

# Reid Crowther

Please refer to file 23849-C00-4  
1-002GRR.DOC

August 27, 1993

Fairmont Hot Springs Resort Ltd,  
405, 1111-11 Avenue SW  
Calgary, Alberta T2R 0G5

Attention: Mr. Peter Mulyk, P. Eng.

Dear Sir:

**RE: Coldspring Creek Diversion Stage 2**

We are pleased to present the results of the hydraulic design for the extension of the Coldspring Creek channelization upstream of Highway 93/95. (Figure 1.1)

The purpose of the study was to review the design of the channelization of Coldspring Creek from the upper end of the existing channelization (Columbia River to immediately downstream of Highway 93/95) to an existing debris control dam. A previous study (J N Mackenzie Engineering Ltd, January, 1989) defined the hydrologic, hydraulic, and debris flow design criteria and parameters. The same parameters and criteria will apply to the current study.

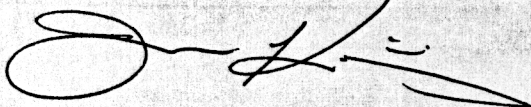
The existing location of the Coldspring Creek is shown on Figure 1.2. The creek currently crosses Highway 93/95 and three local roads in Fairmont development, by means of small culverts which currently require periodic maintenance to clean out. The creek slope varies from 7.81% through the development area to 12.12% in the upper reaches of the study area near the ski hill access road.

The channelization of the creek may follow the existing route, or may be shifted for development planning purposes. The alignment is not critical as long as design grades are not exceeded and bend radii are not less than 30m. Channel bend radius is defined as the radius to the centerline of the channel for any curved portions. In order to ensure debris flows pass unimpeded along the channel, road crossings as shown on figure 1.2 are recommended.

If you should have any questions, please call.

Yours truly,

**REID CROWTHER & PARTNERS LTD.**

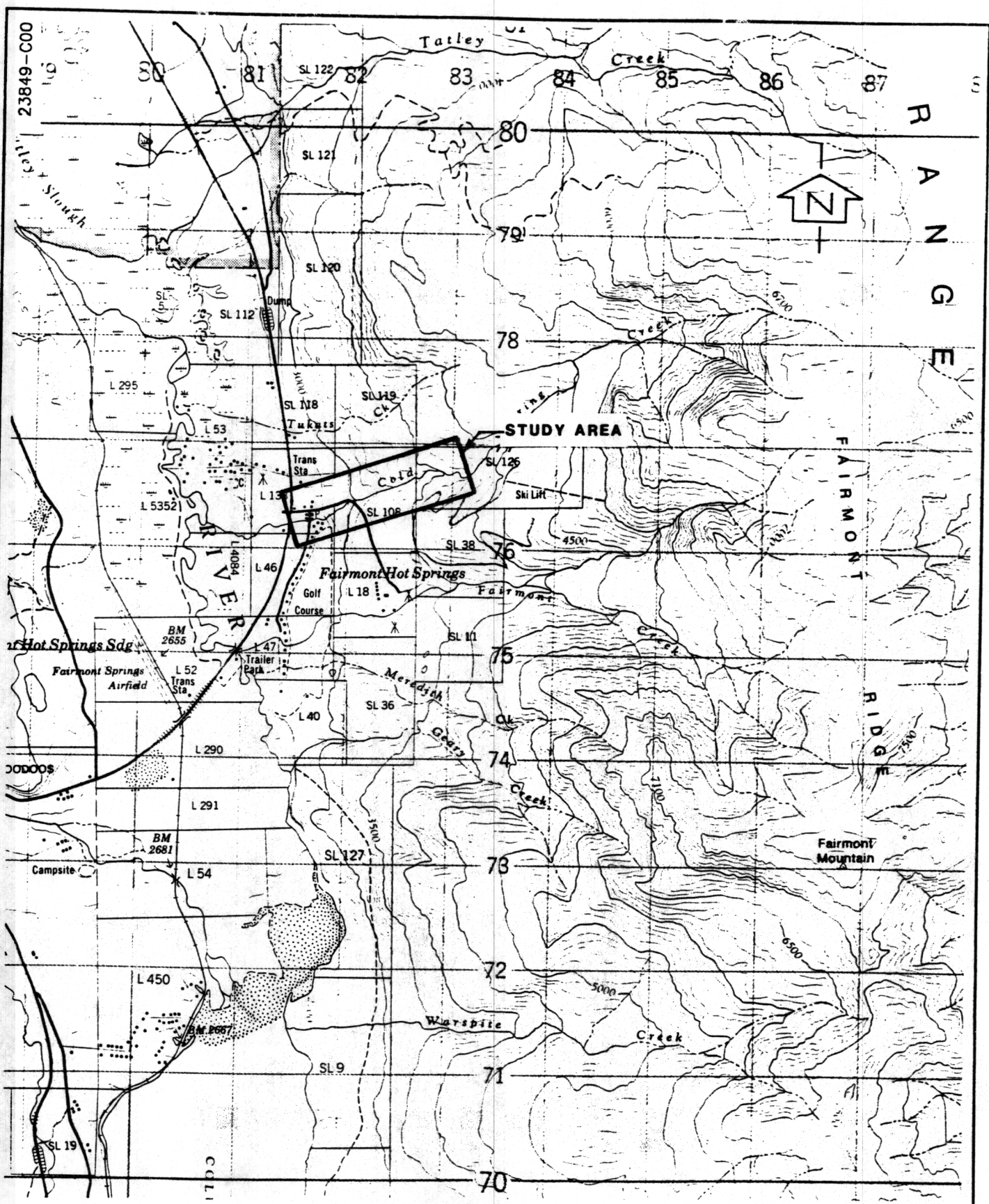


J.N. Mackenzie, P.Eng.

Reid Crowther & Partners Ltd.

Consulting Engineers

#300, Atrium VII, 340 Midpark Way S.E., Calgary, Alberta T2X 1P1, Phone: (403) 254-3301, Fax: (403) 254-3333



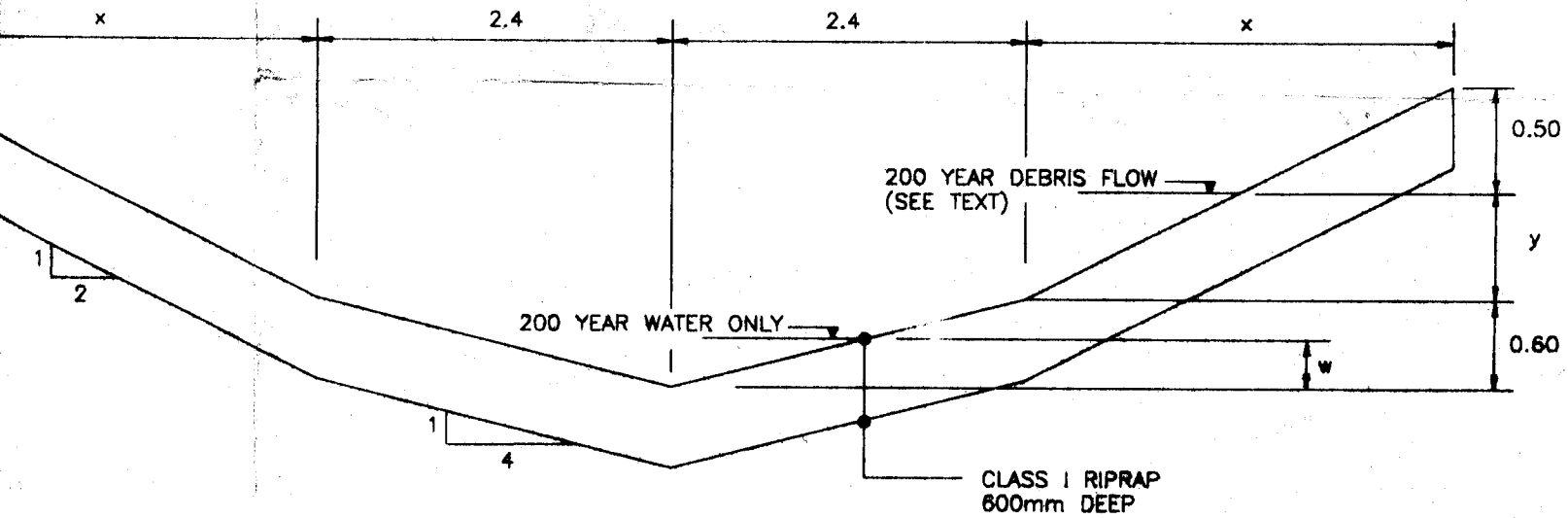
SCALE 1:50,000

FIGURE 1.1

**Reid  
Crowther**

FAIRMONT HOT SPRINGS RESORT LTD.  
COLD SPRING CREEK DIVERSION STAGE 2  
LOCATION PLAN





TYPICAL CHANNEL CROSS-SECTION

N.T.S.

SLOPE	x (m)	y (m)	w (m)
0.0781	2.80	0.90	0.50
0.1000	2.70	0.85	0.47
0.1212	2.60	0.80	0.46

FIGURE 1.2

PROPOSED CHANNEL

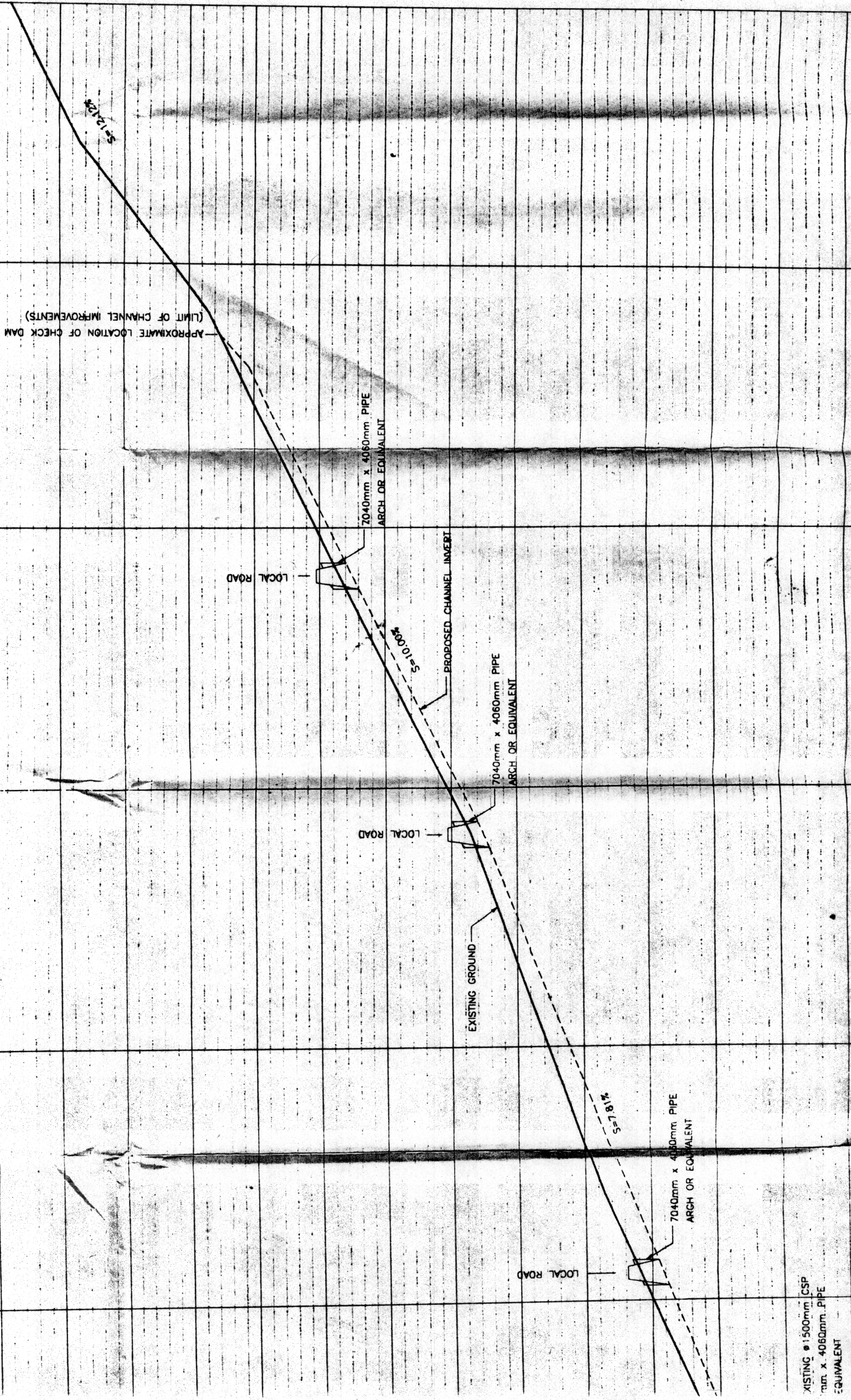
UPSTREAM OF HWY 93/95

FAIRMONT HOT SPRINGS RESORT LTD

COLD SPRING CREEK DIVERSION STAGE

SCALE 1/2500 HORIZONTAL  
1/500 VERTICAL

DATE JULY 1993



APPROXIMATE LOCATION OF CHECK DAM  
(LIMIT OF CHANNEL IMPROVEMENTS)

S=12.12%

7040mm x 4060mm PIPE  
ARCH OR EQUIVALENT

LOCAL ROAD

S=10.04%

PROPOSED CHANNEL INVERT

7040mm x 4060mm PIPE  
ARCH OR EQUIVALENT

LOCAL ROAD

EXISTING GROUND

S=7.81%

7040mm x 4060mm PIPE  
ARCH OR EQUIVALENT

LOCAL ROAD

EXISTING  $\phi$  1500mm CSP  
PIPE x 4060mm PIPE  
EQUIVALENT