

**CROMWELL BOROUGH COUNCIL**  
**NEIGHBOURHOOD ONE DEVELOPMENT**

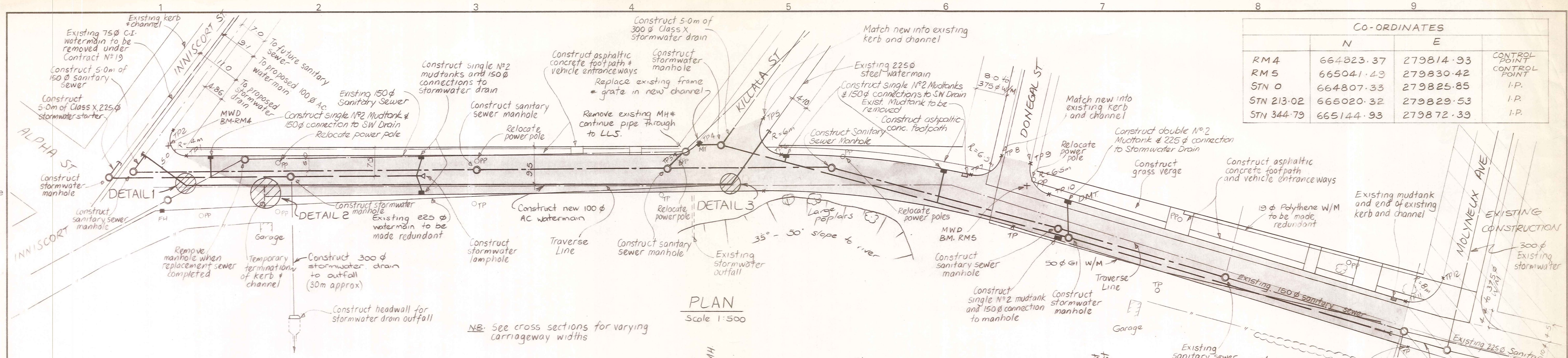


DUFFILL WATTS & KING LTD  
Consulting Engineers

CONTRACT NO 18

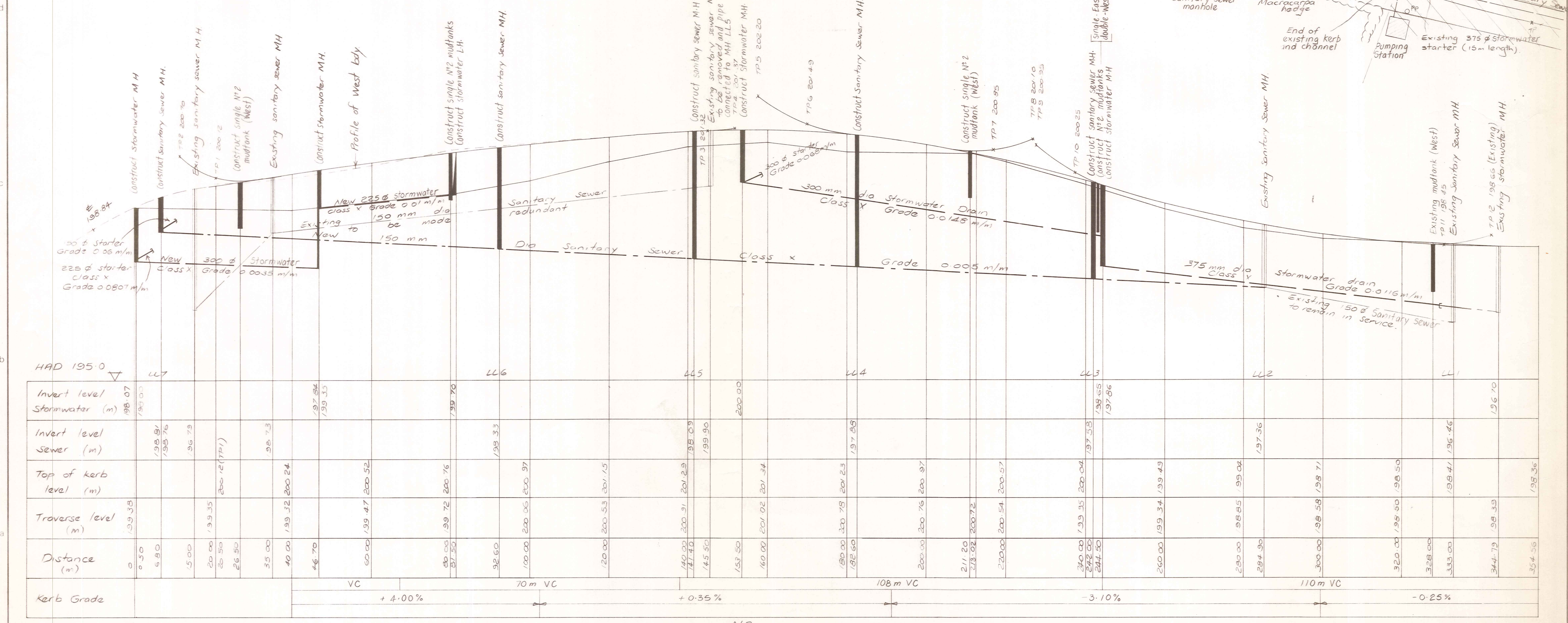
ALPHA ST.

Set No



|            | CO-ORDINATES |           |               |
|------------|--------------|-----------|---------------|
|            | N            | E         |               |
| RM 4       | 664823.37    | 279814.93 | CONTROL POINT |
| RMS        | 665041.49    | 279830.42 | CONTROL POINT |
| STN 0      | 664807.33    | 279825.85 | I.P.          |
| STN 213.02 | 665020.32    | 279829.53 | I.P.          |
| STN 344.79 | 665144.93    | 279872.39 | I.P.          |

PLAN  
Scale 1:500



LONGITUDINAL SECTION  
Scales 1:500 Horiz, 1:50 Vert.

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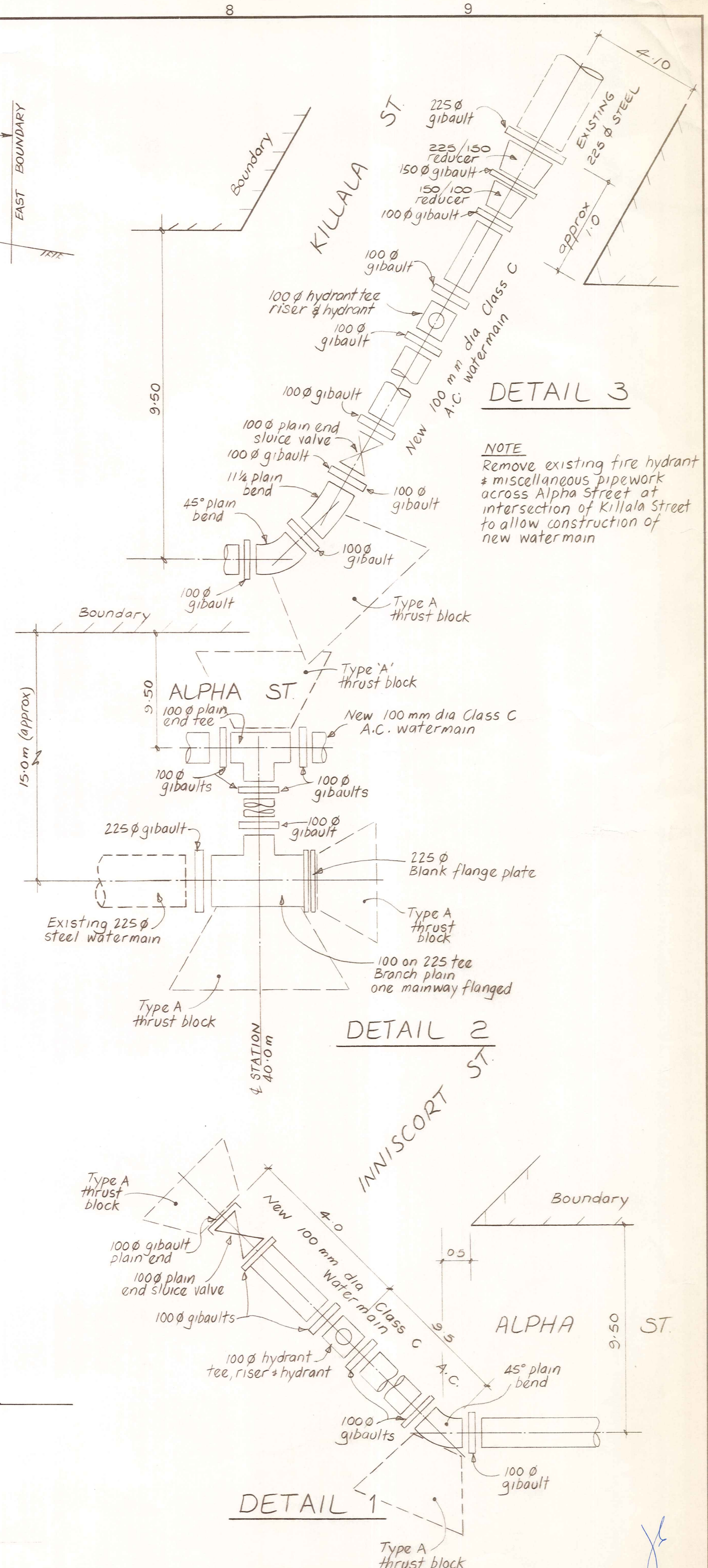
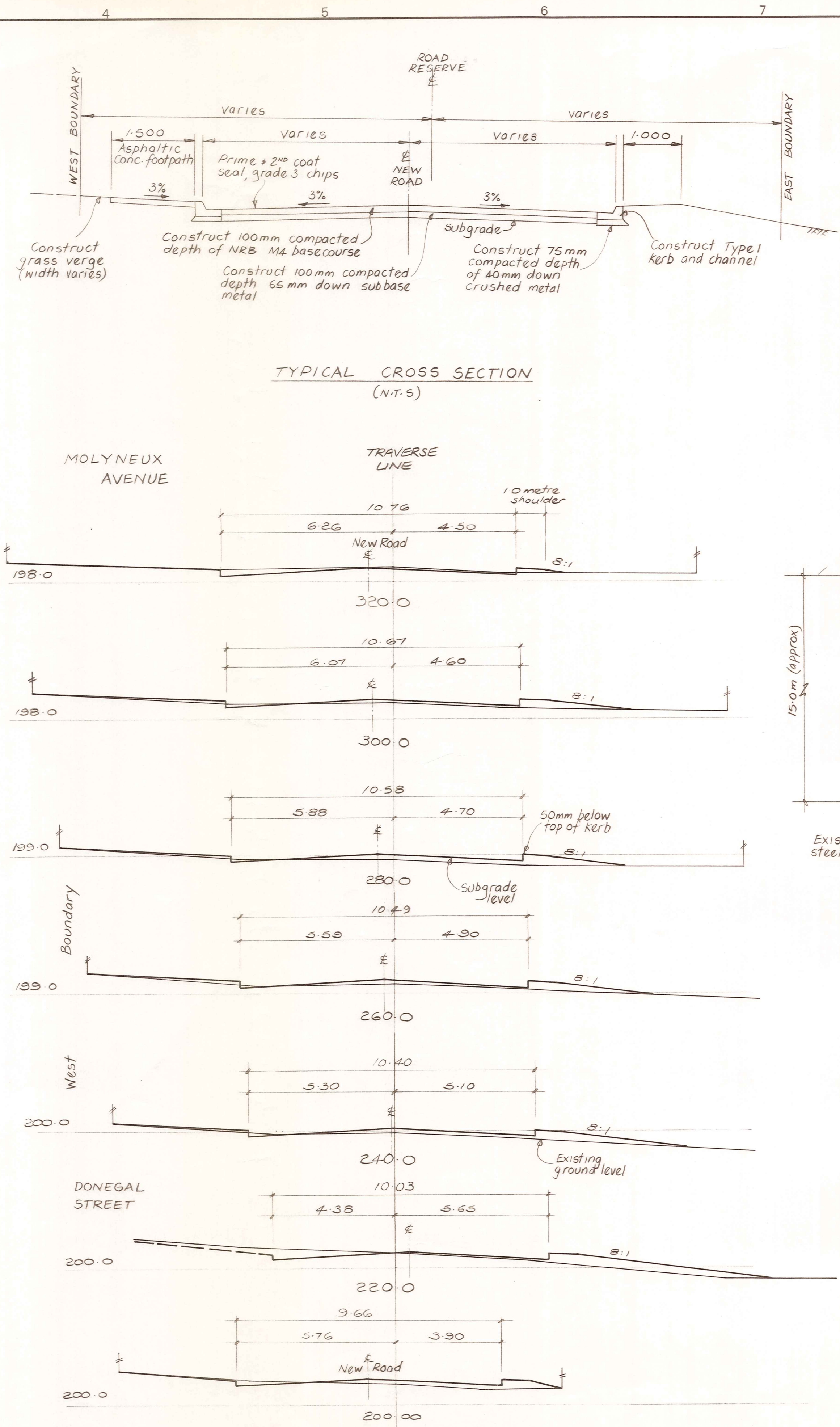
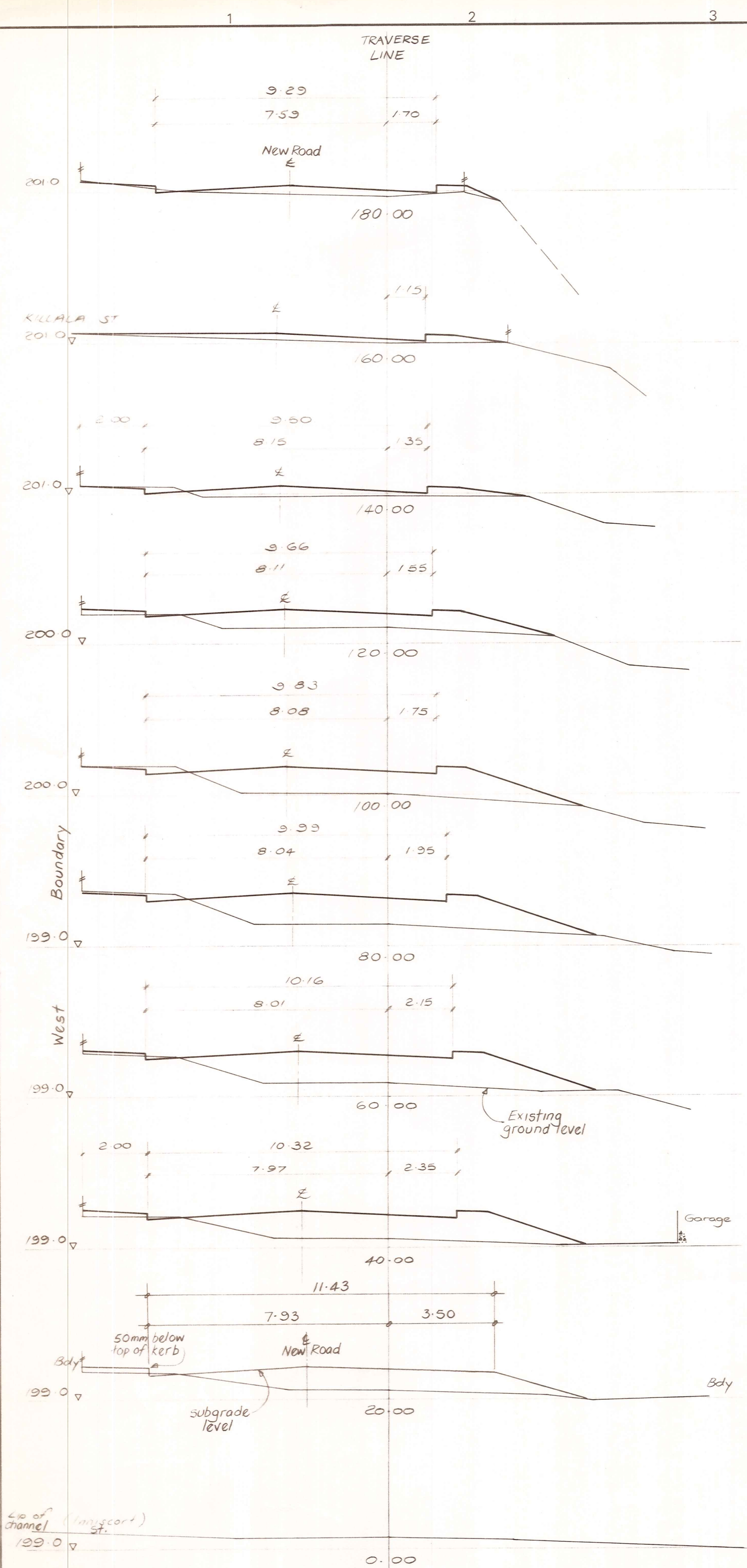
CROMWELL  
BOROUGH COUNCIL

NEIGHBOURHOOD 1  
DEVELOPMENT

CONTRACT NO. 18  
CONSTRUCTION OF  
STREETWORKS AND  
ENGINEERING SERVICES

ALPHA STREET  
(STAGE III TRUNKMANS AND  
STREETWORKS)

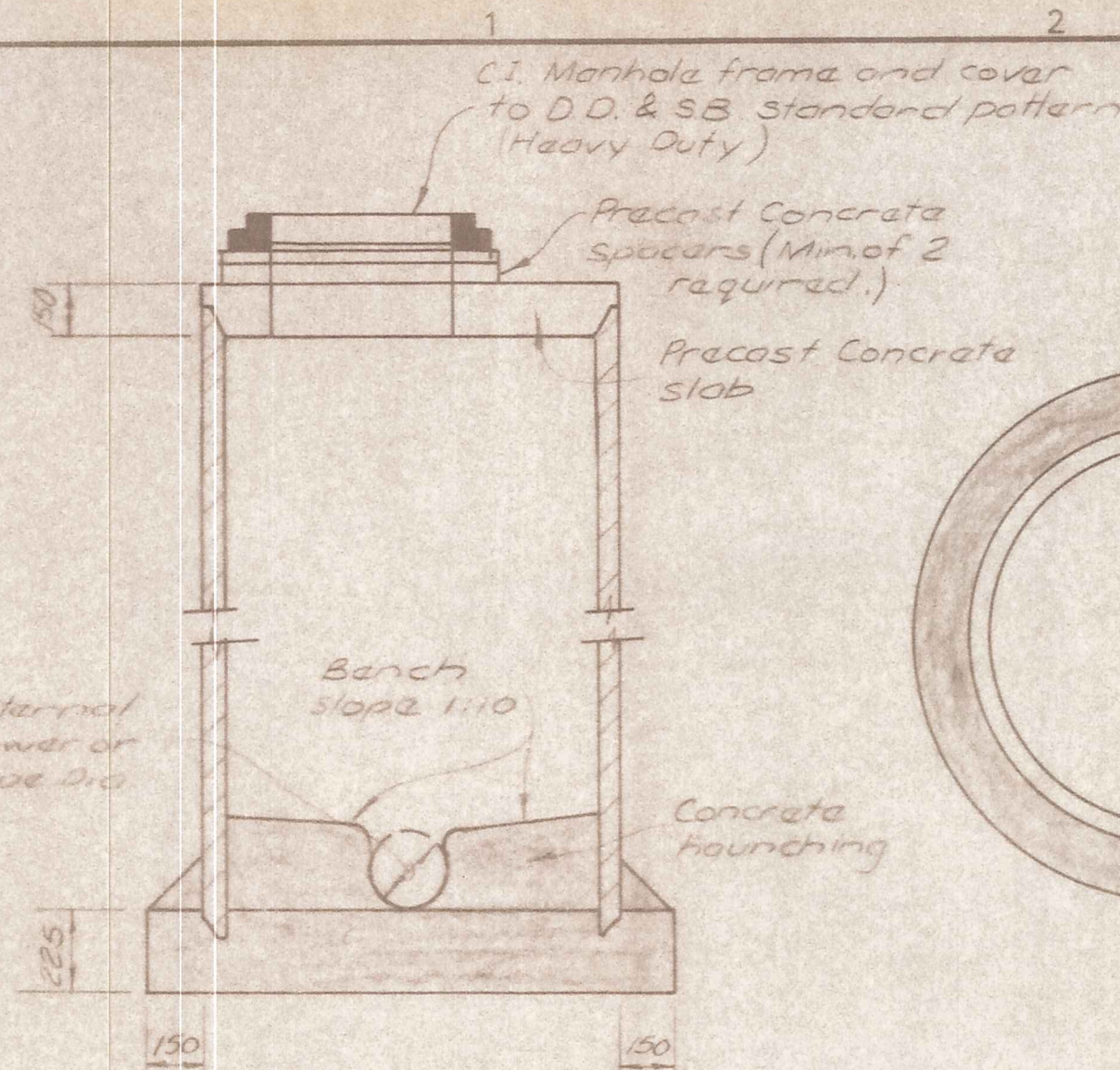
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|------------|----|------|--------------|-------------------|-----------------------|-----------|
| NO.        | BY | DATE |              |                   | 10126                 | 1         |
|            |    |      | Surveyed     | N. Jelley Jan '83 |                       |           |
|            |    |      | Drawn        | " " "             |                       |           |
|            |    |      | Calculations | " " "             |                       |           |
|            |    |      | Traced       | J. Murie Aug '83  |                       |           |
|            |    |      | Checked      | R. H. "           | of 6 sheets           |           |
|            |    |      | Approved     | [Signature] 3/84  | File 3/13/80 L.B. 415 | F.B. ~    |



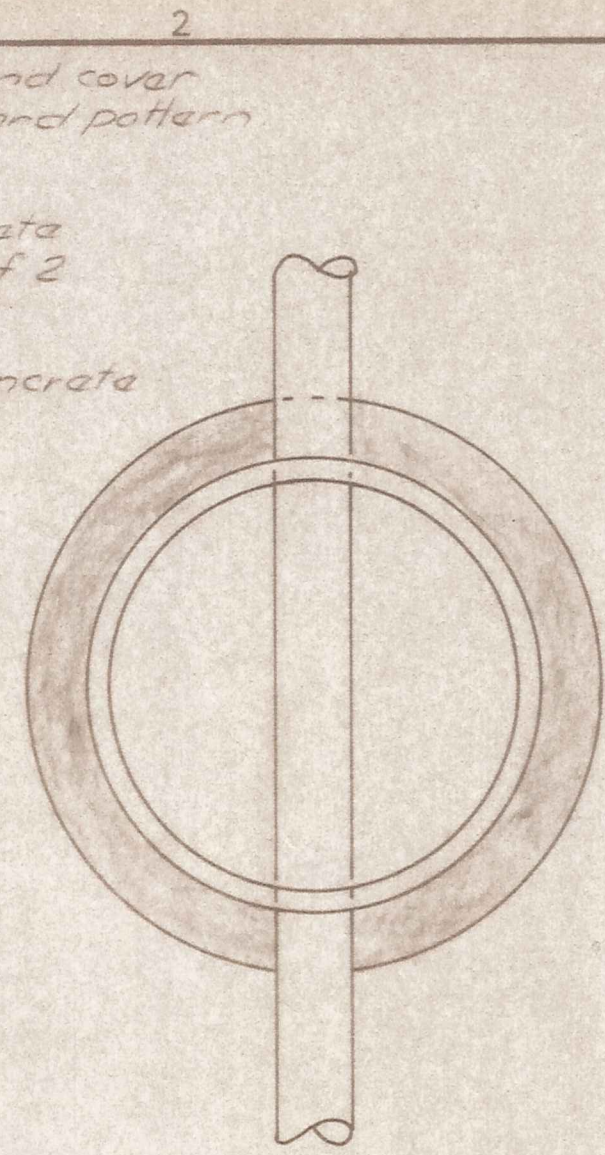
SCALE 1:100

ORIGINAL SIZE INCHES

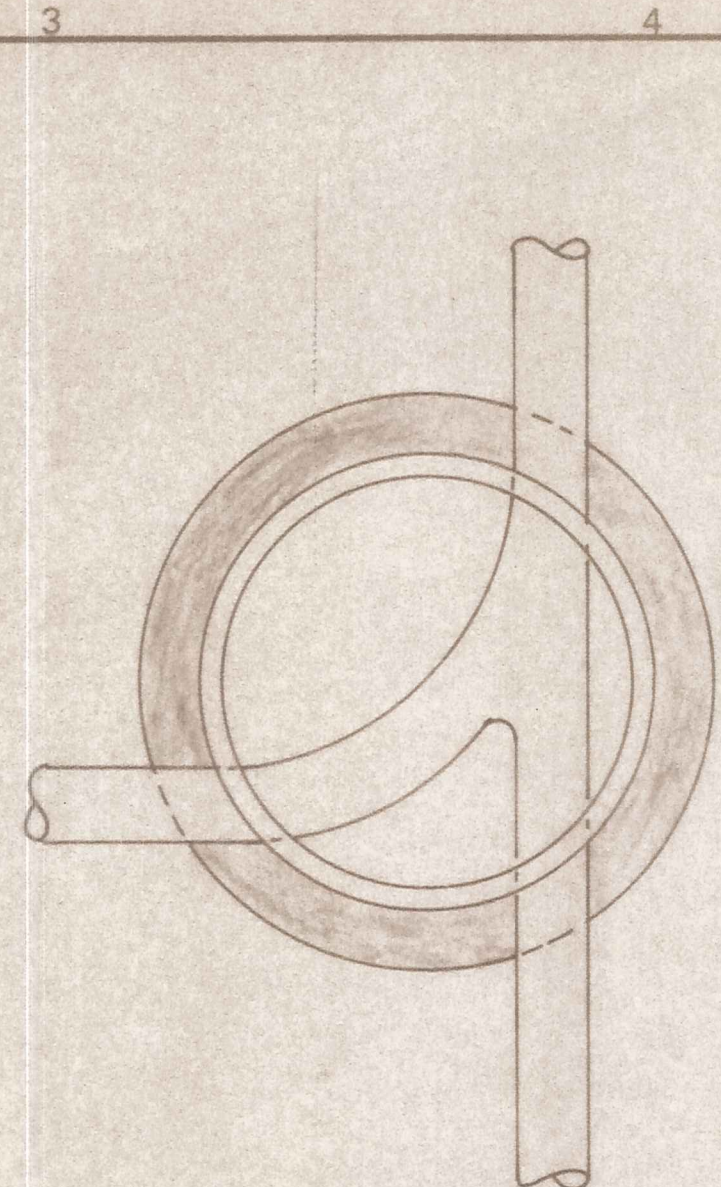
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|---|---------------------------------|------------------------------------|--|---|------------|----------------------------|-------|----------------------------|----------------|-----------|
| <b>DUFFILL WATTS &amp; KING LTD</b><br>CONSULTING CIVIL & STRUCTURAL ENGINEERS<br>Dunedin PO Box 5269 Ph 777-133 Invercargill PO Box 576 Ph 83049<br>Cromwell PO Box 82 Ph 50-391 | <b>CROMWELL BOROUGH COUNCIL</b> | <b>NEIGHBOURHOOD 1 DEVELOPMENT</b> | CONTRACT NO. 18                                      | <b>ALPHA STREET</b><br>(STAGE III TRUNKMAINS AND STREETWORKS) | AMENDMENTS |                            |       | NAME DATE                  | JOB NO.        | Sheet No. |
|   |                                 |                                    | CONSTRUCTION OF STREETWORKS AND ENGINEERING SERVICES | NO. BY DATE   | Appvd.     | Surveyed N. Jelley Jan '83 | 10126 | 2                          |                |           |
|   |                                 |                                    |  |   |            |                            |       | Drawn " " "                |                |           |
|   |                                 |                                    |  |   |            |                            |       | Calculations " " "         |                |           |
|   |                                 |                                    |  |   |            |                            |       | Traced J. Murie August '83 |                |           |
|   |                                 |                                    |  |   |            |                            |       | Checked R. H.              |                |           |
|   |                                 |                                    |  |   |            |                            |       | Approved [Signature] 3/84  | File # 1/19/20 | L.B. 415  |



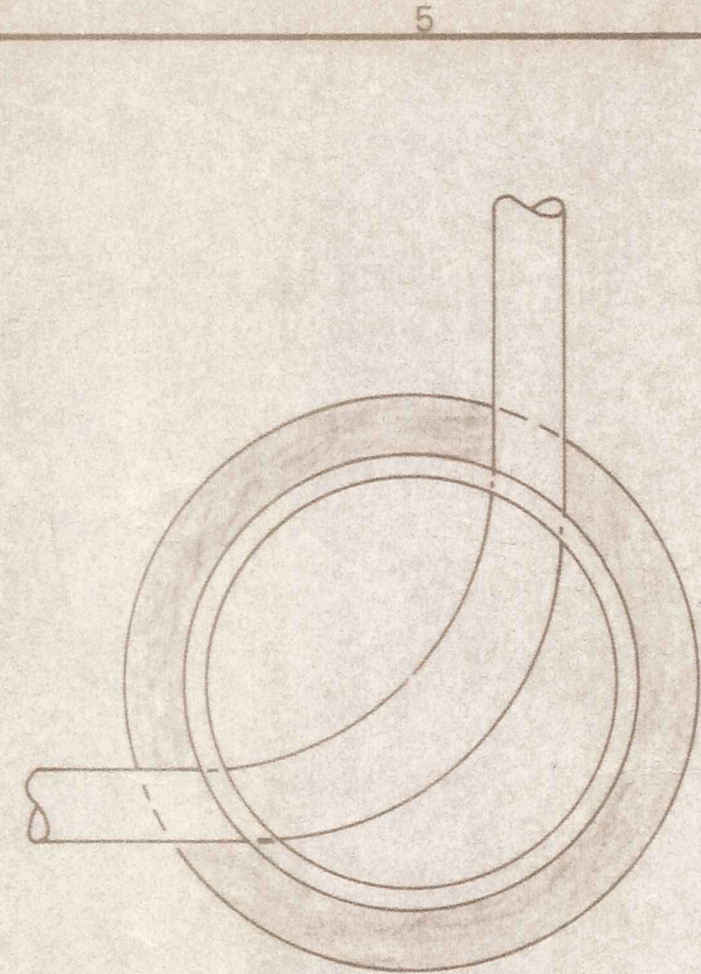
SECTION  
PRECAST MANHOLE



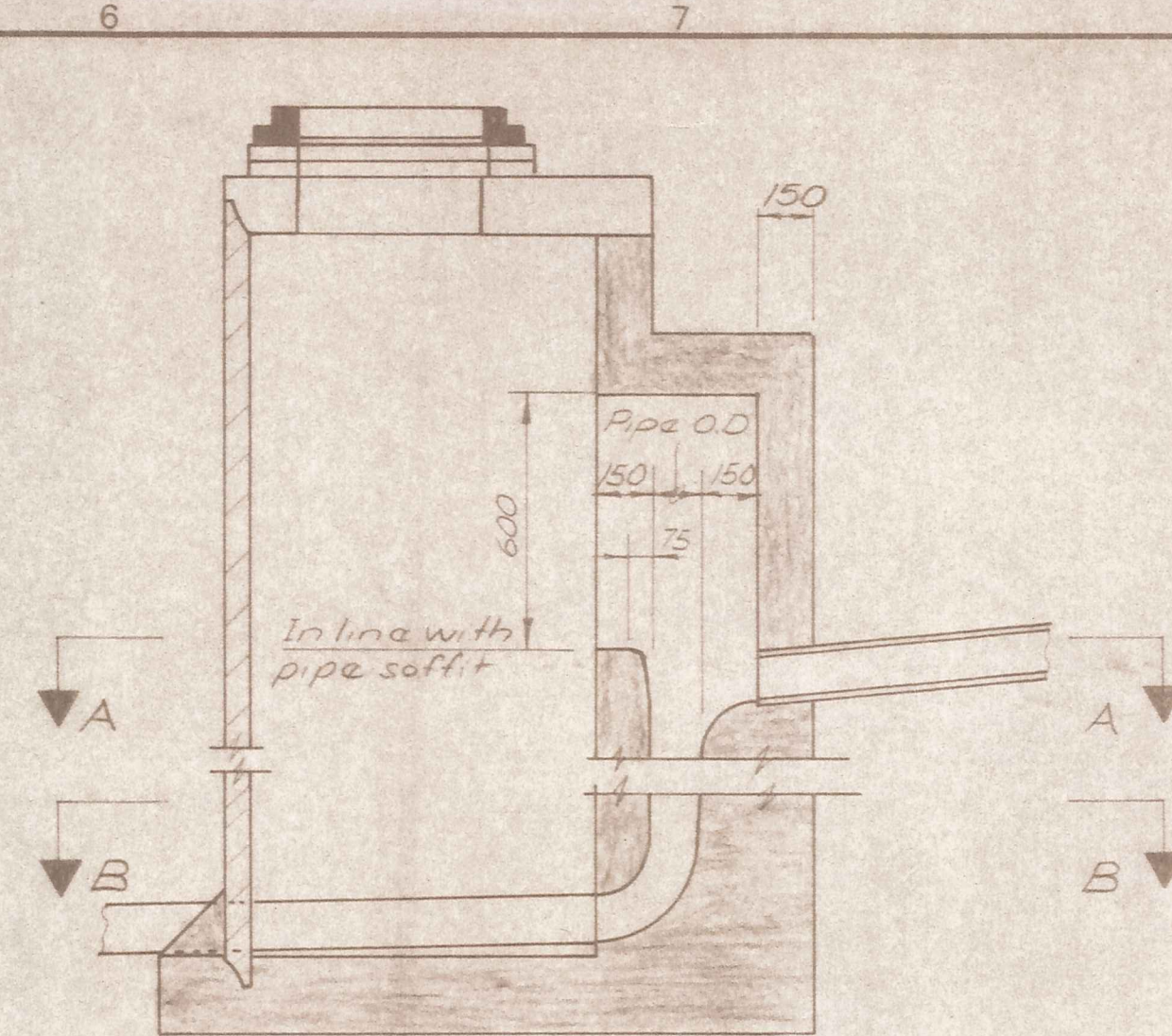
PRECAST  
STRAIGHT THRU MANHOLES



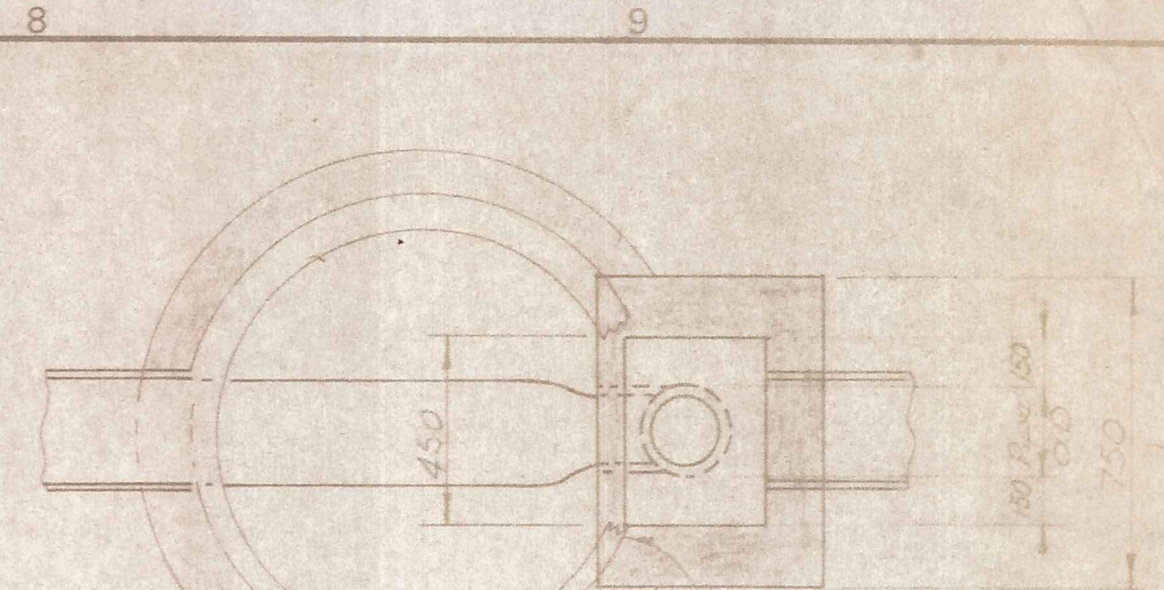
PRECAST  
JUNCTION MANHOLES



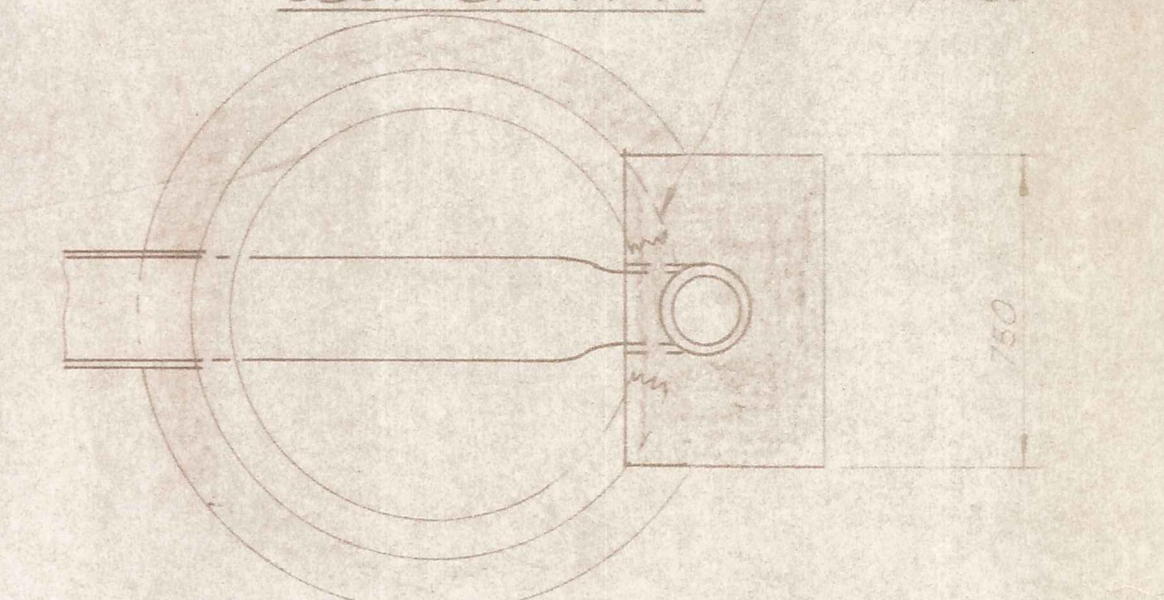
PRECAST  
ANGLE MANHOLES



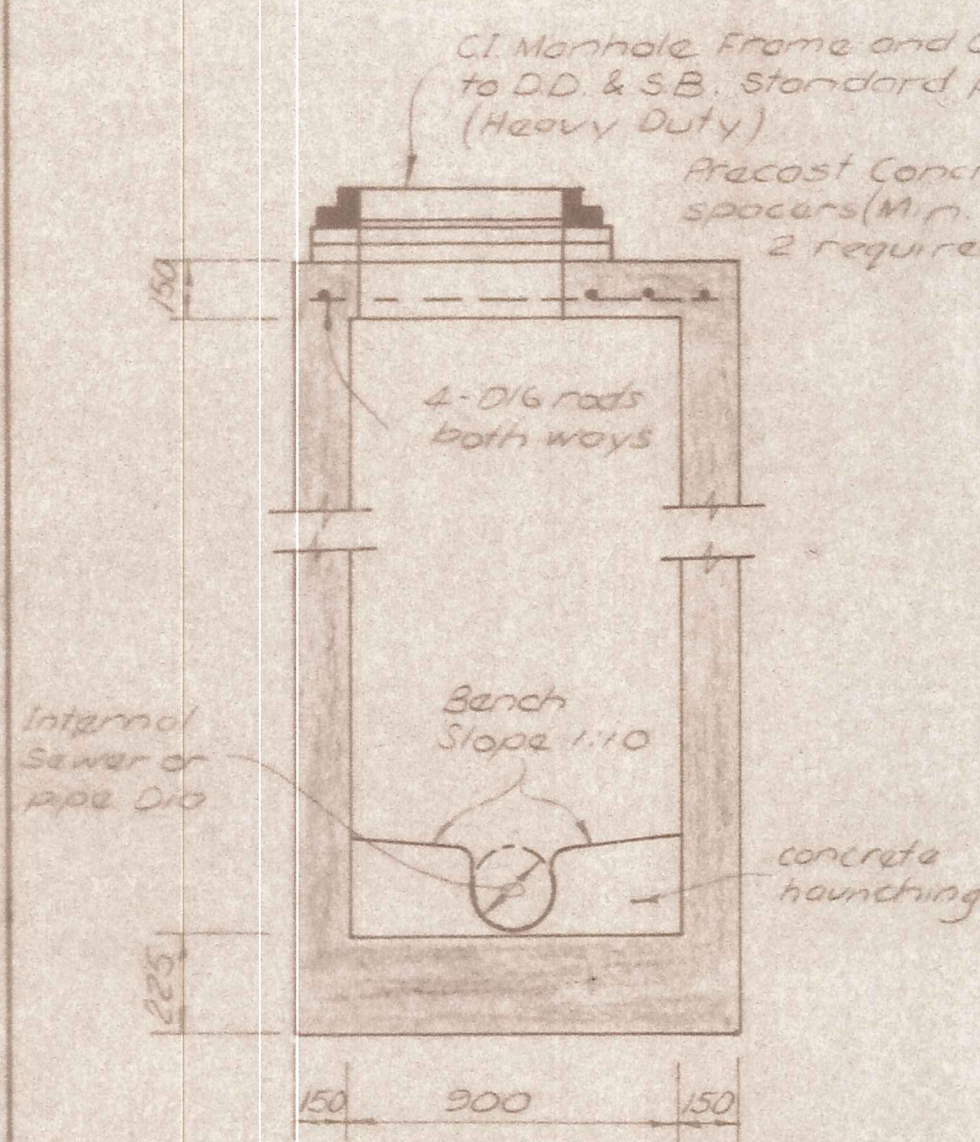
PRECAST  
DROP MANHOLE



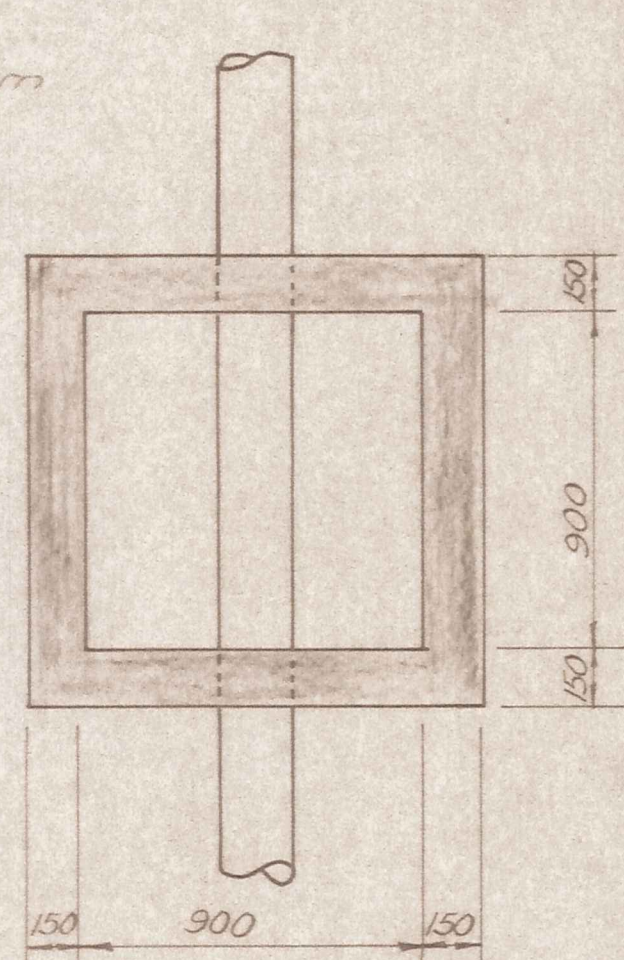
SECTION A-A



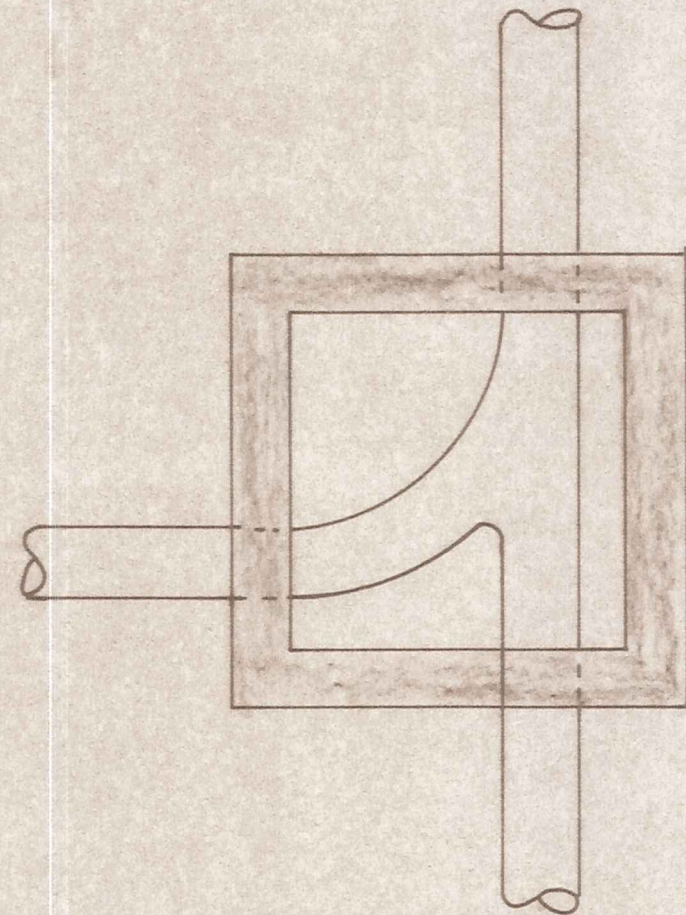
SECTION B-B



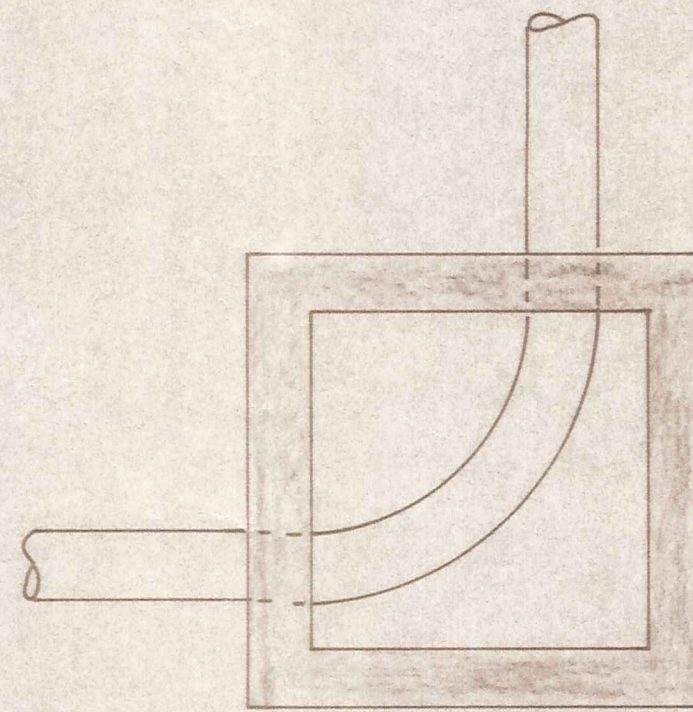
SECTION  
CAST IN-SITU MANHOLE



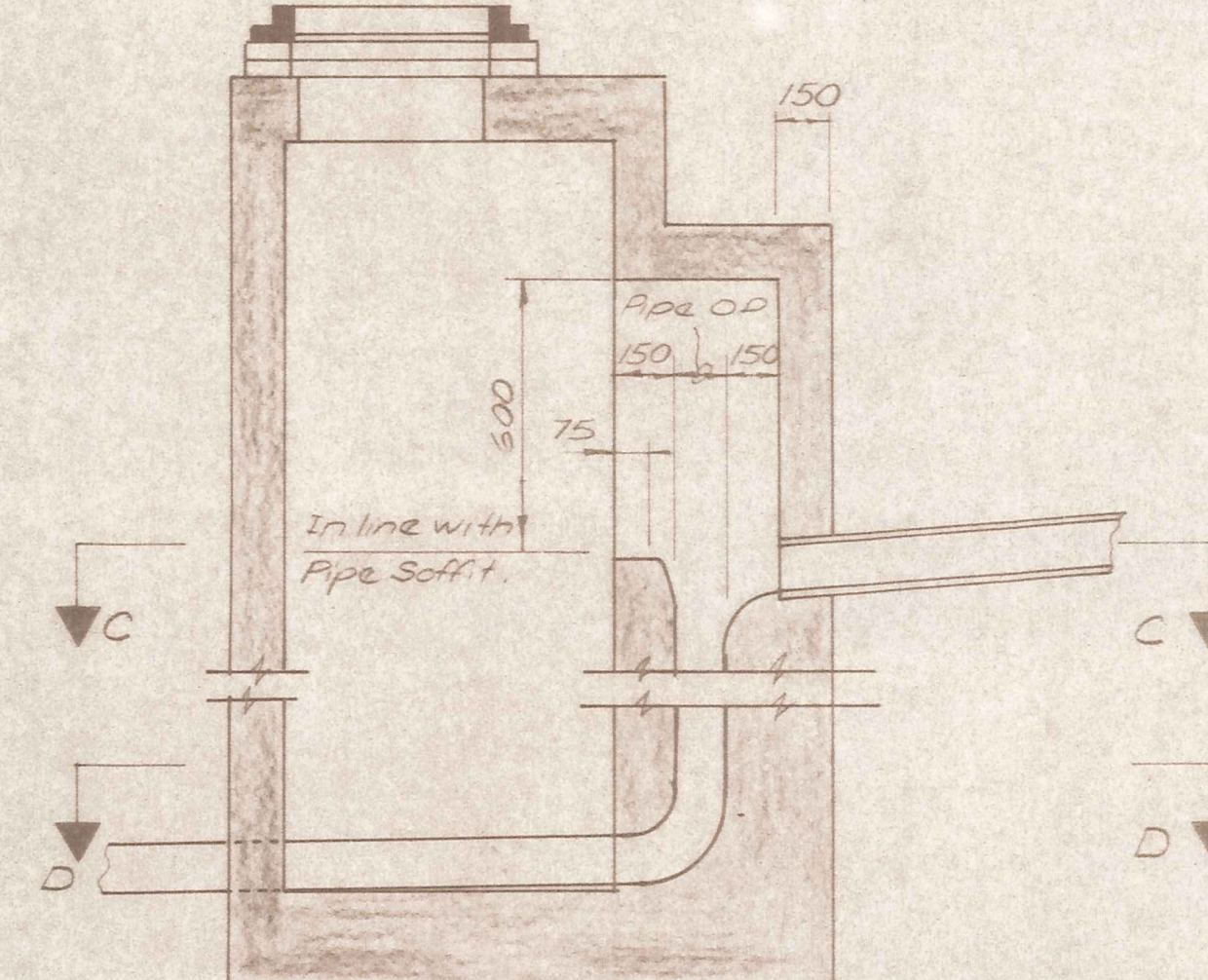
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STRAIGHT THRU MANHOLES



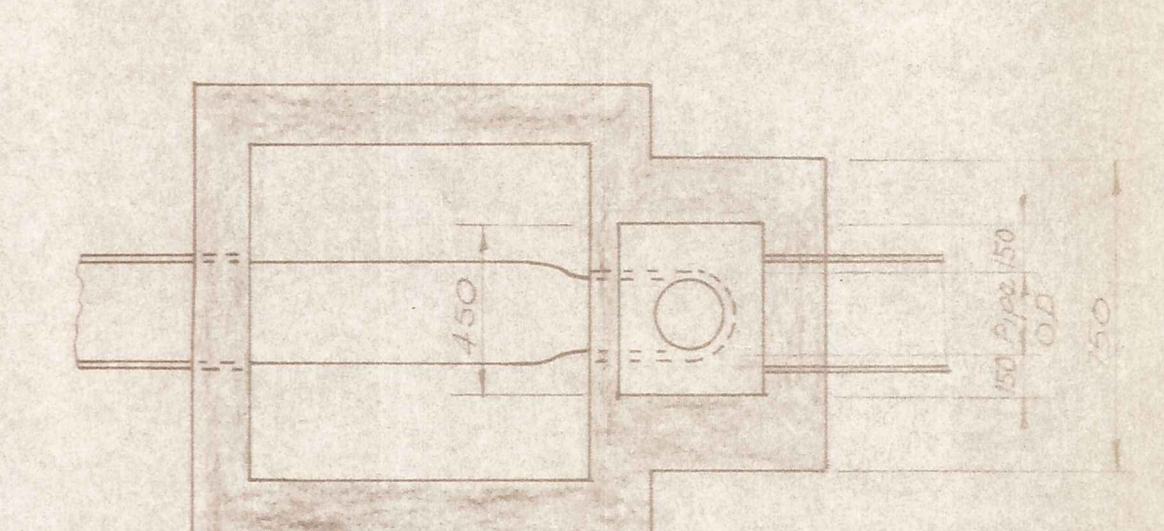
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JUNCTION-MANHOLE



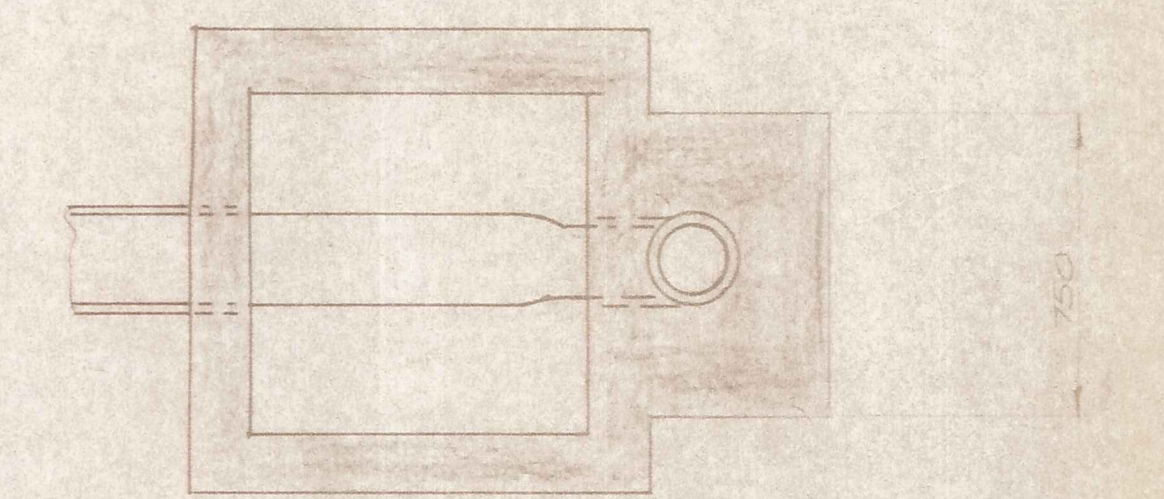
CAST IN-SITU  
ANGLE MANHOLE



CAST IN-SITU  
DROP MANHOLE



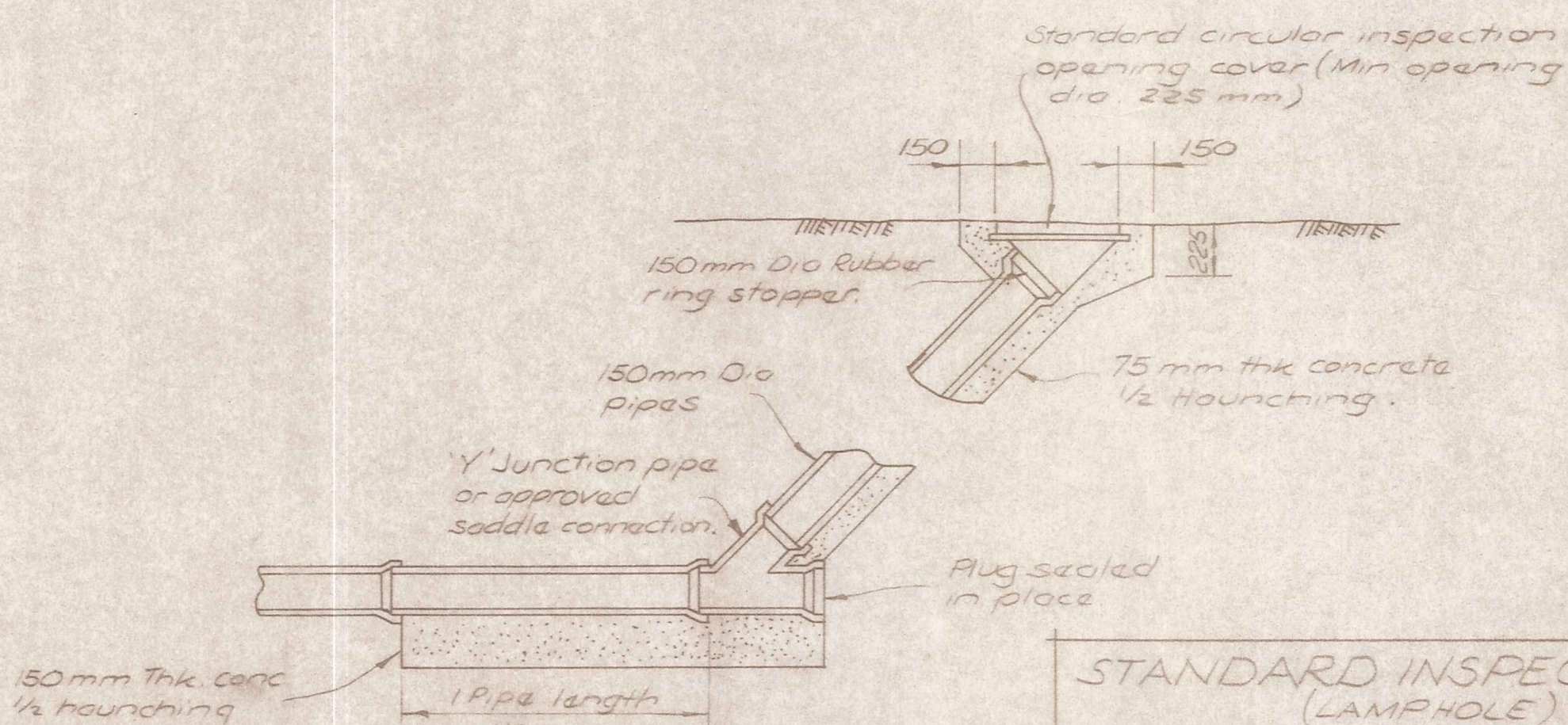
SECTION C-C



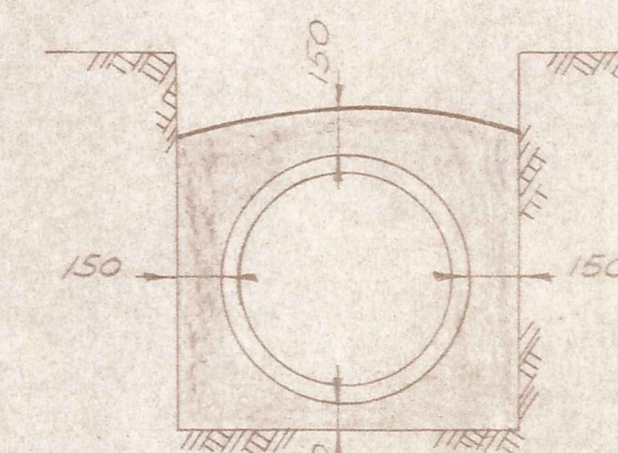
SECTION D-D

NOTE: Wall thickness increases to 225mm for manholes greater than 3.0m deep.

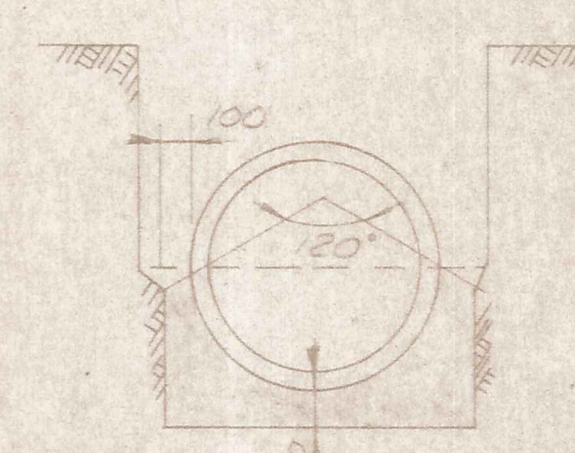
STANDARD SANITARY SEWER MANHOLE DETAILS  
(FOR DIAMETERS LESS THAN 375 mm)



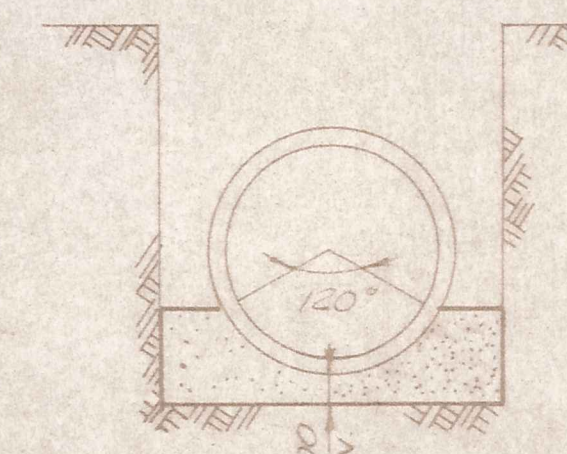
STANDARD INSPECTION OPENING  
(LAMP HOLE)



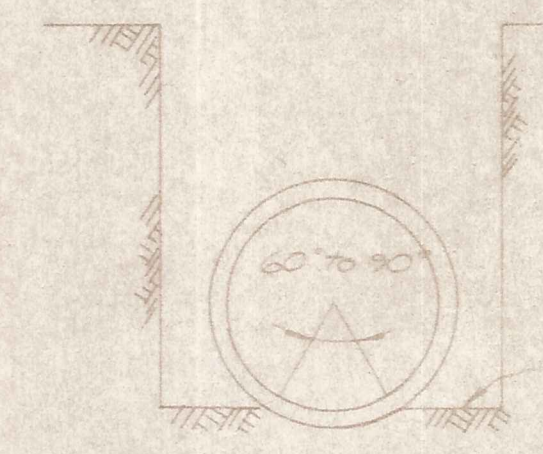
CONCRETE SURROUND



CONCRETE BEDDING



GRAVEL BEDDING



ORDINARY BEDDING

BEDDING OF PIPES

NOT TO SCALE

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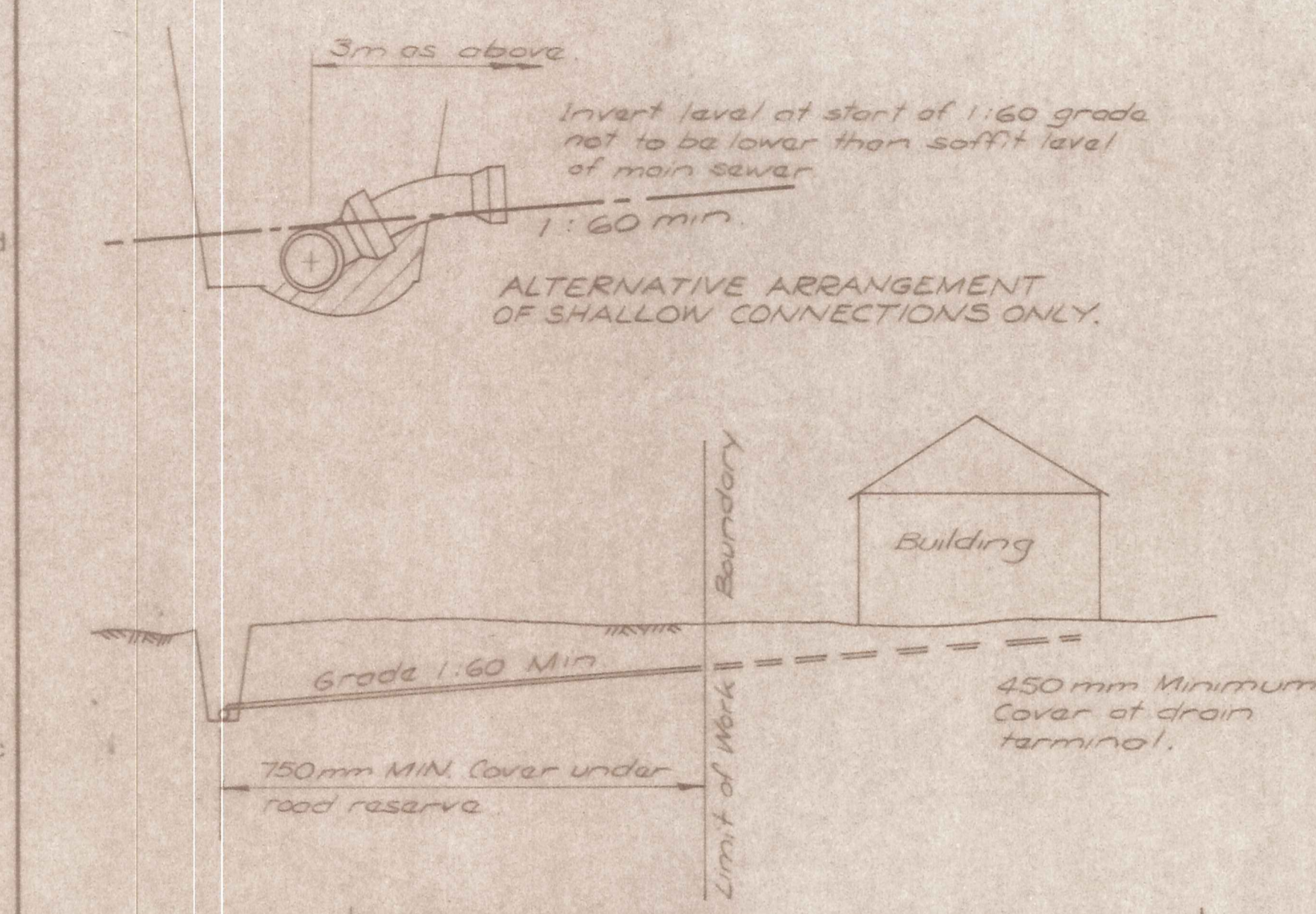
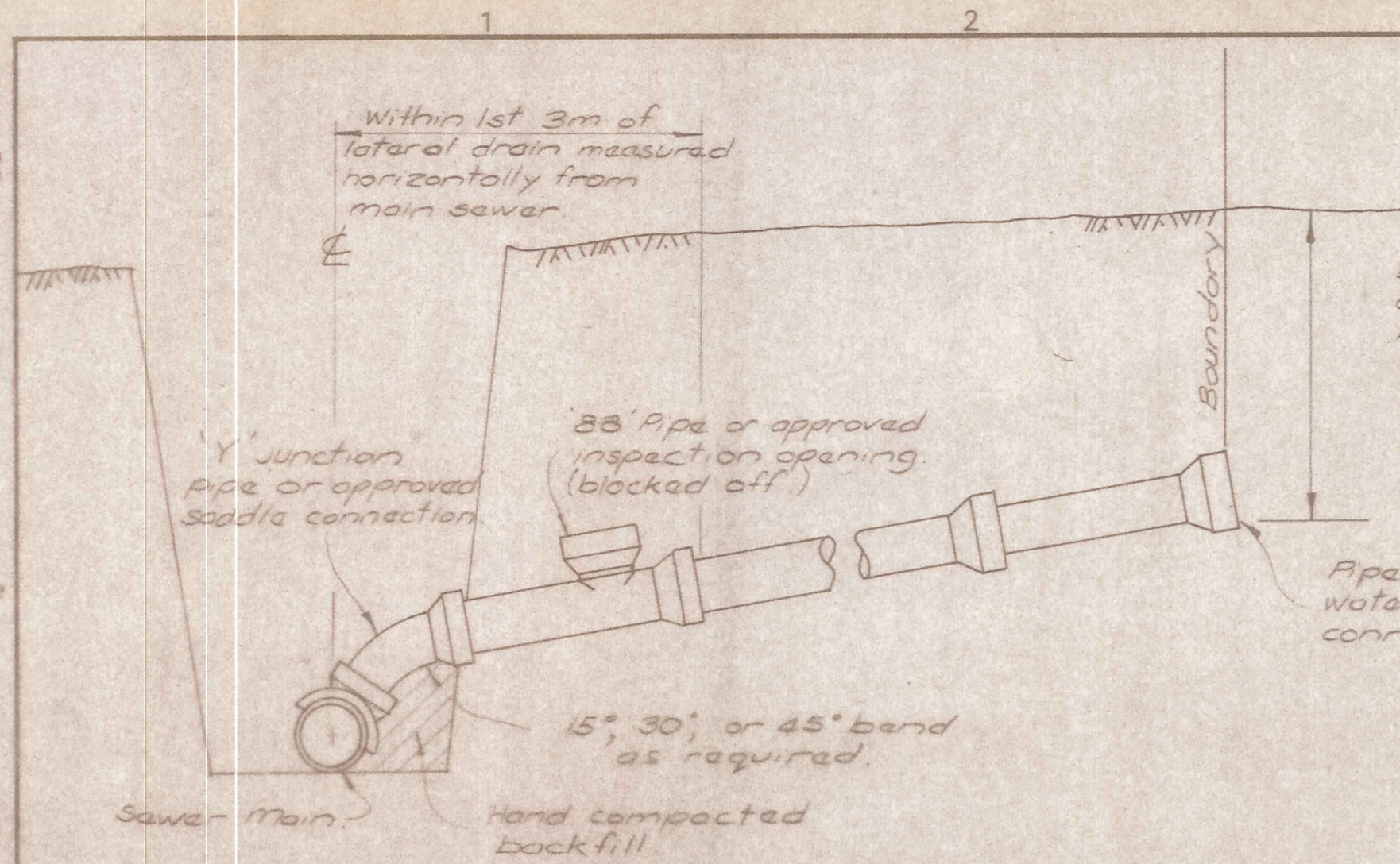
CROMWELL  
BOROUGH COUNCIL

NEIGHBOURHOOD 1  
DEVELOPMENT

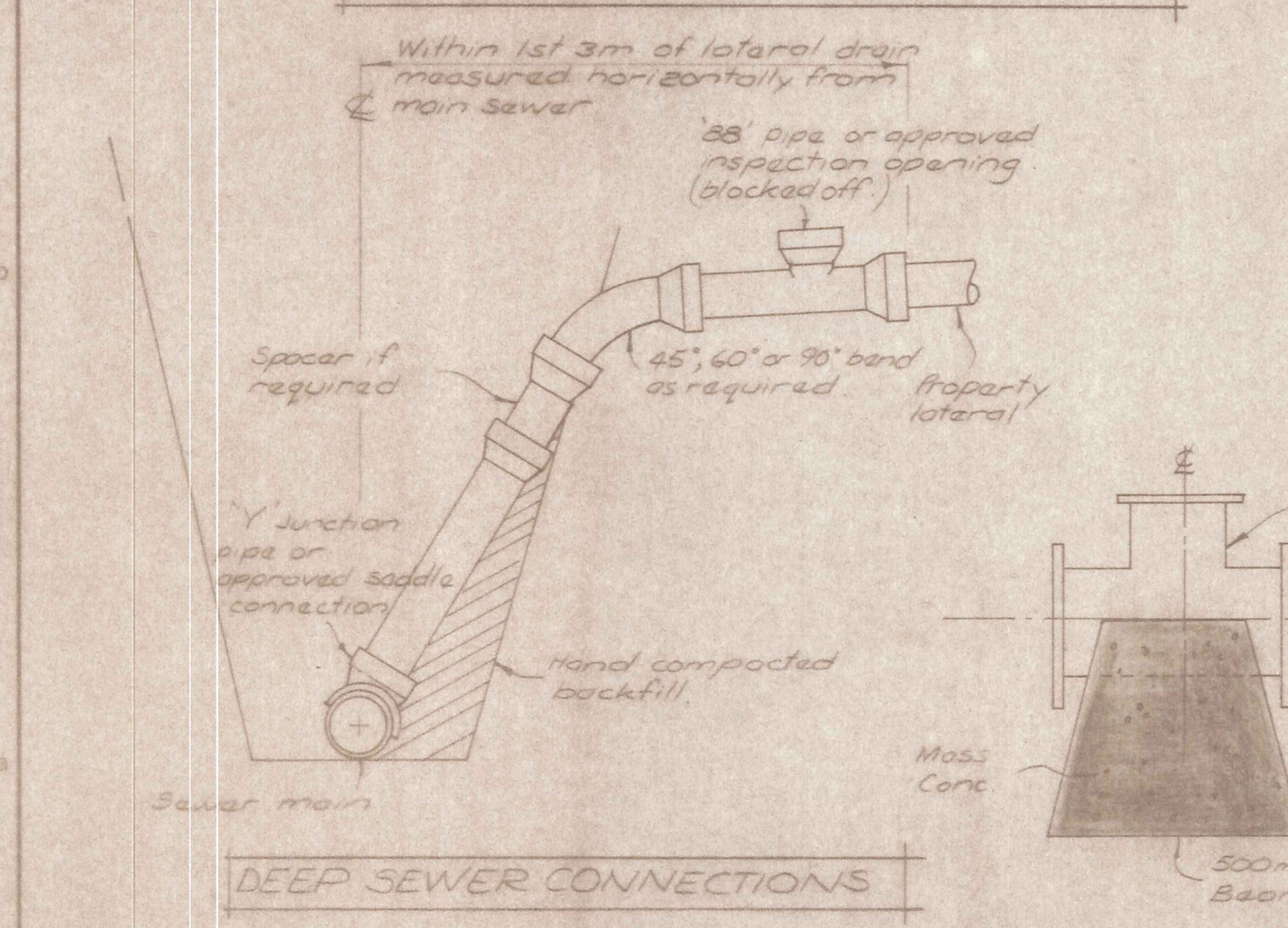
CONTRACT No 18  
CONSTRUCTION OF  
STREETWORKS AND  
ENGINEERING SERVICES

STANDARD DETAILS

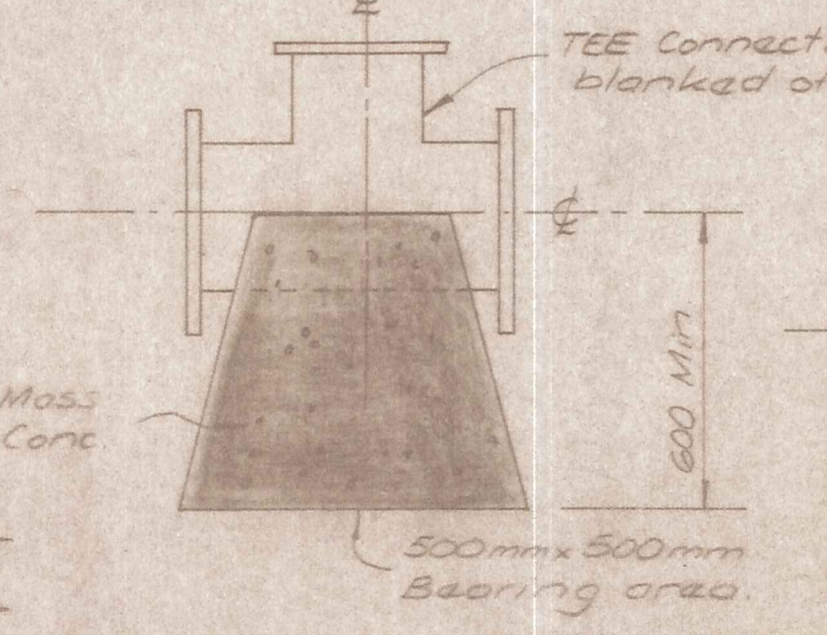
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|------------|----|------|--------|--------------|------------|---------|-------|------|
| NO.        | BY | DATE | Apprs. | Surveyed     |            | 10126   | 3     |      |
|            |    |      |        | Drawn        | B. HAWKINS |         |       | 6-82 |
|            |    |      |        | Calculations |            |         |       |      |
|            |    |      |        | Traced       | M. COOPER  |         |       | 6-82 |
|            |    |      |        | Checked      | R.H.       |         |       |      |
|            |    |      |        | Approved     |            |         |       |      |
|            |    |      |        |              | 3/84       | 9/19/20 |       |      |



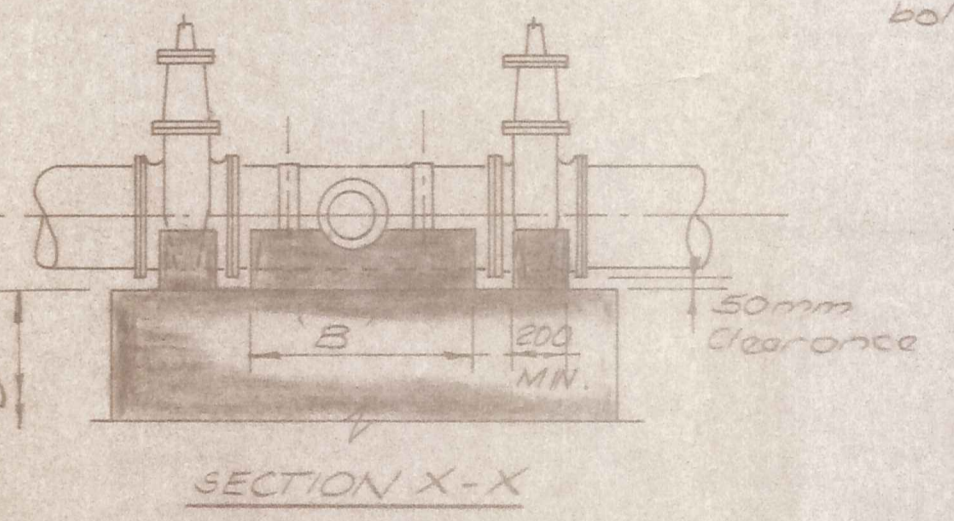
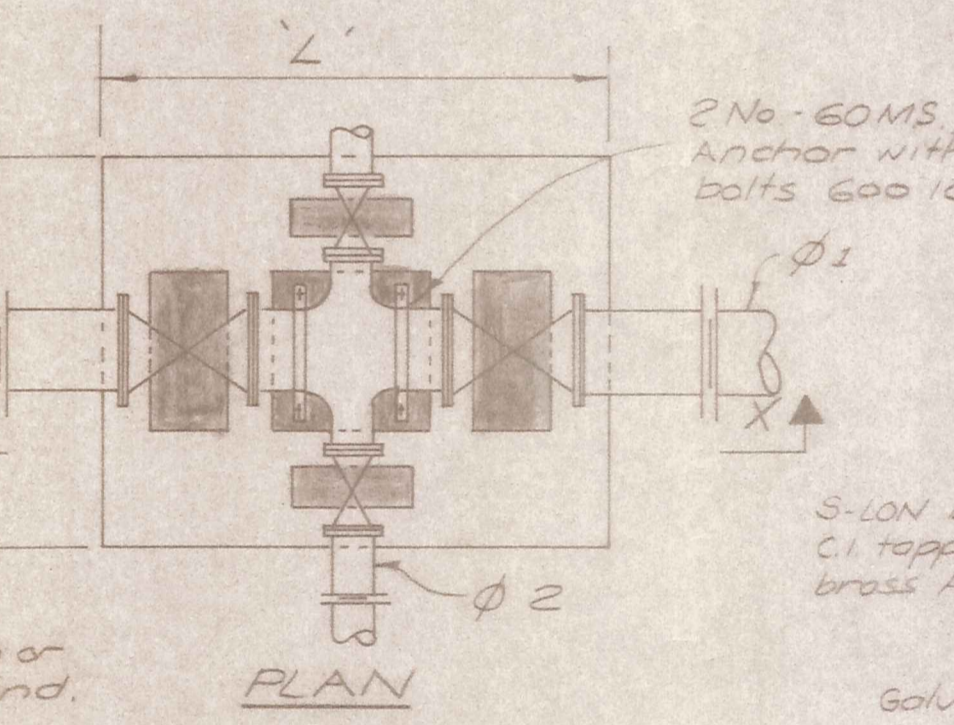
**SHALLOW SEWER CONNECTIONS**



**DEEP SEWER CONNECTIONS**

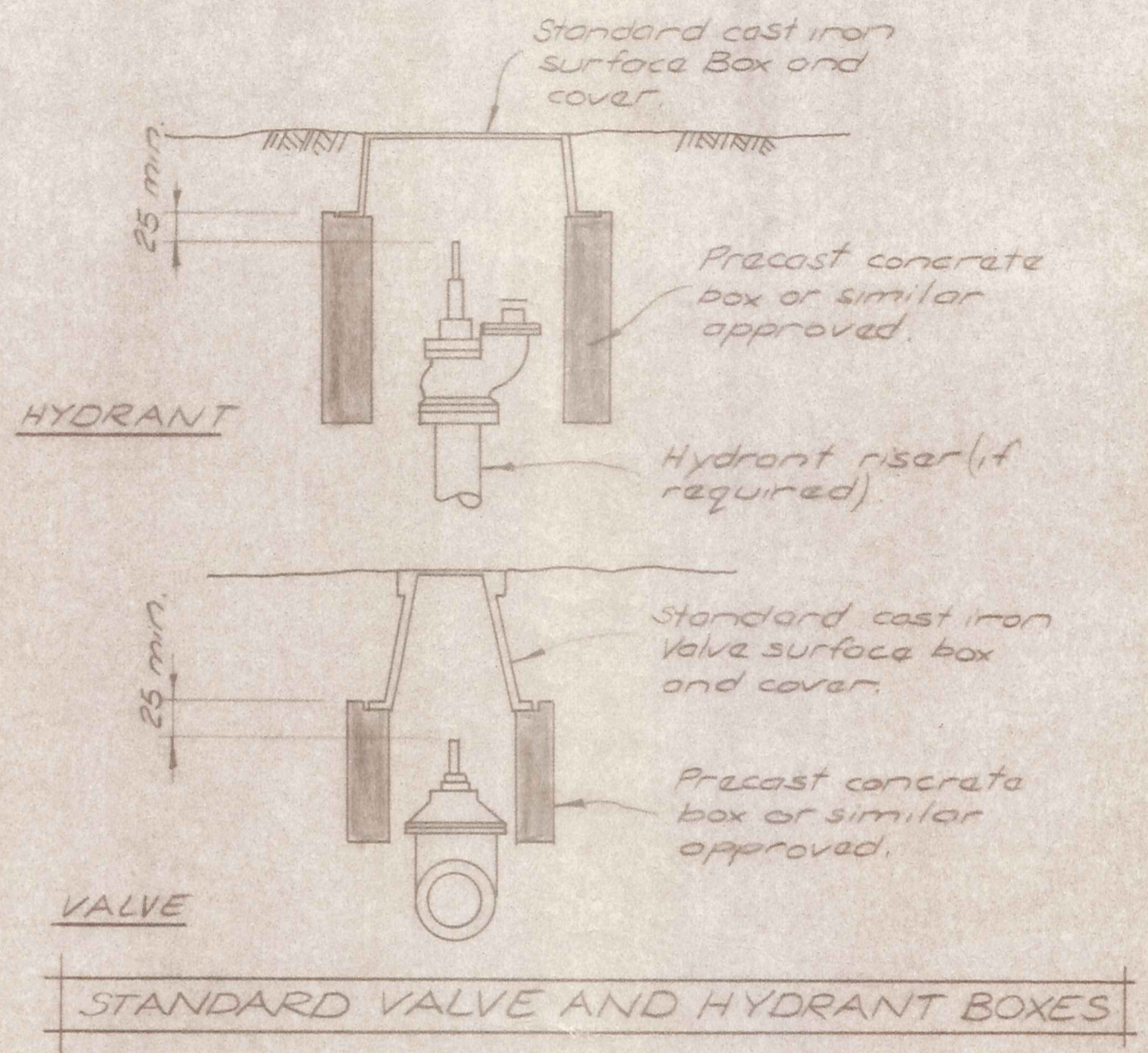


DETAIL OF THRUST BLOCK - TYPE A

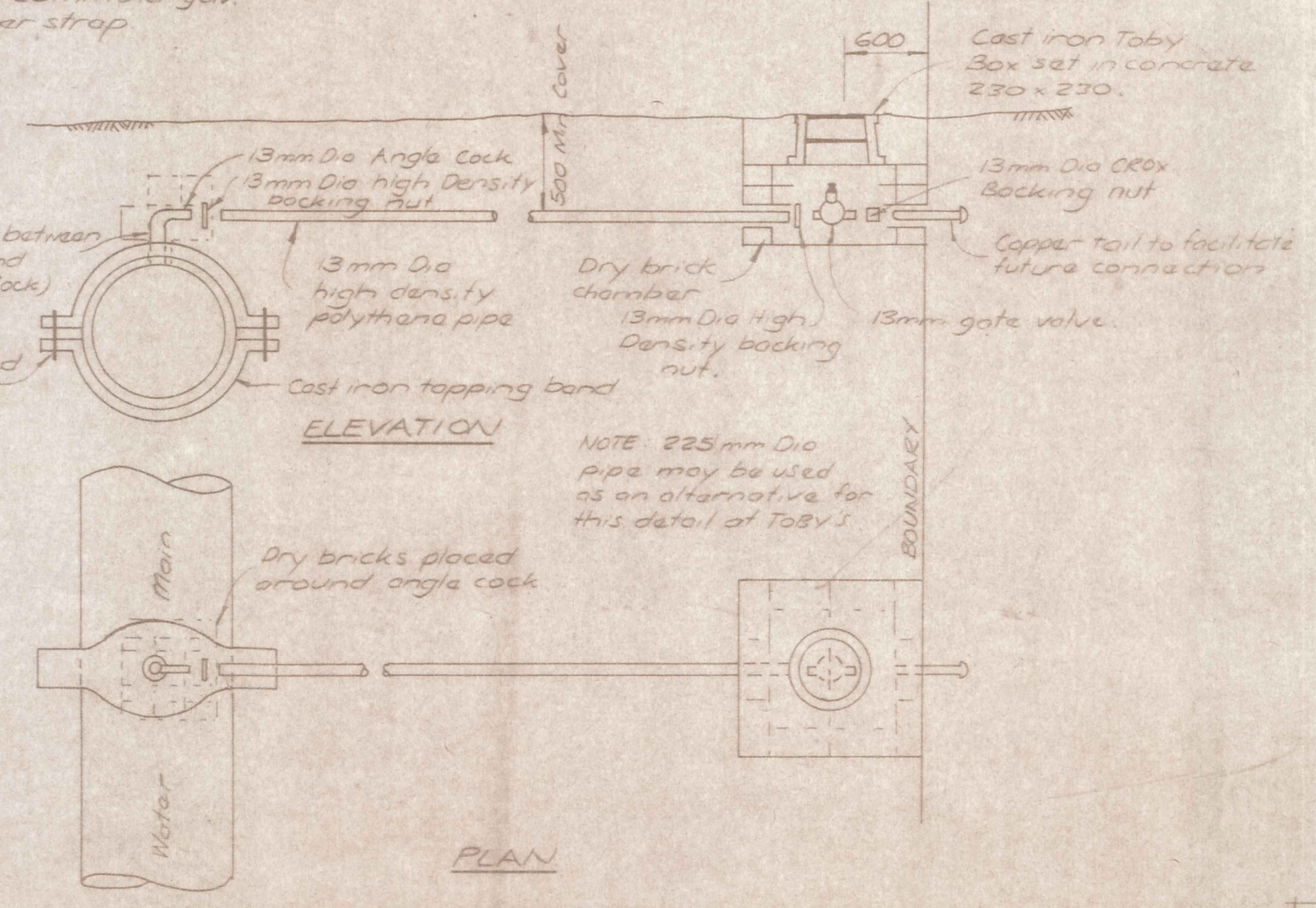


| TYPE | Ø1  | Ø2  | W    | L    | D   | B   |
|------|-----|-----|------|------|-----|-----|
| A    | 100 | 100 | 900  | 900  | 400 | 200 |
| B    | 150 | 100 | 1000 | 1000 | 400 | 250 |
| C    | 150 | 150 | 1000 | 1000 | 400 | 250 |
| D    | 375 | 150 | 400  | 1600 | 400 | 750 |

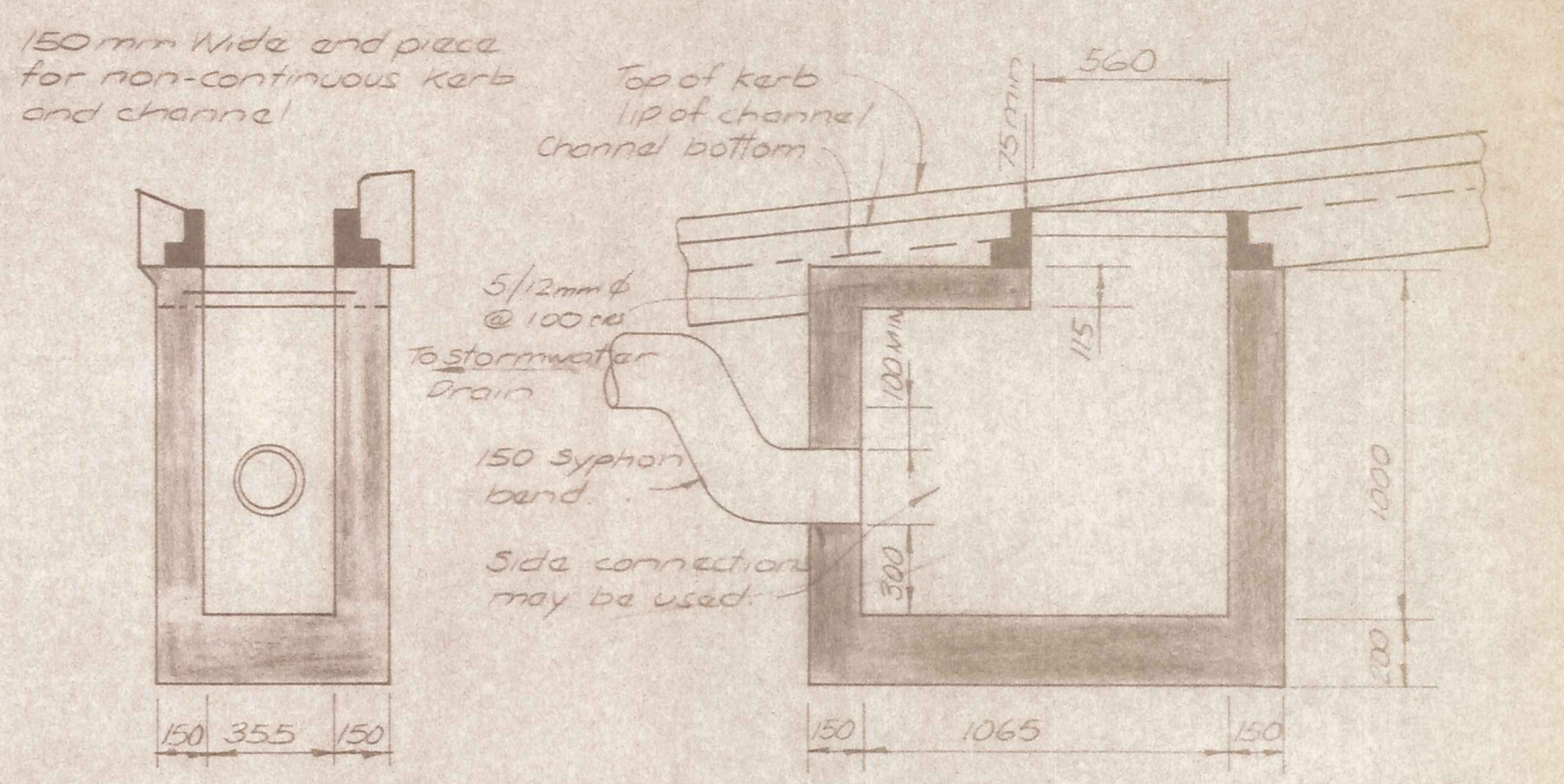
CROSS ANCHOR BLOCK DETAIL N.T.S.



STANDARD VALVE AND HYDRANT BOXES

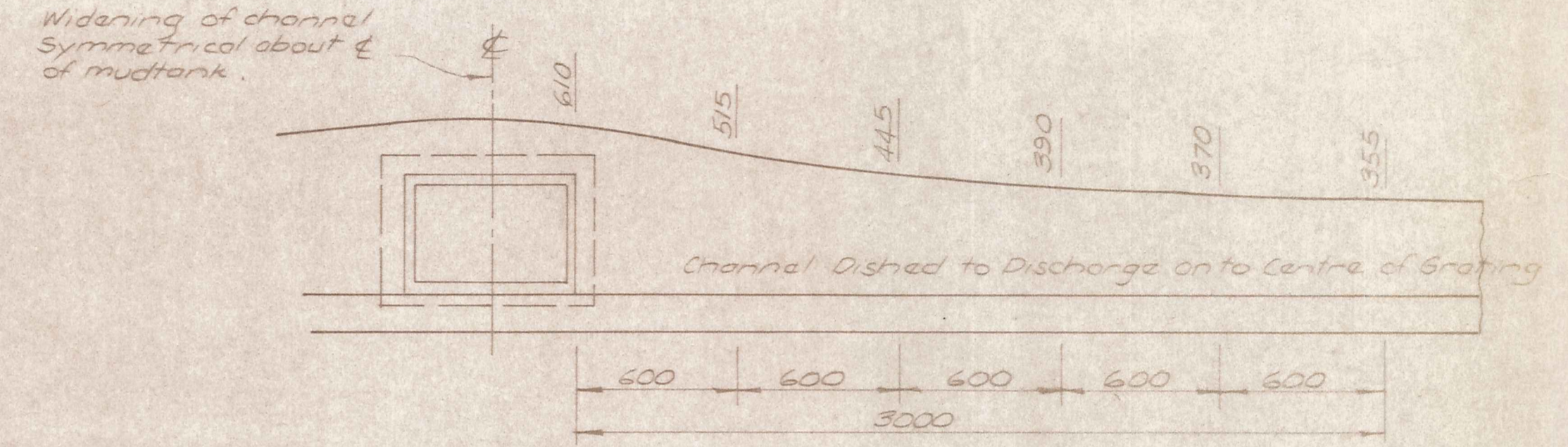


HOUSEHOLD WATER CONNECTION DETAIL N.T.S.

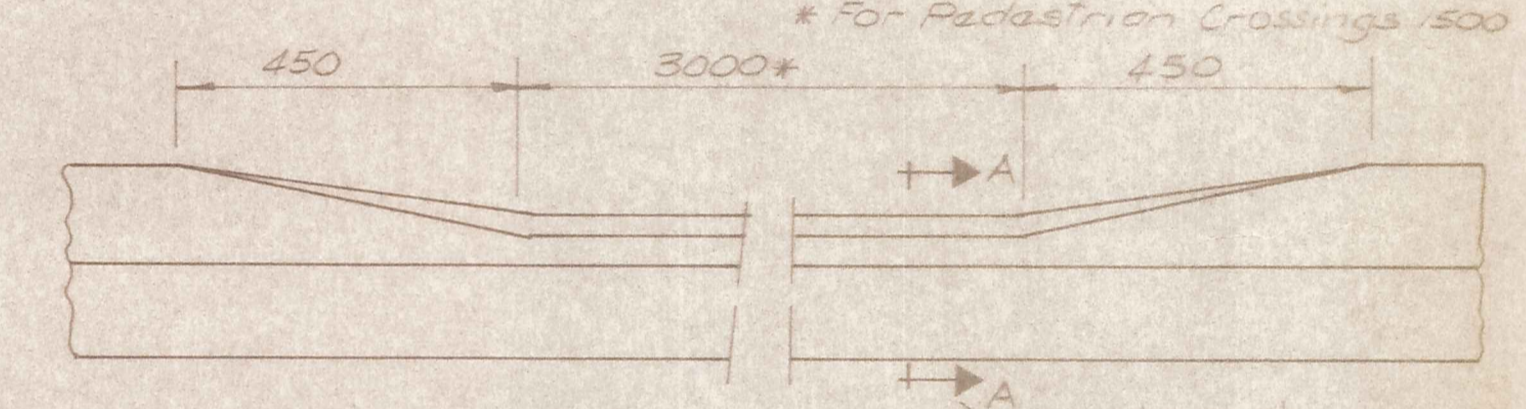


END ELEVATION SIDE ELEVATION

No. 2 MUDTANK

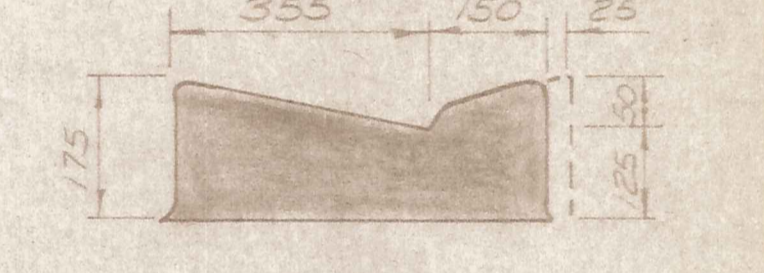


PLAN OF CHANNEL AT MUDTANKS

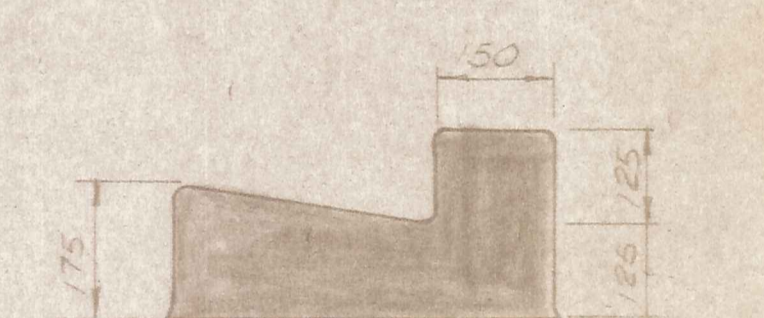


DROP KERB CROSSING

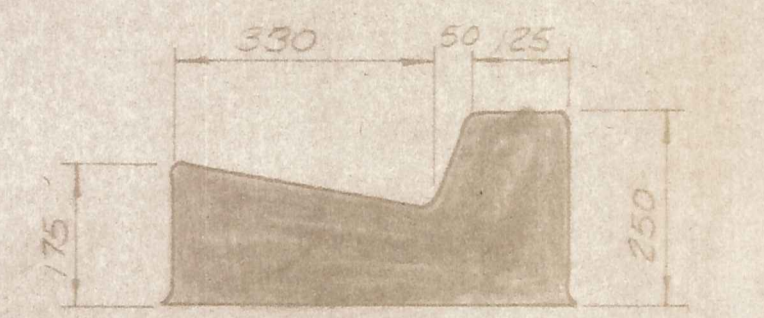
NOTE: Length of crossings 3000. Invert must be on grade. Concrete strength 20M Pa @ 28 days



SECTION A-A



TYPE 1 (EAST OF MONAGHAN ST)



TYPE 2 (WEST OF MONAGHAN ST)

KERB AND CHANNEL DETAILS

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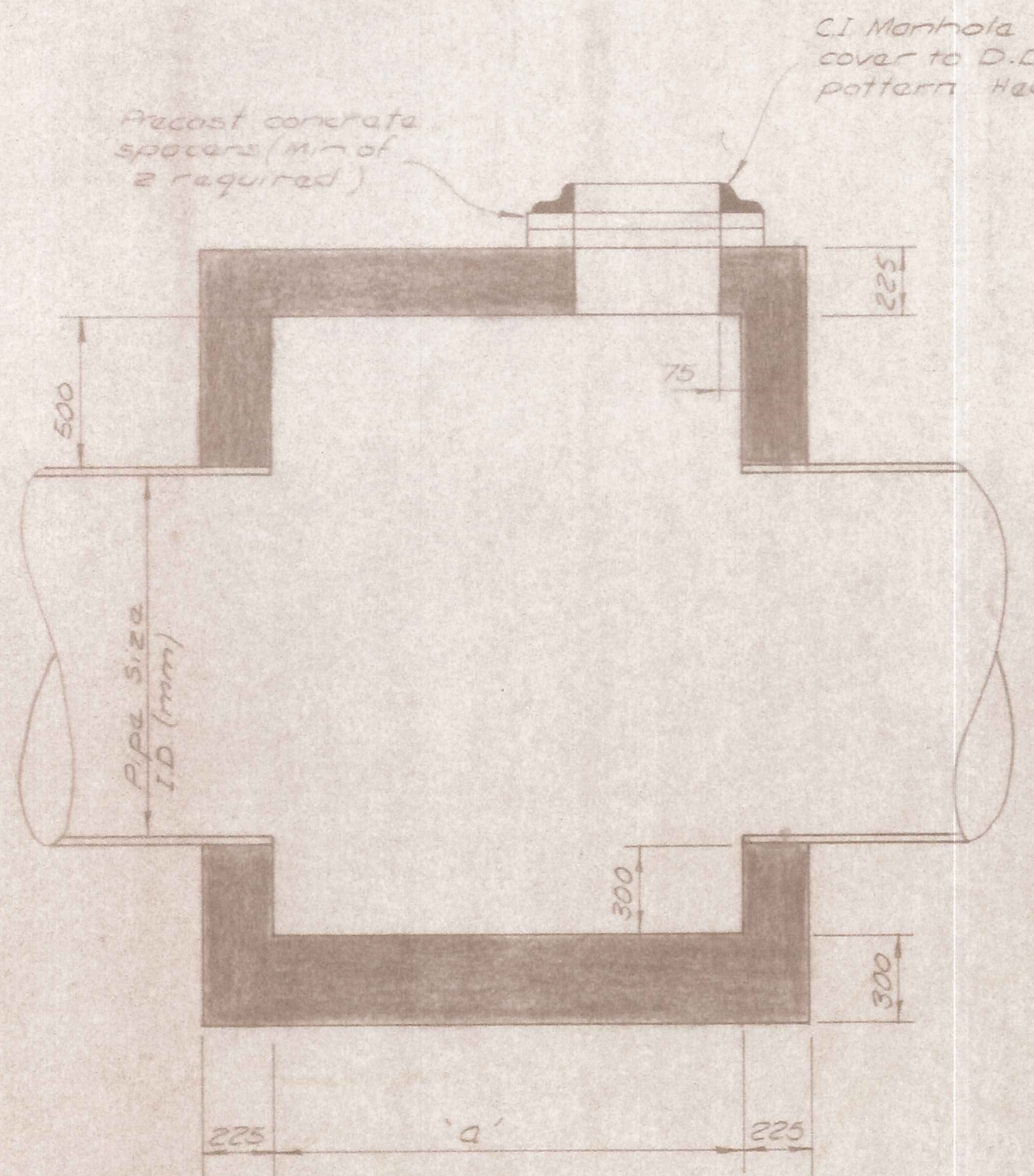
CROMWELL  
BOROUGH COUNCIL

NEIGHBOURHOOD 1  
DEVELOPMENT

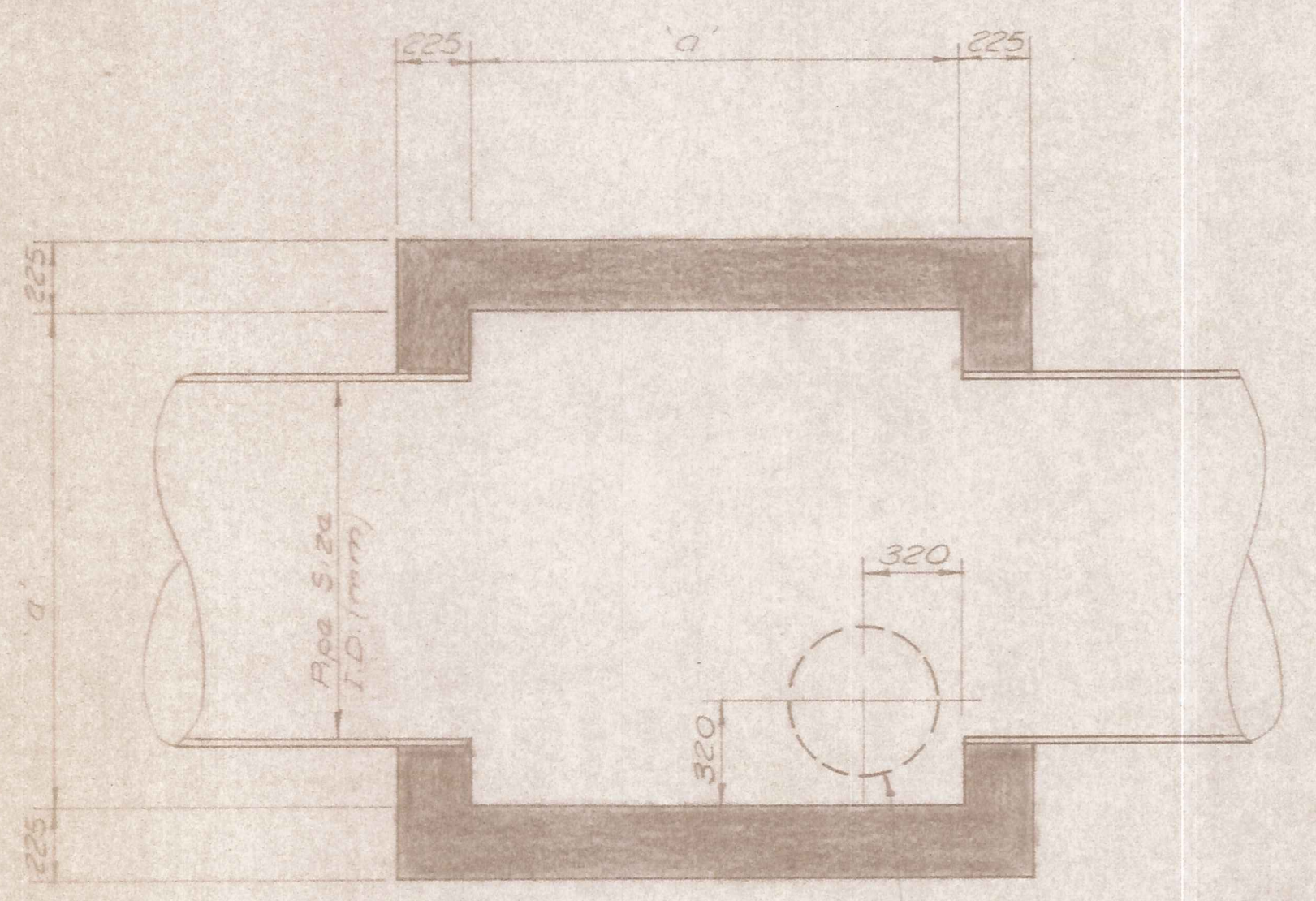
CONTRACT No 18  
CONSTRUCTION OF  
STREETWORKS AND  
ENGINEERING SERVICES

STANDARD DETAILS

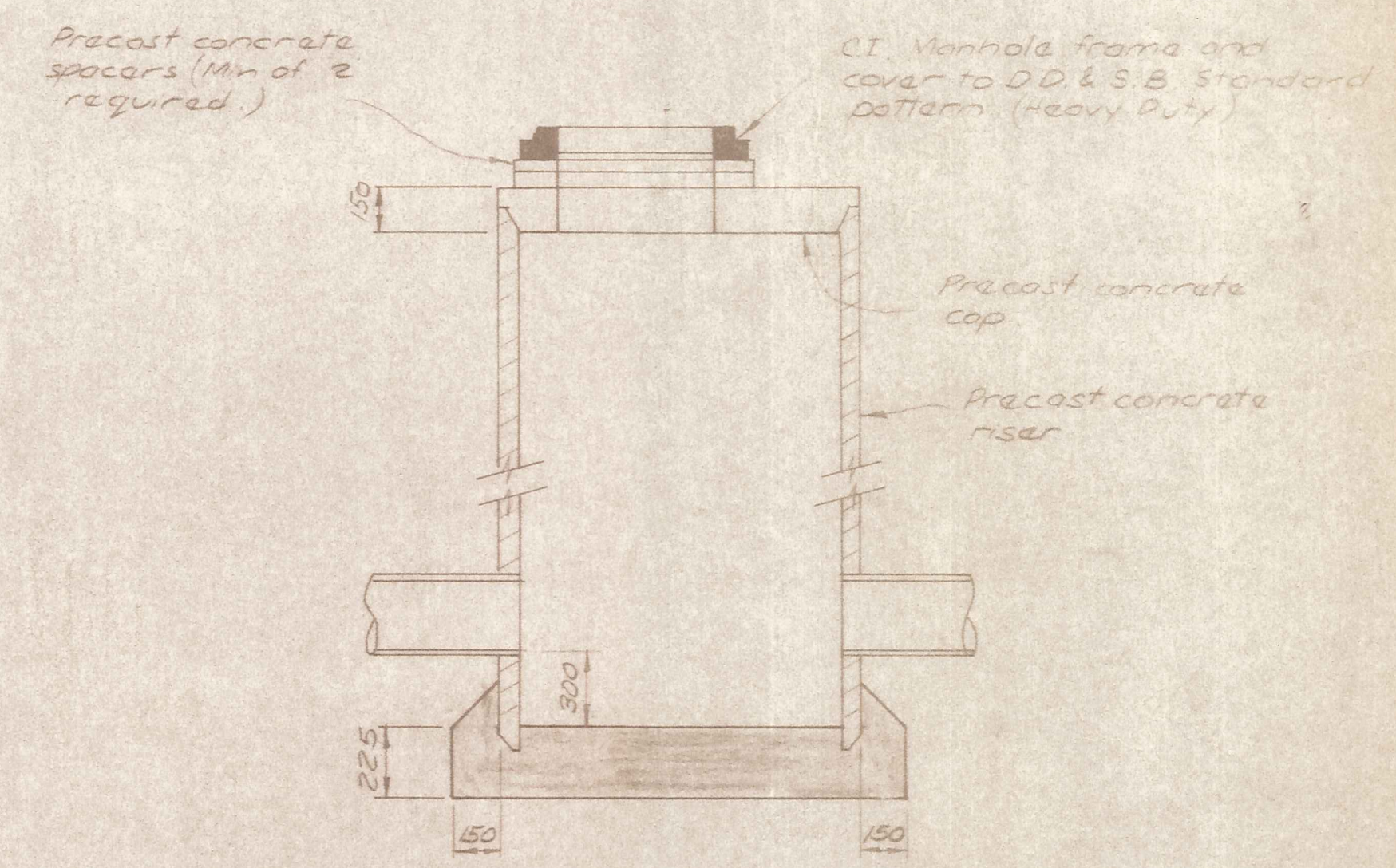
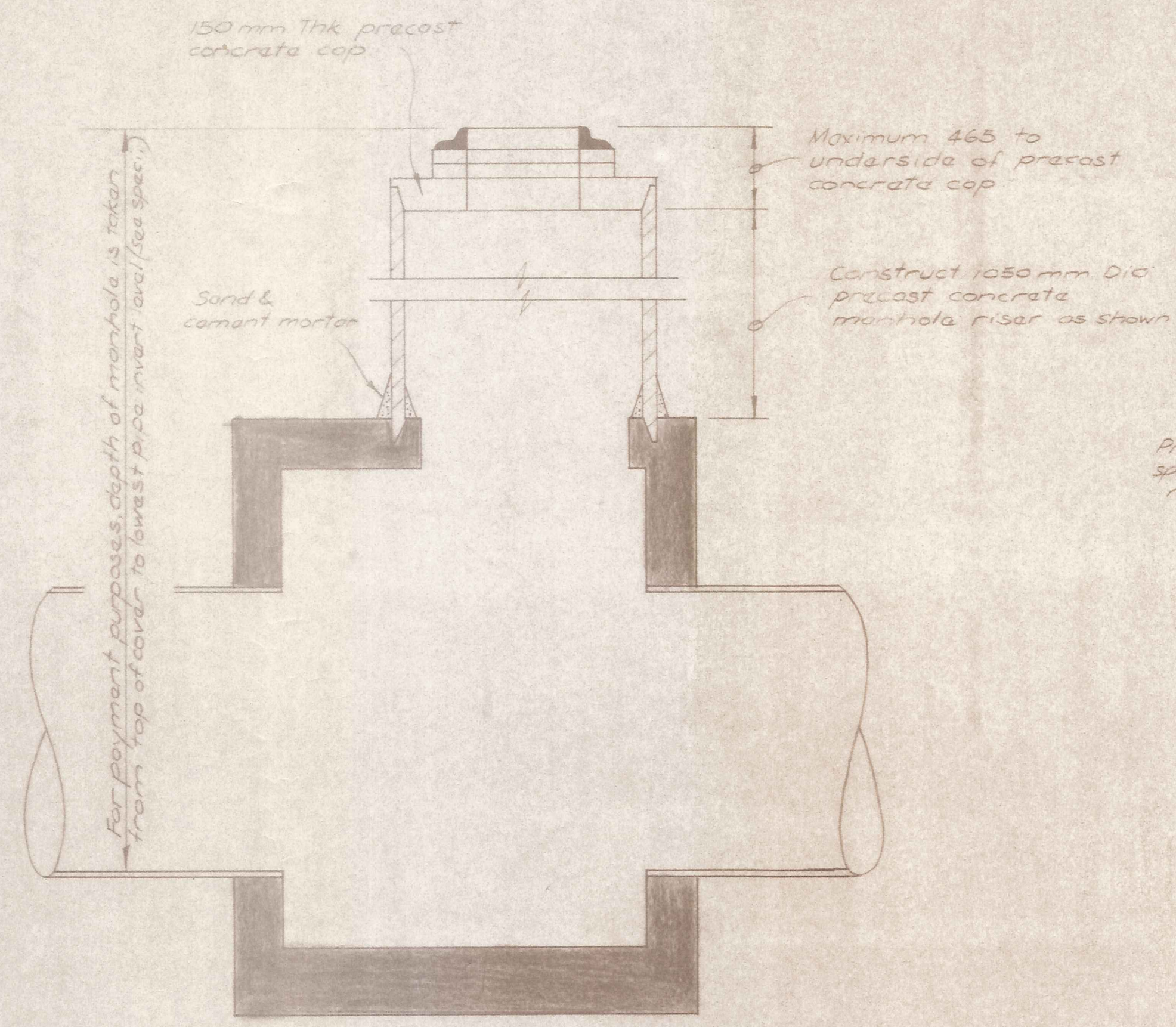
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|------------|----|------|--------|--------------|--------------------|---------|-------------|
| NO         | BY | DATE | Appvd. | Surveyed     |                    |         |             |
|            |    |      |        | Drawn        | B. HAWKINS         | 6-82    | 4           |
|            |    |      |        | Calculations |                    |         | of 6 sheets |
|            |    |      |        | Traced       | M. COOPER          | 6-82    |             |
|            |    |      |        | Checked      | R.H.               |         |             |
|            |    |      |        | Approved     | <i>[Signature]</i> | 3/84    |             |



ELEVATION



PLAN

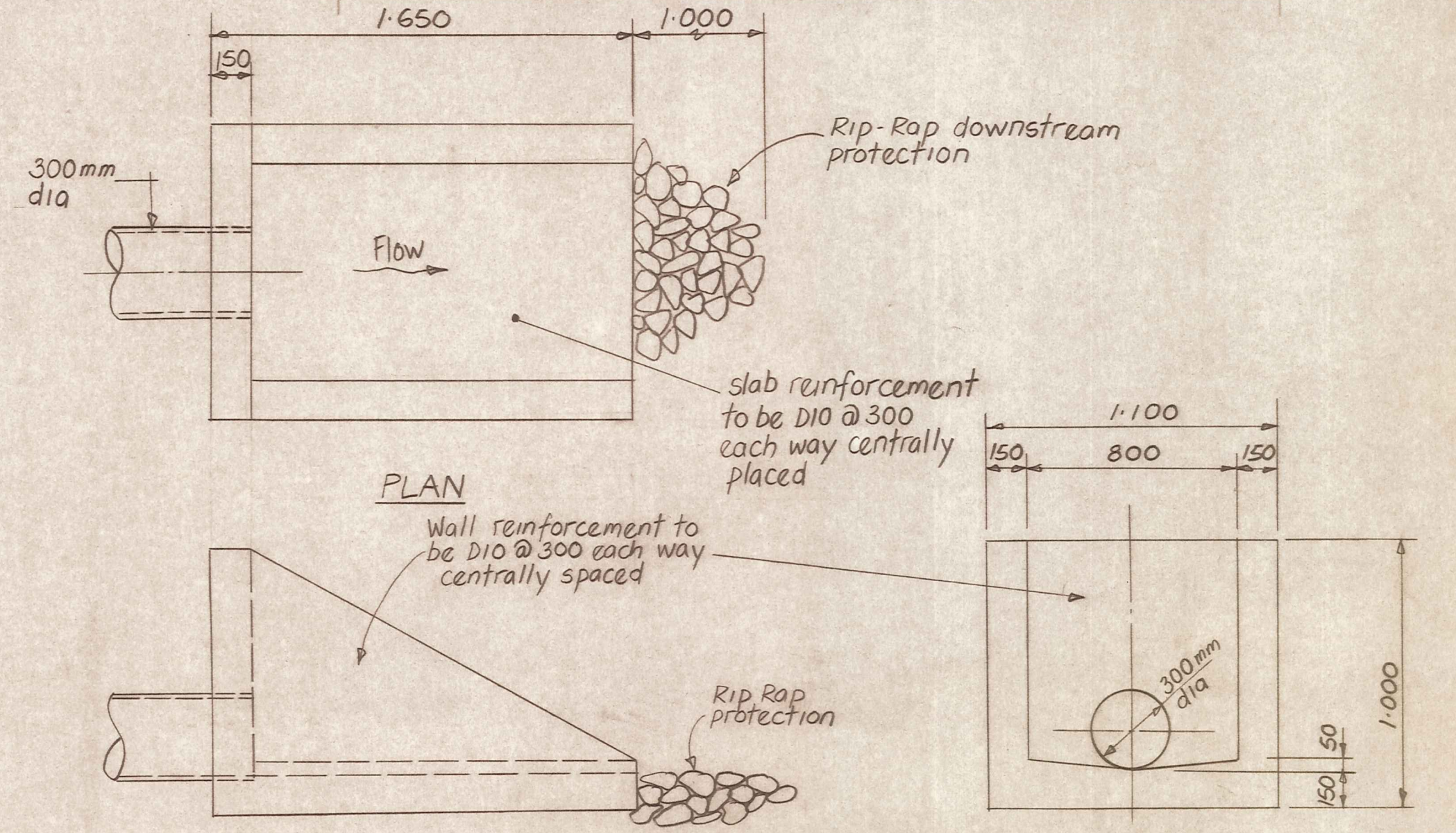


SECTION PRECAST MANHOLE

| DIMENSIONS           |          | REINFORCING  |
|----------------------|----------|--|
| Pipe Sizes I.D. (mm) | 'a' (mm) |  |
| 1350                 | 1750     | ROOF:<br>D12 @ 150 cns. Each way<br>(50 cover)                               |
| 1200                 | 1600     |  |
| 1050                 | 1600     |  |
| 900                  | 1300     | Walls:<br>D12 @ 300 cns. Horz.<br>D12 @ 450 cns. Vert.<br>(centrally placed) |
| 750                  | 1200     |  |
| 600                  | 1200     |  |
| 525                  | 1200     |  |
| 450                  | 1050     |  |

NOTE: Precast riser shaft to be positioned before in situ concrete at base is poured. The riser is to be supported such that a minimum 75mm is embedded into concrete. A sand and cement mortar is to be placed completely around base of riser as shown.

STANDARD STORMWATER DRAIN MANHOLE  
(FOR STORMWATER DRAINS LESS THAN 450mm Dia)



SIDE ELEVATION

DOWNSTREAM ELEVATION

CLUTHA RIVER OUTFALL HEADWALL DETAILS  
SCALE 1:20

STANDARD STORMWATER DRAIN MANHOLE  
(FOR STORMWATER DRAINS 450mm Dia & LARGER)

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CONSULTING CIVIL & STRUCTURAL ENGINEERS  
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Timaru PO Box 82 Ph: 50-391

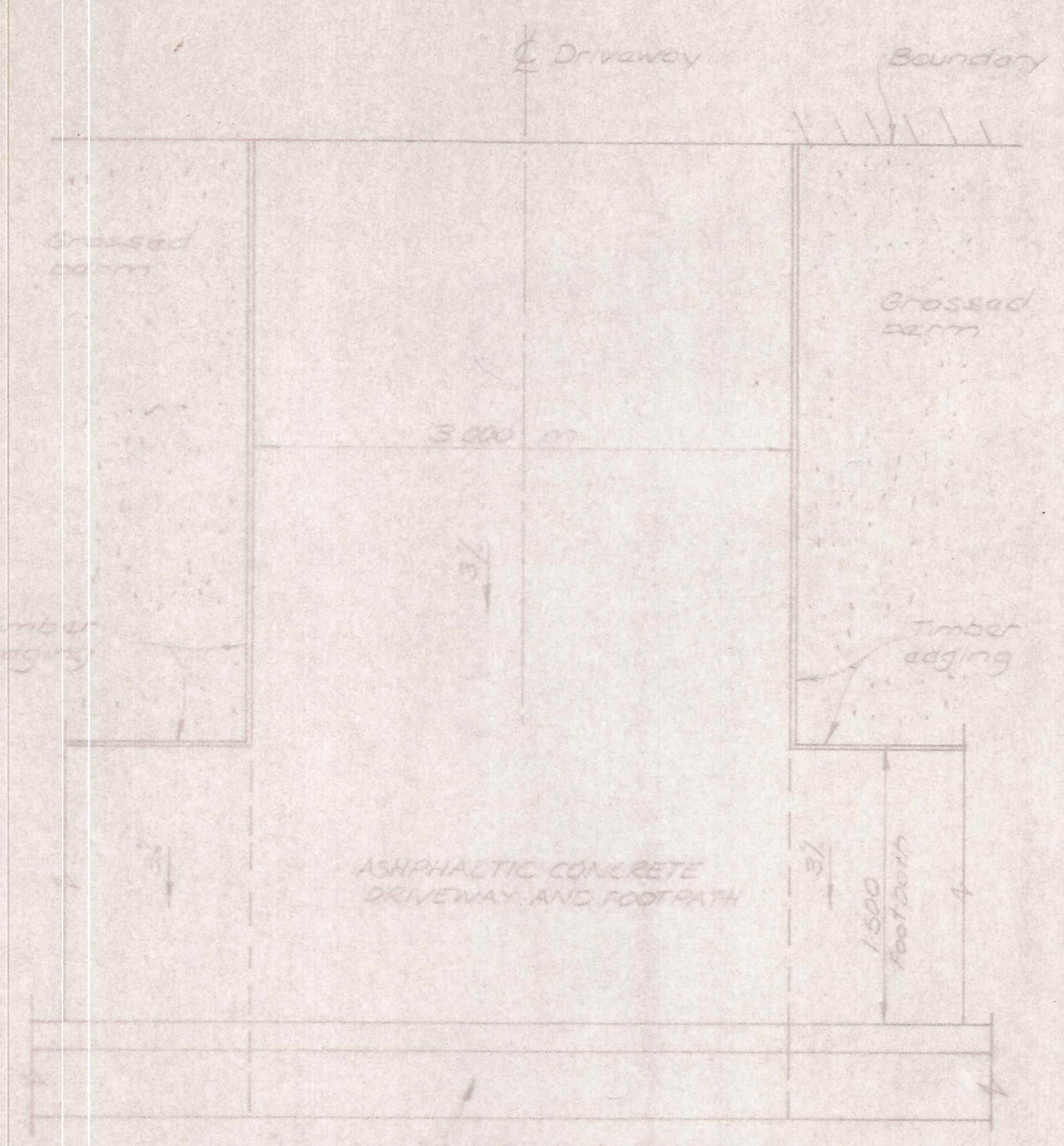
CROMWELL BOROUGH COUNCIL

NEIGHBOURHOOD 1 DEVELOPMENT

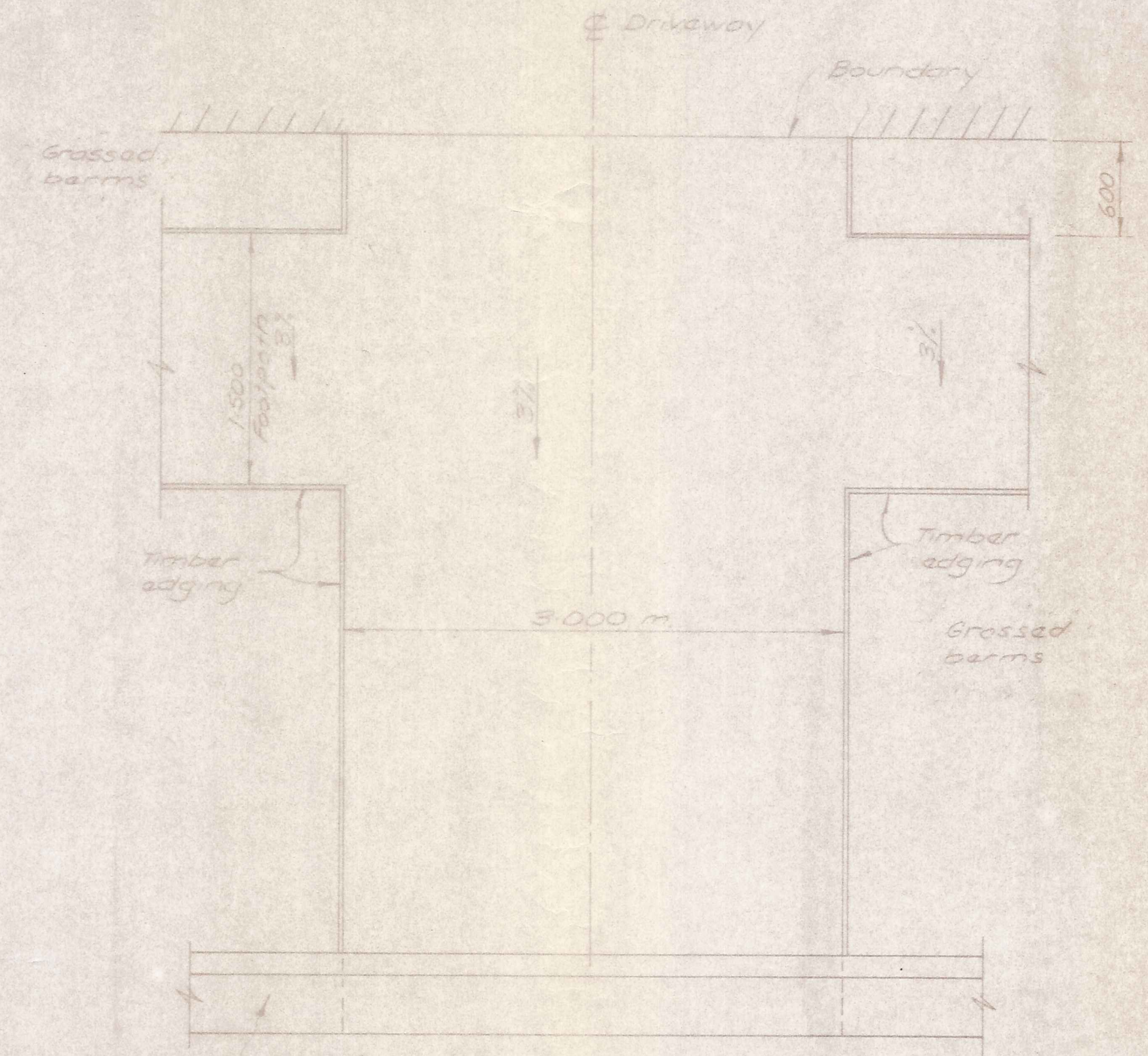
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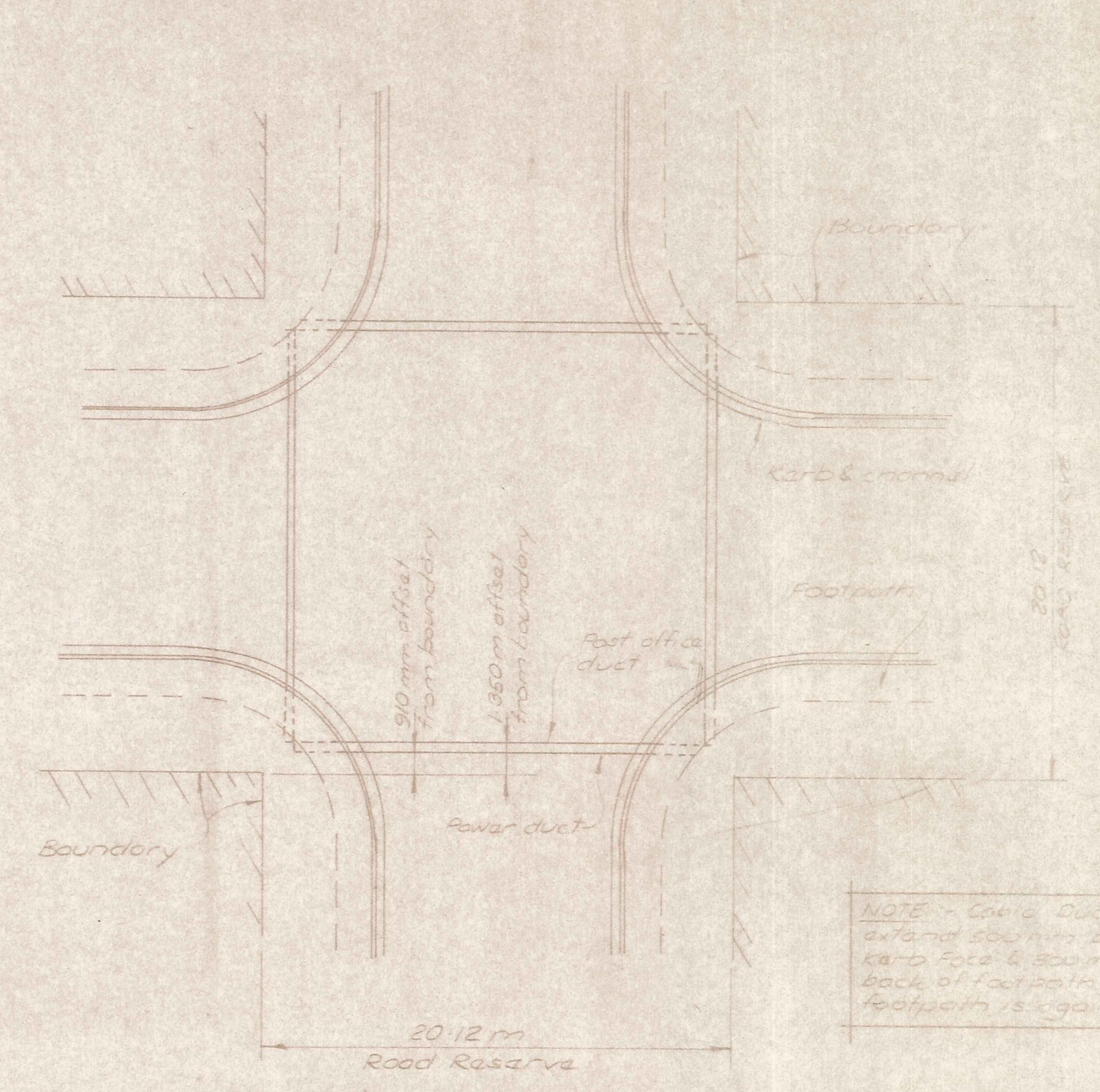
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|------------|----|------|----------|--------------|---------|-------|
| NO         | BY | DATE | Appvd.   | Surveyed     | 10126   | 5/6   |
|            |    |      |          | Drawn        |         |       |
|            |    |      |          | Calculations |         |       |
|            |    |      |          | Traced       |         |       |
|            |    |      |          | Checked      |         |       |
|            |    |      | Approved |              | 9/19/20 | L.B.  |



TYPICAL PLAN OF DRIVEWAY WITH FOOTPATH ADJACENT TO KERB  
N.T.S.

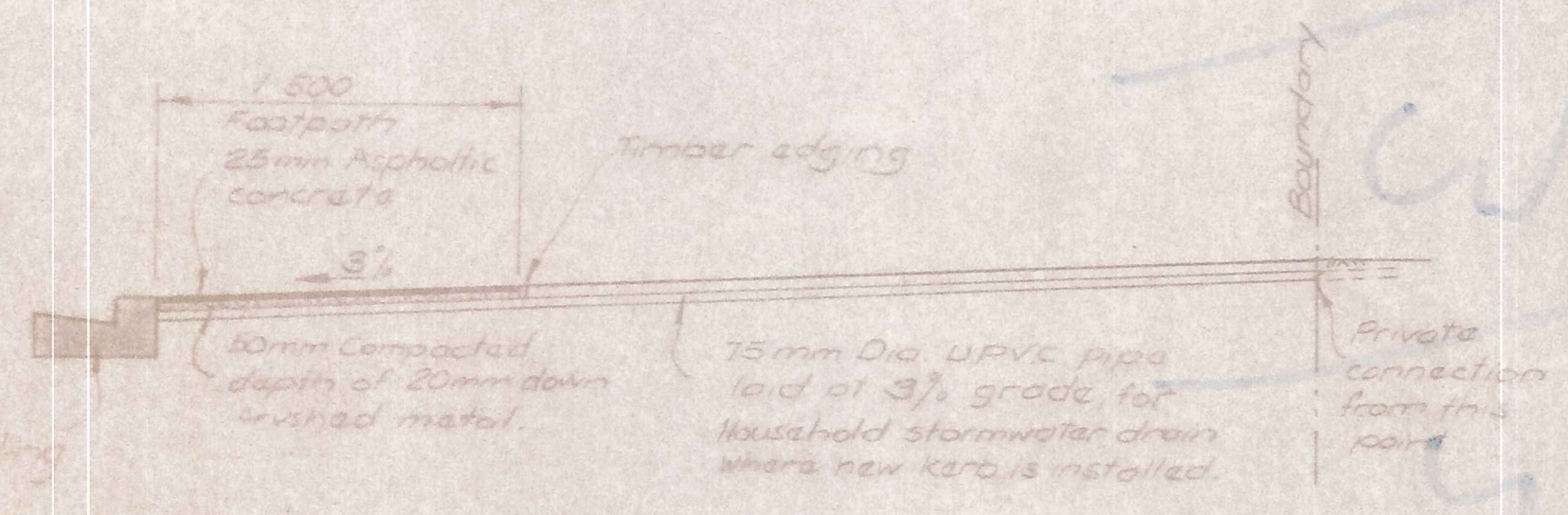


TYPICAL PLAN OF DRIVEWAY WITH FOOTPATH 600 mm OUT FROM THE BOUNDARY  
N.T.S.

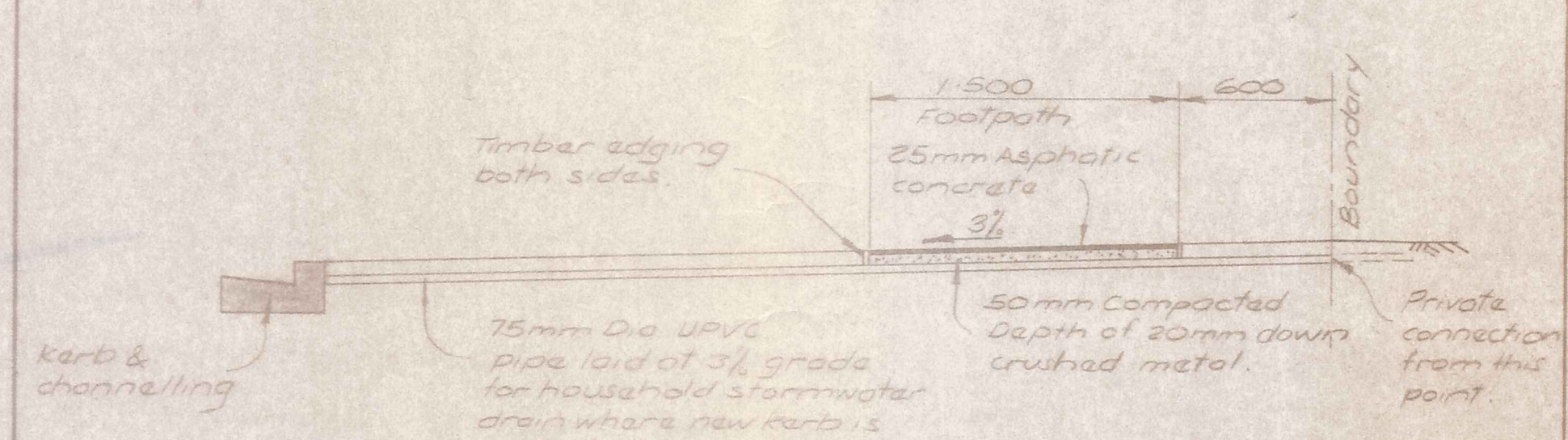


PLAN  
N.T.S.

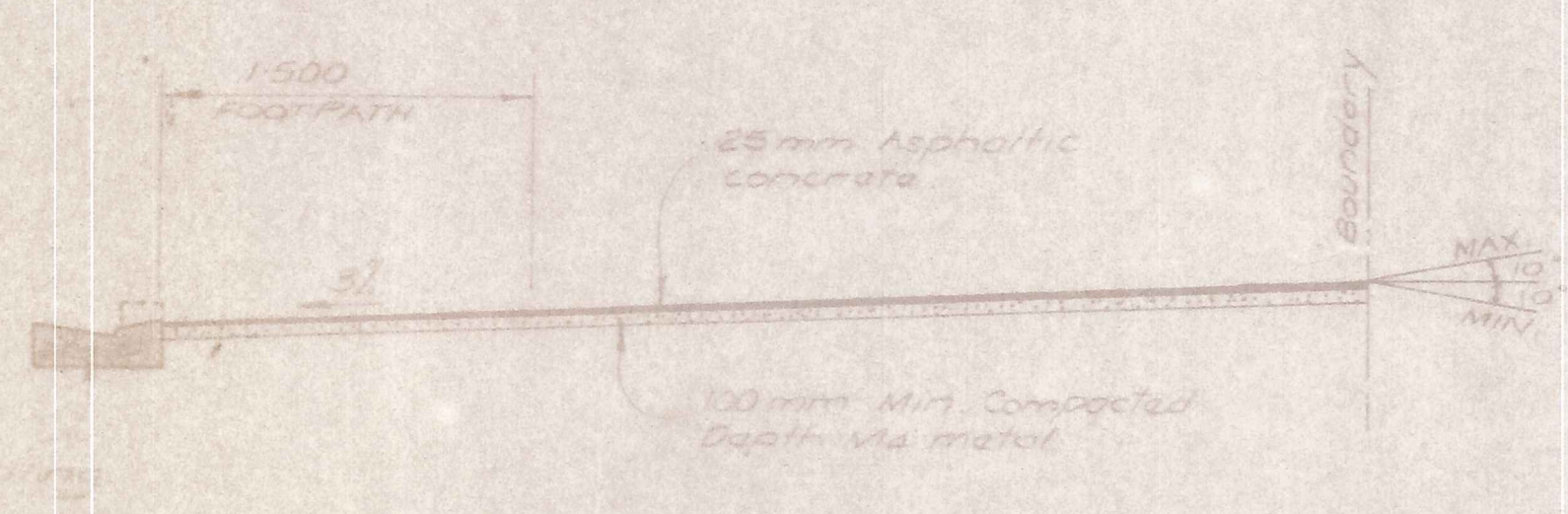
NOTE - Cable Ducts to extend 500 mm beyond kerb face & 500 mm from back of footpath where footpath is adjacent kerb



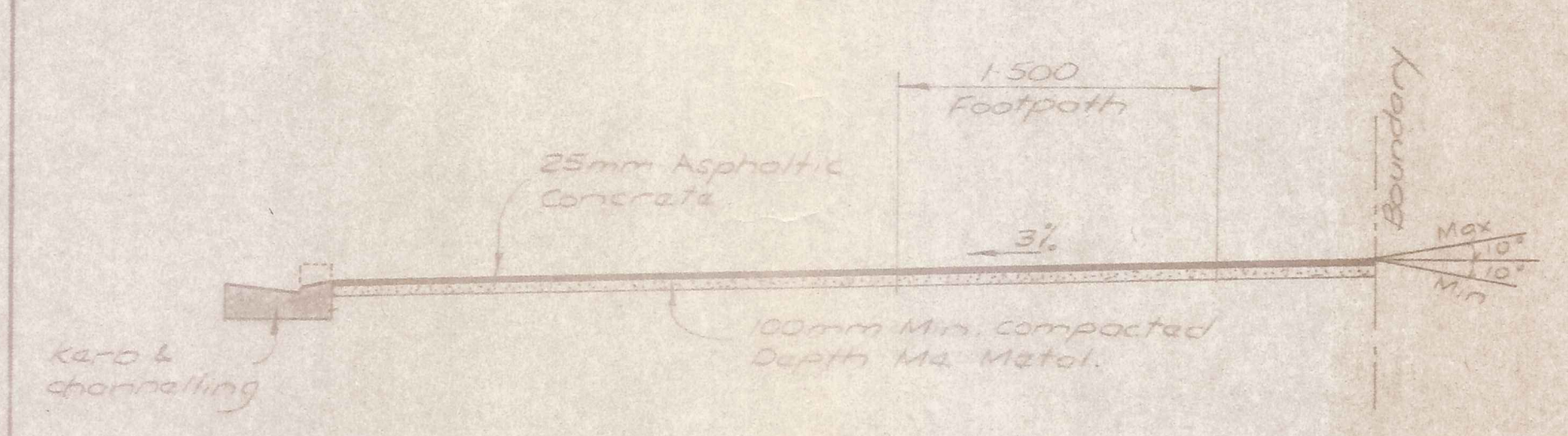
TYPICAL SECTION BETWEEN DRIVEWAYS (SHOWING HOUSEHOLD STORMWATER CONNECTION)



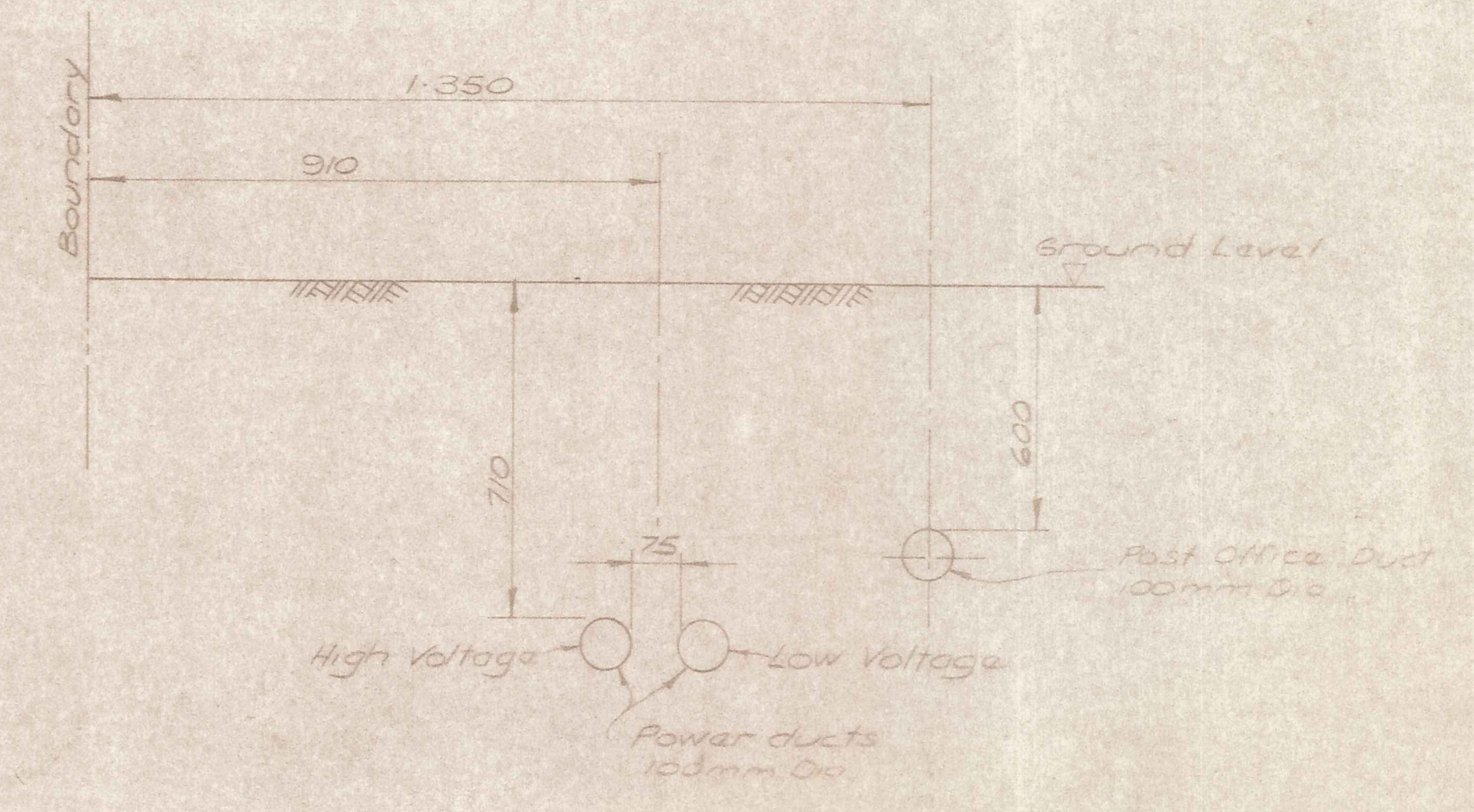
TYPICAL SECTION BETWEEN DRIVEWAYS



TYPICAL SECTION ALONG & DRIVEWAYS



TYPICAL SECTION ALONG & DRIVEWAYS



POWER AND TELEPHONE CABLE DUCTS INTERSECTION DETAILS  
N.T.S.

DUFFILL WATTS & KING LTD  
CONSULTING CIVIL & STRUCTURAL ENGINEERS  
120 Queen St, Dunedin, N.Z. 9010

CROMWELL BOROUGH COUNCIL

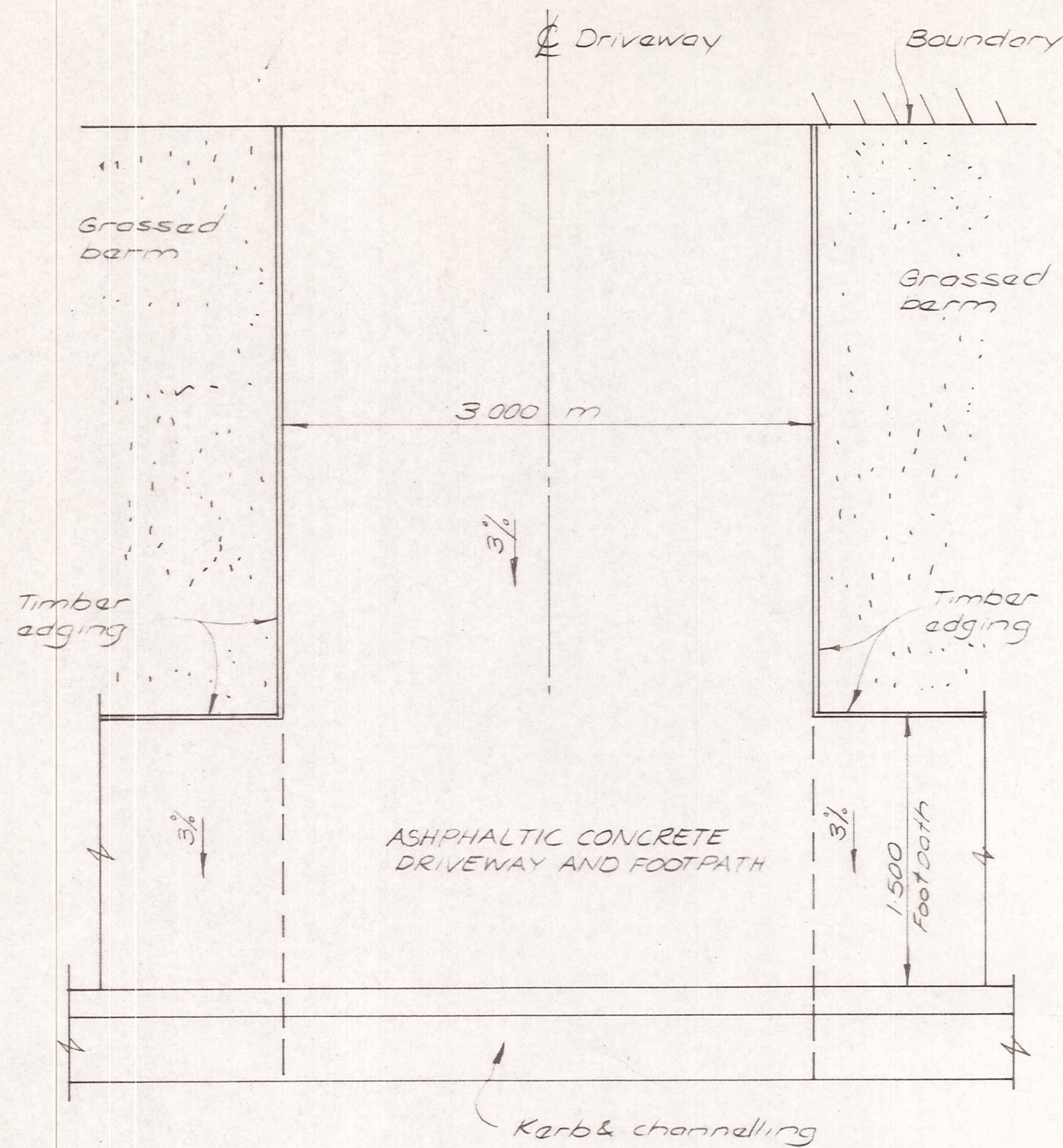
NEIGHBOURHOOD 1 DEVELOPMENT

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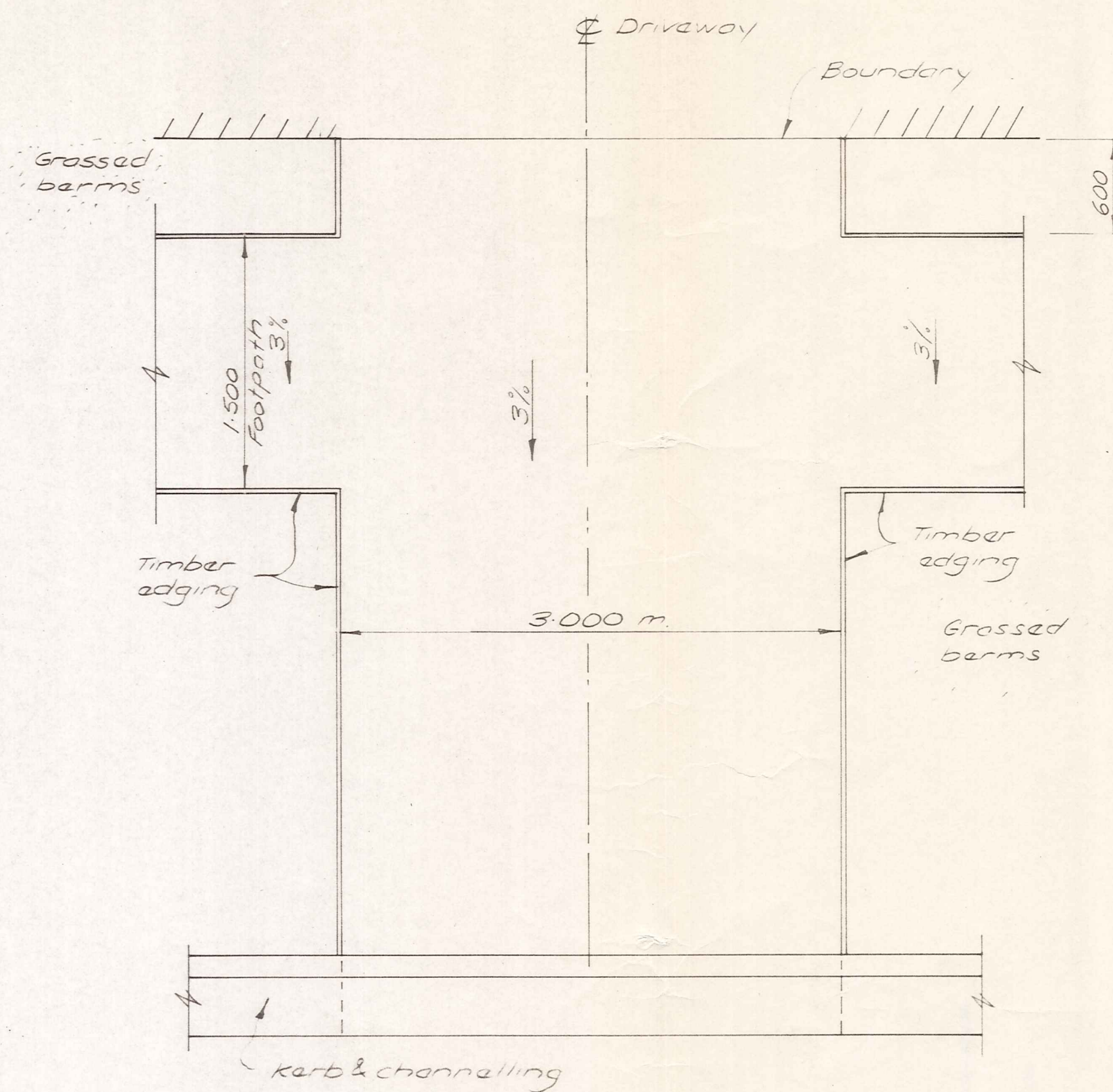
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|------------|----|------|--------------|------------|------|--------|
| NO.        | BY | DATE | APPROVED     | DRAWN      |      |        |
|            |    |      | Surveyed     | B. HAWKINS | 5-52 | 10126  |
|            |    |      | Drawn        |            |      |        |
|            |    |      | Calculations |            |      |        |
|            |    |      | Traced       | M. COOPER  | 6-82 |        |
|            |    |      | Checked      | R.H.       |      |        |
|            |    |      | Approved     | R.H. Watts | 3/84 |        |

6  
6



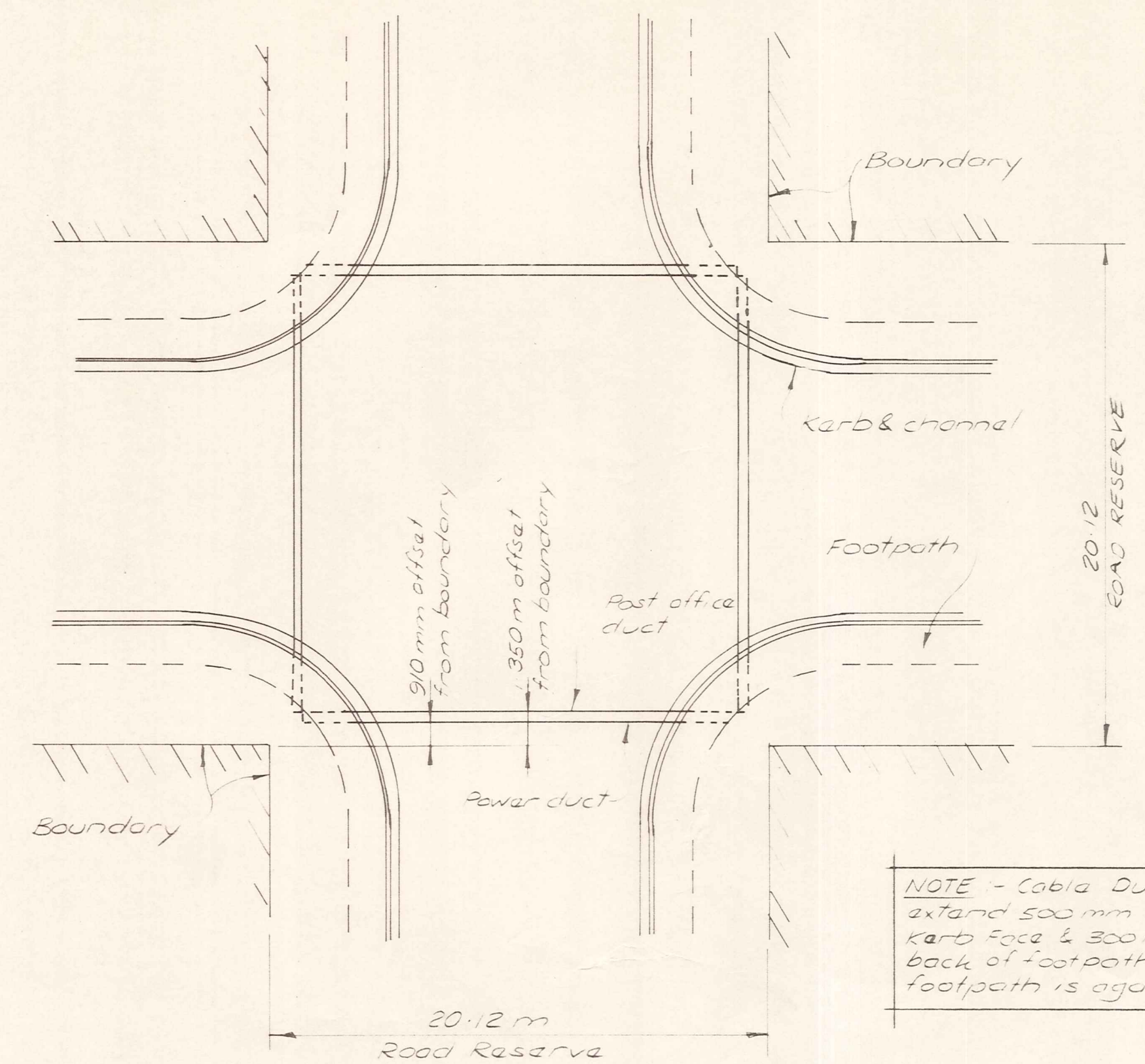
TYPICAL PLAN OF DRIVEWAY WITH FOOTPATH ADJACENT TO KERB

N.T.S.



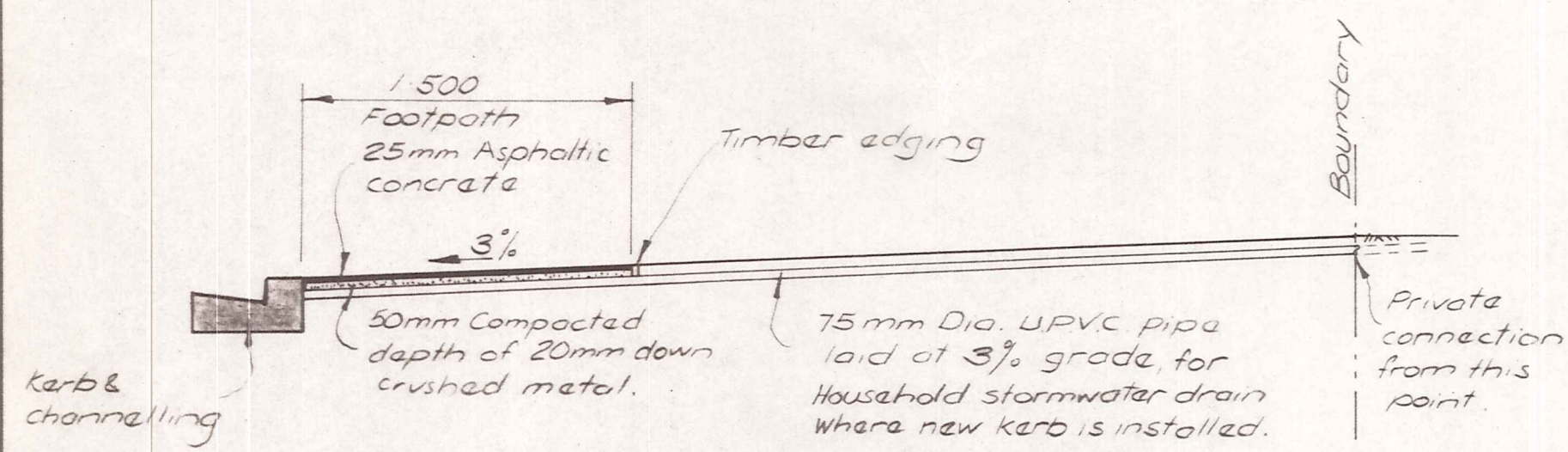
TYPICAL PLAN OF DRIVEWAY WITH FOOTPATH 600 mm OUT FROM THE BOUNDARY

N.T.S.

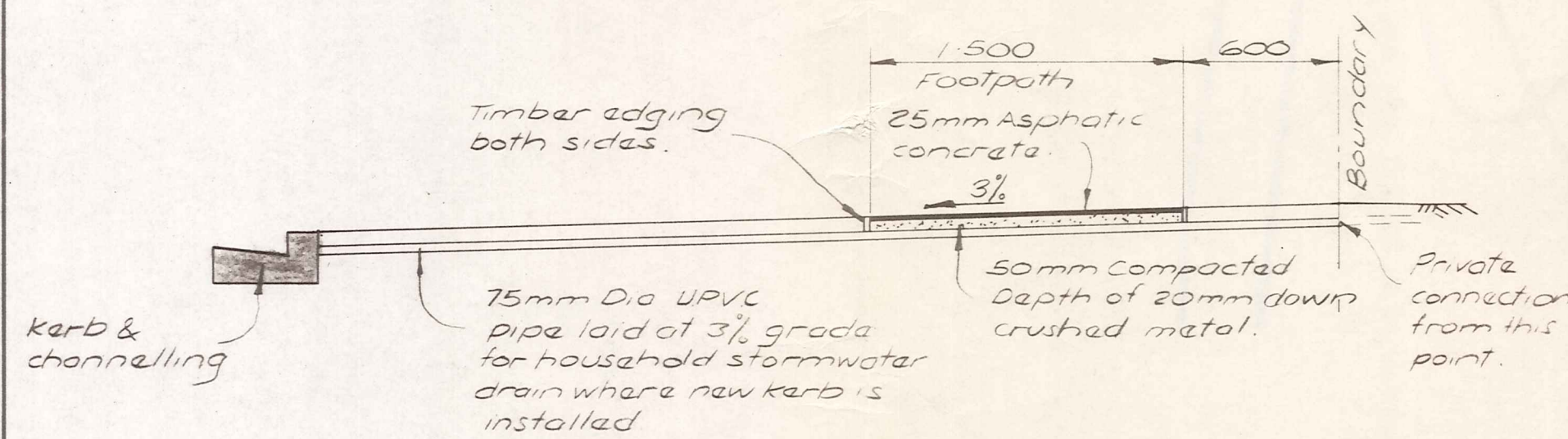


NOTE - Cable Ducts to extend 500 mm behind kerb face & 300 mm from back of footpath where footpath is against kerb

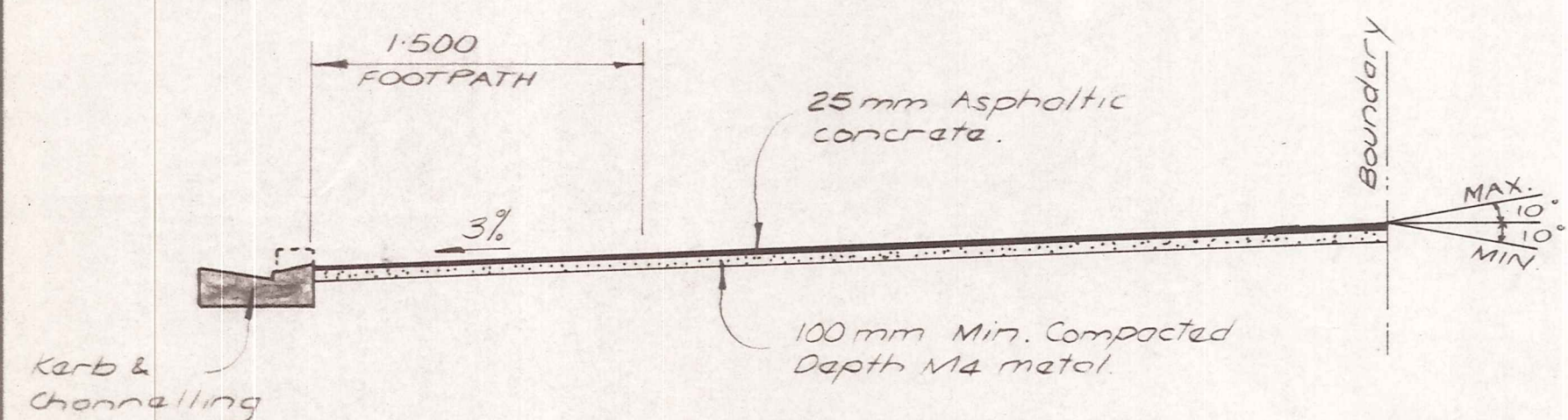
PLAN  
N.T.S.



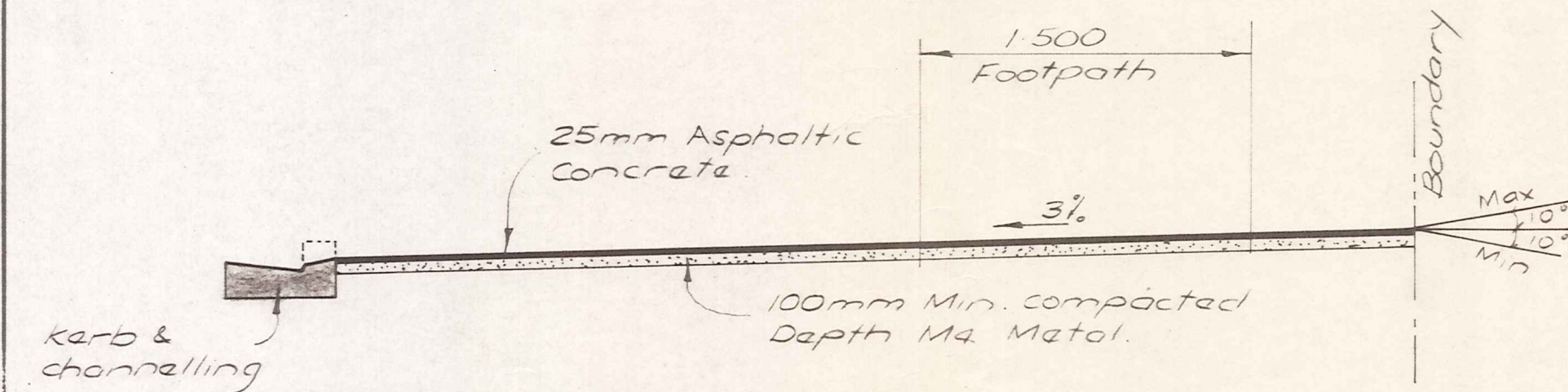
TYPICAL SECTION BETWEEN DRIVEWAYS (SHOWING HOUSEHOLD STORMWATER CONNECTION)



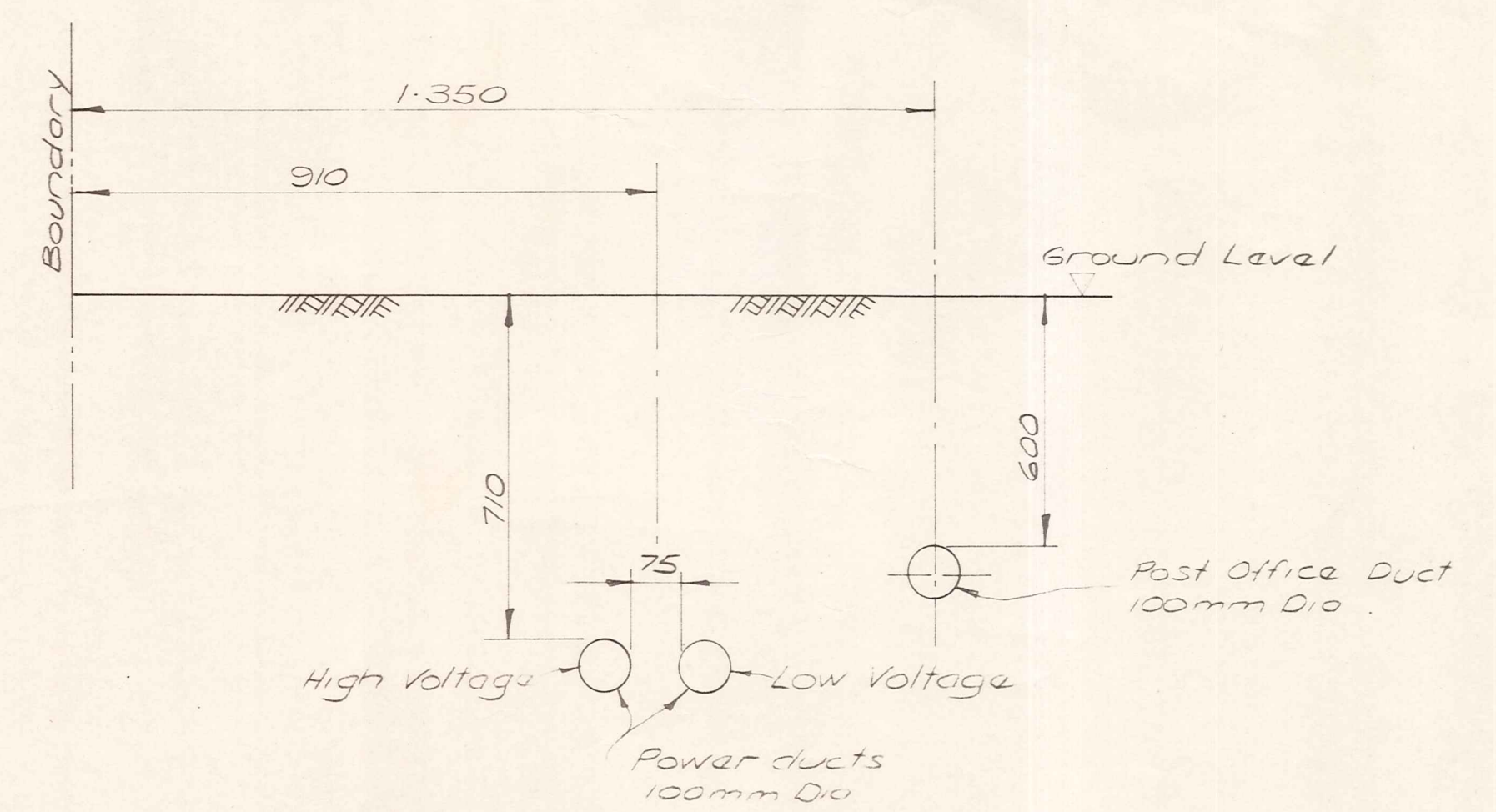
TYPICAL SECTION BETWEEN DRIVEWAYS



TYPICAL SECTION ALONG & DRIVEWAYS



TYPICAL SECTION ALONG & DRIVEWAYS



POWER AND TELEPHONE CABLE DUCTS INTERSECTION DETAILS

N.T.S.