach 7- Paceo Road to Van Buren Channel DiversionSta. 216+40 to Sta 216+95 - Replace Culvert at Paceo Road w/ 3-10'x5' PCB

Remove Exst Culvert - L.S. = \$15,000

Shove Excav - $[(45)(3)(55) + (20)(5)(55)]/27 = 500 \text{ CY} @ \$6 = \$3,000$ Shove Back - $[(10)(55)(7) + (45)(55)(1)]/27 = 300 \text{ CY} @ \$7 = \$2,000$ Bedding - $(45)(55)(0.5)/27 = 50 \text{ CY} @ \$15 = \$1,000$ Shove Conc - 3-10'x5' PCB = $[(3)(1.52) - (2)(7)(1)/27](55) = 222$ Hd walls - $(2)(34)(0.09) = 6$ Wing walls - (5' Ave H - 20'L) = $(4)(20)(0.36) = 29$

260 CY @ \$275 = \$71,500

Pipe up - $(35)(50)(3)/27 = 200 \text{ CY} @ \$40 = \$8,000$ Curb and Gutter - $(2)(55) = 110 \text{ LF} @ \$8 = \$1,000$ Sidewalk - $(2)(4)(55)/9 = 50 \text{ SY} @ \$17 = \$1,000$ Guardrail - $(2)(34) + (4)(20) = 148 \text{ LF} @ \$15 = \$2,500$ Asp Punt Replmt - $(55)(36)/9 = 225 \text{ SY} @ \$12 = \$3,000$

\$108,000

+ 20% Eng, Admin, & Cont

\$21,500

\$129,500 $\Rightarrow$ Use \$130,000

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PROJ.

Shooks Run

SHEET

30

DATE

February 3, 1993

SUBJ.

Estimate of Probable
Construction Costs - Soft-Lined

Sta 216+45 to Sta 218+30 - New open channel between Paseo Road and Jefferson Street

Clearing - $(50)(135)/43560 = 0.2 \text{ Ac} @ \$20000 = \$4,000$

Earthwork - $(0.6)(354)(135)/27 = 1000 \text{ CY} @ \$4 = \$4,000$

5' High Rock Retain Wall - $(2)(0.2)(135) = 54 \text{ LFC} @ \$100 = \$5,500$

Landscaping - $(110)(135)/43560 = 0.3 \text{ Ac} @ \$35000 = \$10,500$

Asp Path - $(15)(135)/9 = 225 \text{ SY} @ \$6 = \$1,500$

R.O.W. Acquisition - Residences - 3 Each @ $\$75000 = \$225,000$

Partial Residential Lot - 1 Each @ $\$5000 = \$5,000$

Remove Residences - 3 Each @ $\$10000 = \$30,000$

$\$285,500$

+ 20% Eng., Admin., & Cont $\$57,000$

$\$342,500 \Rightarrow \underline{\text{Use } \$345,000}$

Sta. 218+30 to 219+10 - Replace Culvert at Jefferson Street w/ 3-10'x5'PCB

Remove Exist Culvert - L.S. = $\$10,000$

Stucc Excav - $[(45)(4)(80) + (25)(4)(80)]/27 = 1000 \text{ CY} @ \$6 = \$6,000$

Stucc Back - $[(10)(80)(7) + (45)(80)(1)]/27 = 500 \text{ CY} @ \$7 = \$3,500$

Bedding - $(45)(80)(0.5)/27 = 100 \text{ CY} @ \$15 = \$1,500$

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PROJ. Shooks Run

SHEET 31

DATE February 4, 1993

SUBJ. Estimate of Probable OF
Construction Costs - Soft-Lined

$$\text{Struct Conc} - 3-10' \times 5' \text{ RCB} - [(13)(1.52) - (2)(7)(11)/27](80) = 323$$

$$\text{Hd walls} - (2)(34)(0.09) = 6$$

$$\text{Wings} - (5' \text{ Ave H} - 20' \text{ L}) = (4)(20)(0.36) = 29$$

$$360 \text{ CY} @ \$275 = \$99,000$$

$$\text{Riprap} - (35)(50)(3)/27 = 200 \text{ CY} @ \$40 = \$8,000$$

$$\text{Curb and Gutter} - (2)(55) = 110 \text{ LF} @ \$8 = \$1,000$$

$$\text{Sidewalk} - (2)(4)(55)/9 = 50 \text{ SY} @ \$17 = \$1,000$$

$$\text{Guardrail} - (2)(34) + (4)(20) = 148 \text{ LF} @ \$15 = \$2,500$$

$$\text{Asp Pmnt Replmt} - (55)(36)/9 = 225 \text{ SY} @ \$12 = \$3,000$$

$$\$135,500$$

$$+ 20\% \text{ Eng, Admin, \& Cont} \quad \$27,000$$

$$\$162,500 \Rightarrow \underline{\underline{\text{Use } \$165,000}}$$

Sta 219+10 to 222+50 - New open channel between Jefferson Street
and Madison Street

$$\text{Clearing} - (50)(340)/43560 = 0.4 \text{ Ac} @ \$20,000 = \$8,000$$

$$\text{Earthwork} - (0.6)(354)(340)/27 = 3000 \text{ CY} @ \$4 = \$12,000$$

$$5' \text{ High Rock Retain Wall} - (2)(0.2)(340) = 136 \text{ LF} @ \$100 = \$14,000$$

$$\text{Landscaping} - (110)(340)/43560 = 0.9 \text{ Ac} @ \$35,000 = \$31,500$$

$$\text{Asp Path} - (15)(340)/9 = 575 \text{ SY} @ \$6 = \$3,500$$