HIGHLANDS RANCH QUADRANGLE
COLORADO
7.5 MINUTE SERIES (TOPOGRAPHIC)

5063 III NE (FITZSIMONS)

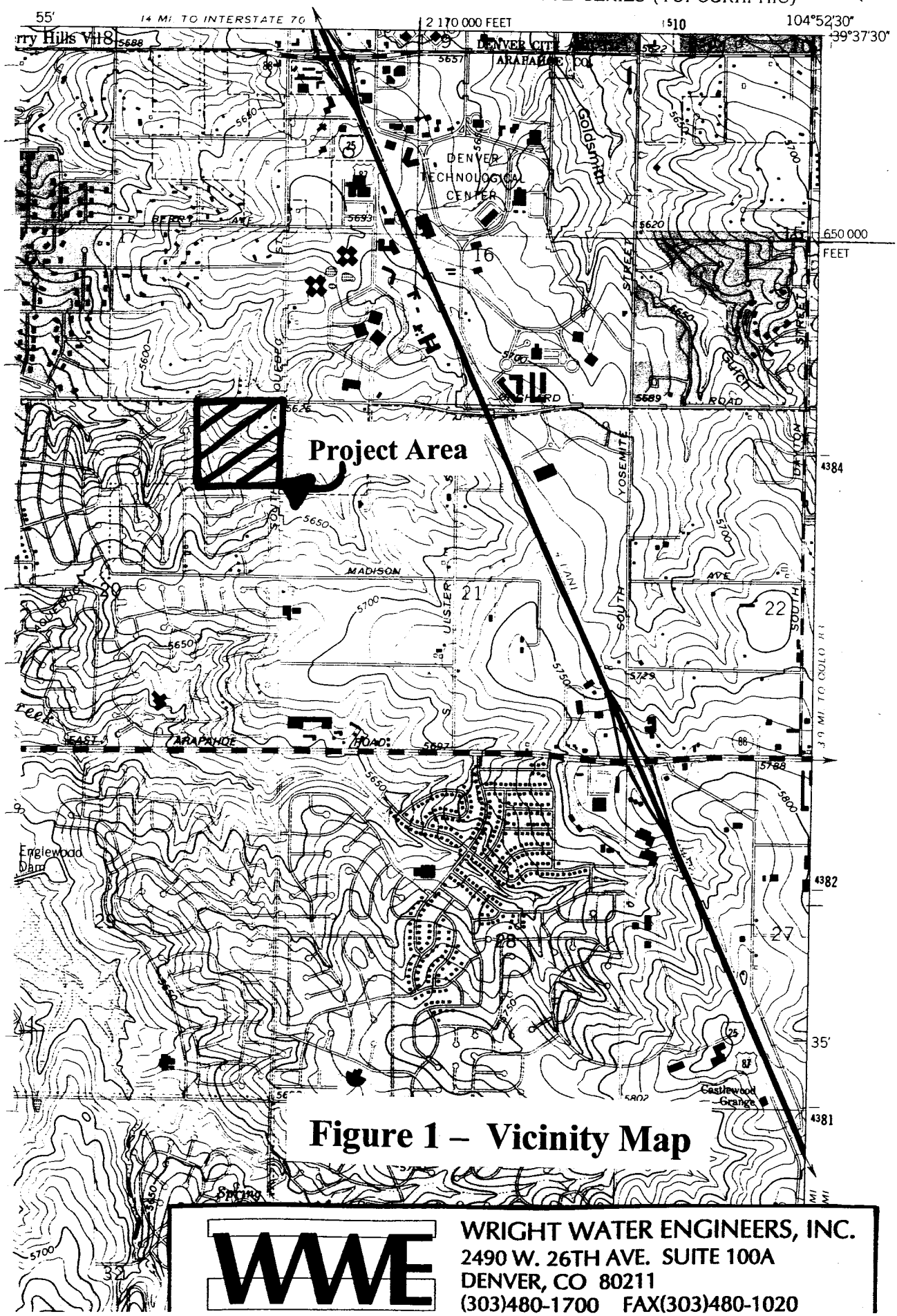


Figure 1 – Vicinity Map

WRIGHT WATER ENGINEERS, INC.
2490 W. 26TH AVE. SUITE 100A
DENVER, CO 80211
(303)480-1700 FAX(303)480-1020

ORCHARD POINT
PROPOSED WETLAND AND CHANNEL FILL AREAS

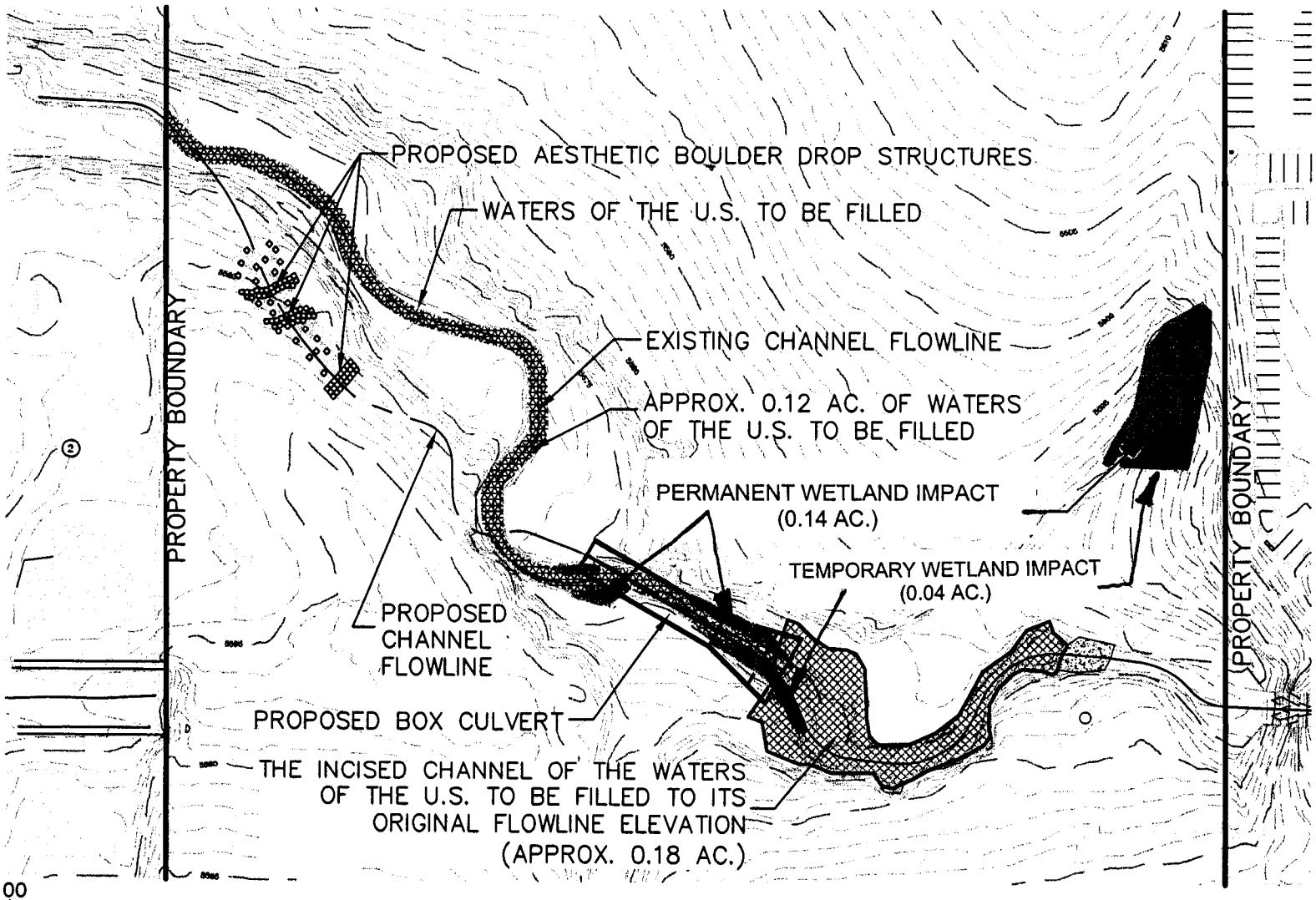
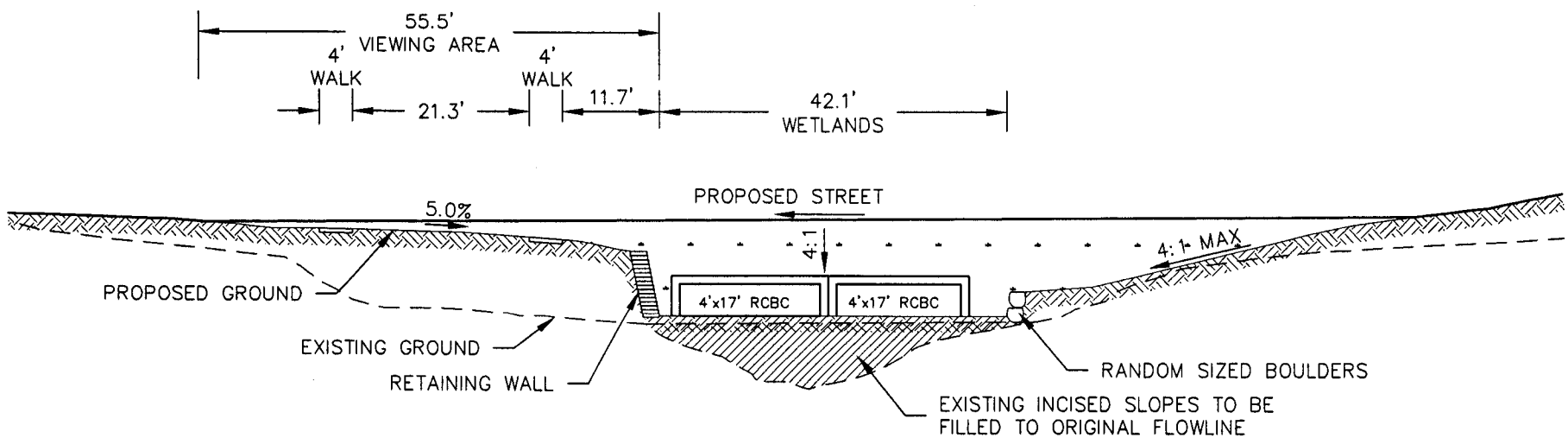


Figure 2: Current Site Conditions and Impact Assessment

Carroll & Lange INC
Professional Engineers & Land Surveyors
165 South Union Blvd., Suite 156
Lakewood, Colorado 80228
(303) 980-0200

P:\2689\CONSTRUCTION\CHANNEL\2689-XSEC.DWG, PREPARED 02/24/03, REV.

CHANNEL CROSS-SECTION AT CULVERT INLET LOOKING DOWNSTREAM



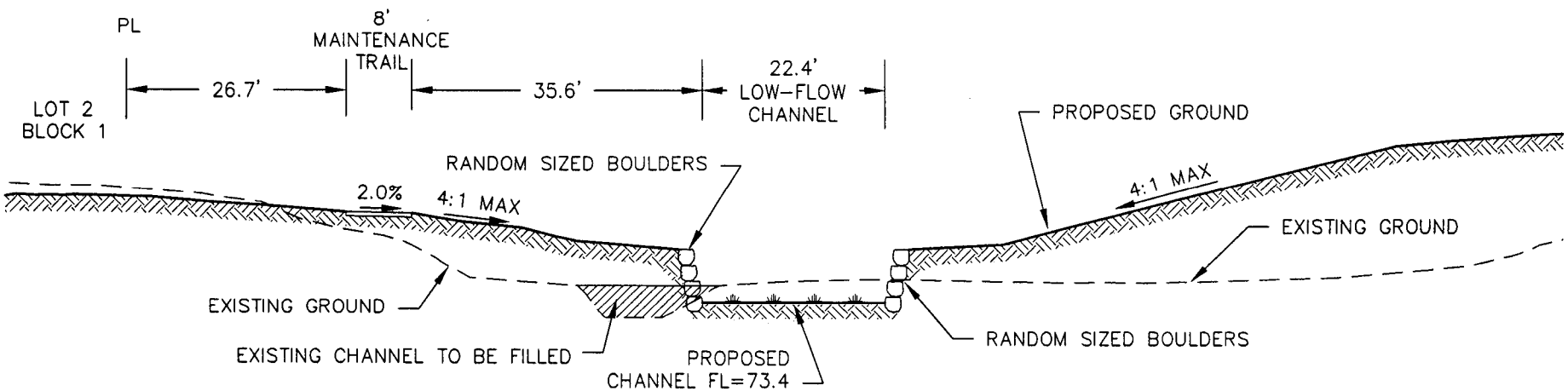
SCALE: 1" = 20'

Figure 5A

Carroll & Lange INC
Professional Engineers & Land Surveyors
165 South Union Blvd., Suite 156
Lakewood, Colorado 80228
(303) 980-0200

P:\2689\CONSTRUCTION\CHANNEL\2689-XSEC.DWG, PREPARED 02/24/03, REV.

CHANNEL CROSS-SECTION AT CULVERT OUTLET LOOKING DOWNSTREAM

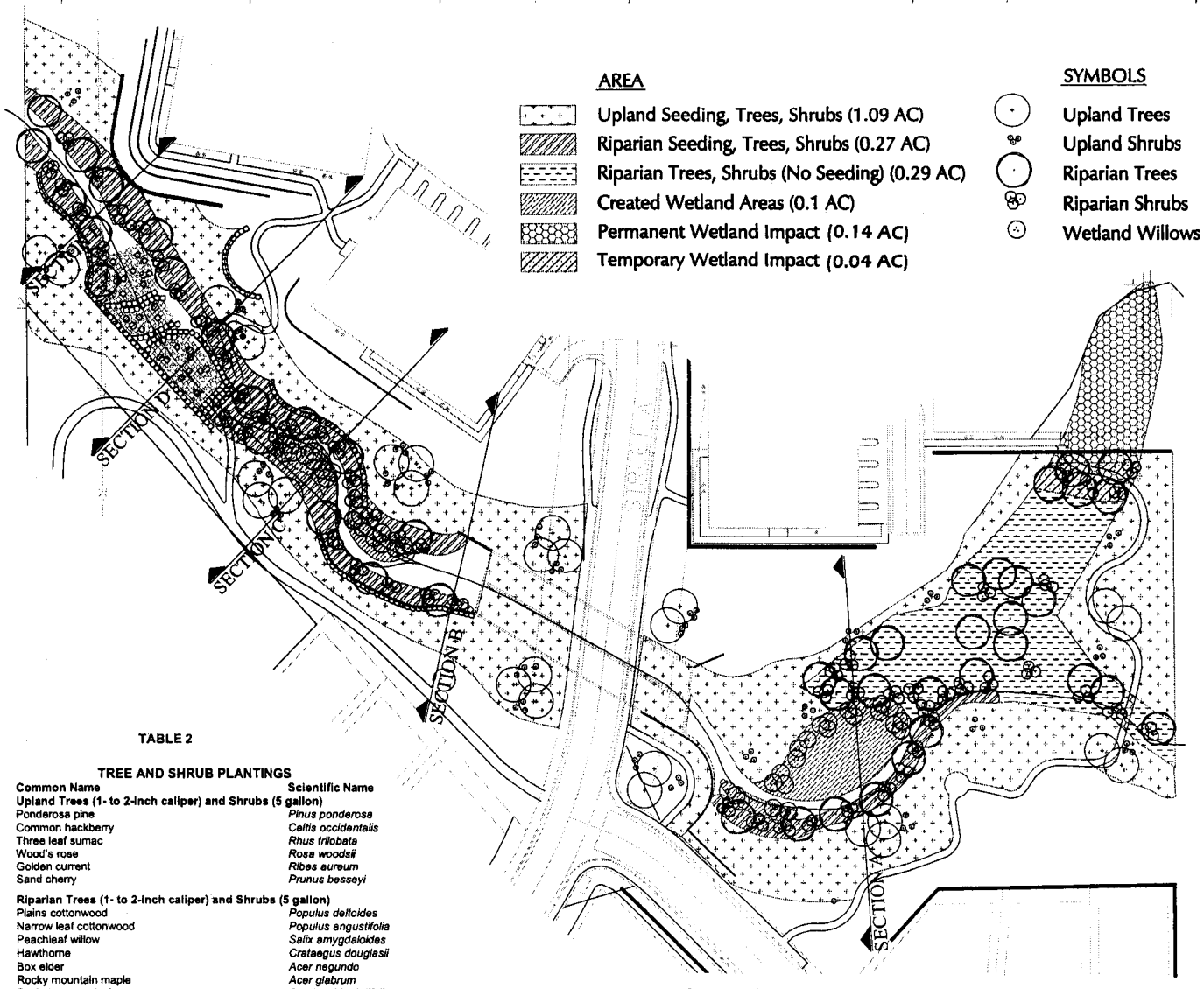


SCALE: 1" = 20'

Figure 5B

Carroll & Lange inc
Professional Engineers & Land Surveyors
165 South Union Blvd., Suite 156
Lakewood, Colorado 80228
(303) 980-0200

P:\2689\CONSTRUCTION\CHANNEL\2689-XSEC.DWG, PREPARED 02/24/03, REV.



1 Drainage Channel Design & Landscape Treatment

SCALE: 1"=40'

0 20 40 80 120 NORTH

TABLE 2

TREE AND SHRUB PLANTINGS

Common Name	Scientific Name
Upland Trees (1- to 2-inch caliper) and Shrubs (5 gallon)	
Ponderosa pine	*Pinus ponderosa*
Common hackberry	*Celtis occidentalis*
Three leaf sumac	*Rhus trilobata*
Wood's rose	*Rosa woodsii*
Golden current	*Ribes aureum*
Sand cherry	*Prunus besseyi*
Riparian Trees (1- to 2-inch caliper) and Shrubs (5 gallon)	
Plains cottonwood	*Populus deltoides*
Narrow leaf cottonwood	*Populus angustifolia*
Peachleaf willow	*Salix amygdaloides*
Hawthorne	*Crataegus douglasii*
Box elder	*Acer negundo*
Rocky mountain maple	*Acer glabrum*
Saskatoon serviceberry	*Amelanchier latifolia*
Chokecherry	*Prunus virginiana*
American wild plum	*Prunus americana*
Red twig dogwood	*Cornus sericea*
Common snowberry	*Symphoricarpos albus*

TABLE 3

WETLAND HERBACEOUS PLANTS MIX [1]

Common Name	Scientific Name
Shallow Water Regime (0 to 6 inches in depth)	
Wooly sedge	*Carex lanuginosa*
Nebraska sedge	*Carex nebrascensis*
Spike rush	*Eleocharis pakustris*
Torrey's rush	*Juncus torreyi*
Baltic rush	*Juncus balticus*
Prairie cordgrass	*Spartina pectinata*
Blue vervain	*Verbena hastata*
Deeper Water Regime (6 to 12 inches in depth)	
Hardstem bulrush	*Scirpus acutus*
Small-fruit bulrush	*Scirpus microcarpus*
Cloaked bulrush	*Scirpus pallidus*
Wetland Shrubs (5 gallon)	
Coyote willow	*Salix exigua*
Blue willow	*Salix geyeriana*

[1] 10-cubic-inch plugs placed at 1.5 feet on center.

TABLE 4

RIPARIAN AND UPLAND GRASS SEED MIXES [1]

Common Name	Scientific Name	Pounds PLS*/Acre
Riparian Area		
Basin wild rye	*Leymus cinereous*	5.7
Inland salt grass	*Distichlis spicata*	1.6
Western wheatgrass	*Pascopyron smithii*	7.9
Alkali sacaton	*Sporobolus airoides*	0.5
Slender wheatgrass	*Elymus trachycaulus*	5.5
Switchgrass	*Panicum virgatum*	1.3
	Total	22.5 pounds PLS*/Acre
Upland Area		
Canada wild rye	*Elymus canadensis*	8.3
Alkali sacaton	*Sporobolus airoides*	0.5
Streambank wheatgrass	*Elymus lanceolatus*	5.6
Western wheatgrass	*Pascopyron smithii*	7.9
Blue grama	*Bouteloua gracilis*	4.0
	Total	26.3 pounds PLS*/Acre

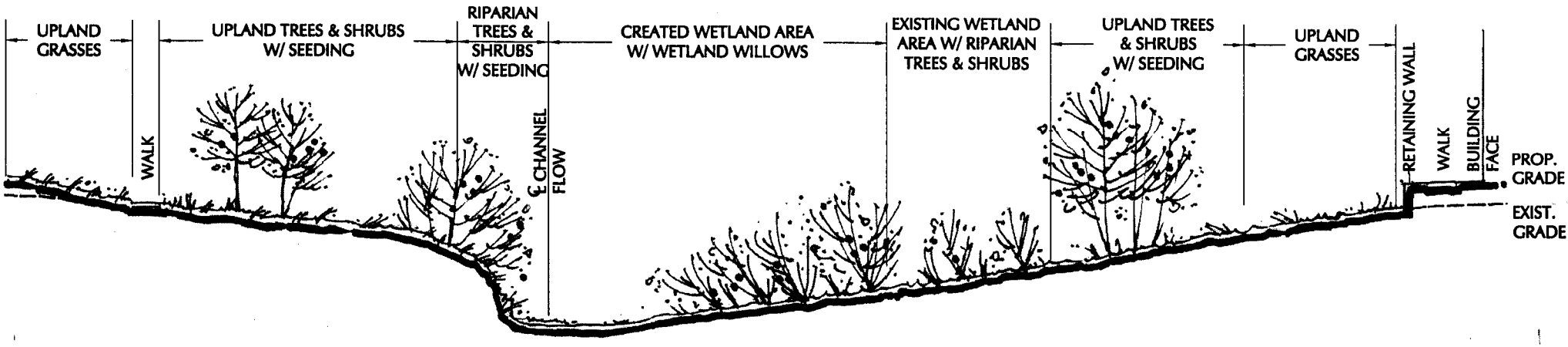
[1] Add 50 percent if hydro seeded or brillion drilled. Add 100 percent if broadcast seeded.
*PLS = Pure live seed

TABLE 5

CHANNEL VEGETATION TYPES AND QUANTITIES

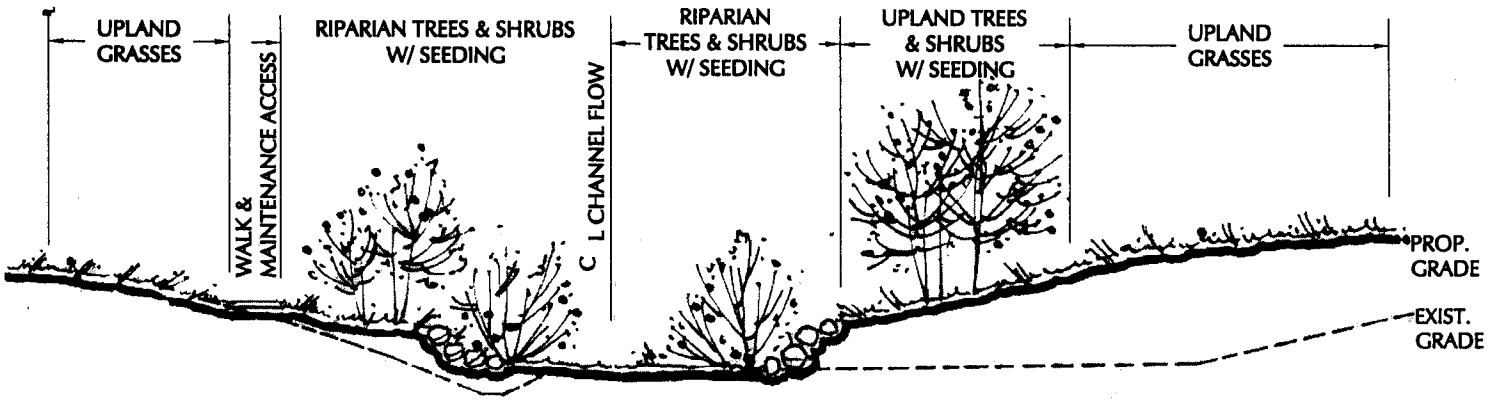
Vegetation Type	Quantity
Upland seeding	47,445 square feet
Upland deciduous trees	27
Upland conifer trees	8
Upland shrubs	69
Riparian seeding	11,730 square feet
Riparian trees	42
Riparian shrubs	168
Wetland shrubs	42
Wetland plants	4,356 square feet

Figure 6A: Mitigation Plan and Cross Sections



2 SECTION A

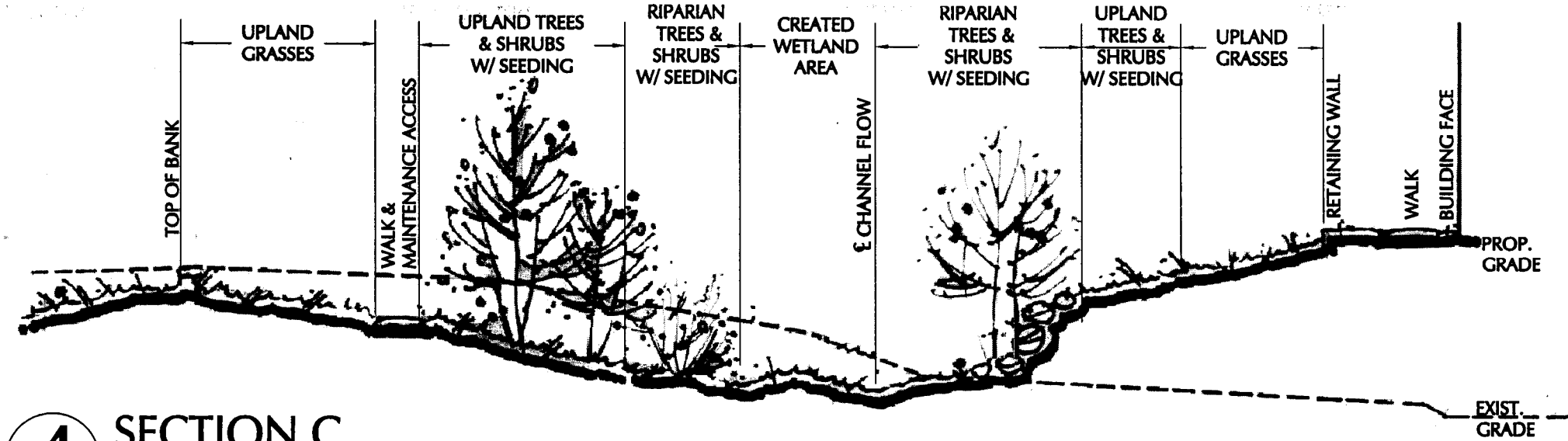
SCALE: NTS



3 SECTION B

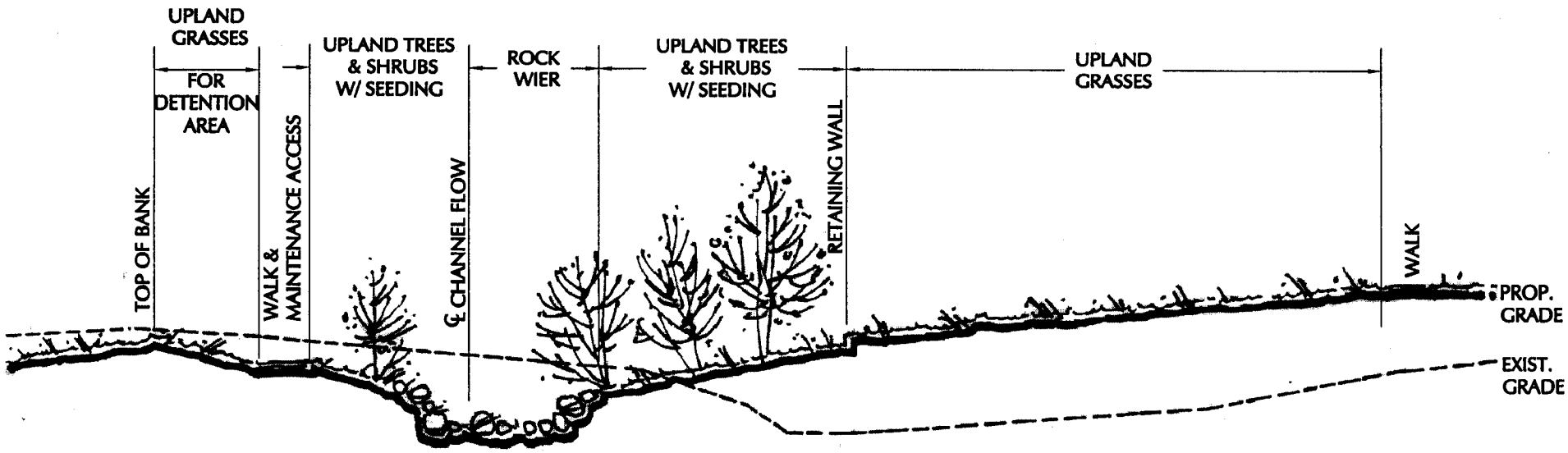
SCALE: NTS

Figure 6B: Mitigation Plan and Cross Sections



4 SECTION C

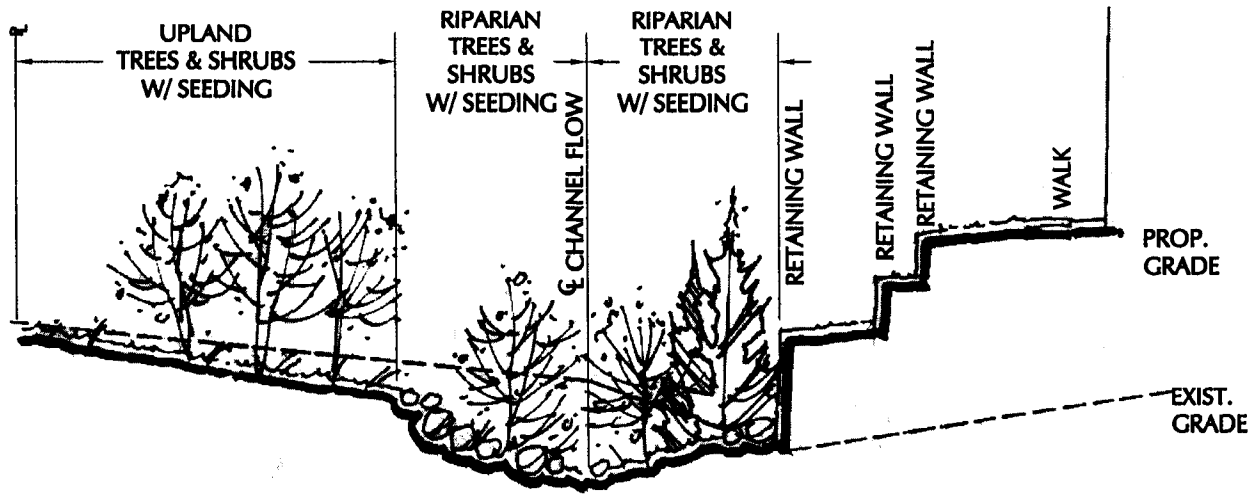
SCALE: NTS



5 SECTION D

SCALE: NTS

Figure 6C: Mitigation Plan and Cross Sections



6 SECTION E

SCALE: NTS

Figure 6D: Mitigation Plan and Cross Sections