



Job No. 10641

11th March 2011

Development Manager – Daniel Maurici
Henroth Investments Pty Ltd
801 / 46-56 Kippax Street
Surry Hills NSW 2010

email: dan@henroth.com.au

Dear Dan,

**RE: PART 3A APPLICATION FOR CONCEPT PLAN APPROVAL
MIXED-USE DEVELOPMENT – 566-594 PRINCES HIGHWAY, KIRRAWEE
RESPONSE TO SUTHERLAND SHIRE COUNCIL SUBMISSION - STORMWATER**

We refer to the Part 3A Application for Concept Plan Approval of the proposed mixed-use development at the former Kirrawee Brick Pit site. This is with regard to the recent submissions from stakeholders as part of the Application process. In particular this correspondence offers response to Sutherland Shire Council Stormwater Engineer Comments – received by email as an Attachment “E”.

To this end, Northrop offers the following comments in general response to matters raised in the subject Council Submission:

Concept Stormwater Management Plan

1. Northrop has performed all necessary calculations, assessments and design processes to demonstrate feasibility of the proposed scheme for site stormwater management. We have placed high importance on the Concept Design demonstrating that the variety of objectives for stormwater / water management can be integrated into the development – and the need to achieve outcomes that can be constructed to operate effectively.

Groundwater

2. Page 2 of the “Response to Drainage and Stormwater Management Matters”, prepared by Northrop (dated 12.11.10) identifies that *“tanking of proposed basement levels (at the required depths) [is proposed] in order to manage potential impacts to existing groundwater levels, and reduce any need for pre-treatment and disposal of sub-surface water from the site.”* In this regard, no groundwater flows are expected to be “managed” for discharge from the site. We refer also to the detailed groundwater assessment report prepared by C.M. Jewell and Associates (as part of the subject Part 3A Application).

Flooding

3. The proposed on-site stormwater detention (OSD) facilities have been indicated on the plans to show their respective positions (and levels) within the basement structure. These concepts have been coordinated with the Architect (and urban design).
4. The reference to the applicant agreeing to *“a maximum rate of stormwater flow to address Council’s concerns”* relates to a previous Development Application scheme – and is not relevant to this particular Project / Part 3A Application.

5. The maximum discharge rate for runoff from the 'southern two thirds catchment' of the subject development has been derived from evidence that a 450mm-diameter stormwater drainage pipe once serviced the site. The supporting information is attached as follows:

Appendix	Title	Comment
Appendix A	Sutherland Shire Council - Detail Survey Plan Oak Road, Kirrawee - Brick Pits and Quarry	- Detail Survey Plan indicates point of “Stormwater Interception and Disposal” – bottom right hand corner of site
Appendix B	Extract from Sydney Water Report, April1993 Kirrawee Brick Pit: Environmental Status and Suitability for Landfill	- Section 2.2.2 states “Escape of water from the site occurs:.....(b) via a stormwater outlet in the south eastern corner”
Appendix C	Norton Survey Partners – Survey Plan and Pit Details	- Sheet 1 and 2 shows Pit 3 (located at the upstream end of Flora Street) with 450mm-diameter pipe connecting from upstream.

6. The Proponent should be permitted to drain the 'southern two thirds catchment' to the public drainage system in Flora Street. This is consistent with the natural catchment.
7. The maximum flow-rate proposed for the Project represents approximately half of what would be expected from the site catchment in its 'natural' (undeveloped) state. It is reasonable for the Proponent to be permitted to discharge this amount to the public drainage system directly downstream of the subject site.
8. The Council submission states that *"some of the downstream drainage systems are already subject to flooding and water pollution under existing conditions."* The Proponent should not be compensating for:
 - i. Existing deficiencies in the downstream drainage system, or
 - ii. Inadequacies of the existing drainage system to accommodate the controlled release of runoff from the site, particularly when the proposed flow (a) was previously accommodated by a 450mm-diameter pipe (refer to Point 5), and (b) is approximately half the rate that would be expected from the site in its 'natural' state (refer to Point 7).

Ornamental Lake / Compensatory Water Body

9. There is no definitive standard for the water quality levels required to support grey-headed flying foxes. Cumberland Ecology has advised the ANZECC Guidelines (Stock Water) are sufficient to suit the purpose (i.e. for flying foxes to drink) – as outlined in their response to Ecological Matters. These Guidelines have formed the basis for conceptual design of the runoff treatment systems proposed to drain to the Compensatory Water Body, supplemented by data from Sutherland Shire Council (for Engadine Wetland).
10. It is questionable the quality of water at the outlet represents what flying foxes drink at Engadine Wetland Pond. The outlet represents water once it passes through the system.

We provide these comments to assist response to the Sutherland Shire Council Submission on stormwater matters. We remain available to provide further information at your discretion.

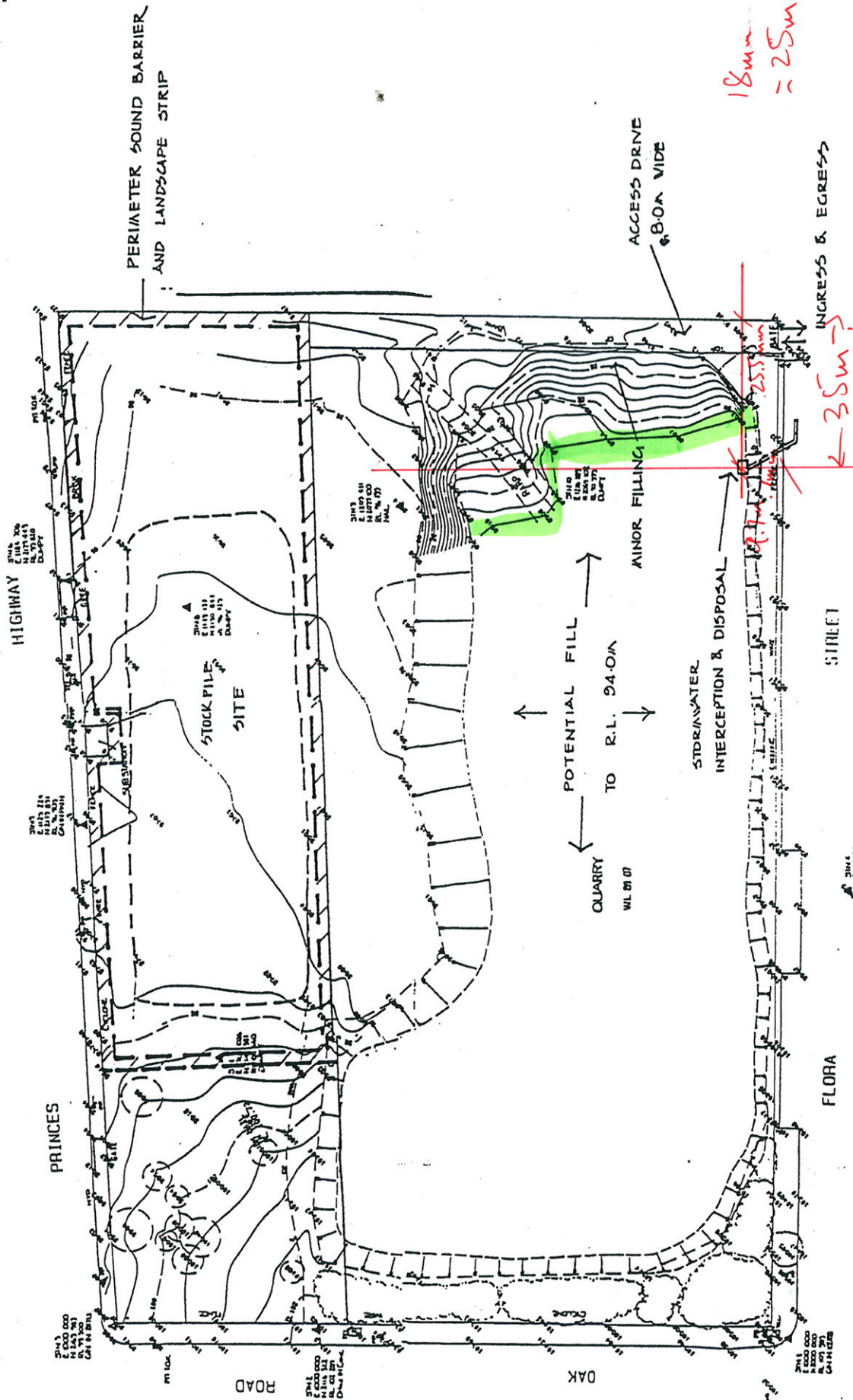
Yours faithfully,

NORTHROP
Mathew Richards
Principal – Civil Engineering Manager

Electrical Environmental Civil Hydraulic Mechanical Structural Electrical Environmental Civil Hydraulic Mechanical Structural
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**APPENDIX A: SUTHERLAND SHIRE COUNCIL - DETAIL SURVEY PLAN
OAK ROAD, KIRRAWEE - BRICK PITS AND QUARRY**



P. M. M. M.

19-10-72

SUTHERLAND SHIRE COUNCIL
OAK ROAD - KIRRAWEE
BROOK PIT AND QUARRY
FLAT SURVEY

LEGEND		NOTES	
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3	PROPOSED	3	PROPOSED
4	PROPOSED	4	PROPOSED
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APPENDIX B: EXTRACT FROM SYDNEY WATER REPORT, APRIL 1993
KIRRAWEE BRICK PIT: ENVIRONMENTAL STATUS AND SUITABILITY
FOR LANDFILL

Upon notification by the EPA, the Board immediately stopped disposing silt to drying beds at the Brickpit site. The Board is now aware that if it disposes of reservoir silt by landfill, the site needs to be registered with the EPA as a depot (see Appendix 2).

2.2 Physical and Biological Environment

The degree of environmental impact of a landfill operation depends not only on the type and quantity of waste, but on the ability of the receiving environment to cope with impacts. This section provides a preliminary assessment of the physical and biological environment at the Kirrawee site. Additional investigation would have been required if the waste had been found to be unsuitable for landfill.

2.2.1 Topography

Topographic features of the brickpit site are depicted in the detail survey plan (Figure D). The stockpile site slopes gently eastwards (Plate 3). To the south of this, the quarry walls range from about 30m high on the western side to about 10m on the east. Walls are very steep on three sides (Plate 4) and less steep on the eastern side.

2.2.2 Water

The quarry itself is often partly filled with water (Plates 5 & 6) and may contain illegally dumped wastes. Water in the quarry may comprise some leachate. Surface water inflow to the quarry occurs during rain, either directly onto the quarry or as runoff from the stockpile site. Groundwater may also seep into the quarry. Amounts and rates of water leaving the quarry are primarily influenced by rainfall, evaporation, soils, topography and geology. Escape of water from the site occurs:

- (a) by evaporation;
- (b) via a stormwater outlet in the south eastern corner; or
- (c) by entering the groundwater system.

None of these flows have been quantified.

2.2.3 Soil Erosion

Runoff is greater where vegetation cover is sparse, especially where the old brickpit structures exist at ground level; vehicles have driven and material has been stockpiled (Plates 7 & 8). To reduce the amount of runoff and consequent soil erosion, siltation controls have been constructed around the northern and eastern rims of the quarry (Plates 9 & 10). Siltation controls employed at the site include bunds which direct flow to low points in the landscape at the edge of the quarry. At

APPENDIX C: NORTON SURVEY PARTNERS – SURVEY PLAN AND PIT DETAILS



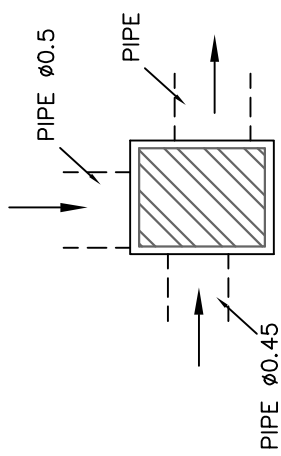
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PIT 3	322301.43	6232374.71	PIT 19	322344.04	6232226.10
PIT 4	322314.56	6232372.72	PIT 20	322501.15	6232186.80
PIT 5	322344.52	6232368.02	PIT 21	322502.65	6232196.24
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PIT 7	322359.01	6232390.47	PIT 23	322516.02	6232196.48
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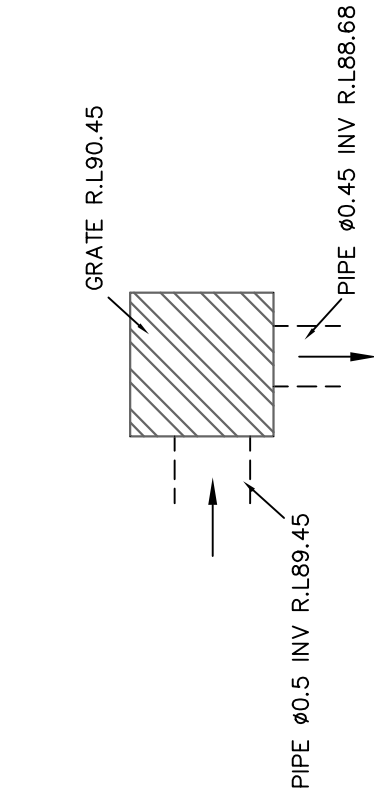
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- 2) ORIGIN OF LEVELS: SSM37046 R.L.91.016 (A.H.D.) SCIMS
- 3) UNDERGROUND SERVICES HAVE NOT BEEN INVESTIGATED.
- 4) SEE SHEETS 3 AND 4 FOR PIT DETAILS.
- 5) ——— DENOTES APPROXIMATE LOCATION OF MAIN DRAINAGE TRUNK.
- 6) PITS LOCATED WITHIN PRIVATE PROPERTY OR RAIL CORRIDOR NOT SURVEYED.

ISSUE	DATE	AMENDMENT

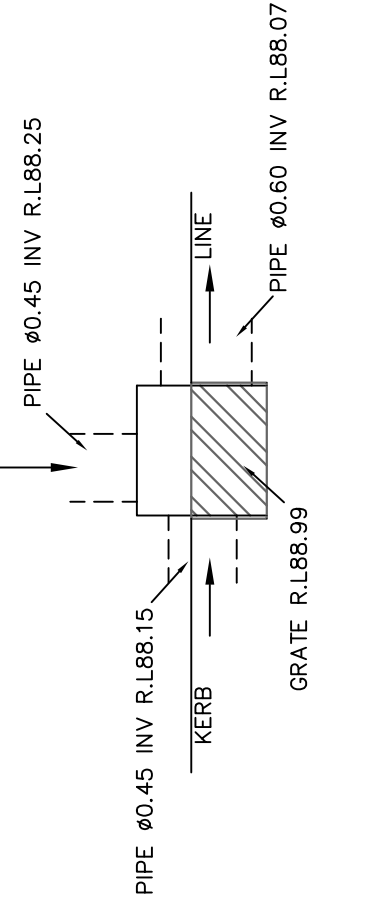
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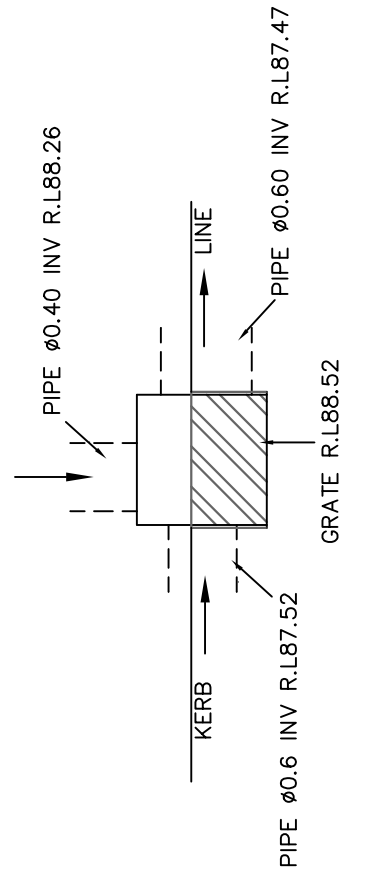
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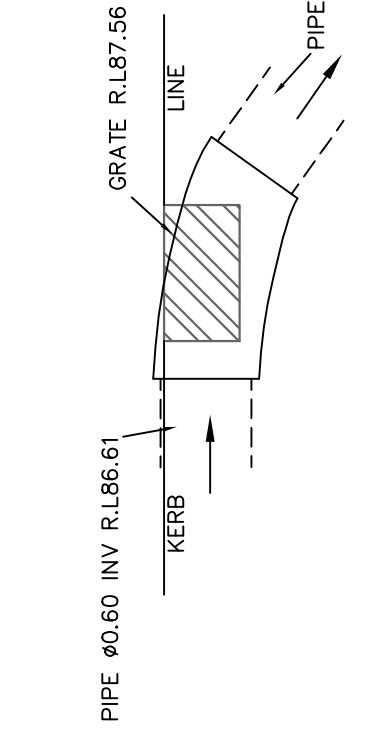
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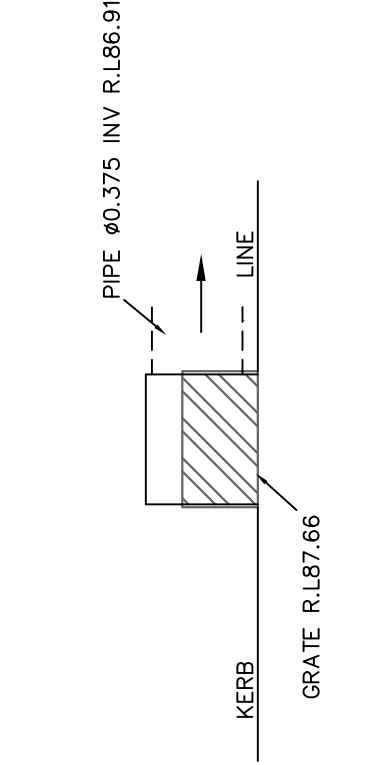
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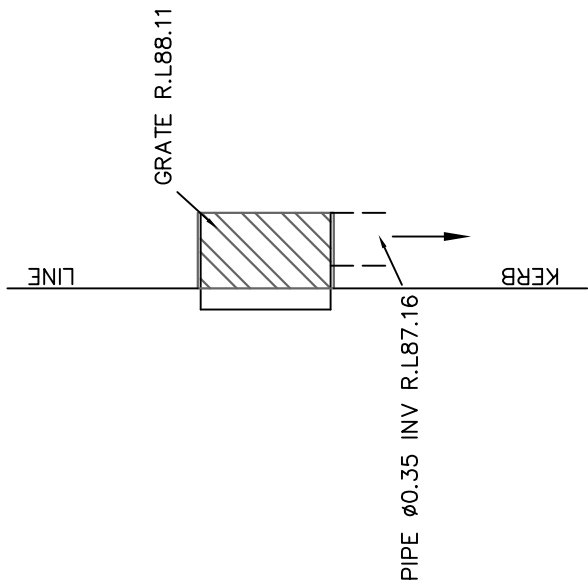
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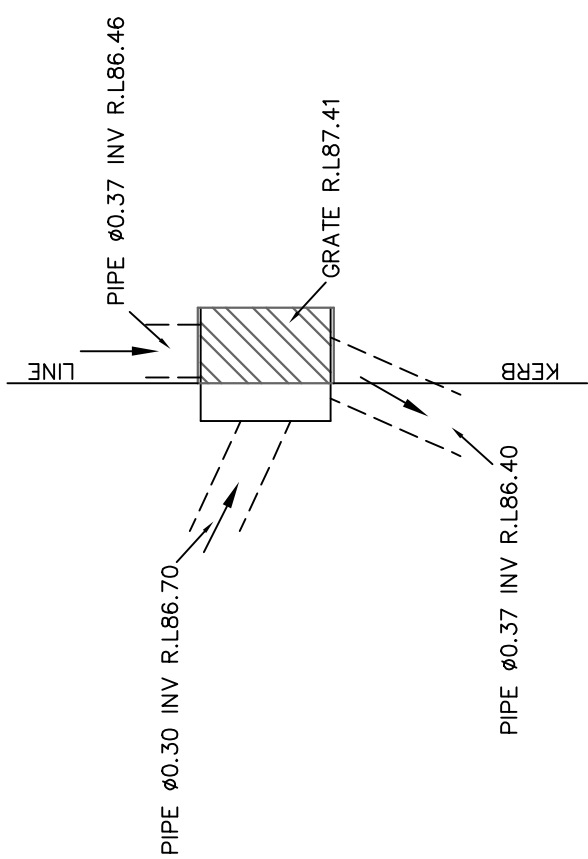
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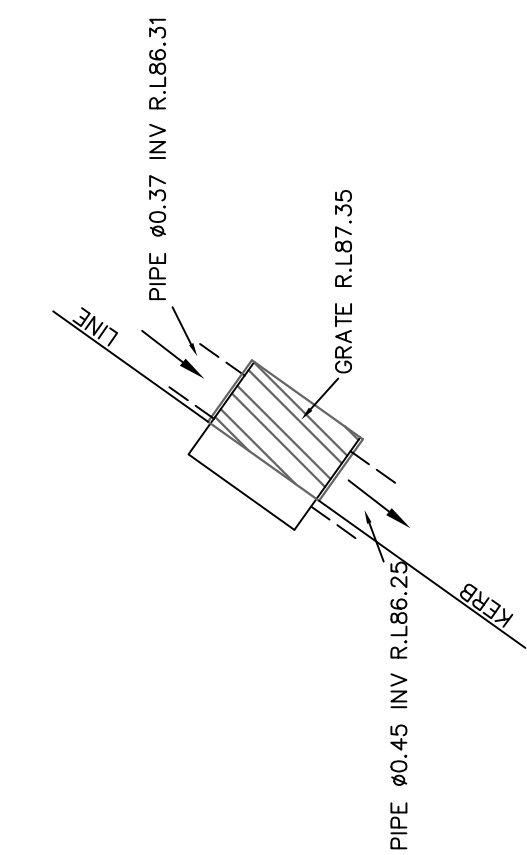
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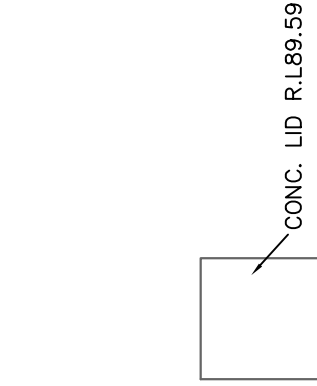
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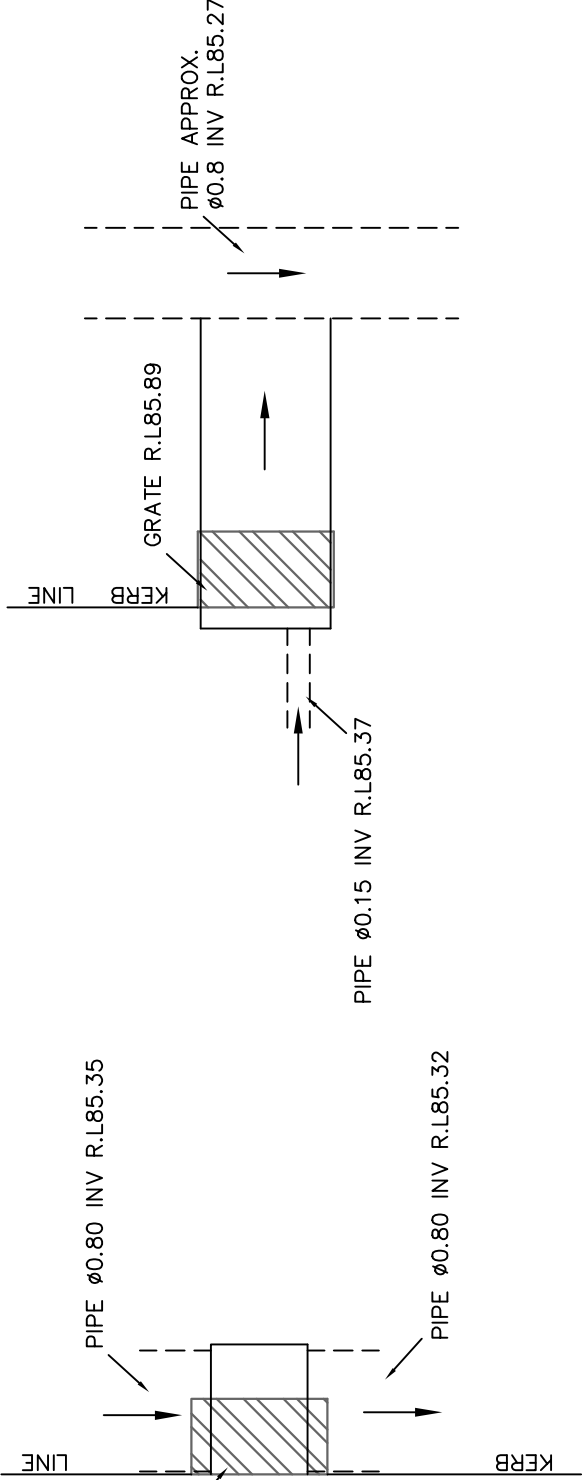
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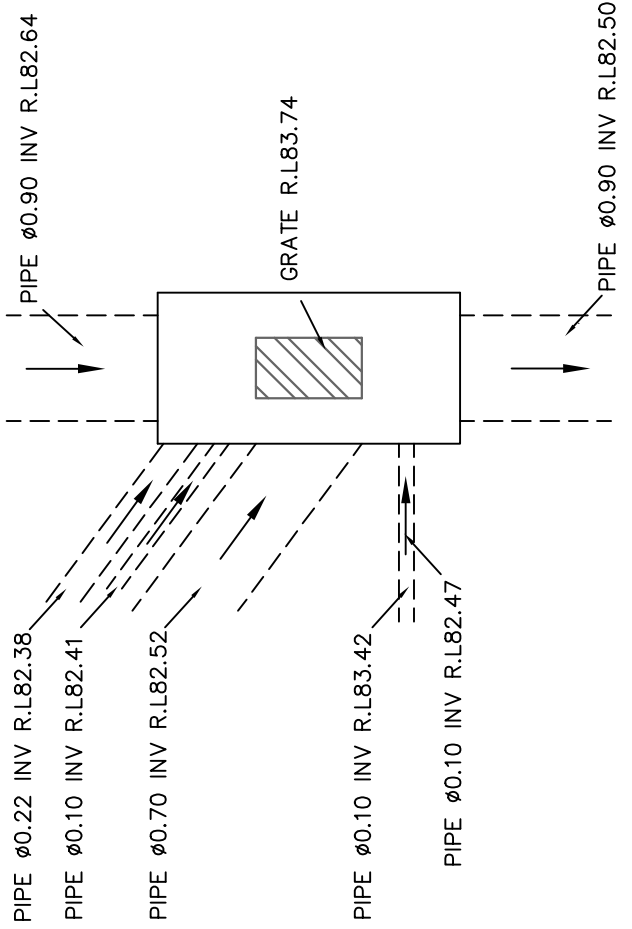
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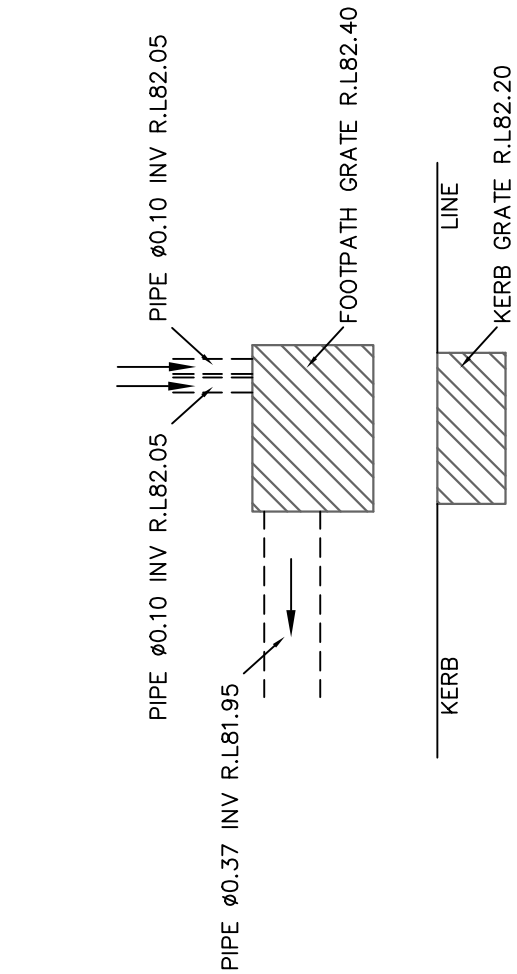
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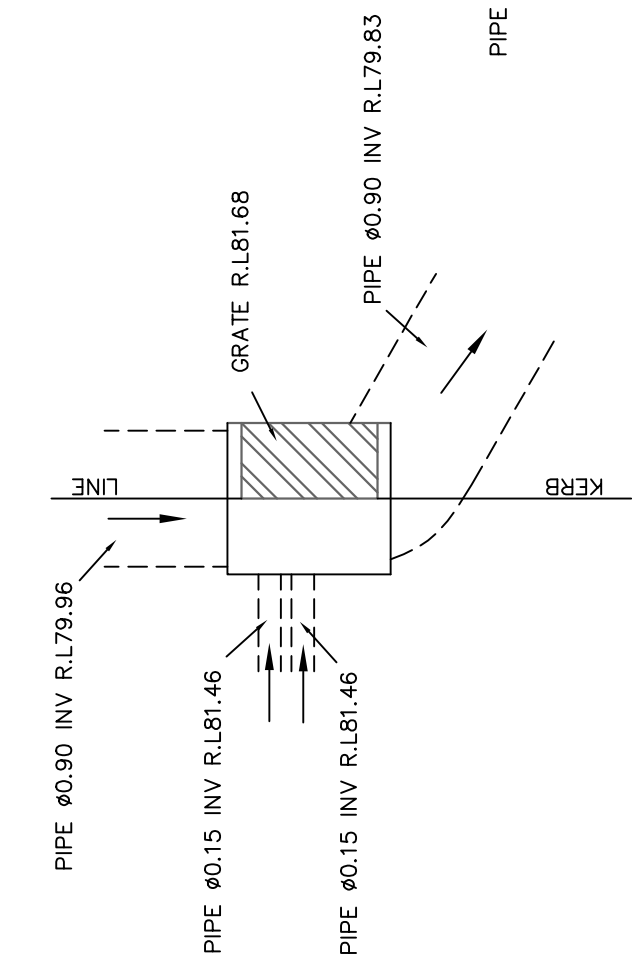
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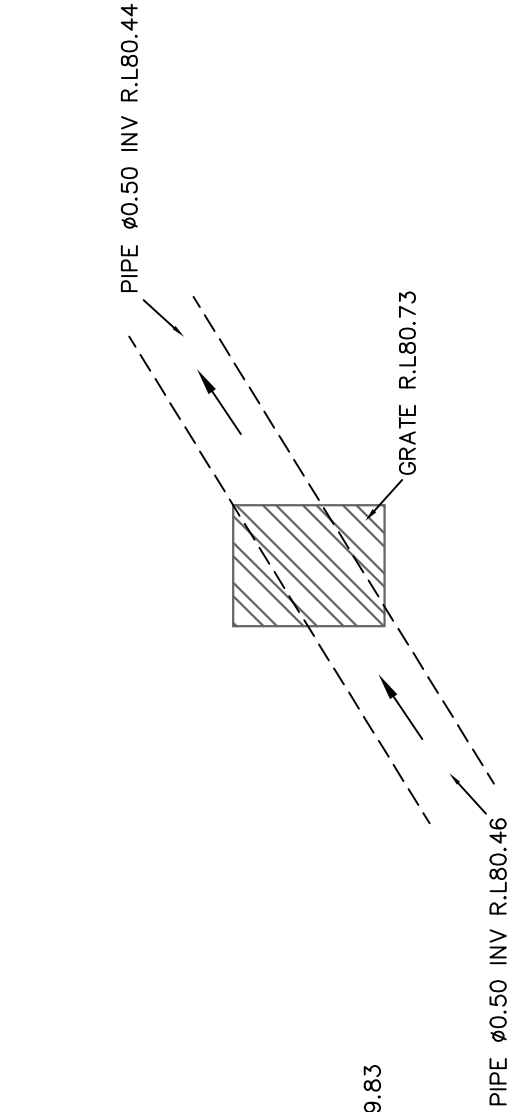
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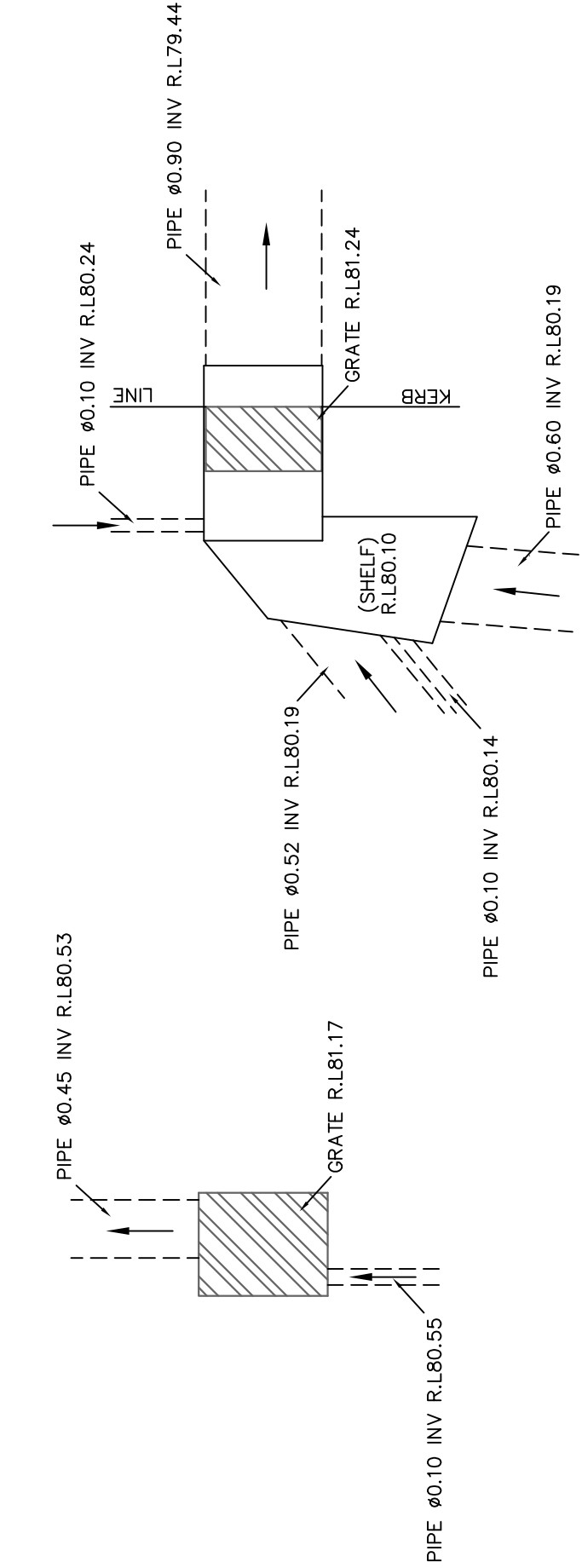
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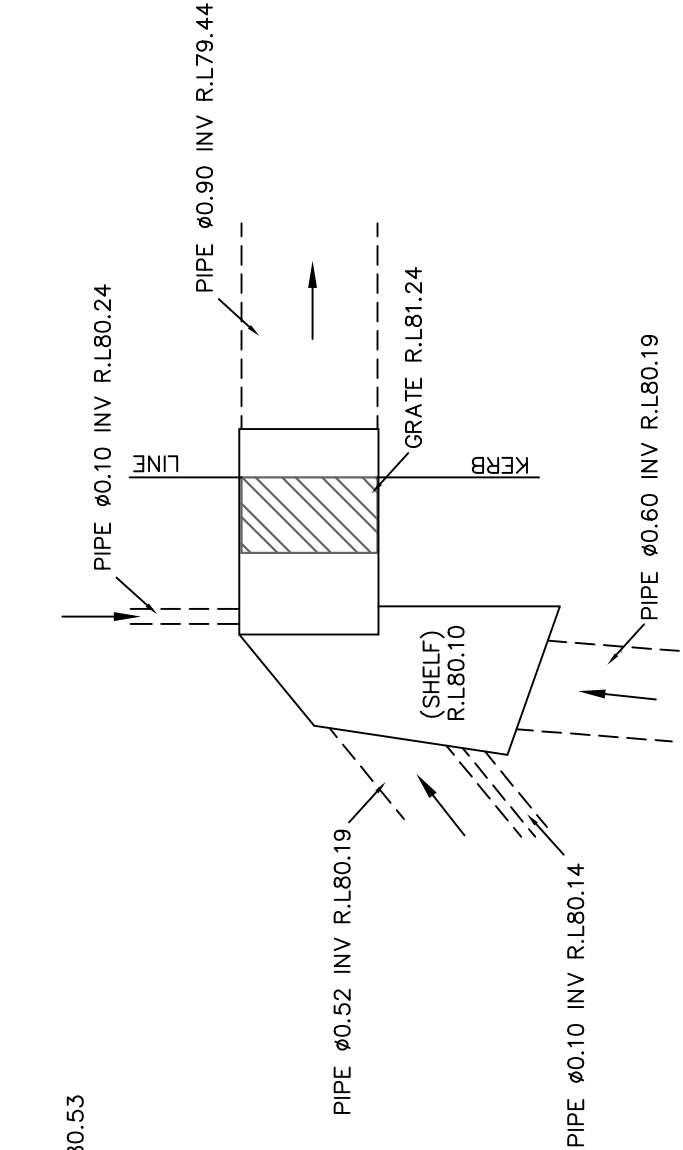
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PIT 16



PIT 17

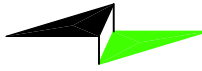


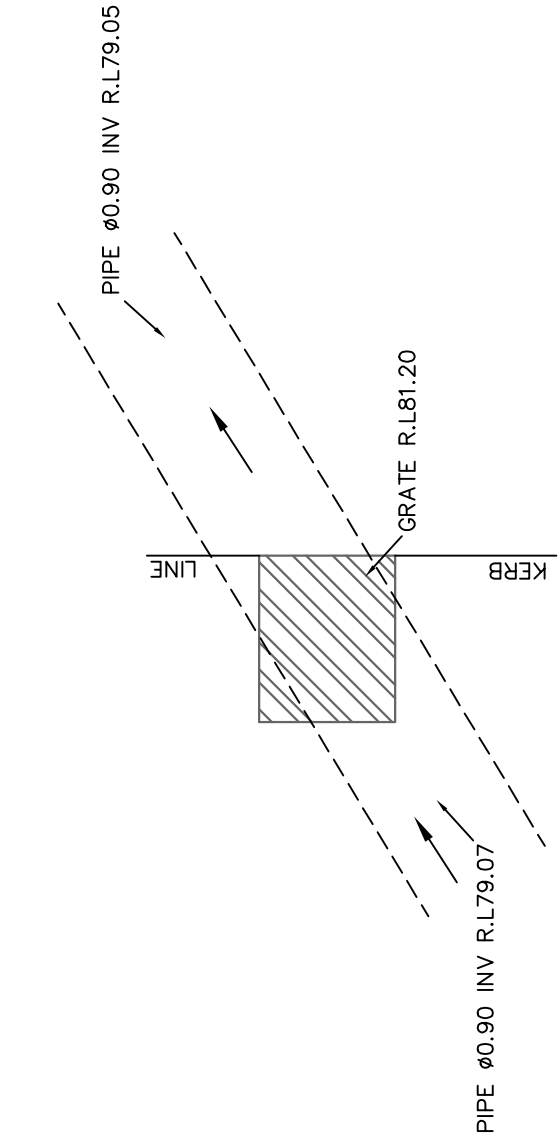
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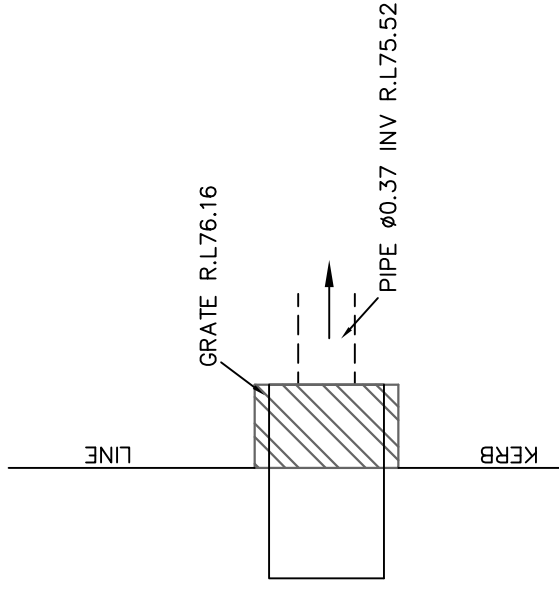
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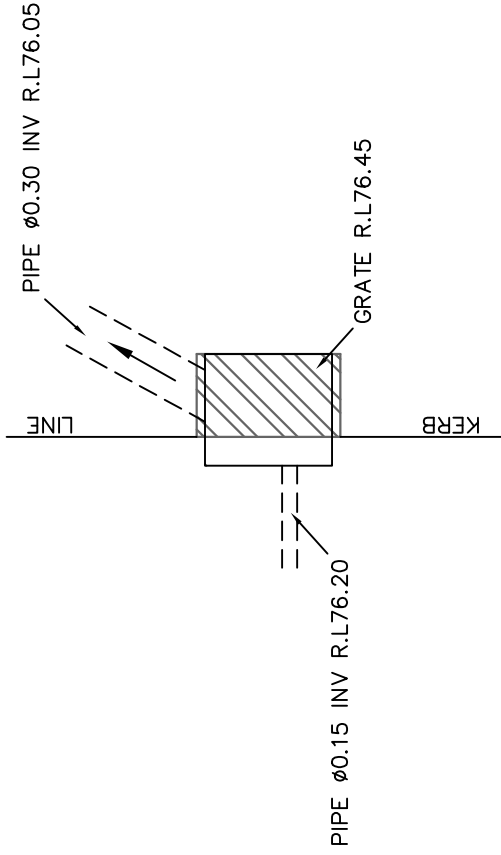




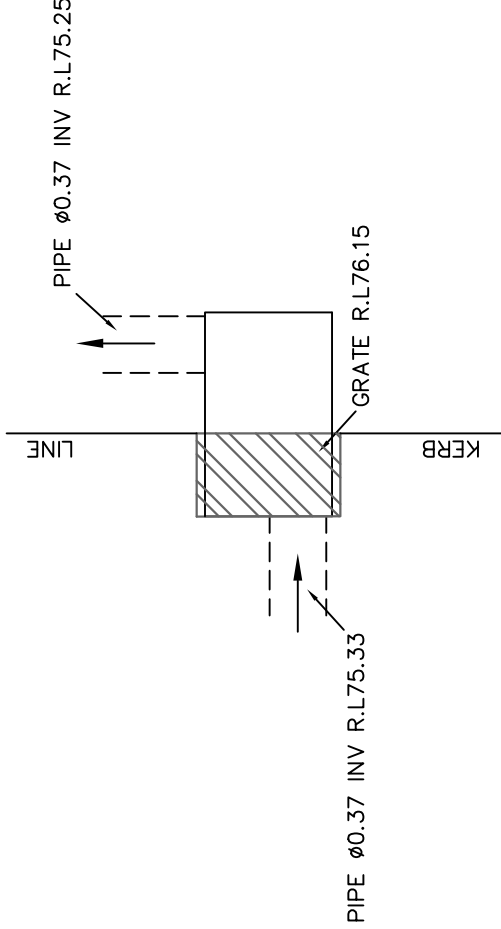
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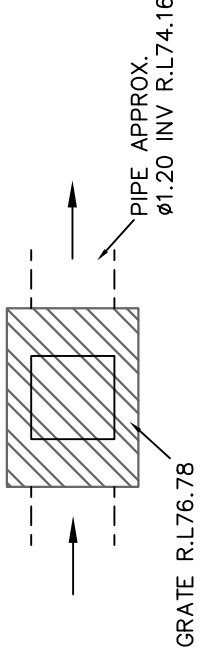
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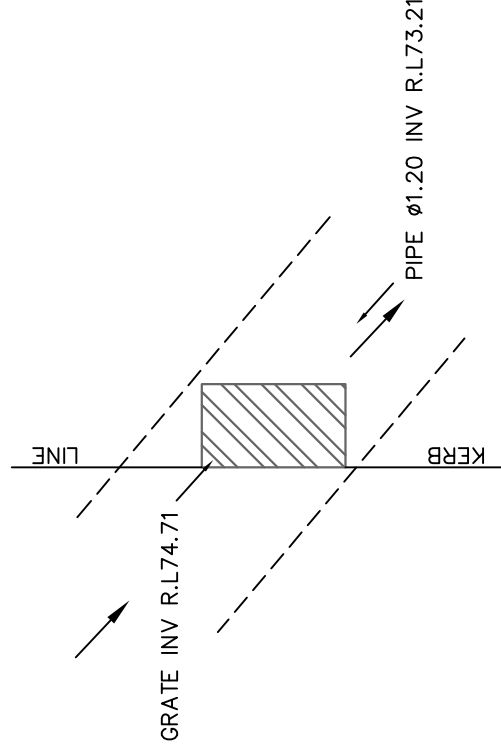
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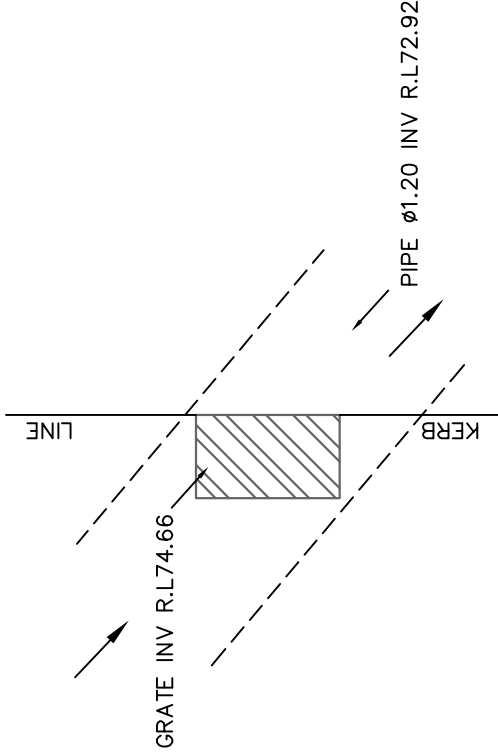
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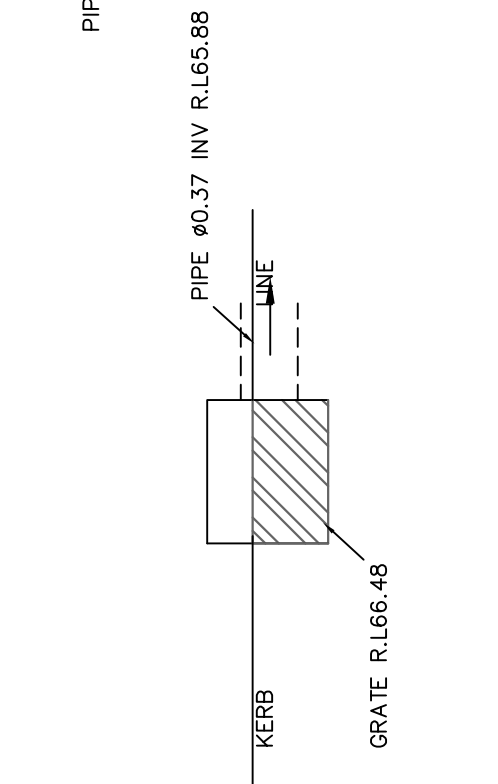
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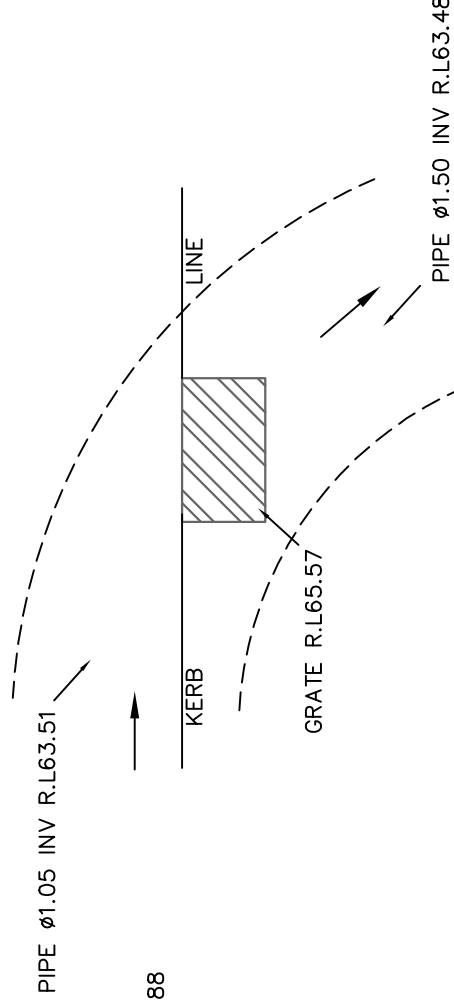
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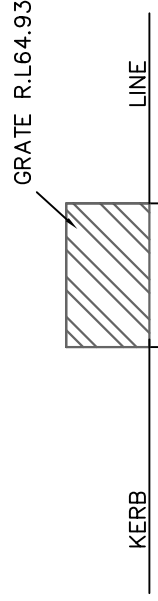
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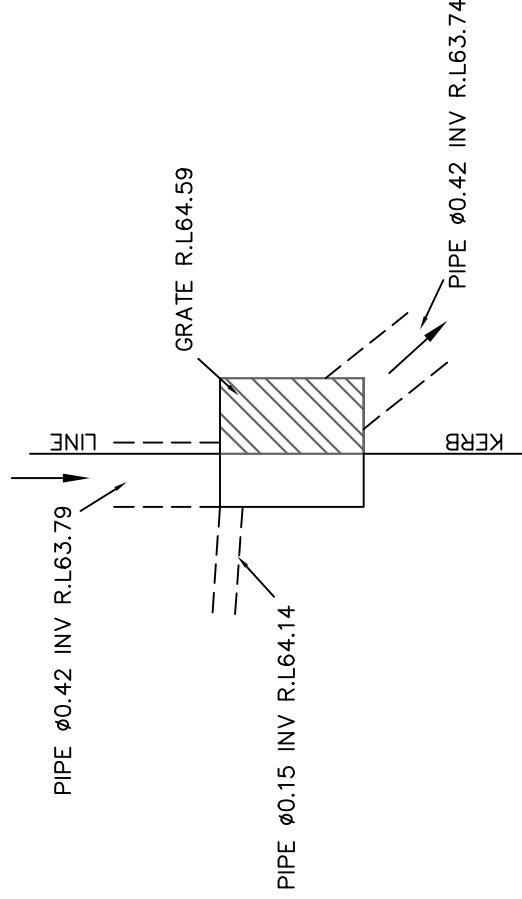
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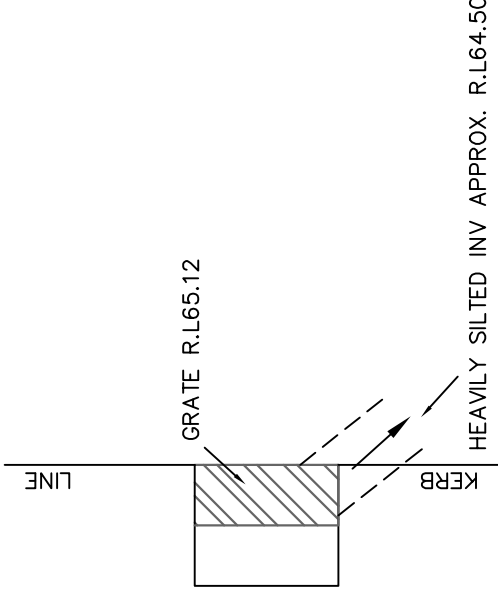
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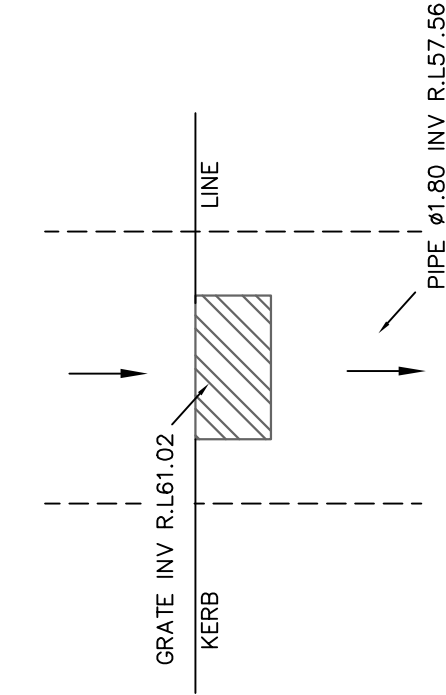
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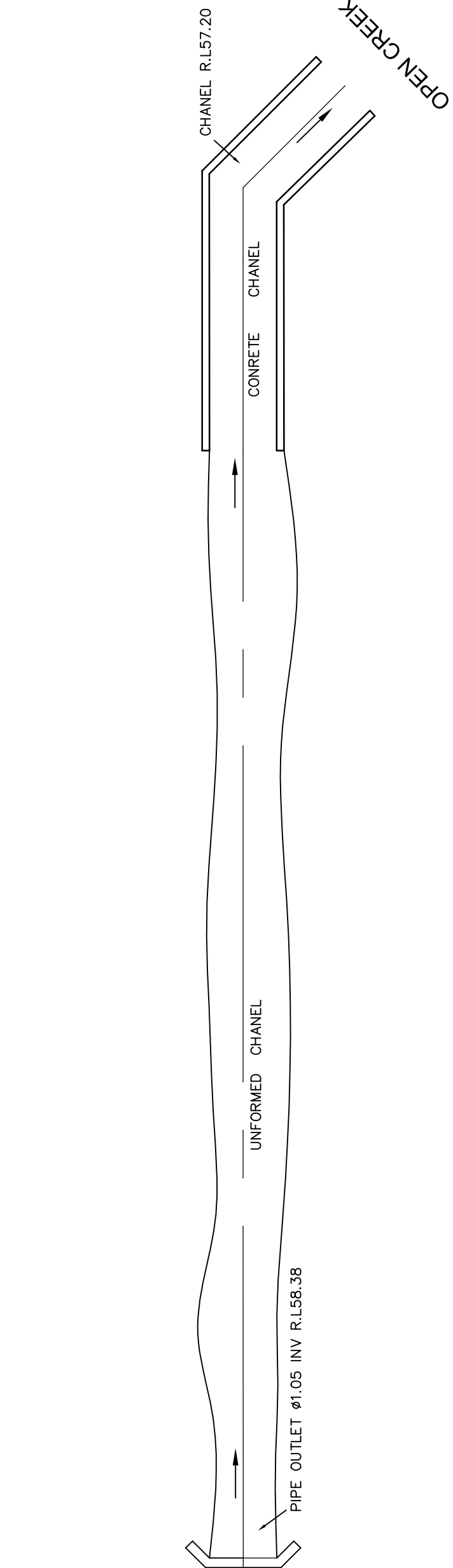
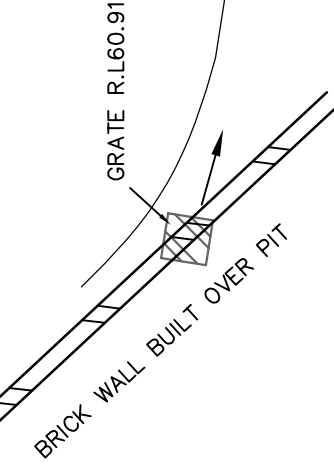
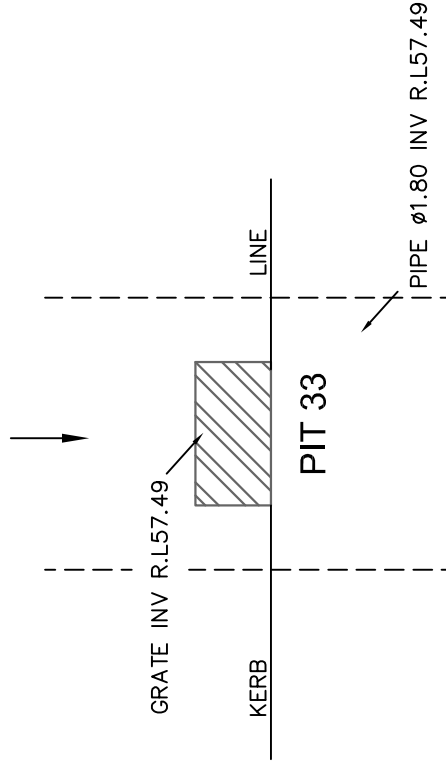
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PIT 31



PIT 32



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NOTES:

1) SEE SHEET 1 FOR LOCATIONS

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