DEPARTMENT OF WATER AND SANITATION

DUE AT 11:00 ON

CLOSING DATE: 18 FEBRUARY 2025

DWS21-0125 WTE

CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

SUBMIT BID DOCUMENTS TO:

POSTAL ADDRESS:
DIRECTOR-GENERAL:
WATER AND SANITATION
PRIVATE BAG X313
PRETORIA, 0001

OR

TO BE DEPOSITED IN:
THE BID BOX AT THE ENTRANCE
OF ZWAMADAKA BUILDING
157 FRANCIS BAARD STREET
PRETORIA, 0001

Compulsory Briefing Session
Date: 28 January 2025
Time: 14:00pm
Venue: Clanwilliam dam
at the Contractors Office Boardroom, Construction South, Western Cape Province
(GPS co-ordinates 32°11'46.8"S and 18° 52' 38.8"E)

TAKE NOTE: T 1.2 Tender data – Clause 5.7: Compulsory clarification meeting requirements

Name of Tenderer: . . . . . .

COMPILED BY:
DEPARTMENT OF WATER AND SANITATION: CONSTRUCTION SOUTH

DEPARTMENT OF WATER AND SANITATION

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CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

PROCUREMENT DOCUMENT

Based on GCC - The General Conditions of Contract for Construction Works, 3rd Edition (2015), published by the South African Institution of Civil Engineering

Issued by:
Department of Water and Sanitation
Zwamadaka building
157 Francis Baard Street
Pretoria
0001

Prepared by:
Construction South
Department of Water and Sanitation

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CONTENT OF DOCUMENT (as presented)

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Appendix A: Drawings (Digital)

Appendix B: Site layout

Appendix C: Site installation of pipe – welding & corrosion protection

Appendix D: Pipe assembly drawings CWD7006 and CWD7002

Appendix E: Historical weather data

Appendix F: General requirements for storage of mechanical equipment on-site

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T1.1 TENDER NOTICE AND INVITATION TO TENDER

The Department of Water and Sanitation has invited contractors to enter into a contract for the service of a corrosion protection contractor, over a 5-year term, for the pipes and specials for Clanwilliam dam project, relating to any or all of the following:

1. Corrosion protection of:
    a. Pipes and Pipe specials at own workshop.
    b. On Site repairs
    c. Site Field joints.

2. Transportation to Site from own workshop.

This contract will be based on GCC - The General Conditions of Contract for Construction Works, 3rd Edition (2015), published by the South African Institution of Civil Engineering.

Tenderers must have a CIDB contractor grading designation of 7SD or higher.

Documents may be downloaded from the Department of Water and Sanitation website at www.dws.gov.za/Tenders/tendersCurrent.aspx and from National Treasury website at www.etenders.gov.za.

Queries relating to the issue of these documents may be addressed in writing to bidenquirieswte@.gov.za and CWD-Tenders@DWS.gov.za

A compulsory site clarification meeting with representatives of the Employer will take place at Clanwilliam dam Site (GPS co-ordinates 32º11’ 46.8” S and 18º 52’ 38.8” E at security control gate entrance to site – see Submission Data for further particulars) on 28 January 2025 starting at 14:00 hrs.

The closing time for receipt of tenders is 11:00 hrs on 18 February 2025. Telegraphic, telephonic, telex, facsimile, e-mail and late tenders will not be accepted.

Tenders may only be submitted on the tender documentation that is issued.

Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the Tender Data.

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T1.2 TENDER DATA

The conditions of tender are those contained in the latest edition of SANS ISO 10845-3: 2022 Ed2, Construction Procurement – Part 3: Standard conditions of tender.

SANS ISO 10845-3:2022 Ed2 makes several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the provisions of SANS ISO 10845-3: 2022 Ed2.

Each **clause number** of data given below is cross-referenced to the clause in SANS ISO 10845-3: 2022 Ed2 to which it mainly applies.

Clause number	TENDER DATA
4	**GENERAL REQUIREMENTS**
4.1	The Employer is the **Department of Water and Sanitation** **Chief Directorate Construction Management** **Construction South**
4.2	DWS 9900 (2nd Edition; July 2022) DWS 2020 CWD 44 CWD 65 CWD 67 EMP Appendix A: Drawings (Digital) Appendix B: Site layout Appendix C: Site installation of pipe – welding & corrosion protection Appendix D: Pipe assembly drawings CWD7006 and CWD7002 Appendix E: Historical weather data Appendix F: General requirements for storage of mechanical equipment on-site
4.4	The employer's agent email address is: CWD-Tenders@DWS.gov.za
4.4	The language for communications is **English**

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5	**TENDERER'S OBLIGATIONS**
5.1.1	Only those tenderers who satisfy the following eligibility criteria and who provide the required evidence in their tender submissions are eligible to have their tenders evaluated: An Entity is not eligible to submit a bid if: (a) the Tenderer does not comply with the legal requirements of the Department's Procurement; (b) the Entity submitting the bid is under restrictions or has principals who are under restriction to participate in the Department's procurement due to corrupt or fraudulent practices; (c) the Tenderer does not have the legal capacity to enter into the contract; (d) the Entity submitting the bid is insolvent, in receivership, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of the foregoing; (e) the Tenderer cannot demonstrate that he possesses the necessary professional and technical qualifications and competent, financial resources, equipment and other physical facilities, managerial capability, personnel, experience and reputation to perform the contract; (f) the Tenderer cannot provide proof that he is in good standing with respect to duties, taxes, levies and contributions required in terms of the legislation applicable to the work in the contract; (g) The respondent and any of its directors/shareholders are not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 or the National Treasury's Database of Restricted Suppliers (see www.treasury.gov.za) as a person prohibited from doing business with the public sector; (h) The respondent is registered on the Central Supplier Database (CSD) for the South African government (see https://secure.csd.gov.za/) unless it is a foreign supplier with no local registered entity and attached company CSD report (Annexure M); (i) The respondent has completed the Compulsory Declaration and there are no legal reasons for not permitting the respondent from contracting with the Employer; (j) The respondent, unless a foreign supplier, is tax compliant or provides written proof from SARS that the respondent has made arrangements to meet outstanding tax obligations. Proof of Tax pin page to be submitted (Annexure L); (k) The respondent can provide financial statements complying with applicable legislation for the preceding financial year within 24 months of the year end; (l) The respondent is registered and in good standing with the compensation fund or with a licensed compensation insurer; (m) the Tenderer has failed to perform on any previous contract and has been given a written notice to this effect; (n) the Tenderer or a competent authorized representative of the Entity who submitted the tender has not attended the compulsory clarification meeting or site briefing session if applicable; (o) the bid-offer is not signed by a person authorized to sign on behalf of the Tenderer; (p) more than one bid has been submitted by a Tenderer. Each Tenderer shall submit only one bid for the same project, either individually as a Tenderer or as a partner in a joint venture. No Entity can be a subcontractor while submitting a bid individually or as a partner of a joint venture in the same bidding process. An Entity, if acting in the capacity of subcontractor in any bid, may participate in more than one bid, but only in that capacity. A Tenderer who submits or participates in more than one bid will cause all the proposals in which the Tenderer has participated to be disqualified; (q) Tenderers needs to satisfy the requirement of clause 6.8 and 6.11.

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5.1.1	Only those Tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a Contractor grading designation equal to or higher than a Contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a CIDB 7SD or higher class of construction work, are eligible to have their tenders evaluated. All projects of R60m and above must apply the Standard for Indirect Targeting for Enterprise Development. Joint ventures are eligible to submit tenders provided that: 1. every member of the joint venture is registered with the CIDB; & 2. the lead partner has a Contractor grading designation in the CIDB 6SD or higher class of construction work; and the combined Contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a Contractor grading designation determined in accordance with the sum tendered for a CIDB 7SD or higher class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.
5.5	Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are incorporated into the tender documents by reference.
5.7	The arrangements for a compulsory site clarification meeting are as stated in the Tender Notice and Invitation to Tender. (Site clarification meeting is also referred to as site briefing session.) **DIRECTIONS:** The dam site is situated on the Olifants River, immediately next to the N7 and accessed through a controlled gate (GPS co-ordinates 32°11'46.8" S and 18° 52' 38.8" E) approximately 2 km South- West of Clanwilliam Town in the Western Cape province. The gravel site access roads are regularly maintained but can get challenging under abnormal rainfall conditions. **NOTE TO TENDERER:** Personal Protective Equipment (PPE) such as safety boots will be required before entering the site to examine some aspects of the works. A full-time employee of the respondent who is/are duly authorised and involved in preparing submissions shall sign the attendance list in the respondent's name and get the Annexture A signed by a duly authorised DWS official. If addenda should be issued, it will only be issued to the respondents appearing on the attendance register.
5.10	Tenderers are required to state the rates and currencies in South African Rand (ZAR).
5.12	No alternative offer will be accepted.
5.13.1	Parts of each tender offer communicated on paper shall be submitted as an original, plus one (1) softcopy. The tenderer is requested to also provide an electronic format **PDF (soft) copy on a USB flash drive** of the complete tender submission and to include this in their tender submission.
5.13.2	The tenderer is required to provide proof of authority for the signatory to sign the form of offer and acceptance and attach it to Annexure J, e.g., a company resolution. Complete and sign Annexure J

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5.13.4	The tenderer is required to submit with his tender the following certificates as per requirements in 6.8 and returnable documents T2.2.
5.13.5	The employer's details and address for delivery of tender offers and identification details that are to be shown on each tender offer package are: **1) <u>TENDER DETAILS:</u>** **Tender reference number: DWS21-0125 WTE** **Title of Tender:** **CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID** **2) <u>DETAILS AND ADDRESS FOR DELIVERY OF TENDER OFFERS:</u>** **Location of tender box** THE BID BOX AT THE ENTRANCE **Physical address:** ZWAMADAKA BUILDING 157 FRANCIS BAARD STREET, PRETORIA, 0001
5.13.5	The "ORIGINAL" and "PDF (soft) copy on USB flash disk" are to be submitted. The PDF soft copy on a USB Flash drive is to be submitted together with the "ORIGINAL" packages.
5.13.6	Telephonic, telegraphic, telex, facsimile or e-mailed tender offers shall **NOT** be accepted.
5.14	Tender offer which do not provide all the data or information requested, completely and in the form required, may be regarded by the Employer as being non-responsive.
5.15	The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.
5.16.1	The tender offer validity period is 120 days.
5.19	Minimum notification period for access to the Tenderers premises for inspection, test and analysis as follows: 1) 72 hours (3 days) notification from the Employer to the Tenderer/Contractor; & 2) 72 hours (3 days) notification from the Contractor to the Employer for inspections.
5.20	The Tenderer is required to submit with his tender a letter of intent from an approved insurer undertaking to provide the Performance Guarantee to the format included in Part C1.3 of this procurement document. (See also GCC 2015: Clause 6.2 – Security.)
6	**EMPLOYER'S UNDERTAKINGS**
6.1.1	The Employer will respond to requests for clarification received up to seven (7) working days before the tender closing time.
6.2	The employer shall issue an addenda until four (4) working days before tender closing time.
6.4	Tenders will be opened immediately after the closing time for tenders at 11:00 hrs

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6.8	Determine, after opening and before detailed evaluation, whether each tender offer that was properly received a) complies with the requirements of the standard conditions of tender in this document, b) has been properly and fully completed and signed, and c) is responsive to the other requirements of the tender documents. A responsive tender is one that conforms to all the terms, conditions, and scope of work of the tender documents, without material deviation or qualification. A material deviation or qualification is one which, in the employer's opinion, would d) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the scope of work, e) significantly change the employer's or the tenderer's risks and responsibilities under the contract, or f) unfairly affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified. Reject a non-responsive tender offer, and do not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.
6.9	Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern. Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with 6.11 for a) the gross misplacement of the decimal point in any unit rate, b) omissions made in completing the pricing schedule or bill of quantities, or c) arithmetical errors in 1) line-item totals resulting from the product of a unit rate and a quantity in bill of quantities or schedules of prices, or 2) the summation of the prices. Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices. Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows: d) If a bill of quantities or pricing schedules apply and there is an error in the line-item total resulting from the product of the unit rate and the quantity, the line-item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line-item total as quoted shall govern, and the unit rate shall be corrected. e) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer shall be asked to revise selected item prices (and their rates if bill of quantities apply) to achieve the tendered total of the prices. Consider the rejection of a tender offer if the tenderer does not correct or accept the correction of errors in the required manner.
6.11	Bids will be evaluated in accordance with the new Preferential Procurement Regulations, 2022, using 90/10 preference points system as prescribed in the Preferential Procurement Policy Framework Act (PPPFA, Act 5 of 2000. The lowest acceptable bid will score 90 points for price and a maximum of 10 points will be awarded for the specific goals. Maximum of 100 points will be scored for functionality (quality). Bids received will be evaluated on the five (5) phases namely: (1) Mandatory Requirements, (2) Quality, (3) Price & Preference, (4) Evaluation Method 4, and (5) Administrative Compliance.

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6.11	**1) PHASE 1: MANDATORY REQUIREMENTS:** Failure to submit any of the documents listed below will render your bid non-responsive and the bid will be disqualified. An Entity is not eligible if: 1) the Tenderer or a competent authorized representative of the Entity who submitted the tender has not attended the compulsory clarification meeting (site briefing session), if applicable: a) signed both the attendance registered; and b) submit a Certificate of attendance at compulsory clarification meeting (Annexure A) as per clause 5.7. Proof of Company's board resolution for Duly Authorised person to be submitted (Annexure J); AND 2) Only those Respondents who are registered with the Construction Industry Development Board or are capable of being so registered within 21 working days from the closing date for submission of tenders, in a contractor grading designation of 7SD or higher, are eligible to have their submissions evaluated. Proof of CIDB registration to be submitted (Annexure K); AND 3) Financial statements with an available capital of R 4 million in the resent two years (Annexure I); AND 4) The Respondent must have a valid industry membership of the Corrosion Institute of Southern Africa. Proof to be submitted (Annexure U).
6.11	**2) PHASE 2: QUALITY** As explained in 6.11.9. The Tenderer must score a minimum of 70 points out of 100 to allow them to proceed to the next phase of evaluation. The quality evaluation shall be performed alongside at least one experienced technical professional with expertise in the corrosion protection field.
6.11	**3) PHASE 3: PRICE AND PREFERENCE** As explained in 6.11.7 & 6.11.8.
6.11	**4) PHASE 4: EVALUATION METHOD 4** As explained in 6.11.5

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6.11

5) PHASE 5: ADMINISTRATIVE COMPLIANCE

Tenderers are required to comply with the following listed below:

In the case of Joint Venture: all parties need to submit the below documentation.

No	Criteria	Yes	No
1	Companies must be registered with the National Treasury's Central Supplier Database and must submit a CSD report (Annexure M).		
2	Tax compliant with SARS. Attach a copy of valid Tax Compliance Status pin page (to be confirmed through SARS) - (Annexure L).		
3	Proof of active registration with Company Intellectual Property Commission (to be verified through CSD and CIPC). Attach copy of Tenderer's CIPC / CIPRO certificate (Annexure G).		
4	Proof of active registration and in good standing with the compensation fund or with a licensed compensation insurer. A valid letter of Good Standing with the Compensation Commissioner in terms of the Compensation for Occupational Injuries and Diseases Act No 130 of 1993 and or third parties' insurance registered with Financial Service Board (COID) to be submit (Annexure N).		
5	Letter of appointment of duly authorized person to sign bid. Proof of such authority must be submitted with the bid. If by an individual, must be signed by that individual or by someone on his behalf duly authorised thereto and proof of such authority must be produced. If the bid is by a Company, it must be signed by a person duly authorised thereto by a Resolution of a Board of Directors a copy of which Resolution, duly certified by the Chairman of the Company is to be submitted with the bid (Annexure J).		
6	Complete, sign, submit SBD1, SBD3.2, SBD4 & SBD6.1.		
7	Complete, sign, submit compulsory declaration (Annexure D), preference schedule (Annexure E) & B-BBEE (Annexure F).		
8	Complete, sign, submit Annexure B, C, H, I, J, O, P, Q, R, S, T & V.		
9	Failure to Initial the entire tender document, will render your bid non-responsive and disqualified.		

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6.11.5	The procedure for the evaluation of responsive tenders is Method 4. {(Financial offer – SBD 3.2) (Quality – Annexure O), and (Preference – Annexure E)} The total number of tender evaluation points (T_{EV}) shall be determined in accordance with the following formula. $T_{EV} = f_1\ (N_{FO} + N_P) +\ f_2 N_Q$ Where: f_1 and f_2 are fractions, f_1 equals 1 minus f_2 and f_2 equals 0,3 N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with 6.11.7 where the score for a financial offer is calculated using the following formula: $N_{FO} = W_1\ x\ A$ Where: $A = \left(1 - \left(\frac{P - P_m}{P_m}\right)\right)$ and W_1 equals 90 N_P is the number of tender evaluation points awarded for preferences claimed in accordance with the Preferencing Schedule N_Q is the number of tender evaluation points awarded for the quality offered in accordance with 6.11.9 where W_2 = 100. Up to 100 minus W_1 tender evaluation points will be awarded to tenderers who complete the preferencing schedule and who are found to be eligible for the preference claimed.
6.11.7	**Price Score:** Score for financial offers using the following formula: $N_{FO} = W_1\ x\ A$ Where: N_{Fo} ➔ is the number of tender evaluation points awarded for the financial offer; $A = \left(1 - \left(\frac{P - P_m}{P_m}\right)\right)$ (As per Preferential Procurement Regulations, 2022) P is the comparative offer of the tender offer under consideration; P_m is the comparative offer of the most favourable comparative offer; and W_1 equals 90 where the financial value inclusive of VAT of all responsive tenders received have a value in excess of R50 000 000,00.

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6.11.8

Preference Score:

Preferential Procurement Regulations, 2022, will be used to evaluate this proposal as per the applicable threshold value.

Bid proposals will be evaluated based on the 90/10 preference points system in accordance with the PPPFA Act (Act no. 5 of 2000). Where a maximum of 90 points will be awarded in respect of price and a maximum of 10 points will be awarded for specific goals.

N_p shall be calculated to a maximum of 10 points, as claimed in Table 1 below in accordance with Preferential Procurement Regulations, 2022 and described below.

Points claimed will be according to a Tenderer's specific goals as indicated in Table 1 below:

In terms of Regulation 4(2) and 5(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the tenderer's goals claimed as per Table 1 below. The tenderer goal claimed must be supported by proof / documentation as per Table 2 and the special conditions of this tender where applicable.

Table 1: Specific goals for the tender and points claimed

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system)
Women Ownership	2
Disability Ownership	2
Youth Ownership	2
Location of enterprise (local equals province) – Western Cape	1
B-BBEE status level contribution from level 1 to 2 which are QSE or EME	3
TOTAL SCORED POINTS	**10**

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"Specific goals" means specific goals as contemplated in section 2(1)*(d)* of the PPPFA Act which may include contracting with persons, or categories of persons, historically disadvantaged by unfair discrimination on the basis of race, gender and disability including the implementation of programmes of the Reconstruction of Development Programme as published in *Government Gazette* No. 16085 date 23 November 1994.

"Ownership" means the percentage ownership and control, exercised by individuals within an enterprise.

"Disability" means, in respect of a person, a permanent impairment of a physical, intellectual, or sensory function, which results in restricted, or lack of, ability to perform an activity in the manner, or within the range, considered normal for a human being.

i. A blind person (in terms of the Blind Persons Act, 1968 (Act no.26 of 1968);
ii. A deaf person, whose hearing is impaired to such an extent that he/she cannot use it as a primary means of communication;
iii. A person who, as a result of permanent disability, requires a wheelchair, caliper or crutch to assist him/her to move from one place or another;
iv. A person who requires an artificial limb; or
v. A person who suffers from a mental illness (in terms of the Mental Health Act, 1973 (Act no. 18 of 1973).

"Youth" means, in respect of a person younger than 35 years of age.

"Location of enterprise" Local equals province. Where a project cuts across more than on province, the Tenderer may be located in anu of the relevant provinces to obtain the points.

Women, disability, and youth will be measured by calculating the pro-rata percentage of ownership of the bidding company which meets the criterion. E.g., Company A has five shareholders each of whom own 20% of the company. Three of the five share holders meet the criterion, i.e. they are women/disability/youth. Therefore, this Tenderer will obtain 60% of the points allowable for this goal.

Documents/ information listed on the below Table 2 must be submitted to support and verify points claimed as per Table 1 above.

Table 2: Documents required for verification of Tenderer claimed points

Specific Goal	Requires Proof Documents
Women Ownership	Full CSD Report
Disability Ownership	Full CSD Report
Youth Ownership	Full CSD Report
Location of enterprise	Full CSD Report
B-BBEE status level contribution from level 1 to 2 which are QSE or EME	• Valid B-BBEE certificate/sworn affidavit • Consolidated B-BBEE certificate in cases of Joint Ventures • Full CSD Report

Failure on the part of a Tenderer to submit proof of documentation required in terms of this tender to claim for specific goals with the bid, will be interpreted to mean that preference points for specific goals are not claimed and will not be allocated.

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<table>
<tr><td>6.11.9</td><td>The quality criteria and maximum score in respect of each of the criteria are as follows:

<table>
<tr><th colspan="2">Quality criteria</th><th>Maximum number of points</th></tr>
<tr><td>1</td><td>Company Experience in Relation to Scope of Works</td><td>25</td></tr>
<tr><td>2</td><td>Key-personnel / Supervisory and Management Staff</td><td>30</td></tr>
<tr><td>3</td><td>Technical Proposal</td><td>45</td></tr>
<tr><td colspan="2">Maximum possible score for quality (M_S)</td><td>100</td></tr>
</table>

Quality shall be scored by not less than three evaluators in accordance with the following schedules:
• Annexure O: Quality Achievement Schedule
The minimum number of evaluation points for quality is 70.</td></tr>
<tr><td>6.11.9</td><td><u>SCORING OF QUALITY:</u>
The prompts for judgment and the associated scores used in the evaluation of quality shall be as follows:

Each evaluation criteria will be assessed in terms of five indicators – no response, poor, satisfactory, good and very good. Scores of 0, 40, 70, 90 or 100 will be allocated to no response, poor, satisfactory, good and very good, respectively. The scores of each of the evaluators will be averaged, weighted, and then totalled to obtain the final score for quality.</td></tr>
<tr><td>6.13</td><td>Tender offers will only be accepted if:
a) the Tenderer is registered on the Central Supplier Database (CSD) for the South African government (see https://secure.csd.gov.za/) unless it is a foreign supplier with no local registered entity;
b) the Tenderer, unless a foreign supplier, is tax compliant or provides written proof from SARS that the tenderer has made arrangements to meet outstanding tax obligations;
c) the financial offer is market-related and/or represents value for money;
d) the Tenderer is registered with the Construction Industry Development Board (CIDB) in an appropriate Contractor grading designation;
e) the Tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 the National Treasury's Database of Restricted Suppliers (see www.treasury.gov.za) as a person prohibited from doing business with the public sector;
f) the Tenderer has not:
i. abused the Employer's Supply Chain Management System; or
ii. failed to perform on any previous contract and has been given a written notice to this effect;
g) the Tenderer has completed the Compulsory Declaration and there are no conflicts of interest which may impact on the Tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process;
h) the Tenderer submits a letter of intent from an approved insurer undertaking to provide the Performance guarantee to the format included in Part C1.3 of this procurement document;
i) the Tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer; &
j) the employer is reasonably satisfied that the Tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the necessary competencies and resources to carry out the work safely.</td></tr>
</table>

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6.14	If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of a) addenda issued during the tender period, b) inclusion of some of the returnable documents, and c) other revisions agreed between the employer and the successful tenderer during the process of offer and acceptance. Complete the schedule of deviations attached to the form of offer and acceptance, if any.
6.17	The number of paper copies of the signed contract to be provided by the employer to the successful Tenderer is One (1).

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DEPARTMENT OF WATER AND SANITATION

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CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

T2.1 LIST OF RETURNABLE DOCUMENTS AND SCHEDULES

THE TENDER DOCUMENT MUST BE SUBMITTED AS A WHOLE i.e. All volumes (including the fully priced and extended Provisional Bills of Quantities) as is bound together in one single document herein. All forms must be properly completed in black ink as required, and the document shall not be taken apart or altered in any way whatsoever.

Note: Should any of the below-mentioned documents and/or the entire Tender Enquiry Document not be submitted the tender submission may be viewed as NON-RESPONSIVE.

The Tenderer shall complete or provide the following returnable document/schedules:

RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES THAT WILL BE INCORPORATED INTO THE CONTRACT		
Doc. Ref. Nr.	**Document / Schedule**	**Completed (Tick)**
SBD 1	SBD 1: Invitation to Bid	
Annexure A	Certificate of Attendance at Compulsory Clarification Meeting (Site briefing)	
Annexure B	Record of Addenda to Tender Documents	
Annexure C	Proposed Amendments and Qualifications	
SBD 4	SBD 4: Declaration of Interest	
Annexure D	Compulsory Declaration	
SBD 6.1	SBD 6.1: Preference Points Claim Form: General Conditions and Definitions	
Annexure E	Preferencing Schedule	
Annexure F	B – BBEE Status Verification Certificate	
Annexure G	Company Intellectual Property Commission Certificate	
Annexure H	Municipal Declaration	
Annexure I	Annual Financial Statements Declaration	

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RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES THAT WILL BE INCORPORATED INTO THE CONTRACT		
Doc. Ref. Nr.	**Document / Schedule**	**Completed (Tick)**
Annexure J	Authority Of Signatory	
Annexure K	Contractor Registration with Construction Industry Development Board (CIDB)	
Annexure L	TAX compliance Status	
Annexure M	Registration on National Treasury Central Supplier Database	
Annexure N	Proof of Good Standing with Compensation Commissioner	
Annexure O	Quality Achievement Schedules	
Annexure P	Schedule of Proposed sub-contractor	
Annexure Q	Form of Offer and Acceptance (Part C1.1)	
Annexure R	Contract Data (Part C1.2)	
Annexure S	Pro Forma Performance Guarantee (Part C1.3)	
Annexure T	Health and Safety Act agreement (Part C1.4)	
SBD 3.2	SBD 3.2: Bill of Quantities – Non-Firm Price (Priced and extended Provisional Bill of Quantities - Part C2.2)	
Annexure U	Estimated times	
Annexure V	Corrosion Institute of Southern Africa Membership	

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DEPARTMENT OF WATER AND SANITATION

DWS21-0125 WTE

CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

T2.2 RETURNABLE DOCUMENTS AND SCHEDULES

Initial _____

SBD 1

PART A
INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (*NAME OF DEPARTMENT/ PUBLIC ENTITY*)					
BID NUMBER:	DWS21-0125 WTE	CLOSING DATE:	18 FEBRUARY 2025	CLOSING TIME:	11:00am
DESCRIPTION	CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID				
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT *(STREET ADDRESS)*					

BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO		**TECHNICAL ENQUIRIES MAY BE DIRECTED TO:**	
CONTACT PERSON	Department of Water& Sanitation: Bid Enquiries Office	CONTACT PERSON	**Beukes van Heerden**
TELEPHONE NUMBER	012 336 8142/8151/6562/8870/7596	TELEPHONE NUMBER	**083 449 6521**
FACSIMILE NUMBER		FACSIMILE NUMBER	**NA**
E-MAIL ADDRESS	bidenquirieswte@dws.gov.za	E-MAIL ADDRESS	CWD-Tenders@DWS.gov.za

SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		**OR**	CENTRAL SUPPLIER DATABASE No:	MAAA
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	TICK APPLICABLE BOX] ☐ Yes ☐ No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT		[TICK APPLICABLE BOX] ☐ Yes ☐ No

[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]

ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐Yes ☐No [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS /SERVICES /WORKS OFFERED?**	☐Yes ☐No [IF YES, ANSWER THE QUESTIONNAIRE BELOW]

QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?	☐ YES ☐ NO
DOES THE ENTITY HAVE A BRANCH IN THE RSA?	☐ YES ☐ NO
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	☐ YES ☐ NO
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?	☐ YES ☐ NO
IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?	☐ YES ☐ NO

IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 BELOW.

Initial _____

SBD 1

PART B
TERMS AND CONDITIONS FOR BIDDING

1.	**BID SUBMISSION:**
1.1.	BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
1.2.	**ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED–(NOT TO BE RE-TYPED) OR IN THE MANNER PRESCRIBED IN THE BID DOCUMENT.**
1.3.	THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022, THE GENERAL CONDITIONS OF CONTRACT (GCC 2015) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.
1.4.	**THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (SBD7).**
2.	**TAX COMPLIANCE REQUIREMENTS**
2.1	BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
2.2	BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.
2.3	APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.
2.4	BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
2.5	IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED; EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
2.6	WHERE NO TCS PIN IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.
2.7	NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE, COMPANIES WITH DIRECTORS WHO ARE PERSONS IN THE SERVICE OF THE STATE, OR CLOSE CORPORATIONS WITH MEMBERS PERSONS IN THE SERVICE OF THE STATE."

NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

SIGNATURE OF BIDDER: .....

CAPACITY UNDER WHICH THIS BID IS SIGNED: .....
(Proof of authority must be submitted e.g. company resolution)

DATE: .....

Initial _____

ANNEXURE A

CERTIFICATE OF ATTENDANCE AT COMPULSORY CLARIFICATION MEETING

NOTE: Unless the attendee's name, details and signature also appear on the attendance register this Certificate of attendance shall not be accepted and the tenderer's offer shall be deemed non-responsive.

This is to certify that *(Tenderer) I,* .....

was represented by the person of (tenderer duly authorised) .....

of(address) .....

Telephone number .....

named below at the compulsory meeting held for all Tenderers at (location).....

on(date)..... starting at (time) .....

I/we acknowledge that the purpose of the meeting was to acquaint myself/ourselves with the site conditions, scope of works and available site facilities.

I/we further certify that I/we am/are satisfied with the description of the scope of work, and/or matters incidental to doing the work specified in the tender documents, as well as the explanations given by the Department of Water and Sanitation Representative. I/we understand perfectly the work to be done, as specified and implied, in the execution of this Contract, in order for me/us to take account of everything necessary when compiling rates and prices included in the tender.

I/we have previously studied the document. I/we carefully examined the site and equipment. I/we have made myself/ourselves familiar with all the equipment likely to influence the work and the cost thereof.

I/we have attended the clarification meeting for which I/we am/are submitting the Tender and have, so far as is practicable, familiarised myself/ourselves with all information, risks, contingencies and other circumstances which may influence or affect my/our tender.

I/we acknowledge that I/we am/are acquaint with the site conditions, scope of work, available site facilities in order for me/us to take account of everything necessary to compile a responsive bid, prepare method statements, a tender programme and to price realistic rates in the tender.

Particulars of person attending the meeting: (Signed on behalf of Tenderer) PRINT NAME & SIGNATURE

Name:.. ……Signature: ……..……

Capacity: .....

Attendance of the above person at the meeting is confirmed by the Employer's representative, namely:

(PRINTED NAME & SIGNATURE)

Name: .. .. Signature: .....

Capacity: ..... Date and Time: .....

Initial _____

ANNEXURE B

RECORD OF ADDENDA TO TENDER DOCUMENTS

We confirm that the following communications received from the Employer before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer:

	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		

Attach additional pages if more space is required.

Signed ..... Date .....

Name ..... Position .....

Tenderer .....

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ANNEXURE C

PROPOSED AMENDMENTS AND QUALIFICATIONS

The Tenderer should record any deviations or qualifications he may wish to make to the tender documents in this Returnable Schedule. Alternatively, a Tenderer may state such deviations and qualifications in a covering letter to his tender and reference such letter in this schedule.

The Department reserve the rights to accept and or reject any proposed qualifications.

The Tenderer's attention is drawn to clause 6.8 of SANS ISO 10845-3: 2022 Rev2 regarding proposed qualifications and the employer's handling of material deviations and qualifications.

Page	Clause or item	Proposal

Signed ---------- Date ----------

Name ---------- Position ----------

Tenderer ----------

Initial _____

SBD 4

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the Bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. Bidder's declaration

2.1 Is the Bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest1 in the enterprise, employed by the state?

YES/NO

2.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	Identity Number	Name of State institution

[1] the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.

Initial _____

2.2 Do you, or any person connected with the Bidder, have a relationship with any person who is employed by the procuring institution? **YES/NO**

2.2.1 If so, furnish particulars:

……

……

2.3 Does the Bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract?

YES/NO

2.3.1 If so, furnish particulars:

……

……

3 DECLARATION

I, the undersigned, (name)…… in submitting the accompanying bid, do hereby make the following statements that I certify to be true and complete in every respect:

3.1 I have read and I understand the contents of this disclosure;

3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;

3.3 The Bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium2 will not be construed as collusive bidding.

3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.

3.4 The terms of the accompanying bid have not been, and will not be, disclosed by the Bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

[2] Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

Initial _____

3.5 There have been no consultations, communications, agreements or arrangements made by the Bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the Bidder was not involved in the drafting of the specifications or terms of reference for this bid.

3.6 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.
I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

……	……
Signature	Date
……..	……
Position	Name of Bidder

Initial _____

ANNEXURE D

COMPULSORY DECLARATION

The following particulars must be furnished. In the case of a joint venture, separate declaration in respect of each partner must be completed and submitted.

Section 1: **Enterprise Details**

Name of enterprise:	
Contact person:	
Email:	
Telephone:	
Cell no	
Fax:	
Physical address	
Postal address	

Section 2: Particulars of companies and close corporations

Company / Close Corporation registration number	

Section 3: SARS Information

Tax reference number	
Tax compliance status pin number (unless a foreign supplier)	
VAT registration number:	*State Not Registered if not registered for VAT*
The tender is a foreign supplier (tick appropriate boxes)	The tenderer: ☐ is not a resident of the Republic of South Africa; **and** ☐ does not have a branch in South Africa, a permanent establishment in South Africa or any source of income from South Africa.

Section 4: CIDB registration number *(if applicable)*

CIDB Registration number	

Section 5: National Treasury Central Supplier Database

Supplier number	
Unique registration reference number	

Attach CSD registration or summary report ***not older than 7 days prior to tender closing***

Section 6: Particulars of principals

principal: means a natural person who is a partner in a partnership, a sole proprietor, a director of a company established in terms of the Companies Act of 2008 (Act No. 71 of 2008) or a member of a close corporation registered in terms of the Close Corporation Act, 1984, (Act No. 69 of 1984).

Full name of principal	Identity number	Personal tax reference number

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Attach separate page if necessary

Section 7: Declaration by tendering entity

1) Is the tendering entity, or any of its directors/trustees / shareholders / members / partners or any person having a controlling interest in the enterprise, employed by the state?

tick appropriate box ☐ yes ☐ no

If yes, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietors/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in the tabulation below.

Full Name	Identity Number	Name of State institution

Note: A controlling interest is the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence.

2 Do you, or any person connected with the tendering entity, have a relationship with any person who is employed by the procuring institution?

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If so, furnish particulars: .....

.....

.....

3 Does the tendering entity or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are tendering for this contract?

tick appropriate box ☐ yes ☐ no

If yes, furnish particulars:

.....

.....

.....

Section 8: Record in the service of the state

Indicate by marking the relevant boxes with a cross, if any principal is currently or has been within the last 12 months in the service of any of the following:

- ☐ a member of any municipal council
- ☐ a member of any provincial legislature
- ☐ a member of the National Assembly or the National Council of Province
- ☐ a member of the board of directors of any municipal entity
- ☐ an employee of any department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act of 1999 (Act No. 1 of 1999)
- ☐ a member of an accounting authority of any national or provincial public entity
- ☐ an employee of Parliament or a provincial legislature

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☐ an official of any municipality or municipal entity

If any of the above boxes are marked, disclose the following:

Name of principal	Name of institution, public office, board or organ of state and position held	Status of service *(tick appropriate column)*	
		Current	**Within last 1 months**

*insert separate page if necessary

Section 9: Record of family member in the service of the state

family member: a person's spouse, whether in a marriage or in a customary union according to indigenous law, domestic partner in a civil union, or child, parent, brother, sister, whether such a relationship results from birth, marriage or adoption

Indicate by marking the relevant boxes with a cross, if any family member of a principal as defined in section 5 is currently or has been within the last 12 months been in the service of any of the following:

☐ a member of any municipal council
☐ a member of any provincial legislature
☐ a member of the National Assembly or the National Council of Province
☐ a member of the board of directors of any municipal entity
☐ an official of any municipality or municipal entity
☐ an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999)
☐ a member of an accounting authority of any national or provincial public entity
☐ an employee of Parliament or a provincial legislature

Name of family member	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	**Within last 12 months**

*insert separate page if necessary

Section 10: Record of termination of previous contracts with an organ of state

Was any contract between the tendering entity including any of its joint venture partners terminated during the past 5 years for reasons other than the employer no longer requiring such works or the employer failing to make payment in terms of the contract.

☐ Yes ☐ No (Tick appropriate box)

If yes, provide particulars (interest separate page if necessary):

.....

Initial _____

ANNEXURE D

. . . . . .

. . . . . .

Section 10: Declaration

I the undersigned, ... (name) who warrants that I am duly authorised to do so on behalf of the tendering entity, in submitting the accompanying tender, do hereby make the following statements that I certify to be true and complete in every respect:

1) I have read and I understand the contents of this disclosure.

2) I understand that the accompanying tender will be disqualified if this disclosure is found not to be true and complete in every respect.

3) The tendering entity has arrived at the accompanying tender offer independently from, and without consultation, communication, agreement, or arrangement with any competitor.

Note: Communication between partners in a joint venture or consortium (i.e. an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract) will not be construed as collusive tendering.

4) There have been no consultations, communications, agreements, or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the tender, tendering with the intention not to win the tender and conditions or delivery particulars of the products or services to which this tender invitation relates.

5) The terms of the accompanying tender have not been, and will not be, disclosed by the tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening or of the awarding of the contract.

6) There have been no consultations, communications, agreements, or arrangements made by the tenderer with any official of the procuring institution in relation to this procurement process prior to and during the tendering process except to provide clarification on the tender submitted where so required by the institution; and the tenderer was not involved in the drafting of the specifications or terms of reference for this tender.

7) I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to tenders and contracts, tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

8) I confirm that

i) neither the name of the tendering entity or any of its principals appears on:

   a) the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004 (Act No. 12 of 2004)

   b) National Treasury's Database of Restricted Suppliers (see www.treasury.gov.za)

Initial _____

ANNEXURE D

ii) neither the tendering entity of any of its principals has within the last five years been convicted of fraud or corruption by a court of law (including a court outside of the Republic of South Africa);

iii) any principal who is presently employed by the state has the necessary permission to undertake remunerative work outside such employment (attach permission to this declaration);

iv) the tendering entity is not associated, linked or involved with any other tendering entities submitting tender offers

v) has not engaged in any prohibited restrictive horizontal practices including consultation, communication, agreement, or arrangement with any competing or potential tendering entity regarding prices, geographical areas in which goods and services will be rendered, approaches to determining prices or pricing parameters, intentions to submit a tender or not, the content of the submission (specification, timing, conditions of contract etc) or intention to not win a tender;

vi) has no other relationship with any of the Tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest;

vii) neither the Tenderer or any of its principals owes municipal rates and taxes or municipal service charges to any municipality or a municipal entity and are not in arrears for more than 3 months;

viii) SARS may, on an on-going basis during the term of the contract, disclose the Tenderer's tax compliance status to the Employer and when called upon to do so, obtain the written consent of any subcontractors who are subcontracted to execute a portion of the contract that is entered into in excess of the threshold prescribed by the National Treasury, for SARS to do likewise.

NOTE 1 The Standard Conditions of Tender contained in SANS 10845-3 prohibits anticompetitive practices (clause 3.1) and requires that Tenderers avoid conflicts of interest, only submit a tender offer if the Tenderer or any of his principals is not under any restriction to do business with employer (4.1.1) and submit only one tender either as a single tendering entity or as a member in a joint venture (clause 4.13.1). Clause 5.7 also empowers the Employer to disqualify any Tenderer who engages in fraudulent and corrupt practice. Clause 3.1 also requires Tenderers to comply with all legal obligations.

NOTE 2: Section 30(1) of the Public Service Act, 1994, prohibits an employee (person who is employed in posts on the establishment of departments) from performing or engaging remunerative work outside his or her employment in the relevant department, except with the written permission of the executive authority of the department. When in operation, Section 8(2) of the Public Administration Management Act, 2014, will prohibit an employee of the public administration (i.e. organs of state and all national departments, national government components listed in Part A of Schedule 3 to the Public Service Act, provincial departments including the office of the premier listed in Schedule 1 of the Public Service Act and provincial departments listed in schedule 2 of the Public Service Act, and provincial government components listed in Part B of schedule 3 of the Public Service Act) or persons contracted to executive authorities in accordance with the provisions of section 12A of the Public Service Act of 1994 or persons performing similar functions in organs of state from conducting business with the State or to be a director of a public or private company conducting business with the State. The offence for doing so is a fine or imprisonment for a period not exceeding 5 years or both. It is also a serious misconduct which may result in the termination of employment by the employer.

NOTE 3: Regulation 44 of Supply Chain Management regulations issued in terms of the Municipal Finance Management Act of 2003 requires that organs of state and municipal entities not award a contract to a person who is the service of the state, a director, manager or principal shareholder in the service of the state or who has been in the service of the state in the previous twelve months.

NOTE: 4: Regulation 45 of Supply Chain Management regulations requires a municipality or municipal entity to disclose in the notes to the annual statements particulars of any award made to a close family member in the service of the state.

NOTE: 5 Corrupt activities which give rise to an offence in terms of the Prevention and Combating of Corrupt Activities Act of 2004) include improperly influencing in any way the procurement of any contract, the fixing of the price, consideration or other moneys stipulated or otherwise provided for in any contract and the manipulating by any means of the award of a tender.

NOTE: 6 Section 4 of the Competition Act of 1998 prohibits restrictive horizontal practice including agreements between parties in a horizontal relationship which have the effect of substantially preventing or lessening competition, directly or indirectly fixing prices or dividing markets or constitute collusive tendering. Section 5 also prohibits restrictive vertical practices. Any restrictive practices that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties.

Signed _____ Date .....

Name _____ Position .....

Tenderer .....

Initial _____

SBD 6.1

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022

This preference form must form part of all tenders invited. It contains general information and serves as a claim form for preference points for specific goals.

NB: BEFORE COMPLETING THIS FORM, TENDERERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF THE TENDER AND PREFERENTIAL PROCUREMENT REGULATIONS, 2022

---

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to invitations to tender:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 **To be completed by the organ of state**

a) The applicable preference point system for this tender is the 90/10 preference point system.

1.3 Points for this tender (even in the case of a tender for income-generating contracts) shall be awarded for:

(a) Price; and

(b) Specific Goals.

1.4 **To be completed by the organ of state:**

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	**90**
SPECIFIC GOALS	**10**
Total points for Price and SPECIFIC GOALS	**100**

1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.

1.6 The organ of state reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the organ of state.

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2. DEFINITIONS

(a) **"tender"** means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation;

(b) **"price"** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;

(c) **"rand value"** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

(d) **"tender for income-generating contracts"** means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and

(e) **"the Act"** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

3.1.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

A maximum of 80 or 90 points is allocated for price on the following basis:

80/20 **or** **90/10**

$$Ps = 80\left(1 - \frac{Pt - P\,min}{P\,min}\right) \text{ or } \quad Ps = 90\left(1 - \frac{Pt - P\,min}{P\,min}\right)$$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

Initial _____

3.2. **FORMULAE FOR DISPOSAL OR LEASING OF STATE ASSETS AND INCOME GENERATING PROCUREMENT**

3.2.1. **POINTS AWARDED FOR PRICE**

A maximum of 80 or 90 points is allocated for price on the following basis:

80/20 **or** **90/10**

$$Ps = 80\left(1 + \frac{Pt - P\,max}{P\,max}\right) \text{ or } \quad Ps = 90\left(1 + \frac{Pt - P\,max}{Pmax}\right)$$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmax = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:

4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—

(a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system; or

(b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,

then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

Initial _____

Table 1: Specific goals for the tender and points claimed are indicated per the table below.

(Note to organs of state: Where either the 90/10 or 80/20 preference point system is applicable, corresponding points must also be indicated as such.

***Note to tenderers: The tenderer must indicate how they claim points for each preference point system.*)**

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)
Women Ownership	**2**	
Disability Ownership	**2**	
Youth Ownership	**2**	
Location of enterprise (local equals province): Western Cape	**1**	
B-BBEE status level contribution from level 1 to 2 which are QSE or EME	**3**	

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm…….

4.4. Company registration number: ……...

4.5. TYPE OF COMPANY/ FIRM

- ϒ Partnership/Joint Venture / Consortium
- ϒ One-person business/sole propriety
- ϒ Close corporation
- ϒ Public Company
- ϒ Personal Liability Company
- ϒ (Pty) Limited
- ϒ Non-Profit Company
- ϒ State Owned Company

[TICK APPLICABLE BOX]

4.6. I, the undersigned, who is duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the specific goals as advised in the tender, qualifies the company/ firm for the preference(s) shown and I acknowledge that:

i) The information furnished is true and correct;

Initial _____

ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;

iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;

iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –

(a) disqualify the person from the tendering process;

(b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

(c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;

(d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and

(e) forward the matter for criminal prosecution, if deemed necessary.

.....
SIGNATURE(S) OF TENDERER(S)
SURNAME AND NAME: .....
DATE: .....
ADDRESS: .....
.....
.....
.....

Initial _____

ANNEXURE E

PREFERENCING SCHEDULE

1 Preference

Preferences shall be granted in respect of the following:

1.1 Ownership by women, people with disabilities and youth

The percentage shareholding of an enterprise as at the closing time for submissions of natural persons who are women, people with disabilities or youth as evidenced by:

a) voting rights that are not subject to any limitation; and

b) economic interest.

where

people with disabilities are people who have a long-term or recurring physical or mental, intellectual or sensory impairment which, in interaction with various barriers, may substantially limit their prospects of entry into, or advancement in, employment.

youth are people aged between 14 and 35 years (NYP 2020-2030)

1.2 Local enterprise

An enterprise which operates from a building together with its land and outbuildings located within the boundaries of the Western Cape Province as at the closing time for submissions.

1.3 B-BBEE status level contributors from level 1 or level 2 who are Exempted Micro Enterprises or Small Qualifying Enterprises

The status of an enterprise as measured in accordance with the provisions of **an applicable code of good practice** issued in terms of Section 9(1) of the B-BBEE Act of 2003 as at the closing time for submissions.

Note: The Construction Sector Code applies to the B-BBEE compliance measurement of all entities that fall within the Construction Sector i.e., all enterprises who derive more than 50% of their annual Revenue from Construction Related Activities.

2 Conditions associated with the granting of preferences

Tenderers who claim a preference shall provide in support of their claim the following in relation to their claim, failing which their claims for preferences will be rejected:

Preference applied for	Verification document
Ownership by women	Completed Percentage Ownership Affidavit (Annexure 1)
Ownership by people with disabilities	
Ownership by youth	
Location of enterprise	Completed Location of enterprise affidavit (Annexure 2) and proof of ownership of premises or a valid rental agreement with the owner of such premises
B-BBEE status level of contributor	B-BBEE Verification Certificates issued by a verification agency accredited by the South African National Accreditation System (SANAS) (see www.sanas.co.za/Pages/index.aspx) or, in the case of an Exempted Micro Enterprise or a Qualifying Small Enterprise, if permitted in terms of the relevant code, a duly completed sworn affidavit on the relevant and appropriate form obtained from one the following websites: ○ www.thedtic.gov.za/wp-content/uploads/BEE_Affidavit-QSE-Gen.pdf ○ www.thedtic.gov.za/wp-content/uploads/BEE_Affidavit-EME-Gen.pdf ○ www.abp.org.za/wp-content/uploads/2018/03/Final-CSC-EME-Affidavit-March-2018-2.pdf

Initial _____

ANNEXURE E

3 Preferences points offered and claimed

The preference points offered by the Employer in accordance with the provisions of the Preferential Procurement Policy Framework Act of 2000 and claimed by the tenderer are as follows:

Preference claimed		**Number of preference points allocation**		**Preference claimed** (tick relevant block)
		90/10 preference points system	**80/20 preference points system**	
Ownership	by women	Up to 2	Up to 5	
	by people with disabilities	Up to 2	Up to 5	
	by youth	Up to 2	Up to 5	
Location of enterprise	Western Cape Province	1	2	
B-BBEE status	Level 1 or level 2 contributors who are Exempted Micro Enterprises or Small Qualifying Enterprises	3	3	

where the points claimed for ownership are calculated separately for each type of ownership in terms of the following formula:

90 / 10 preference points system: NO = 2 x PS / 100

80 / 20 preference points system: NO = 5 x PS / 100

where

NO = number of points awarded to tenderer claiming a preference for ownership by women, people with disabilities or youth

PS = percentage shareholding by women, people with disabilities or youth as declared in the Percentage Ownership Affidavit

4 Declaration

The undersigned, who warrants that he/she is duly authorized to do so on behalf of the tenderer, confirms that he/she understands the conditions under which such preferences are granted and confirms that the tenderer satisfies the conditions pertaining to the granting of tender preferences which are claimed.

Signature: .....

Name: .....

Duly authorised to sign on behalf of: .....

Telephone: ..... Date: .....

Name of witness: ..... Signature of witness: .....

Note: Failure to complete the declaration will lead to the rejection of a claim for a preference.

Initial _____

ANNEXURE E

Annexure 1: Percentage Ownership Affidavit

I, the undersigned,

full name and surname . . . . . .

identity number . . . . . .

hereby declare under oath that

1) I am a member / director / owner of the enterprise:

name : . . . . . .

trading name, if applicable . . . . . .

registration number: . . . . . .

physical address: . . . . . .

. . . . . .

in which the following natural persons who are women, people with disabilities or youth at the time of the tender submission have

a) voting rights that are not subject to any limitation; and

b) economic interest.

as indicated below

Name	Economic interest (%)			Identity number
	Women	People with disabilities	Youth	

Initial _____

ANNEXURE E

Where:

people with disabilities are people who have a long-term or recurring physical or, mental, intellectual or sensory impairment which, in interaction with various barriers, may substantially limit their prospects of entry into, or advancement in, employment

Note: The Code of Good Practice on Employment of Persons with Disabilities (2015) considers "substantially limit" as "*if in its nature, duration or effects it substantially limits the person's ability to perform the essential functions of the job for which they are being considered"* and points out that *"some impairments* are so easily controlled, corrected or lessened that they have no limiting effects.

youth are people aged between 14 and 35 years (NYP 2020-2030)

2) the contents of this statement are to the best of my knowledge a true reflection of the facts;

3) I know and understand the contents of the affidavit and I have no objection to take the prescribed oath binding on my conscience and on the Owners of the Enterprise which I represent in this matter.

Deponent signature: **Date:**

Commissioner of oaths
Signature and stamp

Initial _____

ANNEXURE E

Annexure 2: Location of enterprise affidavit

I, the undersigned,

full name and surname . . . . . .

identity number . . . . . .

hereby declare under oath that

1) I am a member / director / owner of the enterprise:

   name : . . . . . .

   trading name, if applicable . . . . . .

   registration number: . . . . . .

   physical address: . . . . . .

   . . . . . .

   which is an enterprise which operates from a building together with its land and outbuildings located within the boundaries of the *Western Cape* Province as at the closing time for submissions;

2) the contents of this statement are to the best of my knowledge a true reflection of the facts;

3) I know and understand the contents of the affidavit and I have no objection to take the prescribed oath binding on my conscience and on the Owners of the Enterprise which I represent in this matter.

Attach proof of ownership of premises or a valid rental agreement with the owner of such premises

Deponent signature: **Date:**

Commissioner of oaths
Signature and stamp

Initial _____

ANNEXURE F

B – BBEE STATUS VERIFICATION CERTIFICATE

Preferencing schedule: Broad Based Black Economic Empowerment Status

In the case of a joint venture, separate declaration in respect of each partner must be completed and submitted.

Preamble

Section 10(b) of the Broad-Based Black Economic Empowerment Act of 2003 (Act No. 53 of 2003) states that "*Every organ of state and public entity must take into account and. as far as is reasonably possible. apply any* ***relevant code of good practice*** *issued in terms of this Act in developing and implementing a preferential procurement policy:"*

A number of codes of good practice have been issued in terms of Section 9(1) of the B-BBEE Act of 2003 including a generic code of good practice and various sector codes. The sector codes vary the metrics, weightings and targets used in the generic code of good practice to establish the overall performance of an entity and its B-BBBEE status. The B-BBEE status needs to be assessed in accordance with the applicable code.

1 Conditions associated with the granting of preferences

Tenderers who claim a preference shall provide sufficient evidence of their B-BBEE Status in accordance with the requirements of section 2 in respect of the applicable code as at the closing time for submissions, failing which their claims for preferences will be rejected.

2 Sufficient evidence of qualification

2.1 Exempted micro enterprises

Sufficient evidence of qualification as an Exempted Micro-Enterprise is a :

a) a registered auditor's certificate or similar certificate issued by an accounting officer as contemplated in the Close Corporation Act of 1984 in respect of the entity's last financial year or a 12 month period which overlaps with its current financial year; or a certificate issued by a verification agency and which is valid as at the closing date for submissions; or.

b) a sworn affidavit - B-BBEE Exempted Micro Enterprise (see www.thedti.gov.za/gazzettes/Affidavit_EME.pdf

2.2 Enterprises other than micro exempted enterprises

Sufficient evidence of B-BBEE Status is:

a) an original or certified copy of the certificate issued by a verification agency accredited by the South African National Accreditation System (SANAS) or registered auditors approved by Independent Regulatory Board for Auditors (IRBA) and which is valid as at the closing date for submissions; or.

b) a sworn affidavit – B-BBEE Qualifying Small Enterprise (see www.thedti.gov.za/gazzettes/BBEE_QUALIFYING_SMALL_ENTERPRISE.pdf)

3 Declaration

The Tenderer declares that

a) the tendering entity is a level contributor as stated in the submitted evidence of qualification as at the closing date for submissions

b) the tendering entity has been measured in terms of the following code *(tick applicable box)*

☐ Generic code of good practice

☐ Other – specify . . . . . .

c) the contents of the declarations made in terms of a) and b) above are within my personal knowledge and are to the best of my belief both true and correct

Initial _____

ANNEXURE F

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the Tenderer confirms that he / she understands the conditions under which such preferences are granted and confirms that the Tenderer satisfies the conditions pertaining to the granting of tender preferences.

Signature : .....

Name : .....

Duly authorised to sign on behalf of : .....

Telephone : .....

Fax: ..... Date : .....

Name of witness . . . . . Signature of witness . . . . . .

Note: 1) Failure to complete the declaration will lead to the rejection of a claim for a preference

2) Supporting documentation of the abovementioned claim for a preference must be submitted with the tender submission to be eligible for a preference

NOTE: ATTACHED TOGETHER WITH PREFERENCING SCHEDULE THE FOLLOWING:

Attached B-BBEE Status level in original or certified copy of B-BBEE certificate issued in accordance with the revised Notice of Clarification published in the Notice 44 of 2015 published in Government Gazette 38799 on 15 May 2015 by the Department of Trade and Industry.

Attached hereto this page is my / our B-BBEE Status Level verification Certificate/s. My failure to submit the certificate/s with my / our tender document may result in the award of 0 (zero) points for specific goals (as per SBD 6.1).

SIGNATURE: ..... DATE: ……

(of person authorised to sign on behalf of the Tenderer)

Initial _____

ANNEXURE G

COMPANY INTELLECTUAL PROPERTY COMMISSION CERTIFICATE

CONTRACTOR'S COMPANY INTELLECTUAL PROPERTY COMMISSION (CIPC/CIPRO) PROOF OF REGISTRATION

Attached to this page: Originally certified copies of Tenderer's CIPC / CIPRO company registration documents listing all members with percentages. In the case of a joint venture, separate CIPC / CIPRO company registration in respect of each partner must be completed and submitted.

Attached hereto this page is my / our Proof of CIPC/CIPRO active registration certificate.

SIGNATURE: .....……..…….. DATE: ……..
(of person authorised to sign on behalf of the Tenderer)

Initial _____

ANNEXURE H

MUNICIPAL DECLARATION AND RETURNABLE DOCUMENTS

In the case of a joint venture, separate municipal declarations shall be submitted in respect of each partner.

Section 1: Enterprise Details

Name of enterprise:	
Contact person:	
Email:	
Telephone:	
Cell no	
Fax:	
Physical address	
Postal address	

Municipality where the business is situated	
Municipal account number for rates	
Municipal account number for water and electricity	

Attach a copy of municipal accounts which includes the municipal account number for rates and for water and electricity not older than 3 months

I, the undersigned who warrants that I am duly authorised on behalf of the tendering entity, hereby declare that the tendering entity *(tick appropriate box):*

☐ has a municipal account and the tendering entity's municipal rates and taxes and service charges in the municipality where the business is situated are not in arrears

☐ does not have a municipal account as the rental agreement for the property from which the business operates is inclusive of municipal rates, electricity and water charges and the owner of the property is responsible for settling all municipal rates and charges.

Signature: .....

Name: .....

Duly authorised to sign on behalf of: .....

Telephone: ..... Date: .....

Name of witness: ..... Signature of witness: .....

Initial _____

ANNEXURE I

ANNUAL FINANCIAL STATEMENTS DECLARATION

In the case of a joint venture, separate declaration in respect of each partner must be completed and submitted.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the respondent, confirms that:

1) The enterprise's financial year end is . . . . . .

2) The enterprise's financial statements have been prepared in accordance with the provisions of the Companies Act of 2008 or the Close Corporation Act of 1984, as applicable

3) The enterprise has compiled its financial accounts [tick one box]:

☐ internally ☐ independently

4) The following statement applies to the enterprise [tick one box and provide relevant information]

☐ enterprise has had its financial statements audited;

name of auditor . . . . . .

☐ enterprise is required by law to have an independent review of its financial statements

name of independent reviewer . . . . . .

☐ enterprise has not had its financial statements audited and is not required by law to have an independent review or audit of such statements

5) The attached income statement and balance sheet is a true extract from the financial statements complying with applicable legislation for the preceding financial year within 24 months of the financial year end.

[Attach the income statement and the balance sheet contained in the financial statement]

6) The annual turnover for the best financial year is R . . . . . .

7) The available capital for the best financial year is R . . . . . .

8) The total assets as at the end of the best financial year is R . . . . . .

9) The total liabilities as at the end of the best financial year is R . . . . . .

I hereby declare that the contents of this Declaration are within my personal knowledge, and save where stated otherwise are to the best of my belief both true and correct.

Signed ..... Date _____

Name ..... Position

Tender .....

Initial _____

ANNEXURE J

AUTHORITY OF SIGNATORY

CONTRACTOR'S DULY AUTHORISED SIGNATORY

Details of person responsible for tender process:

Name:

Contact number:

Office address:

Attach herewith a Duly authorised signatory from of company with proof of authority for signatory, e.g. a company resolution.

Attached hereto this page is my / our Proof of authority for signatory of duly authorised person/s (supporting documents).

SIGNATURE: .....……..…….. DATE: …….....
(of person authorised to sign on behalf of the Tenderer)

Initial _____

ANNEXURE K

REGISTRATION WITH CIDB

CONTRACTOR'S CERTIFICATE OF REGISTRATION WITH CIDB

Attached to this page: certified copy of Certificate of Contractor Registration issued by the Construction Industry Development Board (CIDB).

Note 1: Only certificates for the specified category 7SD or higher class of construction works are acceptable.

The tenderer shall provide a printed copy of the Active Contractor's Listing off the CIDB website. (www.cidb.org.za). Tenderers whose CIDB registration expires within 21 days after close of tender should attach proof of their application for re-registration (refer to Tender Data Clause 5.1.1). In the case of a Joint Venture, a printed copy of the Active Contractor's Listing must be provided for each member of the Joint Venture, together with Joint Venture CIDB Calculation.

Name of Contractor:

.....

Contractor Grading Designation:

.....

CIDB Contractor Registration Number:

.....

Expiry Date:

.....

Attached hereto this page is my / our Certificate of Registration with CIDB. My failure to submit the certificate with my / our tender document will lead to the conclusion that I am / we are not registered with the CIDB and therefore will not be eligible to tender.

SIGNATURE: .....……..…….. DATE: …….....
(of person authorised to sign on behalf of the Tenderer)

Initial _____

ANNEXURE L

TAX COMPLIANCE STATUS

CONTRACTOR'S TAX COMPLIANCE STATUS

Attached to this page: Tax Compliance Status (TCS) PIN page. In the case of a joint venture, separate Tax pin page in respect of each partner must be completed and submitted.

Attached hereto this page is my / our Tax Compliance Status PIN (SARS pin) page. My failure to submit the TAX compliance status with my / our tender document may lead to the conclusion that I am / we are not Tax compliant and therefore maybe not eligible to tender.

SIGNATURE: .....……..…….. DATE: ……..
(of person authorised to sign on behalf of the Tenderer)

Initial _____

ANNEXURE M

REGISTRATION ON NATIONAL TREASURY CENTRAL SUPPLIER DATABASE

CONTRACTOR'S CSD REPORT

The tenderer shall provide a printed copy of the Active Supplier Listing on the National Treasury Central Supplier Database, containing MAAA number (www.treasury.gov.za). In the case of a Joint Venture, a printed copy of the Active Supplier Listing must be provided for each member of the Joint Venture.

Affix Proof of the National Treasury Central Supplier Database to this page
(Full CSD required, not summary)

Attached hereto this page is my / our Proof of Registration with National Treasury's Central Supplier Database (CSD).

SIGNATURE: .....……...…….. DATE: …….....
(of person authorised to sign on behalf of the Tenderer)

Initial _____

ANNEXURE N

PROOF OF GOOD STANDING WITH COMPENSATION COMMISSIONER

CONTRACTOR'S LETTER OF GOOD STANDING FROM COIDA

Attached to this page: A valid letter of Good Standing with the Compensation Commissioner in terms of the Compensation for Occupational Injuries and Diseases Act No 130 of 1993 and or third parties' insurance registered with Financial Service Board

The tenderer shall attach to this Form evidence that he is registered and in good standing with the compensation fund or with a licensed compensation insurer who is approved by Department of Labour in terms of section 80 of the Compensation for Injury and Disease Act 1993 (COID) (Act 130 of 1993).

In the case of a Joint Venture, a valid letter of Good Standing with the Compensation Commissioner in terms of the Compensation for Occupational Injuries and Diseases Act No 130 of 1993 and or third-party insurance registered with the Financial Service Board must be provided for each member of the Joint Venture.

Affix certified Proof of Good Standing with Compensation Commissioner to this page as per the required CIDB grading

Attached hereto this page is my / our Letter of Good Standing from COIDA.

SIGNATURE: .....……...…….. DATE: …….....
(of person authorised to sign on behalf of the Tenderer)

Initial _____

ANNEXURE O

QUALITY ACHIEVEMENT SCHEDULES

A1: COMPANY EXPERIENCE **[MAX POINTS: 25]**

The Tenderer will receive a maximum of 25 points based on information provided in this schedule.

Evaluation shall be based on similar and successfully completed projects to qualify for maximum points. Only experience from the tendering entity, and not by staff members or sub-contractors, shall be considered.

The Tenderer must provide at least three contactable references as the contractor for corrosion protection works related to pipework including associated specialist corrosion protection of on-site welded field joints according to the following:

- One project having a contract value of at least R 9 million including VAT and which has been satisfactorily completed during the last five years;
  AND
- Two projects having a contract value no less than R 5 million including VAT and which has been satisfactorily completed during the last ten years.

Tenderers are required to demonstrate their company's relevant experience with regards to the provision of corrosion protection services in projects, in relation to the Scope of work. Complete the detail tenderer's specific experience related to this project / similar work undertaken and completed, as explain below.

Completed projects that dealt with Corrosion protection of pipes, special and welded field joints, for relevant work done, will be accepted for evaluation. The following suggested method and or combination of methods that could have been used, are as followed:

- Degreasing, grit blasting and other steel surface preparation methods
- Blasting and coating / lining of dissimilar metals in contact with one another
- Corrosion protection in confined spaces and with limited access / ventilation
- Airless spray, hand application. Lining application where access to internals of pipes by personnel is not possible (Diameter of pipes is too small / access is difficult)

They shall supply sufficiently detail list of contracts, indicating the following:

a) Title of project/contract;
b) Name of client;
c) Start and end dates of contract;
d) Scope of services provided by Tenderer;
e) Signed-off quality control plan and log sheets for one item per project showing standard of work; &
f) Name and contact details of client representative.

Initial _____

ANNEXURE O

Relevant **Overall** Experience of Company amounts to 25 points.

Table: Evaluation of Company Experience

CRITERIA	SCORING CRITERIA Completed projects that dealt with corrosion protection of pipes, special and welded field joints, for relevant work done, will be accepted for evaluation. The following suggested method and or combination of methods that could have been used, are as followed: • Degreasing, grit blasting and other steel surface preparation methods • Blasting and coating / lining of dissimilar metals in contact with one another • Corrosion protection in confined spaces and with limited access / ventilation • Airless spray, hand application. Lining application where access to internals of pipes by personnel is not possible (Diameter of pipes is too small / access is difficult)	POINTS
Company experience (The suitability of resources to Scope of Work) (Total points: 25)	The Tenderer has submitted insufficient information to determine a score	0
	The company experience has not satisfied the requirements for the project in terms of experience in the scope of work required. Proof off: Two projects having a contract value no less than R 5 million including VAT and which has been satisfactorily completed during the last ten years.	10
	The company experience is complete and reasonable satisfactory. Proof off: One project having a contract value of at least R 9 million including VAT and which has been satisfactorily completed during the last five years.	17.5
	The company experience is complete and detailed. The technical level and composition of the work experience are adequate and in line with the scope of work requirement. Proof off: One project having a contract value of at least R 9 million including VAT and which has been satisfactorily completed during the last five years And One project having a contract value no less than R 5 million including VAT and which has been satisfactorily completed during the last ten years.	22.5
	The company experience is complete and detailed. The technical level and composition of the work experience are exemplary and in line with the scope of work requirement. Proof off: One project having a contract value of at least R 9 million including VAT and which has been satisfactorily completed during the last five years And Two projects having a contract value no less than R 5 million including VAT and which has been satisfactorily completed during the last ten years.	25

Initial _____

ANNEXURE O

NOTE: IF NO SIMILAR WORK HAS BEEN CARRIED OUT, THE ABOVE SCHEDULE IS TO BE MARKED “NIL” BY THE TENDERER

NAME OF TENDER: _____

COMPANY NAME: _____

SIGNATURE OF TENDER: _____

DATE: _____

IMPORTANT NOTE:

FAILURE BY THE TENDER TO LIST PREVIOUS SIMILAR WORK DONE, THE BID SHALL BE REGARDED AS NON-RESPONSIVE

Initial _____

ANNEXURE O

A2: Key-personnel / Supervisory and Management Staff **[MAX POINTS: 30]**

The Tenderer will receive a maximum of 30 points based on information provided in this schedule.

Organisation chart or organogram showing site management reporting to top management. Curriculum Vitae including relevant experience and proof of qualifications shall be provided for the following key personnel. Key personnel shall be in compliance with DWS 9900(2nd Edition; July 2022)

Organisation Chart / Organogram

The Tenderer shall attach organisation chart or organogram showing site management reporting to top management, that clearly identifies the key resources proposed for this contract, articulating their roles and responsibilities. The following key-personal should be indicated on the organisation chart or organogram (but not limited to):

- Contractor's MD / CEO
- Corrosion Protection Project manager
- Corrosion Protection Supervisor 1 & 2
- Corrosion Protection Applicator 1 to 4

Key personnel

The Tenderer shall attach construction team key personnel detailed curriculum vitae, certified copies (must have been certified by a commissioner of oath within the last three months) of all qualification certificates, proof of attendance for training courses and registrations certificates and must be appended to the tender for scoring of points, otherwise no points will be allocated.

A CV of the Corrosion Protection Project manager, Supervisors and Applicators of not more than 3 pages each should be attached to this schedule:

Each CV should be structured under the following headings:

1) Personal particulars

   a. name

   b. date and place of birth

   c. place (s) of tertiary education and dates associated therewith

   d. professional awards

2) Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations)

3) Skills

4) Name of current employer and position in enterprise

5) Overview of postgraduate / diploma experience (year, organization and position)

6) Outline of recent assignments / experience that has a bearing on the scope of work

7) References

Initial _____

ANNEXURE O

To attain the indicted scores, all requirements set forth under the various scoring categories must be attained. List of key personnel requirements:

A. Corrosion Protection Project manager.

Minimum of 10 years' experience of project management of corrosion protection projects.
And from DWS 9900(2nd Edition; July 2022):
Design Engineering companies, Project Management companies and Consultant companies shall employ and involve in the project at least one staff member who is a professionally registered coatings/Cathodic Protection practitioner with the appropriate corrosion awareness qualifications, skills and experience that are acceptable to the employer as described below:

This corrosion protection project manager shall have passed any two of the following corrosion courses:

- *Corrosion Engineering Course **
- *Water Industry Course **
- *Economics of Corrosion **
- *Paint Supervisors Course **
- *SAQA approved equivalent courses,*
- *Other International approved courses, such as but not limited to ICORR (UK), Corrodere, ACA, NACE CIP and SSPC.*

B. Corrosion Protection Supervisor 1&2

Must have a NACE level 1 and or AMPP level 1 qualification with at least 3 years' experience.

OR

Where the Corrosion Protection Supervisor doesn't have the relevant qualifications, the supervisor must have at least relevant experience of 10 years.

C. Corrosion Protection Applicators 1 to 4

Have a minimum SAQCC Paint Applicators Certification or equivalent formal qualification at the discretion of the Corrosion Engineer and 2 years relevant involvement and documented experience.

OR

Where the corrosion protection applicator doesn't have the relevant qualification/s the applicator must have at least relevant experience of 5 years.

Initial _____

ANNEXURE O

CRITERIA	SCORING CRITERIA Minimum of 10 years' experience of project management of corrosion protection projects. *This corrosion protection project manager shall have passed any two of the following corrosion courses:* ○ *Corrosion Engineering Course ** ○ *Water Industry Course ** ○ *Economics of Corrosion ** ○ *Paint Supervisors Course ** ○ *SAQA approved equivalent courses,* ○ *Other International approved courses, such as but not limited to ICORR (UK), Corrodere, ACA, NACE CIP and SSPC.*	POINTS
A. Corrosion Protection Project manager (Weight 10)	The Tenderer has submitted insufficient information to determine a score. No CV submitted or No experience in the Corrosion protection field and no recognized qualifications	0
	The CV and supporting information did not satisfy the key personal experience requirements for the project. CV submitted with more than 1 years but less than 3 years of relevant experience.	4
	The CV and supporting information submitted is complete and reasonable meet the requirements. CV submitted with more than 3 years but less than 6 years of relevant experience and 1 of the indicated qualifications.	7
	The CV and supporting information provided is complete and adequately in line with the required qualifications and experience. CV submitted with more than 6 years but less than 10 years of relevant experience and 2 of the indicated qualifications.	9
	The CV and supporting information have satisfied the requirements for the project in terms of the key-person experience. Besides providing a "good" CV and supporting information, the proposed keyperson's experience and qualification shows an exemplary participation as a specialist in the corrosion protection field. CV submitted with 10 years or more of relevant experience and 2 of the indicated qualifications.	10

Initial _____

ANNEXURE O

CRITERIA	SCORING CRITERIA Must have a NACE level 1 and or AMPP level 1 qualification with at least 3 years' experience. OR Where the Corrosion Protection Supervisor doesn't have the relevant qualifications, the supervisor must have at least relevant experience of 10 years.	POINTS
B. **Corrosion Protection Supervisor 1 & 2** (Weight 5 for each supervisor)	The Tenderer has submitted insufficient information to determine a score No CV submitted OR no experience in the Corrosion protection field AND no recognized qualifications	0
	The CV and supporting information did not satisfy the key personal experience requirements for the project. CV submitted with more than 1 years but less than 3 years of relevant experience and none of the indicated qualifications	1
	The CV and supporting information submitted is complete and reasonable meet the requirements. CV submitted with more than 1 years but less than 2 years of relevant experience and 1 of the indicated qualifications. OR CV submitted with more than 3 years but less than 6 years of relevant experience	3
	The CV and supporting information provided is complete and adequately in line with the requirements. CV submitted with more than 2 years but less than 3 years of relevant experience and 1 of the indicated qualifications. OR CV submitted with more than 6 years but less than 10 years of relevant experience	4
	The CV and supporting information have satisfied the requirements for the project in terms of the key-person experience. Besides providing a "good" CV and supporting information, the proposed keyperson's experience and / or qualification shows an exemplary participation as a specialist in the corrosion protection field. CV submitted with 3 year or more of relevant experience and 1 of the indicated qualifications. OR CV submitted with 10 years or more of relevant experience	5

Initial _____

ANNEXURE O

CRITERIA	SCORING CRITERIA Have a minimum SAQCC Paint Applicators Certification or equivalent formal qualification at the discretion of the Corrosion Engineer and 2 years relevant involvement and documented experience. OR Where the corrosion protection applicator doesn't have the relevant qualification/s the applicator must have at least relevant experience of 5 years.	POINTS
C. **Corrosion Protection Applicator 1 to 4** (Weight 2.5 for each applicator)	The Tenderer has submitted insufficient information to determine a score No CV submitted OR no experience in the Corrosion protection field AND no recognized qualifications	0
	The CV and supporting information did not satisfy the key personal experience requirements for the project. CV submitted with more than 1 years but less than 2 years of relevant experience and no of the indicated qualifications	1
	The CV and supporting information submitted is complete and reasonable meet the requirements. CV submitted with more than 0.5 years but less than 1 years of relevant experience and 1 of the indicated qualifications. OR CV submitted with more than 2 years but less than 3 years of relevant experience	1.75
	The CV and supporting information provided is complete and adequately in line with the requirements. CV submitted with more than 1 years but less than 1.5 years of relevant experience and 1 of the indicated qualifications. OR CV submitted with more than 3 years but less than 5 years of relevant experience	2.25
	The CV and supporting information have satisfied the requirements for the project in terms of the key-person experience. Besides providing a "good" CV and supporting information, the proposed keyperson's portfolio shows exemplary work experience and application techniques in line with the scope of work. CV submitted with 2 years or more of relevant experience and 1 of the indicated qualifications. OR CV submitted with 5 years or more of relevant experience	2.5

SIGNATURE: .....……..…… DATE: .....
(of person authorised to sign on behalf of the Tenderer)

Initial _____

ANNEXURE O

ONLY FOR DWS EVALUATION PURPOSE:
(Key person points scored allocation)

KEY-PERSON	POINTS SCORE
Corrosion Protection Project manager	/10
Corrosion Protection Supervisor 1	/5
Corrosion Protection Supervisor 2	/5
Corrosion Protection Applicator 1	/2.5
Corrosion Protection Applicator 2	/2.5
Corrosion Protection Applicator 3	/2.5
Corrosion Protection Applicator 4	/2.5
TOTAL	**/30**

Initial _____

ANNEXURE O

A3: TECHNICAL PROPOSAL **[MAX POINTS: 45]**

The Tenderer will receive a maximum of 45 points based on information provided in this schedule.

This technical proposal should articulate what value the tenderer will add in achieving the stated objectives for the project. The tenderer must as such explain his / her understanding of the objectives and the Employer's stated and implied requirements. He / She should further highlight the issues of importance and explain the technical approach they would adopt to address them.

The approach paper should explain the methodologies which are to be adopted and demonstrate the compatibility of those methodologies with the proposed approach.

Additionally, the tenderer should demonstrate that the required facilities is available to achieve this proposal.

The tenderer must attach its approach paper to this page. The approach paper must respond to the scope of work and outline the proposed approach / methodology relating to:

1) Project Approach
2) Preliminary method statements (please include all quality control methods and measure taken at each step)
   a) Workshop work
      i) Pipe handling; offloading, movement and flow of pipes in workshop
      ii) Surface preparation
         - Degreasing
         - Salt testing
         - Blasting
            ⇒ Dust and derby
            ⇒ Profile
      iii) Coating and lining
   b) Field welded joints
      i) Access to, dust control, ventilation of pipes, internal and external
         - Horizontal
         - Vertical
      ii) Surface preparation
         - Degreasing
         - Salt testing
         - Blasting
      iii) Coating, Lining and coating repair
3) Management of quality
   a) Proposed QCP for coating and lining of pipes and specials in workshop
   b) Proposed QCP for coating and lining of welded field joints on site
   c) Proposed QCP for coating and lining repair.
   d) Quality management system
4) Construction regulations to OHS act
5) Environmental management and compliance

Initial _____

ANNEXURE O

The technical proposal will be scored based on the below table. The Bid evaluation committee will score the technical proposal based on this table using their best judgment as professional technical persons. By participating in the tender process, the tenderer agrees that the score achieved with this method is final and binding.

SECTION NO.	SECTION HEADING AND REQUIREMENTS	POINTS 45
1	**PROJECT APPROACH:** **Scoring Requirements:** Does the project approach align well with the Employer's objectives and Outline of services as stated in the Scope of work Sections 1 and 3 respectively?	/1
2	**Preliminary method statements (please include all quality control methods and measure taken at each step)**	
2(a)	**WORKSHOP WORK**	
2(a)(i)	**PIPE HANDLING; OFFLOADING, MOVEMENT AND FLOW OF PIPES IN WORKSHOP:** **Scoring Requirements / guidelines:** Did the method statement adequately present methods of offloading, movement and handling of the pipes and specials in the workshop with regards to the scope of work? Where the tenderers own facilities cannot accommodate the movement and handling of the biggest and heaviest pipes does: • The method statement presents a good and reliable plan to address this. (Max. weight = 10255kg) • Is there sufficient space / access to allow for abnormal vehicles for the bigger pipes? Did the tenderer adequately explain all the different areas where the pipe will be moved and the methods they will be using to move the pipes including prevention of mild steel contamination. Offloading, movement and loading. Movement between: • Offloading area • Wash bay • Blasting booth • Spray booth • Laydown / loading area • etc Did the tenderer indicate that coated pipes will be: • Lifted using broad band slings that will not damage coating on the pipes. • Any other methods to ensure pipes is not damaged while handling. Also see Section 11 of the scope of work “Protection against transport damage and storage”.	/3

Initial _____

2(a)ii	**SURFACE PREPARATION**	
	DEGREASING: **Scoring Requirements / guidelines:** As outlined in Section 11 of the Scope of work: Did the tenderer indicate the availability of a suitable wash bay where pipes and specials can be degreased and how this will be achieved? • Equipment used • Process used • etc Did the tendered indicate a method of quality control to be used in line with the approved methods?	/1
	SALT TESTING: **Scoring Requirements / guidelines:** As outlined in Section 11 of the scope of work: • Did the tendered indicate a method of quality control to be used in line with the approved methods? • Did the tenderer indicate a method to remove metallic salts if quality control methods indicate higher than accepted levels?	/1
	BLASTING: **Scoring Requirements / guidelines:** As set out in Section 11 of the Scope of work: Did the method statement address the requirements in terms of: • facilities and equipment availability • ability to carry out work safely. Take note of the following: • Did the method statement indicate how the segregation of the abrasive blasting of the mild steel and stainless-steel parts of the pipes will be achieved, and can the indicated facilities / equipment achieve this requirement? • Did the method statement indicate that abrasive blasting media recycling is planned? If recycling is planned how will blasting media segregation be achieved and cleanliness for recycled blasting media measured? • Did the method statement indicate the type of abrasive blasting media to be used, and does it conform to the Scope of work and specification? • Did the method statement indicate how the Specification in terms of timing restrictions from blasting to coating will be achieved? (as soon as possible) • Did the method statement indicate and articulate how quality control specifications in terms of environmental conditions, steel temperatures, profile, dust and debris will be achieved, and do they conform with the specifications as set out in Section 11 of the scope of work?	/4

Initial _____

2(a)iii	**COATING AND LINING.**
	Scoring Requirements / guidelines:
	Did the method statement address the requirements as set out in Section 11 of the Scope of work and did it indicate that the facilities and equipment at their disposal will be available and safe to carry out the work?
	
	Take note of the following
	• Did the method statement indicate, what and why, the particular coating / lining materials are going to be used, and is it in line with the requirements?
	• Did the method statement indicate how the different sizes of pipes will be lined, particularly where the diameter of the pipe becomes too small for safe entry?
	• Did the method statement indicate what different application methods will be utilized, where and why?
	• Did the method statement address the requirements in terms of the following:
	  ○ First Coat
	  ○ Cleanliness During Application
	  ○ Stripe Coat and Crevices
	  ○ Second and Subsequent Coats
	  ○ Coat Colours
	  ○ Over-coating Times
	• Did the method statement indicate how quality control will be measured and recorded in terms of the following:
	  ○ Dry fil thicknesses
	  ○ Holiday detection
	  ○ Environmental readings
		/4

2(b)	**FIELD WELDED JOINTS**	
2(b)i	**ACCESS TO, DUST CONTROL, VENTILATION OF PIPES, INTERNAL AND EXTERNAL:**	
	HORIZONTAL: **Scoring Requirements / guidelines:** Does the method statement make safe provision for the following to the internals and externals of the welded filed joints? • Access to the internals and externals of the pipes, note that different pipes might require different access (see Scope of work section 11; Field welded joints; SCAFFOLDING) • Lighting • Dust control and ventilation • Removal of spent abrasive blasting material • Protection against damage from moving over coating and lining.	/2
	VERTICAL: **Scoring Requirements / guidelines:** Does the method statement make safe provision for the following to the internals and externals of the welded filed joints? • Access to the internals and externals of the pipes. (see Scope of work section 11; Field welded joints; SCAFFOLDING) • Lighting • Dust control and ventilation • Removal of spent abrasive blasting material • Protection against damage from moving over coating and lining.	/2

Initial _____

2(b)ii	**SURFACE PREPARATION**	
	DEGREASING: **Scoring Requirements / guidelines:** • Did the method statement make provision for a method of safe removal of the runoff from degreasing of the welded field joints. • Did the method statement indicate a method of quality control to be used in line with the approved methods as outlined in Section 11 of the Scope of work?	/1
	SALT TESTING: **Scoring Requirements / guidelines:** Did the method statement indicate a method of quality control to be used in line with the approved methods as outlined in Section 11 of the scope of work? Did the method statement indicate a method of dealing with metallic salts should quality control methods indicate salt levels above the levels indicated in Section 11 of the Scope of work Take note that not all salt testing methods works equally well on horizontal surfaces vs vertical surfaces. Did the tenderer address this?	/1
	BLASTING: **Scoring Requirements / guidelines:** As set out in Section 11 of the Scope of work: Did the method statement address the requirements in terms of: • facilities and equipment availability • ability to carry out work safely. Take note of the following: • Did the method statement indicate the type of abrasive blasting media to be used and does it conform to the specification? • Did the method statement indicate if there will be different methods used on vertical and horizontal weld areas and how abrasive blasting will be achieved when the pipe diameter does not allow for safe access as set out in the specifications. • Did the method statement indicate how the specification in terms of timing restrictions from blasting to coating will be achieved? (as soon as possible) • Did the method statement include details to control the environmental conditions, specifically on the internals of the pipes considering that some of the coating might be done during the winter months? • Did the method statement indicate how spent abrasive blasting media will be removed from the internals of the pipes? • Did the method statement indicate how the lining and coating will be masked against over-blasting? • Did the method statement indicate how quality control specifications in terms of environmental conditions, steel temperatures, profile, dust and debris will be achieved, and do they conform with the specifications?	/4

Initial _____

2(b)iii	**COATING, LINING AND COATING REPAIR:**
	Scoring Requirements / guidelines:
	Did the method statement address the requirements as set out in Section 11 of the Scope of work? Also did it indicate that the facilities and equipment at their disposal will be available and safe to carry out the work?
	
	Take note of the following
	• Did the method statement indicate, what and why, the particular coating / lining materials are going to be used, and is it in line with the requirements?
	• Did the method statement indicate how the different sizes of pipes will be lined, particularly where the diameter of the pipe becomes too small for safe entry?
	• Did the method statement indicate what different application methods will be utilized, where and why?
	• Did the method statement address the requirements in terms of the following:
	  ○ First Coat
	  ○ Cleanliness During Application
	  ○ Stripe Coat and Crevices
	  ○ Second and Subsequent Coats
	  ○ Coat Colours
	  ○ Over-coating times
	• Did the method statement indicate how quality control will be measured and recorded in terms of the following:
	  ○ Dry fil thicknesses
	  ○ Holiday detection
	  ○ Environmental readings
	• Did the method statement include a comprehensive coating repair procedure that conforms to the specification?
		/4

3	**MANAGEMENT OF QUALITY**	
3(a)	**PROPOSED QCP FOR COATING AND LINING OF PIPES AND SPECIALS IN WORKSHOP:** **Scoring Requirements / guidelines:** The QCP should be in accordance with: • Method statements submitted in section 2 of this proposal • The Scope of work and specifications: The QCP should also as a min address the following: • The required tests and / or activities to be performed in each step of the corrosion protection proses • The standard and / or acceptance requirements for each of the Steps in the Corrosion protection proses • How the measured / observed data is recorded • Make allowance for the Hold, Witness, Surveillance and review points. For the Contractor, 3rd Pary Inspector and Employer.	/3

Initial _____

ANNEXURE O

3(b)	**PROPOSED QCP FOR COATING AND LINING OF WELDED FIELD JOINTS ON SITE:** **Scoring Requirements / guidelines:** The QCP should be in accordance with: • Method statements submitted in section 2 of this proposal • The Scope of work and specifications: The QCP should also as a min address the following: • The required tests and / or activities to be performed in each step of the corrosion protection proses • The standard and / or acceptance requirements for each of the Steps in the Corrosion protection proses • How the measured / observed data is recorded • Make allowance for the Hold, Witness, Surveillance and review points. For the Contractor, 3rd Pary Inspector and Employer.	/3
3(c)	**PROPOSED QCP FOR COATING AND LINING REPAIR:** **Scoring Requirements / guidelines:** The QCP should be in accordance with: • Method statements submitted in section 2 of this proposal • The Scope of work and specifications: The QCP should also as a min address the following: • The required tests and / or activities to be performed in each step of the corrosion protection proses • The standard and / or acceptance requirements for each of the Steps in the Corrosion protection proses • How the measured / observed data is recorded • Make allowance for the Hold, Witness, Surveillance and review points. For the Contractor, 3rd Pary Inspector and Employer.	/3
3(d)	**QUALITY MANAGEMENT SYSTEM:** **Scoring Requirements / guidelines:** Does the contractor address the requirements as set out in the scope of work for Section 30?	/4
4	**CONSTRUCTION REGULATIONS TO OHS ACT:** **Scoring Requirements / guidelines:** Does the contractor address the requirements as set out in the scope of work for Section 17?	/2
5	**ENVIRONMENTAL MANAGEMENT AND COMPLIANCE:** **Scoring Requirements / guidelines:** Does the contractor address the requirements as set out in the scope of work for Sections 42 and 44?	/2

SIGNATURE: .....……..…….. DATE: …….....
(of person authorised to sign on behalf of the Tenderer)

Initial _____

ANNEXURE O

SUMMARY OF QUALITY ACHIEVEMENT SCHEDULE

	QUALITY CRITERIA	MAXIMUM POINTS TO BE ALLOCATED	ALLOCATED POINTS
1	Company Experience in Relation to Scope of Works	25	
2	Key-personnel / Supervisory and Management Staff	30	
3	Technical Proposal	45	
	TOTAL	**100**	

Initial _____

ANNEXURE O

CONTRACTOR'S HEALTH AND SAFETY DECLARATION

In terms of Clause 5(1)(h) of the OHSA 1993 Construction Regulations 2014 (referred to as "the Regulations" hereafter), a Principal Contractor may only be appointed to perform construction work if the Client is satisfied that the Principal Contractor has the necessary competencies and resources to carry out the work safely in accordance with the Occupational Health and Safety Act No 85 of 1993 and the OHSA 1993 Construction Regulations 2014.

To that effect a person duly authorised by the Tenderer must complete and sign the declaration hereafter in detail.

Declaration by Tenderer

1. I, the undersigned, hereby declare and confirm that I am fully conversant with the Occupational Health and Safety Act No 85 of 1993 (as amended by the Occupational Health and Safety Amendment Act No 181 of 1993), and the OHSA 1993 Construction Regulations 2014.

2. I hereby declare that my company has the competence and the necessary resources to safely carry out the construction work under this contract in compliance with the Construction Regulations and the Employer's Health and Safety Specifications.

3. I propose to achieve compliance with the Regulations by one of the following (Tenderers are to Circle Applicable - Yes or No):

    a) From my own competent resources as detailed in 4(a) hereafter.

    b) From my own resources still to be appointed or trained until competency is achieved, as detailed in 4(b) hereafter:

    c) From outside sources by appointment of competent specialist Subcontractors as detailed in 4(c) hereafter:

Circle Applicable	
Yes	No
Yes	No
Yes	No

4. Details of resources I propose:
   (Note: Competent resources shall include safety personnel such as a construction supervisor and construction safety officer as defined in Regulation 8, and competent persons as defined in Regulations 9, 10, 11, 12, 13, 14, 16, 17, 20, 21, 22, 23(1), 24, 25, 26, 27, 28 and 29, as applicable).

    a) Details of the competent and qualified key persons from my company's own resources, who will form part of the contract team:

NAMES OF COMPETENT PERSONS	POSITIONS TO BE FILLED BY COMPETENT PERSONS

Initial _____

ANNEXURE O

b) Details of training of persons from my company's own resources (or to be hired) who still have to be trained to achieve the necessary competency:

i) By whom will training be provided?	
ii) When will training be undertaken?	
iii) Positions to be filled by persons to be trained or hired:	

c) Details of competent resources to be appointed as subcontractors if competent persons cannot be supplied from own company:

Name of proposed subcontractor:	
Qualifications or details of competency of the subcontractor:	

5. I, the undersigned, hereby undertake, if this tender is accepted, to provide, before commencement of the works under the contract, a suitable and sufficiently documented Health and Safety Plan in accordance with Regulation 7(1) of the Construction Regulations, which plan shall be subject to approval by the Client.

6. I, the undersigned, confirm that copies of this company's approved Health and Safety Plan, the Client's Safety Specifications as well as the OHSA 1993 Construction Regulations 2014 will be provided on site and will at all times be available for inspection by the Principal Contractor's personnel, the Client's personnel, the Employer's Agent, visitors, and officials and inspectors of the Department of Labour.

7. I, the undersigned, hereby confirm that adequate provision has been made in the tendered rates and prices in the Bill of Quantities to cover the cost of all resources, actions, training and all health and safety measures envisaged in the OHSA 1993 Construction Regulations 2014, and that I will be liable for any penalties that may be applied by the Client in terms of the said Regulations (Regulation 33) for failure on the Principal Contractor's part to comply with the provisions of the Act and the Regulations.

8. I, the undersigned, agree that failure to complete and execute this declaration to the satisfaction of the Client will mean that this company is unable to comply with the requirements of the OHSA 1993 Construction Regulations (2014) and accept that this tender will be prejudiced and may be rejected at the discretion of the Client.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block capitals): ....

SIGNATURE: ..... DATE: .....…….....
(of person authorised to sign on behalf of the Tenderer)

Initial _____

ANNEXURE P

SCHEDULE OF PROPOSED SUB-CONTRACTORS

SCHEDULE OF PROPOSED SUB-CONTRACTORS

We notify you that it is our intention to employ the following Subcontractors for work in this contract. If we are awarded a contract, we agree that this notification does not change the requirements for us to submit the names of proposed Subcontractors in accordance with requirements in the contract for such appointments. If there are no such requirements in the contract, then your written acceptance of this list shall be binding between us. We confirm that all Subcontractors on this contract comply with to all contractual requirements.

In order to complete the Works under this Contract, I/we propose to employ the following sub-contractors to carry out the portion/type of work as detailed. **Affix Original or Certified proof of 3 previous projects for each sub-contractor.**
(Note: All proposed sub-contractors must be listed).

Sub-contractor: Name, Address and Telephone No.	**Portion/type of work to be undertaken**	
		Previous value of work: **Previous Experience:**

ATTACHED: Schedule of Proposed Sub-contractor together with a pro-forma sub-contracting agreement signed by both parties
In accordance with the General Conditions of Contract the Tender shall state hereunder the names of Sub-contractors he proposes to employ for the execution of certain sections of the Works.

No	PROPOSED SUB-CONTRACTOR	ADDRESS AND TELEPHONE OF PROPOSED SUBCONTRACTOR	NATURE AND EXTENT OF WORK	PREVIOUS EXPERIENCE WITH SUBCONTRACTOR

NOTE: Acceptance of this tender shall not be construed as approval of all or any of the listed specialist subcontractors. Should any or all of the specialist subcontractors not be approved subsequent to the acceptance of the tender, it shall in no way invalidate this tender, and the tendered unit rates for the various items of work shall remain final and binding, even in the event of a subcontractor not listed below being approved by the engineer.

NAME OF TENDER: _____

COMPANY NAME: _____

SIGNATURE OF TENDER: _____

DATE: _____

Initial _____

ANNEXURE Q

FORM OF OFFER AND ACCEPTANCE

Form of Offer and Acceptance is in section – Contract C1, under C1.1

Complete this document and place back into bid at C1.1

Initial _____

ANNEXURE R

CONTRACT DATA

Contract data is in section – Contract C1, under C1.2

Complete this document and place back into bid at C1.2

Initial _____

ANNEXURE S

PRO FORMA PERFORMANCE GUARANTEE

Pro Forma Performance Guarantee is in section – Contract C1, under C1.3

Complete this document and place back into bid at C1.3

Initial _____

ANNEXURE T

HEALTH AND SAFETY ACT AGREEMENT

Occupational Health and Safety Agreement is in section – Contract C1, under C1.4

Complete this document and place back into bid at C1.4

Initial _____

PRICING SCHEDULE

PRICING SCHEDULE – NON-FIRM PRICES (PURCHASES)

SBD 3.2 is in section – Contract C2, under C2.2

Complete this document and place back into bid at C2.2

Initial _____

ANNEXURE U

ESTIMATED TIMES

See Scope of Work section 16: Planning Requirements

Item No.	Description	Drg. No.	Nominal Size (NB)	Estimated m2	Total time in days for Typical item	Day / m2
	Work in workshop					
2	Straight pipe	CWD 7010	1800	112		
11	Straight pipe	CWD 7013	1000	63		
112	Straight Pipe	CWD 7041	600	17		
173	Ventilation Pipe	CWD 7053	400	11,3		
154	Straight Pipe (L = 6005)	CWD 7049	300	11,6		
183	Drainage Pipe (L = 4770)	CWD 7054	150	5		
	Work on site					
	welded field joint	N/A	1800			
	welded field joint	N/A	1000			
	welded field joint	N/A	600			
	welded field joint	N/A	400			
	welded field joint	N/A	300			
	Coating Repair batch of 10 repairs	N/A	N/A	6		
	Lining Repair batch of 5 repairs	N/A	N/A	2		

Attached hereto this page is my / our estimated time frames. We will adhere to the time frames during the project duration.

SIGNATURE: .....……..…….. DATE: ……..

(of person authorised to sign on behalf of the Tenderer)

Initial _____

ANNEXURE V

CORROSION INSTITUTE OF SOUTHERN AFRICA MEMBERSHIP

CONTRACTOR'S CORROSION INSTITUTE OF SOUTHERN AFRICA

Attached to this page: Corrosion Institute of Southern Africa Membership.

Attached hereto this page is my / our corrosion institute membership proof. My failure to submit the membership proof with my / our tender document may lead to the conclusion that I am / we are not a member and therefore maybe not eligible to tender.

SIGNATURE: .....……..…….. DATE: ……..
(of person authorised to sign on behalf of the Tenderer)

Initial _____

DEPARTMENT OF WATER AND SANITATION

DWS21-0125 WTE

CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

THE CONTRACT

C1 AGREEMENTS AND CONTRACT DATA

Initial _____

DEPARTMENT OF WATER AND SANITATION

DWS21-0125 WTE

CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

C1.1 FORM OF OFFER AND ACCEPTANCE

Initial _____

C1.1 FORM OF OFFER AND ACCEPTANCE

FORM OF OFFER AND ACCEPTANCE - RENDERING OF SERVICES (as per GCC 2015)

OFFER

The Employer, identified in the acceptance signature block, has solicited offers to enter into a contract in respect of the following works:

CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

The Tenderer, identified in the Offer signature block below, has examined the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules, and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the Tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance, the Tenderer offers to perform all of the obligations and liabilities of the Contractor under the Contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the Conditions of Contract identified in the Contract Data.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS

.....

.....Rand (in words); R ..... (in figures)

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

For the Tenderer:

Signature(s): _____

Name(s): _____

Capacity: _____

Date: _____

Initial _____

Name and address of organisation:

_____

_____

_____

_____

Signature and names of witness:

Signature(s): _____

Name(s): _____

Capacity: _____

Date: _____

ACCEPTANCE

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the Tenderer's offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the Conditions of Contract identified in the Contract Data. Acceptance of the Tenderer's offer shall form an agreement, between the Employer and the Tenderer upon the terms and conditions contained in this Agreement and in the Contract that is the subject of this Agreement.

The terms of the contract, are contained in

Part 1: Agreements and Contract Data, (which includes this Form of Offer and Acceptance)

Part 2: Pricing Data

Part 3: Scope of Work

Part 4: Site Information

Part 5: Annexures

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and drawings and documents or parts thereof, which may be incorporated by reference into Part T1 to Part C4 above.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules as well as any changes to the terms of the Offer agreed by the Tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Agreement. No amendments to or deviations from said documents are valid unless contained in this Schedule, which must be duly signed by the authorised representative(s) of both parties.

The Tenderer shall within two weeks after receiving a completed copy of this Agreement, including the schedule of deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data at, or just after, the date this Agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Tenderer receives one fully completed original copy of this document, including the schedule of deviations (if any). Unless the Tenderer (now Contractor) within five days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this Agreement, this agreement shall constitute a binding contract between the parties.

For the Employer:

Signature(s): _____

Name(s): _____

Capacity: _____

Date: _____

Name and address of organisation:

_____

_____

_____

_____

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Signature and names of witness:

Signature(s): _____

Name(s): _____

Capacity: _____

Date: _____

SCHEDULE OF DEVIATIONS

Notes:

1. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender;
2. A Tenderer's covering letter shall not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid become the subject of agreements reached during the process of, offer and acceptance, the outcome of such agreement shall be recorded here;
3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the contract shall also be recorded here;
4. Any change or addition to the tender documents arising from the above agreements and recorded here, shall also be incorporated into the final draft of the Contract.

1. **Subject:** _____

   Details _____

2. **Subject:** _____

   Details _____

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By the duly authorised representatives signing this Agreement, the Employer and the Tenderer agree to and accept the foregoing schedule of deviations as the only deviations from and amendments to the documents listed in the Tender Data and addenda thereto as listed in the Tender schedules, as well as any confirmation, clarification or change to the terms of the offer agreed by the Tenderer and the Employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the Tenderer of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this Agreement.

FOR THE TENDERER:		**FOR THE EMPLOYER**
_____	Signature(s)	_____
_____	Name(s)	_____
_____	Capacity	_____
Name and address of organisation		Name and address of organisation
_____		_____
_____		_____
_____		_____
_____	Witness signature	_____
_____	Witness Name	_____
_____	Date	_____

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DEPARTMENT OF WATER AND SANITATION

DWS21-0125 WTE

CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

C1.2 CONTRACT DATA

PART 1: DATA PROVIDED BY THE EMPLOYER

1.2.1 GENERAL CONDITIONS OF CONTRACT

The Contract shall be governed by the **"**General Conditions of Contract for Construction Works, Third Edition, 2015, refer to as GCC 2015, published by the South African Institution of Civil Engineering, Private Bag X200, Halfway House, 1685 and is obtainable from www.saice.org.za. It is supplemented with the Special Conditions of contract for the GCC and the Contract Data for GCC.

The only variations from these GCC 2015 shall be given in the Special conditions of Contract below. Whenever there is a conflict, the provisions in the Special Conditions and contract specific data of Contract shall prevail.

1.2.2 SPECIAL CONDITIONS OF CONTRACT

GENERAL

These Special Conditions of Contract (SCC) form an integral part of the Contract. The Special Conditions of Contract (SCC) shall amplify, modify or supersede, as the case may be, to the extent specified below, and shall take precedence and shall govern.

AMENDMENT TO THE GENERAL CONDITIONS OF CONTRACT FOR CONSTRUCTION WORKS. (3rd Edition 2015) (GCC)

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The clauses of the Special Conditions hereafter are numbered "SCC" followed in each case by the number of the applicable clause or sub clause in the General Conditions of Contract for Construction Works (3rd Edition 2015), and the applicable heading. A new special condition, that has no relation to the existing clauses, is introduced by a number that follows after the last clause number in the General Conditions, and an appropriate heading.

The pro forma annexures included in the General Conditions of Contract for Construction Works (3rd Edition 2015) are deleted for the purpose of this Contract and are replaced with the forms bound into this document.

SCC 1(1) Definitions

The definitions contained in Clause 1(1) are hereby amended and/or supplemented as follows:

Clause	Information
SCC 1.1.1	In the contract defined as: **DWS21-0125 WTE** **CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID** the following words and expressions shall have the meanings herby assigned to them except where the context otherwise requires:
SCC1.1.1.15	"Employer" means the Department of Water and Sanitation acting on behalf of the Government of the Republic of South African and shall include the Employer's duly authorised representative.
SCC1.1.1.16	"Employers Agent" means Department of Water and Sanitation: Construction South: Contract Manager or any other person appointed from time to time by him and notified in writing to the Contractor.
SCC 6.5	Day works: Delete in entirety

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1.2.3 CONTRACT SPECIFIC DATA

The General Conditions of Contract for Construction Works, Third Edition, 2015 published by the South African Institution of Civil Engineering, Private Bag X200, Halfway House, 1685, is applicable to this Contract and copies of these Conditions of Contract may be obtained from the South African Institution of Civil Engineering (Tel 011 805 5947), www.saice.org.za.

The General Conditions of Contract make several references to the Contract Data for specific data, which together with these conditions collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the Contract. The Contract Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the General Conditions of Contract.

The following contract specific data, referring to the General Conditions of Contract for Construction Works Third Edition (2015), are applicable to this Contract:

PART 1: DATA PROVIDED BY THE EMPLOYER		
Clause	**Description**	**Information**
1.1.1.13	Defects and liability period	12 months after final practical completion certificate issued
1.1.1.14	Due Completion Date	60 months after commencement date
1.1.1.15	The name of Employer	Department of Water and Sanitation. Represented by the Chief Directorate Construction Management, Construction South.
1.2.1.2	The address of the Employer	Department of Water and Sanitation Construction South Private Bag X313 Pretoria 0001
1.1.1.16	The name of the Employers Agent	Department of Water and Sanitation, Chief Directorate Construction Management - Construction South - Contract Manager
1.2.1.2	The address of the Employers Agent	Department of Water and Sanitation Construction South 4 Alkmar Street Paarl
1.1.1.26	The Pricing Strategy	Re-measurable
3.2.3	Specific approval of the Employer required	9.1 Termination of Contract 9.2 Termination by Employer
5.1.1.1	Special non-working days	1. Statuary holidays as declared by National or Regional Government. 2. Three weeks annual Builders holiday December to January (dates to be confirmed) **As PER SAFCEC To Be Announced** 3. The last Friday of every month.

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5.8.1	Non-working days	Sundays
5.3.1	The documentation required before commencement with works execution:	Health and Safety (Clause 4.3) Initial programme (Clause 5.6) Security (Clause 6.2) Insurance (Clause 8.6) Method Statements (as required by the applicable Specifications) Environmental Plan Other documents as specified in C3
5.3.2	The time to submit the documentation required before commencement with Works execution	28 calendar days
5.4.2	The access and possession of the Site	Shall not be exclusive to the Contractor but as set out in the Site Information (C3: Scope of work)
5.13.1	The penalty for failing to complete the Works	The penalty for failing to complete the Works is: **0.05 %** of the Total Tender Sum per Calendar Day
5.14.1	Requirements for practical completion	Final field joint QCP approved (signed off)
5.16.3	The latent defect period	The latent defect period is **10 years** after date of completion
6.2	Security	Security will be provided to the value of 10% of the contract value.
6.8.2	Application of the Contract Price Adjustment Factor	Contract Price Adjustments is applicable as per Contract Price Adjustment Schedule
6.10.3	The limit of retention money	**5%** of the Contract Sum
8.6.1.1.2	Value of plant and materials supplied by the employer to be included in the insurance sum	Not required
8.6.1.1.3	Amount cover professional fees for repairing damage and loss to be included in the insurance sum	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum will be calculated at **10%** of the claim value.
8.6.1.3	The limit of indemnity for liability insurance	The limit of indemnity for liability insurance is R 5 000 000.00 for any single claim. The number of claims during the construction and defects liability period shall be unlimited.
10.5.2	Dispute resolution by ad-hoc adjudication	Dispute resolution shall be **ad-hoc** adjudication.
10.5.3	The number of Adjudication Members to be appointed.	Three
10.8.1	The determination of disputes	Court proceedings

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PART 2: DATA PROVIDED BY THE CONTRACTOR

The Contractor is advised to read the General Conditions of Contract for Construction Works, Third Edition (2015) published by the South African Institution of Civil Engineering, in order to understand the implications of this Data which is required to be completed.

Each item of data given below is cross-referenced to the clause of Conditions of Contract to which it mainly applies.

FORM H CONTRACT DATA		
PART 2: DATA PROVIDED BY THE CONTRACTOR		
Clause	**Description**	**Information**
1.1.1.9	The name of the Contractor	
1.2.1.2	The address of the Contractor	Physical address: Postal address: E-mail address: Telephone:
6.2.1	The security to be provided by the Contractor	Performance guarantee of 10% of Contract sum.
6.8.3	Price adjustments for variations in the costs of special materials are allowed	Special Material(s) Unit Rate …… …… …… …… …… ……

(End of Section C1.2)

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NAME OF TENDER: _____

COMPANY NAME: _____

SIGNATURE OF TENDER: _____

DATE: _____

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DEPARTMENT OF WATER AND SANITATION

DWS21-0125 WTE

CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

C1.3 PRO FORMA PERFORMANCE GUARANTEE

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C1.3 PRO FORMA PERFORMANCE GUARANTEE

Tender Reference No: DWS21-0125 WTE

General Conditions of Contract for Construction Works, Third Edition (2015)

PRO FORM PERFORMANCE GUARANTEE

For use with the General Conditions of Contract for Construction Works, Third Edition (2015).

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means: ….....

Physical address: .....

"Employer" means: ….....

"Contractor" means: .....

"Employer's Agent" means: ...……

……

"Works" means: .....

"Site" means: .....

"Contract" means: The Agreement made in terms of the Form of Offer and Acceptance and such amendments or additions to the Contract as may be agreed in writing between the parties.

"Contract Sum" means: The accepted amount inclusive of tax of R .....

Amount in words: .....

"Guaranteed Sum" means: The maximum aggregate amount of R .....

Amount in words: .....

Type of Performance Guarantee: ……(*Insert Variable or Fixed*)

"Expiry Date" means: ……..……(*Give date*) or any other later date set by the

Contractor and/or Employer provided such instruction is received prior to the Expiry Date as indicated here.

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CONTRACT DETAILS

Employer's Agent issues: Interim Payment Certificates, Final Payment Certificate and the Certificate of Completion of the Works as defined in the Contract.

1. VARIABLE PERFORMANCE GUARANTEE

1.1 Where a Variable Performance Guarantee has been selected, the Guarantor's liability shall be limited during the following periods to diminishing amounts of the Guaranteed Sum as follows:

1.1.1 From and including the date of signing the Performance Guarantee up to and including the date of the interim payment certificate certifying, for the first time, more than 50% of the Contract Sum:

R.....(Amount in words)……..)

1.1.2 From the day following the date of the said interim payment certificate up to and including the Expiry Date, or the date of issue by the Employer's Agent of the Certificate of Completion of the Works, whichever occurs first:

R.....(Amount in words)……..)

1.2 The Employer's Agent and/or the Employer shall advise the Guarantor in writing of the date on which the interim payment certificate certifying, for the first time, more than 50% of the Contract Sum, has been issued and the date on which the Certificate of Completion of the Works has been issued.

2. FIXED PERFORMANCE GUARANTEE

2.1 Where a Fixed Performance Guarantee has been selected, the Guarantor's liability shall be limited to the amount of the Guaranteed Sum.

2.2 The Guarantor's period of liability shall be from and including the date on which the Performance Guarantee is signed, up to and including the Expiry Date, or the date of issue by the Employer's Agent of the Certificate of Completion of the Works, or the date of payment in full of the Guaranteed Sum, whichever occurs first.

2.3 The Employer's Agent and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.

3. CONDITIONS APPLICABLE TO VARIABLE AND FIXED PERFORMANCE GUARANTEES

3.1 The Guarantor hereby acknowledges that:

3.1.1 Any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship.

3.1.2 Its obligation under this Performance Guarantee is restricted to the payment of money.

3.2 Subject to the Guarantor's maximum liability referred to in 1.1 or 2.1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 3.2.1 to 3.2.3:

3.2.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Employer's Agent in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 3.2.2;

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3.2.2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 3.2.1 and the sum certified has still not been paid;

3.2.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 3.2.

3.3 Subject to the Guarantor's maximum liability referred to in 1.1 or 2.1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:

3.3.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 3.3; or

3.3.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 3.3; and

3.3.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.

3.4 It is recorded that the aggregate amount of payments. required to be made by the Guarantor in terms of 3.2 and 3.3 shall not exceed the Guarantor's maximum liability in terms of 1.1 or 2.1.

3.5 Where the Guarantor has made payment in terms of 3.3, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.

3.6 Payment by the Guarantor in terms of 3.2 or 3.3 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.

3.7 Payment by the Guarantor in terms of 3.3 will only be made against the return of the original Performance Guarantee by the Employer.

3.8 The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may consider fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.

3.9 The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.

3.10 This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 1.1.2 or 2.2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.

3.11 This Performance Guarantee, with the required demand notices in terms of 3.2 or 3.3, shall be regarded as a liquid document for the purposes of obtaining a court order.

3.12 Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrates' Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

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Signed at: ……

Date: ……

Guarantor's signatory (1): ……

Capacity: ……

Guarantor's signatory (2): ……

Capacity: ……

Witness signatory (1): ……

Witness signatory (2): ……

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DEPARTMENT OF WATER AND SANITATION

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C1.4 OCCUPATIONAL HEALTH AND SAFETY AGREEMENT

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C1.4 OCCUPATIONAL HEALTH AND SAFETY AGREEMENT

Tender Reference No: DWS21-0125 WTE

AGREEMENT WITH MANDATORY IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, NO. 85 OF 1993

THIS AGREEMENT is made between the **DEPARTMENT OF WATER AND SANITATION (DWS)** (hereinafter called the EMPLOYER) of the one part, herein represented by:

.....

in his capacity as: .....;

AND:

(hereinafter called the CONTRACTOR) of the other part, herein represented by:

.....

in his capacity as: .....
duly authorized to sign on behalf of the Contractor.

Compensation Fund (FEMA) Number:…….....

INTRODUCTION

The Employer has called for the execution of the work as set out in **Annexure 'AA'** and the Contractor undertook to carry out the work.

This Agreement is intended to comply with and constitutes the agreement contemplated in Section 37(2) of the Occupational Health and Safety Act No. 85 of 1993, as amended, and all regulations thereunder **('OHSA').**

The Contractor acknowledges and accepts that it is an employer in its own right and hereby acknowledges and accepts that it is obliged to comply with of the provisions of OHSA while on the premises of the Employer and with the conditions and safety procedures of the Employer.

The Contractor acknowledges that its duties and functions shall include that it, its employees, agents, sub - contractors and all other parties entering the premises of the Employer to execute the work in terms of Annexure 'AA' meet all the minimum requirements in terms of OHSA.

1 **DEFINITIONS AND INTERPRETATION**

In this Agreement, the following definitions apply unless the context otherwise requires:-

1.1 'Agreement' means this agreement;

1.2 'Construction Regulations' means the Construction Regulations promulgated in terms of Section 43 of the OHSA as regulations under the OHSA;

1.3 'Contractor' means a contractor as defined in Section 1 of the Construction Regulations,

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and an employer as defined in Section 1 of the OHSA, who performs construction work (as defined in the Construction Regulations);

1.4 'Employer's Representative' means the person nominated as such in terms of clause 2.2;

1.5 'Contractor's Employees' means all employees, servants, contractors, and sub-contractors of the Contractor;

1.6 'HIRA' means Hazard Identification and Risk Assessment;

1.7 'Parties' means the parties to this Agreement, being the Employer and the Contractor;

1.8 'Premises' means all premises of an Employer, where the Contractor and the Contractor's Employees perform work or render a service for and on behalf of the Employer, as set out in Annexure 'AA';

1.9 In the interpretation of this Agreement, the following applies, unless the context requires otherwise:

1.10 The singular includes the plural and the other way around (vice versa);

1.11 One gender includes the other genders;

1.12 If a word or phrase is defined, its other grammatical forms have a corresponding meaning;

1.13 A reference to a person, corporation, trust, partnership, unincorporated body or other entity includes any of them;

1.14 A reference to a clause is a reference to a clause of this Agreement;

1.15 A reference to an agreement or document (including a reference to this Agreement) is to the agreement or document as amended, varied, supplemented, novated or replaced except to the extent prohibited by this Agreement or that other agreement or document;

1.16 A reference to a Party to this Agreement or to a Party to another agreement or document includes the Party or Party's successors and permitted substitutes or assigns;

1.17 A reference to legislation or to a provision of legislation includes a modification or re-enactment of it, a legislative provision substituted for it and a regulation or statutory instrument issued under it; and

1.18 Headings are for convenience only and do not affect the interpretation.

2 REPORTING

2.1 The person nominated by the Contractor as the competent person shall report to the Employer's Representative prior to the commencement of the work at the Premises.

2.2 The Employer shall nominate a person or persons as the Employer Representative, and shall notify the Contractor in writing of such nomination, including the relevant contact details of such person(s).

2.3 The person so nominated by the Contractor, and the Employer Representative shall meet, prior to commencement of work, which meeting shall be formally minuted.

2.4 The purpose of such meeting includes (only when applicable):-

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a) For the Employer to provide the Contractor with the Health and Safety Specification as contemplated in the Construction Regulations;

b) For the Employer to provide the Contractor with any information which might affect the health and safety of any person at work carrying out construction work;

c) The appointment or confirmation of the appointment of the Contractor in terms of the Constructions Regulations;

d) For the Employer to communicate changes to design or construction and provide appropriate resources to the Contractor to execute the work safely;

e) For the Employer to discuss and negotiate with the Contractor the contents of the Contractor's health and safety plan and approve the Contractor's health and safety plan; and

f) To discuss and confirm whether the Contractor will be appointed, in writing, to act as the Employer's representative to carry out the Employer's responsibilities at the Premises.

3 DUTIES AND RESPONSIBILITIES OF THE CONTRACTOR

The Contractor:-

3.1 Shall carry out appropriate hazard identification and risk assessments which may include baseline, issue-based and continuous, depending on the scope of the work and services to be provided.

3.2 Shall appoint competent persons as contemplated in the OHSA and Regulations, including the Construction Regulations. Copies of such appointments will be provided by the Contractor to the Employer's Representative.

3.3 Will provide appropriate health and safety training to the Contractor's Employees as contemplated in OHSA and which will include communication of information regarding the hazards associated with the work or services to be performed.

3.4 Shall ensure that it has an updated copy of the OHSA on the Premises at all times, and that it is accessible to the relevant appointees and the Contractor's Employees.

3.5 Shall ensure that all work or services are performed under the supervision of the competent persons, and shall take reasonably practicable steps to ensure that no unsafe or unhealthy work practices are carried out.

3.6 Shall take appropriate disciplinary and related action against any of the Contractor's Employees regarding non-compliance by such employee with any health and safety standards, policies, practices and procedures, or carries out any act or omission which impacts on health and safety.

3.7 Will apply its systems, including, work instructions, standards and procedures in respect of the work and/or services to be provided to the Employer.

3.8 Will ensure that competent persons, appointed by the Contractor, carry out over-inspection.

3.9 Shall ensure that the Contractor's Employees report all unsafe or unhealthy working situations immediately after they become aware of such unsafe or unhealthy work

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situations.

3.10 Shall report all significant unsafe or unhealthy working situations to the Employer through appropriate means, including, reports, health and safety meetings, and other communications, whichever is appropriate and applicable.

3.11 Shall ensure that the Contractor's Employees provide full cooperation and information if and when the Employer or the Employer Representative enquires into occupational health and safety issues concerning the Contractor, to the extent that these are relevant to the work and/or the services being provided by the Contractor at the Premises.

3.12 Shall make available to the Employer and the Employer Representative, on request, all and any checklists and inspection registers required to be kept by the Contractor in respect of any materials, machinery or equipment.

3.13 Shall be entitled to utilise the procedures, guidelines and other documentation as used by the Employer for the purposes of ensuring a healthy and safe working environment. In the event that such procedures, guidelines and other documentation are used by the Contractor, this will form part of the health and safety training and communication provided to the Contractor's Employees.

3.14 Shall, to the extent appropriate, implement and enforce safe work practices as prescribed by the Employer, from time to time, and it shall ensure that its responsible persons and the Contractor's Employees are made conversant with the contents of these practices, and that the Contractor's Employees adhere to such procedures.

3.15 Shall ensure that the Contractor's Employees do not perform any work for which a permit is required before obtaining such permit.

3.16 Shall, if required in terms of the OHSA, establish its own health and safety committees and ensure that health and safety meetings are held, as may be required.

3.17 Shall ensure that it is registered and remains registered for the duration of this Agreement, with the Compensation Commissioner, as required in terms of the Compensation for Occupation Injuries and Diseases Act No. 130 of 1993 ('COIDA'), and that all payments due to the Commissioner are made.

3.18 Shall ensure that is undergo medical examinations in accordance with OHSA.

3.19 Shall report all incidents referred to in Section 24 of the OHSA to the Department of Labour and to the Employer. The Employer retains an interest in the notification of any aforementioned incident as well as any informal investigation and/or inquiry conducted in terms of Section 32 of the OHSA.

3.20 Shall notify the Employer of any sub-contractor it may wish to engage to perform work on the Premises.

3.21 Shall ensure that the terms and conditions of this Agreement are extended to any sub-contractor who shall be bound by the terms and conditions contained in this Agreement.

3.22 Confirms that it has familiarised itself with the Premises and agrees to the arrangements, standards and procedures as contemplated in this Agreement.

3.23 Shall procure that the Contractor's Employees shall only access and exit the Premises through the main gate(s) and/or checkpoint(s) designated by the Employer.

3.24 Shall ensure that the Contractor's Employees observe the security rules of the Employer at all times and shall not permit any unauthorised Contractor's Employees onto the

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Premises. The Contractor and the Contractor's Employee shall not enter any unauthorised areas.

3.25 Shall ensure that all materials, machinery or equipment brought by it onto the Premises is registered in accordance with the Employer's procedures.

3.26 Shall ensure that an adequate and appropriate supply of fire protection and first aid facilities are provided for the work or services to be performed on the Premises by the Contractor's Employees.

3.27 Shall, in cooperation with the Employer, make the Contractor's Employees familiar with all fire precautions at the Premises.

3.28 Shall ensure that the area where the work is performed is at all times maintained to reasonably practicable levels of hygiene and that it maintains the area immediately surrounding the area where the work or services is being performed, to reasonably practicable level of cleanliness.

3.29 Shall ensure, to the extent reasonable practicable, that neither it nor the Contractor's Employees undertake any activity which may cause environmental impairment or constitute any form of nuisance to the Employer and/or its surroundings. No intoxicating substance of any form shall be allowed on the Premises. Any person suspected of being intoxicated shall not be allowed on the Premises, save that any person required to take medication shall notify the relevant responsible person thereof, as well as the potential side effects of the medication.

3.30 Shall ensure that personal protective equipment ('PPE') which is applicable to the work being carried out by the relevant Contractor's Employees, is provided, in accordance with the provisions of the OHSA and that such PPE is used at all relevant times.

3.31 Shall take reasonably practicable steps to ensure that all the plant, machinery, equipment and/or vehicles used for the purposes of carrying out the work or providing the services at the Premises, comply with the provisions of the OHSA and are fit for the purpose for which they are intended.

3.32 Hereby acknowledges that the employees shall not be permitted to use any material, machinery or equipment of the Employer unless the prior written consent of the Employer has been obtained, in which case, the Contractor shall ensure that only those persons authorised to make use of the same, have access thereto.

3.33 Shall take reasonably practicable steps to ensure that all vehicles used on the Premises by the Contractor or the Contractor's Employees are in a roadworthy condition, are licensed and insured. All drivers shall have relevant valid driver's licenses and no vehicle shall carry passengers unless it is specifically designed to do so. All drivers shall adhere to the speed limits and road signs on the Premises. In the event that any hazardous substances are to be transported on the Premises, the Contractor shall ensure that the requirements of the Hazardous Chemical Substances Act No. 15 of 1973 and/or the Hazardous Chemical Substances Regulations (whichever is applicable) are complied with to the extent reasonably practicable.

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4 INDEMNITY BY CONTRACTOR

4.1 The Employer shall not, save for gross negligence and/or wilful misconduct by the Employer, its employees or agents, be responsible for any loss, damage, injury or death, howsoever caused, to the Contractor or to the Contractor's Employees, and the Contractor hereby indemnifies the Employer and holds the Employer harmless against all and any claims, losses, demands, liability, costs and expenses of whatsoever nature, which the Employer may, at any time sustain or incur arising out of the circumstances referred to herein.

4.2 The Contractor undertakes to ensure that it carries the appropriate insurance cover, including third party public liability cover for the duration of this Agreement, the details of which shall be furnished to the Employer on demand by the Employer.

5 CLARIFICATION

In the event that Contractor requires clarification of any of the terms or provisions of this Agreement, it may do so by requesting such clarification from the Employer Representative.

6 DURATION OF AGREEMENT

This Agreement shall commence on the commencement date as set out in Annexure 'AA' and shall remain in force for all future work done for the Employer unless revoked in writing.

Thus signed at …… for and on behalf of the **CONTRACTOR**

On this …… day of …… 20……..

Signature _____

For and on behalf of the Contractor:

Name and Surname:_____

Company Name: _____

In his/her capacity as: _____

AS WITNESSES:

1. _____ 2. _____

Name (in capitals):

Initial _____

Thus signed at ..... for and on behalf of the **EMPLOYER**

on this the …….. day of ..... 20……

SIGNATURE: .....

NAME AND SURNAME: .....

CAPACITY: .....

AS WITNESSES:

1. _____ 2. _____

NOTE: As and when required; the Contractor will be required to sign project specific agreements in terms of section 37(2) of the Occupational Health and Safety Act no 85 of 1993.

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ANNEXURE AA

NAME OF CONTRACTOR	
COMPANY REGISTRATION NUMBER	
PHYSICAL ADDRESS	
EMAIL ADDRESS	
COMPENSATION FUND NAME	
COMPENSATION FUND NUMBER	
LETTER OF GOOD STANDING ATTACHED	
COMMENCEMENT DATE	
CONTRACTOR OHS REPRESENTATIVE NAME	
CONTRACTOR OHS REPRESENTATIVE CONTACT NUMBER	
WORK TO BE PERFORMED	As per section C3 – Scope of work

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DEPARTMENT OF WATER AND SANITATION

DWS21-0125 WTE

CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

THE CONTRACT

C2 PRICING DATA

C2.1 PRICING INSTRUCTIONS

C2.2 BILL OF QUANTITIES

Initial _____

DEPARTMENT OF WATER AND SANITATION

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CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM. DAM ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

C2.1 PRICING INSTRUCTIONS

C2.1 PRICING INSTRUCTIONS

1. GENERAL

This section provides the tenderer with guidelines and requirements with regard to the completion of the Bil of Quantities. The Schedule has to be completed in black ink and the tenderer is referred to the arithmetical errors.

The Bill of Quantities forms part of the Contract Documents and must be read and priced in conjunction with all the other documents comprising the Tender Documents which include the Conditions of Tender, Conditions of Contract, the Specifications (Scope of work/site information including the Project Specification), and the Drawings, as cross referenced.

The nature and extent of the work is to be ascertained by reference to all the documents comprising the Contract. Where Clause references are contained in item descriptions, these are given for guidance only and are not exclusive to other relevant provisions of the Contract.

State the rates and prices in Rand unless instructed otherwise in the tender conditions.

Any entry made by the Tenderer in the Bill of Quantities, form, etc., which the tenderer desires to change, shall not be erased or painted out. A line shall be drawn through the incorrect entry and the correct entry shall be written above in black ink and the full signature of the Tenderer shall be placed next to the correction.

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2. DESCRIPTION OF ITEMS IN THE SCHEDULE

The Bill of Quantities has been drawn up generally in accordance with the project and particular specifications.

The short descriptions of the items in the Bill of Quantities are for identification purposes only and the measurement and payment clause of the Standardised Specifications and each Particular Specification, read together with the relevant clauses of the Project Specification and directives on the drawings, set out what ancillary or associated work and activities are included in the rates for the operations specified.

3. QUANTITIES REFLECTED IN THE SCHEDULE

The quantities given in the Bill of Quantities are estimated quantities only and will be subject to re-measuring during the execution of the work. Where quantities or sums are indicated as "Provisional", the Employer reserves the right to adjust the quantity or sum upwards or downwards as necessary, or the item can be omitted altogether. The Contractor shall obtain the Employer detailed instructions for all work before ordering any materials or executing work or making arrangements for it.

The Works as finally completed in accordance with the Contract shall be measured and paid for as specified in the Bill of Quantities, and the contract price for the completed contract shall be computed at the relevant unit rates and prices, all in accordance with the General and Special Conditions of Contract, the Specifications and Project Specifications, and the Drawings, et. Unless otherwise stated, items are measured net in accordance with the Drawings, and no allowance has been made for waste.

The validity of the contract will in no way be affected by differences between the quantities in the Bill of Quantities and the quantities finally certified for payment.

4. PRICING OF THE SCHEDULE

The prices and rates to be inserted by the Tenderer in the Bill of Quantities shall be the full inclusive prices to be paid by the Employer for the work described under the several items, and shall include full compensation for all costs and expenses that may be required in and for the completion and maintenance during the defects liability period of all the work described and as shown on the drawings as well as all overheads, profits, incidentals and the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the Tender is based. Reasonable unit rates and prices shall be entered in the Bill of Quantities as these will be used for the assessment of payment for any additional work that may have to be carried out.

All prices shall be tendered in accordance with the units specified in this schedule. Where a value is given in the “Quantity” column, a Rate and Price is required to be inserted in the relevant columns. Each item shall be priced and extended to the "Total" column by the Tenderer, with the exception of the items for which “rate only” is required or items which already have Prime Cost or Provisional Sums affixed thereto. If the Contractor omits to price any items in the Bill of Quantities, then these items will be considered to have a nil rate or price.

All items for which terminology such as "inclusive" or "not applicable" have been added by the Tenderer will be regarded as having a nil rate which shall be valid irrespective of any change in quantities during the execution of the Contract.

All rates and amounts quoted in the Bill of Quantities shall be in Rand and shall include all levies and taxes (other than VAT). VAT will be added in the summary of the Bill of Quantities.

5. CORRECTION OF ENTRIES

Incorrect entries shall not be erased or obliterated with correction fluid but must be crossed out neatly. The correct figures must be entered above or adjacent to the deleted entry, and the alteration must be initialled by the Tenderer.

6. MONTHLY PAYMENTS

Unless otherwise specified in the Specifications and Project Specifications, progress payments in Interim Certificates, referred to in Clause 6.10 of the General Conditions of Contract 2015 (Third edition), in respect of "sum" items in the Schedule of Quantities shall be by means of interim progress instalments assessed by the Employers Agent and based on the measure in which the work actually carried out relates to the extent of the work to be done by the Contractor.

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7. UNITS OF MEASUREMENT

The units of measurement described in the Bill of Quantities are metric units for which standard international abbreviations are used. Abbreviations used in the Bill of Quantities, including some non-standard abbreviations, are as follows:

Non-Standard Abbreviations	
Abbreviation	Unit
%	Percent
No.	Number
Prov sum ; PS	Provisional sum
R/only ; R/o	Rate only
Sum, Lump sum	sum
W/day	Work day
h	Hour
wk	Week
d	Day
Standard Abbreviations	
kPa	kilopascal
mm	millimetre
m	metre
km	kilometre
m²	square metre
ha	hectare
m³	cubic metre
kN	Kilonewton
MN	meganewton
MN.m	meganewton-metre
MPa	megapascal
kg	kilogram
t	ton (1000 kg)

For the purpose of this Bill of Quantities, the following words shall have the meanings hereby assigned to them:

Unit: The unit of measurement for each item of work as defined in the Standardized, Project or Particular Specifications

Quantity: The number of units of work for each item

Rate: The agreed payment per unit of measurement at which the Tenderer bids to do the work

Amount: The product of the quantity and the agreed rate for an item.

Sum; Lump-sum: An agreed amount for an item, the extent of which is described in the Bills of Quantities but the quantity of work of which is not measured in any units.

Provisional sum: An amount provided for work the scope and/or the necessity of which is undecided, and which will be dealt with in accordance with clause 6.6.1 of the General Conditions of Contract.

8. ARITHMETICAL ERRORS

Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with 6.11 for

a) the gross misplacement of the decimal point in any unit rate,

b) omissions made in completing the pricing schedule or bill of quantities, or

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c) arithmetical errors in

1) line-item totals resulting from the product of a unit rate and a quantity in bill of quantities or schedules of prices, or

2) the summation of the prices.

Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.

Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

d) If a bill of quantities or pricing schedules apply and there is an error in the line-item total resulting from the product of the unit rate and the quantity, the line-item total shall govern, and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line-item total as quoted shall govern, and the unit rate shall be corrected.

e) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern, and the tenderer shall be asked to revise selected item prices (and their rates if bill of quantities apply) to achieve the tendered total of the prices.

Consider the rejection of a tender offer if the tenderer does not correct or accept the correction of errors in the required manner.

9. PROVISIONAL ITEMS

All items described as "Provisional" shall be used as directed by the Employer and measured and valued or paid for. No work for which "Provisional" items are allowed shall be commenced without written instructions from the Employer.

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DEPARTMENT OF WATER AND SANITATION

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C2.2 BILL OF QUANTITIES

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DEPARTMENT OF WATER AND SANITATION

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C2.2 BILL OF QUANTITIES

SBD 3.2

PRICING SCHEDULE – NON-FIRM PRICES (PURCHASES)

NOTE: PRICE ADJUSTMENTS WILL BE ALLOWED AT THE PERIODS AND TIMES SPECIFIED IN THE BIDDING DOCUMENTS.

IN CASES WHERE DIFFERENT DELIVERY POINTS INFLUENCE THE PRICING, A SEPARATE PRICING SCHEDULE MUST BE SUBMITTED FOR EACH DELIVERY POINT

Name of Bidder……Bid number……

Closing Time 11:00 …….. Closing date……..

1. OFFER TO BE VALID FOR 120 DAYS FROM CLOSING DATE OF BID

Pipe Schedule for Transport cost (including packaging against damage)

Raising of Clanwilliam Dam - Pipes and Specials

* Pipe item number

Item No.*	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
1	Bellmouth	CWD 7009	7	1800	4293		
2	Straight pipe	CWD 7010	12	1800	5200		
3	Straight pipe	CWD 7010	7	1800	3610		
4	Straight pipe	CWD 7010	1	1800	4300		
5	Sweep Tee	CWD 7014	1	1800	7645		
6	Sweep Tee	CWD 7014	4	1800	7970		
11	Straight pipe	CWD 7013	23	1000	2125		
						Carried forward	

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Item No.*	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
12	Straight pipe	CWD 7013	5	1000	1515		
13	Bend - 90º	CWD 7013	6	1000	1340		
14	Straight pipe	CWD 7013	3	1000	655		
15	Closer pipe	CWD 7013	10	1000	320		
16	T-piece	CWD 7015	1	1000	2505		
17	T-piece	CWD 7015	1	1000	2570		
18	Straight pipe	CWD 7016	7	1000	2183		
19	Straight pipe	CWD 7016	2	1000	1065		
21	Sweep Tee	CWD 7014	1	1800	7600		
22	30º Branch Pipe	CWD 7017	1	1800	10255		
23	T-piece	CWD 7018	2	1800	7790		
24	T-piece	CWD 7018	2	1800	8055		
25	Pipe with bend & manhole	CWD 7019	1	1800	4505		
26	Straight Pipe with manhole	CWD 7019	1	1800	2845		
27	Straight Pipe with manhole	CWD 7019	3	1800	2105		
28	Straight Pipe with manhole	CWD 7019	2	1800	2105		
29	Manhole cover to suit 1800 NB	CWD 7019	15	700	265		
30	30º Bend	CWD 7020	2	1800	3790		
31	45º Bend	CWD 7020	2	1800	3882		
32	Straight Pipe (Flanged)	CWD 7020	4	1800	4115		
						Carried forward	

Initial _____

Item No.*	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
33	40º Branch Pipe	CWD 7021	2	1800	9226		
34	Angled Pipe	CWD 7022	1	1800	3340		
35	Angled Pipe	CWD 7022	1	1800	4015		
36	Straight Pipe	CWD 7022	1	1000	1843		
37	Straight Pipe	CWD 7022	2	1000	505		
38	Straight Pipe	CWD 7022	1	1800	2732		
39	Straight Pipe	CWD 7022	1	1000	1058		
45	20º Bend	CWD 7023	1	1000	814		
46	30º Double Bend	CWD 7023	1	1000	1595		
47	Closer pipe (L=1486)	CWD 7023	6	1800	1375		
48	Closer pipe (L=1356)	CWD 7023	4	1800	1315		
49	Straight Pipe	CWD 7023	2	1000	1818		
50	Straight Pipe	CWD 7023	2	1800	3190		
51	Blank Flange	CWD 7024	9	1800	1615		
52	Blank Flange (Testing)	CWD 7024	3	1800	1800		
53	Blank Flange (Inline)	CWD 7024	2	1800	1930		
54	Blank Flange (Inline)	CWD 7024	1	1800	2315		
55	Blank Flange (Testing)	CWD 7025	4	1000	545		
56	Blank Flange	CWD 7025	1	1000	460		
57	Blank Flange	CWD 7025	1	600	140		
						Carried forward	

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Item No.*	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
58	Blank Flange	CWD 7025	12	300	26		
59	Blank Flange	CWD 7025	18	200	13		
60	30º Reducing Branch Pipe	CWD 7026	2	1800	8810		
61	Water Level Recorder Reducer	CWD 7028	1	100	170		
62	100 NB Straight Pipe	CWD 7028	1	100	100		
63	Isolating Ball	CWD 7028	1	Dia 350	40		
64	End Cap	CWD 7028	7	Dia 420	13		
67	30º Bend	CWD 7029	1	1800	3570		
68	72º Bend	CWD 7029	1	1800	3290		
69	60º Bend	CWD 7029	1	1800	2603		
70	Straight Pipe	CWD 7029	3	1800	1857		
71	Straight Pipe	CWD 7029	1	1800	1582		
72	Straight Pipe	CWD 7029	1	1800	1330		
73	Straight Pipe	CWD 7030	2	1800	5680		
74	Straight Pipe	CWD 7030	1	1800	3965		
75	Straight Pipe	CWD 7030	2	1800	2506		
76	Manhole Cover to suit 1000 NB Pipe	CWD 7030	10	700	255		
77	Off Take Pipe	CWD 7031	1	1800	6155		
78	Off Take Pipe	CWD 7031	1	1800	6155		
						Carried forward	

Initial _____

Item No.*	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
79	1800 - 1000 NB Eccentric Reducer	CWD 7032	2	1800	3140		
80	1000 - 600 NB Eccentric Reducer	CWD 7032	2	1000	1606		
81	Straight Pipe	CWD 7033	2	1800	4762		
82	Straight Pipe	CWD 7033	2	1800	4115		
83	Pipe	CWD 7033	2	1000	2515		
84	Straight Pipe	CWD 7033	2	1000	1420		
85	Straight Pipe (As Drawn)	CWD 7034	1	1800	2293		
86	Straight Pipe (Opp. Hand)	CWD 7034	1	1800	2293		
87	Straight Pipe	CWD 7034	2	1800	2980		
88	Straight Pipe	CWD 7035	2	1000	1035		
89	Straight Pipe	CWD 7035	2	1000	2050		
90	1000 - 600 NB Eccentric Reducer	CWD 7036	1	1000	1986		
91	Straight Pipe	CWD 7036	2	1000	2300		
92	Straight Pipe (off take)	CWD 7037	1	1000	1775		
93	5^{o} Bend	CWD 7037	1	1000	1630		
94	60^{o} Bend	CWD 7037	3	1000	1776		
95	Straight Pipe	CWD 7038	1	1000	1268		
96	Straight Pipe	CWD 7038	1	1000	1198		
						Carried forward	

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Item No.*	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
106	Off Take Pipe	CWD 7039	1	1000	1778		
112	Straight Pipe	CWD 7041	2	600	422		
113	90º Bend	CWD 7041	2	1000	945		
114	70º Bend	CWD 7042	2	1000	1022		
115	Straight Pipe	CWD 7042	2	1800	4720		
116	Straight Pipe	CWD 7043	1	1000	2027		
117	Straight Pipe	CWD 7043	1	1000	1984		
118	Straight Pipe	CWD 7043	1	1000	1592		
119	Straight Pipe	CWD 7044	1	1000	1270		
120	Straight Pipe	CWD 7044	1	1000	1908		
121	Straight Pipe	CWD 7044	1	1000	1868		
124	Pipe	CWD 7045	1	1800	2117		
125	Pipe	CWD 7045	1	1800	2582		
126	Pipe	CWD 7045	1	1800	3377		
127	Pipe	CWD 7045	3	1800	343		
128	Gritted Flange	CWD 7046	3	-----	36		
129	30º Bend	CWD 7046	3	620 O/D	74		
130	45º Bend	CWD 7046	1	620 O/D	107		
131	Double Bend	CWD 7047	1	620 O/D	205		
132	90º Bend	CWD 7047	1	620 O/D	227		
135	Stub End	CWD 7047	2	25	1		
137	Closer Pipe (L=563)	CWD 7048	2	300	33		
138	Closer Pipe (L=620)	CWD 7048	3	300	35		
						Carried forward	

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Item No.*	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
139	Closer Pipe (L=658)	CWD 7048	2	300	36		
140	Closer Pipe (L=765)	CWD 7048	11	300	40		
141	90º Duckfoot Bend	CWD 7048	7	300	72		
142	Straight Pipe (L=4560)	CWD 7048	1	300	168		
143	Straight Pipe (L=4770)	CWD 7048	1	300	176		
144	Straight Pipe (L=5005)	CWD 7048	1	300	185		
145	Straight Pipe	CWD 7048	2	300	71		
146	90º Bend	CWD 7048	1	300	48		
147	Tee	CWD 7049	1	300	200		
148	Tee	CWD 7049	1	300	163		
149	Tee	CWD 7049	2	300	118		
150	Tee	CWD 7049	2	300	68		
151	Straight Pipe	CWD 7049	1	300	185		
152	Straight Pipe (L = 2410)	CWD 7049	1	300	100		
153	Straight Pipe (L = 3005)	CWD 7049	2	300	122		
154	Straight Pipe (L = 6005)	CWD 7049	1	300	233		
155	Straight Pipe	CWD 7049	4	300	241		
156	Straight Pipe (L = 4721)	CWD 7050	3	300	200		
						Carried forward	

Initial _____

Item No.*	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
157	Straight Pipe (L = 3700)	CWD 7050	1	300	161		
159	Straight Pipe	CWD 7050	1	300	146		
160	Straight Pipe	CWD 7050	3	300	363		
161	Straight Pipe (L = 3425)	CWD 7050	1	300	157		
162	Straight Pipe (L = 5120)	CWD 7050	2	300	220		
163	Sweep Tee	CWD 7051	1	300	102		
164	Sweep Tee	CWD 7051	1	300	140		
165	Tee	CWD 7051	2	300	146		
166	70° Bend	CWD 7051	1	300	164		
167	Closer pipe (L=1303)	CWD 7023	7	1800	1291		
168	Closer pipe	CWD 7052	1	1000	306		
169	Anchor Plate	CWD 7052	28	-----	27		
170	Straight Pipe with offtake	CWD 7052	2	200	46		
171	Straight Pipe with offtake	CWD 7052	11	200	20		
172	Blank with offtake	CWD 7052	7	25	3		
173	Ventilation Pipe	CWD 7053	15	400	225		
174	Ventilation Pipe	CWD 7053	2	400	385		
175	Ventilation Pipe	CWD 7053	2	400	382		
176	Ventilation Pipe	CWD 7053	2	400	382		
177	Ventilation Pipe	CWD 7053	1	400	501		
						Carried forward	

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Item No.*	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
178	Ventilation Pipe	CWD 7053	6	400	353		
219	1000 - 600 NB Eccentric Reducer	CWD 7036	1	1000	1986		
246	60º Bend	CWD 7037	1	1000	1844		
						TOTAL (Transport of Pipe and Specials)	

Notes:
1.) This pipe schedule shall be read in conjunction with the detailed manufacturing drawings and parts list.

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Pipe Schedule for Corrosion Protection

Raising of Clanwilliam Dam - Pipes and Specials

* Pipe item number

Item No. *	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
1	Bellmouth	CWD 7009	7	1800	4293		
2	Straight pipe	CWD 7010	12	1800	5200		
3	Straight pipe	CWD 7010	7	1800	3610		
4	Straight pipe	CWD 7010	1	1800	4300		
5	Sweep Tee	CWD 7014	1	1800	7645		
6	Sweep Tee	CWD 7014	4	1800	7970		
11	Straight pipe	CWD 7013	23	1000	2125		
12	Straight pipe	CWD 7013	5	1000	1515		
13	Bend - 90°	CWD 7013	6	1000	1340		
14	Straight pipe	CWD 7013	3	1000	655		
15	Closer pipe	CWD 7013	10	1000	320		
16	T-piece	CWD 7015	1	1000	2505		
17	T-piece	CWD 7015	1	1000	2570		
18	Straight pipe	CWD 7016	7	1000	2183		
19	Straight pipe	CWD 7016	2	1000	1065		
21	Sweep Tee	CWD 7014	1	1800	7600		
22	30° Branch Pipe	CWD 7017	1	1800	10255		
23	T-piece	CWD 7018	2	1800	7790		
24	T-piece	CWD 7018	2	1800	8055		
25	Pipe with bend & manhole	CWD 7019	1	1800	4505		
26	Straight Pipe with manhole	CWD 7019	1	1800	2845		
						Carried forward	

Initial _____

Item No. *	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
27	Straight Pipe with manhole	CWD 7019	3	1800	2105		
28	Straight Pipe with manhole	CWD 7019	2	1800	2105		
29	Manhole cover to suit 1800 NB	CWD 7019	15	700	265		
30	30° Bend	CWD 7020	2	1800	3790		
31	45° Bend	CWD 7020	2	1800	3882		
32	Straight Pipe (Flanged)	CWD 7020	4	1800	4115		
33	40° Branch Pipe	CWD 7021	2	1800	9226		
34	Angled Pipe	CWD 7022	1	1800	3340		
35	Angled Pipe	CWD 7022	1	1800	4015		
36	Straight Pipe	CWD 7022	1	1000	1843		
37	Straight Pipe	CWD 7022	2	1000	505		
38	Straight Pipe	CWD 7022	1	1800	2732		
39	Straight Pipe	CWD 7022	1	1000	1058		
45	20° Bend	CWD 7023	1	1000	814		
46	30° Double Bend	CWD 7023	1	1000	1595		
47	Closer pipe (L=1486)	CWD 7023	6	1800	1375		
48	Closer pipe (L=1356)	CWD 7023	4	1800	1315		
49	Straight Pipe	CWD 7023	2	1000	1818		
50	Straight Pipe	CWD 7023	2	1800	3190		
51	Blank Flange	CWD 7024	9	1800	1615		
52	Blank Flange (Testing)	CWD 7024	3	1800	1800		
53	Blank Flange (Inline)	CWD 7024	2	1800	1930		
54	Blank Flange (Inline)	CWD 7024	1	1800	2315		
						Carried forward	

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Item No. *	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
55	Blank Flange (Testing)	CWD 7025	4	1000	545		
56	Blank Flange	CWD 7025	1	1000	460		
57	Blank Flange	CWD 7025	1	600	140		
58	Blank Flange	CWD 7025	12	300	26		
59	Blank Flange	CWD 7025	18	200	13		
60	30° Reducing Branch Pipe	CWD 7026	2	1800	8810		
61	Water Level Recorder Reducer	CWD 7028	1	100	170		
62	100 NB Straight Pipe	CWD 7028	1	100	100		
63	Isolating Ball	CWD 7028	1	Dia 350	40		
64	End Cap	CWD 7028	7	Dia 420	13		
67	30° Bend	CWD 7029	1	1800	3570		
68	72° Bend	CWD 7029	1	1800	3290		
69	60° Bend	CWD 7029	1	1800	2603		
70	Straight Pipe	CWD 7029	3	1800	1857		
71	Straight Pipe	CWD 7029	1	1800	1582		
72	Straight Pipe	CWD 7029	1	1800	1330		
73	Straight Pipe	CWD 7030	2	1800	5680		
74	Straight Pipe	CWD 7030	1	1800	3965		
75	Straight Pipe	CWD 7030	2	1800	2506		
76	Manhole Cover to suit 1000 NB Pipe	CWD 7030	10	700	255		
77	Off Take Pipe	CWD 7031	1	1800	6155		
78	Off Take Pipe	CWD 7031	1	1800	6155		
						Carried forward	

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Item No. *	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
79	1800 - 1000 NB Eccentric Reducer	CWD 7032	2	1800	3140		
80	1000 - 600 NB Eccentric Reducer	CWD 7032	2	1000	1606		
81	Straight Pipe	CWD 7033	2	1800	4762		
82	Straight Pipe	CWD 7033	2	1800	4115		
83	Pipe	CWD 7033	2	1000	2515		
84	Straight Pipe	CWD 7033	2	1000	1420		
85	Straight Pipe (As Drawn)	CWD 7034	1	1800	2293		
86	Straight Pipe (Opp. Hand)	CWD 7034	1	1800	2293		
87	Straight Pipe	CWD 7034	2	1800	2980		
88	Straight Pipe	CWD 7035	2	1000	1035		
89	Straight Pipe	CWD 7035	2	1000	2050		
90	1000 - 600 NB Eccentric Reducer	CWD 7036	1	1000	1986		
91	Straight Pipe	CWD 7036	2	1000	2300		
92	Straight Pipe (off take)	CWD 7037	1	1000	1775		
93	5° Bend	CWD 7037	1	1000	1630		
94	60° Bend	CWD 7037	3	1000	1776		
95	Straight Pipe	CWD 7038	1	1000	1268		
96	Straight Pipe	CWD 7038	1	1000	1198		
106	Off Take Pipe	CWD 7039	1	1000	1778		
112	Straight Pipe	CWD 7041	2	600	422		
113	90° Bend	CWD 7041	2	1000	945		
114	70° Bend	CWD 7042	2	1000	1022		
						Carried forward	

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Item No. *	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
115	Straight Pipe	CWD 7042	2	1800	4720		
116	Straight Pipe	CWD 7043	1	1000	2027		
117	Straight Pipe	CWD 7043	1	1000	1984		
118	Straight Pipe	CWD 7043	1	1000	1592		
119	Straight Pipe	CWD 7044	1	1000	1270		
120	Straight Pipe	CWD 7044	1	1000	1908		
121	Straight Pipe	CWD 7044	1	1000	1868		
124	Pipe	CWD 7045	1	1800	2117		
125	Pipe	CWD 7045	1	1800	2582		
126	Pipe	CWD 7045	1	1800	3377		
127	Pipe	CWD 7045	3	1800	343		
128	Gritted Flange	CWD 7046	3	-----	36		
129	30° Bend	CWD 7046	3	620 O/D	74		
130	45° Bend	CWD 7046	1	620 O/D	107		
131	Double Bend	CWD 7047	1	620 O/D	205		
132	90° Bend	CWD 7047	1	620 O/D	227		
135	Stub End	CWD 7047	2	25	1		
137	Closer Pipe (L=563)	CWD 7048	2	300	33		
138	Closer Pipe (L=620)	CWD 7048	3	300	35		
139	Closer Pipe (L=658)	CWD 7048	2	300	36		
140	Closer Pipe (L=765)	CWD 7048	11	300	40		
141	90° Duckfoot Bend	CWD 7048	7	300	72		
142	Straight Pipe (L=4560)	CWD 7048	1	300	168		
143	Straight Pipe (L=4770)	CWD 7048	1	300	176		
						Carried forward	

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Item No. *	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
144	Straight Pipe (L=5005)	CWD 7048	1	300	185		
145	Straight Pipe	CWD 7048	2	300	71		
146	90° Bend	CWD 7048	1	300	48		
147	Tee	CWD 7049	1	300	200		
148	Tee	CWD 7049	1	300	163		
149	Tee	CWD 7049	2	300	118		
150	Tee	CWD 7049	2	300	68		
151	Straight Pipe	CWD 7049	1	300	185		
152	Straight Pipe (L = 2410)	CWD 7049	1	300	100		
153	Straight Pipe (L = 3005)	CWD 7049	2	300	122		
154	Straight Pipe (L = 6005)	CWD 7049	1	300	233		
155	Straight Pipe	CWD 7049	4	300	241		
156	Straight Pipe (L = 4721)	CWD 7050	3	300	200		
157	Straight Pipe (L = 3700)	CWD 7050	1	300	161		
159	Straight Pipe	CWD 7050	1	300	146		
160	Straight Pipe	CWD 7050	3	300	363		
161	Straight Pipe (L = 3425)	CWD 7050	1	300	157		
162	Straight Pipe (L = 5120)	CWD 7050	2	300	220		
163	Sweep Tee	CWD 7051	1	300	102		
164	Sweep Tee	CWD 7051	1	300	140		
165	Tee	CWD 7051	2	300	146		
166	70° Bend	CWD 7051	1	300	164		
167	Closer pipe (L=1303)	CWD 7023	7	1800	1291		
168	Closer pipe	CWD 7052	1	1000	306		
						Carried forward	

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Item No. *	Description	Drg. No.	Qty	Nominal Size (NB)	Mass (kg) per item	Total cost per Item	Total cost
						Brought forward	
169	Anchor Plate	CWD 7052	28	-----	27		
170	Straight Pipe with offtake	CWD 7052	2	200	46		
171	Straight Pipe with offtake	CWD 7052	11	200	20		
172	Blank with offtake	CWD 7052	7	25	3		
173	Ventilation Pipe	CWD 7053	15	400	225		
174	Ventilation Pipe	CWD 7053	2	400	385		
175	Ventilation Pipe	CWD 7053	2	400	382		
176	Ventilation Pipe	CWD 7053	2	400	382		
177	Ventilation Pipe	CWD 7053	1	400	501		
178	Ventilation Pipe	CWD 7053	6	400	353		
219	1000 - 600 NB Eccentric Reducer	CWD 7036	1	1000	1986		
246	60° Bend	CWD 7037	1	1000	1844		
						TOTAL (Corrosion Protection of Pipe and Specials)	

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Preliminaries and general and site work

Raising of Clanwilliam Dam

Item No.	Description	Qty	unit	Nominal Size (NB)	R/unit	Total cost
a	**Work in Contractors facilities**					
a.1	Provisional sum for coating to mainline pipe specification	90	m2	600 to 1800		
a.2	Provisional sum for coating to mild steel specification	10	m2	600 to 1800		
a.3	Provisional sum for lining mainline pipe specification	90	m2	600 to 1800		
a.4	Provisional sum for coating to mainline pipe specification	20	m2	150 to 400		
a.5	Provisional sum for coating to mild steel specification	5	m2	150 to 400		
a.6	Provisional sum for lining mainline pipe specification	20	m2	150 to 400		
					TOTAL (SECTION A – WORK CONDUCTED IN CONTRACTORS FACILITIES)	
b	**Work on Site**					
b.1	Compliance to Environmental requirements	1	sum	N/A	N/A	
b.2	Compliance to Health and safety requirements	1	sum	N/A	N/A	
b.3	Site establishment	1	Sum	N/A	N/A	
b.4	Site de-establishment	1	Sum	N/A	N/A	
b.5	Mobilization to site	41	off	N/A		
b.6	Mobilization from site	41	off	N/A		
					Carried forward (Section B -Work on Site)	

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Item No.	Description	Qty	unit	Nominal Size (NB)	R/unit	Total cost
					Brough forward (Section B – Work on Site)	
b.7	Provisional sum for coating to mainline pipe specification	120	m2	600 to 1800		
b.9	Provisional sum for coating to mild steel specification	10	m2	600 to 1800		
b.10	Provisional sum for lining mainline pipe specification	120	m2	600 to 1800		
b.11	Provisional sum for coating to mainline pipe specification	40	m2	150 to 400		
b.12	Provisional sum for coating to mild steel specification	10	m2	150 to 400		
b.13	Provisional sum for lining mainline pipe specification	40	m2	300 to 400		
b.14	**Corrosion protection of 1800NB welded field joints**					
b.14.1	Coating	81	off	1800		
b.14.2	Lining	81	off	1800		
b.14.3	Platform / man cage to work inside vertical 1800NB pipe	1	off	N/A		
b.14.4	Masking, ventilation and dust control	81	off	N/A		
b.14.5	Scaffolding and access	1	off	N/A		
b.15	**Corrosion protection of 1000NB welded field joints**					
b.15.1	Coating	87	off	1000		
b.15.2	Lining	87	off	1000		
b.15.3	Masking, ventilation and dust control	87	off	N/A		
b.15.4	Scaffolding and access	87	off	N/A		
					Carried forward (Section B -Work on Site)	

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Item No.	Description	Qty	unit	Nominal Size (NB)	R/unit	Total cost
					Brough forward (Section B – Work on Site)	
b.16	**Corrosion protection of 600NB welded field joints**					
b.16.1	Coating	3	off	600		
b.16.2	Lining	3	off	600		
b.16.3	Masking, ventilation and dust control	3	off	N/A		
b.16.4	Scaffolding and access	3	off	N/A		
b.17	**Corrosion protection of 400NB welded field joints**					
b.17.1	Coating	31	off	400		
b.17.2	Lining	31	off	400		
b.17.3	Masking, ventilation and dust control	31	off	N/A		
b.17.4	Scaffolding and access	31	off	N/A		
b.18	**Corrosion protection of 300NB welded field joints**					
b.18.1	Coating	9	off	300		
b.18.2	Lining	9	off	300		
b.18.3	Masking, ventilation and dust control	9	off	N/A		
b.18.4	Scaffolding and access	9	off	N/A		
b.19	**Lining repairs**	10	m2	N/A		
b.20	**Coating repairs**	20	m2	N/A		
					TOTAL (SECTION B– WORK CONDUCTED ON SITE)	

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SUMMARY OF COST

RAISING OF CLANWILLIAM DAM

ITEM NO	DESCRIPTION	TOTAL COST
A	TOTAL (Section A – Work Conducted in Contractors Facilities)	
B	TOTAL (Section B – Work on Site)	
C	TOTAL (Transport of Pipe and Specials)	
D	TOTAL (Corrosion Protection of Pipe and Specials)	
E	SUB TOTAL E (Section A+ B+ C + D)	
F	Contingencies 15% on SUB TOTAL E	
G	SUB TOTAL G(E + F)	
H	Escalation 20% on SUB TOTAL G	
I	SUB TOTAL (G + H)	
	15% VAT	
	TOTAL (Incl Vat)	

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PRICE ADJUSTMENTS

A NON-FIRM PRICES SUBJECT TO ESCALATION

1. IN CASES OF PERIOD CONTRACTS, NON-FIRM PRICES WILL BE ADJUSTED (LOADED) WITH THE ASSESSED CONTRACT PRICE ADJUSTMENTS IMPLICIT IN NON-FIRM PRICES WHEN CALCULATING THE COMPARATIVE PRICES

2. IN THIS CATEGORY PRICE ESCALATIONS WILL ONLY BE CONSIDERED IN TERMS OF THE FOLLOWING FORMULA:

$$(1 - \mathrm{x})\left[\frac{aL_t}{L_o} + \frac{bP_t}{P_o} + \frac{cM_t}{M_o} + \frac{dF_t}{F_o} - 1\right]$$

Where:

X = Fixed 10% (0,10) of the original bid price. Is portion of the bid price remains firm, it is not subject to any price escalations.

a = Factor of the bid price for Labour

b = Factor of the bid price for Contractors Equipment

c = Factor of the bid price for Material

d = Factor of the bid price for Fuel

The total of the various factors “a”, “b”, “c”, “d” must add up to 100%

“Lt", “Pt” , “Mt” & “Ft” = Index figure obtained from a Statistics South Africa and published by SAFCEC from time to time **(As defined in C1.2.3 – Clause 6.8.2)**

“Lo”, "Po” “Mo”, “Fo” = Index figures at time of bidding

3. The following index/indices must be used to calculate your bid price: **(As per C1.2.3 Contract data: THE INDICES BASED DATE WILL BE 30 DAYS BEFORE TENDER CLOSING DATE- CLAUSE 6.8.2)**

Index Lo = ……. Dated…….

Index Po = …… Dated…….

Index Mo = ……... Dated…….

Index Fo = …… Dated…….

4. FURNISH A BREAKDOWN OF PRICE IN TERMS OF ABOVE-MENTIONED FORMULA. THE TOTAL OF THE VARIOUS FACTORS MUST ADD UP TO 100%.

FACTORS (“a”, “b”, “c” & “d”)	**PERCENTAGE OF BID PRICE**
a	30%
b	30%
c	25%
d	15%
TOTAL	100%

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B PRICES SUBJECT TO RATE OF EXCHANGE VARIATIONS

1. Please furnish full particulars of your financial institution, state the currencies used in the conversion of the prices of the items to South African currency, which portion of the price is subject to rate of exchange variations and the amounts remitted abroad.

PARTICULARS OF FINANCIAL INSTITUTION	ITEM NO	PRICE	CURRENCY	RATE	PORTION OF PRICE SUBJECT TO ROE	AMOUNT IN FOREIGN CURRENCY REMITTED ABROAD
				ZAR=		
				ZAR=		
				ZAR=		
				ZAR=		
				ZAR=		
				ZAR=		

2. Adjustments for rate of exchange variations during the contract period will be calculated by using the average monthly exchange rates as issued by your commercial bank for the periods indicated hereunder: (Proof from bank required)

AVERAGE MONTHLY EXCHANGE RATES FOR THE PERIOD:	DATE DOCUMENTATION MUST BE SUBMITTED TO THIS OFFICE	DATE FROM WHICH NEW CALCULATED PRICES WILL BECOME EFFECTIVE	DATE UNTIL WHICH NEW CALCULATED PRICE WILL BE EFFECTIVE

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DEPARTMENT OF WATER AND SANITATION

DWS21-0125 WTE

CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

C3 SCOPE OF WORKS

SCOPE OF WORK (DATA) ASSOCIATED WITH A WORK PACKAGE		
TOPIC		COMMENTARY
NR	DESCRIPTION OF THE SERVICES	
1	**Employer's objectives**	The successful corrosion protection of pipes and specials, field joints and coating / lining repair from installation damage to specification while adhering to timelines dictated by the overall project program. The dam cannot function without the pipework. Pipework will be cast into concrete and future maintenance will therefore be challenging. This makes it imperative that the quality and durability of the corrosion protection is of the highest standard. No deviation from the specification will be allowed without the express permission of the Corrosion Engineer.
2	**Background to the services**	The Department of Water and Sanitation's Construction Division has been appointed to undertake the raising of the Clanwilliam Dam. New pipes need to be installed into the dam wall and needs to be corrosion protected before installation. The corrosion protection of the pipes and specials needs to be completed at the workshop of the Contractor. Thereafter the Contractor is to arrange safe transport of the

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		pipes to Clanwilliam Dam Site, where storage for a few pipes will be allowed. Pipes will then be installed by the Employer or his agent by means of field joint welding. After welding the Contractor will need to applied Corrosion protection to the field joint.
3	**Outline of the services**	**Work to be done at Contractor's facilities and transport:** **Services required:** Corrosion Protection, transit packing, storage and transport of pipes and pipe specials. **Context to services:** Pipes are being manufactured by the Employer at his facilities in Jan Kempdorp. The Employer will deliver completed (fettled and pressure tested) pipes to the Contactors facilities in batches as dictated by overall project requirements. The Contractor will then be responsible to complete the corrosion protection of the pipes and transport them to Site. No fettling / grinding is to be done on the pipes by the Contractor. Delivery of the pipes to Site will be done as dictated by the on-site progress of overall project. Notification for delivery to the Contractor and to Site will be made by the *Employers agent* or one of his delegates with his approval. Space on Site is at a premium and limited laydown space will be provided by the Employer on Site. The Contractor needs to ensure that pipes that is stored in the laydown area is stored in such a way as to prevent damage to corrosion protection be it from the environment or the weight of the pipes. See section 5.4 of DWS 9900 (2nd Edition; July 2022). **Work to be done on Site:** **Services required:** • Repairs of incidental installation damage to corrosion protection • Corrosion protection of welded field joints **Context to services:** Pipes will be installed and joined together by the Employer, or his agent as dictated by the overall project requirements. Joining of pipes will be by means of field joint welding and subsequent pressure testing. Pressure testing will, as a rule be done on a series of pipes and not one at a time, however there might be times where this will not be the case. Corrosion repair and corrosion protection of external field joints needs to be completed prior to the pipes being cast into the concrete structure of the dam. Depending on overall project requirements

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		corrosion protection of internal field joints might happen before casting concrete or after. Corrosion repairs and corrosion protection of field joints will need to be done on Site under construction conditions. Other construction activities will be ongoing (will occur) around the pipes, while the corrosion repairs need to be conducted. Therefore, careful planning and consideration of the particular requirements for the corrosion protection needs done. Take note that pipes from the intake tower to the left bank will be installed in a tunnel running below the current dam wall. The tunnel will be approximately 30m long, 10m high and 4m wide. Allowance is to be made for ventilation, dust extraction and adequate lighting. There is a possibility that corrosion protection of field joints will take place during the winter months. For this reason, heating of field joint areas may become necessary to reach the required steel temperature for corrosion protection activities. Allowances needs to be made for the availability of infrared heating or heating pads or similar to achieve this. Timeously notification for mobilization to Site will be made from the *Supervisor* or one of his delegates with his approval. Allowances for mobilizations to and from Site is made in the BoQ. **NOTE:** This scope of work and BoQ does not in any way guarantee that the *Contractor* will be entitled to or receive purchase orders for the entirety of the work. Work will be done in baches or a series of baches for pipes, as well as field joints and repairs as required by the *Employer.* Purchase orders will be issued accordingly.
NR	**INFORMATION AND OTHER THINGS PROVIDED BY THE EMPLOYER**	
4	**Property affected by the service**	**Clanwilliam Dam** **Location and access to Site** The dam Site is situated on the Olifants River, in the Western Cape, approximately 2 km South- West of Clanwilliam town in the Western Cape Province. The Site is immediately next to the N7 and accessed through a controlled gate. The gravel roads on the Site is maintained regularly but it could get challenging under abnormal rainfall conditions. **Directions to Site:** • From Cape Town International Airport: Take N2 freeway towards Cape Town • Take exit 14 for M7 / Vanguard Drive • Turn right onto Vanguard Dr • Continue onto N7 for about 230 km

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		• The dam will be on the right about 2 km south of the town of Clanwilliam Dam in the Olifants River
5	**Existing information**	Appendix A: Drawings (Digital)
6	**Reference data**	Appendix B: Site layout Appendix C: Site installation of pipe – welding & corrosion protection Appendix D - Pipe assembly drawings CWD7006 and CWD7002 Appendix E - Historical weather data
7	**Information and other things provided by the employer**	**Information:** The following will be provided prior to pricing: Digital copies of the following specifications will be provided: • DWS 9900 (2nd Edition; July 2022) • DWS 2020 • CWD 44 **Facilities** **Equipment / plant:** Mobile crane (30-Ton) can be provided as needed for offloading, with prior notification for availability.
8	**Information and other things provided by others**	Not Applicable
9	**Acceptance by others**	The Quality control plans, and method statements will require the approval of the *Employer or his agent* and the 3rd Party inspector.
10	**Facilities and equipment provided by the employer**	**Pipe Laydown area:** Before delivery of pipes to Site a 48h notice needs to be given to the *Employers agent.* Pipes can only be delivered to Site on receipt of conformation of the date and time and crane availability from the *Employer or employer's representative.* Pipes will be off loaded and arranged according to the overall project program requirements. **On-Site Mobile crane** As stated above the mobile crane can be made available for offloading of pipes when needed and when available as long as notice is given, and conformation is received. Employer will not be held liable for damage during offloading of the pipes. Cost for repairs will be for the contractor.

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		The boom crane can also be made available for on Site operations if it does not interfere with other Site operations. Arrangements can be made with the *Employer or employer's representative*. Take note: No claims will be entertained because of a lack of availability to the Contractor of the crane on Site other than offloading of pipes.
NR	**SPECIFICATIONS**	
11	**General requirements**	**CORROSION PROTECTION** **Note:** The following is to highlight portions of DWS 9900 and CWD 44 that is of high importance to the project. It does not mean that the project specification is only subject to the sections highlighted here. The entirety of the DWS 9900 and CWD 44 still applies. **Degreasing** From DWS 9900, Section 7.2.3 Degreasing: *All surfaces to be coated shall be tested for oil and grease contamination by the water break free test or ultra-violet light or any other method agreed to by the Corrosion Engineer.* *Oil and grease contamination shall be removed by:* • *Steam-cleaning.* • *An emulsifiable or aqueous detergent applied in accordance with SANS 1344.* • *An alkaline cleaning solution.* *Allow to react, then rinse off with clean, potable water to remove all residues prior to surface preparation, all in accordance with clauses 4.3 and 4.4 of SANS 10064.* *The surfaces shall be tested after degreasing and show no oil, grease, and chemical contamination after degreasing.* *Care shall be taken to avoid entrapment of cleaning agents in recesses or other retention areas.* *Volatile solvent degreasers, such as thinners, are to be avoided as the solvent spreads the grease around and then evaporates leaving a thin residual film of grease over a larger surface area.* **Salt testing:** As the pipes is newly manufactured it is not expected that there will be much, if any salt contamination problems, however the Tenderer should still conform to the DWS 9900. Please see DWS 9900 Section 7.6.2 *"WATER SOLUBLE SALT TEST METHODS* *An approved method shall be used to carry out salt contamination tests prior to washing and after abrasive blast cleaning. One salt contamination test shall*

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be carried out at each end of the pipe. For other steel structures or for maintenance work the frequency of testing shall be as indicated in the project Specification or more frequently as required by the Corrosion Engineer."

The following three tests may be used as screening for ferric chloride:

- *Weber Riley spray may be used as a screening qualitative test only for atmospheric conditions to indicate the presence of ferric chloride. Weber Riley shall not be used for immersed conditions.*
- *Watman papers may be used as a screening qualitative test for immersed and atmospheric conditions, but only to indicate the presence of ferric chloride.*
- *Conductivity test instruments that use liquid swabbed on the surface to dissolve soluble metallic salts may also be used as a screening qualitative test for immersed and atmospheric conditions. Conductivity test instruments results do not accurately quantify salt concentrations for individual ions such as sulphates or nitrates. These instruments can incorrectly assume that the conductivity reading relates only to chlorides.*

If any screening test indicates an unacceptable level of salt or there is any dispute in the concentration level, then the quantitative test below shall be used.

The generally accepted quantitative test methods are as follows:

- *Bresle patch predominately for horizontal surfaces.*
- *Chlor condom tests for vertical surfaces and inverted upside-down surfaces.*
- *CSN test kit. (the Chloride, Sulphate and Nitrate test kit)*
- *Merck-o quant.*
- *Swab and titration.*

"The majority tests do not separately detect sulphates, nitrates, and soluble ferrous ion.

Substrate surfaces shall be tested for the presence of water-soluble salt contaminants using a reliable repeatable method as per above and the results shall not exceed the limits as per the table below:"

WATER SOLUBLE SALTS	FOR DRY/ABOVE GROUND CONDITIONS	FOR IMMERSED OR BURIED CONDITIONS
Maximum at any point using test method described in Section 7.6.2 (WATER SOLUBLE SALT TEST METHODS)	A max of 150 mg/m^2 of chloride	Chloride - max 70 mg/m^2 Soluble ferrous ion contaminants - Max 100 mg/m^2 Sulphate contaminants - max of 170 mg/m^2

NOTE: The conversion factor for salt concentration on a steel surface to change between milligrams per square metre and micro grams per square centimetre is 10 mg/m2 to 1 microgram/cm2.

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		Blasting Blasting material shall be approved by the Corrosion Engineer and adhere to DWS 9900. From Section 7.5.3 of DWS 9900 (2nd Edition; July 2022) for blasting of Stainless steel. **From Section 7.5.3 of DWS 9900 (2nd Edition; July 2022) for blasting of Stainless steel.** *CORROSION RESISTANT AND STAINLESS STEEL* *Components fabricated from corrosion resistance and stainless steel shall not be contaminated with iron or carbon steel through the use of contaminated grinding discs, wire brushes, scratch marks, steel grit etc.* *Conventional slag abrasives often contain up to 35% ferrous and ferric compounds where the resultant iron residues can set up corrosion cells on the surface of stainless steels.* *The blasting abrasive type shall meet the requirements as specified in ISO 11127 for Non-Metallic abrasives.* *Note that platinum slag and garnet may contain iron in the form of ferrous and ferric compounds and should therefore preferably not used. Permissible abrasives for blasting stainless steel which is to be coated and immersed shall be:* • *Aluminium Oxide.* • *Glass Grit.* • *Stainless Steel Grit.* *Care must be taken to ensure that specified surface profile is achieved because stainless steel is harder than carbon steel and therefore more difficult to obtain roughness.* Also take special note of DWS 9900 Section 7.4.4.7 if grit recycling is considered. *7.4.4.7 RE-CYCLING* *Re-cycled steel grit blasting-material shall be used if:* *(a) Blasting-materials were only used on degreased surfaces.* *(b) Dust and debris are removed from the blasting-material.* *(c) Particles are kept angular and within specified sizes.* *Re-cycled slag blasting-material may only be used for rough blasting and pre-blasting.* *Re-cycled slag blasting-material shall not be used for final blasting.* *NOTE: When using recycled abrasives, special care shall be taken to ensure that the dust and debris residue on the surfaces shall not exceed the limits specified "in Section 7.4.1 (SURFACE PREPARATION PARAMETERS FOR NEW STEEL)"*

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		Further note that the Stainless-steel pipe will have mild steel flanges and puddle flanges. Grit selection for mild steel and stainless steel may differ and care needs to be taken to keep blasting of mild steel and stainless steel separated. Grit used for blasting of mild steel will not be permitted to be recycled and used for blasting or pre blasting of stainless steel and vice versa. Also take note of DWS 9900 section 7.5.3.2: *SURFACES TO BE COATED* *Degreasing Surfaces shall be degreased in accordance with Section 7.2.3 (DEGREASING).* • *Profile* *Corrosion resistant steel surfaces shall be blast-cleaned with stainless steel grit or non-metallic abrasive to create a profile in accordance with table in Sect ion 7.4.1 (SURFACE PREPARATION PARAMETERS FOR NEW STEEL). The use of steel shot and steel or cast-iron grit is strictly prohibited. Stainless steel tends to have a harder surface and is more difficult to obtain blast profile. Surface profile shall be a minimum of 30 µm for atmospheric corrosion conditions and 50 µm for immersed corrosion conditions.* *"Where blasting is impractical, a written concession shall be obtained from the Corrosion Engineer for alternative surface preparation such as manual or power sanding with abrasive paper. In all instances, clean, uncontaminated surface preparation equipment must be used."* • *Dust and Debris* *"Dust and debris shall be removed by vacuum-cleaning in accordance with* *Section 7.4.1 (SURFACE PREPARATION PARAMETERS FOR NEW STEEL)"* • *Time Limitation of application of coating systems* *The time interval between blast cleaning of stainless steel and application of coating should be immediate or as short as practically possible to prevent the formation of a chrome-oxide layer developing.* **Coating and lining** Coating Coating refers to the external coating of pipes and pipe specials.

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		Top coating colour (marked as “X” / “P” on drawings) of exposed pipes shall be to H10 (DWS 9900 2nd Edition; July 2022: Annexture J). Take note of the “corrosion protection notes” supplied on each drawing, which specifications is applicable to the items on that drawing page. Lining Lining refers to the internal corrosion protection of pipes and pipe specials. Please refer to DWS 9900 (2nd Edition; July 2022) and CWD 44 for required coating systems. Please also take note of the Drawing notes, not all the notes on the drawings are the same. The drawing notes refers to the item/s on that specific drawing. As an example, from the Drawing notes: *Corrosion protection notes:* • *in accordance with DWS standard specification DWS 9900* • *pipe coating: apply two pack epoxy (150 µm oft). ('plus a top coat of pure aliphatic polyurethane (25 µm oft) over indicated area marked 'p' on detail).* • *pipe lining: apply two pack epoxy (250 µm DFT).* • *puddle collar coating two pack epoxy (300 µm DFT).* • *flange face: apply two pack epoxy (60 - 90 µm DFT)* **NOTE:** “Pure Aliphatic Polyurethane” top coating of pipes and specials as indicated on drawings as well as in Particular Specification CWD 44, will be replaced with “Re-coatable Polyurethane”. The polyurethane used need to have a good UV resistance. “Two pack Epoxy” in CWD 44 as well as on the drawings refers to coating materials as defined in DWS 9900 (2nd Edition; July 2022) Section 12. Take special note of the following from CWD 44: *CWD 44.5.3.2 Toxicity of Lining Material* *Materials used for the lining of valves and pipes shall be non-toxic and shall not impart any odour, taste, or colour to the water. Certification shall be submitted to the Corrosion Engineer for his approval.* Take special note of the following from DWS 9900:

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12.1. MATERIAL

(e) Two pack Epoxies shall be in accordance with Chapter 10 (COMPARATIVE EVALUATION CRITERIA FOR MATERIAL SELECTION). Preference will be given to solvent free epoxies in confined spaces.

(g) Multi-purpose epoxy for immersed conditions shall be of the high build epoxy mastic type, modified with glass-flakes, containing at least 90% solids.

12.2. SPECIAL COATING AREAS

(e) For pipe diameters that are too small for safe man entry, the special coating areas (internal circumferential field joints, by-pass pipes, scour pipes etc.) shall have the internal lining application method statement and method of quality control pre-approved by the Corrosion Engineer. The contractor shall be required to demonstrate the effectiveness of the proposed methods before the relevant commencement of work on site.

12.3.5.6. METHOD OF APPLICATION

- *Application*

  Coatings and Linings shall be applied by any appropriate method recommended by the manufacturer thereof and approved by the Corrosion Engineer.

- *First Coat*

  The first coat shall be applied to a minimum dry film thickness of at least 40 µm above the peaks of the blast profile.

- *Cleanliness During Application*

  During application and curing of the coating layers, the items shall be protected against contamination by dust or other foreign matter and shall be kept dry and shaded from direct sunlight.

  If the environmental conditions such as dust and moisture are not able to be controlled on the site, the Corrosion Engineer shall have the discretion to specify an appropriate single coat system to avoid the risk of inter-coat bond contamination and subsequent bond failures.

  All coats shall be clean and free from dust, oil, moisture, and perspiration before overcoating.

  Care must be taken overnight as dew or frost may form on the previous layer and have a detrimental effect on intercoat bond strength.

  Operators handling blast-cleaned or partially painted surfaces shall wear clean gloves to avoid contamination of the surface.

- *Stripe Coat and Crevices*

  All metal edges, up stands, welds, bolts and nuts shall be adequately coated. Additional stripe coatings shall be applied after initial priming, if ordered by the Corrosion Engineer.

  Special attention shall be given to crevices and edges to ensure complete coverage and uniform paint thickness.

- *Second and Subsequent Coats*

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		The second and subsequent layers shall then be applied within the recommended overcoating periods. • *Coat Colours* *The colour of each subsequent coat shall be different to that of the previous coat except where two finishing coats of the same colour are necessary to achieve colour uniformity.* *The first coat is not permitted to be grey as it does not give adequate contrast to the grit blasted substrate.* *The final coat colour is not permitted to be similar to that of rust or corrosion product (brown, orange and red).* • *Over-coating Times* *Over-coating times shall be not less than the minimum nor greater than the maximum specified by the manufacturer relevant to the ambient temperature.* *Strict adherence to over-coating times is particularly important for coatings which are subsequently immersed.* **Note:** Stripe coating of all welds and edges is required internally and externally with the exclusion of the sealing faces and bolt holes on the flanges. Stripe coating needs to be applied before the final spray coat. The coating of the open-ended pipes not to be coated to the end as specified on the drawings. Blasting is to be done on the entire internal and external of the pipe, even the sections that will remain un-coated/lined. This is done to reduce on Site profile blasting. Joints will still need to be degreased and blasted on Site but having an existing profile on most of the joint area will reduce on Site blasting. The coating of the flanged ends as specified on the drawings. Take note of the details/notes provide on each drawing for corrosion protection requirements. All corrosion systems must be approved by the Department of Water and Sanitation's Corrosion Engineer prior to application, as per Standard Specification DWS 9900 (2nd Edition; July 2022) – Corrosion Protection and Particular Specification CWD 44 – Pipes and Specials. **Coating repair** Coating repair needs to be done to the same specification as the original coating. QCP's for coating repair needs to be produced for approval and all relevant quality control measures as for original coating / lining needs to be followed. From DWS 9900: *12.5. DAMAGED COATINGS*

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		Evaluation of epoxy to determine the extent of damage and if repair or refurbishment is possible. *(a) All repairs and procedures shall be approved by the Corrosion Engineer and subject to inspection procedures as set out in Chapter 4 (QUALITY REQUIREMENTS AND TESTING PROCEDURES)* *(b) Where the damage is extensive and the original coating or lining must be removed, the remedial procedures shall be agreed upon in writing with the Corrosion Engineer and the inspection procedures as described in Chapter 4 (QUALITY REQUIREMENTS AND TESTING PROCEDURES) shall be followed.* *(c) All repairs shall comply with the requirements of the repair -product manufacturer's data sheet. The Corrosion Engineer may at his discretion request that repaired coating areas undergo adhesion tests.* *(d) Any damage occurring during transit from the Contractor's premises to the site, shall be the responsibility of the Contractor. The Contractor responsible for installation of equipment at site shall repair any damage occurring on site during handling, assembly, storage, transport, and erection.* *(e) The repaired area shall be tested for compliance with the relevant requirements for thickness, full cure and electrical insulation defects respectively.* *(f) Any item showing electrical insulation defects exceeding an average of five per square metre (a cluster of pinholes within a radius of 25 mm being regarded as a single defective area), or flaking or other signs of loss of adhesion, shall not be repaired. The item shall be blast cleaned and re-coated in accordance with the relevant requirements of the specification.* *12.5.1 REPAIR METHODS FOR MINOR DEFECTS* *The repair of areas showing electrical insulation defects, lack of full cure or low film thickness shall, if approved by the Corrosion Engineer, be carried out as follows:* *(a) Degrease in accordance with Section 7.2.3 (DEGREASING).* *(b) Thoroughly abrade the damaged area, including an adjacent surrounding area of at least 25 mm wide, with a minimum roughness grade 100 abrasive paper.* *(c) Vacuum-clean the surface to remove dust and debris in accordance with SANS 8502-3 and Section 7.2.7.5 (Residual Dust and Debris).* *(d) Wipe only the abraded paint surface with methyl ethyl ketone or solvent as recommended by the paint manufacturer and allow to dry.* *(e) Apply as many coats of repair material as necessary to achieve the specified thickness and finish.* *NOTE: 1. When solvent borne materials are used, curing time between coats, as specified by the coating material manufacturer, shall be adhered to.*

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		NOTE: 2. Apply a final topcoat over the repaired area to achieve uniform finish of the item *12.5.2 REPAIR METHODS FOR MAJOR DEFECTS* *The repair of areas showing damage down to the steel surface shall, if approved by the Corrosion* *Engineer be carried out as follows:* *(a) Degrease in accordance with Section 7.2.3 (DEGREASING).* *(b) Blast-clean all damaged areas to Sa 3 (SANS ISO 8501-1).* *(c) Feather the surrounding paint for a distance of 50 mm beyond the damaged areas with a minimum roughness grade 100 abrasive paper.* *(d) Vacuum-clean the surface to remove dust and debris in accordance with SANS 8502-3 and Section 7.2.7.5 (Residual Dust and Debris).* *(e) Wipe only the abraded paint surface with methyl ethyl ketone or solvent as recommended by the paint manufacturer and allow to dry.* *(f) Apply as many coats of repair material as necessary to achieve the specified thickness and finish.* ***NOTE 1:** When solvent borne materials are used, curing time between coats, as specified by the coating material manufacturer, shall be adhered to.* ***NOTE 2:** Apply a final topcoat over the repaired area to achieve uniform finish of the item* **Field welded joints**: Corrosion protection of the welded field joints shall be to the same specification or better than the mainline coating / lining. Please pay special attention to Section 10 of DWS 9900 (2nd Edition; July 2022). Should different materials be used compatibility between materials needs to be ensured. Corrosion protection of the field joins will overlap onto the existing coating by at least 50mm. Existing coating on the overlap area will need to be roughened. This can be done by means of sanding, similar to the repair of defects as above with a minimum roughness grade 100 abrasive paper. The area next to the joint area shall be masked to prevent damage from over blast. After lining any rough areas shall be sanded and smoothed. When Corrosion protection is done on the internals of the pipes, access to the joints will be gained through the pipes. Corrosion protection activities will therefore be over the already lined pipes. Care needs to be taken when teams move over coated areas and allowances needs to be made for masking of the bottoms of the already lined pipes.

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		Damage to the coating or lining of pipes form the *Contractors* activities will be for his account. The Contractor is to ensure that there is proper ventilation, intrinsically safe lighting and dust control when working on Site. Please take special note of the following from Appendix C: Site installation of pipe – welding & corrosion protection: *"4. Access* *Adjacent horizontal pipework shall be supported on trestles ± 700 mm above the concrete floor (refer to drawing 16920/13/ME (CWD 7002) and Figure 2 above). Vertical pipework shall be supported adequately and have suitable access to perform the required welds (i.e. platform or man-cage for the 1800 NB stacks in the intake tower).* *No person shall coat or weld inside a pipe with a diameter smaller than 800 mm (Government Gazette No. 37305 dated 7 Feb 2014). Ventilation is required where welding on the inside of the pipe takes place to ensure adherence to the OHS-Act. Pipes smaller than 800 NB shall be blasted and lined using machinery to gain access (limited to ± 20 to 25 m straight sections depending on machinery and contractor)."* **Protection against transport damage and storage** Please take note that no stacking of pipes will be allowed. The Contractor is responsible for the pipes until final release. Final release will only happen when pipes are safely and securely stored on Site and the *Employer, or his agent* has signed off on the delivered items. Please include cost for protection against transport damage and storage into the price for the corrosion protection of the pipes at the *Contractor's* facilities. See from DWS 9900 *5.4. HANDLING AND TRANSPORT* *5.4.1 PHYSICAL PROTECTION* *Adequate provision shall be made for the protection of the pipe coating, between the completion of manufacture and installation.* *The coated items shall not be handled within the drying time recommended by the coating manufacturer, relevant to the ambient temperature.* *5.4.2 END COVERS* *After inspection, testing and final acceptance, all ends (including branch ends), shall be sealed as follows:* *All plain ends shall be sealed with plastic or other approved sheeting secured to the pipe circumference with double flat steel binding strips and all flanged ends shall be closed off with sturdy timber flanges.*

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		All plastic covers and timber flanges to be clearly marked: "NOT TO BE REMOVED BEFORE INSTALLATION". *Plastic covers and timber flanges shall remain in place during, handling, transport, storage, and laying.* *5.4.5 LIFTING* *All coated items shall only be lifted by means of broad band slings that will not damage the coating.* *5.4.6 TRANSPORT* *Coated items shall be handled with due regard to the relatively soft nature of organic coatings and appropriate precautions shall be taken.* *The Contractor is responsible for the safe delivery of all the items and small parts to site without damage. All items shall be securely packed to prevent damage while in transit.* *If transported by a third party, the Contractor is responsible for ensuring protection of items as specified.* *Precaution shall be taken to support and chock the pipes on padded cradles and / or saw-dust filled bags to prevent movement when loading onto vehicles.* *Where stacked pipes are transported, the packing shall be of a thickness and positioned to ensure that pipes do not touch when they flex.* *Items shall be firmly lashed or chained with padded lashing. The area of padded surfaces shall be adequate to prevent damage to coatings.* *Bolts in bags and other small components shall be labelled and crated. The bags and crates shall be tagged using metallic tags and shall be marked in accordance with Section 5.4.5 (MARKING OF PIPES, CRATES AND BAGS) (b) above.* *Each bag or crate shall have the delivery address listed on a separate metallic tag.* *The Site Engineer shall be notified of the delivery date and of any requirements* *regarding off-loading and storage at site.* *5.4.7 OFF-LOADING AT SITE* *The Contractor shall be responsible for the transportation and supervision during offloading of the pipes and other small components at the delivery site.* *Under no circumstances shall coated pipes be allowed to rest directly on the ground.* *The final delivery inspection and acceptance of equipment supplied shall be undertaken on site after off-loading has been completed.* *5.4.8 STACKING AND STORAGE* *The Contractor shall provide all the necessary balks of timber and saw-dust filled bags used to support the items on soil, concrete or other hard*

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		surface and to separate them from each other both at his works, on site and when stringing along the trench. *DAMAGE* *Any damage that occurs during the handling and storage of items at the Manufacturer / Contractor's works, including transportation to site, shall be repaired by the Manufacturer / Contractor at his own cost, in accordance with the specification and to the approval of the Engineer.* **NOTE**: Refer to Appendix F – "*General requirements for storage of mechanical equipment on-site"*. **SCAFFOLDING** Allowance needs to be made for enough scaffolding to be able to conduct corrosion protection on the field joints. The maximum number of joints that will require scaffolding at a time will be a function of how fast final blasting can be done and the first coat be applied. To assist with scaffold designs / requirements, see pipe layout - Appendix C and Appendix D. **RUBBER LINING** Some of the items include rubberizing / lining. Pricing for the rubberizing / lining needs to be include it in the pricing on the BoQ for the Corrosion protection. Rubberizing should be done in the workshop after corrosion protection as specified on the drawings.
12	**Applicable national or international standards**	As per DWS 9900 (2nd Edition; July 2022). For context as to where the different national or international standards is applicable, please read the DWS 9900 and CWD 44.
13	**Applicable standard industry or organisational standards**	**Required industry registration:** Member of Corrosion Institute of South Africa **Standard specifications** DWS 9900 (2nd Edition; July 2022) DWS 2020
14	**Particular/generic specifications**	CWD 44 The particular specification CWD 44 will take preference in terms of corrosion protection systems and dry-film thicknesses (DFT). All other aspects relating to corrosion protection shall be in accordance with the latest version of DWS 9900 (2nd Edition; July 2022). For Example: The pipes shall be prepared, handled, etc in accordance with DWS 9900 (2nd Edition; July 2022) and coated / lined as specified in CWD 44 and on the technical drawings.

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		Unspecified information shall be in accordance with DWS 9900 (2nd Edition; July 2022). In the event of a further discrepancy between the Specifications, (including the Project Specifications) and the drawings and / or the Bill of Quantities, the discrepancy shall be resolved by the Engineer before the execution of the work under the relevant item. CWD 65 - HS Health and Safety Specification CWD 67 - Environmental EMP
15	**Design requirements**	Scaffolding platforms and man cages shall comply with health and safety regulations.
16	**Planning requirements**	**General requirements (but not limited to) of a project program:** • Start date. • Major steps in the coating proses • End date • Hold, witness and surveillance points on the QCP's • Any other inspections needed from the 3rd Party Inspector, *Employer* or the *Employer's Agent*. In line with GCC 2015, Clause 5.6 **Work to be done in Contractor's facilities:** As part of the BoQ an **estimated time** required for corrosion protection per meter squared for the various sizes of pipes is required from the *Contractor.* This time will be based on a typical pipe for the various sizes and is for estimating the lead times only. Include time for the entire corrosion protection proses including masking for transport and delivery. At least 14 calendar days prior to delivery notification will be given from the *Employer* or his *Agent* to the Contractor on the delivery date to Contractor's facilities. The notification will indicate the items in the batch or series of batches as per the provided drawings and an expected completion date based on estimated times as above. From the date of notification the *Contractor* will then have 7 Calander days to provide the *Employer*'s *Agent* with a project plan for his approval. Should the *Contractor* program not fall within the estimated completion date, he will motivate this to the *Employer*'s *Agent* for his approval. Once the program is approved this will then be used as the project program in terms of GCC for the particular batch of pipes.

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		Work to be done on Site: Similarly to the above, an estimated time required for corrosion protection per field joint and per square meter of repairs is required as part of the BoQ from the *Contractor.* At least 21 calendar days prior to the *Contractor* starting on Site notice will be given by the *Employer*'s *Agent.* The notice will include a starting date on Site, an estimated date of completion based on the above durations and work that is required to be done on Site. Work will be done in parts as dictated by the overall project plan. The *Contractor* will then have 7 Calander days to provide the *Employer*'s *Agent* with a project plan for the approval of the *Employer*'s *Agent*. Should the *Contractor* program not fall within the estimated completion date, he will motivate this to the *Employer*'s *Agent* for his approval. Once the program is approved this will then be used as the project program in terms of GCC for the particular part of the work. As soon as the *Contractor* is on Site an inspection will be done with the *Employer*'s *Agent* or one of his delegates and the *Contractor* will have an opportunity to update the program for the approval of the *Employer*'s *Agent* should the repair work or Site conditions be of such a nature that it will affect the duration negatively. All effort needs to be made to stay within the approved project completion dates.
17	**Health and safety requirements**	The Contractor shall ensure that only competent personnel are employed in operations involving particular skills affecting the quality of the Works. Should the competence of any member of the Contractor's workforce be in doubt, the *Employer* may order that the member be sent for additional training at the Contractor's account and / or that member be replaced with a competent person to perform the work**.** It will be required from the Contractor to: • Work on heights on the project; • Work in confined spaces; & • Work with volatile chemicals and solvents. For this contract the Contractor will be the mandatory of the *Employer* which means that the Contractor, as employer in his own right in respect of the contract, will be responsible for all the duties and obligations of an employer as set out in the Act (OHSA 1993) and the Construction Regulations 2014. Furthermore, the Contractor shall comply with any additional current statutory requirements of any relevant Government Departments regarding health and safety and specifically environmental health issues.

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		Nothing specified in this document shall relieve the Contractor of any obligations or responsibilities with regard to health and safety responsibilities. Where safety precautions are not being observed, the Employer may order the Contractor to comply with minimum safety requirements at the Contractor's expense, and compliance with such an order will not absolve the Contractor from any of his responsibilities and obligations under the Contract. All Covid-19 related regulatory specification needs to be implemented and adhered to by the Contractor. Before commencement of work under the contract the Contractor shall: 1. **Enter into an agreement with the Employer** (Client) to confirm his status as mandatory (employer) for the contract under consideration. 2. **Submit a Health and Safety Plan to the Employer** within 28 days after the Commencement Date. The Contractor shall immediately implement the policy and any amendments and keep it in operation for the full duration of the Contract. 3. **Submit a risk assessment of the contract works** as part of the Health and Safety Plan, and which is to include; (i) Identification of the risks and hazards; (ii) Analysis and evaluation of the risks and hazards identified; (iii) A documented plan of safe work procedures; (iv) A monitoring plan; and (v) A review plan. 4. **Undergo compulsory Site Safety and Environmental Induction training** by all personnel who will be performing supervisory work and work related to the work under this contract before starting with any work on Site. 5. **Submit valid medical certificates** for all employees that will work on Site. The Contractor is required to keep health and safety records (which shall include audit reports) on Site in an orderly filing system which shall be handed over to the Employer on completion of construction. Failure by the Contractor to comply with safety requirements will entitle the Employer to reduce payment of the relevant Bill of Quantity items and / or order a temporary halt of work within the affected areas until the specified requirements are met, without any extension of time being granted and without any additional payment.

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		All vehicles and plant to be operated and maintained according to Construction Regulations 23. Refer to CWD 65 HS Health and Safety Specification in the Particular Specification Document. **Audits** The Contractor shall arrange for health and safety audits at monthly intervals to be carried out. The results and details of these audits shall be submitted to the Employer within the first week of the next month. The Employer will monitor compliance by the Contractor with the Health and Safety Policy by means of Audits and may give instructions for improvements. The Contractor shall note that independent health and safety audits (or if considered suitable by the Employer combined audits with the Contractor's auditor) will be carried out as considered necessary by the Employer. **Works Health and Safety Committee** For the purpose of implementing and monitoring the Health and Safety Plan the Contractor shall put in place a Health and Safety Committee. The Committee shall meet at least at monthly intervals. Signed minutes of the meeting shall be kept by the Contractor and copied to Employer within 7 days of the meeting. **Health and Safety Officers** The Contractor shall appoint a full-time permanent Health and Safety Officer on the commencement of the works. On the commencement of shift working, the Contractor shall appoint at least one deputy with the same duties. The Health and Safety Officer and the deputy (or deputies) shall be employed exclusively on health and safety matters, and at least one of them shall always be available on Site so that Health and Safety matters receive 24-hour coverage for the full duration of the Contract. The Health and Safety Officer or his deputy shall carry out regular and random checks of all parts of the Site where work is taking place. **First Aid Provisions** The Contractor shall provide a first aid station. The Contractor shall institute and operate a basic first aid training program to ensure that at least each foreman or work crew leader is trained in first aid and possesses a valid certificate to that effect issued by the Red Cross Society of South Africa, or equivalent qualification within 3 months of his appointment. There shall be a person certified in first aid in each work crew. **Accident Reporting** The Contractor, through the Health and Safety Officer or his deputy, shall keep the Employer informed at the time, or as soon thereafter as

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		is practical but not later than 12 hours, of any occurrence during the course of work, whether on or off the Site, if the said occurrence affected or may have affected the health or safety of any person employed on the Site or of any member of the public. The Contractor shall submit to the Employer at the end of each month reports and statistics in spreadsheet format approved by the Employer on all accidents involving any person employed on or visiting the works. **Workman's Compensation Act** By accepting the Contract, the Contractor warrants that all his and his Sub-Contractor's workmen are covered in terms of the Compensation for Occupational Injuries and Diseases Act (Act no 130 of 1993) which covers shall remain in force whilst any workman is present on the Site.
18	**Facilities and equipment to be provided by the Contractor for the Contractor**	The following is to be provided but is not limited to by the Contractor. • Contractor Facilities: Please see DWS 9900 (2nd Edition; July 2022) • Contractors Equipment: Compressors – no electricity will be available for large plant; Blasting and Coating equipment as per DWS 9900 (2nd Edition; July 2022); Backup generators for hand tools; & Heating lamps / elements for heating on Site work.
NR	**CONSTRAINTS ON HOW THE SERVICES ARE TO BE PROVIDED**	
19	**General constraints**	**ACCESS TO CLANWILLIAM DAM CONSTRUCTION SITE:** Access permit will only be granted to service provider after Site induction was done. **WORKING AND DELIVERY TIMES** Official working hours **for deliveries** on this construction Site is: • Summer Times: 06h30 - 15h30 for Mondays to Thursdays • Winter Times: 07h00 – 16h00 for Mondays to Thursdays **No deliveries** on the following days or periods: • Fridays 12h00 to Mondays 07h00 • The last Friday of every Month • All public holidays • The period 11 December to 9 January (Builders recess) Unless otherwise agreed. Offloading on Site will only be allowed in dedicated (designated) approved area.

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		Deliveries will only be allowed on agreed (arranged) date and time. Parking on Site, might be a restricted due to construction activities. All noise, vibrations to comply to health and safety requirements. The use of the Employer's equipment will not be allowed. At all times Health, safety and environmental requirements needs to be comply with. No spillage / pollution is allowed. Permission to be required before storage of hazardous materials on Site. No office space will be provided on Site by the Employer.
20	**Confidentiality**	The Contractor does not disclose or make any information arising from or in connection with this contract available to others. This undertaking does not, however, apply to information which at the time of disclosure or thereafter, without default on the part of the Contractor, enters the public domain or to information which was already in the possession of the Contractor at the time of disclosure (evidenced by written records in existence at that time).
21	**Security and identification of people**	The following will be mandatory for all persons working on Site: • Conformation of South African citizenship for employees • Criminal record check • Security induction • Access control card – Issued from the Employer. • Vehicle access permit – Issued from the Employer All Contractor's personnel visiting or working on Site will be registered by DWS at the project Site access point and will be clearly identified with their name tags and the Contractor's logo while working on Site.
22	**Protection of affected property**	To adhere to all Clanwilliam Dam H&SE requirements
23	**Protection of the work on the affected property**	**Any damage to the pipe or pipe specials is for the Contractors cost from the date of delivery to the Contractor's facility to the date of acceptance on Site by the *Employer or his agent.*** **Transit packing and protection in laydown area.** After corrosion protection is complete and signed off, all pipes and pipe specials will be protected by means of fully covering and end capping. The covering must protect the coating and lining from the extreme temperatures that is experienced during the summer months. Black plastic covering will therefore not be acceptable. The Corrosion Engineer must approve the material used for the wrapping.

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		It is the responsibility of the Contractor to ensure when pipes are offloaded on Site that they be laid down in such a way as to not damage the corrosion protection. See DWS 9900 section 5.4. **Please take note that no stacking of the pipes will be allowed,** at the Contractor's facilities, during transport or on Site.
24	**Management or oversight structures for the project**	As part of the management of the Overall project a Professional Services Provider was appointed by the client that is responsible for the overall management of the project. For the corrosion protection work a 3rd Party Inspector / Corrosion Engineer will be appointed that will report to the Professional Services Provider. The 3rd Party Inspector / Corrosion Engineer will be responsible (along with the *Employer*'s *Agent*) to Approve the Quality control plans and Method statements. The 3rd Party Inspector / Corrosion Engineer will also sign any, hold, witness and surveillance points on the QCP's with the *Employer*'s *Agent* or one of his delegates as an overview. The Contractor will keep to the approved Corrosion protection program and additionally give 48hr notice when the 3rd party inspector will be needed for inspections. Should the 3rd Party Inspector / Corrosion Engineer not be available arrangements can be made with his representative Engineer.
25	**Approvals**	Approval for project programs – *From the Employer, employer's agent or his delegate.* Approval for QCP's and Method statement – 3rd Party Inspector / Corrosion Engineer and the *Employer, employer's agent or his delegate.* Approval of any deviations from specification – The Corrosion Engineer
26	**Procurement**	The Contractor shall achieve in the performance of the contract, targeted enterprises, local enterprises and labor, and targeted labor as per SANS 10845: 2022. The Contractor shall achieve in the performance of the contract, skills development goal established in this Standard for developing skills through infrastructure contracts (March 2020) – (see Department of Public Works and Infrastructure Notice 363 of 2020 (Government gazette No. 43495 of 3 July 2020). The Contractor shall provide in a format acceptable to the Employer or the Employer's agent monthly data which facilitates the reporting on key performance indicators relating to development targets to a wide range of stakeholders.

Initial _____

27	**Access to land, buildings or Sites**	Access to Site will be required through a security control boom gate with approval received from security manager. All access will be strictly controlled by DWS. DWS has the right to restrict access / deny access to Site at any time.
28	**Planning and programming**	A detail Contract Programme conforming to the GCC 2015 shall be developed using the latest version of Construction Computer Software for Windows or Microsoft Project for Windows or equal. Five working days before the monthly progress meeting the Contractor shall submit to the *Employer or his agent* a programme update that reflects the actual progress against current programmes and the effect on future activities. The Contractor shall also submit a narrative report with each monthly update including a description of current and anticipated programme related problem areas, current and anticipated delaying factors and their impact, and an explanation of corrective actions taken or proposed. All variances from the Programme shall be promptly reported and the future impact of such variations shall be determined and analysed by the Contractor and necessary corrective measures established, subject to the approval of the Employer. **Note:** this section is to be Read in conjuncture with the *Planning requirements* section of this document
29	**Software application for programming**	Construction Computer Software for Windows or Microsoft Project for Windows or equal. All documents to be submitted in MS Word, MS Excel or PDF format. Soft copy and hard copies to be submitted.
30	**Quality management**	The Contractor shall be responsible under the Contract for the quality of workmanship and production processes in fulfilment of the Contract. The Contractor shall have a Quality Management system in place which details the following in order to satisfy the Specification relevant to each operation to the Works in accordance with the Contract: • Quality control procedures; • Personnel responsibilities; • Equipment and calibration; • Hold points in production for inspection; • Rejection and rectification procedures; • Documentation and communication. Training certificates and experience of personnel must be provided on request.

Initial _____

		Close out and sign off Once the corrosion protected pipes and specials are offloaded on site an inspection will be done with the Employer, his agent or one of his delegates. During this inspection all damage to the pipes will be marked and numbered. These repairs are for the contractor's cost. Should there be any damage found on an item 2% of the cost of corrosion protection of the item will be withheld until the repairs has been made and signed off by the 3rd party inspector, the Employer, his agent or one of his delegates. During the inspection the contractor will draw up a list for all delivered items showing the following per item: • If there was damage found per item • The reference number of said damage per item • Description of the damage This Checklist will be signed off by the 3rd party inspector, the Employer, his agent or one of his delegates and attached to the payment certificate that is submitted for said batch of pipes. Once the pipes are installed and the contractor is on site for the Corrosion protection of the welded field joints the Contractor can perform the repairs at his cost. During this exercise an inspection will again be done. Any damages found because of installation will also be logged and this can be claimed under the BoQ item for the repair of the pipes. Please take note that damages caused by the Contractor during the corrosion protection of the welded field joints should also be included on the checklist and logged but will be for the contractor's account. Once all the repairs that is for the Contractors account is performed the checklist can be updated, signed off and the outstanding percentage can be claimed. As stated above when claiming for the corrosion protection a signed off list needs to accompany the payment certificate as proof.
31	**Format of communications**	All contractual communication is to be done in writing sent via e-mail to *Employer or his Agent.* The original hard copies of all the QCP's and Quality control log sheets will be provided to the Employer as well as a PDF scanned copy of the final QCP's. All communication shall be in writing to ensure that there's an audit trail.
32	**Key personnel**	Please see DWS 9900 (2nd Edition; July 2022) see section 4.10. List the required personal and their Qualifications as per DWS 9900 (2nd Edition; July 2022) that is currently employed full time and that is

Initial _____

		planned to be used for the project on a schedule and attach it along with his or her CV to the submission. See evaluation criteria of this document.
33	**Management meetings**	The Contractor will be required to attend regular Site meetings with the *Employers agent* where the progress will be reviewed. Such meetings will normally be held monthly. Prior to each meeting updated programmes showing separately the various activities of the *Contractor* anticipated will be submitted to the Employer or his agent.
34	**Electronic payments**	The Contractor is to submit to the Employer confirmation of banking details, invoices for payment purposes and any other required supporting documentation required by the Employer, in order to obtain payments. All payments will only be done electronically.
35	**Daily records**	Recordkeeping of environmental conditions and steel temperatures.
36	**Payment certificates**	Payment will only be made after the *Employer and the Employers Agent* have signed of the supporting documents and sheets. Payment for Corrosion Protection and Transport will only be made per item, when the item is delivered to Site and signed off. Final release for the corrosion protection of the pipes will only be applicable when the pipes is off loaded and safely stored on Site. Also see section 30 of this scope of work for more details. Payment will be done within 30 days of receipt of the original invoice. Payment is done by direct bank transfer. No cash payment or cheque payment will be done.
37	**Property provided for the Contractor's use**	Area for site office / storage. The *Employers* ablution facilities will be made available to the *Contractor* for his responsible use.
38	**Proof of compliance with the law**	Will be identified and requested as necessary (if applicable).
39	**Condition surveys**	On completion of the corrosion protection of the joints an inspection will be done with the 3rd Party Inspector and the ***Employer's agent*** or one of his delegates. Should it be found that there is any damage to the coating or the lining due to the Contractors activities the repairs will be for the Contractors account.
40	**Consideration of others**	Addressed in this table; **Nr 11 General requirements.**
41	**Co-operation with other service providers**	3rd Party Inspector, professional services provider, notifications / instructions etc

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42	**Site cleanliness**	The Contractor shall ensure that there are adequate and sufficient refuse bins in and around the working area and that these shall be emptied frequently. All refuse bins shall be placed on a concrete base, which shall, from time to time, be sprayed with insecticide. All refuse collection, removal and disposal on Site shall be the responsibility of the Contractor. All refuse shall be disposed of at a licensed landfill Site only, and certificates of receipt shall be kept on record. The Contractor shall take full responsibility for protecting the natural environment and eliminating or minimising the negative impacts of construction on the environment during construction. **General** The main project, Raising of Clanwilliam Dam, has been environmentally authorised under a Record of Decision (ROD)/ Environmental Authorization. The ROD requires that all activities conducted by the Employer and Contractors / Sub-Contractors are within the framework of the Environmental Management Plan (EMP) and Rehabilitation Specifications (RS). The Contractor and his staff must be familiar with the *EMP & RS and* execute the project in such a way that it complies with the requirements of the EMP and RS. The Employers Agent will regularly inspect the Contractor's Site. In the event that the Contractor does not comply with the requirements the deviation must be rectified as recommended by the Employers Agent at the Contractor's cost. The Contractor shall construct and / or implement all the necessary environmental protection measures in each area before any production work will be allowed to proceed. The Employer may suspend the works at any time should the Contractor, fail to implement, operate or maintain any of the environmental protection measures adequately. The costs of such suspension shall be to the Contractor's account. The Contractor shall submit a Method Statement containing details of all Site layouts and environmental protection measures proposed to the Employer for review and approval. (as per Evaluation). Full Environmental file to be submitted before any work will commence on Site (including but not limited to): Copy of Site Environmental Inspection Documents / Sheet. **Temporary Services and Facilities** When refuelling of vehicles and plant it needs to be done in a banded area, and or if not possible, needs to be done over a secured drip tray. Vehicles worked on outside the wash bays will have portable drip trays placed under them to catch oil and diesel which may leak from the vehicles.

Initial _____

		Protection of Flora The removal, damage and disturbance of indigenous flora is prohibited. The Contractor shall request permission before removal of any vegetation on the designated work area and undertake to demarcate and protect flora outside the designated work area. **Protection of the Fauna** The Contractor shall protect fauna living within the Site and shall ensure that fishing, hunting, snaring, poisoning, shooting, nest raiding or egg-collecting and disturbance does not occur. The Contractor is to ensure that his employees are instructed not to feed wild animals, and no domestic pets or livestock are permitted on Site. The use of pesticides is prohibited unless approved by the Employer. **NOTE**: Refer to EMP and CWD 67 Particular Specification Documents.
43	**Permits and licences**	Potable water certification of coating material
44	**Waste and surplus materials**	Contractor to remove spent grit, coating material containers, used masking materials or any other waste generated by on Site corrosion protection to an approved solid waste dump. **Refuse and Waste Control** The management of solid waste on Site shall be strictly controlled and monitored. The Contractor shall adhere to and implement the following: ▪ Labelled recycling bins shall be used, and waste separated where possible. In addition, a recycled-material collection schedule shall be established, and the bins shall be collected regularly; ▪ Eating areas for the construction staff shall be designated and supplied with waste bins to control litter; ▪ No on-Site burying or dumping or unauthorised burning of any waste materials, vegetation, litter or refuse shall occur; Solid waste shall be disposed of off Site, at an approved landfill Site. The Contractor shall supply the Employer with a certificate of disposal; and waste shall be separated into recycling, domestic waste, building/construction rubble, scrap metal, oil and grease and hazardous waste and dealt with in the following manner: ○ **Recycling** Suitable recycling bins, all with lids, shall be provided by the Contractor for his own buildings. Recycling shall be collected and removed from all facilities on the Site at least twice per week. Recycling waste shall be transported to the approved refuse disposal Site off Site in covered containers or covered trucks. ○ **Domestic waste** Suitable refuse bins, all with lids, shall be provided by the Contractor for his own buildings. Refuse shall be collected and

Initial _____

		removed from all facilities on the Site at least twice per week. Domestic waste shall be transported to the approved refuse disposal Site off Site in covered containers or covered trucks. c) **Organic waste** Refuse from food preparation and eating areas shall be collected and removed daily. Organic waste shall be disposed of as per Domestic waste. d) **Building / Construction waste** Inert building/construction rubble shall be disposed of by burying in the dam basin in borrow pits, at a Site and in such a way as approved by the Employer. e) **Scrap metal** Scrap metal shall be disposed of off Site. f) **Used oil and grease** Used oil and / or grease shall be removed from Site and sold to an approved used oil recycling company. The certificated thereof shall be placed on file on Site. g) **Hazardous waste** All hazardous waste shall be disposed of in an approved hazardous waste disposal Site and a disposal certificate supplied to the Employer. The certificated thereof shall be placed on file on Site.
45	**Communication system**	All communication shall be by way of letter, email, or meeting minutes to ensure audit trail. Telephone and virtual meetings will also be considered. All communication to be done in English and in writing.

Initial _____

DEPARTMENT OF WATER AND SANITATION

DWS21-0125 WTE

CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

C4 SITE INFORMATION

Information covered in scope of work. Also see appendixes.

Initial _____

DEPARTMENT OF WATER AND SANITATION

DWS21-0125 WTE

CORROSION PROTECTION AND TRANSPORT OF PIPES AND SPECIALS FOR THE RAISING OF CLANWILLIAM DAM. ONLY RESPONDENTS WITH CIDB GRADING 7SD OR HIGHER ARE ELIGIBLE TO BID

APPENDIX'S

Initial _____

APPENDIX A : DRAWINGS

CWD 7009
CWD 7010
CWD 7014
CWD 7013
CWD 7015
CWD 7016
CWD 7017
CWD 7018
CWD 7019
CWD 7020
CWD 7021
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CWD 7036
CWD 7037
CWD 7038
CWD 7039
CWD 7041
CWD 7042
CWD 7043
CWD 7044
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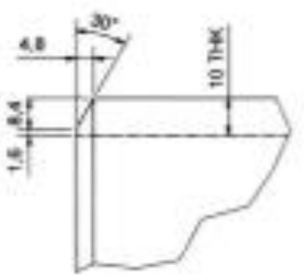
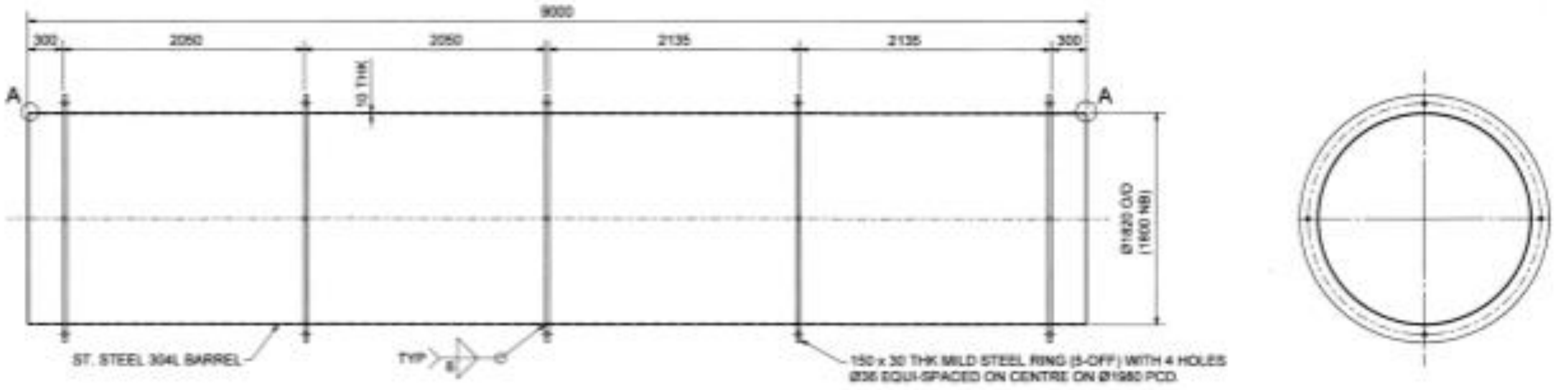
CWD 7047
CWD 7048
CWD 7049
CWD 7050
CWD 7051
CWD 7052
CWD 7053

Initial _____



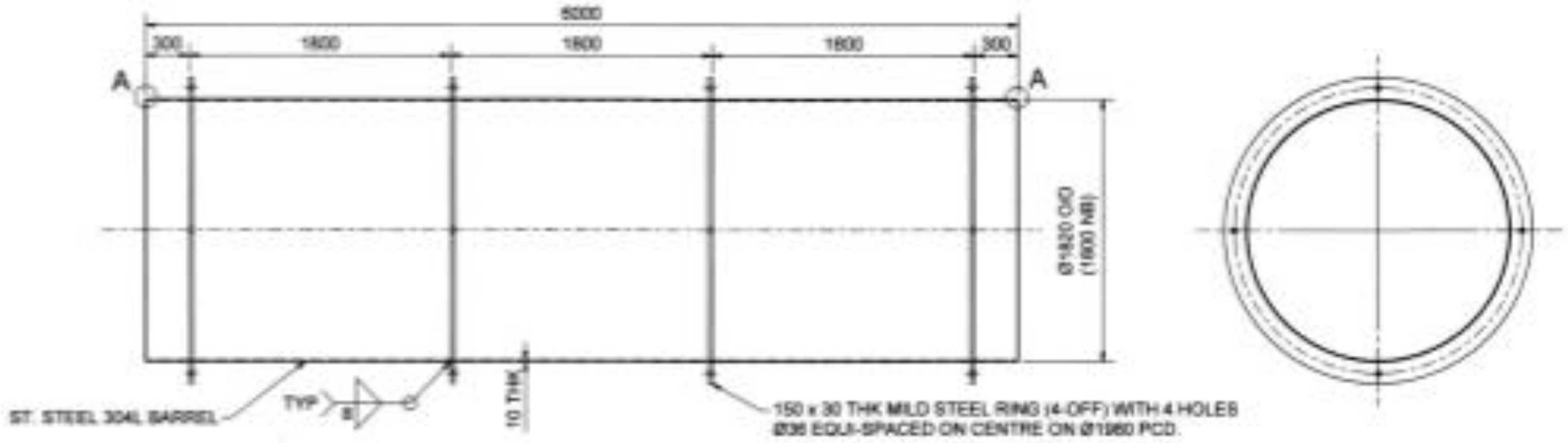
DETAIL A
TYPICAL DETAIL OF WELD
PREPARATION - (BOTH ENDS)
SCALE 1 : 1



2	STRAIGHT PIPE		
MATL.	MILD & ST. STEEL	MASS:	5200 kg ea.
NO. OFF:	12	SCALE:	1:25

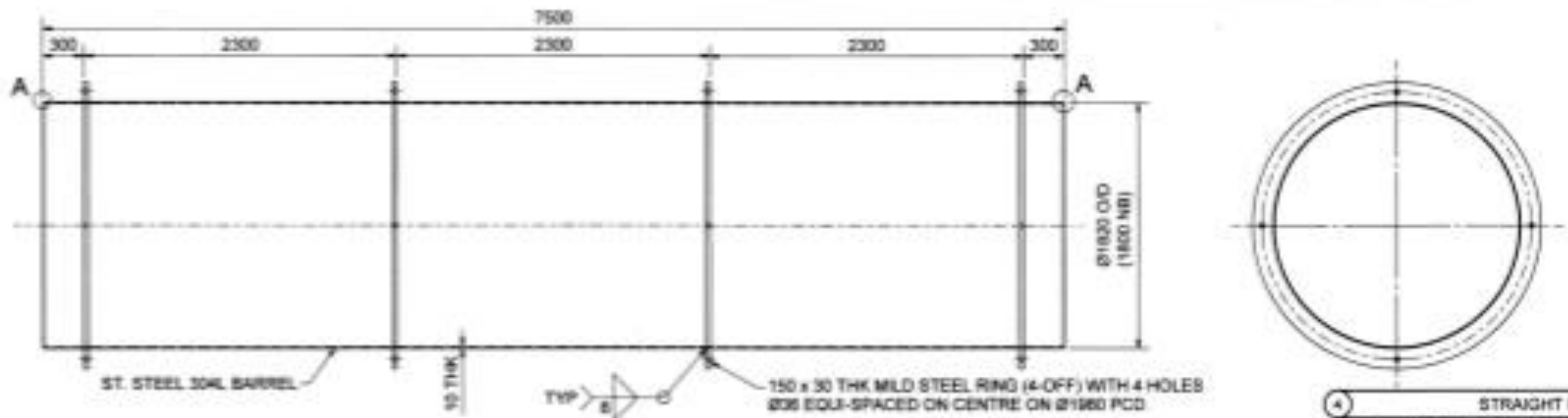
LOCATING LUG
TYPICAL DETAIL
SCALE 1 : 4

NOTE A:
LOCATING LUGS TO BE GROUND OFF ON SITE AFTER TACK-WELDING TWO ADJACENT PIPES IN ORDER TO PERFORM FULL EXTERNAL CIRCUMFERENTIAL WELDS.



3	STRAIGHT PIPE		
MATL.	MILD & ST. STEEL	MASS:	3610 kg ea.
NO. OFF:	7	SCALE:	1:25

2



4	STRAIGHT PIPE		
MATL.	MILD & ST. STEEL	MASS:	4300 kg
NO. OFF:	1	SCALE:	1:25

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- ALL STAGGERED WELDS TO BE FETTLED AND DRESSED FLUSHED AFTER REMOVAL OF LOCATING LUGS DURING INSTALLATION.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

MATERIAL:
ALL MILD STEEL ITEMS TO BE IN ACCORDANCE WITH SANS 50025 / EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA. PIPE BARRELS TO BE ST.STEEL 304L.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION AS PER DETAIL.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR PIPE WELDING FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 500 kPa
- TESTING PRESSURE: 800 kPa

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE
SQUARENESS TOLERANCE:	± 3 mm ACROSS DIAGONALS

THE OVALITY TOLERANCE OF PIPE I/D ON PIPE ENDS SHALL BE ±1,8 mm ALL AROUND THE CIRCUMFERENCE OVER 150 mm DISTANCE FROM PIPE ENDS. PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLOR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 270 mm FROM PIPE ENDS TO BE UNCOATED.

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 800 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

ALL DIMENSIONS IN MILLIMETRES

DO NOT SCALE DRAWING

REMOVE ALL SHARP EDGES

SCALE (mm)

PROJECTION (I.O.D.)

REV. No.	DATE	DESCRIPTION		
0		ISSUED FOR CONSTRUCTION		
1		LOCATING LUGS REMOVED CORROSION PROTECTION UPDATED		
2		ITEM 3 QTY INCREASED FROM 6 TO 7		

DEPARTMENT OF WATER AFFAIRS
REPUBLIC OF SOUTH AFRICA

DESIGN: J.J THERON
DRAWN: J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCES PROJECT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS

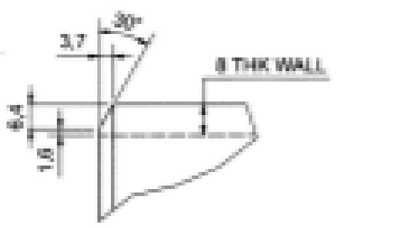
PIPES & SPECIALS

-DETAILS-

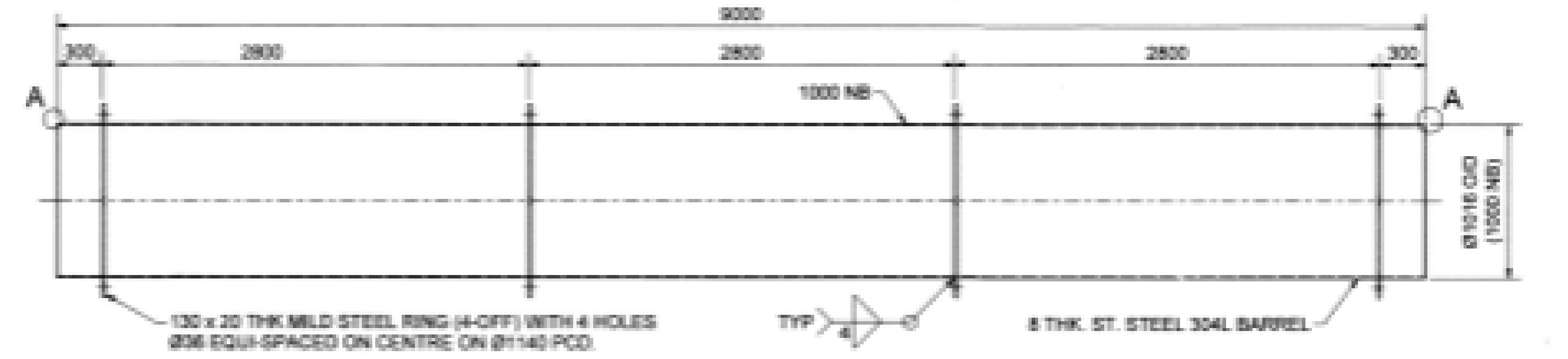
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | CLW | P/P | DET | CWD 7010

169328/13 ME | 2

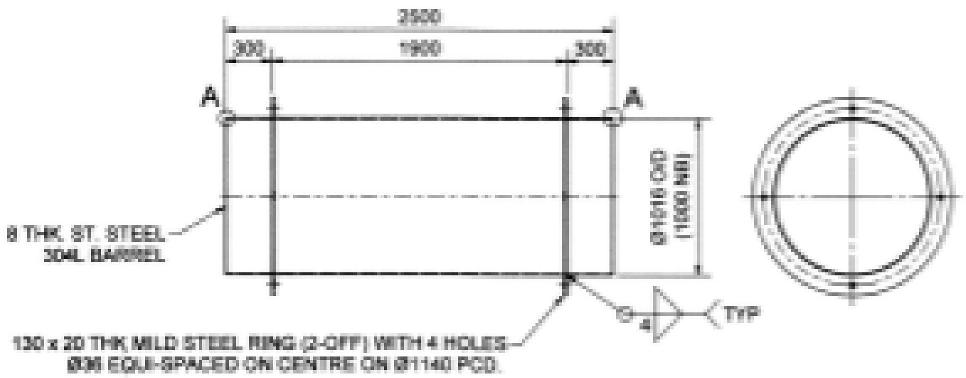
11



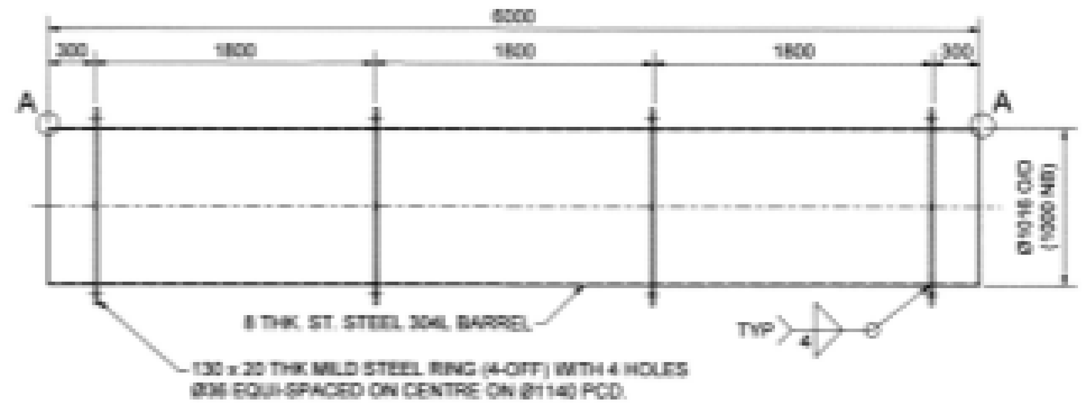
DETAIL A
TYPICAL DETAIL OF WELD
PREPARATION FOR 1000 NB PLAIN END PIPES
SCALE 1 : 1



11	STRAIGHT PIPE		
MATL.:	MILD & ST. STEEL	MASS:	2125 kg ea.
NO. OFF:	23	SCALE:	1:25



14	STRAIGHT PIPE		
MATL.:	MILD & ST. STEEL	MASS:	650 kg ea.
NO. OFF:	2	SCALE:	1:25



12	STRAIGHT PIPE		
MATL.:	MILD & ST. STEEL	MASS:	1515 kg ea.
NO. OFF:	5	SCALE:	1:25

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION AS PER DETAIL.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED (IN ACCORDANCE WITH ASME IX) FOR PIPE WELDING FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 8.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- ALL STAGGERED WELDS TO BE FETTLED AND DRESSED FLUSH AFTER REMOVAL OF LOCATING LUGS DURING INSTALLATION.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CW044 - PIPES AND SPECIALS.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, RINGS AND GUSSETS SHALL BE MILD STEEL UNLESS OTHERWISE STATED.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/ EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

FLANGES: (U.O.S.)
- ALL FLANGES SHALL BE FLAT FACED.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

NOTE: PIPE ENDS TO BE JOINED BY SITE WELDING TO BE PROVIDED WITH APPOPRIATE SPIDER JACKS TO ENSURE ACCEPTABLE OVALITY TOLERANCES.

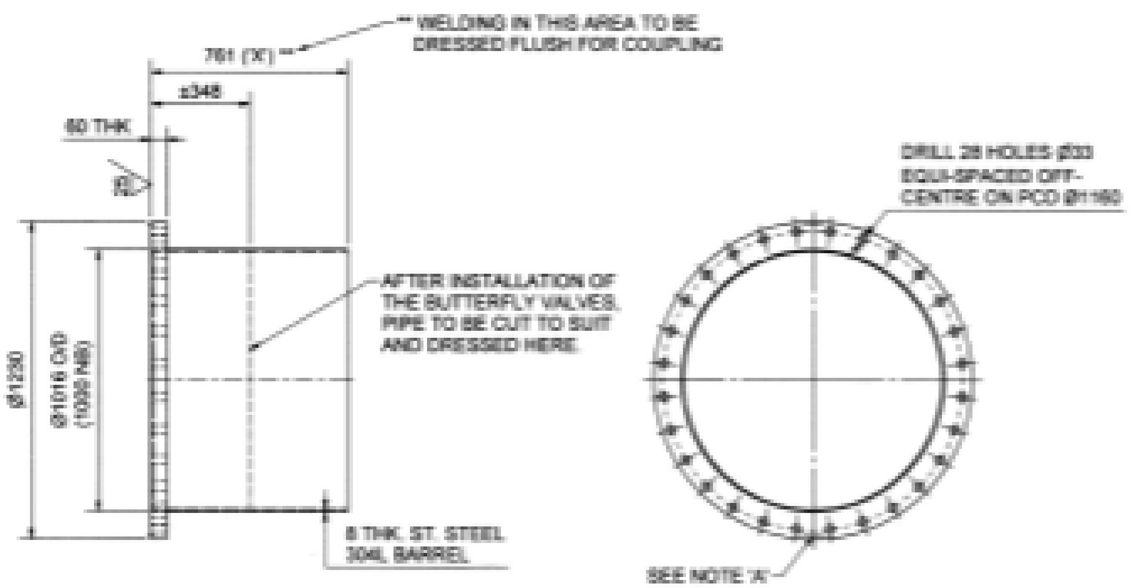
SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

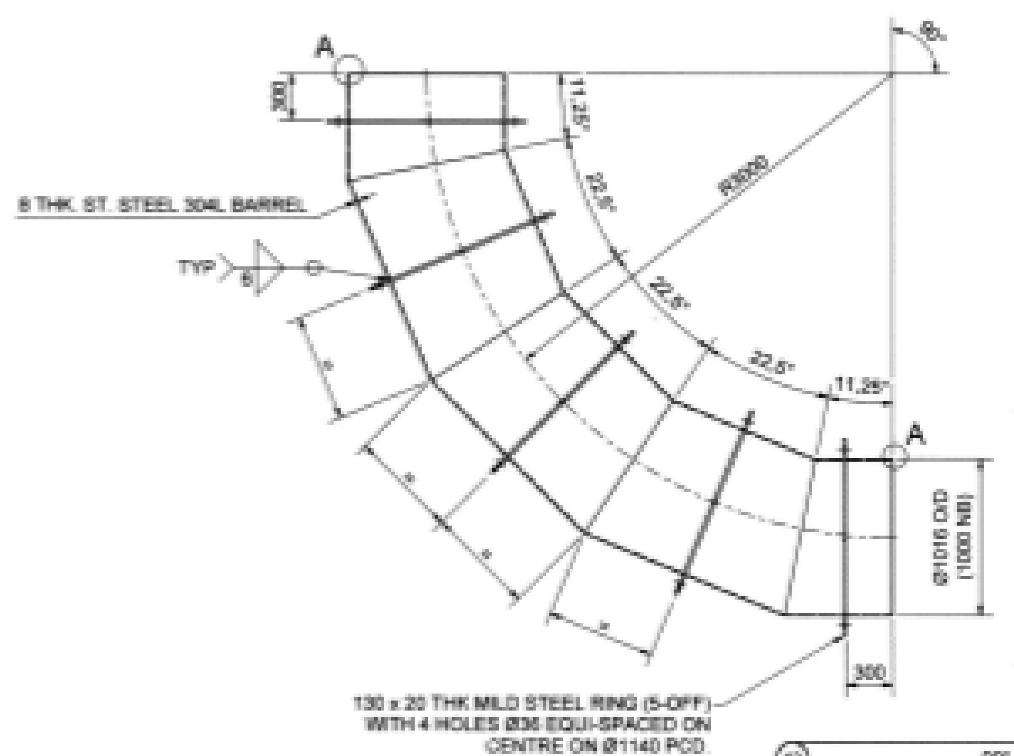
THE OVALITY TOLERANCE OF PIPE I/D AT PIPE ENDS SHALL BE ±1,8 mm (FOR 1800 NB) AND +2,4 -0,8 (FOR 1000 NB) ALL AROUND THE CIRCUMFERENCE OVER 150 mm DISTANCE FROM PIPE ENDS.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

ALL DIMENSIONS IN MILLIMETRES



NOTE 'A'
Ø6 x 2 mm DEEP HOLE ON Ø1205 PCD ON TOP AND BOTTOM DEAD CENTRE ON GASKET SIDE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

15	CLOSER PIPE		
MATL.:	MILD & ST. STEEL	MASS:	320 (236) kg ea.
NO. OFF:	10	SCALE:	1:15



13	90° BEND		
MATL.:	MILD & ST. STEEL	MASS:	1340 kg ea.
NO. OFF:	6	SCALE:	1:25

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 μm DFT) (*PLUS A TOP COAT OF PURE ALIPHATIC POLY-URETHANE (25 μm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (280 μm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 μm DFT).
- AREA 270 mm FROM PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES. ONLY OPEN ENDED PIPES, EXCEPT ITEM 15).

DO NOT SCALE DRAWING

SCALE (mm)
PROJECTION (U.O.S.)

REMOVE ALL SHARP EDGES

REVISION

REV	DATE	DESCRIPTION
0	02/14	ISSUED FOR CONSTRUCTION
1	02/14	COATING LUGS REMOVED; CORROSION PROTECTION UPDATED
2	08/15	ITEM 12 QTY INCREASED FROM 3 TO 5
3	02/16	ITEM 11 QTY CHANGED FROM 22 TO 23

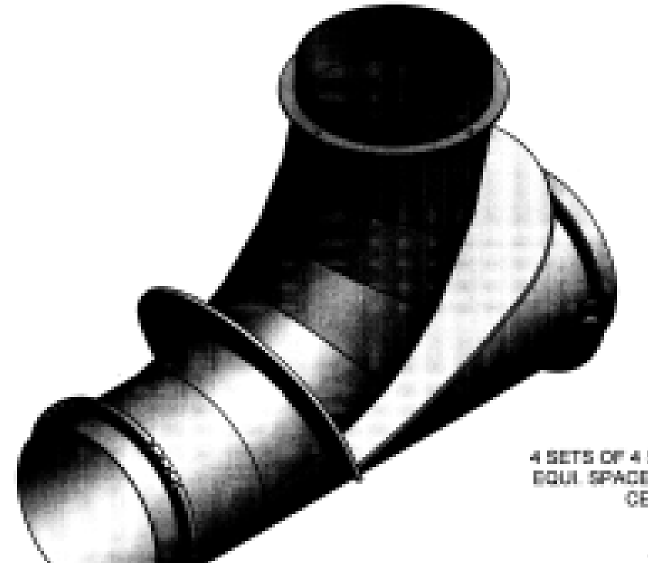
DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

DESIGN: J.J THERON
DRAWN: J.J THERON

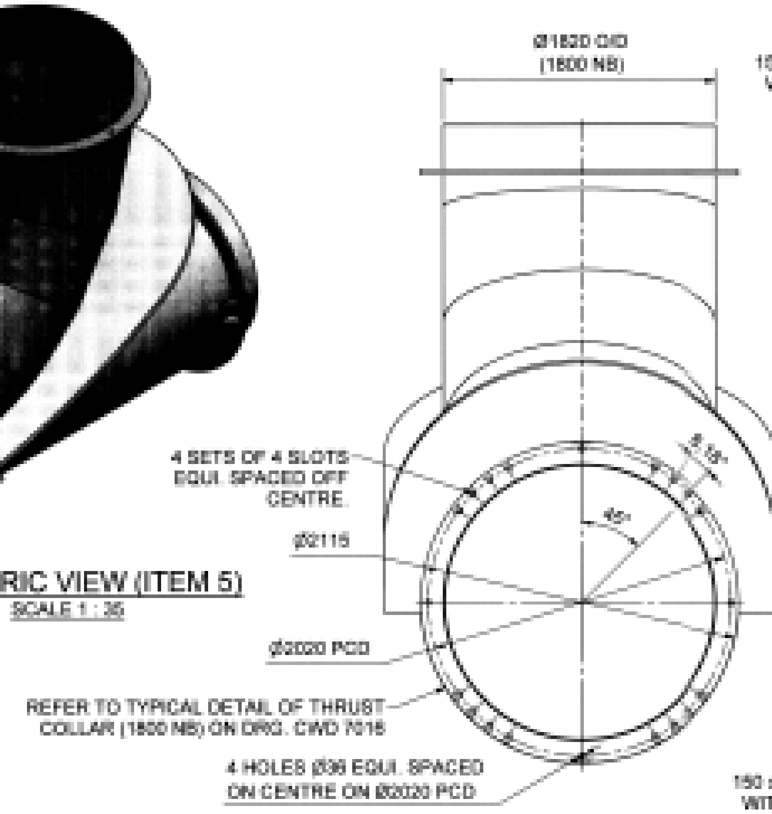
OLIFANTS-DOORN RIVER WATER RESOURCES PROJECT
RAISING OF CLANWILLIAM DAM
OUTLET WORKS
PIPES & SPECIALS
-DETAILS-

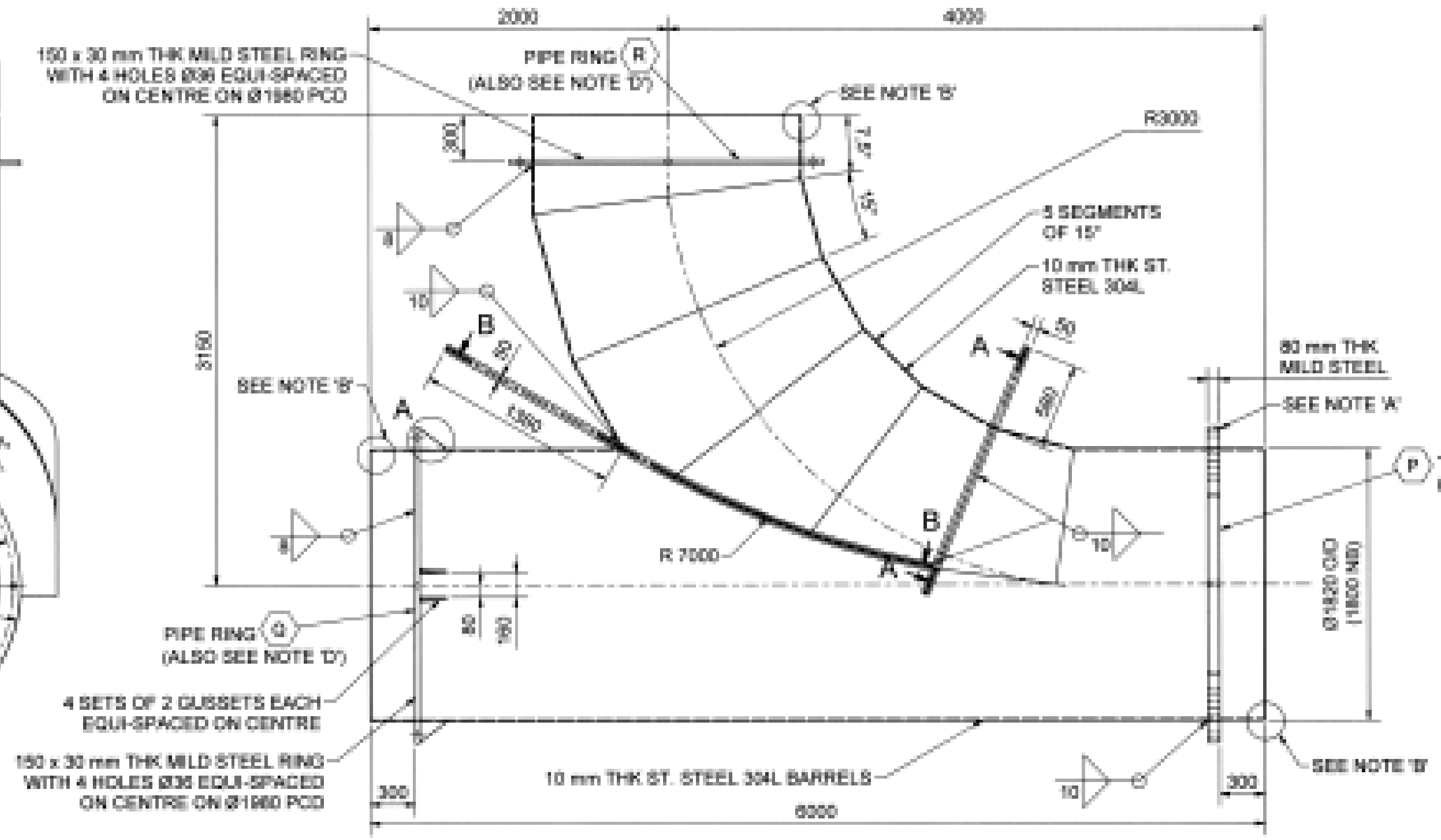
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM

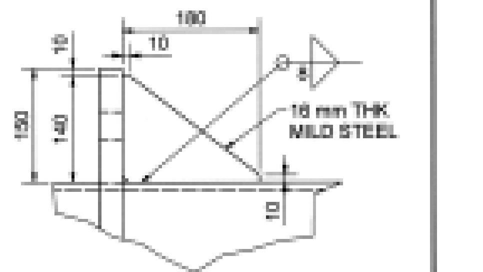
SHEET 14
REG. No. 169331/13 ME
REV. 3



ISOMETRIC VIEW (ITEM 5)
SCALE 1 : 35

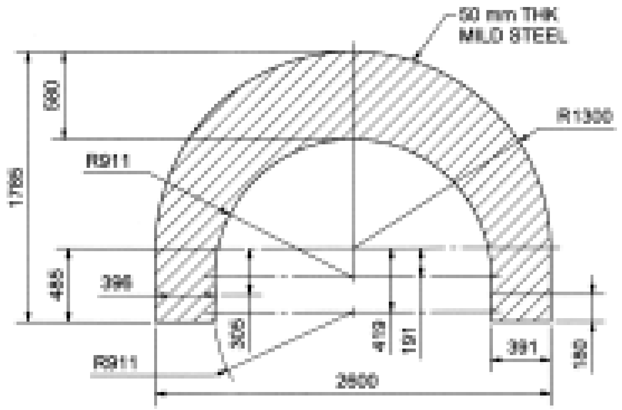






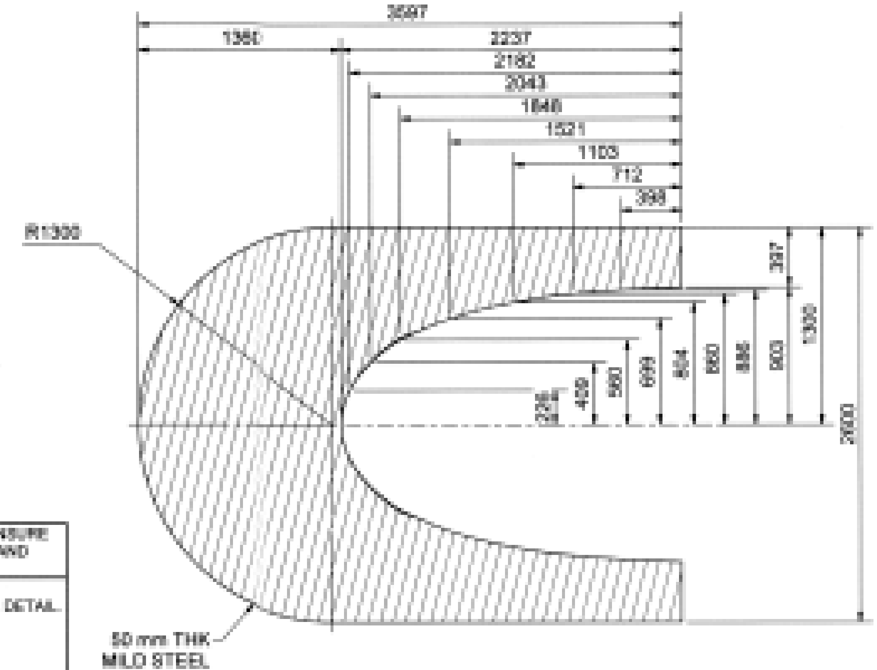
DETAIL A
GUSSET DETAIL
SCALE 1 : 5

NOTE 'B'
SEE TYPICAL WELD PREPERATION DETAIL 'A' ON DRG. CWD 7010.



SECTION A-A
REINFORCING PLATE
(FLOOR DEVELOPMENT PLAN - 816 kg)
SCALE 1 : 25

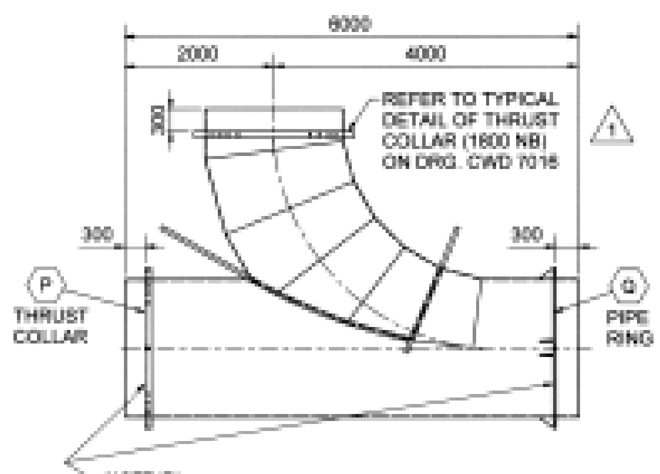
NOTE 'C'
PERFORM THE REQUIRED WELD PREPERATION ON THE REINFORCING PLATES.



SECTION B-B
REINFORCING PLATE
(FLOOR DEVELOPMENT PLAN - 2060 kg)
SCALE 1 : 25

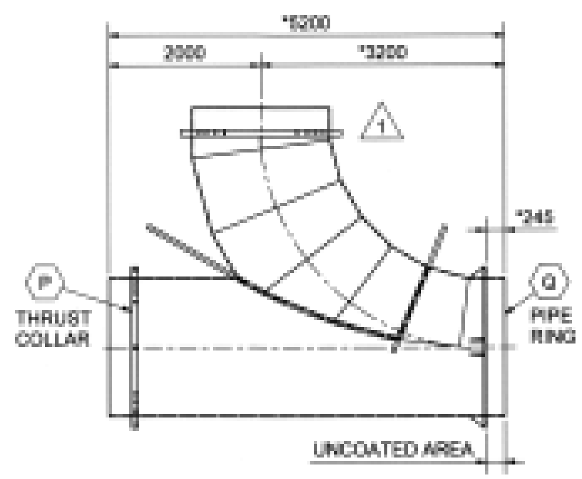
NOTE 'A'
Ø6 x 2 mm DEEP HOLE ON Ø2090 PCD ON TOP AND BOTTOM DEAD CENTRE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION).

(5) SWEEP TEE			
MATL.:	MILD & ST. STEEL	MASS:	7605 kg ea.
NO. OFF:	1	SCALE:	1:25



NOTE 'D'
SWEEP TEE DIMENSIONS TO BE IDENTICAL TO ITEM 5 WITH THE EXCEPTION THAT TRUST COLLAR MARKED [P] AND PIPE RING MARKED [Q] ON ITEM 5 ARE SWITCHED. AND THE PIPE RING MARKED [R] IS REPLACED WITH A THRUST COLLAR.

(6) SWEEP TEE			
MATL.:	MILD & ST. STEEL	MASS:	7960 kg ea.
NO. OFF:	4	SCALE:	1:50



ALL DIMENSIONS ARE TYPICAL TO ITEM 6 WITH THE EXCEPTION OF DIMENSIONS MARKED THUS *

(21) SWEEP TEE			
MATL.:	MILD & ST. STEEL	MASS:	7595 kg ea.
NO. OFF:	1	SCALE:	1:50

NOTE: PIPE ENDS TO BE JOINED BY SITE WELDING TO BE PROVIDED WITH APPROPRIATE SPIDER JACKS TO ENSURE ACCEPTABLE OVALITY TOLERANCES. ADJACENT PIPE ENDS TO BE JOINED BY SITE WELDING TO BE ALIGNED AND REFORMED USING AN APPROPRIATE PIPE CHAIN CLAMP PRIOR TO SITE WELDING.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS AND RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION AS PER DETAIL.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED (IN ACCORDANCE WITH ASME IX) FOR PIPE WELDING FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0.3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0.5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0.8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

THE OVALITY TOLERANCE OF PIPE ID AT PIPE ENDS SHALL BE ±1.6 mm (FOR 1800 NB) AND +2.4 -0.8 (FOR 1080 NB) ALL AROUND THE CIRCUMFERENCE OVER 150 mm DISTANCE FROM PIPE ENDS.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE AND THRUST COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 270 mm FROM PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES; ONLY OPEN ENDED PIPES).

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | REMOVE ALL SHARP EDGES

SCALE (mm) 0 5 10 100

PROJECTION (U.O.S.)

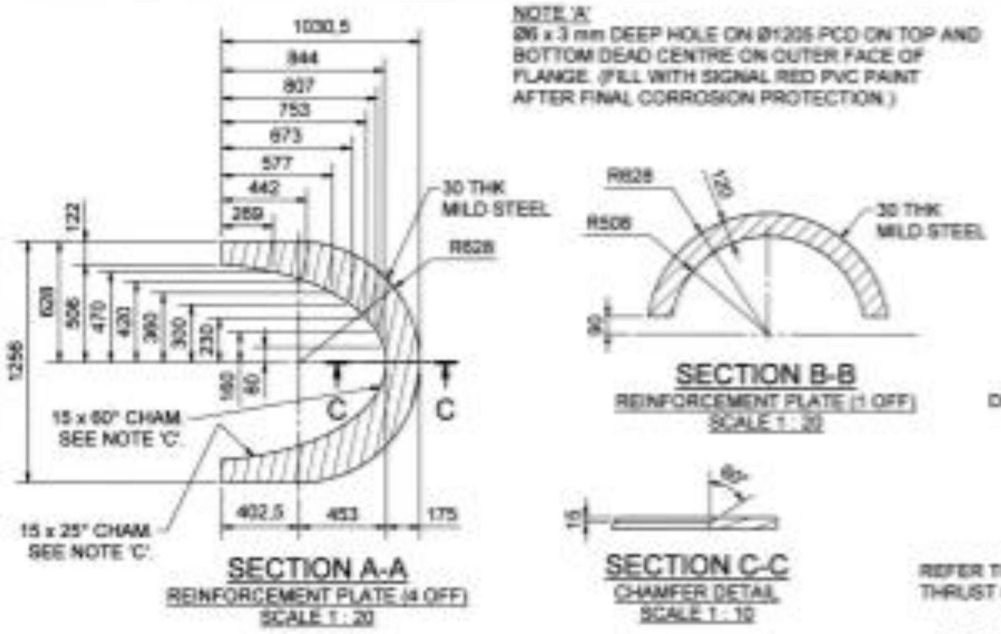
REVISION				
MOD No.	DATE	DESCRIPTION	FOR	DWA
0	08/14	ISSUED FOR CONSTRUCTION		
1	09/14	PIPE RING REPLACED BY A THRUST COLLAR (ITEM 6 & 21)		

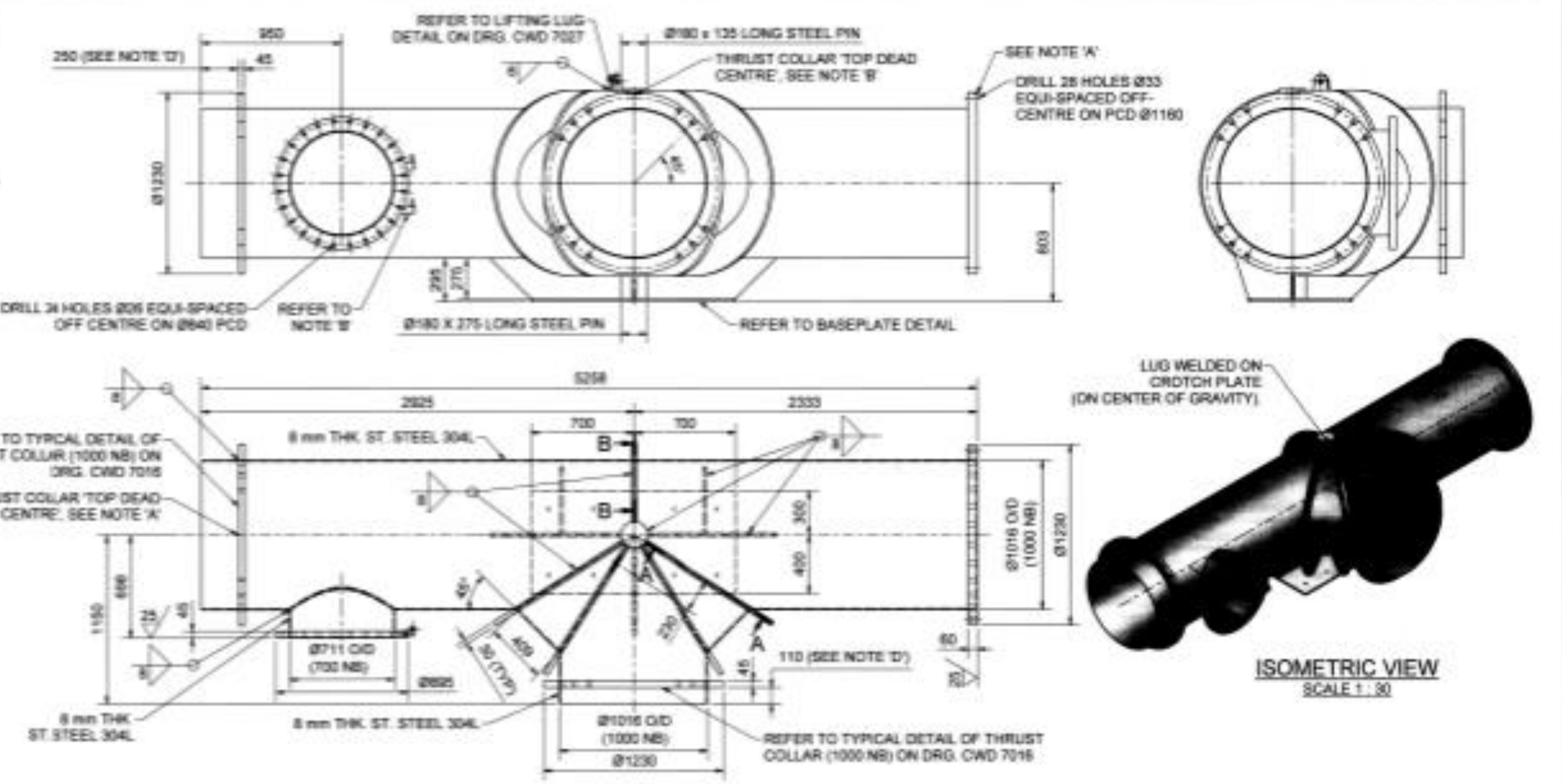
DEPARTMENT OF WATER AFFAIRS
REPUBLIC OF SOUTH AFRICA

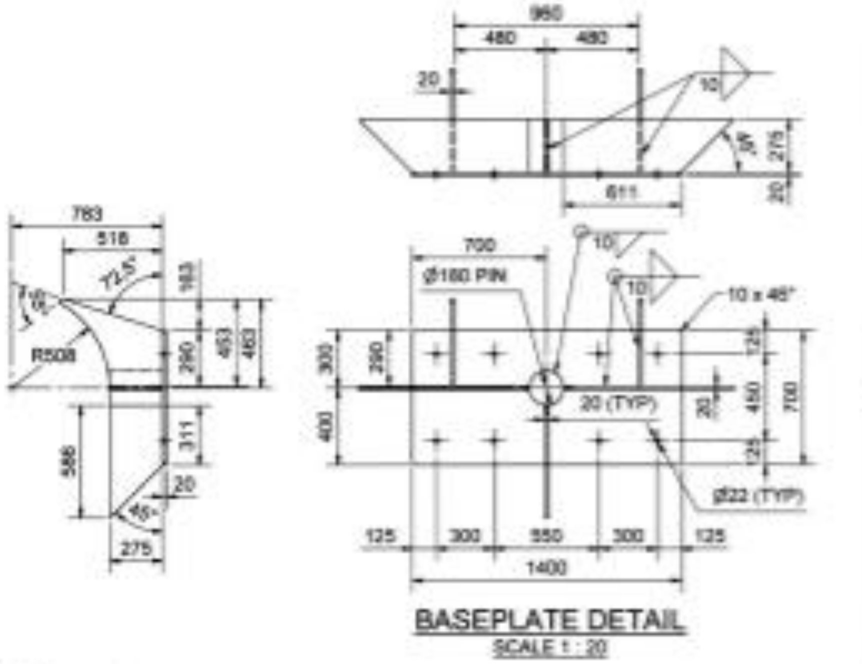
DESIGN: J.J THERON
DRAWN: J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCES PROJECT
RAISING OF CLANWILLIAM DAM
OUTLET WORKS
PIPES & SPECIALS
-DETAILS-

PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | DWA | PRD | DET | OTHER NUMBER: CWD 7014
LOCALITY No. E100-02
CALCULATION FILE: ME/E100-02
SHEET 15
169332/13 ME
REV 1







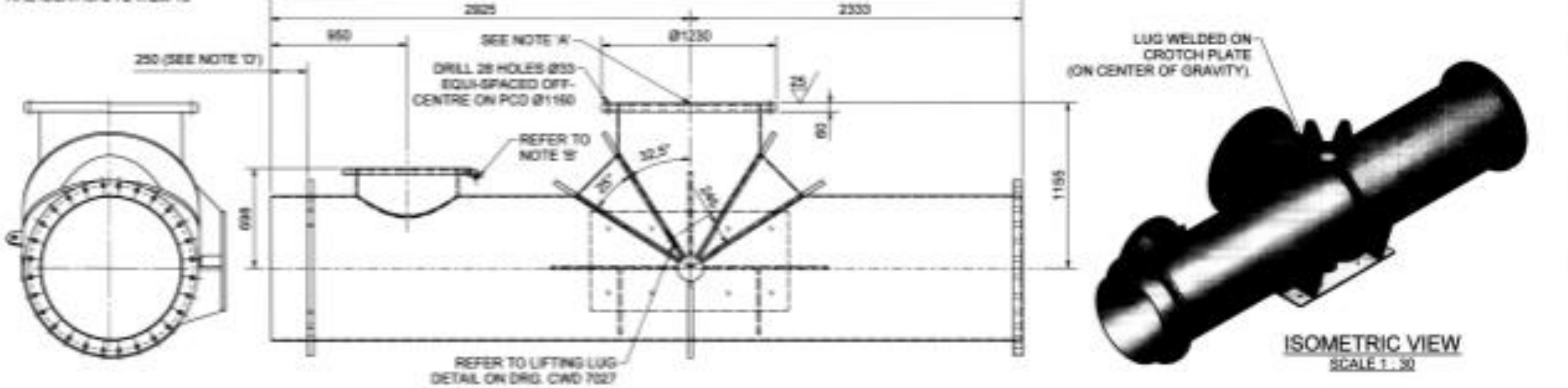
NOTE 'B'
REFER TO TYPE DRAWING REG. NO. 147304/05 ME FOR HINGE DETAILS. NOTE THE ORIENTATION.

NOTE 'C'
CHAMFER EDGE TO SUIT THE PIPE CURVATURE. THE CHAMFER GRADUALLY CHANGES FROM ± 25° TO 60° AS SHOWN ON SECTION A-A AND C-C.

NOTE 'D'
WELDING IN THIS AREA TO BE DRESSED FLUSH FOR COUPLING

(16)	T-PIECE		
MATL:	MILD & ST. STEEL	MASS:	2505 kg
NO. OFF:	1	SCALE:	1:20

NOTE 'E'
DIMENSIONS NOT SHOWN ARE IDENTICAL TO ITEM 16



NOTE 'F'
ONE OFF JIG FOR INSTALLATION PURPOSES OF MOUNTING ANCHORS TO BE MANUFACTURED FROM 10 THK. STEEL PLATE TO MATCH THE EXACT DIMENSIONS OF T-PIECE (ITEM 16 & 17) BASEPLATE.

"WELDING IN THIS AREA TO BE DRESSED FLUSH FOR COUPLING

(17)	T-PIECE		
MATL:	MILD & ST. STEEL	MASS:	2970 kg
NO. OFF:	1	SCALE:	1:20

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION DWD 44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS AND RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 8.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/16.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm."

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: TWO PACK EPOXY (150 µm DFT) PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 µm DFT).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE & THRUST COLLAR COATING: TWO PACK EPOXY (300 µm DFT) PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 µm DFT).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES

ALL DIMENSIONS IN MILLIMETRES

DO NOT SCALE DRAWING

REMOVE ALL SHARP EDGES

PROJECTION

ISSUED FOR CONSTRUCTION

DEPARTMENT OF WATER AND SANITATION

J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

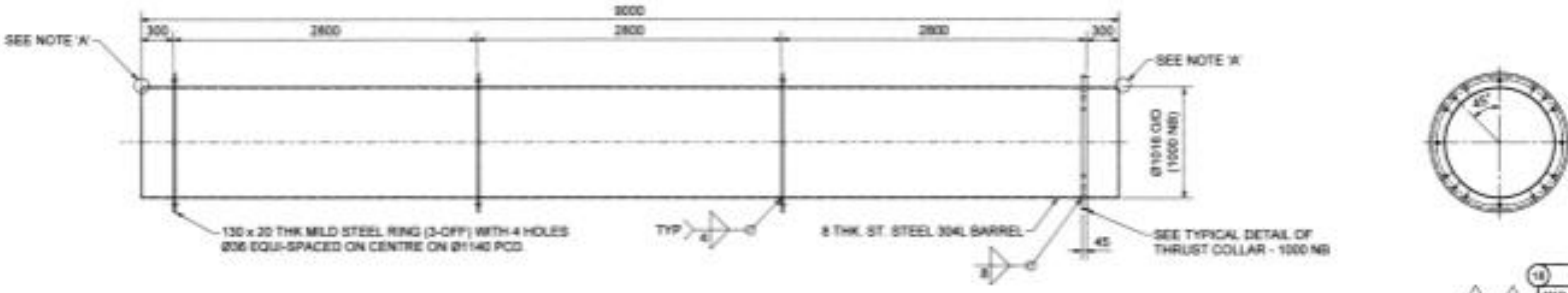
OUTLET WORKS

PIPES & SPECIALS
-DETAILS-

WESTERN CAPE | CLANWILLIAM | CWD 7016

16

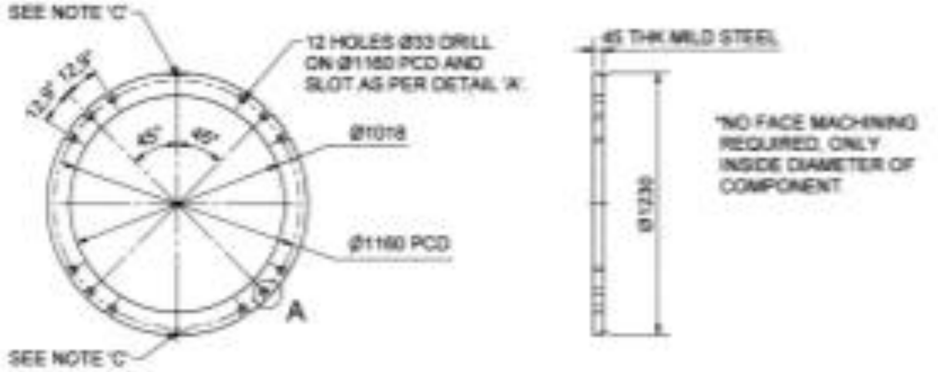
169333/13 ME | 0



18	STRAIGHT PIPE		
MAT'L	MILD & ST. STEEL	MASS	2183 kg ea.
NO. OFF	7	SCALE	1:25

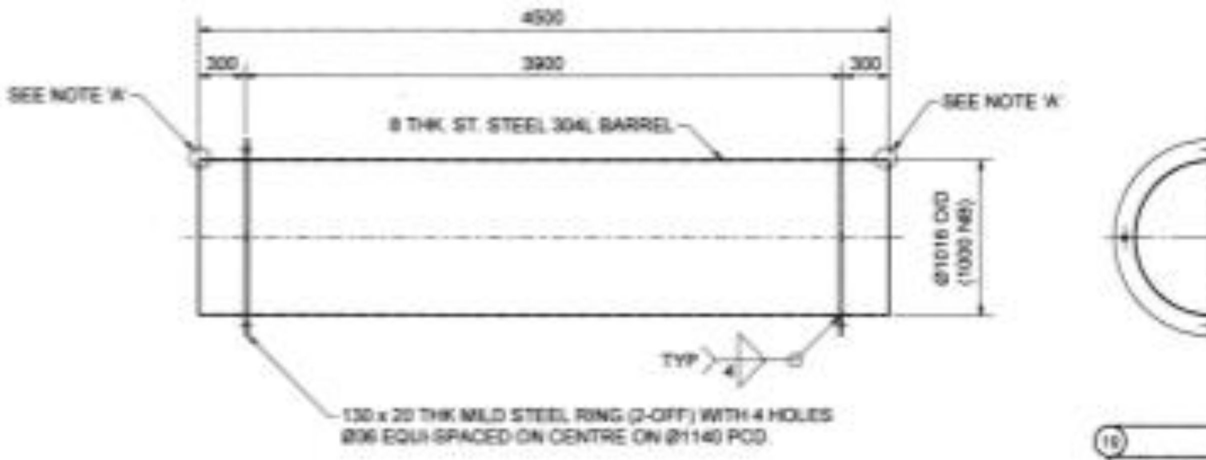
NOTE 'A':
SEE TYPICAL WELD PREPERATION DETAIL 'A' ON DRG. CWD 7013

DETAIL A
SCALE 1 : 2.5



TYPICAL DETAIL OF THRUST COLLAR - 1000 NB
SCALE 1 : 18

NOTE 'C'
Ø6 x 2 mm DEEP HOLE ON Ø1205 PCD ON TOP AND BOTTOM DEAD CENTRE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)



19	STRAIGHT PIPE		
MAT'L	MILD & ST. STEEL	MASS	1066 kg ea.
NO. OFF	2	SCALE	1:20

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION AS PER DETAIL.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED (IN ACCORDANCE WITH ASME IX) FOR PIPE WELDING FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 808 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- ALL STAGGERED WELDS TO BE FETTLED AND DRESSED FLUSH AFTER REMOVAL OF LOCATING LUGS DURING INSTALLATION.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD44 - PIPES AND SPECIALS.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, RINGS AND GUSSETS SHALL BE MILD STEEL UNLESS OTHERWISE STATED.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/ EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

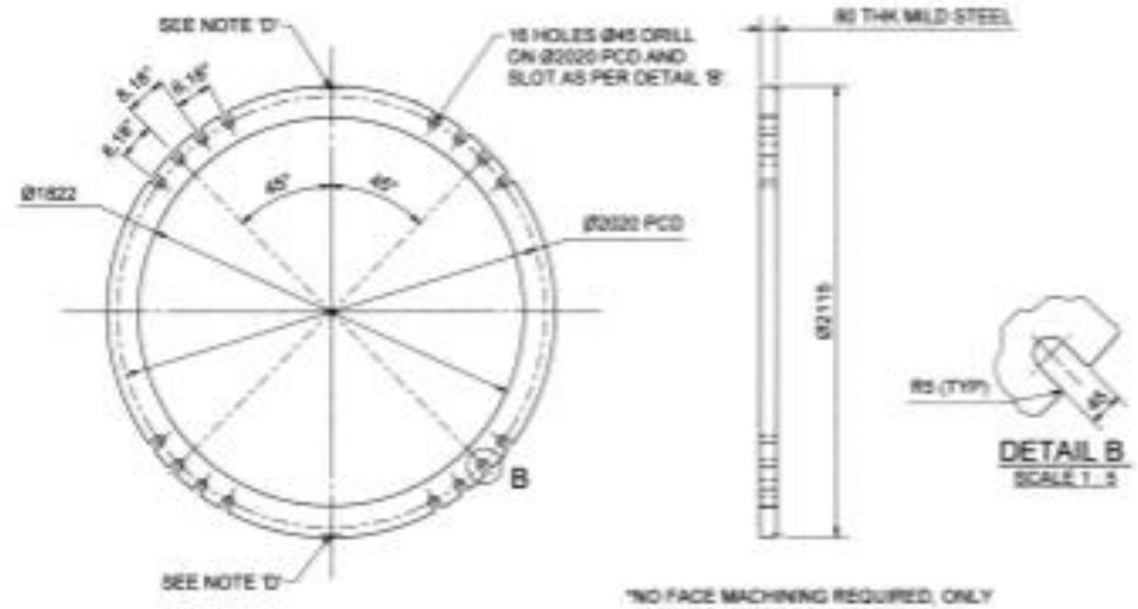
FLANGES: (U.O.S.)
- ALL FLANGES SHALL BE FLAT FACED.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

NOTE: PIPE ENDS TO BE JOINED BY SITE WELDING TO BE PROVIDED WITH APPROPRIATE SPIDER JACKS TO ENSURE ACCEPTABLE OVALITY TOLERANCES.

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES



TYPICAL DETAIL OF THRUST COLLAR - 1800 NB
SCALE 1 : 18

DETAIL B
SCALE 1 : 5

NOTE 'D'
Ø6 x 2 mm DEEP HOLE ON Ø2090 PCD ON TOP AND BOTTOM DEAD CENTRE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

NOTE 'B':
SEE TYPICAL WELD PREPERATION ON DETAIL 'A' ON DRG CWD 7010

20	45° BEND		
MAT'L	MILD & ST. STEEL	MASS	2820 kg ea.
NO. OFF	2	SCALE	1:25

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0.3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0.5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0.8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

THE OVALITY TOLERANCE OF PIPE I/D AT PIPE ENDS SHALL BE ±1.6 mm (FOR 1800 NB) AND +2.4 -0.8 (FOR 1000 NB) ALL AROUND THE CIRCUMFERENCE OVER 150 mm DISTANCE FROM PIPE ENDS.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 μm DFT) (*PLUS A TOP COAT OF PURE ALIPHATIC POLY-URETHANE (25 μm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 μm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 μm DFT).
- AREA 270 mm FROM PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES, ONLY OPEN ENDED PIPES).

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | REMOVE ALL SHARP EDGES

PROJECTION (U.O.S.)

DEPARTMENT OF WATER AFFAIRS
REPUBLIC OF SOUTH AFRICA

DESIGN: J.J THERON
DRAWN: J.J THERON

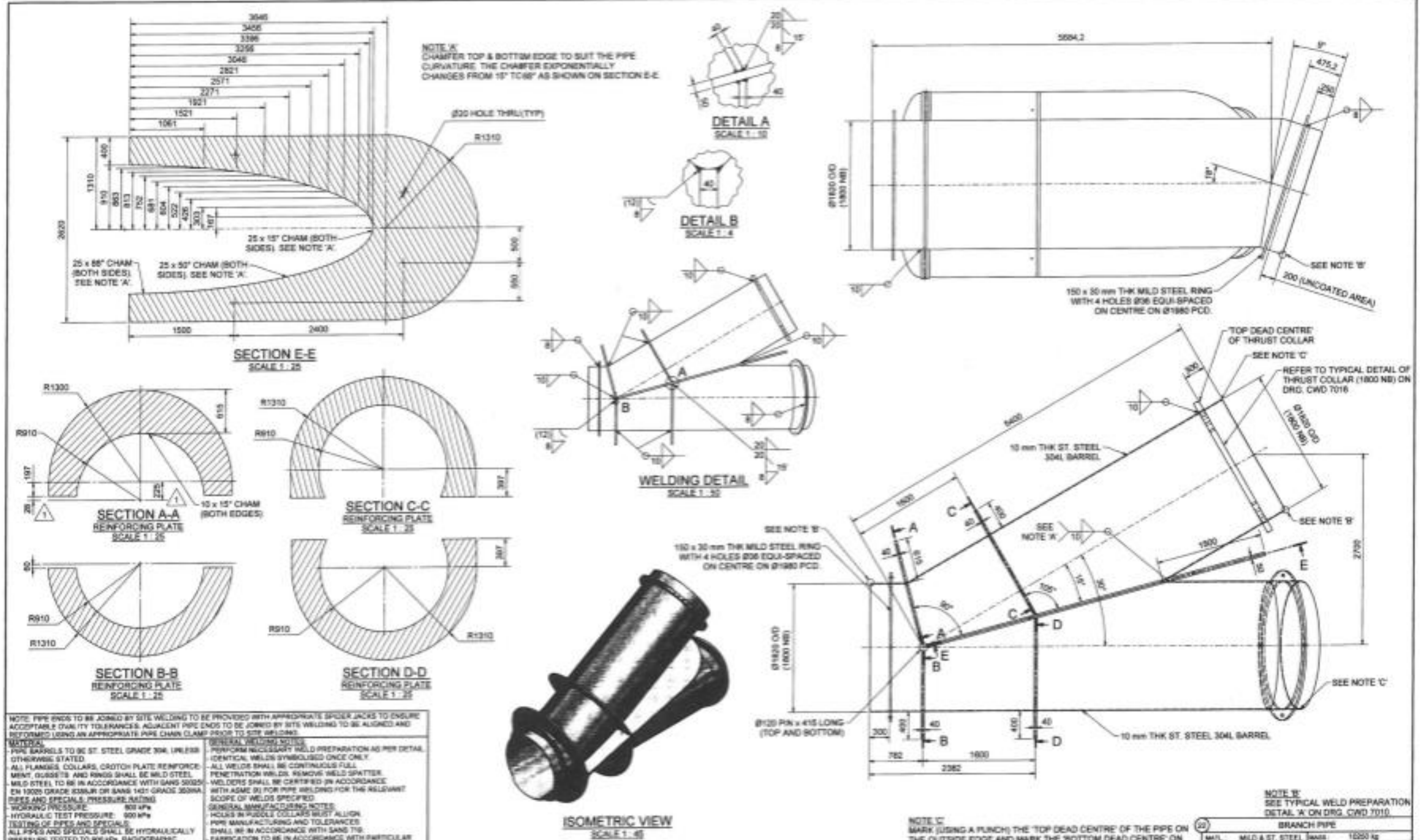
OLIFANTS-DOORN RIVER WATER RESOURCES PROJECT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS
PIPES & SPECIALS
-DETAILS-

PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | CWD 7016

SHEET 17 | 169334/13 ME | 2



NOTE: PIPE ENDS TO BE JOINED BY SITE WELDING TO BE PROVIDED WITH APPROPRIATE SPIDER JACKS TO ENSURE ACCEPTABLE OVALITY TOLERANCES. ADJACENT PIPE ENDS TO BE JOINED BY SITE WELDING TO BE ALIGNED AND REFORMED USING AN APPROPRIATE PIPE CHAIN CLAMP PRIOR TO SITE WELDING.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS AND RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION AS PER DETAIL.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR PIPE WELDING FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

THE OVALITY TOLERANCE OF PIPE ID AT PIPE ENDS SHALL BE ±1,6 mm (FOR 1800 NB) AND +2,4 -0,8 (FOR 1000 NB) ALL AROUND THE CIRCUMFERENCE OVER 150 mm DISTANCE FROM PIPE ENDS.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 0602.
- PIPE COATING: APPLY TWO PACK EPOXY (150 μm DFT).
- PIPE LINING: APPLY TWO PACK EPOXY (200 μm DFT).
- PUDDLE AND THRUST COLLAR COATING: TWO PACK EPOXY (300 μm DFT).
- AREA 273 mm FROM UNFLANGED PIPE ENDS TO BE UNCOATED. (U.O.S)

ALL DIMENSIONS IN MILLIMETRES

DO NOT SCALE DRAWING

SCALE (mm)

PROJECTION (U.O.S.)

REMOVE ALL SHARP EDGES

NOTE 'B'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7010.

NOTE 'C'
MARK (USING A PUNCH) THE 'TOP DEAD CENTRE' OF THE PIPE ON THE OUTSIDE EDGE AND MARK THE 'BOTTOM DEAD CENTRE' ON THE INSIDE OF THE PIPE 5 mm FROM THE EDGE ON ALL ENDS.

(22) BRANCH PIPE			
MAT'L:	MILD & ST. STEEL	MASS:	10250 kg
NO. OFF:	1	SCALE:	1:25

REVISION

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

DESIGN: J.J. THERON
DRAWN: J.J. THERON

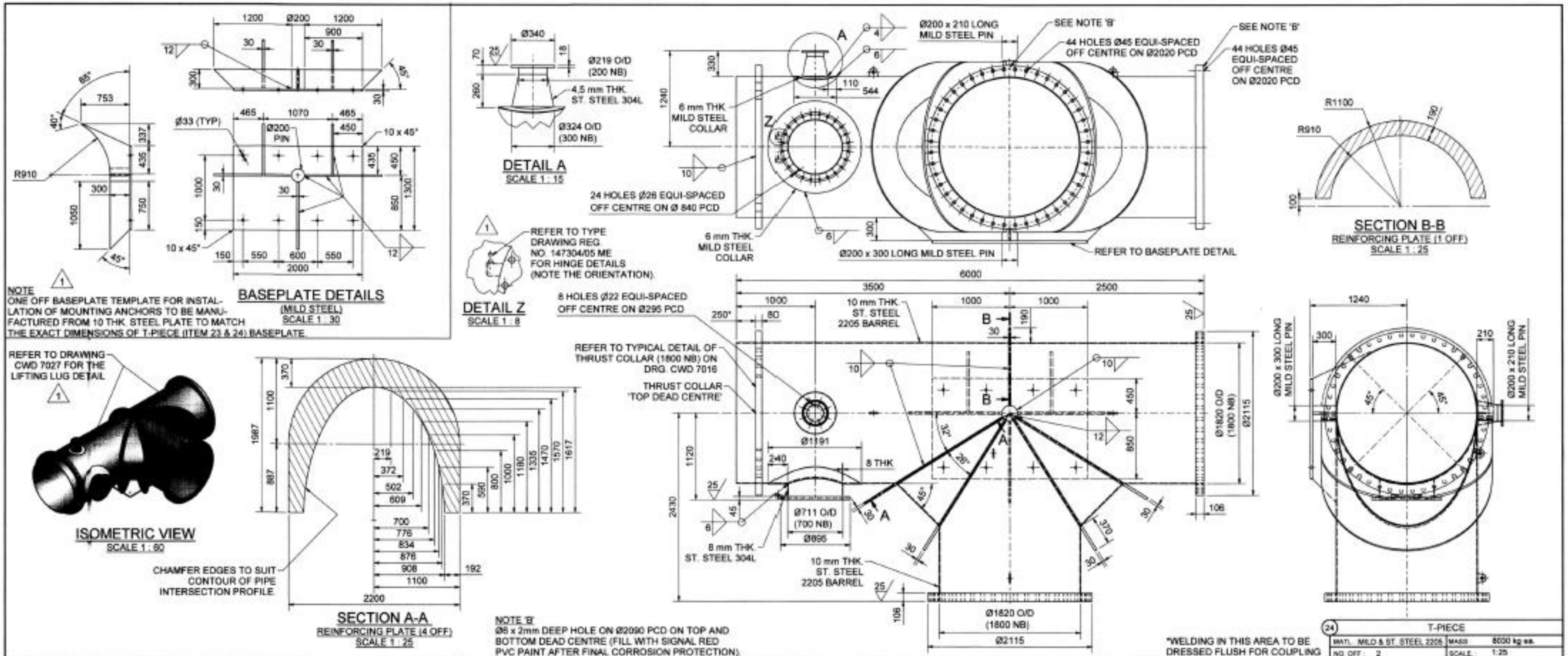
OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS
PIPES & SPECIALS
-DETAILS-

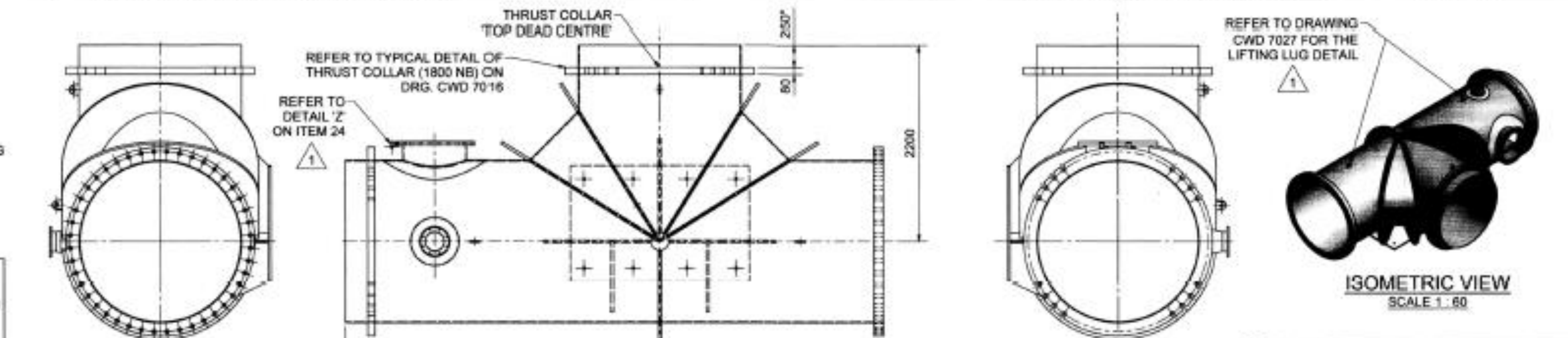
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | CLAN | PIP | PRS | DET | CWD 7017

18 | 169335/13 ME | 1



NOTE 'A':
DIMENSIONS NOT SHOWN ARE TYPICAL TO ITEM 24.

*WELDING IN THIS AREA TO BE DRESSED FLUSH FOR COUPLING



(23)	T-PIECE		
MATL.: MILD & ST. STEEL 2205		MASS:	7765 kg ea.
NO. OFF: 2		SCALE:	1:30

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED (IN ACCORDANCE WITH ASME IX) FOR PIPE WELDING FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 2205 UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS AND RINGS SHALL BE MILD STEEL. MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.
- HOLES IN THRUST COLLAR AND FLANGE TO ALLIGN PRECISELY

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

THE OVALITY TOLERANCE OF PIPE I/D AT PIPE ENDS SHALL BE ±1,6 mm (FOR 1800 NB) AND +2,4 -0,8 (FOR 1000 NB) ALL AROUND THE CIRCUMFERENCE OVER 150 mm DISTANCE FROM PIPE ENDS.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 6600.
- PIPE COATING: TWO PACK EPOXY (150 µm DFT) PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 µm DFT).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE AND THRUST COLLAR COATING: TWO PACK EPOXY (300 µm DFT) PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 µm DFT).
- FLANGE FACE: APPLY TWO PACK EPOXY (80 - 90 µm DFT)

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES

SCALE (mm) 0 5 10 … 100

PROJECTION (U.O.S.)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | REMOVE ALL SHARP EDGES

REVISION

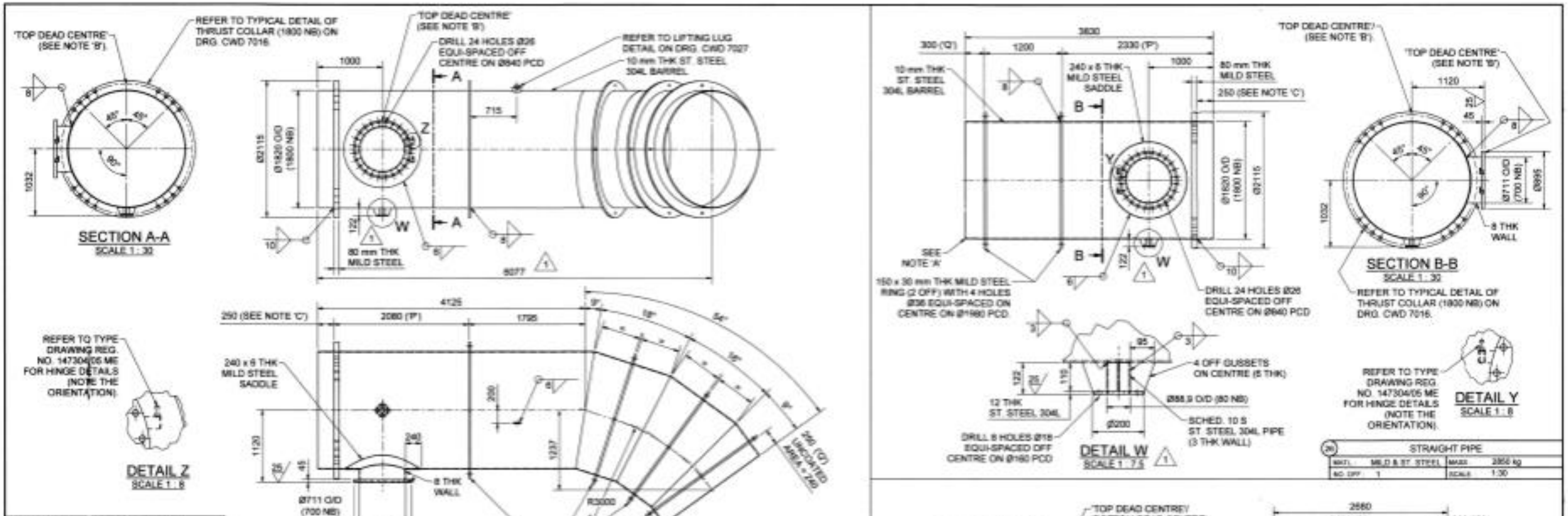
MOD No.	DATE	DESCRIPTION	FOR	DWG
2	09/14	ISSUED FOR CONSTRUCTION		
1	08/17	JIB HINGE DETAIL ADDED - DETAIL 'Z'. LIFTING LUG DETAIL ADDED. BASEPLATE TEMPLATE MATERIAL CHANGED FROM ST. STEEL TO STEEL		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
HEAD OFFICE MECH. /ELEC. ENG. PRIVATE BAG X313 PRETORIA 0001
SEDIBENG BUILDING 185 FRANCIS BAARD STREET PRETORIA (012) 336-7500
Mr. DM MASHITISHO DIRECTOR GENERAL

DESIGN: J.J THERON
DRAWN: J.J THERON
CHECKED
CHIEF ENGINEER / APP (Pr. Eng) DATE
DIRECTOR (Pr. Eng) DATE

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT
RAISING OF CLANWILLIAM DAM
OUTLET WORKS
PIPES & SPECIALS
-DETAILS-

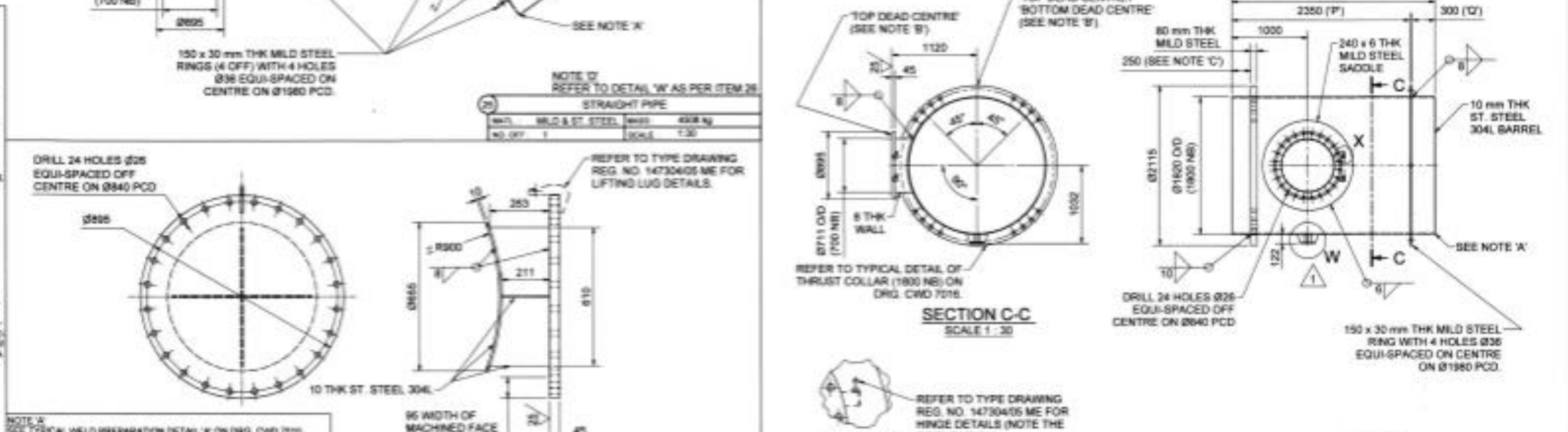
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | KEYCODES: DUW PPB DET | OTHER NUMBER: CWD 7016
LOCALITY No.: E100-02 | TENDER CONTRACT No.:
CALCULATION FILE: ME/E100-02
SHEET: 19 of | DRG. No.: 169336/13 ME | REV No.: 1



26	STRAIGHT PIPE		
MATL.:	MILD & ST. STEEL	MASS:	2850 kg
NO. OFF:	1	SCALE:	1:30

NOTE 'D'
REFER TO DETAIL 'W' AS PER ITEM 26

25	STRAIGHT PIPE		
MATL.:	MILD & ST. STEEL	MASS:	4508 kg
NO. OFF:	1	SCALE:	1:30



GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED (IN ACCORDANCE WITH ASME IX) FOR PIPE WELDING FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE A.

GENERAL MANUFACTURING NOTES:
- PUDDLE COLLAR HOLE CENTRES TO BE IN THE SAME PLANE.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: O/D, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS & HINGES SHALL BE MILD STEEL (U.O.S.).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING:
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

PIPE ENDS TO BE JOINED BY SITE WELDING TO BE ALIGNED AND REFORMED USING AN APPROPRIATE PIPE CHAIN CLAMP AND SPIDER JACKS TO ENSURE ACCEPTABLE QUALITY TOLERANCES.

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES

NOTE 'A':
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7010.

NOTE 'B':
Ø8 x 3 mm DEEP HOLE ON Ø2096 PCD FOR 1800 NB THRUST COLLAR (Ø870 PCD FOR 700 NB FLANGE) ON TOP AND BOTTOM DEAD CENTRE ON GASKET SIDE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

NOTE 'C':
WELDING IN THIS AREA TO BE DRESSED FLUSH FOR PIPE COUPLING.

24	MANHOLE COVER TO SUIT 1800 NB PIPE		
MATL.:	MILD & ST. STEEL	MASS:	285 kg ea.
NO. OFF:	15	SCALE:	1:10

27	STRAIGHT PIPE (AS SHOWN)		
MATL.:	MILD & ST. STEEL	MASS:	2110 kg ea.
NO. OFF:	3	SCALE:	1:30

NOTE 'D'
REFER TO DETAIL 'W' AS PER ITEM 28

28	STRAIGHT PIPE (OPP. HAND)		
MATL.:	MILD & ST. STEEL	MASS:	2110 kg ea.
NO. OFF:	2	SCALE:	1:30

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 μm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 μm DFT) OVER INDICATED AREA MARKED 'P' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 μm DFT).
- PUDDLE AND THRUST COLLAR COATING: TWO PACK EPOXY (300 μm DFT).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 μm DFT).
- AREA 270 mm FROM PIPE ENDS MARKED 'Q' ON DETAIL TO BE UNCOATED (U.O.S).

SCALE (mm)

PROJECTION

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

J.J THERON
J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS

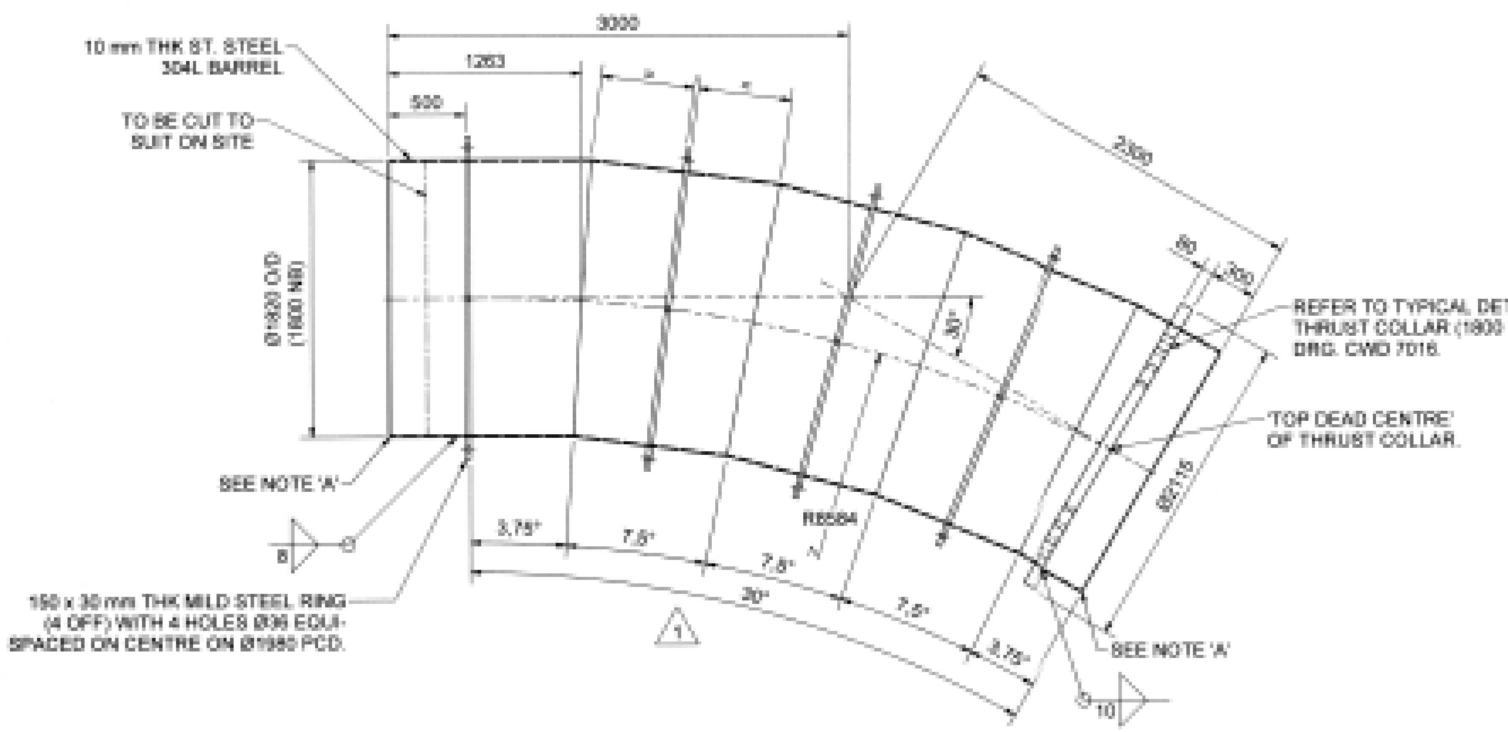
PIPES & SPECIALS

-DETAILS-

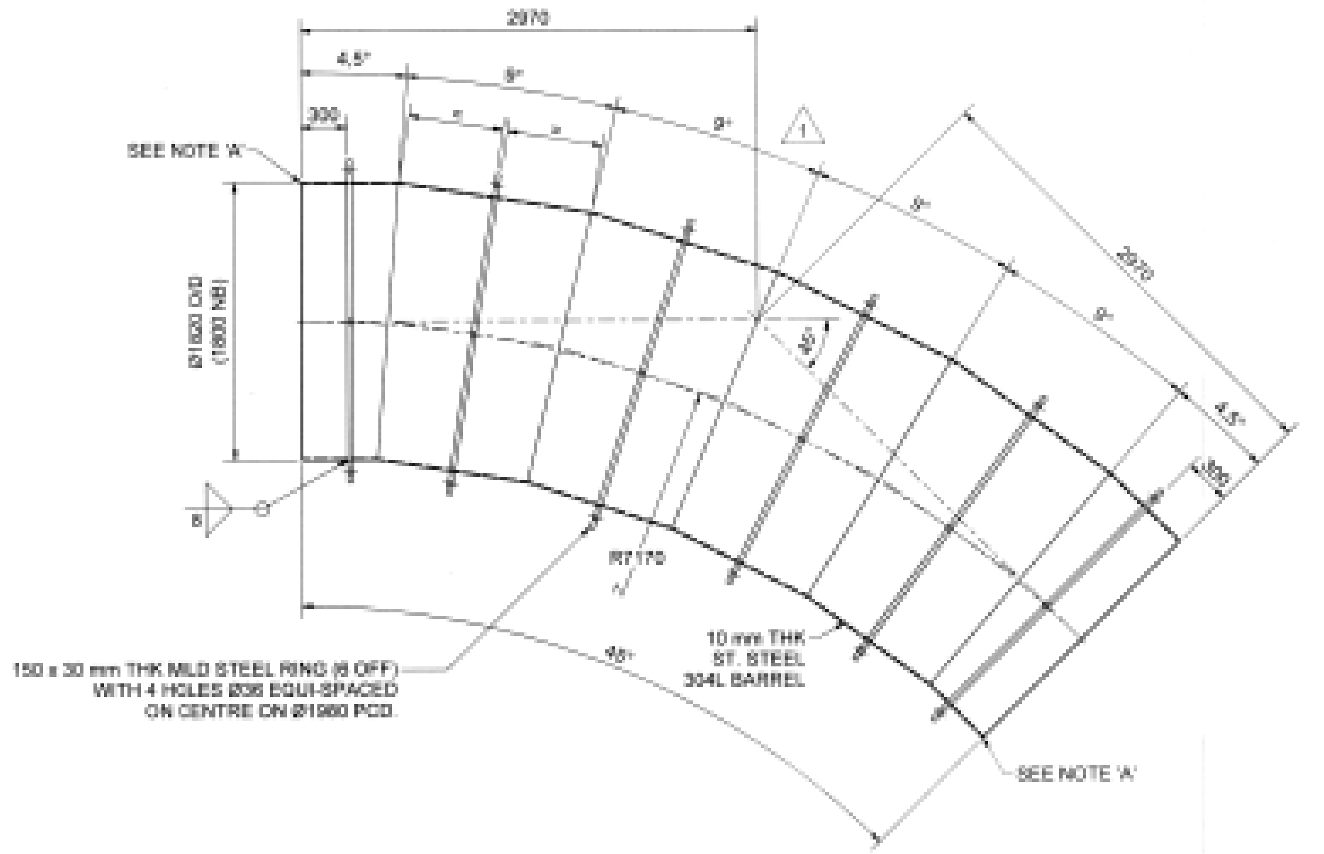
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | CWD 7019

SHEET 20 | 169337/13 ME | 1

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | REMOVE ALL SHARP EDGES



30	30° BEND		
MAT'L	MILD & ST. STEEL	MASS	2700 kg ea.
NO. OFF	2	SCALE	1:25



31	45° BEND		
MAT'L	MILD & ST. STEEL	MASS	3862 kg ea.
NO. OFF	2	SCALE	1:25

NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'X' ON DRG. CWD 7010.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED (IN ACCORDANCE WITH ASME IX) FOR PIPE WELDING FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

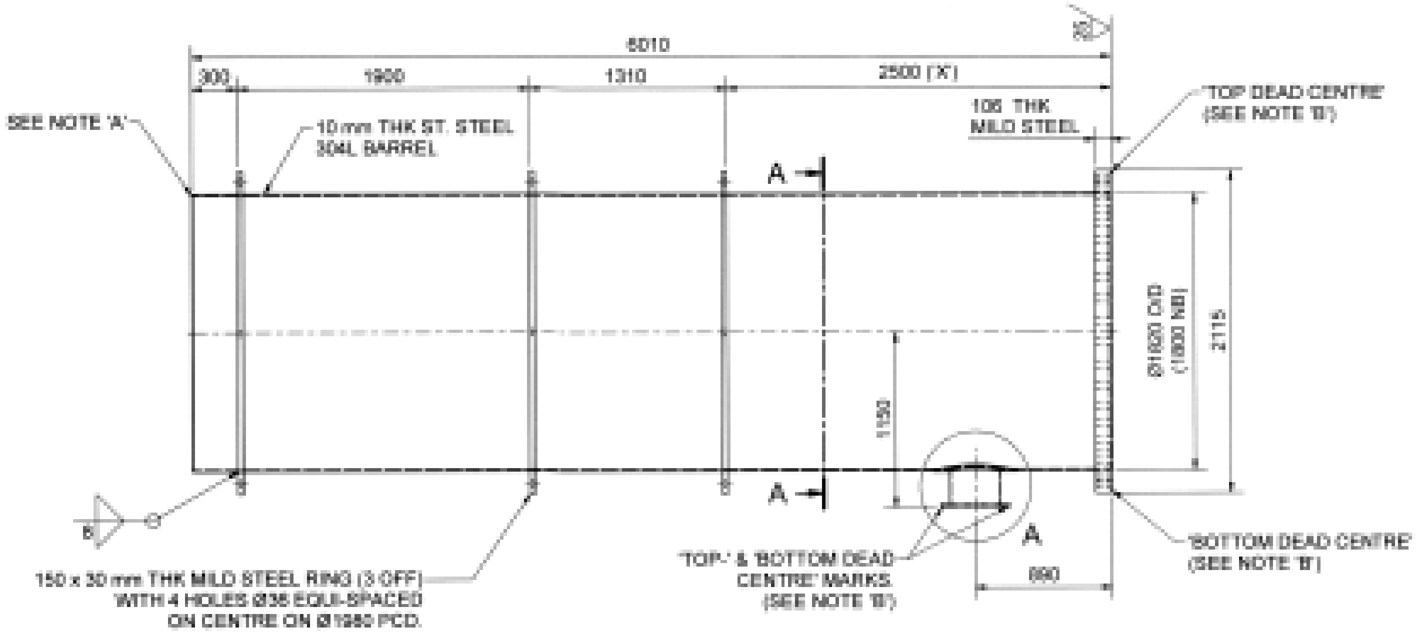
FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.
- HOLES IN THRUST COLLAR AND FLANGE TO ALLIGN PRECISELY.

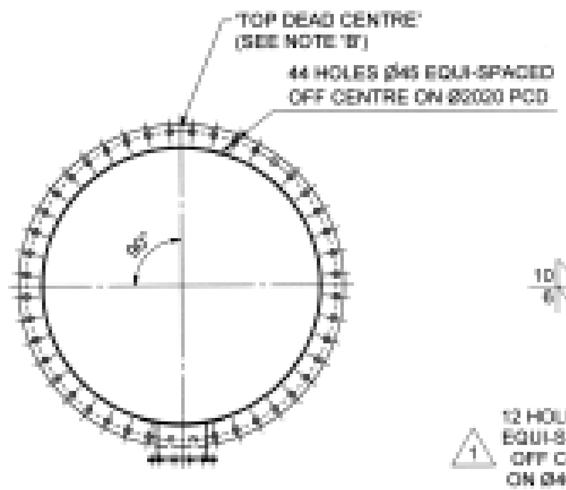
MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS AND RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

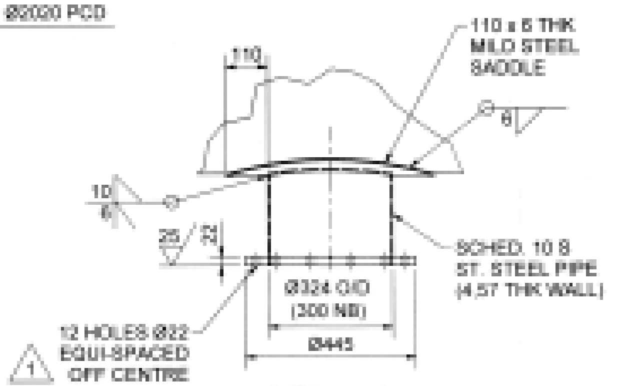
TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL)
'X' = SURFACE ROUGHNESS IN MICROMETRES





SECTION A-A
SCALE 1 : 25



DETAIL A
SCALE 1 : 10

NOTE 'B'
Ø6 x 3 mm DEEP HOLE ON Ø2090 PCD FOR 1800 NB FLANGE (Ø430 PCD FOR 300 NB FLANGE) ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET SIDE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

32	STRAIGHT PIPE		
MAT'L	MILD & ST. STEEL	MASS	4115 kg ea.
NO. OFF	4	SCALE	1:25

NOTE: PIPE ENDS TO BE JOINED BY SITE WELDING TO BE PROVIDED WITH APPROPRIATE SPIDER JACKS TO ENSURE ACCEPTABLE OVALITY TOLERANCES. ADJACENT PIPE ENDS TO BE JOINED BY SITE WELDING TO BE ALIGNED AND REFORMED USING AN APPROPRIATE PIPE CHAIN CLAMPING PRIOR TO SITE WELDING.

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

THE OVALITY TOLERANCE OF PIPE I/D AT PIPE ENDS SHALL BE ±1,8 mm (FOR 1800 NB) AND +2,4 -0,8 (FOR 1800 NB) ALL AROUND THE CIRCUMFERENCE OVER 150 mm DISTANCE FROM PIPE ENDS.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 μm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 μm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL.)
- PIPE LINING: APPLY TWO PACK EPOXY (250 μm DFT).
- PUDDLE AND THRUST COLLAR COATING: TWO PACK EPOXY (300 μm DFT).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 μm DFT)
- AREA 270 mm FROM UNFLANGED PIPE ENDS TO BE UNCOATED (U.O.S)

SCALE (mm)

PROJECTION (U.O.S)

REVISION

REV No.	DATE	DESCRIPTION	TDR	DWA
0	03/15	ISSUED FOR CONSTRUCTION		
1	08/15	ITEM 30: NUMBER OF SEGMENTS INCREASED FROM 4 TO 5. ITEM 31: NUMBER OF SEGMENTS INCREASED FROM 5 TO 6. ITEM 32: 300 NB FLANGE DRILLING INDICATED.		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
DIRECTOR GENERAL

DESIGN: J.J THERON
DRAWN: J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

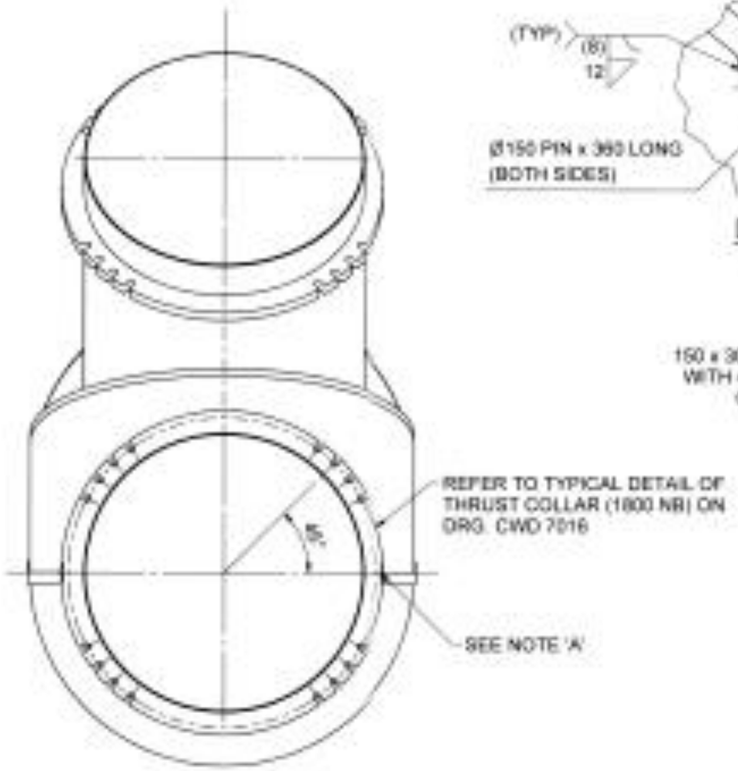
OUTLET WORKS
PIPES & SPECIALS
-DETAILS-

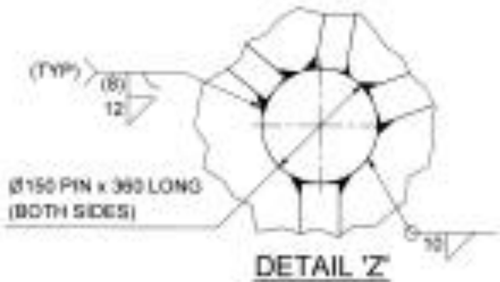
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | CWD 7020
CALCULATION FILE: ME/E100-02
SHEET 21
169338/13 ME
REV 1

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | REMOVE ALL SHARP EDGES

ISOMETRIC VIEW

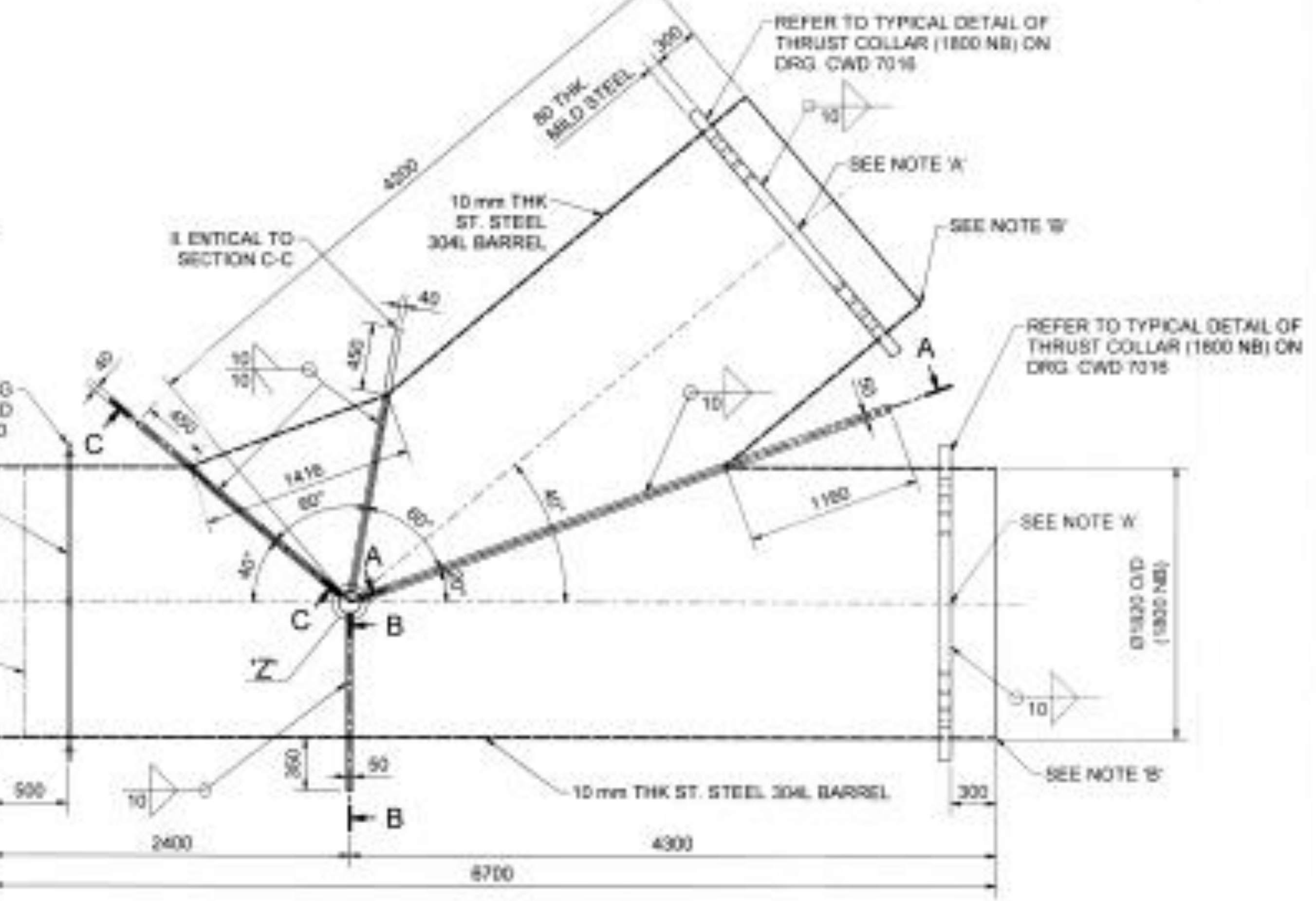
SCALE 1 : 40

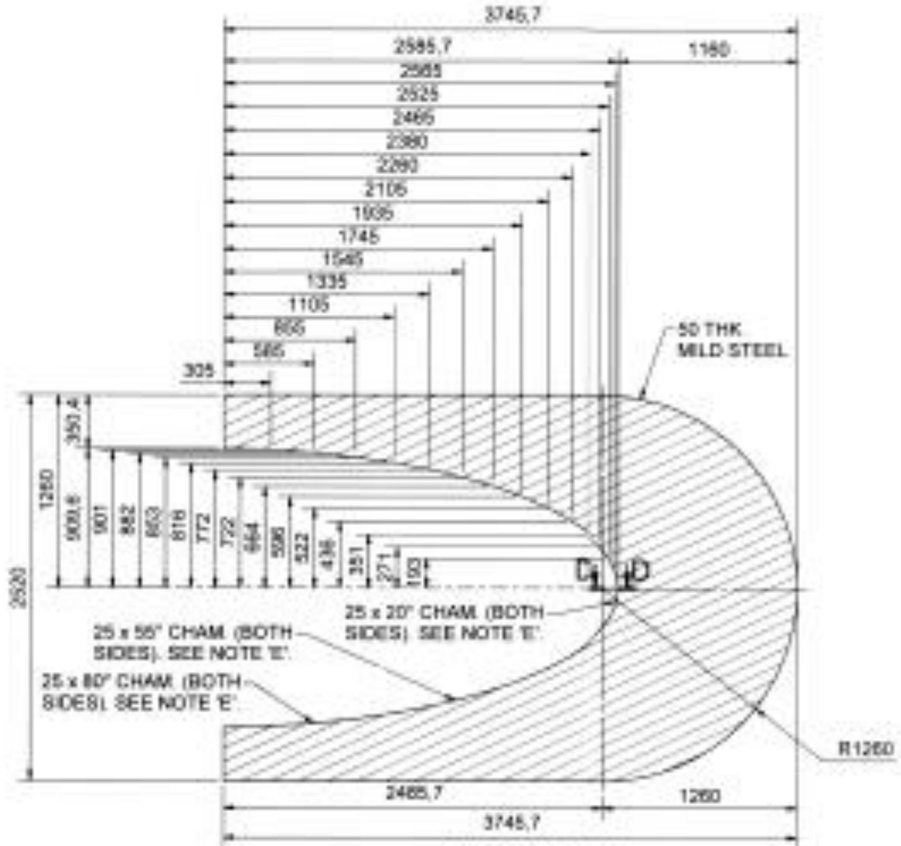




DETAIL 'Z'

SCALE 1 : 5

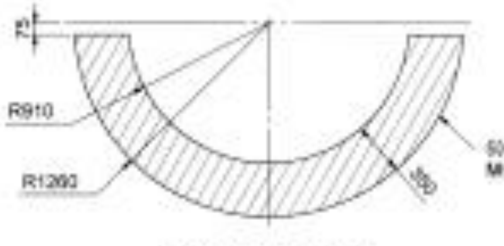




SECTION A-A

REINFORCING PLATE DEVELOPMENT

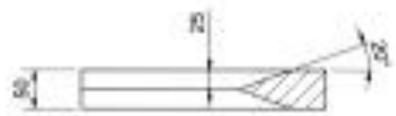
SCALE 1 : 25



SECTION B-B

REINFORCING PLATE DEVELOPMENT

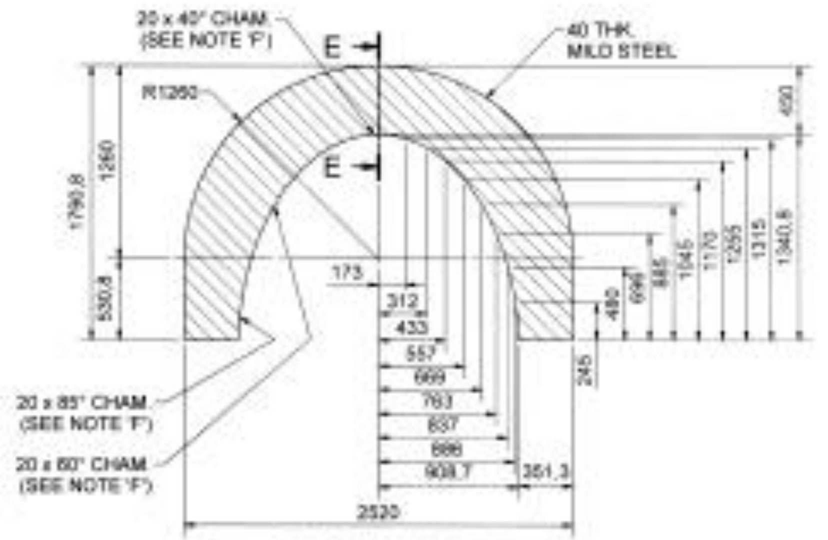
SCALE 1 : 25



SECTION D-D

CHAMFER PREPARATION

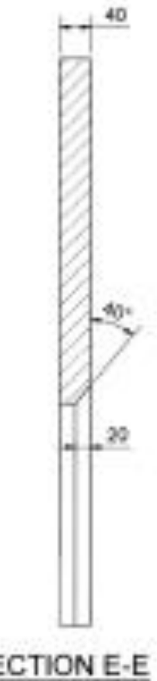
SCALE 1 : 5



SECTION C-C

REINFORCING PLATE DEVELOPMENT

SCALE 1 : 25



SECTION E-E

CHAMFER ORIENTATION

SCALE 1 : 5

NOTE 'A':
2Ø6 x 3 mm DEEP HOLE ON Ø2080 PCD ON TOP AND BOTTOM DEAD CENTRE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION)

NOTE 'B':
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7010.

NOTE 'C':
MARK (USING A PUNCH) THE 'TOP' / & 'BOTTOM DEAD CENTRE' OF THE PIPE ON THE 10mm THK. WALL FACE.

NOTE 'D':
PERFORM THE REQUIRED WELD PREPERATION ON THE REINFORCING PLATES.

NOTE 'E':
CHAMFER TOP & BOTTOM EDGE TO SUIT THE PIPE CURVATURE. THE CHAMFER GRADUALLY CHANGES FROM 20° TO 80° AS SHOWN ON SECTION A-A

NOTE 'F':
CHAMFER ONE EDGE TO SUIT THE PIPE CURVATURE. THE CHAMFER GRADUALLY CHANGES FROM 40° TO 80° AS SHOWN ON SECTION C-C.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

FLANGES:
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.
- HOLES IN THRUST COLLAR AND FLANGE TO ALLIGN PRECISELY.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS AND RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

NOTE: ADJACENT PIPE ENDS TO BE JOINED BY SITE WELDING TO BE ALIGNED AND REFORMED USING AN APPROPRIATE PIPE CHAIN CLAMP PRIOR TO SITE WELDING AND APPROPRIATE SPIDER JACKS TO BE USED TO ENSURE ACCEPTABLE OVALITY TOLERANCES.

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0.3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0.5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0.8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

THE OVALITY TOLERANCE OF PIPE I/D AT PIPE ENDS SHALL BE ±1,6 mm (FOR 1800 NB) AND +2,4 -0,8 (FOR 1000 NB) ALL AROUND THE CIRCUMFERENCE OVER 150 mm DISTANCE FROM PIPE ENDS.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT)
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT)
- PUDDLE AND THRUST COLLAR COATING: TWO PACK EPOXY (300 µm DFT)
- AREA 270 mm FROM UNFLANGED PIPE ENDS TO BE UNCOATED (U.O.S)

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

SCALE (mm)

PROJECTION (U.O.S)

ALL DIMENSIONS IN MILLIMETRES

DO NOT SCALE DRAWING

REMOVE ALL SHARP EDGES

REVISION

No.	DATE	DESCRIPTION
0	03/15	ISSUED FOR CONSTRUCTION
1	08/15	NAME CHANGED TO '40' BRANCH PIPE'

(33)	40° BRANCH PIPE		
MAT'L	MILD & ST. STEEL	MASS	9215 kg ea
NO. OFF	2	SCALE	1:25

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

DESIGN: J.J THERON
DRAWN: J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

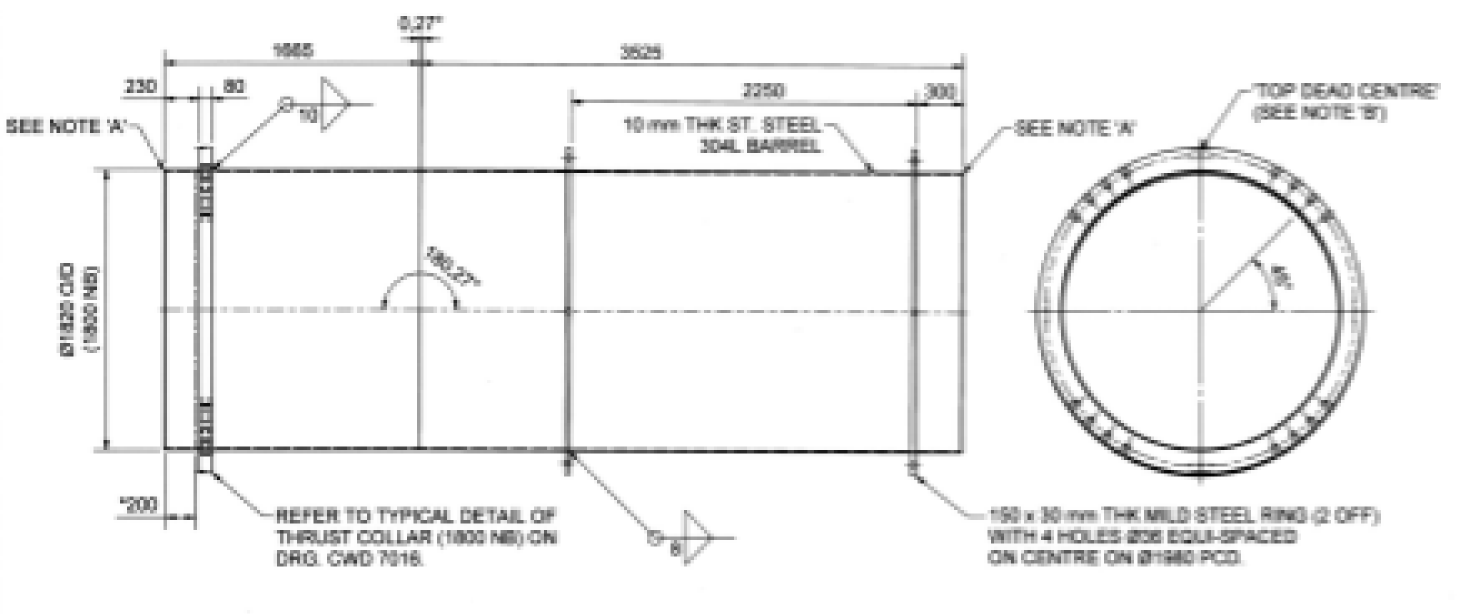
OUTLET WORKS

PIPES & SPECIALS

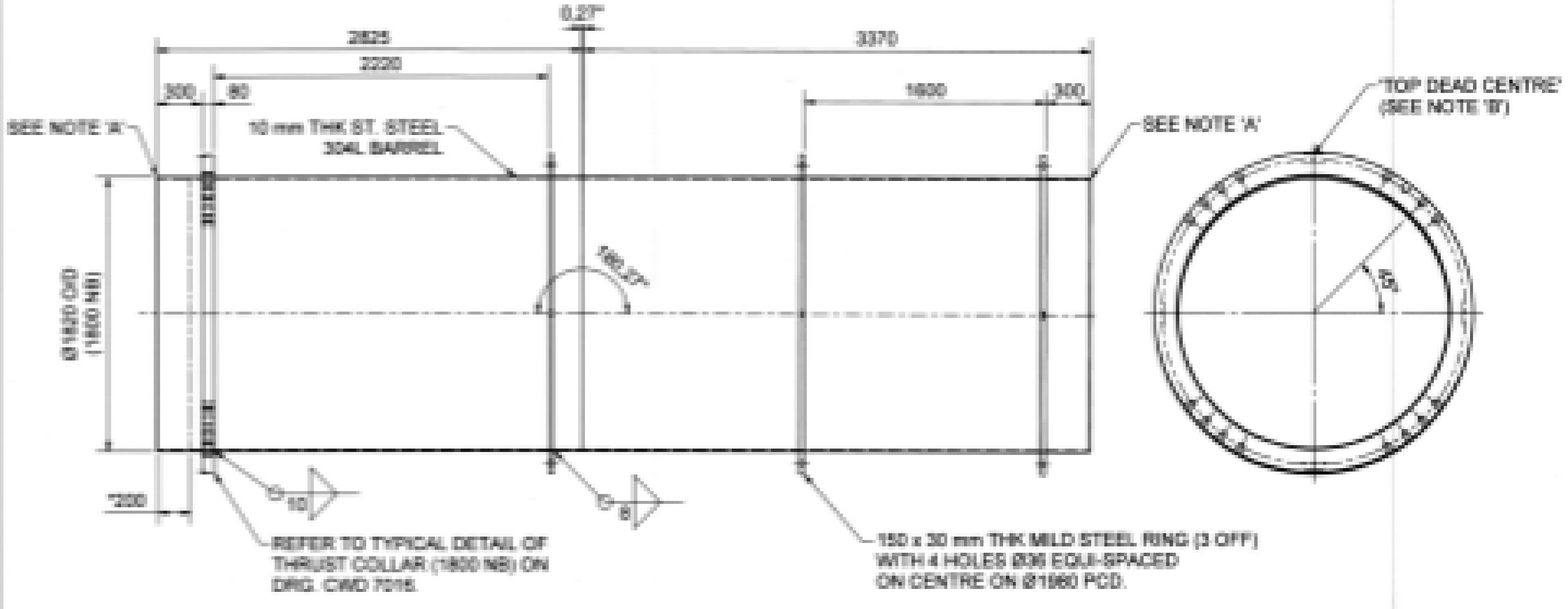
-DETAILS-

PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | OTHER NUMBER: CWD 7021

SHEET: 22 | DRG No.: 169339/13 ME | REV: 1



34	ANGLED PIPE (0,27°)		
MATL.:	MILD & ST. STEEL	MASS:	3340 kg
NO. OFF:	1	SCALE:	1:25



35	ANGLED PIPE (0,27°)		
MATL.:	MILD & ST. STEEL	MASS:	4015 kg
NO. OFF:	1	SCALE:	1:25

NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7010.

NOTE 'B'
Ø6 x 3 mm DEEP HOLE ON Ø2090 PCD FOR 1800 NB THRUST COLLAR (Ø1205 PCD FOR 1000 NB THRUST COLLAR) ON TOP AND BOTTOM DEAD CENTRE ON OUTER FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

NOTE 'C'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7013.

NOTE 'D'
WELDING TO BE DRESSED FLUSH IN THE AREAS WHERE DIMENSIONS ARE DESIGNATED WITH AN ASTERIX ("*") FOR FITMENT OF PIPE COUPLINGS.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS SHALL ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

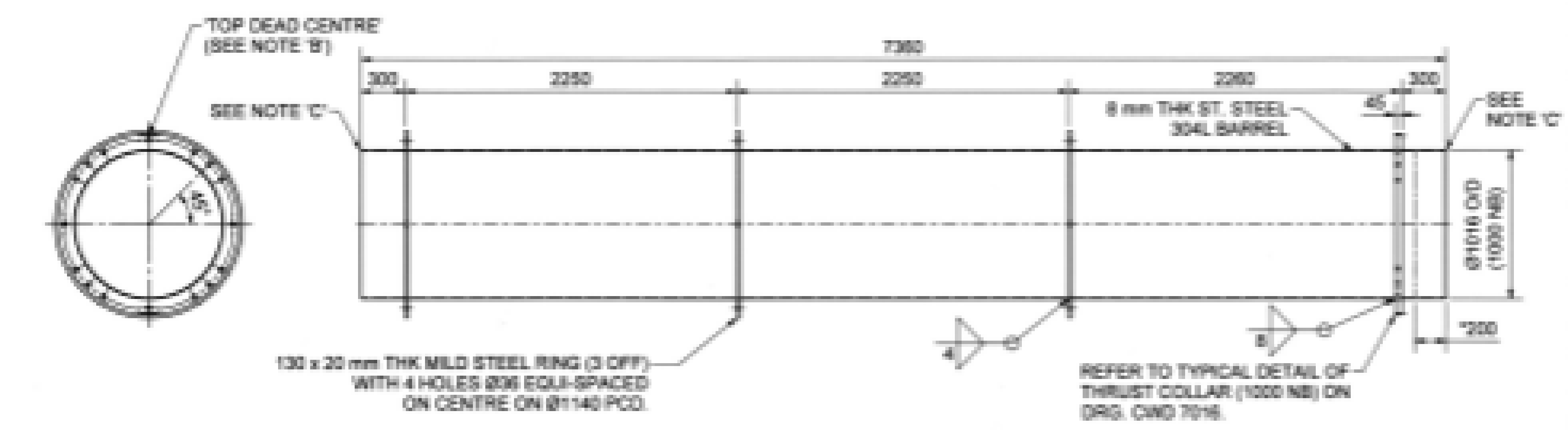
FLANGES:
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/19.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, AND RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

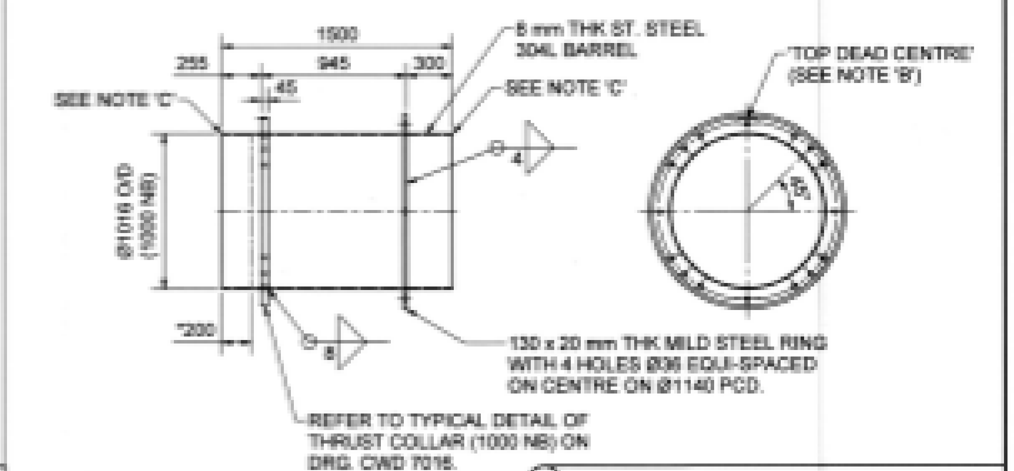
PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

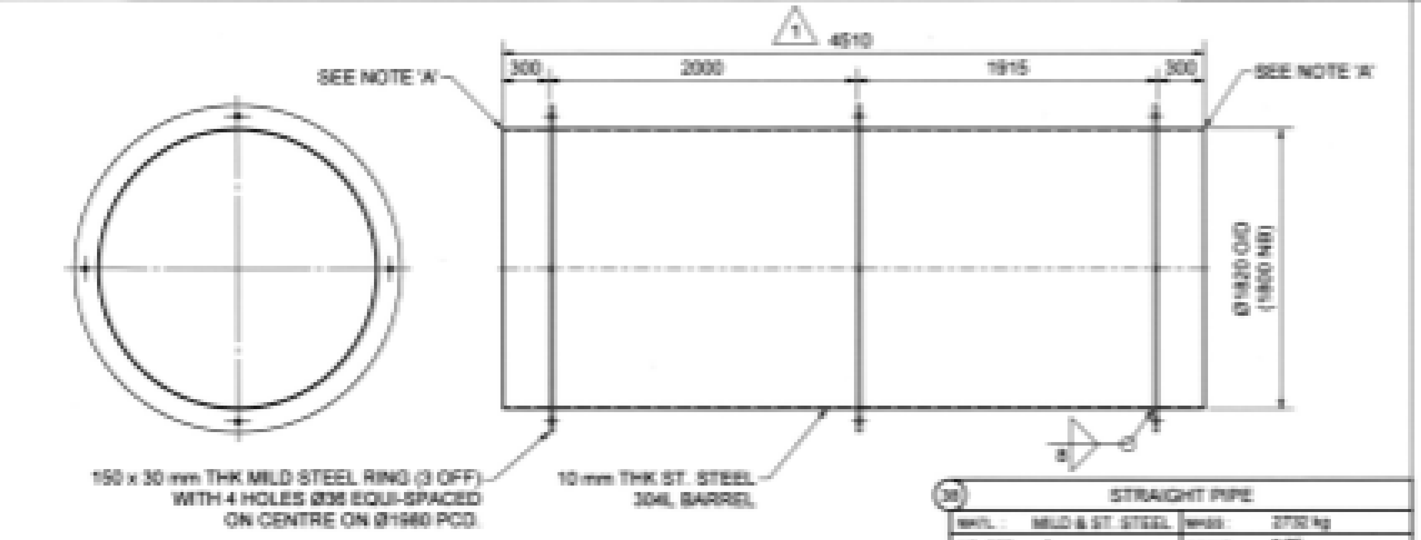
NOTE: ADJACENT PIPE ENDS TO BE JOINED BY SITE WELDING TO BE ALIGNED AND REFORMED USING AN APPROPRIATE PIPE CHAIN CLAMP PRIOR TO SITE WELDING AND APPROPRIATE SPIDER JACKS TO BE USED TO ENSURE ACCEPTABLE OVALITY TOLERANCES.



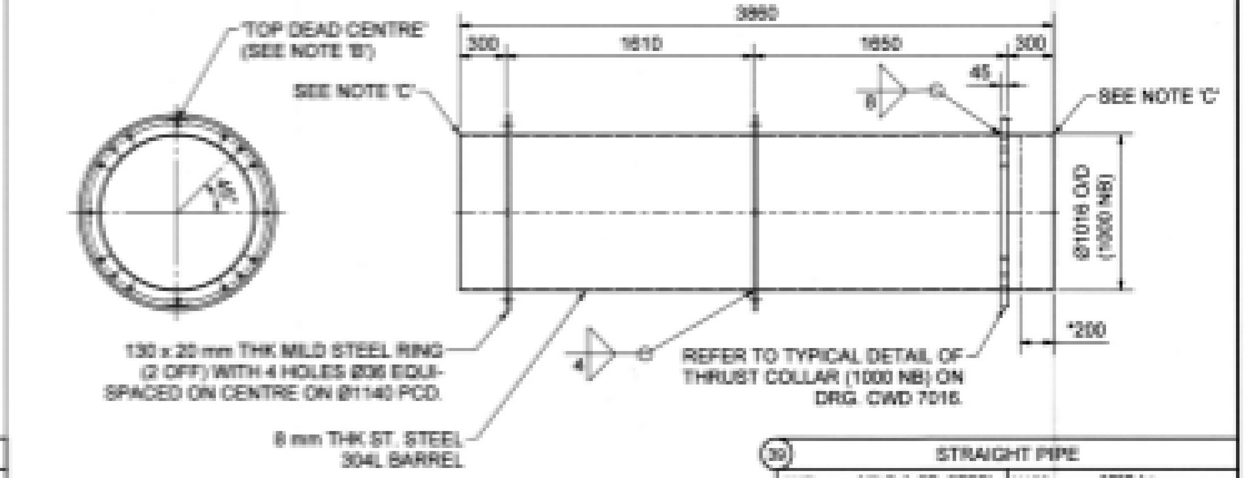
36	STRAIGHT PIPE		
MATL.:	MILD & ST. STEEL	MASS:	1840 kg
NO. OFF:	1	SCALE:	1:25



37	STRAIGHT PIPE		
MATL.:	MILD & ST. STEEL	MASS:	505 kg ea.
NO. OFF:	2	SCALE:	1:25



38	STRAIGHT PIPE		
MATL.:	MILD & ST. STEEL	MASS:	2732 kg
NO. OFF:	1	SCALE:	1:25



39	STRAIGHT PIPE		
MATL.:	MILD & ST. STEEL	MASS:	1056 kg
NO. OFF:	1	SCALE:	1:25

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

THE OVALITY TOLERANCE OF PIPE I/D AT PIPE ENDS SHALL BE ±1,8 mm (FOR 1800 NB) AND +2,4 -0,8 (FOR 1000 NB) ALL AROUND THE CIRCUMFERENCE OVER 150 mm DISTANCE FROM PIPE ENDS.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 8900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE AND THRUST COLLAR COATING: TWO PACK EPOXY (300 µm DFT)
- AREA 270 mm FROM UNFLANGED PIPE ENDS TO BE UNCOATED (U.O.S)

SCALE (mm)

PROJECTION (U.O.S)

REVISION

REV No.	DATE	DESCRIPTION	FOR	DRN
0	08/16	ISSUED FOR CONSTRUCTION		
1	10/16	ITEM 38 LENGTH CHANGED FROM 4895 mm TO 4510 mm		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

DESIGN: J.J THEON
DRAWN: J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

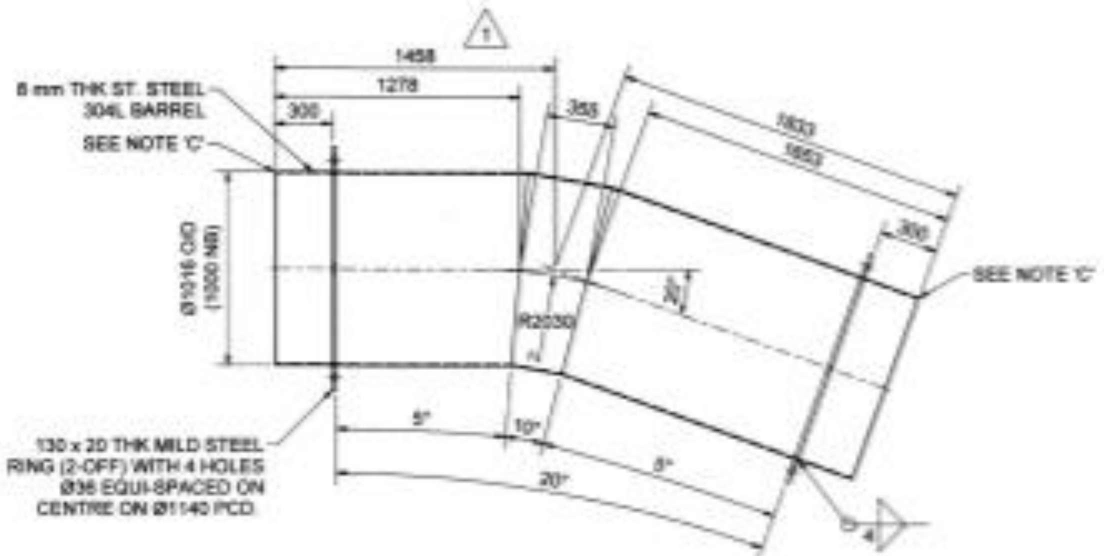
OUTLET WORKS

PIPES & SPECIALS
-DETAIL-

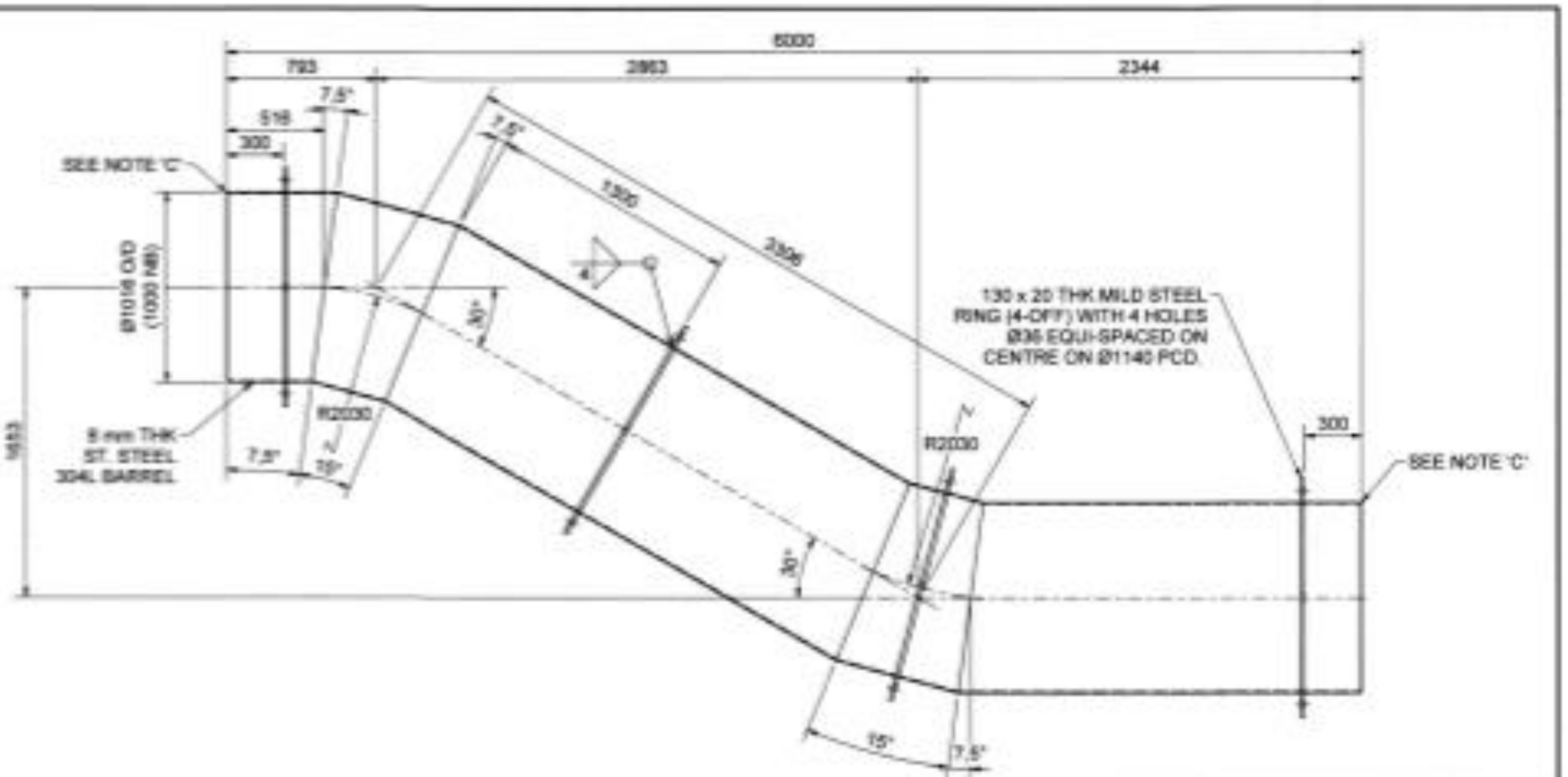
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | REFERENCE: DUW PIP DET | OTHER NUMBER: CWD 7022

SHEET 23 | 169340/13 ME | REV 1

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | REMOVE ALL SHARP EDGES



(45)	20° BEND		
MAT'L	MILD & ST. STEEL	MASS	814 kg
NO. OFF	1	SCALE	1:20



(46)	30° DOUBLE BEND		
MAT'L	MILD & ST. STEEL	MASS	1595 kg
NO. OFF	1	SCALE	1:20

NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7010.

NOTE 'B'
Ø8 x 3 mm DEEP HOLE ON Ø2096 PCD FOR 1800 NB THRUST COLLAR (Ø1226 PCD FOR 1000 NB THRUST COLLAR) ON TOP AND BOTTOM DEAD CENTRE ON OUTER FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

NOTE 'C'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7013.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 808 TYPE 8.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

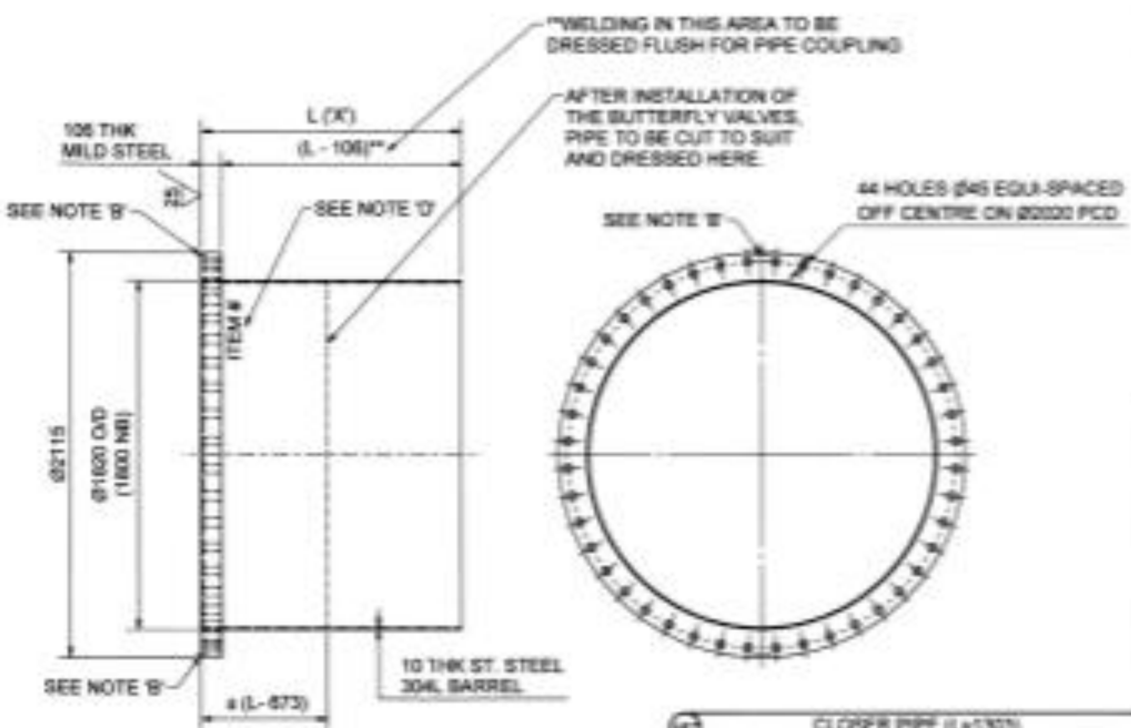
MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS AND RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

NOTE: ADJACENT PIPE ENDS TO BE JOINED BY SITE WELDING TO BE ALIGNED AND REFORMED USING AN APPROPRIATE PIPE CHAIN CLAMP PRIOR TO SITE WELDING AND APPROPRIATE SPIDER JACKS TO BE USED TO ENSURE ACCEPTABLE OVALITY TOLERANCES.

SURFACE FINISH (REMOVAL OF MATERIAL)
X = SURFACE ROUGHNESS IN MICROMETRES.



(167)	CLOSER PIPE (L=1303)		
MAT'L	MILD & ST. STEEL	MASS	1291 kg ea.
NO. OFF	7	SCALE	1:20
(47)	**CLOSER PIPE (L=1486)**		
MAT'L	MILD & ST. STEEL	MASS	1375 kg ea.
NO. OFF	6	SCALE	1:20
(48)	**CLOSER PIPE (L=1356)**		
MAT'L	MILD & ST. STEEL	MASS	1315 kg ea.
NO. OFF	4	SCALE	1:20

NOTE 'D'
ITEM NUMBER TO BE WELDED WITHIN AREA 80 mm FROM FLANGE AS SHOWN (AT TOP & BOTTOM).

(49)	STRAIGHT PIPE		
MAT'L	MILD & ST. STEEL	MASS	1818 kg ea.
NO. OFF	2	SCALE	1:25

(50)	STRAIGHT PIPE		
MAT'L	MILD & ST. STEEL	MASS	3190 kg ea.
NO. OFF	2	SCALE	1:30

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm

THE OVALITY TOLERANCE OF PIPE I/D AT PIPE ENDS SHALL BE ±1,8 mm (FOR 1800 NB) AND +2,4 -0,8 (FOR 1000 NB) ALL AROUND THE CIRCUMFERENCE OVER 150 mm DISTANCE FROM PIPE ENDS.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 2 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9980.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT). (**PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 210 mm FROM PIPE ENDS TO BE UNCOATED. (THIS EXCLUDES ENDS WITH FLANGES, ONLY OPEN ENDED PIPES, EXCEPT ITEM 47, 48 & 167).
- FLANGE FACE: APPLY TWO PACK EPOXY (80 - 90 µm DFT).

SCALE (mm)

PROJECTION (UCS)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | REMOVE ALL SHARP EDGES

REVISION: ISSUED FOR CONSTRUCTION; ITEM 48 NO. OFF REDUCED FROM 11 TO 4 & ITEM 167 ADDED. POSITION OF DIMENSIONS CHANGED ON ITEM 48.

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

DESIGN: J.J THERON
DRAWN: J.J THERON

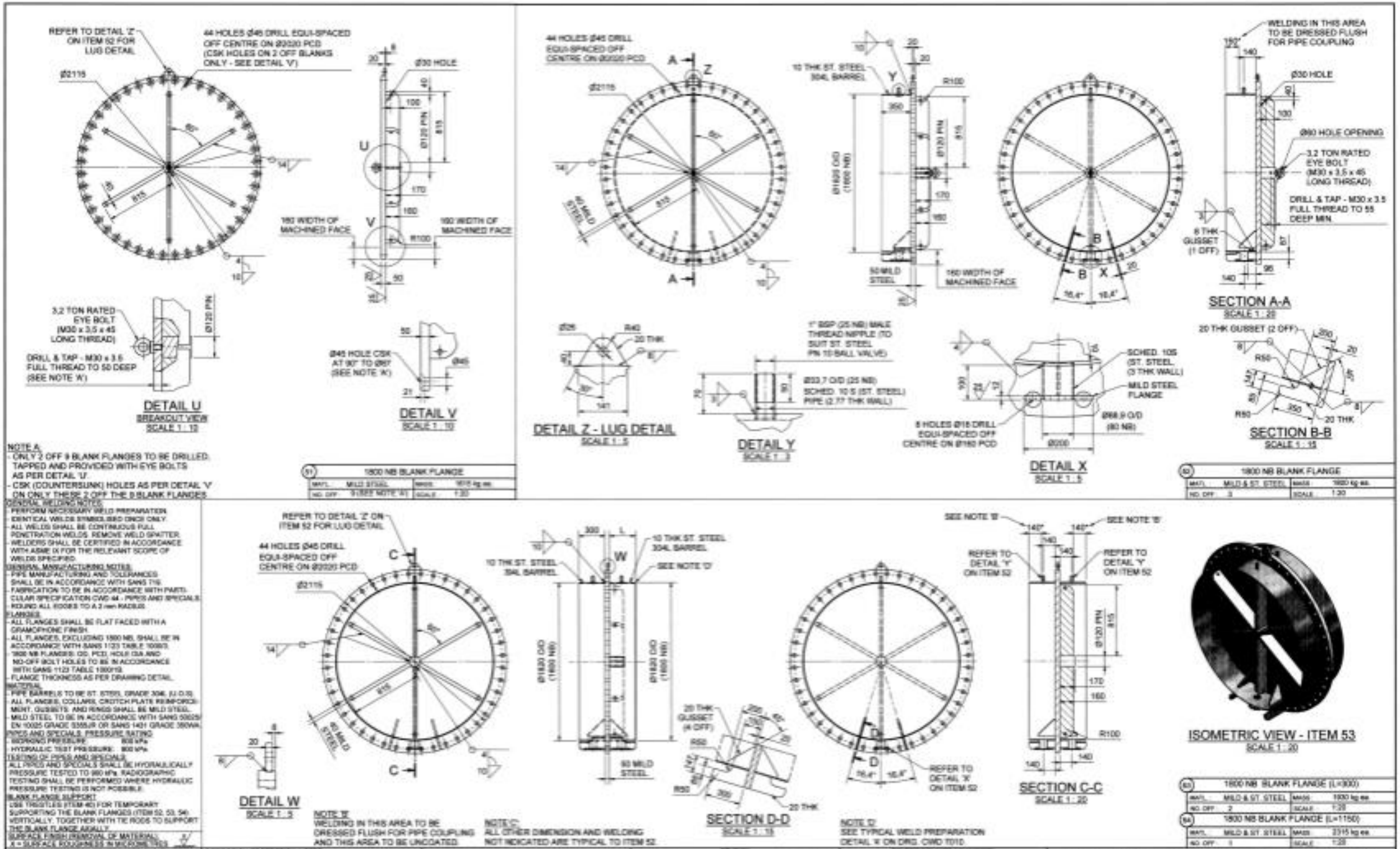
OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS
PIPES & SPECIALS
-DETAILS-

PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | CWD 7023

SHEET 24 | 169341/13 ME | REV 1



NOTE A:
- ONLY 2 OFF 9 BLANK FLANGES TO BE DRILLED, TAPPED AND PROVIDED WITH EYE BOLTS AS PER DETAIL 'U'.
- CSK (COUNTERSUNK) HOLES AS PER DETAIL 'V' ON ONLY THESE 2 OFF THE 9 BLANK FLANGES.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

GENERAL MANUFACTURING NOTES:
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/10.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L (U.O.S).
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, AND RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 800 kPa
- HYDRAULIC TEST PRESSURE: 800 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 980 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

BLANK FLANGE SUPPORT:
USE TRESTLES (ITEM 40) FOR TEMPORARY SUPPORTING THE BLANK FLANGES (ITEM 52, 53, 54) VERTICALLY, TOGETHER WITH TIE RODS TO SUPPORT THE BLANK FLANGE AXIALLY.

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICRONS (Ra)

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

NOTE 'B':
WELDING IN THIS AREA TO BE DRESSED FLUSH FOR PIPE COUPLING AND THIS AREA TO BE UNCOATED.

NOTE 'C':
ALL OTHER DIMENSION AND WELDING NOT INDICATED ARE TYPICAL TO ITEM 52.

NOTE 'D':
SEE TYPICAL WELD PREPARATION DETAIL 'K' ON DRG. CWD 7010

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STD SPECIFICATION DWS 0800.
- PIPE COATING: TWO PACK EPOXY (150 μm DFT) PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 μm DFT).
- PIPE LINING: TWO PACK EPOXY (250 μm DFT).
- BLANK FLANGE COATING: TWO PACK EPOXY (300 μm DFT) PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 μm DFT).
- AREA 140 mm FROM PIPE ENDS OF ITEM 53 AND 54 TO BE UNCOATED.
- FLANGE FACE: APPLY TWO PACK EPOXY (80 - 90 μm DFT).
- COAT "STORE IN A HORIZONTAL POSITION" NOTE CLEARLY ON BOTH FLANGE FACES.

PROJECTION (U.O.S.)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | REMOVE ALL SHARP EDGES

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

DESIGNED: J.J THERON
DRAWN: J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS

PIPES & SPECIALS

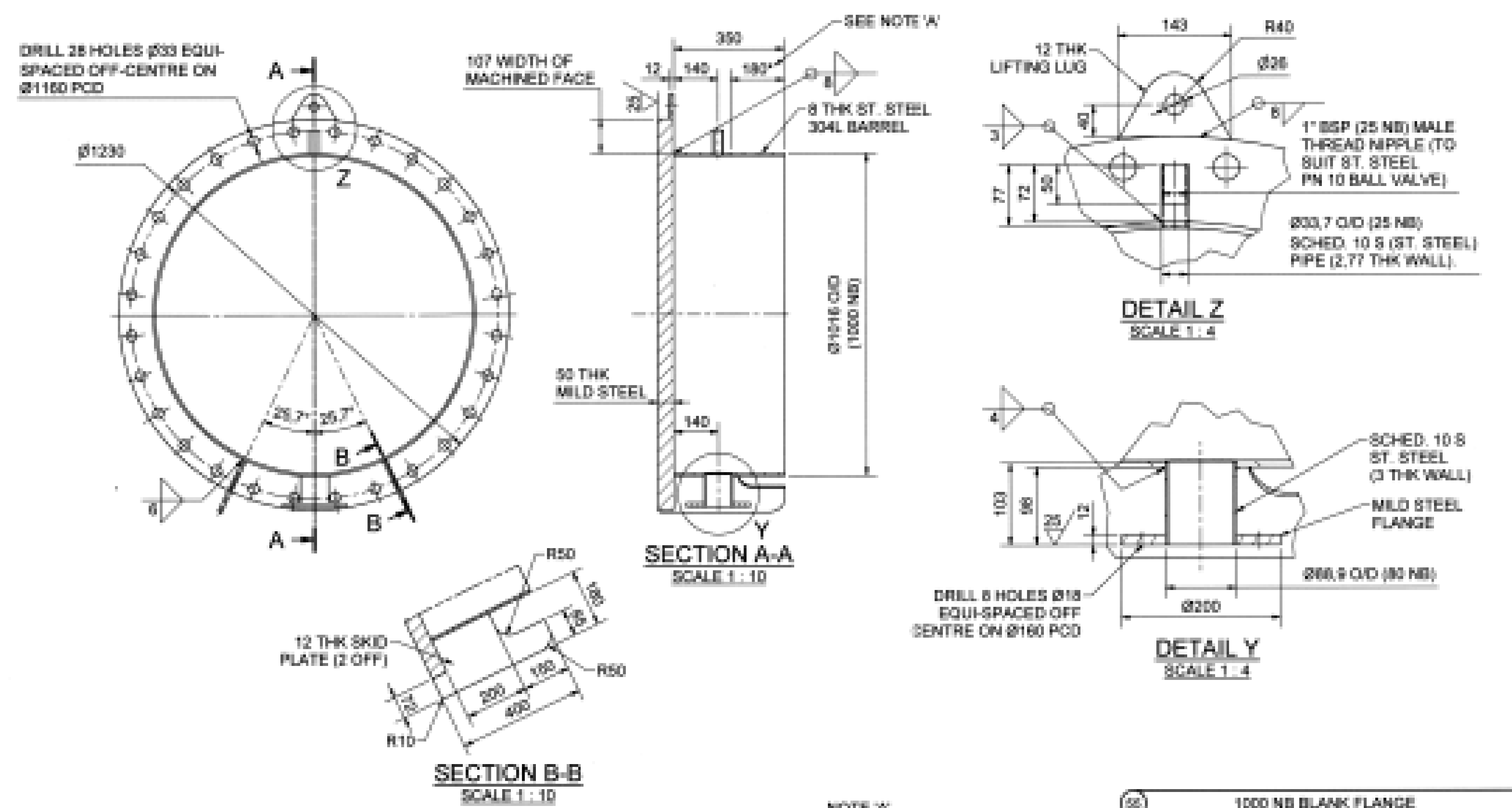
-DETAILS-

PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | DUW | PIP | PPS | DET | CWD 7004

LOCALITY No. E100-02

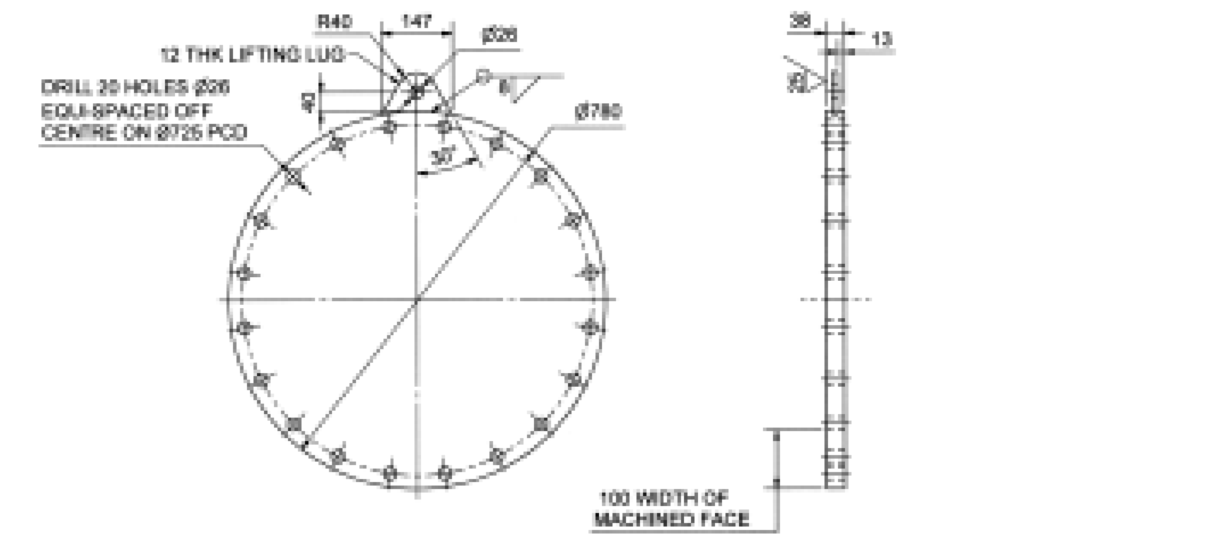
DW COMPUTER FILE: ME/E100-02

SHEET 25 | 169342/13 ME | 0

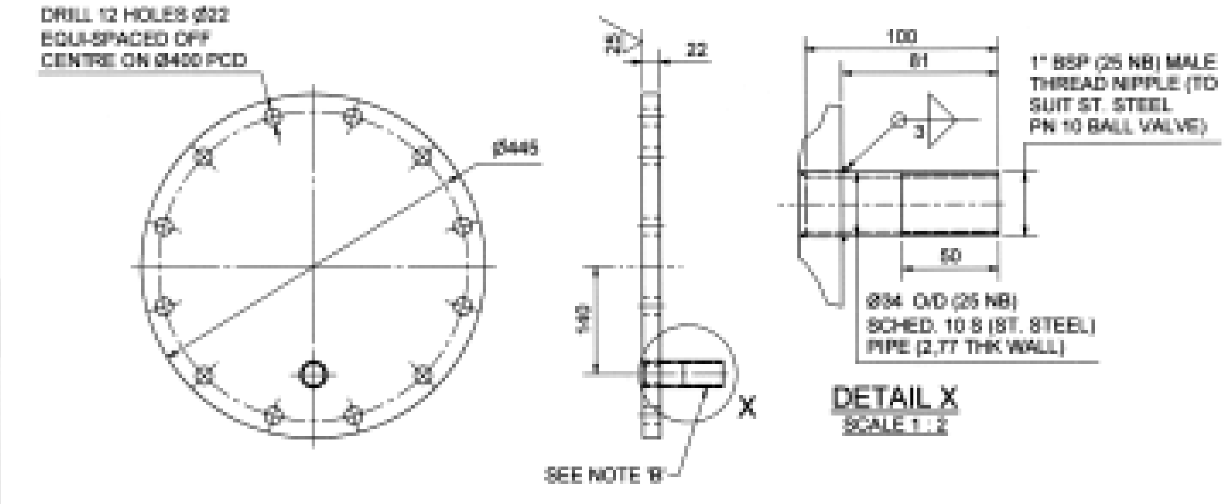


NOTE 'A'
WELDING IN THIS AREA TO BE DRESSED FLUSH FOR PIPE COUPLING

55	1000 NB BLANK FLANGE		
MAT'L :	MILD & ST. STEEL	MASS :	845 kg ea.
NO. OFF :	4	SCALE :	1:10



57	600 NB BLANK FLANGE		
MAT'L :	MILD STEEL	MASS :	140 kg ea.
NO. OFF :	1	SCALE :	1:8



NOTE 'B'
ONLY 2 OFF 12 BLANKS TO BE PROVIDED WITH 25 NB OFF TAKE AS PER DETAIL 'X'.

58	300 NB BLANK FLANGE		
MAT'L :	MILD & ST. STEEL	MASS :	26,2 kg ea.
NO. OFF :	12 (SEE NOTE 'B')	SCALE :	1:5

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

GENERAL MANUFACTURING NOTES:
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

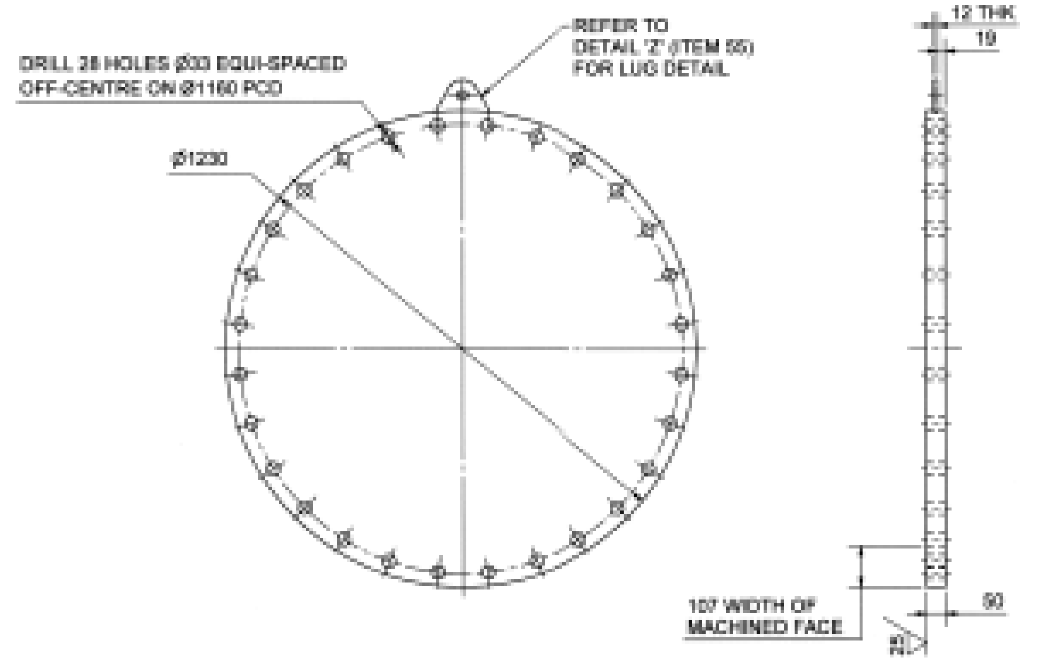
FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L (U.O.S).
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS AND RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

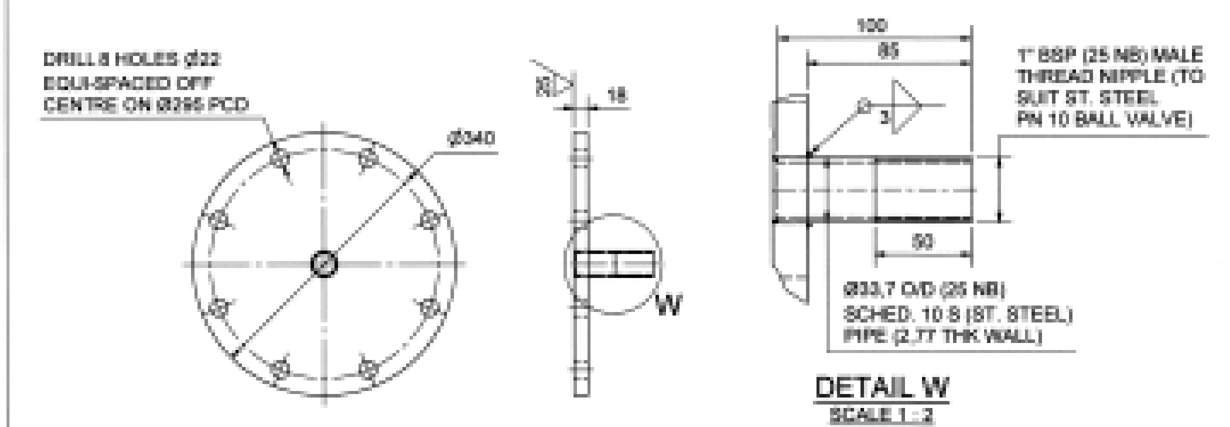
PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

BLANK FLANGE SUPPORT:
USE TRESTLES (ITEM 44) FOR TEMPORARY SUPPORTING THE BLANK FLANGE (ITEM 55) VERTICALLY, TOGETHER WITH TIE RODS TO SUPPORT THE BLANK FLANGE AXIALLY.



56	1000 NB BLANK FLANGE		
MAT'L :	MILD STEEL	MASS :	460 kg ea.
NO. OFF :	1	SCALE :	1:10



59	200 NB BLANK FLANGE		
MAT'L :	MILD & ST. STEEL	MASS :	12,5 kg ea.
NO. OFF :	16	SCALE :	1:5

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STD SPECIFICATION DWS 9900.
- BLANK FLANGE COATING: TWO PACK EPOXY (300 µm DFT) PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 µm DFT).
- FLANGE MACHINED SEALING FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES

SCALE (mm) 0 5 10 100

PROJECTION (U.O.S.)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | REMOVE ALL SHARPEDGES

REVISION

REV No	DATE	DESCRIPTION	FOR	CHKD
0	03/15	ISSUED FOR CONSTRUCTION		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
HEAD OFFICE MECH./ELEC. ENG. PRIVATE BAG X313 PRETORIA 0001
SEDIBENG BUILDING 185 FRANCIS BAARD STREET PRETORIA (012) 336 7500
Ms. M. DIEDRICKS DIRECTOR GENERAL

DESIGN: J.J THERON
DRAWN: J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

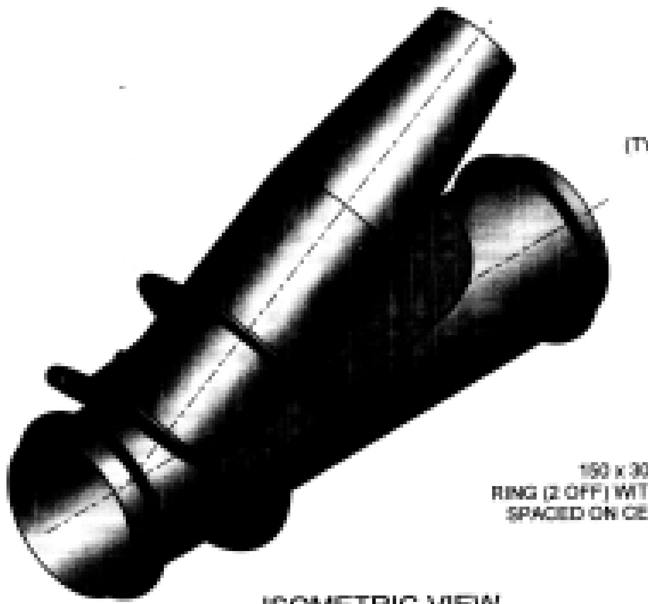
RAISING OF CLANWILLIAM DAM

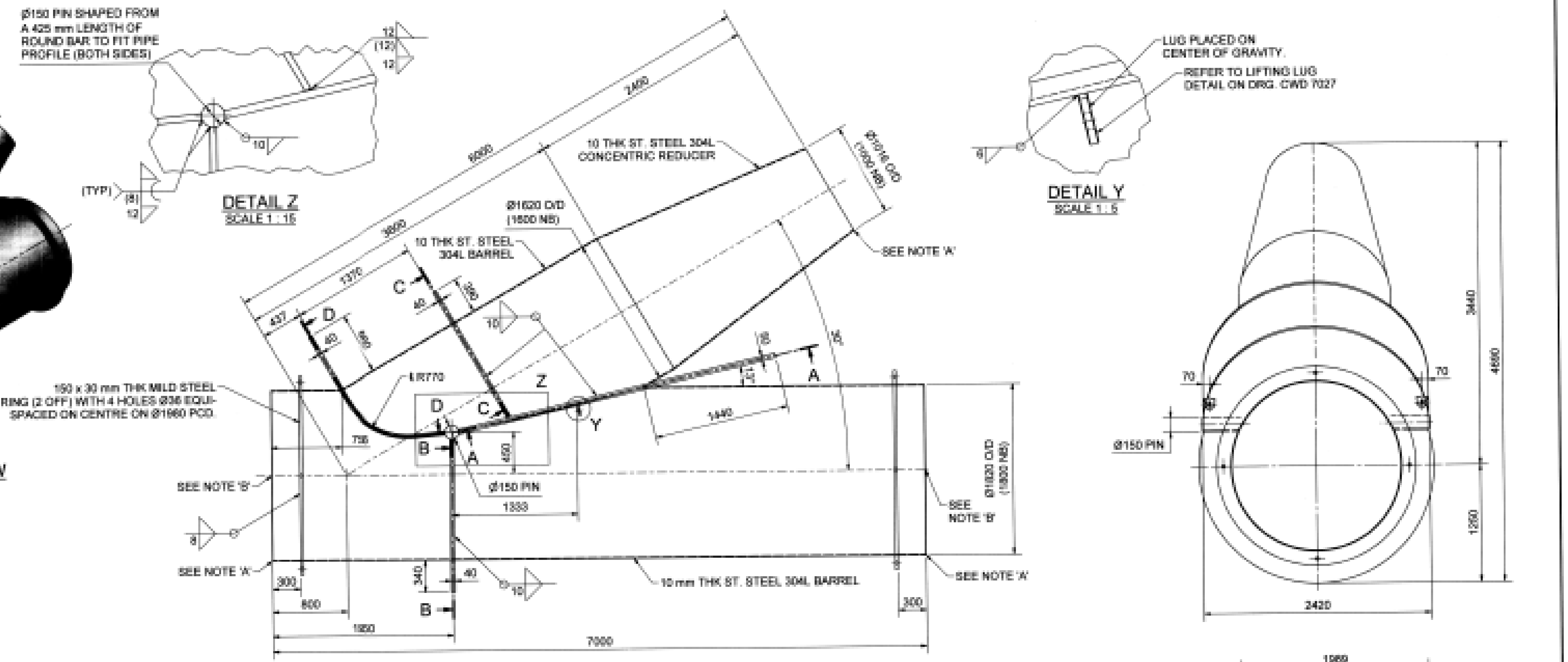
OUTLET WORKS
PIPES & SPECIAL
-DETAILS-

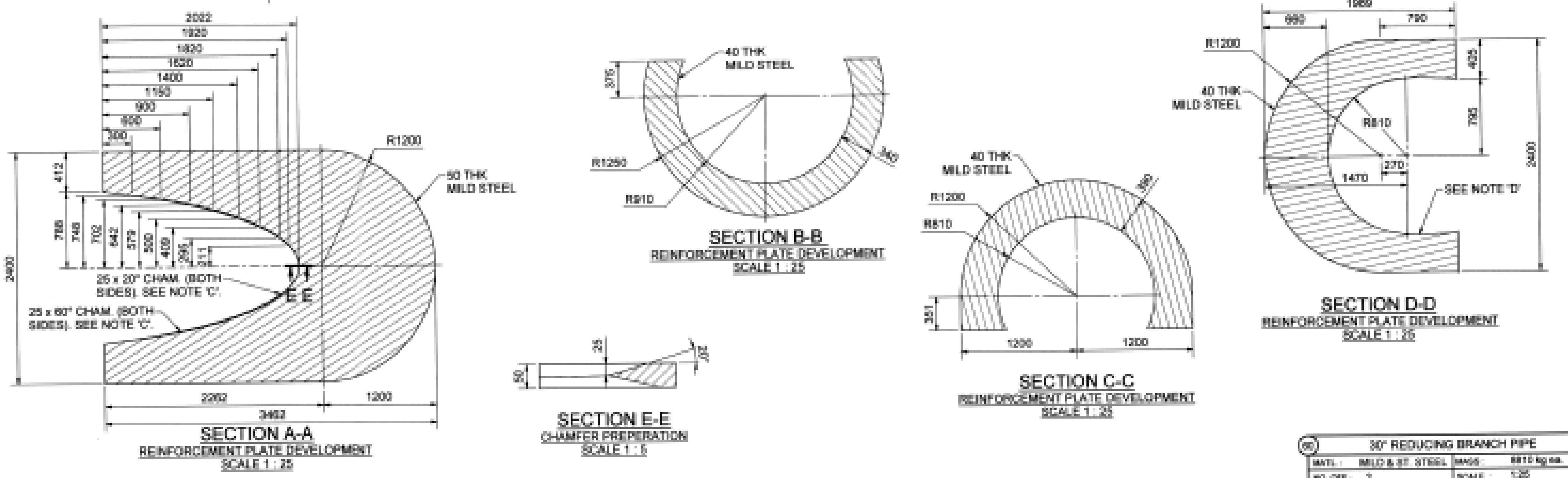
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | KEYCODES: DLW PIP PPB DET | OTHER NUMBER: CWD 1025

SHEET: 26 | DRAWING: 169343/13 ME | REV: 0

30.05.2014







NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7010.

NOTE 'B'
MARK (USING A PUNCH) THE 'TOP' / & 'BOTTOM DEAD CENTRE' OF THE PIPE ON THE 10mm THK. WALL FACE.

NOTE 'C'
CHAMFER TOP & BOTTOM EDGE TO SUIT THE PIPE CURVATURE. THE CHAMFER GRADUALLY CHANGES FROM ± 20° TO 60° AS SHOWN ON SECTION A-A.

NOTE 'D'
PERFORM THE REQUIRED WELD PREPE RATION ON THE REINFORCING PLATES. CHAMFER TOP & BOTTOM EDGE TO SUIT THE PIPE CURVATURE.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS AND RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/ EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

NOTE: ADJACENT PIPE ENDS TO BE JOINED BY SITE WELDING TO BE ALIGNED AND REFORMED USING AN APPROPRIATE PIPE CHAIN CLAMP AND SPIDER JACK PRIOR TO SITE WELDING TO ENSURE ACCEPTABLE OVALITY TOLERANCES.

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR AND REINFORCEMENT PLATE COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 270 mm FROM UNFLANGED PIPE ENDS TO BE UNCOATED (U.O.S).

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

ALL DIMENSIONS IN MILLIMETRES

DO NOT SCALE DRAWING

REMOVE ALL SHARP EDGES

SCALE (mm)

PROJECTION (U.O.S.)

30° REDUCING BRANCH PIPE			
MATL.:	MILD & ST. STEEL	MASS:	8810 kg ea.
NO. OFF:	2	SCALE:	1:25

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

DESIGN: J J THERON
DRAWN: J J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

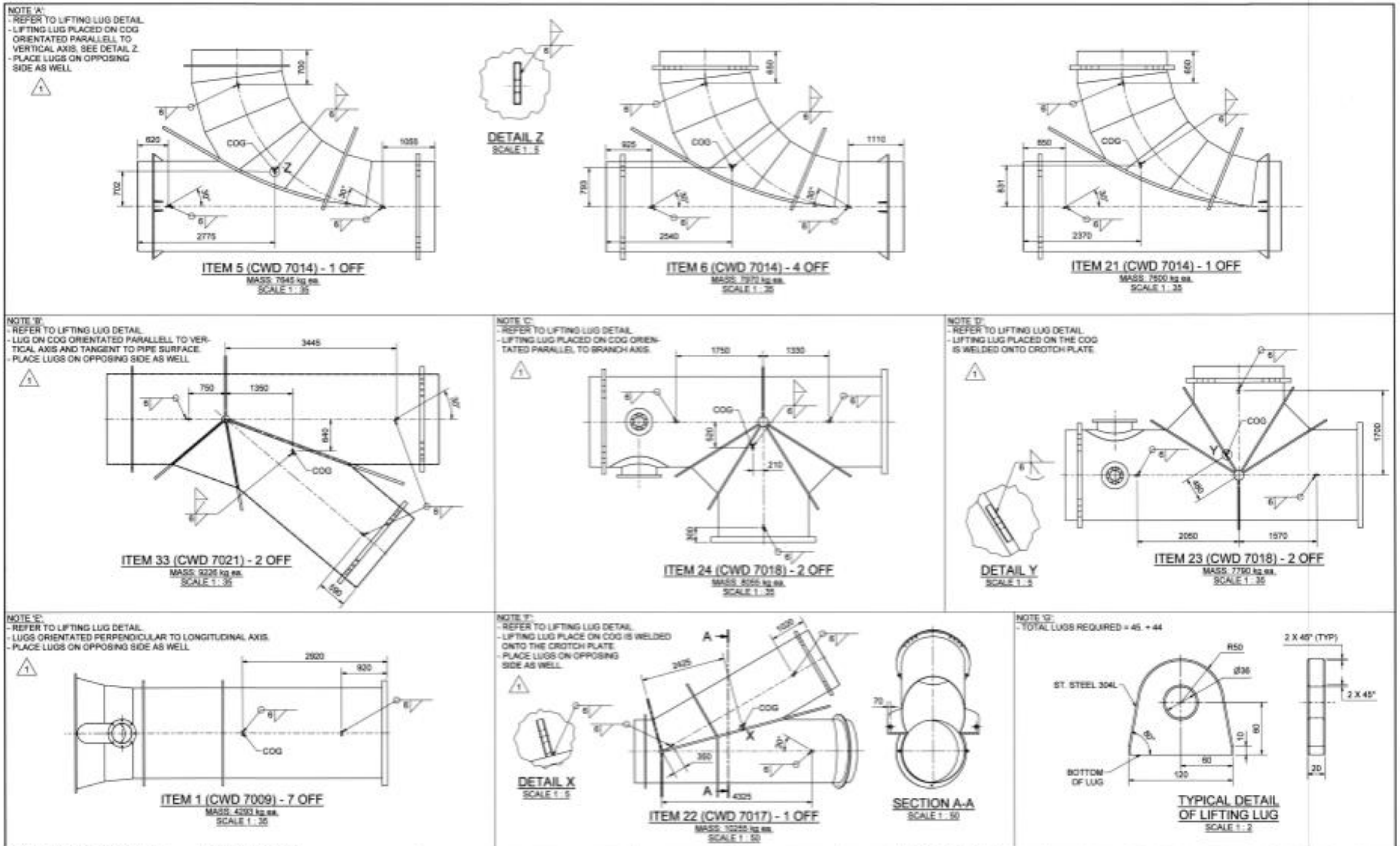
RAISING OF CLANWILLIAM DAM

OUTLET WORKS

PIPES & SPECIALS

-DETAILS-

PROVINCE: WESTERN CAPE
DISTRICT: CLANWILLIAM
LOCALITY No: E100-02
CALCULATION FILE: ME/E100-02
REFERENCE: DWS PPS PIP DET
DRAWING NUMBER: CWD 7026
SHEET: 27
169344/13 ME
REV: 0


NOTE 'A':
- REFER TO LIFTING LUG DETAIL.
- LIFTING LUG PLACED ON COG ORIENTATED PARALLELL TO VERTICAL AXIS, SEE DETAIL Z.
- PLACE LUGS ON OPPOSING SIDE AS WELL.
ITEM 5 (CWD 7014) - 1 OFF
MASS: 7645 kg ea.
SCALE 1 : 35
DETAIL Z
SCALE 1 : 5
ITEM 6 (CWD 7014) - 4 OFF
MASS: 7970 kg ea.
SCALE 1 : 35
ITEM 21 (CWD 7014) - 1 OFF
MASS: 7600 kg ea.
SCALE 1 : 35
NOTE 'B':
- REFER TO LIFTING LUG DETAIL.
- LUG ON COG ORIENTATED PARALLELL TO VERTICAL AXIS AND TANGENT TO PIPE SURFACE.
- PLACE LUGS ON OPPOSING SIDE AS WELL.
ITEM 33 (CWD 7021) - 2 OFF
MASS: 9226 kg ea.
SCALE 1 : 35
NOTE 'C':
- REFER TO LIFTING LUG DETAIL.
- LIFTING LUG PLACED ON COG ORIENTATED PARALLEL TO BRANCH AXIS.
ITEM 24 (CWD 7018) - 2 OFF
MASS: 8055 kg ea.
SCALE 1 : 35
NOTE 'D':
- REFER TO LIFTING LUG DETAIL.
- LIFTING LUG PLACED ON THE COG IS WELDED ONTO CROTCH PLATE.
DETAIL Y
SCALE 1 : 5
ITEM 23 (CWD 7018) - 2 OFF
MASS: 7790 kg ea.
SCALE 1 : 35
NOTE 'E':
- REFER TO LIFTING LUG DETAIL.
- LUGS ORIENTATED PERPENDICULAR TO LONGITUDINAL AXIS.
- PLACE LUGS ON OPPOSING SIDE AS WELL.
ITEM 1 (CWD 7009) - 7 OFF
MASS: 4293 kg ea.
SCALE 1 : 35
NOTE 'F':
- REFER TO LIFTING LUG DETAIL.
- LIFTING LUG PLACE ON COG IS WELDED ONTO THE CROTCH PLATE.
- PLACE LUGS ON OPPOSING SIDE AS WELL.
DETAIL X
SCALE 1 : 5
ITEM 22 (CWD 7017) - 1 OFF
MASS: 10255 kg ea.
SCALE 1 : 50
SECTION A-A
SCALE 1 : 50
NOTE 'G':
- TOTAL LUGS REQUIRED = 45. + 44
ST. STEEL 304L
BOTTOM OF LUG
TYPICAL DETAIL OF LIFTING LUG
SCALE 1 : 2

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0.3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0.5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0.8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

GENERAL MANUFACTURING NOTES:
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- SEAL WELD ALL OPEN CONNECTIONS.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH EACH ITEM'S ORIGINAL DRAWING.

ABBREVIATIONS:
- COG = CENTER OF GRAVITY

ALL DIMENSIONS IN MILLIMETRES

DO NOT SCALE DRAWING

REMOVE ALL SHARP EDGES

PROJECTION

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

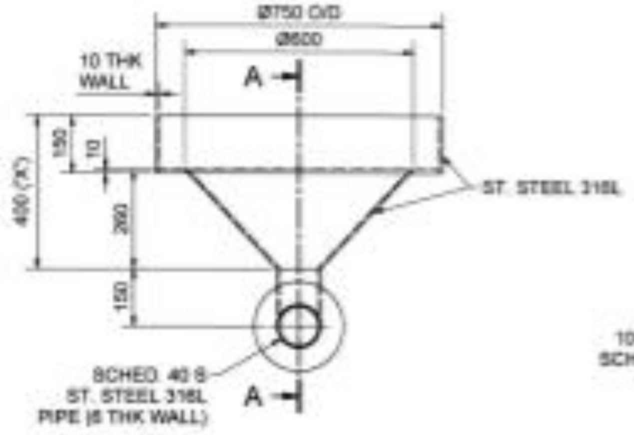
OUTLET WORKS

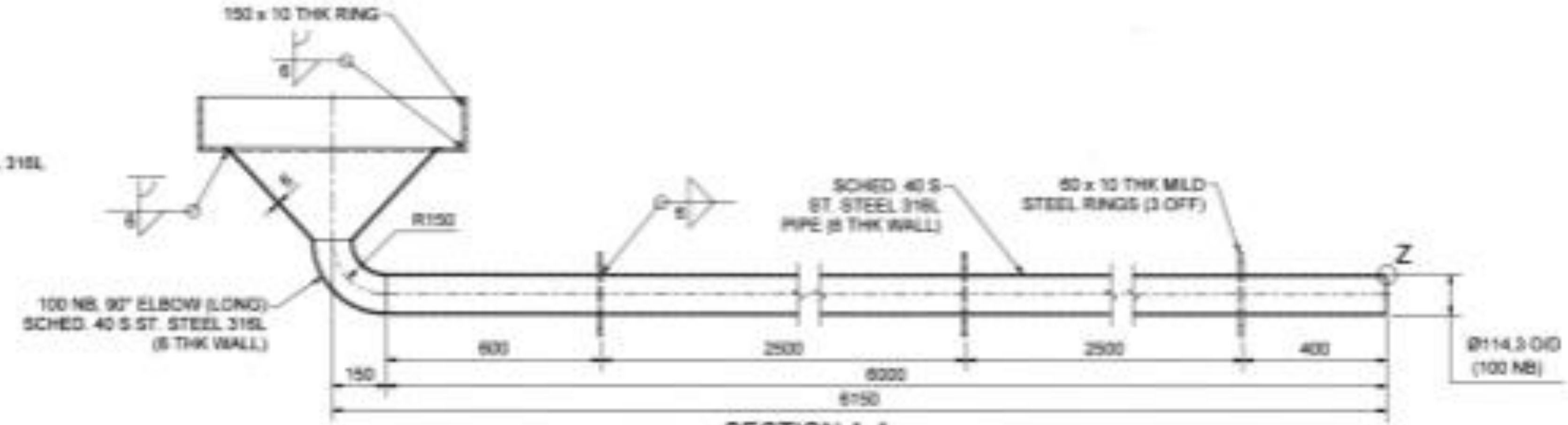
PIPES & SPECIALS
-LIFTING LUG DETAILS-

DESIGN: J.J THERON
DRAWN: J.J THERON

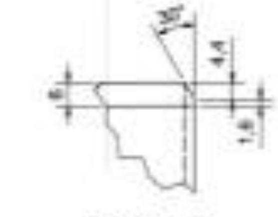
WESTERN CAPE | CLANWILLIAM | DWS | PRO | PIP | DET | CWD 7037

28 | 169345/13 ME | 1



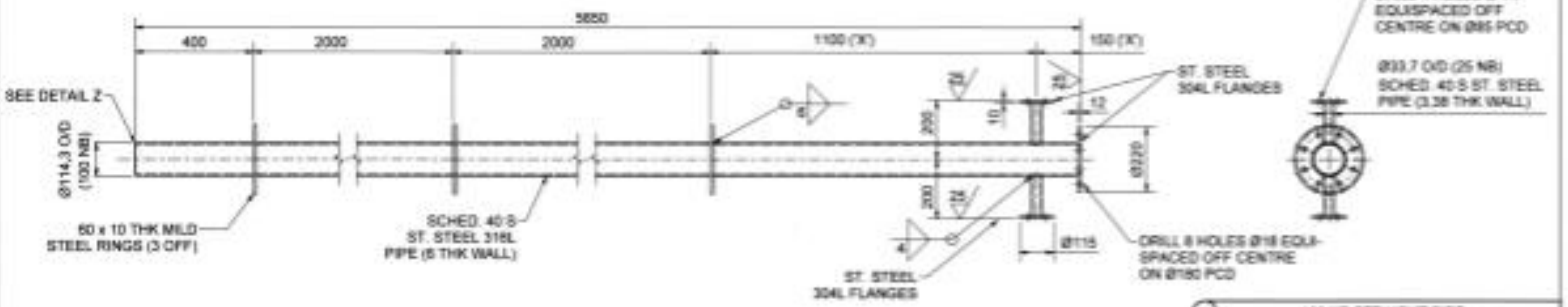


SECTION A-A
SCALE 1 : 10

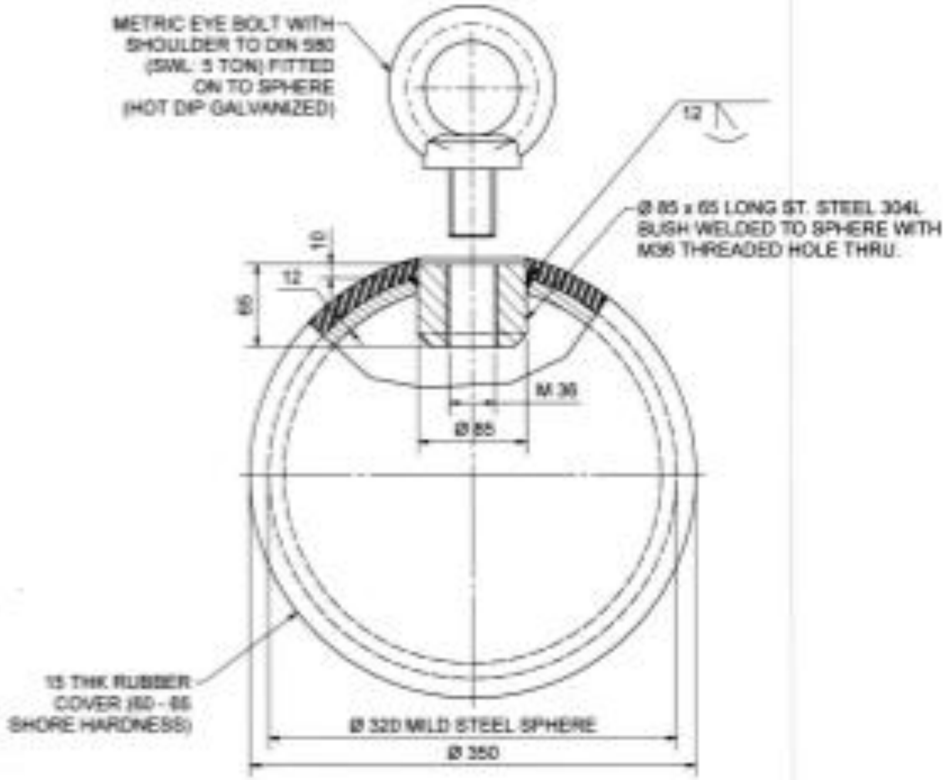


DETAIL Z
TYP. DETAIL OF WELD PREPERATION FOR A 100 NB PIPE
SCALE 1 : 1

(61)	WATER LEVEL RECODER REDUCER		
MATL.	MILD & ST. STEEL	MASS	170 kg
NO. OFF	1	SCALE	1:10



(62)	100 NB STRAIGHT PIPE		
MATL.	MILD & ST. STEEL	MASS	100 kg
NO. OFF	1	SCALE	1:10



GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

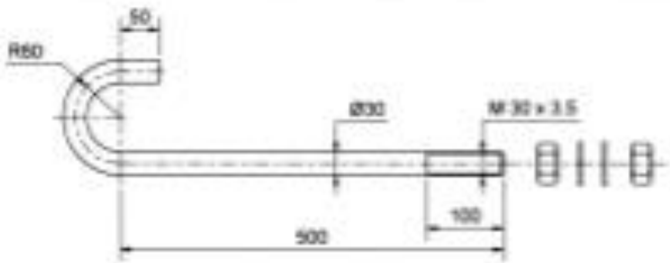
FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS AND RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

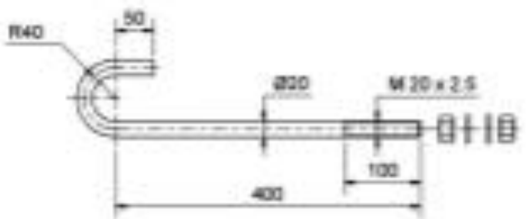
PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

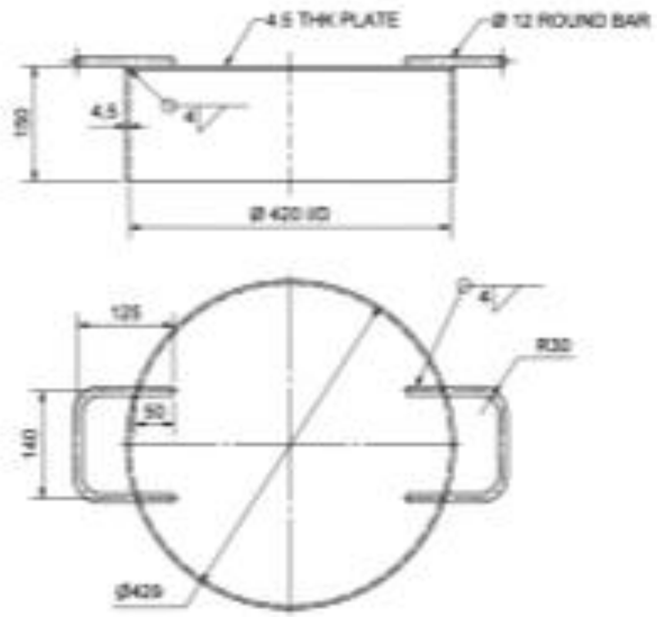
SURFACE FINISH (REMOVAL OF MATERIAL): X = SURFACE ROUGHNESS IN MICROMETRES



(65)	ANCHOR BOLT WITH 2 NUTS & 2 WASHERS		
MATL.	ST. STEEL 304	MASS	4.0 kg ea.
NO. OFF	32	SCALE	1:5



(66)	ANCHOR BOLT WITH 2 NUTS & 2 WASHERS		
MATL.	ST. STEEL 304	MASS	1.7 kg ea.
NO. OFF	16	SCALE	1:5



NOTE A
ITEM 64 TO BE INSTALLED OVER THE 400 NB VENTILATION PIPES DURING CONSTRUCTION STAGES.

(64)	END CAP		
MATL.	ST. STEEL 304L	MASS	13 kg ea.
NO. OFF	7	SCALE	1:5

(63)	ISOLATING BALL		
MATL.	MILD & ST. STEEL	MASS	40 kg
NO. OFF	1	SCALE	1:3

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0.3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0.5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0.8 mm
DIMENSIONS ABOVE 1000:	± 2 mm

OVALITY TOLERANCE: ± 1 mm DEVIATION ON DIAMETER OF PIPE ENDS (FOR 100 NB).
OUTSIDE DIAMETER TOLERANCE: +1.6 -0.8 (FOR ≤ 250 NB PIPES). USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 1.5 mm (≤ 500 NB PIPES).

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT) (*PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 100 mm FROM PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES. ONLY OPEN ENDED PIPES).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

SCALE (mm)

PROJECTION (U.O.S)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | ROUND ALL EDGES TO A 2 mm RADIUS

REVISION: 0 — ISSUED FOR CONSTRUCTION

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

DESIGN: J.J. THERON
DRAWN: J.J. THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

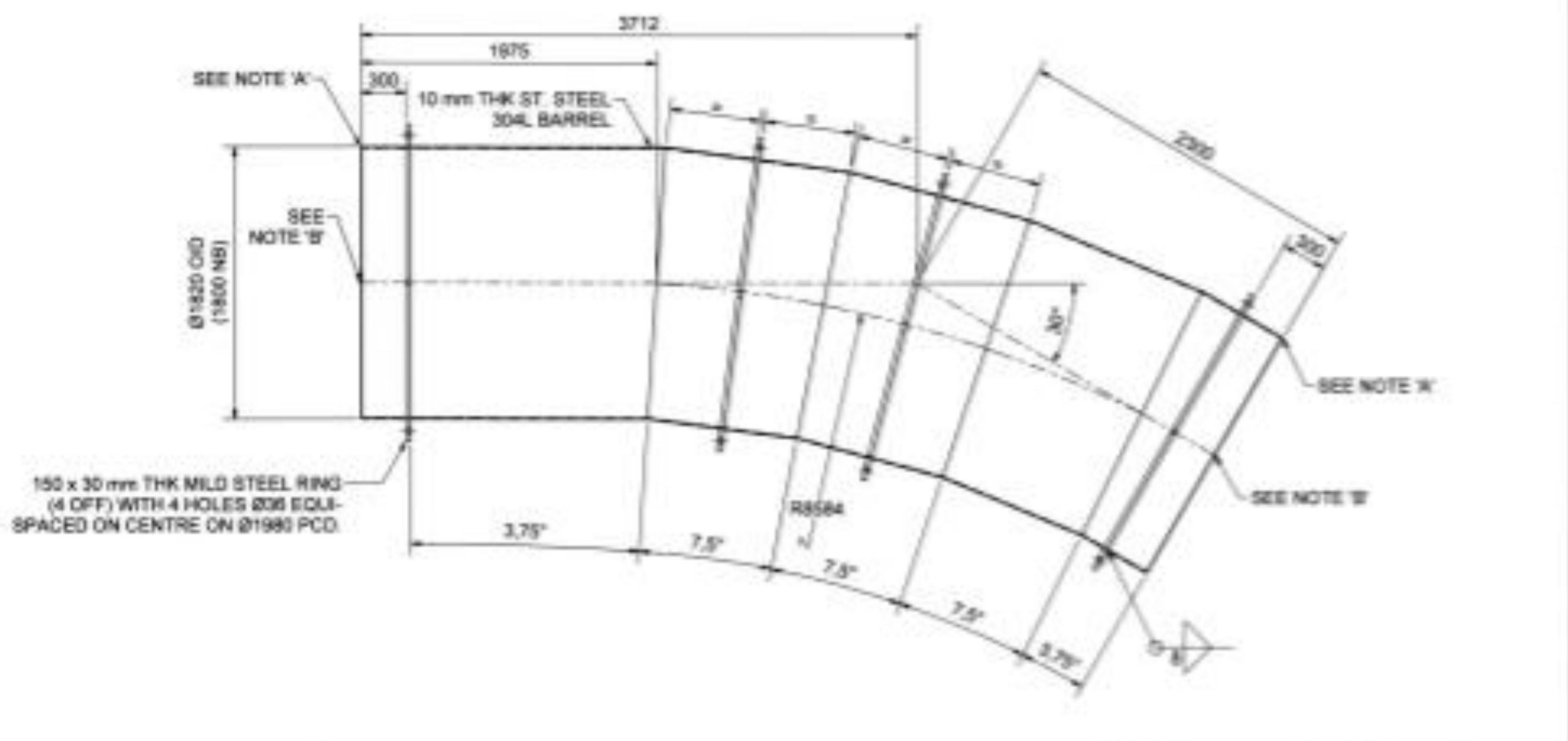
OUTLET WORKS

PIPES & SPECIALS

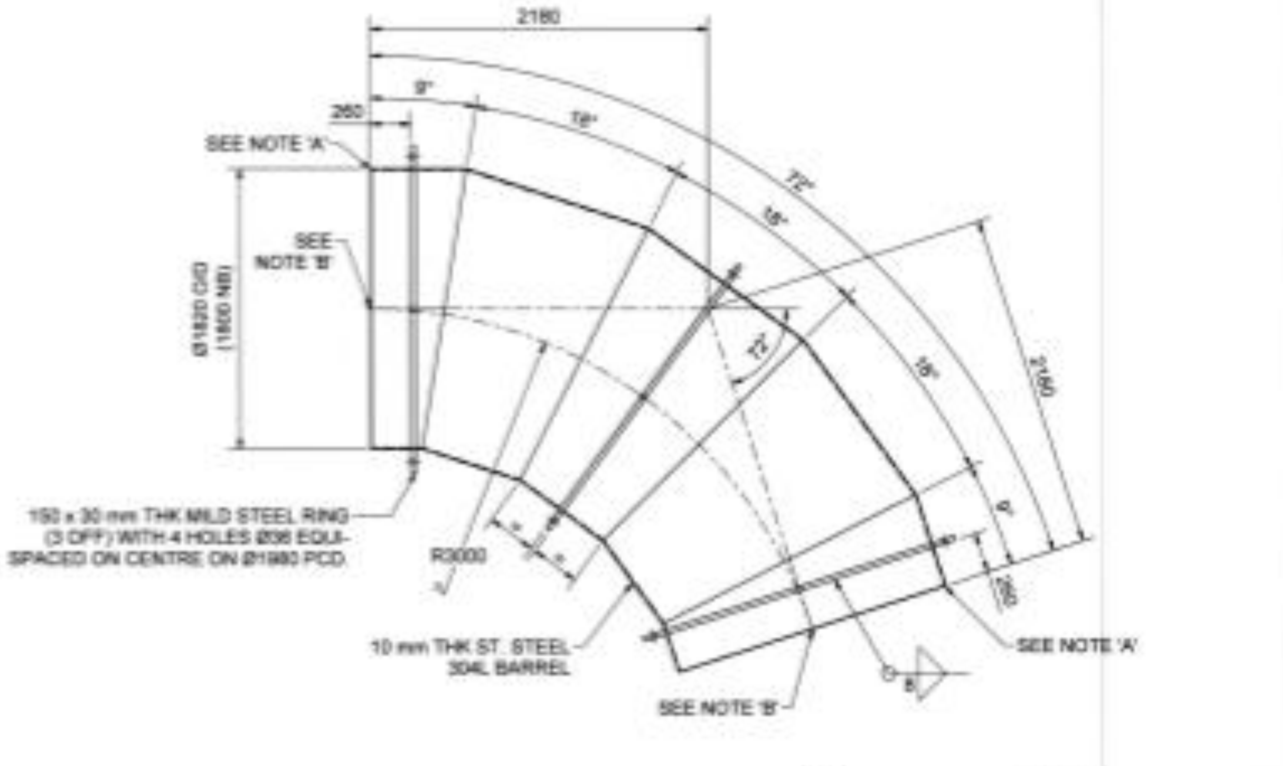
-DETAILS-

PROVINCE	DISTRICT						OTHER NUMBER
WESTERN CAPE	CLANWILLIAM	DUW	PRS	PIP	DET		CWD 7028

LOCALITY No: D1100-02
SHEET: 29
DWG No: 169346/13 ME
REV No: 0



67	30° BEND		
MATL:	MILD & ST. STEEL	MASS:	3970 kg
NO. OFF:	1	SCALE:	1:25



68	72° BEND		
MATL:	MILD & ST. STEEL	MASS:	2380 kg ea.
NO. OFF:	1	SCALE:	1:25

NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7016.

NOTE 'B'
MARK (USING A PUNCH) THE 'TOP -' & 'BOTTOM DEAD CENTRE' OF THE PIPE ON THE 10mm THK. WALL FACE.

NOTE 'C'
WELDING TO BE DRESSED FLUSH IN THE AREAS WHERE DIMENSIONS ARE DESIGNATED WITH AN ASTERIX (*) FOR FITMENT OF PIPE COUPLINGS.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

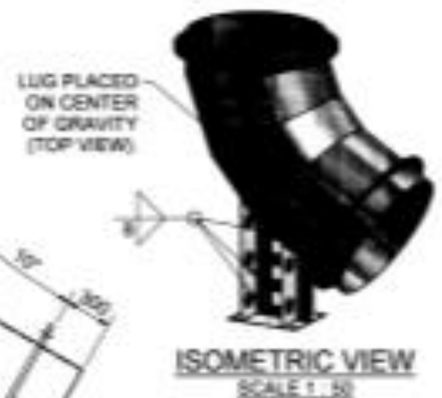
GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.
- ROUND ALL EDGES TO A 2 mm RADIUS.

FLANGES:
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/18.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

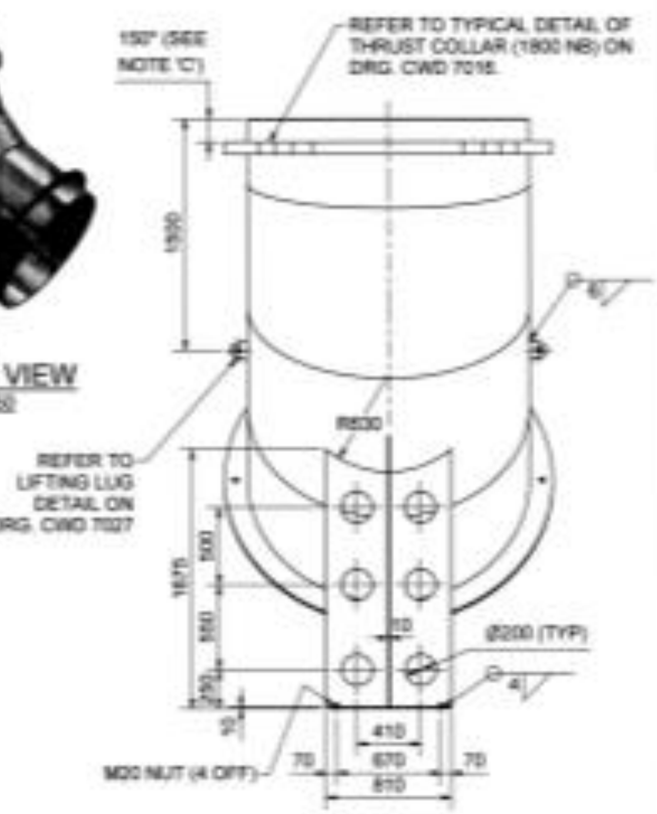
MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS AND RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

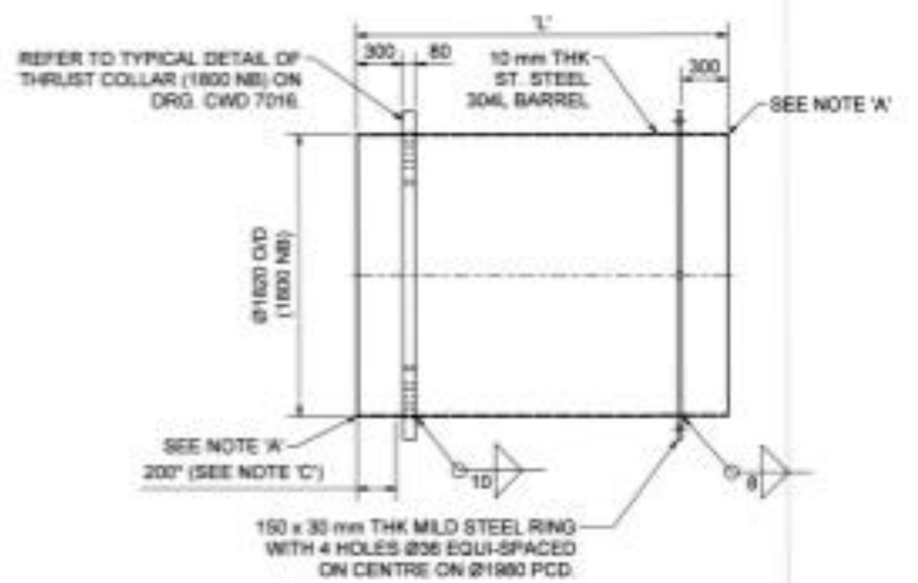
NOTE: ADJACENT PIPE ENDS TO BE JOINED BY SITE WELDING TO BE ALIGNED AND REFORMED USING AN APPROPRIATE PIPE CHAIN CLAMP AND SPIDER JACK PRIOR TO SITE WELDING TO ENSURE ACCEPTABLE OVALITY TOLERANCES.



ISOMETRIC VIEW
SCALE 1 : 50



69	60° BEND		
MATL:	MILD & ST. STEEL	MASS:	2653 kg
NO. OFF:	1	SCALE:	1:25



70	STRAIGHT PIPE (L = 2400)		
MATL:	MILD & ST. STEEL	MASS:	1857 kg ea.
NO. OFF:	3	SCALE:	1:25
71	STRAIGHT PIPE (L = 1800)		
MATL:	MILD & ST. STEEL	MASS:	1582 kg
NO. OFF:	1	SCALE:	1:25
72	STRAIGHT PIPE (L = 1250)		
MATL:	MILD & ST. STEEL	MASS:	1330 kg
NO. OFF:	1	SCALE:	1:25

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 8660.
- PIPE COATING: APPLY TWO PACK EPOXY (150 μm DFT).
- PIPE LINING: APPLY TWO PACK EPOXY (250 μm DFT).
- COLLAR AND STEEL PARTS COATING: TWO PACK EPOXY (300 μm DFT).
- AREA 250 mm FROM PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES. ONLY OPEN ENDED PIPES).

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

ALL DIMENSIONS IN MILLIMETRES

DO NOT SCALE DRAWING

ROUND ALL EDGES TO A 2 mm RADIUS

PROJECTION (U.O.S.)

REVISION: 0 — ISSUED FOR CONSTRUCTION

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

DESIGN: J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS

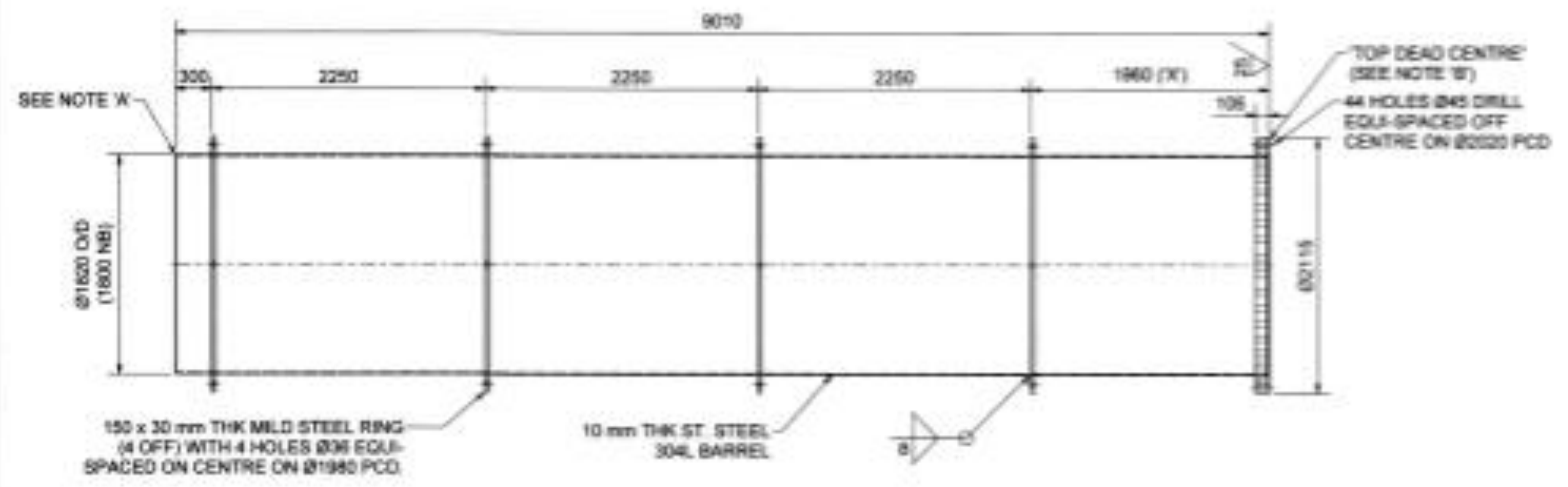
PIPES & SPECIALS
-DETAILS-

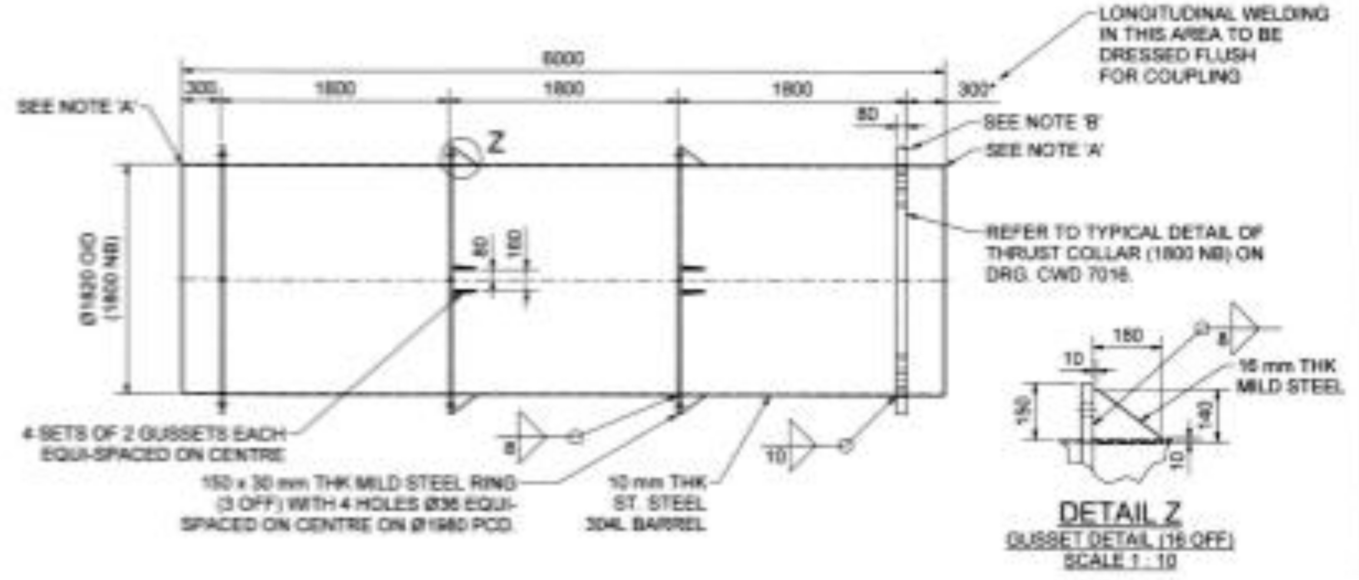
PROVINCE: WESTERN CAPE — DISTRICT: CLANWILLIAM

DRAWING NUMBER: CWD 7026

SHEET 30

169347/13 ME — 0





(73)	STRAIGHT PIPE		
MATL.	MILD & ST. STEEL	MASS	3980 kg ea.
NO. OFF	2	SCALE	1:30

FOR ('X') SEE CORROSION PROTECTION NOTES.

(74)	STRAIGHT PIPE		
MATL.	MILD & ST. STEEL	MASS	3965 kg
NO. OFF	1	SCALE	1:30

NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'W' ON DRG. CWD 7010.

NOTE 'B'
Ø6 x 3 mm DEEP HOLE ON Ø2080 PCD FOR 1800 NB FLANGE (Ø430 PCD FOR 300 NB FLANGE) ON 'TOP' AND 'BOTTOM DEAD CENTRE' ON OUTER FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

NOTE 'C'
WELDING TO BE DRESSED FLUSH IN THE AREAS WHERE DIMENSIONS ARE DESIGNATED WITH AN ASTERISK (*) FOR FITMENT OF PIPE COUPLINGS.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 8.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/15.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

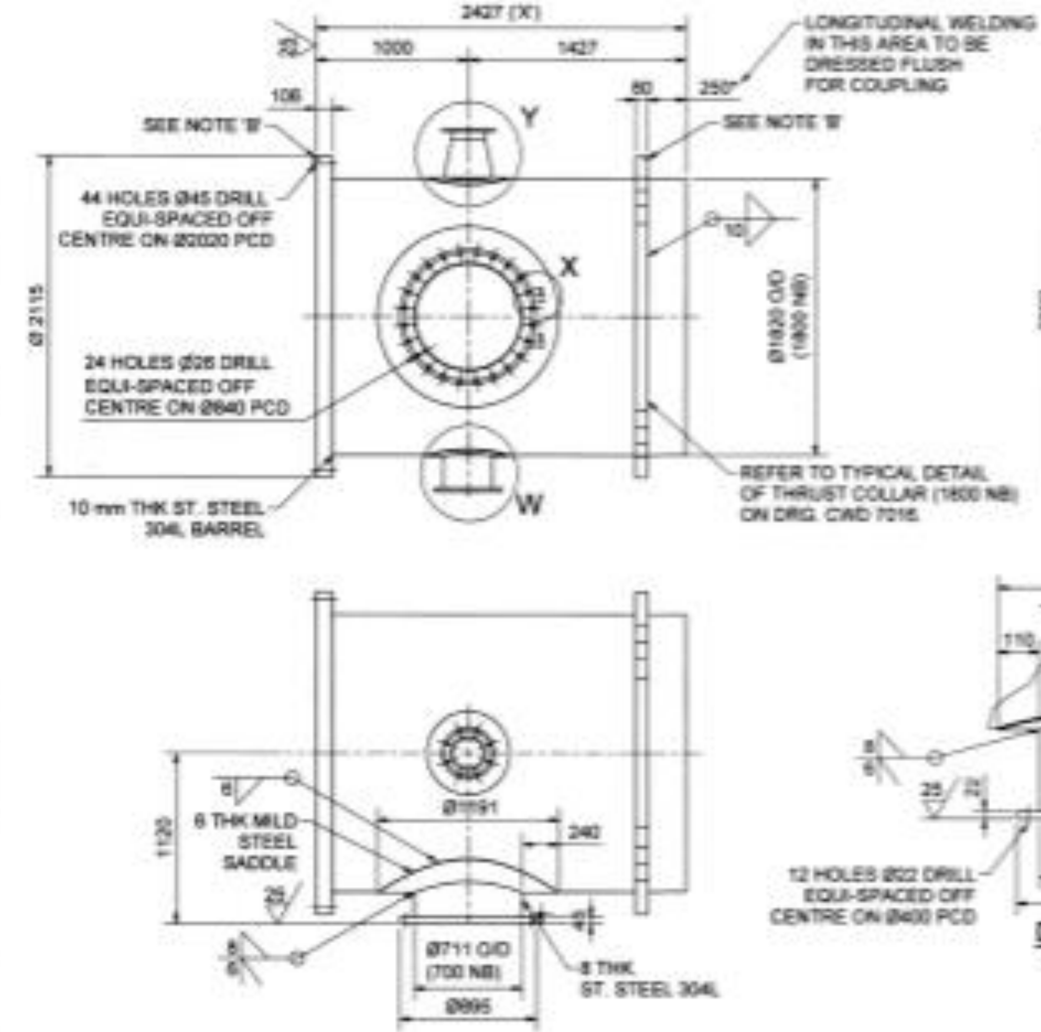
MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

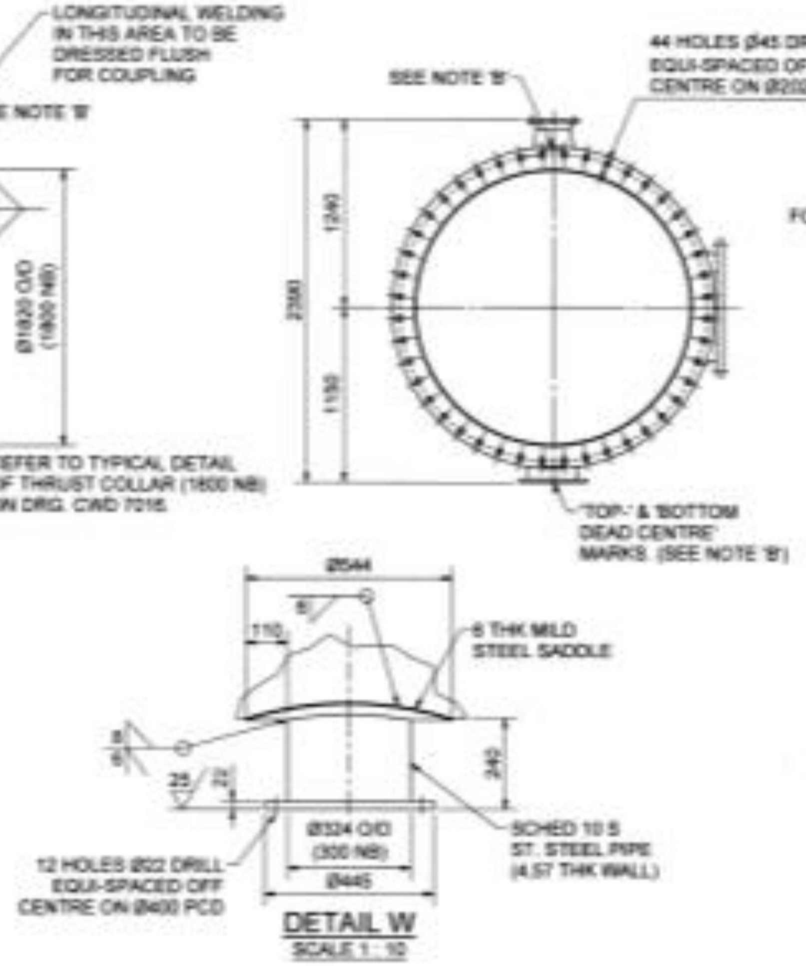
PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

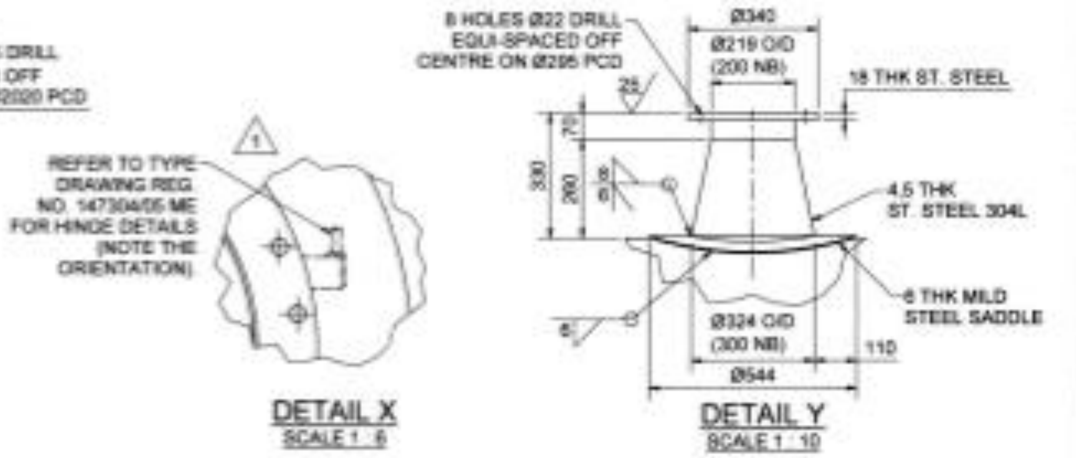
TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

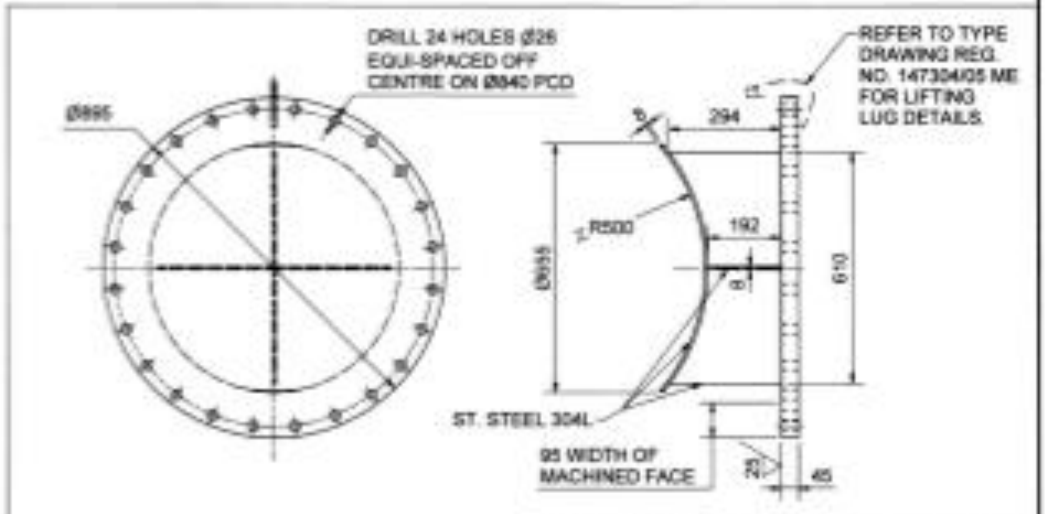
NOTE: ADJACENT PIPE ENDS TO BE JOINED BY SITE WELDING TO BE ALIGNED AND REFORMED USING AN APPROPRIATE PIPE CHAIN CLAMP AND SPIDER JACK PRIOR TO SITE WELDING TO ENSURE ACCEPTABLE OVALITY TOLERANCES.

SURFACE FINISH (REMOVAL OF MATERIAL)
X = SURFACE ROUGHNESS IN MICROMETRES









(75)	STRAIGHT PIPE		
MATL.	MILD & ST. STEEL	MASS	2506 kg ea.
NO. OFF	2	SCALE	1:25

FOR ('X') SEE CORROSION PROTECTION NOTES.

(76)	MANHOLE COVER TO SUIT 1000 NB PIPE		
MATL.	MILD & ST. STEEL	MASS	255 kg ea.
NO. OFF	10	SCALE	1:10

GENERAL DIMENSIONAL TOLERANCES (U.O.S.)

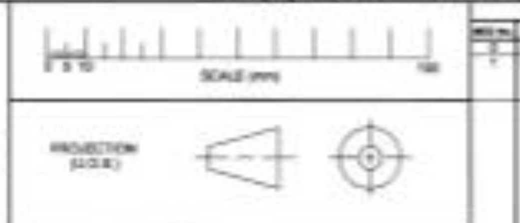
DIMENSIONS UP TO 120:	± 0.3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0.5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0.8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 metre WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1.0 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

ALL DIMENSIONS IN MILLIMETRES.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 0800.
- PIPE COATING: APPLY TWO PACK EPOXY (150 μm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (20 μm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 μm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 μm DFT).
- AREA 270 mm FROM PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES AND ITEM 76. ONLY OPEN ENDED PIPES).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 80 μm DFT).

DO NOT SCALE DRAWING



ROUND ALL EDGES TO A 2 mm RADIUS

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
DIRECTOR GENERAL
J.J. THERON

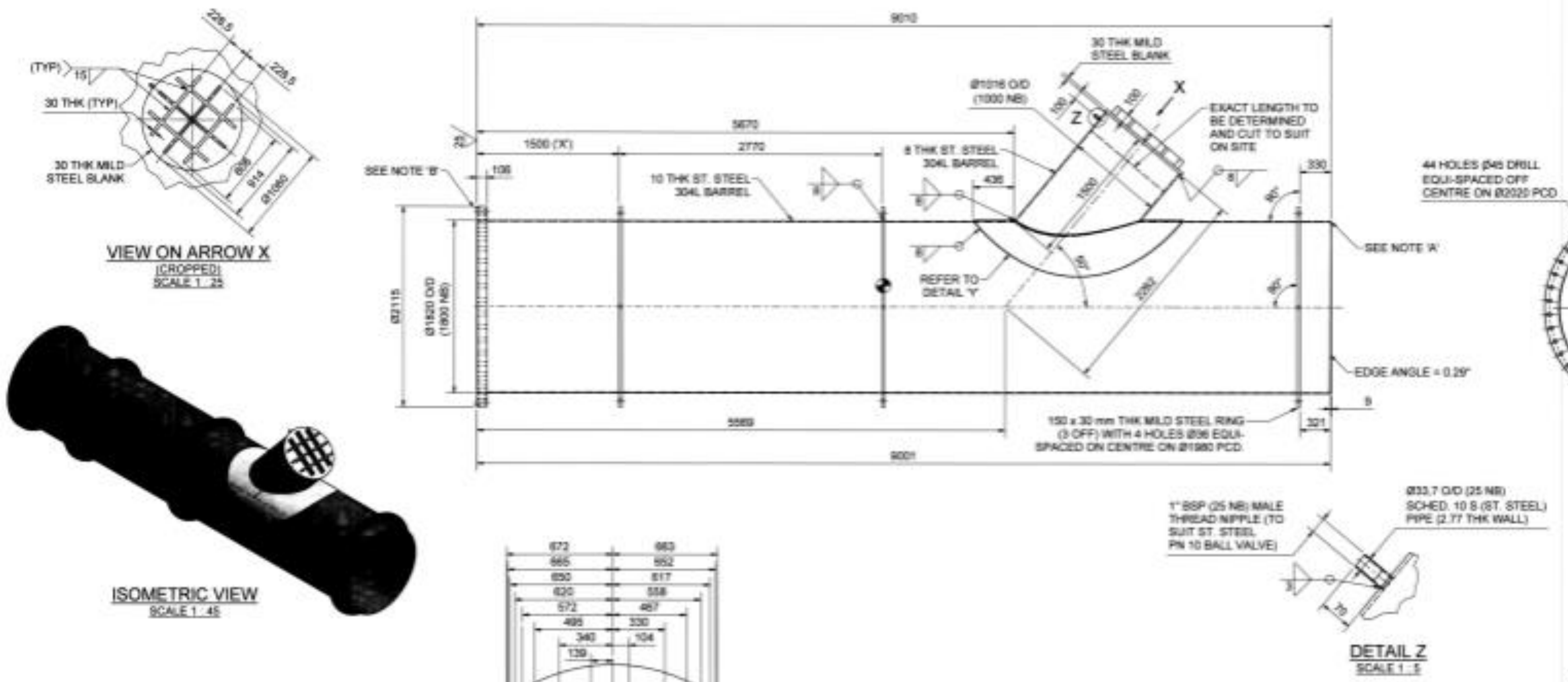
OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

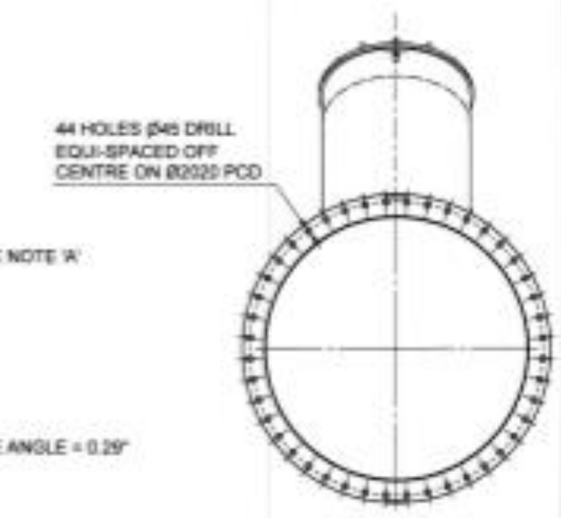
RAISING OF CLANWILLIAM DAM

OUTLET WORKS
PIPES & SPECIALS
-DETAILS-

PROVINCE: WESTERN CAPE
DISTRICT: CLANWILLIAM

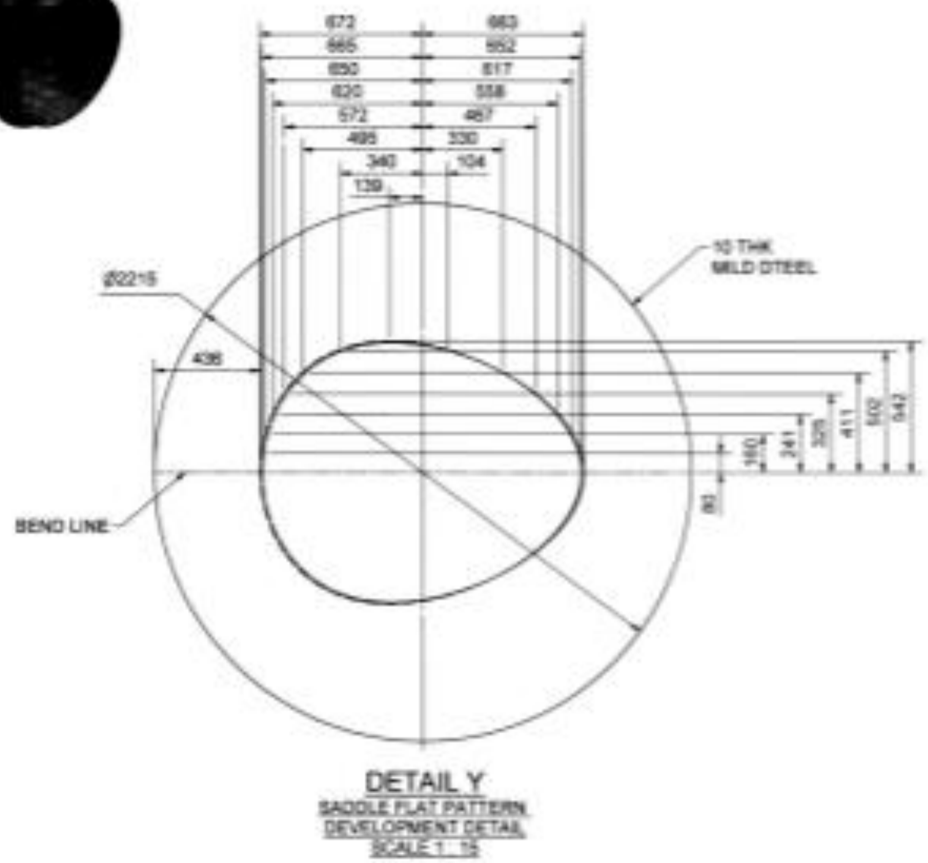
SHEET 31
169348/13 ME
1





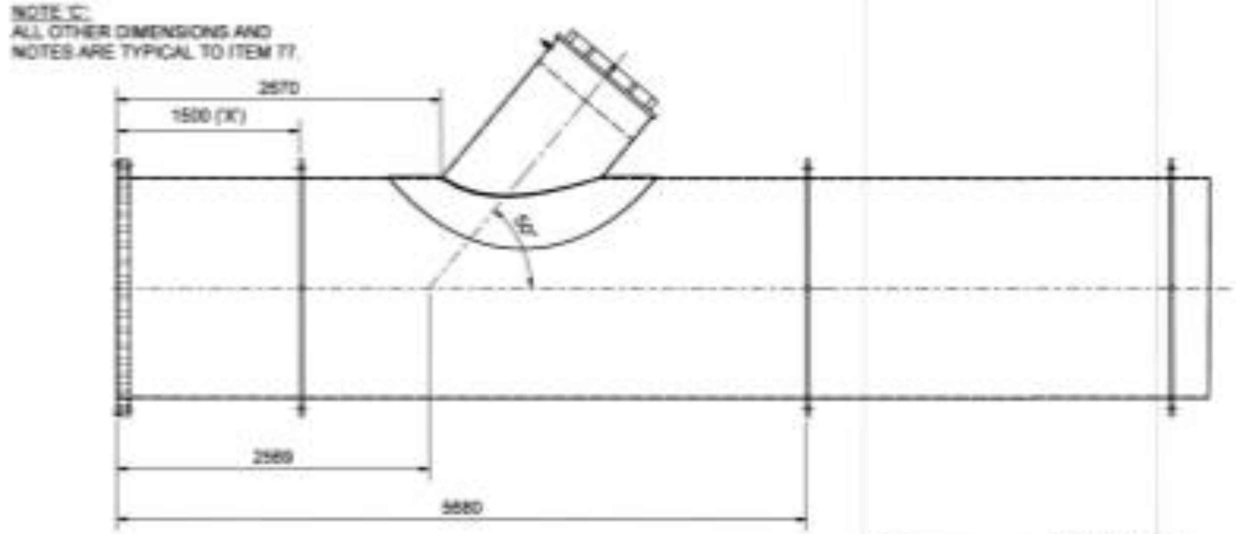
NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7010.
NOTE 'B'
Ø6 x 3 mm DEEP HOLE ON Ø2090 PCD ON 'TOP' AND 'BOTTOM DEAD CENTRE' ON OUTER FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

(77)	OFF TAKE PIPE		
MAT'L	MILD & ST. STEEL	MASS	6155 kg
NO. OFF	1	SCALE	1:25



FOR ('X') SEE CORROSION PROTECTION NOTES.

NOTE 'C':
ALL OTHER DIMENSIONS AND NOTES ARE TYPICAL TO ITEM 77.



(78)	OFF TAKE PIPE		
MAT'L	MILD & ST. STEEL	MASS	6155 kg
NO. OFF	1	SCALE	1:30

CENTRE OF GRAVITY (COG)
= POSITION OF CENTRE OF GRAVITY

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTUTING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9800.
- PIPE COATING: APPLY TWO PACK EPOXY (150 μm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 μm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (350 μm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 μm DFT).
- AREA 270 mm FROM PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES. ONLY OPEN ENDED PIPES).
- FLANGE FACE: APPLY TWO PACK EPOXY (80 - 90 μm DFT).

SCALE (mm)

PROJECTION (S.O.B.)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | ROUND ALL EDGES TO A 2 mm RADIUS

REVISION
1 ISSUED FOR CONSTRUCTION

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
J.J THERON
J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

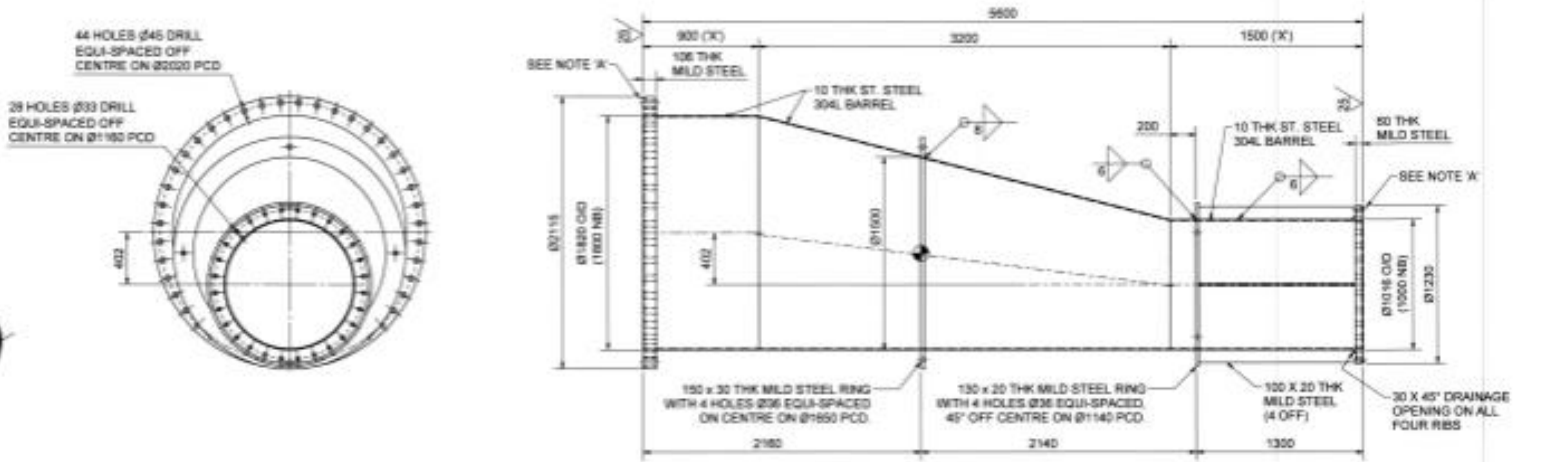
OUTLET WORKS

PIPES & SPECIALS

-DETAILS-

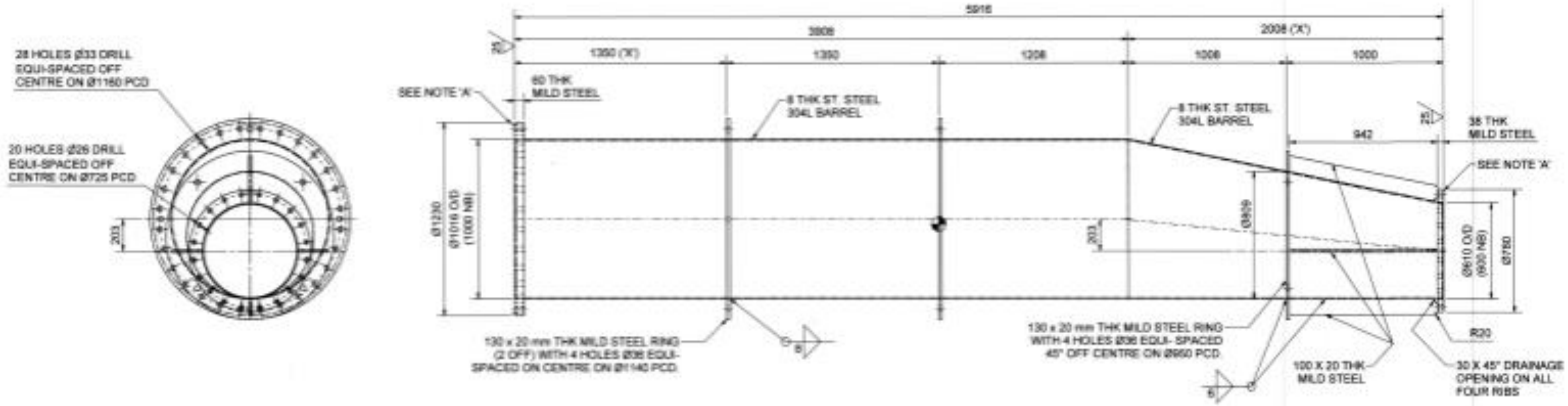
REGION: WESTERN CAPE	DISTRICT: CLANWILLIAM	CODE: DLSW PPS P&P DET	OTHER NUMBER: CWD 7031		
SHEET 32 of	REG No. 169349/13 ME	REV No. 0			

ISOMETRIC VIEW
SCALE 1 : 35



(78)	1800 - 1000 NB ECCENTRIC REDUCER		
MAT'L:	MILD & ST. STEEL	MASS:	3140 kg ea.
NO. OFF:	2	SCALE:	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES



(80)	1000 - 600 NB ECCENTRIC REDUCER		
MAT'L:	MILD & ST. STEEL	MASS:	1008 kg ea.
NO. OFF:	2	SCALE:	1:15

FOR ('X') SEE CORROSION PROTECTION NOTES

NOTE 'A':
Ø8 x 3 mm DEEP HOLE ON Ø2080 PCD FOR 1800 NB FLANGE (Ø1205 PCD FOR 1000 NB FLANGE & Ø755 PCD FOR 600 NB FLANGE) ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON OUTER FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

CENTRE OF GRAVITY (COG)
⊕ = POSITION OF CENTRE OF GRAVITY

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/10.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS PRESSURE RATING:
- WORKING PRESSURE: 680 kPa
- HYDRAULIC TEST PRESSURE: 980 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 980 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0.3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0.5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0.8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 8 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1.6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

ALL DIMENSIONS IN MILLIMETRES

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- FLANGE FACE: APPLY TWO PACK EPOXY (80 - 90 µm DFT).

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES

DO NOT SCALE DRAWING

SCALE (mm)

PROJECTION (U.O.S.)

ROUND ALL EDGES TO A 2 mm RADIUS

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

DESIGN: J.J THERON
DRAWN: J.J THERON

OLIFANTS-DOORN WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS

PIPES & SPECIALS

-DETAILS-

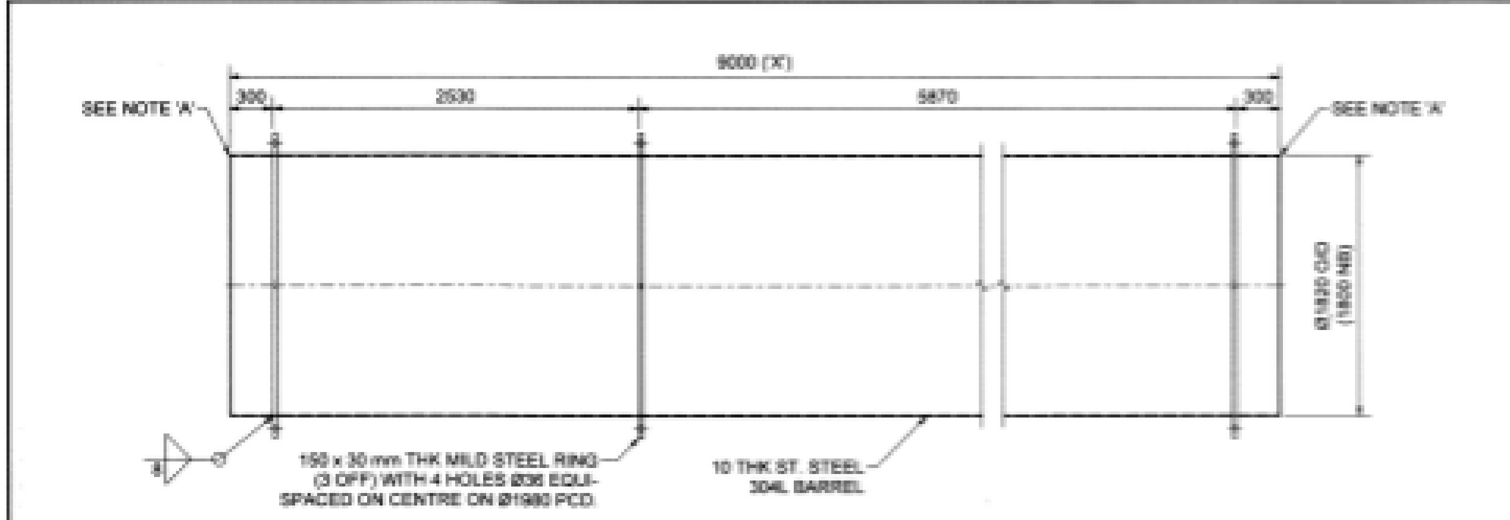
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | DWS | PPS | PIP | DET | CWD 7002

LOCALITY No. E100-02
DRAWING No. ME/E100-02

SHEET: 33-

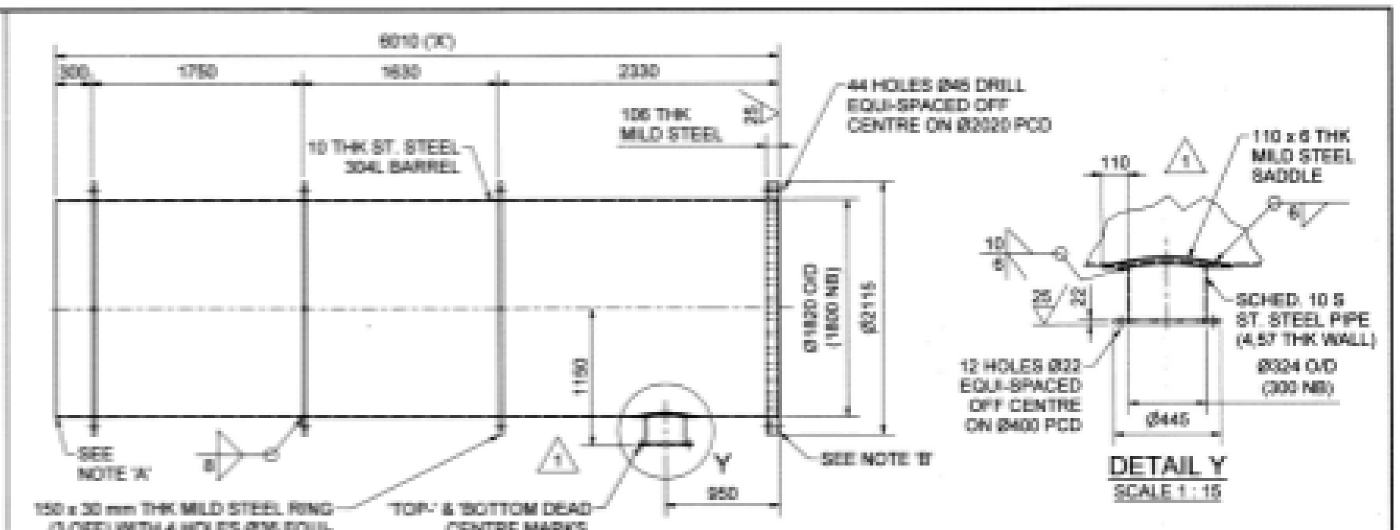
169350/13 ME

REV: 0



(81)	STRAIGHT PIPE		
MAT'L:	MILD & ST. STEEL	MASS:	4762 kg ea.
NO. OFF:	2	SCALE:	1:25

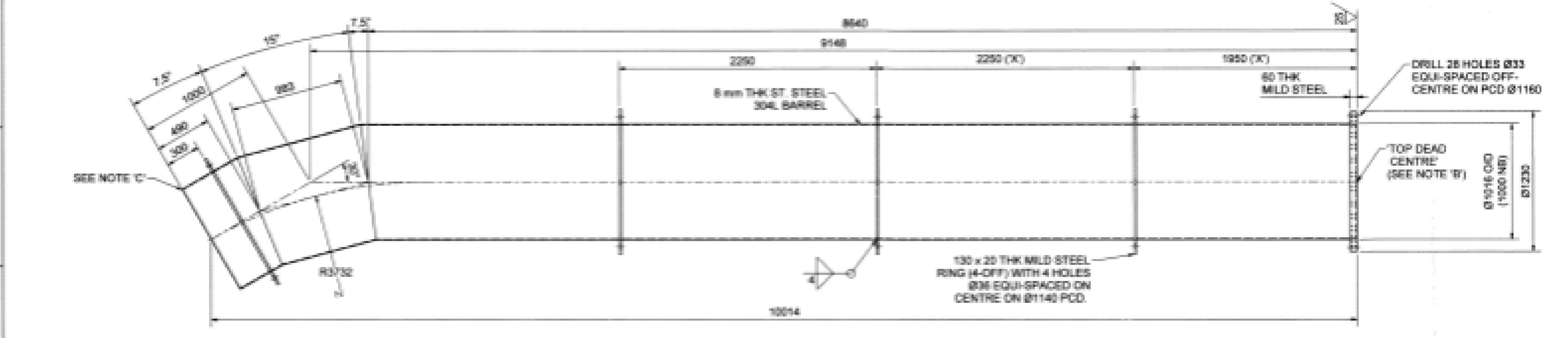
FOR ('X') SEE CORROSION PROTECTION NOTES.



(82)	STRAIGHT PIPE		
MAT'L:	MILD & ST. STEEL	MASS:	4115 kg ea.
NO. OFF:	2	SCALE:	1:30

FOR ('X') SEE CORROSION PROTECTION NOTES.

NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7010.
NOTE 'B'
Ø6 x 3 mm DEEP HOLE ON Ø2080 PCD FOR1800 NB FLANGE (Ø1208 PCD FOR 1000 NB FLANGE & Ø430 PCD FOR 300 NB FLANGE) ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)
NOTE 'C'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7013.



(83)	PIPE		
MAT'L:	MILD & ST. STEEL	MASS:	2515 kg ea.
NO. OFF:	2	SCALE:	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 1.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

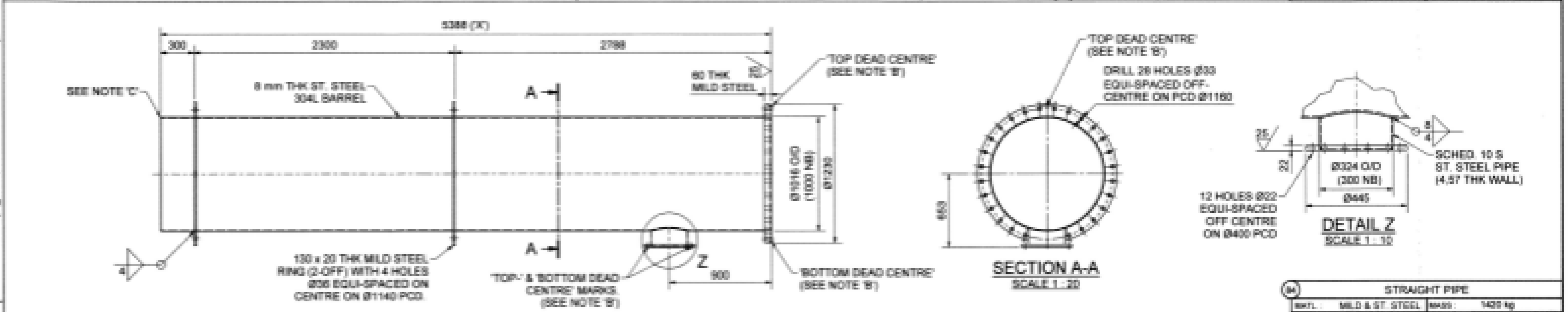
FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/18.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 355WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES



(84)	STRAIGHT PIPE		
MAT'L:	MILD & ST. STEEL	MASS:	1420 kg
NO. OFF:	2	SCALE:	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,2 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 μm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 μm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 μm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 μm DFT).
- AREA 275 mm FROM PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES. ONLY OPEN ENDED PIPES).
- FLANGE FACE: APPLY TWO PACK EPOXY (80 - 90 μm DFT).

ALL DIMENSIONS IN MILLIMETRES

DO NOT SCALE DRAWING

ROUND ALL EDGES TO A 2 mm RADIUS

SCALE (mm)

PROJECTION (U.O.S.)

REVISION

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
DIRECTOR GENERAL

DESIGN: J.J THERON
DRAWN: J.J THERON

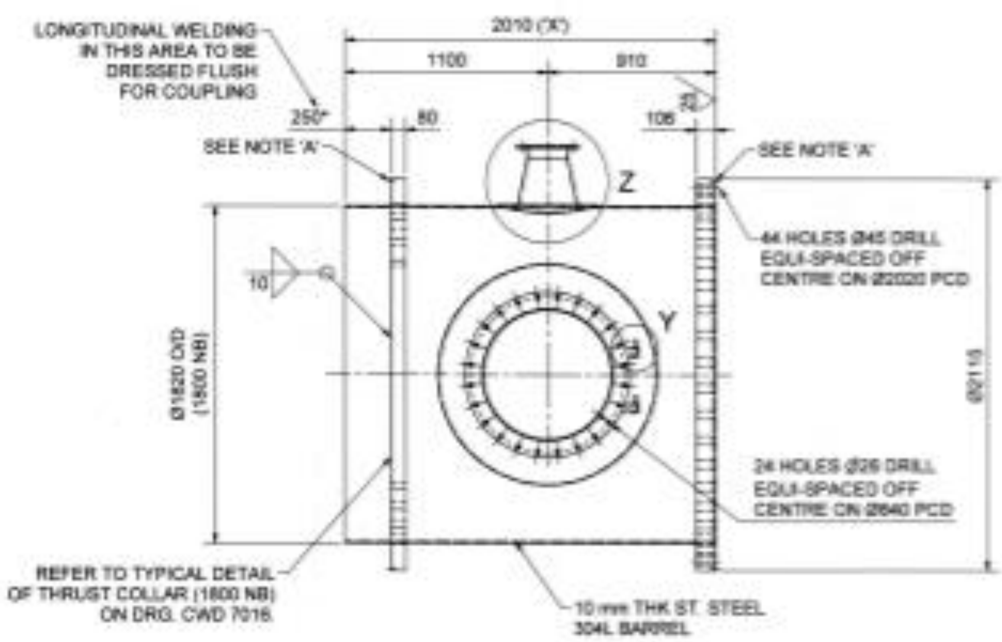
OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

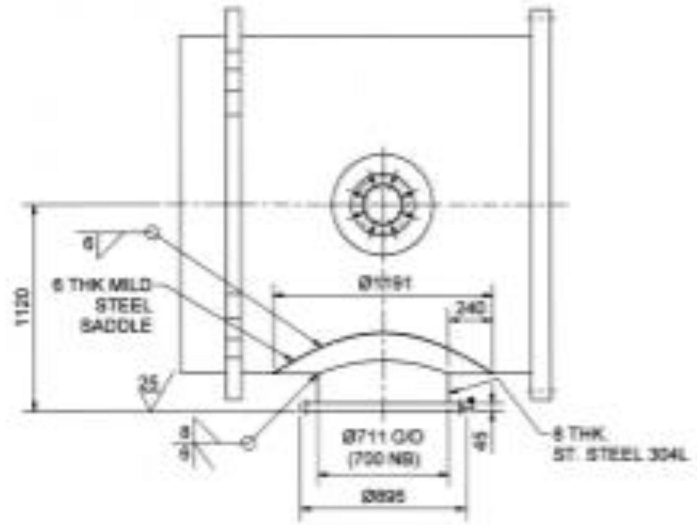
RAISING OF CLANWILLIAM DAM

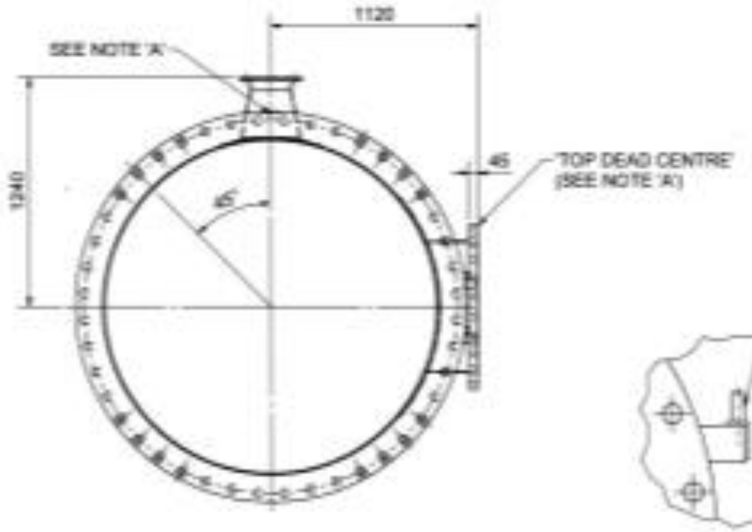
OUTLET WORKS
PIPES & SPECIALS
-DETAILS-

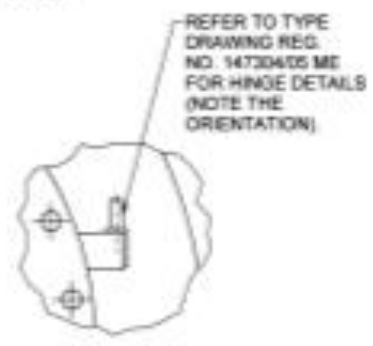
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | DUW | PPB | PIP | DET | DRAWING NUMBER: CWD 7003

SHEET 34 | 169351/13 ME | 1

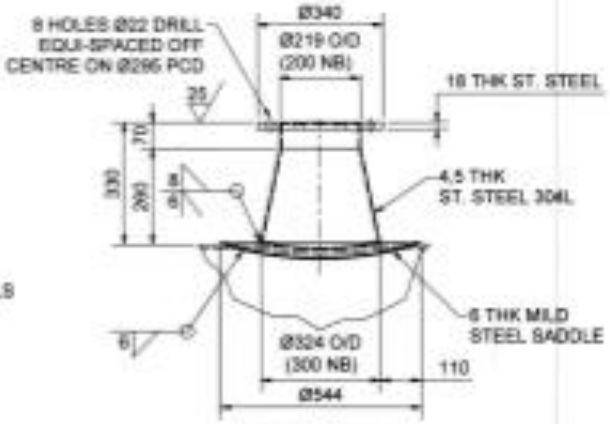








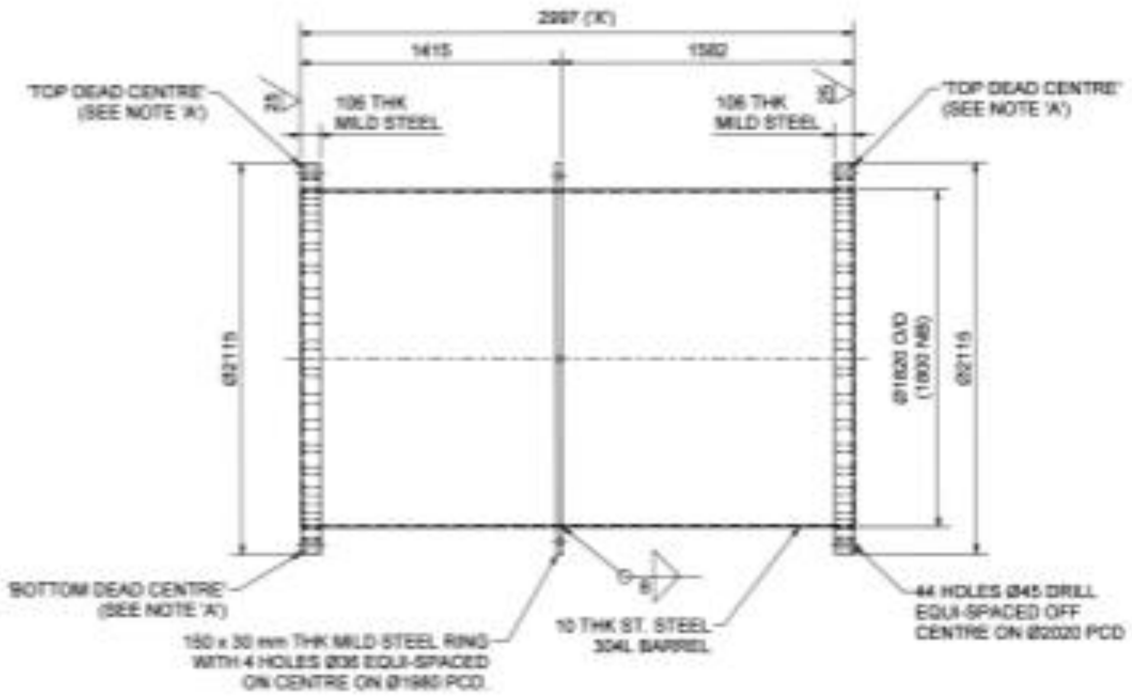
DETAIL Y
SCALE 1 : 5

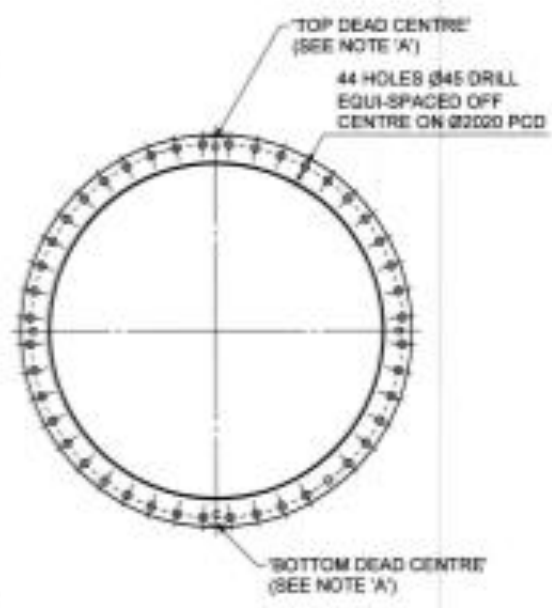


DETAIL Z
SCALE 1 : 10

(85)	STRAIGHT PIPE (AS DRAWN)		
MAT'L	MILD & ST. STEEL	MASS:	2260 kg ea.
NO. OFF:	1	SCALE:	1:20
(86)	STRAIGHT PIPE (OPP. HAND)		
MAT'L	MILD & ST. STEEL	MASS:	2260 kg ea.
NO. OFF:	1	SCALE:	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.





(87)	STRAIGHT PIPE		
MAT'L	MILD & ST. STEEL	MASS:	2080 kg ea.
NO. OFF:	2	SCALE:	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

ALL DIMENSIONS IN MILLIMETRES

NOTE 'A':
Ø6 x 3 mm DEEP HOLE ON Ø2080 PCD FOR 1800 NB FLANGE (Ø1205 PCD FOR 1000 NB FLANGE, Ø870 PCD FOR 700 NB FLANGE & Ø430 PCD FOR 300 NB FLANGE) ON 'TOP' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL.
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 μm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 μm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 μm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 μm DFT).
- FLANGE FACE: APPLY TWO PACK EPOXY (80 - 90 μm DFT).

DO NOT SCALE DRAWING

SCALE (mm)

PROJECTION (U.O.S.)

ROUND ALL EDGES TO A 2 mm RADIUS

REVISION
0 — ISSUED FOR CONSTRUCTION

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

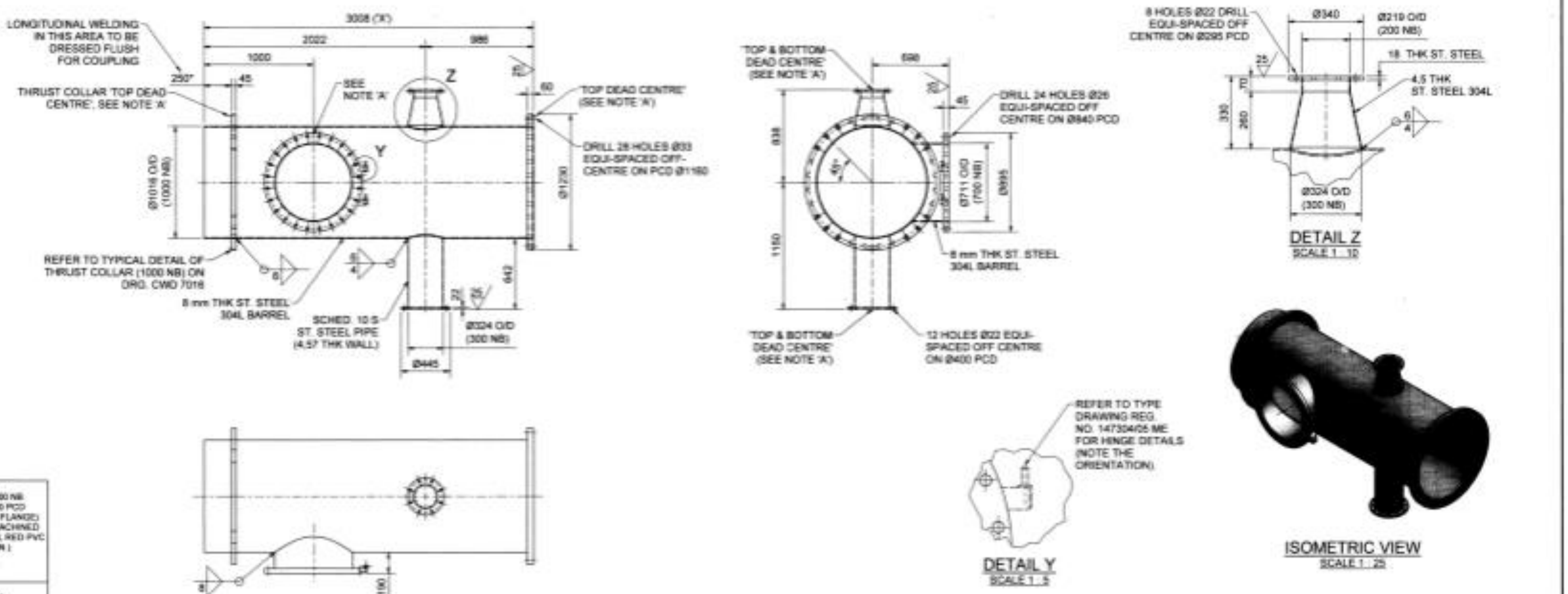
OUTLET WORKS

PIPES & SPECIALS

-DETAILS-

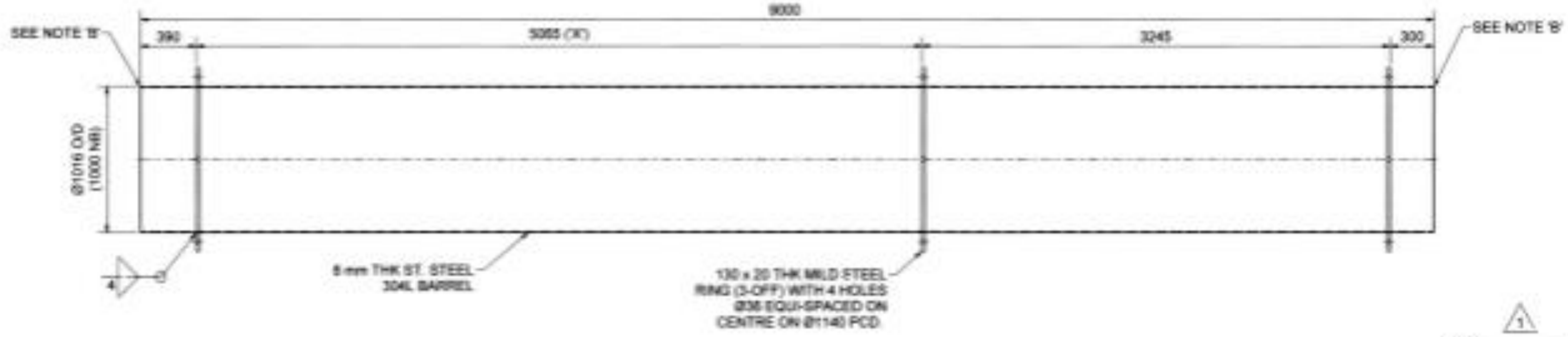
WESTERN CAPE — CLANWILLIAM — DWS PPD PIP DET — CWD 7034

35 — 169352/13 ME — 0



(98)	STRAIGHT PIPE		
MATL.: MILD & ST. STEEL		MASS:	1035 kg ea.
NO. OFF: 2		SCALE:	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.



(99)	STRAIGHT PIPE		
MATL.: MILD & ST. STEEL		MASS:	2080 kg ea.
NO. OFF: 2		SCALE:	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.

NOTE 'A'
Ø6 x 3 mm DEEP HOLE ON Ø1205 PCD FOR 1000 NB FLANGE (Ø870 PCD FOR 700 NB FLANGE, Ø430 PCD FOR 300 NB FLANGE & Ø325 PCD FOR 200 NB FLANGE) ON 'TOP' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

NOTE 'B'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7013.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

ALL DIMENSIONS IN MILLIMETRES

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWA STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 μm DFT). (PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (35 μm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 μm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 μm DFT).
- AREA 270 mm FROM PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ITEM 98 & ENDS WITH FLANGES. ONLY OPEN ENDED PIPES, EXCEPT ITEM 98).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 μm DFT).

DO NOT SCALE DRAWING

SCALE (mm)

PROJECTION

ROUND ALL EDGES TO A 2 mm RADIUS

REVISION

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

DESIGNED: J.J THERON
DRAWN: J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

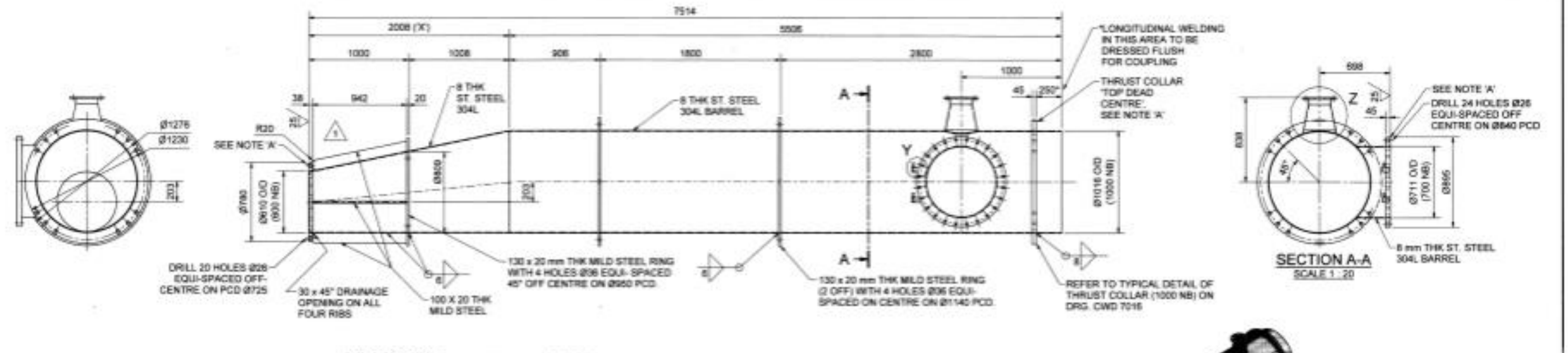
RAISING OF CLANWILLIAM DAM

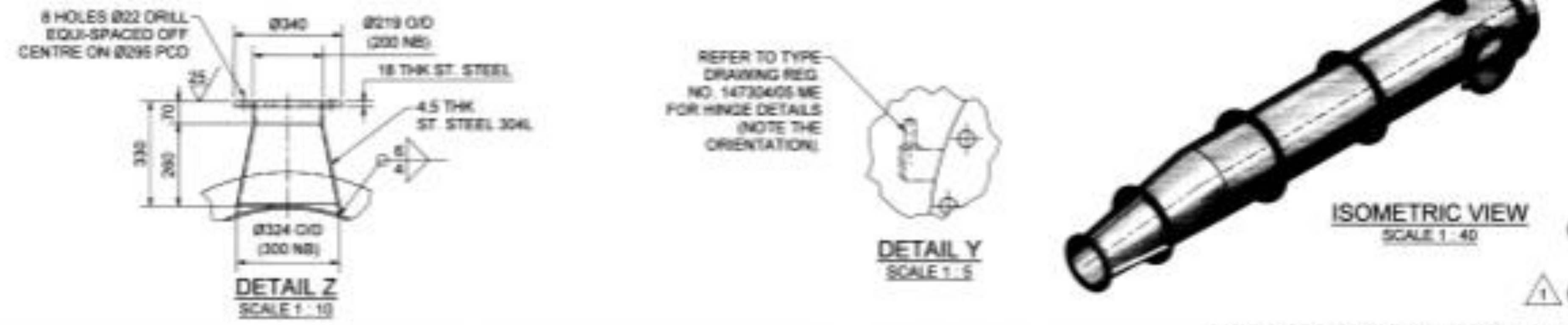
OUTLET WORKS

PIPE & SPECIALS
-DETAILS-

PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | OUW | PPS | PIP | DET | CWD 7030

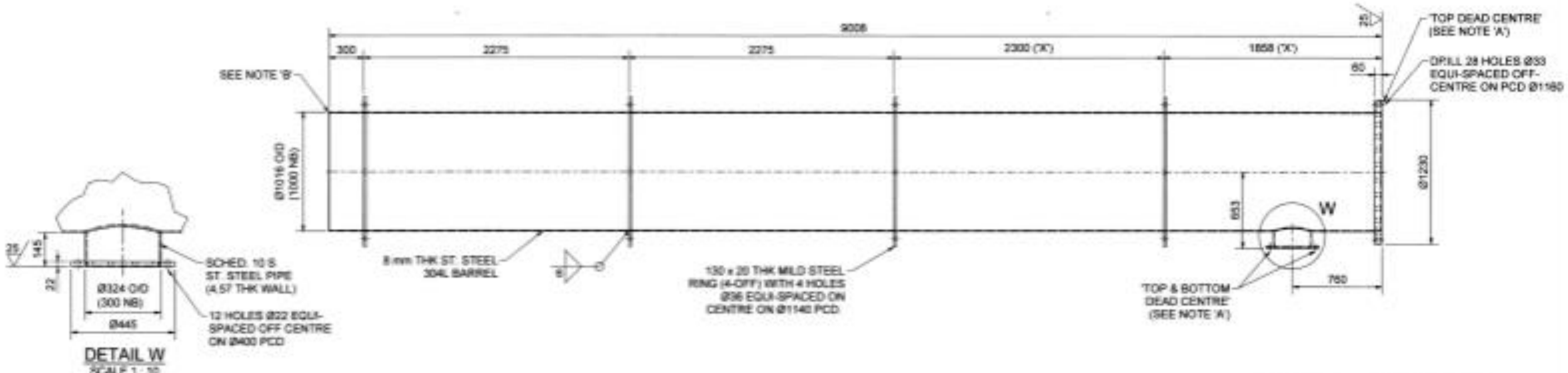
SHEET: 36 | REG. No. 169353/13 ME | REV. 1





219	1000-600 NB ECCENTRIC REDUCER (OPP. HAND)		
MAT'L :	MILD & ST. STEEL	MASS :	1986 kg
NO. OFF :	1	SCALE :	1:20
90	1000 - 600 NB ECCENTRIC REDUCER (AS SHOWN)		
MAT'L :	MILD & ST. STEEL	MASS :	1986 kg
NO. OFF :	1	SCALE :	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES



91	STRAIGHT PIPE		
MAT'L :	MILD & ST. STEEL	MASS :	2300 kg
NO. OFF :	2	SCALE :	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES

NOTE 'A'
Ø6 x 3 mm DEEP HOLE ON Ø1205 PCD FOR 1000 NB FLANGE (Ø870 PCD FOR 700 NB FLANGE, Ø755 PCD FOR 600 NB FLANGE, Ø430 PCD FOR 300 NB FLANGE & Ø325 PCD FOR 200 NB FLANGE) ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

NOTE 'B'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7013.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS SHALL ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0.3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0.5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0.8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 metres WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

ALL DIMENSIONS IN MILLIMETRES

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (180 µm DFT) (PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (380 µm DFT).
- AREA 270 mm FROM PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ITEM 90 & ENDS WITH FLANGES. ONLY OPEN ENDED PIPES. EXCEPT ITEM 90 & 219).
- FLANGE FACE: APPLY TWO PACK EPOXY (80 - 90 µm DFT).

DO NOT SCALE DRAWING

SCALE (mm) 0 5 10 100

PROJECTION (U.O.S.)

ROUND ALL EDGES TO A 2 mm RADIUS

REVISION
ISSUED FOR CONSTRUCTION
ITEM 90 REDUCER END CHANGED FROM 400 NB TO 600 NB
ITEM 91 QTY CHANGED FROM 1 TO 2
ITEM 219 ADDED

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
DIRECTOR GENERAL
DRAWN: J.J THERON
DESIGN: J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

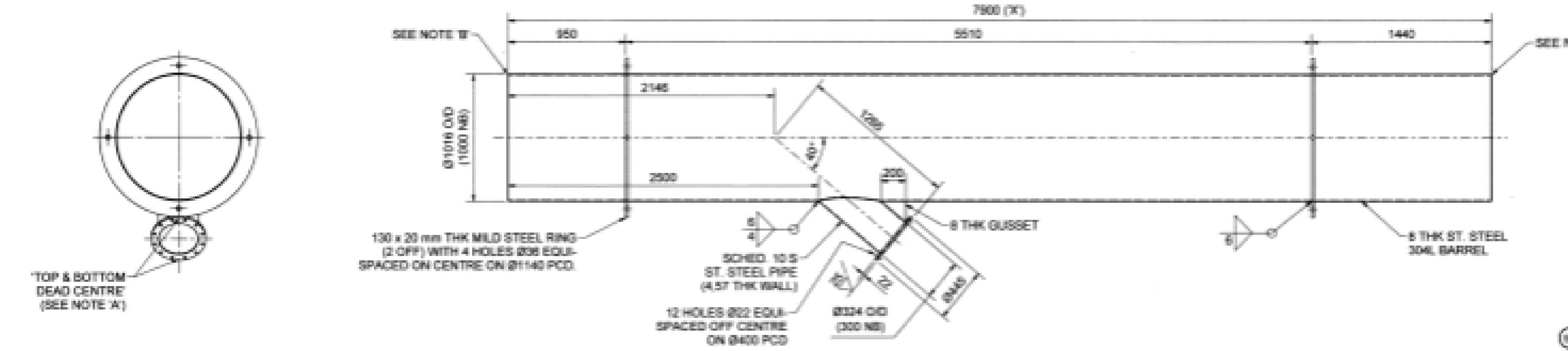
OUTLET WORKS

PIPES & SPECIAL

-DETAILS-

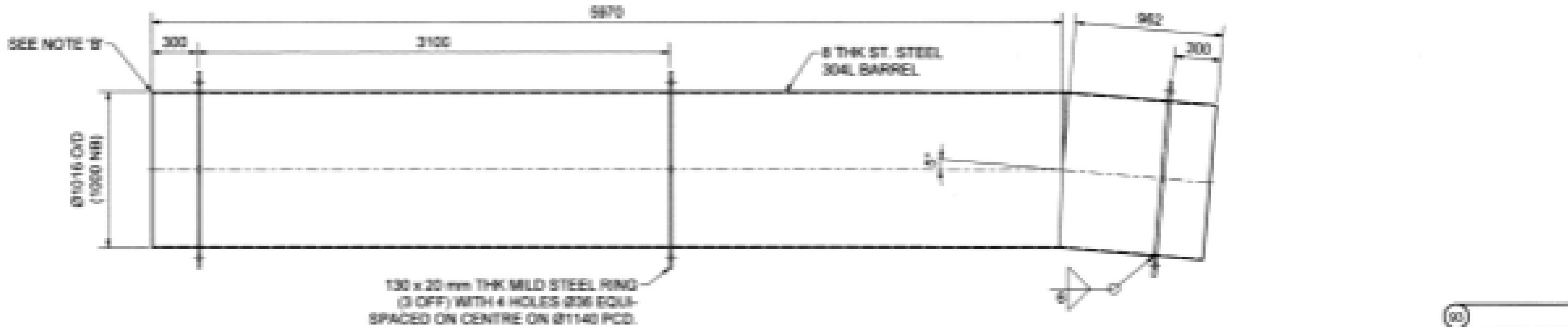
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | DUW | PPE | PIP | DET | CWD 7036

SHEET 37 | 169354/13 ME | REV 1



10	OFF TAKE PIPE		
MATL.:	MILD & ST. STEEL	MASS:	1775 kg
NO. OFF:	1	SCALE:	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.



93	5° BEND		
MATL.:	MILD & ST. STEEL	MASS:	1630 kg
NO. OFF:	1	SCALE:	1:20

NOTE 'A'
Ø5 x 3 mm DEEP HOLE ON Ø400 PCD FOR 300 NB FLANGE ON 'TOP' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

NOTE 'B'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7013.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS SHALL ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

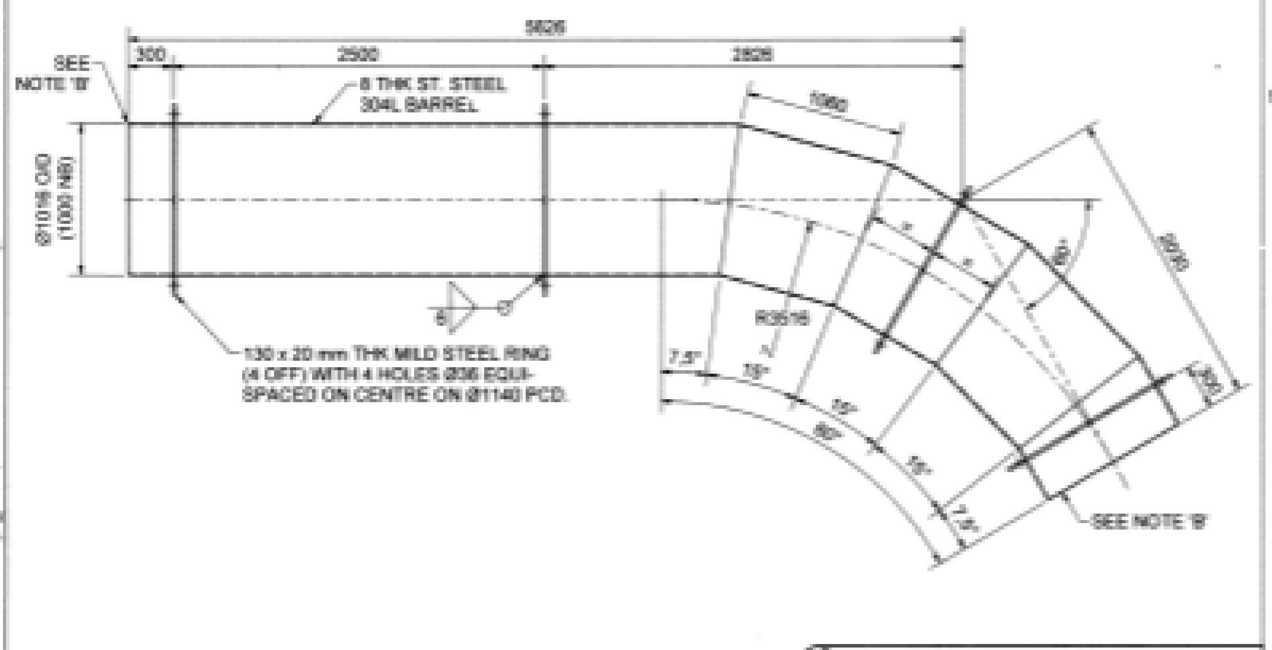
FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1600 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1600 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/18.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/ EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

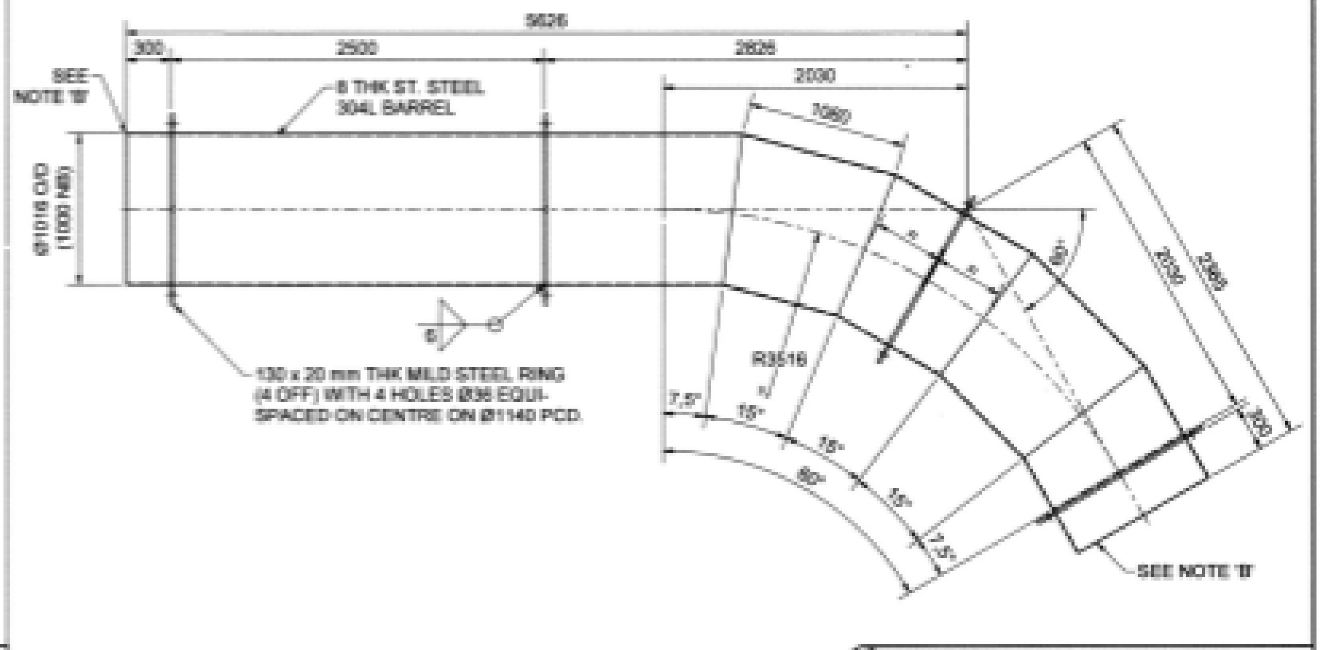
PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES



94	60° BEND		
MATL.:	MILD & ST. STEEL	MASS:	1776 kg ea.
NO. OFF:	3	SCALE:	1:20



94B	60° BEND		
MATL.:	MILD & ST. STEEL	MASS:	1846 kg ea.
NO. OFF:	1	SCALE:	1:25

GENERAL DIMENSIONAL TOLERANCES (U.O.S):

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT). (PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (28 µm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 270 mm FROM PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES; ONLY OPEN ENDED PIPES).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

SCALE (mm)

PROJECTION (U.O.S.)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | ROUND ALL EDGES TO A 2 mm RADIUS

REVISION

DEPARTMENT OF WATER AND SANITATION
DIRECTOR GENERAL

DESIGN: J.J THERON
DRAWN: J.J THERON

OLIFANTS-DOORN WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

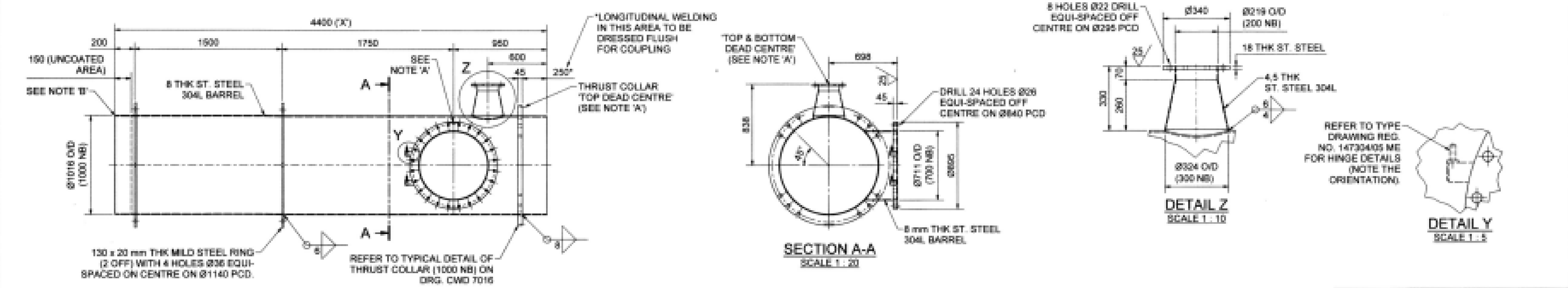
OUTLET WORKS

PIPES & SPECIALS

-DETAILS-

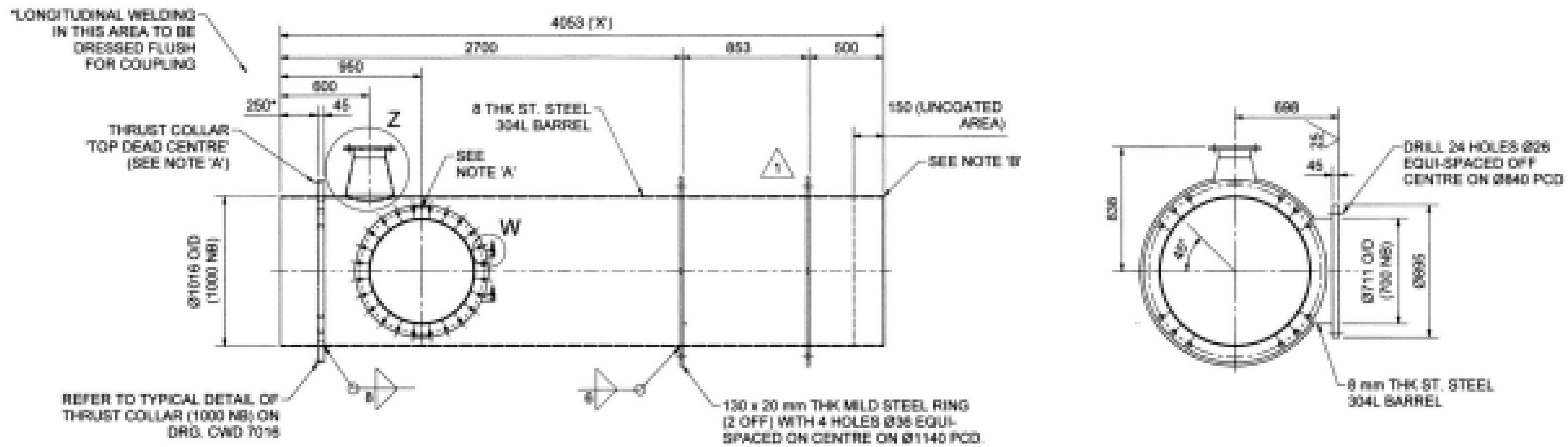
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | DUW | PPS | PIP | DET | CWD 7037

SHEET 38 | 169355/13 ME | REV 1



(95)	STRAIGHT PIPE		
MATL:	MILD & ST. STEEL	MASS:	1268 kg
NO. OFF:	1	SCALE:	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.



(96)	STRAIGHT PIPE		
MATL:	MILD & ST. STEEL	MASS:	1198 kg
NO. OFF:	1	SCALE:	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.

NOTE 'A'
Ø6 x 3 mm DEEP HOLE ON Ø1065 PCD FOR 1000 NB FLANGE (Ø870 PCD FOR 700 NB FLANGE & Ø 325 PCD FOR 200 NB FLANGE)
ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

NOTE 'B'
SEE TYPICAL WELD PREPARATION DETAIL 'W' ON DRG. CWD 7013.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS SHALL ALIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

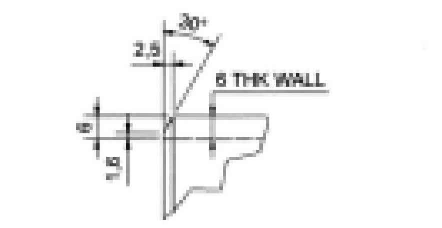
FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1600 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1600 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL)
X = SURFACE ROUGHNESS IN MICROMETRES



DETAIL V
TYPICAL DETAIL OF WELD PREPARATION FOR 600 NB PLAIN END PIPES
SCALE 1 : 1

(97)	STRAIGHT PIPE		
MATL:	MILD & ST. STEEL	MASS:	933 kg ea.
NO. OFF:	4	SCALE:	1:20

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 0800.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT). (PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 250 mm FROM PIPE ENDS ON ITEM 97 TO BE UNCOATED (ITEM 95 & 96 UNCOATED AREAS AS INDICATED).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

SCALE (mm)

PROJECTION (U.O.S)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | ROUND ALL EDGES TO A 2 mm RADIUS

REVISION
0 — ISSUED FOR CONSTRUCTION
1 — REDUCED END OF ITEM 96 REPLACED WITH A STRAIGHT PIPE SECTION. ITEM 97 CANCELLED.

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
DIRECTOR GENERAL

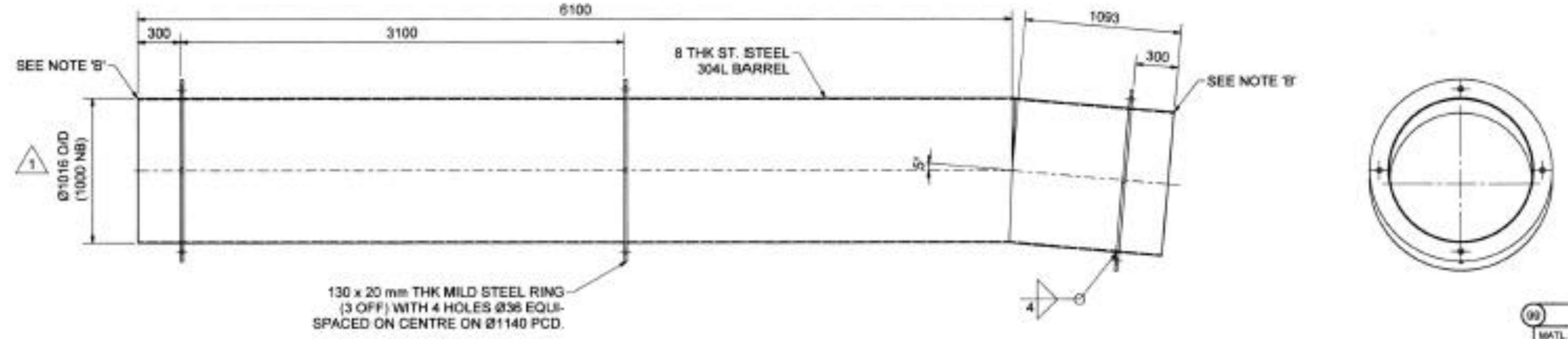
DESIGN: J.J THERON
DRAWN: J.J THERON

OLIFANTS-DOORN RIVER RESOURCE PROJECT
RAISING OF CLANWILLIAM DAM
OUTLET WORKS
PIPES & SPECIALS
-DETAILS-

PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM
SHEET 39 | REG. No. 169356/13 ME | REV. No. 1
OTHER NUMBER: CWD 7030

98	STRAIGHT PIPE		
MATL:	MILD & ST. STEEL	MASS:	905 kg
NO. OFF:	1	SCALE:	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.



99	5° BEND		
MATL:	MILD & ST. STEEL	MASS:	1682 kg
NO. OFF:	1	SCALE:	1:20

NOTE 'A'
Ø6 x 3 mm DEEP HOLE ON Ø430 PCD FOR 300 NB FLANGE ON 'TOP' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

NOTE 'B'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7013.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 8.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

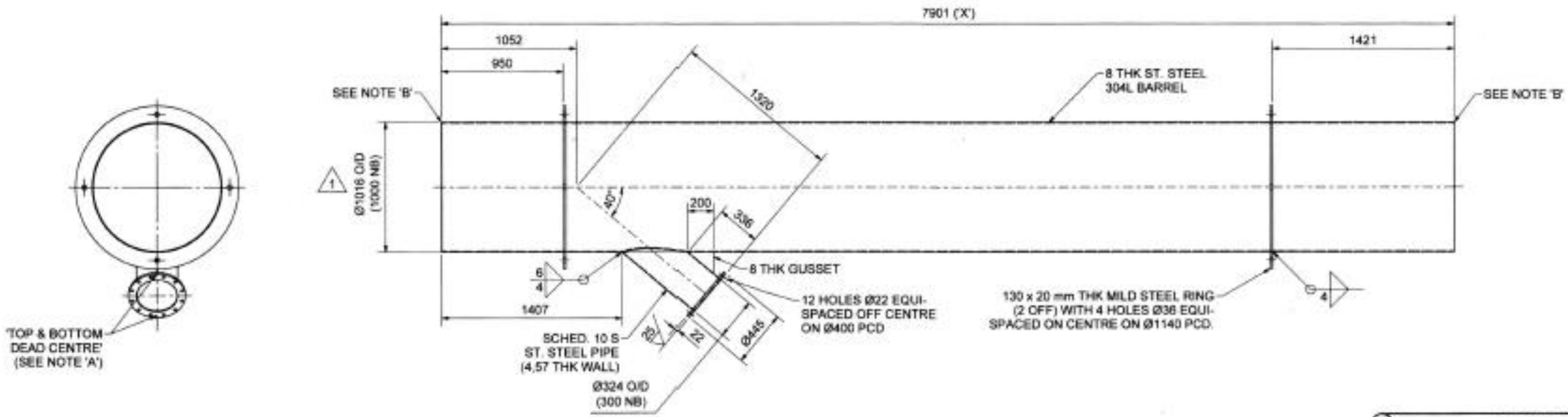
FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/18.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL:
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES



106	OFF TAKE PIPE		
MATL:	MILD & ST. STEEL	MASS:	1778 kg
NO. OFF:	1	SCALE:	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 μm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 μm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 μm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 μm DFT).
- AREA 250 mm FROM PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES: ONLY OPEN ENDED PIPES).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 μm DFT).

SCALE (mm) 0 5 10 ... 100

PROJECTION (U.O.S.)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | ROUND ALL EDGES TO A 2 mm RADIUS

REVISION

REV NO.	DATE	DESCRIPTION	FOR	DWG
0	12/15	ISSUED FOR CONSTRUCTION		
1	02/16	ITEM 98 CANCELLED. ITEM 99 & 1 06 DIA CHANGED FROM 600 NB TO 1000 NB. NOTE 'B' ALTERED		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
DIRECTOR GENERAL

DESIGN: J.J THERON
DRAWN: J.J THERON

OLIFANTS-DOORN WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS

PIPES & SPECIALS

-DETAILS-

PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | KEYCODES: OUW PPB PIP DET | OTHER NUMBER: CWD 7039

LOCALITY No. E100-02

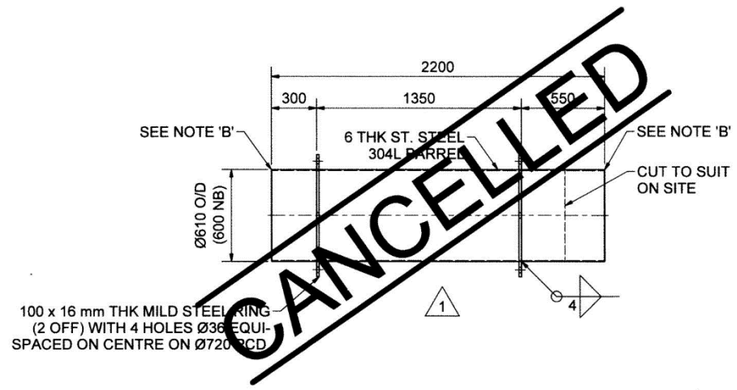
CALCULATION FILE: ME/E100-02

SHEET 40

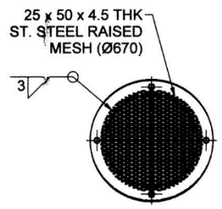
REG. No. 169357/13 ME

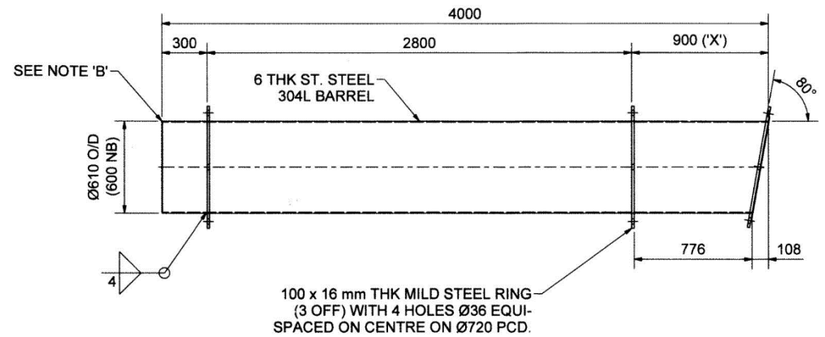
REV No. 1

(110)	60° BEND		
MATL. :	MILD & ST.STEEL	MASS :	677 kg ea.
NO. OFF :	2	SCALE. :	1:20



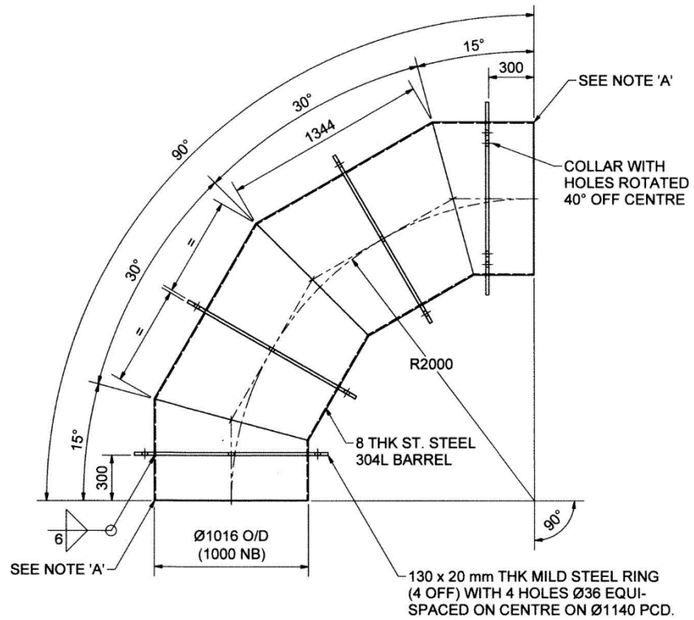
(111)	STRAIGHT PIPE		
MATL. :	MILD & ST.STEEL	MASS :	256 kg
NO. OFF :	1	SCALE. :	1:20

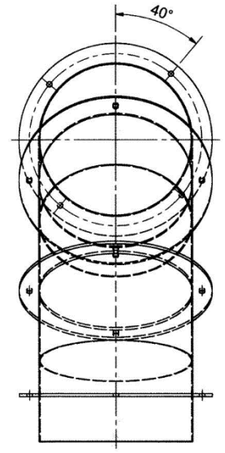




FOR ('X') SEE CORROSION PROTECTION NOTES.

(112)	STRAIGHT PIPE		
MATL. :	MILD & ST.STEEL	MASS :	422 kg ea.
NO. OFF :	2	SCALE. :	1:20





(113)	90° BEND		
MATL. :	MILD & ST.STEEL	MASS :	945 kg ea.
NO. OFF :	2	SCALE. :	1:20

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS SHALL ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL): X
X = SURFACE ROUGHNESS IN MICROMETRES

NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7013.
NOTE 'B'
SEE TYPICAL WELD PREPARATION DETAIL 'V' ON DRG. CWD 7038.

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT). (PLUS A TOP COAT OF PURE ALIPHATIC POLY-URETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 250 mm FROM OPEN ENDED PIPE ENDS TO BE UNCOATED (THIS EXCLUDES THE MESHED EDGE OF ITEM 112)
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

0 5 10 SCALE (mm) 100

PROJECTION (U.O.S.)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | ROUND ALL EDGES TO A 2 mm RADIUS

REVISION			
MOD No.	DATE	DESCRIPTION	FOR DWA
0	10/16	ISSUED FOR CONSTRUCTION	
1	02/18	ITEM 110 & 111 CANCELLED.	

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
HEAD OFFICE
MECH./ELEC. ENG.
PRIVATE BAG X313
PRETORIA 0001
SEDIBENG BUILDING
185 FRANCIS BAARD STREET
PRETORIA
(012) 336-7500
DIRECTOR GENERAL
CHECKED: DATE: 13/6/2018 DESIGN: J.J THERON
ENGINEER: DATE: 03/07/2018 DRAWN: J.J THERON
CHIEF ENGINEER / APP (Pr. Eng): DATE: 27/03/2018
EXT. APPROVAL / DESIGN CHECKED: DATE: 12/02/2018
DIRECTOR (Pr. Eng): DATE: 21/6/2018

OLIFANTS-DOORN WATER RESOURCE PROJECT

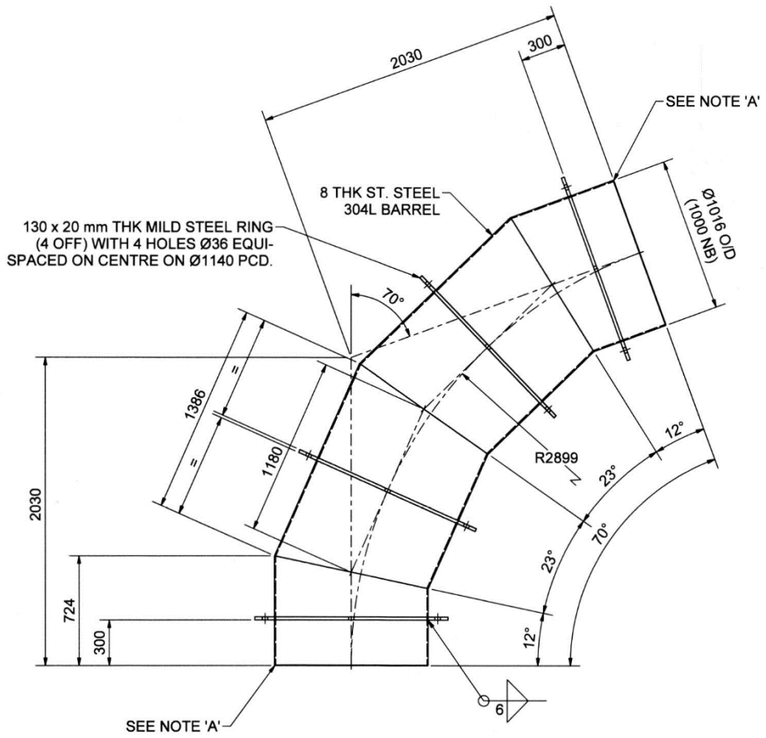
RAISING OF CLANWILLIAM DAM

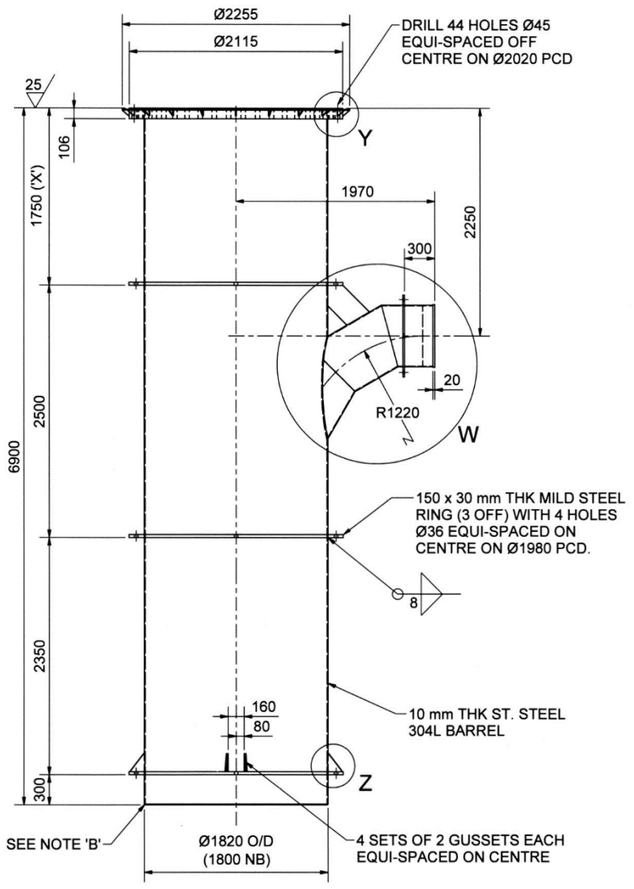
OUTLET WORKS

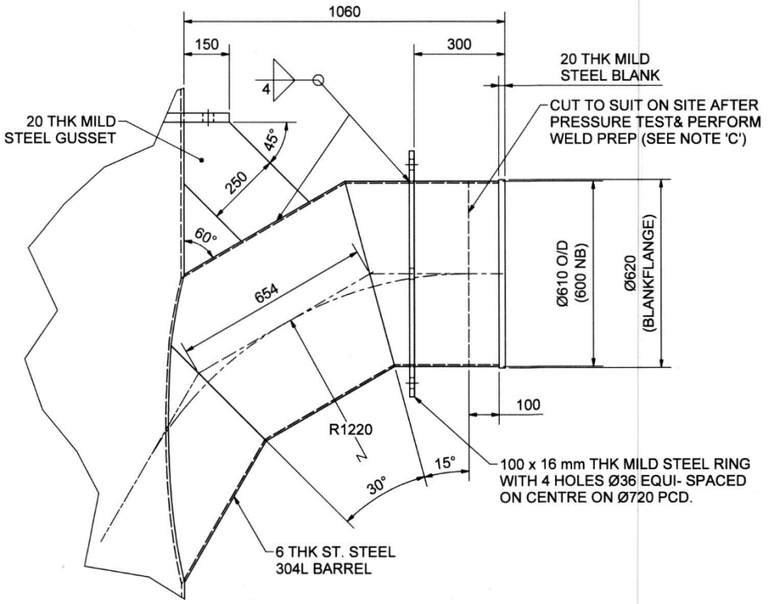
PIPES & SPECIALS

-DETAILS-

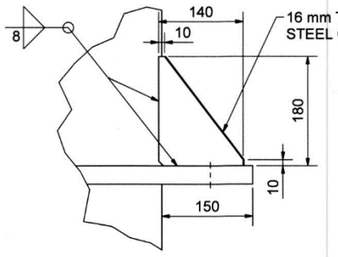
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | KEYCODES: OUW PPB PIP DET | OTHER NUMBER: CWD 7041
LOCALITY No.: E100-02 | TENDER/CONTRACT No.
CALCULATION FILE: ME/E100-02
SHEET: 42 OF | REG No.: 169359/13 ME | REV No: 1





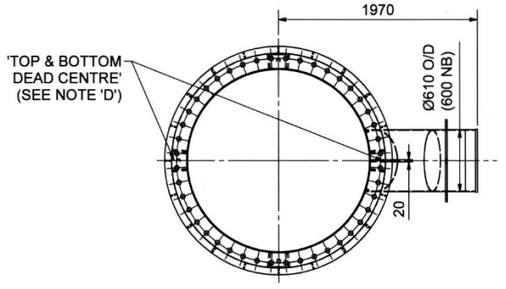


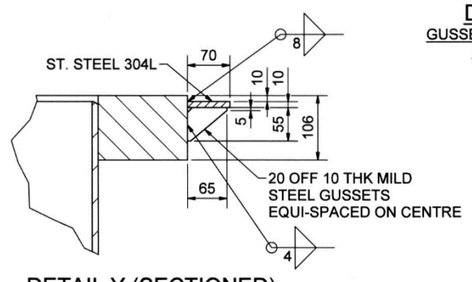
DETAIL W
SCALE 1 : 10



DETAIL Z
GUSSET DETAIL (8 OFF)
SCALE 1 : 5

(114)	70° BEND	
MATL. : MILD & ST. STEEL	MASS : 1022 kg ea.	
NO. OFF : 2	SCALE. : 1:20	





DETAIL Y (SECTIONED)
DETAIL OF COLLAR ON FLANGE
SCALE 1 : 5

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS SHALL ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7013.

NOTE 'B'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7010.

NOTE 'C'
SEE TYPICAL WELD PREPARATION DETAIL 'V' ON DRG. CWD 7038.

NOTE 'D'
Ø6 x 3 mm DEEP HOLE ON Ø2090 PCD FOR1800 NB FLANGE ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

SURFACE FINISH (REMOVAL OF MATERIAL): X/
X = SURFACE ROUGHNESS IN MICROMETRES

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLY-URETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 250 mm FROM OPEN ENDED PIPE ENDS TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

0 5 10 SCALE (mm) 100

PROJECTION (U.O.S.)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | ROUND ALL EDGES TO A 2 mm RADIUS

(115)	STRAIGHT PIPE	
MATL. : MILD & ST. STEEL	MASS : 4720 kg ea.	
NO. OFF : 2	SCALE. : 1:20	

FOR ('X') SEE CORROSION PROTECTION NOTES.

REVISION				
MOD No.	DATE	DESCRIPTION	FOR	DWA
0	10/16	ISSUED FOR CONSTRUCTION		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
HEAD OFFICE
MECH. /ELEC. ENG.
PRIVATE BAG X313
PRETORIA 0001
SEDIBENG BUILDING
185 FRANCIS BAARD STREET
PRETORIA
(012) 336-7500
Mr. A. SINGH
Acting DIRECTOR GENERAL

CHECKED:		DESIGN: J.J THERON	
		DATE:	DRAWN: J.J THERON
ENGINEER	30/09/2016	DATE:	EXT. APPROVAL / DESIGN CHECKED: 27/10/16 DATE:
CHIEF ENGINEER / APP (Pr. Eng):	17/01/2017	DATE:	DIRECTOR (Pr. Eng): 25/10/2016 DATE:

OLIFANT-DOORN WATER RESOURCE PROJECT

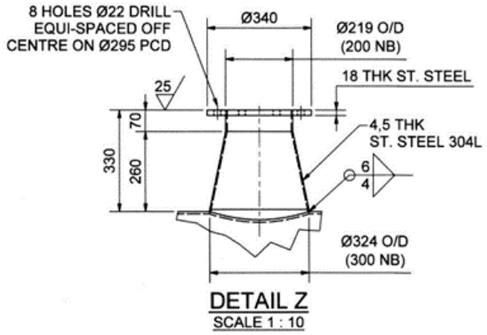
RAISING OF CLANWILLIAM DAM

OUTLET WORKS

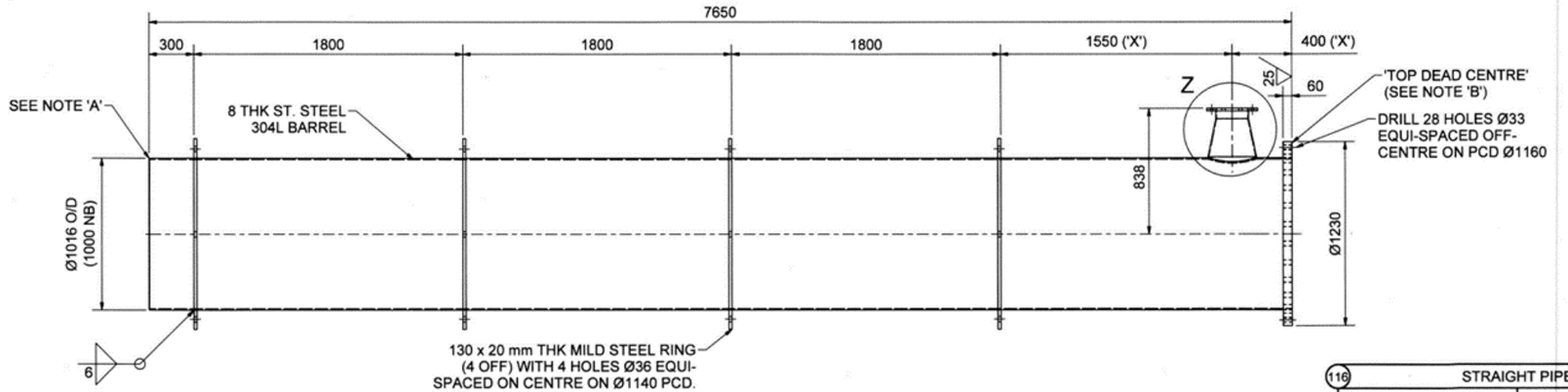
PIPES & SPECIALS

-DETAILS-

PROVINCE: WESTERN CAPE	DISTRICT: CLANWILLIAN	KEYCODES:	OUW	PPB	PIP	DET		OTHER NUMBER CWD 7042
LOCALITY No.: ME/E100-02	TENDER/ CONTRACT No.	SHEET	REG No.					REV No.
CALCULATION FILE: ME/E100-02		43 OF	169360/13 ME					0



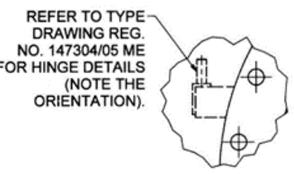
DETAIL Z
SCALE 1 : 10



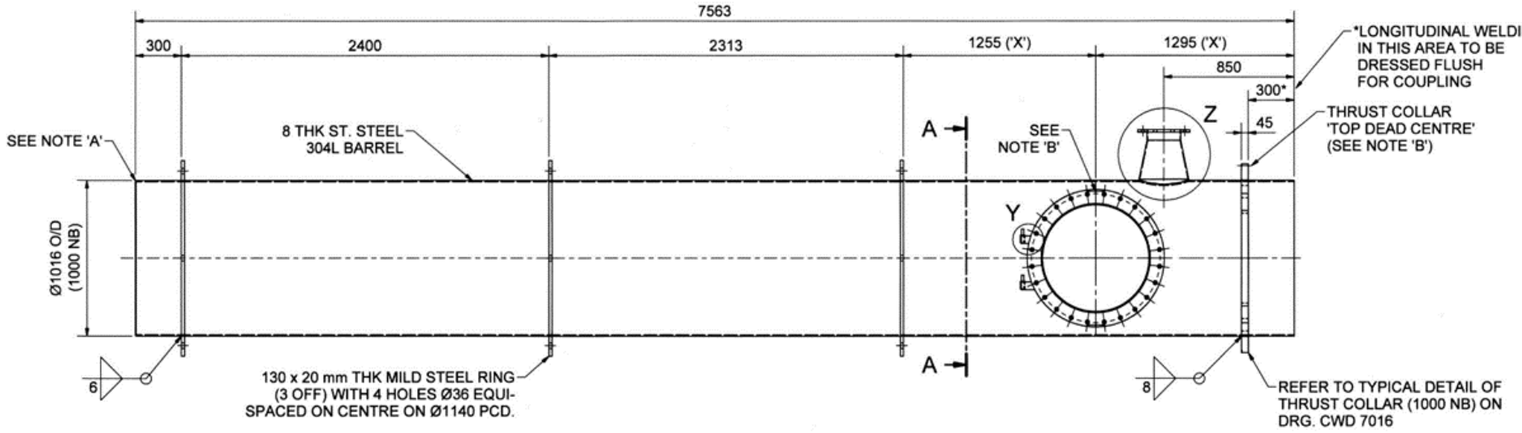
FOR ('X') SEE CORROSION PROTECTION NOTES.

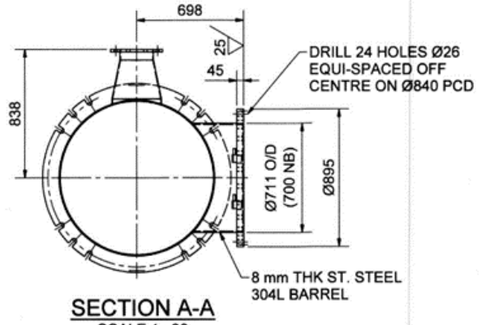
(116) STRAIGHT PIPE

MATL. :	MILD & ST.STEEL	MASS :	2027 kg
NO. OFF :	1	SCALE. :	1:20



DETAIL Y
SCALE 1 : 5





SECTION A-A
SCALE 1 : 20

(117) STRAIGHT PIPE

MATL. :	MILD & ST.STEEL	MASS :	1984 kg
NO. OFF :	1	SCALE. :	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.

NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7013.
NOTE 'B'
Ø6 x 3 mm DEEP HOLE ON Ø1205 PCD FOR 1000 NB FLANGE (Ø870 PCD FOR 700 NB FLANGE) ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS SHALL ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL):
X = SURFACE ROUGHNESS IN MICROMETRES

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

ALL DIMENSIONS IN MILLIMETRES

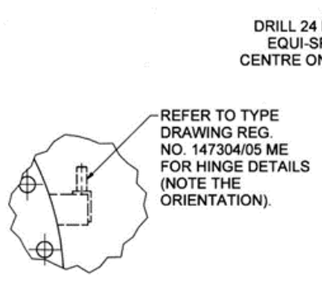
CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT). (PLUS A TOP COAT OF PURE ALIPHATIC POLY-URETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 250 mm FROM OPEN ENDED PIPES TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES & THE EDGES WITH A THRUST COLLAR OF ITEM 117 & 118).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

DO NOT SCALE DRAWING

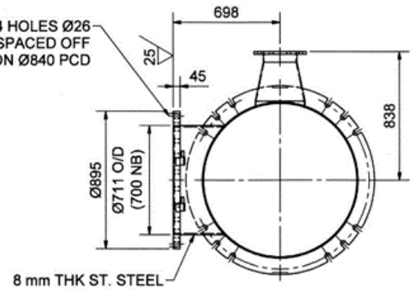
0 5 10 SCALE (mm) 100

PROJECTION (U.O.S.)

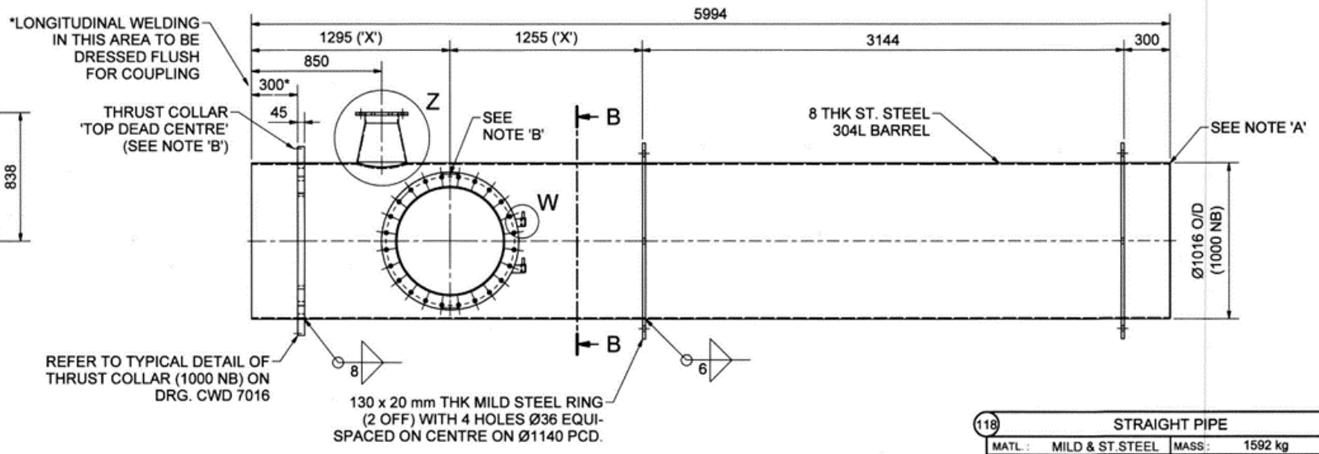
ROUND ALL EDGES TO A 2 mm RADIUS



DETAIL W
SCALE 1 : 5



SECTION B-B
SCALE 1 : 20



(118) STRAIGHT PIPE

MATL. :	MILD & ST.STEEL	MASS :	1592 kg
NO. OFF :	1	SCALE. :	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWA
0	10/16	ISSUED FOR CONSTRUCTION		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
HEAD OFFICE
MECH. /ELEC. ENG.
PRIVATE BAG X313
PRETORIA 0001
SEDIBENG BUILDING
185 FRANCIS BAARD STREET
PRETORIA
(012) 336-7500
Mr. A. SINGH
Acting DIRECTOR GENERAL

CHECKED:	30/09/2016 DATE:	DESIGN: J.J THERON	
ENGINEER:	30/9/2016 DATE:	DRAWN: J.J THERON	
CHIEF ENGINEER / APP (Pr. Eng):	17/10/2017 DATE:	EXT. APPROVAL / DESIGN CHECKED:	25/10/2016 DATE:
		DIRECTOR (Pr. Eng):	

OLIFANTS-DOORN WATER RESOURCE PROJECT

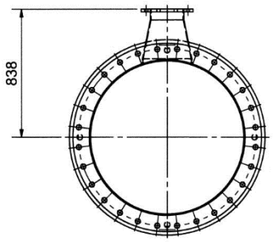
RAISING OF CLANWILLIAM DAM

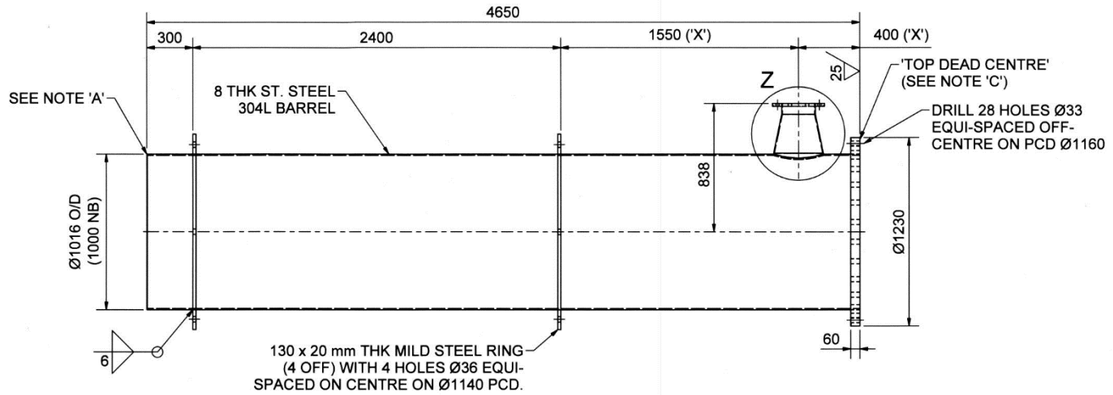
OUTLET WORKS

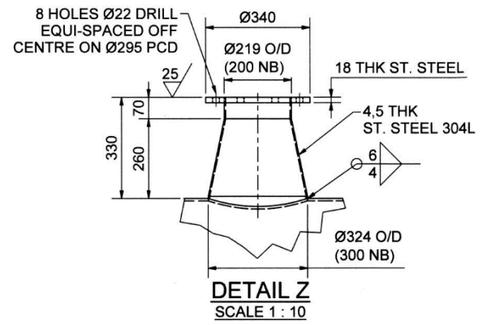
PIPES & SPECIALS

-DETAILS-

PROVINCE: WESTERN CAPE	DISTRICT: CLANWILLIAM	KEYCODES:	OUW	PPB	PIP	DET		OTHER NUMBER	CWD 7043
LOCALITY No.: E100-02	TENDER/ CONTRACT No.	SHEET 44 OF	REG No. 169361/13 ME					REV No.	0
CALCULATION FILE: ME/E100-02									





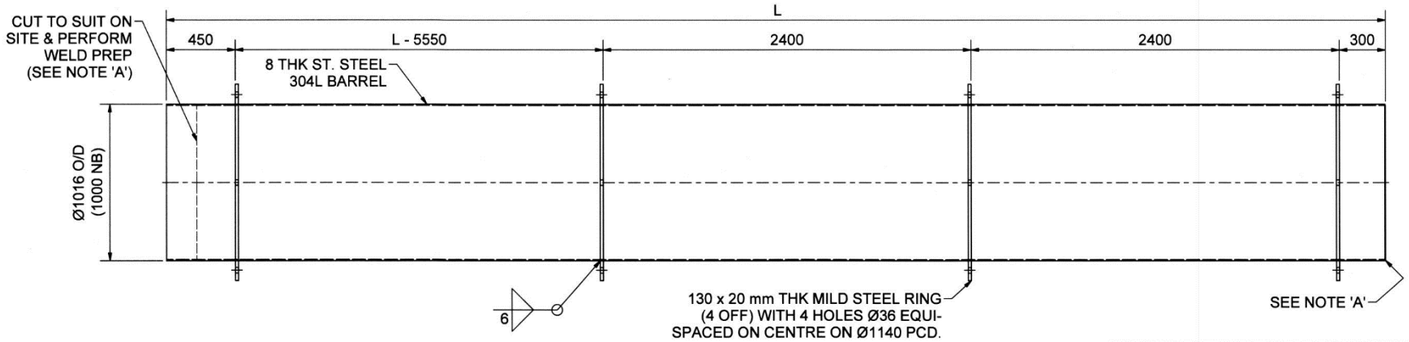


DETAIL Z
SCALE 1 : 10

FOR ('X') SEE CORROSION PROTECTION NOTES.

(119) STRAIGHT PIPE

MATL. :	MILD & ST.STEEL	MASS :	1270 kg
NO. OFF :	1	SCALE. :	1:20

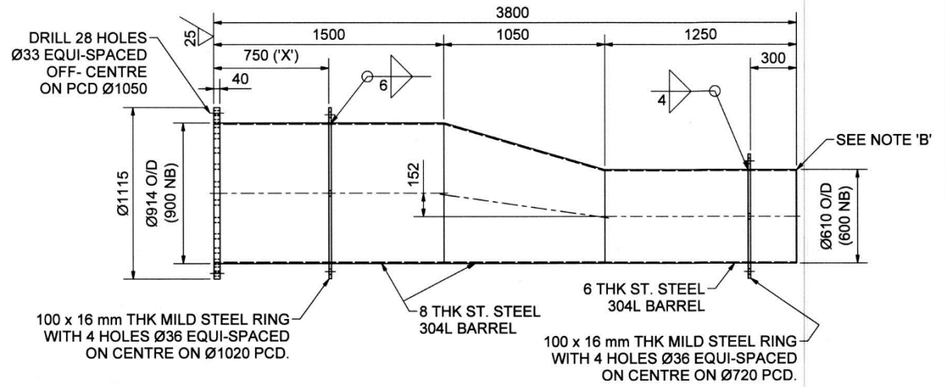


(120) STRAIGHT PIPE (L=7950)

MATL. :	MILD & ST.STEEL	MASS :	1908 kg
NO. OFF :	1	SCALE. :	1:20

(121) STRAIGHT PIPE (L=7750)

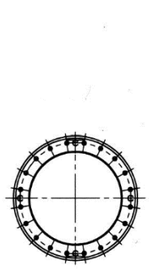
MATL. :	MILD & ST.STEEL	MASS :	1868 kg
NO. OFF :	1	SCALE. :	1:20

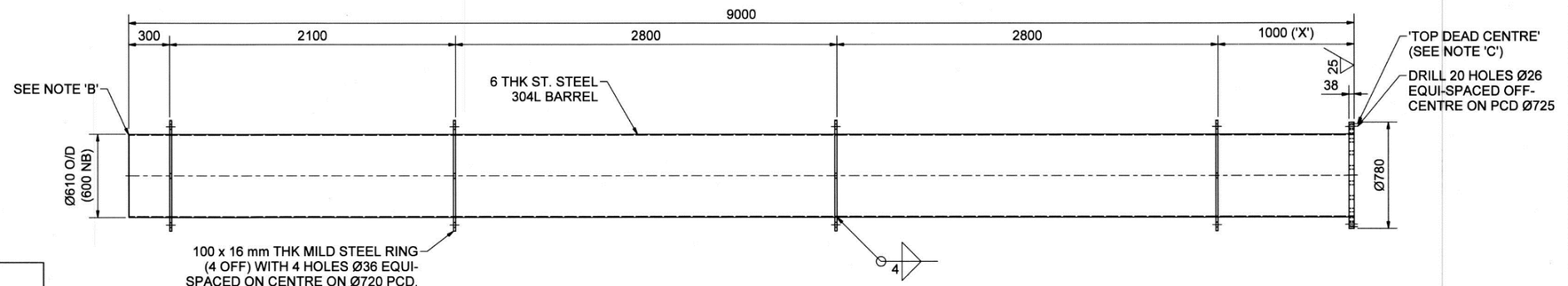


(122) 900 - 600 NB ECCENTRIC REDUCER

MATL. :	MILD & ST.STEEL	MASS :	709 kg
NO. OFF :	1	SCALE. :	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.





(123) STRAIGHT PIPE

MATL. :	MILD & ST.STEEL	MASS :	985 kg
NO. OFF :	1	SCALE. :	1:20

FOR ('X') SEE CORROSION PROTECTION NOTES.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS SHALL ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL): X
X = SURFACE ROUGHNESS IN MICROMETRES

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

ALL DIMENSIONS IN MILLIMETRES

NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7013.
NOTE 'B'
SEE TYPICAL WELD PREPARATION DETAIL 'V' ON DRG. CWD 7038.
NOTE 'C'
Ø6 x 3 mm DEEP HOLE ON Ø1205 PCD FOR 1000 NB FLANGE (Ø870 PCD FOR 700 NB FLANGE) ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLY-URETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'X' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 250 mm FROM OPEN ENDED PIPES TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES & THE GRATING EDGE OF ITEM 123).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

DO NOT SCALE DRAWING

0 5 10 SCALE (mm) 100

PROJECTION (U.O.S.)

ROUND ALL EDGES TO A 2 mm RADIUS

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWA
0	10/16	ISSUED FOR CONSTRUCTION		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

HEAD OFFICE
MECH. /ELEC. ENG.
PRIVATE BAG X313
PRETORIA 0001

SEDIBENG BUILDING
185 FRANCIS BAARD STREET
PRETORIA
(012) 336-7500

Mr. A. SINGH
Acting DIRECTOR GENERAL

CHECKED:	30/9/2016 DATE	DESIGN: J.J THERON	
ENGINEER:	30/9/2016 DATE	DRAWN: J.J THERON	
CHIEF ENGINEER / APP (Pr. Eng):	17/9/2017 DATE	EXT. APPROVAL / DESIGN CHECKED:	27/10/2016 DATE
		DIRECTOR (Pr. Eng):	25/10/2016 DATE

OLIFANTS-DOORN WATER RESOURCE PROJECT

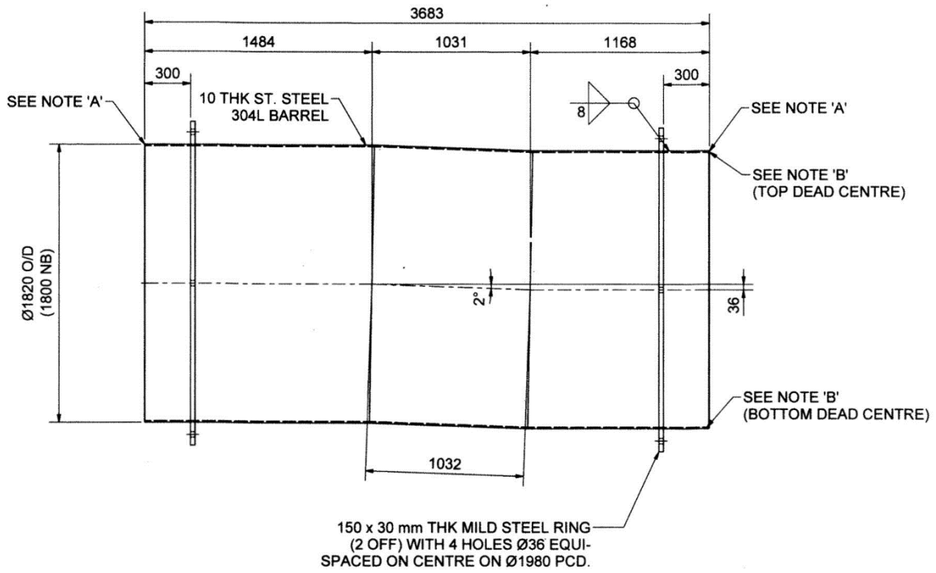
RAISING OF CLANWILLIAM DAM

OUTLET WORKS

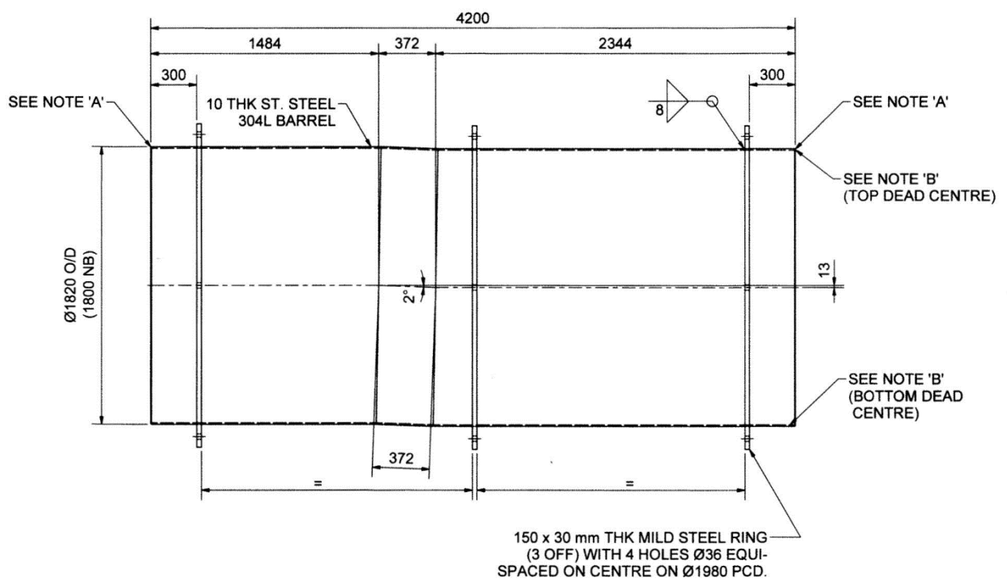
PIPES & SPECIALS

-DETAILS-

PROVINCE: WESTERN CAPE	DISTRICT: CLANWILLIAM	KEYCODES:	OUW	PPB	PIP	DET		OTHER NUMBER	CWD 7044
LOCALITY No: E100-02	TENDER/ CONTRACT No.	SHEET	45 OF	REG No.	169362/13 ME				REV No. 0
CALCULATION FILE: ME/E100-02									



(124)	PIPE		
MATL. :	MILD & ST. STEEL	MASS :	2117 kg
NO. OFF :	1	SCALE. :	1:20



(125)	PIPE		
MATL. :	MILD & ST. STEEL	MASS :	2582 kg
NO. OFF :	1	SCALE. :	1:20

NOTE 'A'
SEE TYPICAL WELD PREPARATION DETAIL 'A' ON DRG. CWD 7010.

NOTE 'B'
MARK (USING A PUNCH) THE 'TOP DEAD CENTRE' OF THE PIPE ON THE OUTSIDE EDGE AND MARK THE 'BOTTOM DEAD CENTRE' ON THE INSIDE OF THE PIPE 5 mm FROM THE EDGE.

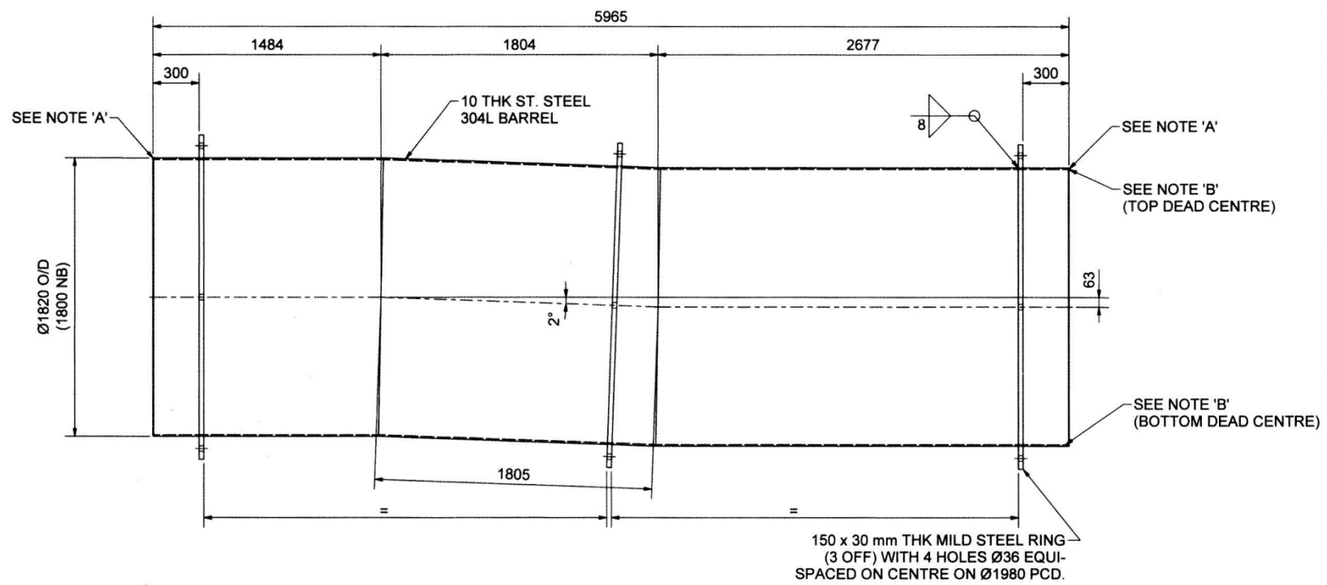
GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS MUST ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

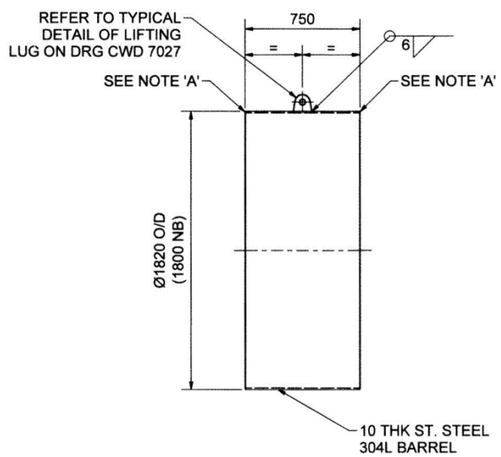
MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.



(126)	PIPE		
MATL. :	MILD & ST. STEEL	MASS :	3377 kg
NO. OFF :	1	SCALE. :	1:20



NOTE 'C'
ITEM 127 SHALL BE USED TO REPLACE THE IN-LINE TESTING BLANKS (ITEM 53 & 54) AFTER HYDRAULIC PRESSURE TESTING.

(127)	STRAIGHT PIPE		
MATL. :	ST. STEEL	MASS :	343 kg ea.
NO. OFF :	3	SCALE. :	1:20

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

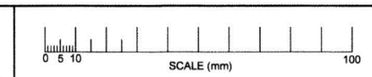
DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

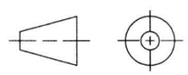
ALL DIMENSIONS IN MILLIMETRES

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 250 mm FROM OPEN ENDED PIPES TO BE UNCOATED.
- ITEM 127 TO BE DELIVERED TO SITE UNCOATED.

DO NOT SCALE DRAWING



PROJECTION (U.O.S.)



ROUND ALL EDGES TO A 2 mm RADIUS

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWA
0	08/17	ISSUED FOR CONSTRUCTION		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

HEAD OFFICE
MECH. /ELEC. ENG.
PRIVATE BAG X313
PRETORIA 0001

SEDIBENG BUILDING
185 FRANCIS BAARD STREET
PRETORIA
(012) 336-7500

Mr. D.M. MASHITISHO
DIRECTOR GENERAL

CHECKED:	13/9/2017 DATE:	DESIGN: J.J THERON	
ENGINEER:	19/9/2017 DATE:	DRAWN: J.J THERON	
CHIEF ENGINEER / APP (Pr. Eng):	02/11/2017 DATE:	EXT. APPROVAL DESIGN CHECKED: 12/12/2017 DATE:	DIRECTOR (Pr. Eng): 16/01/2018 DATE:

OLIFANTS-DOORN WATER RESOURCE PROJECT

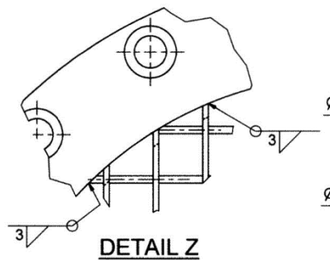
RAISING OF CLANWILLIAM DAM

OUTLET WORKS

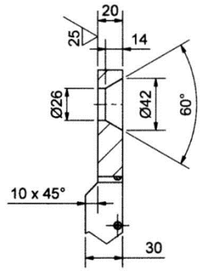
PIPES & SPECIALS

-DETAILS-

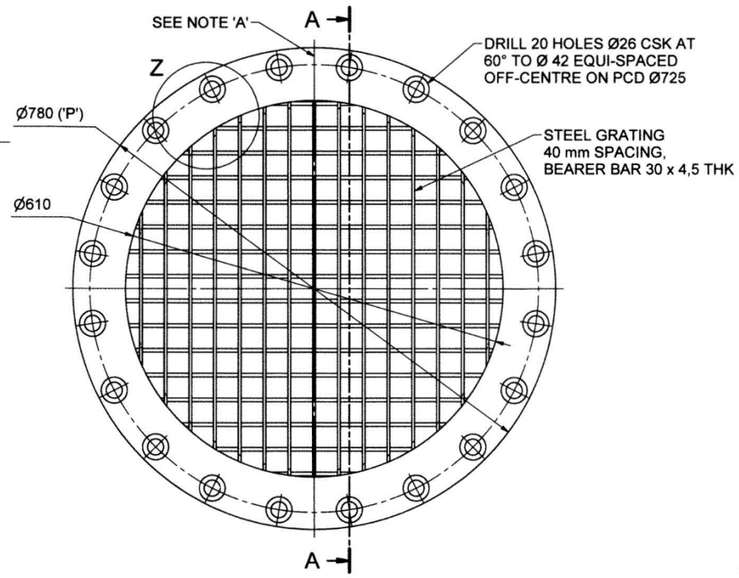
PROVINCE: WESTERN CAPE	DISTRICT: CLANWILLIAM	KEYCODES:	OUW	PPB	PIP	DET		OTHER NUMBER	CWD 7045
LOCALITY No.: E100-02	TENDER/ CONTRACT No.	SHEET	REG. No.						REV No.
CALCULATION FILE: ME/E100-02		46 OF	169363/13 ME						0

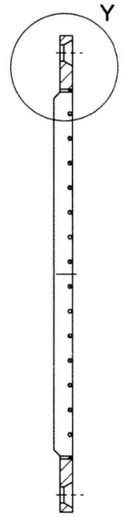


DETAIL Z
SCALE 1 : 2.5

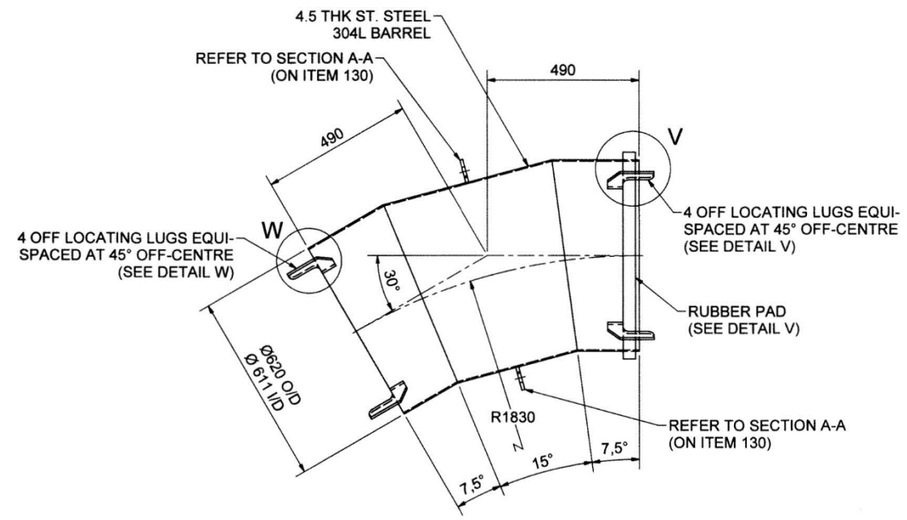


DETAIL Y
SCALE 1 : 2.5





SECTION A-A
SCALE 1 : 5



(128)	GRITTTED FLANGE		
MATL. :	MILD STEEL	MASS :	36 kg
NO. OFF :	3	SCALE :	1:5

FOR ('P') SEE CORROSION PROTECTION NOTES.

NOTE 'C'
1 OFF ITEM TO BE USED AS AN ELECTRICAL DUCT &
2 OFF ITEM TO BE USED FOR WATER TRANSFER
(UNPRESSURIZED), THUS NO PRESSURE TESTING REQUIRED.

(129)	30° BEND		
MATL. :	ST. STEEL 304L	MASS :	74 kg ea.
NO. OFF :	3	SCALE :	1:10

NOTE 'A'
Ø6 x 3 mm DEEP HOLE ON Ø750 PCD FOR 600 NB FLANGE ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

NOTE 'B'
DETAIL 'V' & 'W' ARE ROTATED DETAILED (SECTIONED) VIEWS TAKEN PERPENDICULAR TO THE LOCATING LUG FACE TO PROVIDE A 'TRUE' VIEW.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE B.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S.).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

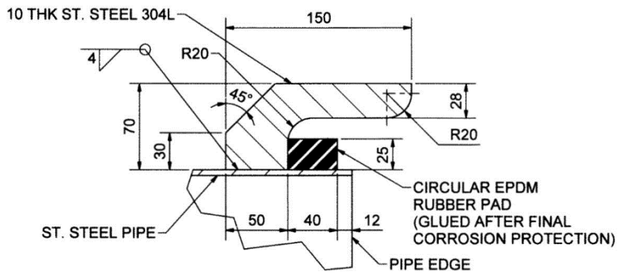
TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL): X
X = SURFACE ROUGHNESS IN MICROMETRES

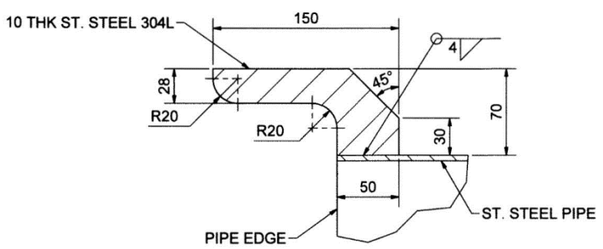
GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

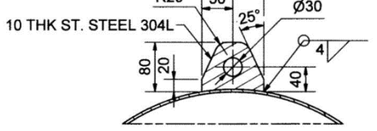
GENERAL MANUFACTURING NOTES:
-PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
-FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.



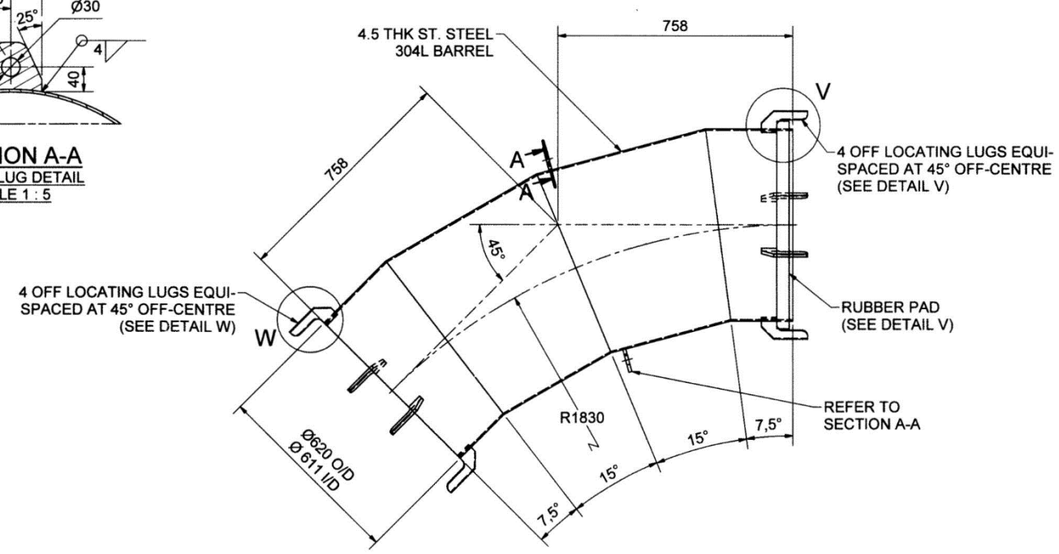
DETAIL V
LOCATING LUG DETAIL
TO SUIT CONCRETE SOCKET EDGE
SCALE 1 : 2.5



DETAIL W
LOCATING LUG DETAIL
TO SUIT CONCRETE SPIGOT EDGE
SCALE 1 : 2.5



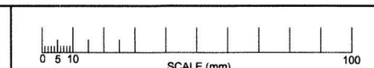
SECTION A-A
LIFTING LUG DETAIL
SCALE 1 : 5

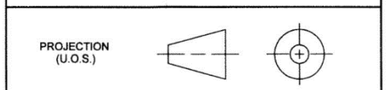


NOTE 'D'
PIPE TO SERVE AS AN ELECTRICAL DUCT, THUS NO PRESSURE TESTING REQUIRED. CORROSION PROTECTION ENTAILS PICKLE & PASSIVATE ONLY.

(130)	45° BEND		
MATL. :	ST. STEEL 304L	MASS :	107 kg
NO. OFF :	1	SCALE :	1:10

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT)
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- FLANGE COATING: TWO PACK EPOXY (300 µm DFT) (*PLUS A TOP COAT OF PURE ALIPHATIC POLY-URETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'P' ON DETAIL)..
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).





ALL DIMENSIONS IN MILLIMETRES

DO NOT SCALE DRAWING

ROUND ALL EDGES TO A 2 mm RADIUS

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWA
0	08/17	ISSUED FOR CONSTRUCTION		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
HEAD OFFICE
MECH. /ELEC. ENG.
PRIVATE BAG X313
PRETORIA 0001
SEDIBENG BUILDING
185 FRANCIS BAARD STREET
PRETORIA
(012) 336-7500
Mr. D.M. MASHITISHO
DIRECTOR GENERAL

CHECKED:	DATE: 02/03/2017	DESIGN: J.J THERON	
ENGINEER:	DATE: 12/9/2017	DRAWN: J.J THERON	DATE: 12/12/2017
CHIEF ENGINEER / APP (Pr. Eng):	DATE: 21/12/2017	EXT. APPROVAL / DESIGN CHECKED:	DATE:
		DIRECTOR (Pr. Eng):	DATE: 16/01/2018

OLIFANTS-DOORN WATER RESOURCE PROJECT

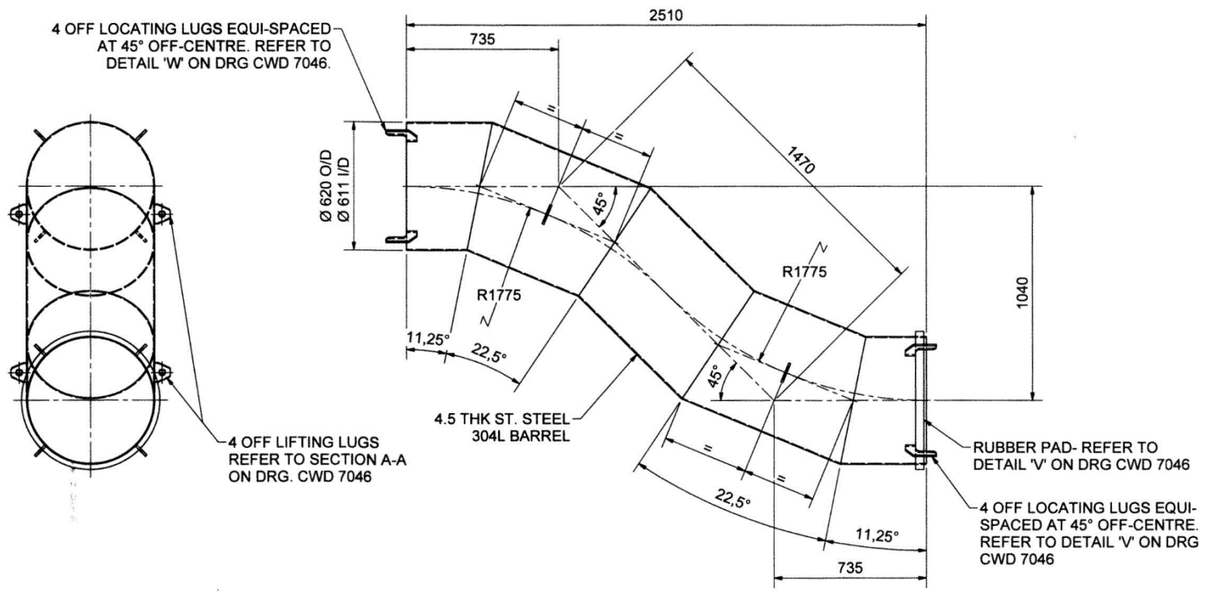
RAISING OF CLANWILLIAM DAM

OUTLET WORKS

PIPES & SPECIALS

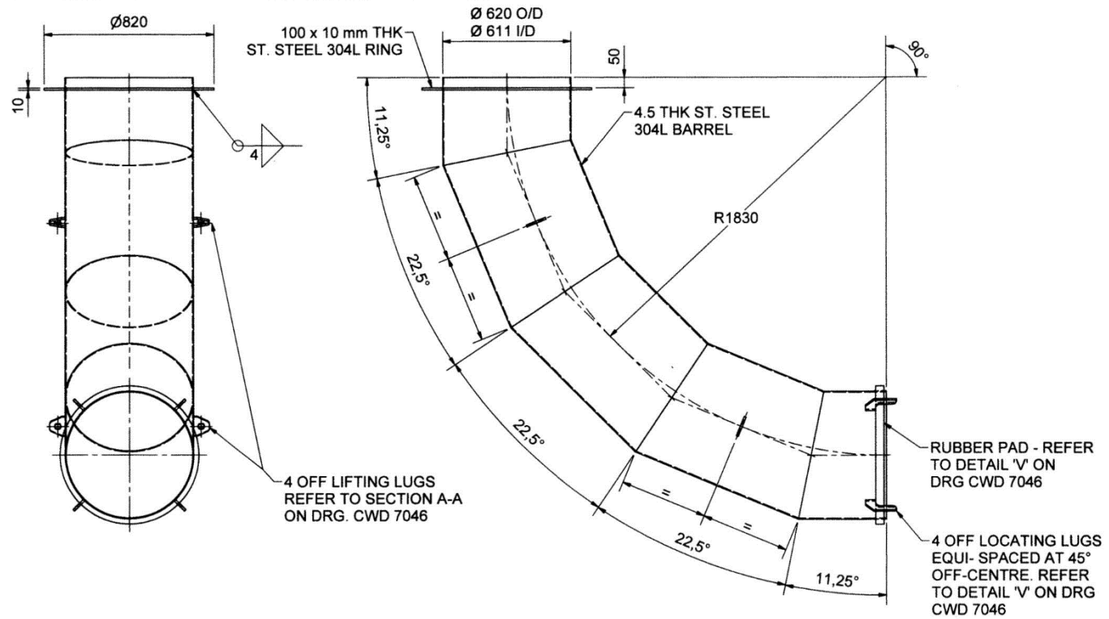
-DETAILS-

PROVINCE: WESTERN CAPE	DISTRICT: CLANWILLIAM	KEYCODES:	OUW	PPB	PIP	DET		OTHER NUMBER: CWD 7046
LOCALITY No.: E100-02	TENDER/ CONTRACT No.	SHEET: 47 OF	REG No.: 169364/13 ME					REV No.: 0
CALCULATION FILE: ME/E100-02								



NOTE 'A'
PIPE TO BE USED FOR WATER TRANSFER (UNPRESSURIZED), THUS NO PRESSURE TESTING REQUIRED.

(131) DOUBLE BEND			
MATL. :	ST. STEEL 304L	MASS :	205 kg
NO. OFF :	1	SCALE. :	1:15



NOTE 'B'
PIPE TO SERVE AS AN ELECTRICAL DUCT, THUS NO PRESSURE TESTING REQUIRED. CORROSION PROTECTION ENTAILS PICKLE & PASSIVATE ONLY.

(132) 90° BEND			
MATL. :	ST. STEEL 304L	MASS :	227 kg
NO. OFF :	1	SCALE. :	1:15

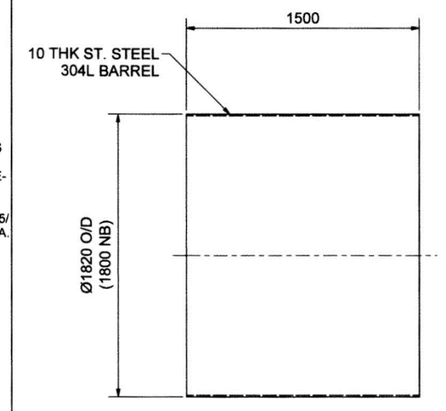
GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE B.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/ EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

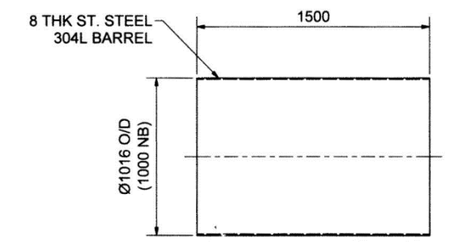
PIPES AND SPECIALS, PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE (U.O.S).



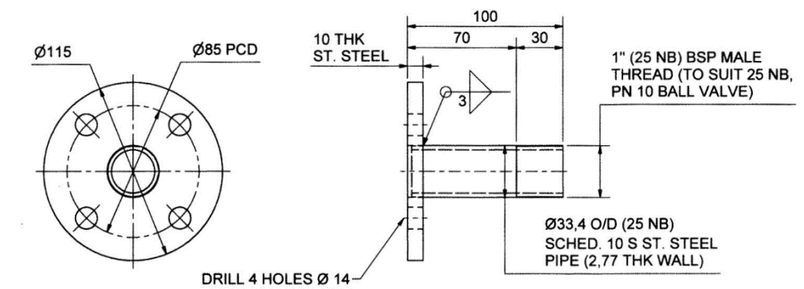
NOTE 'C'
ITEM TO BE UNCOATED. THIS ITEM SERVES AS A SPARE PART FOR SITE.

(133) STRAIGHT PIPE			
MATL. :	ST. STEEL 304L	MASS :	685 kg
NO. OFF :	1	SCALE. :	1:20



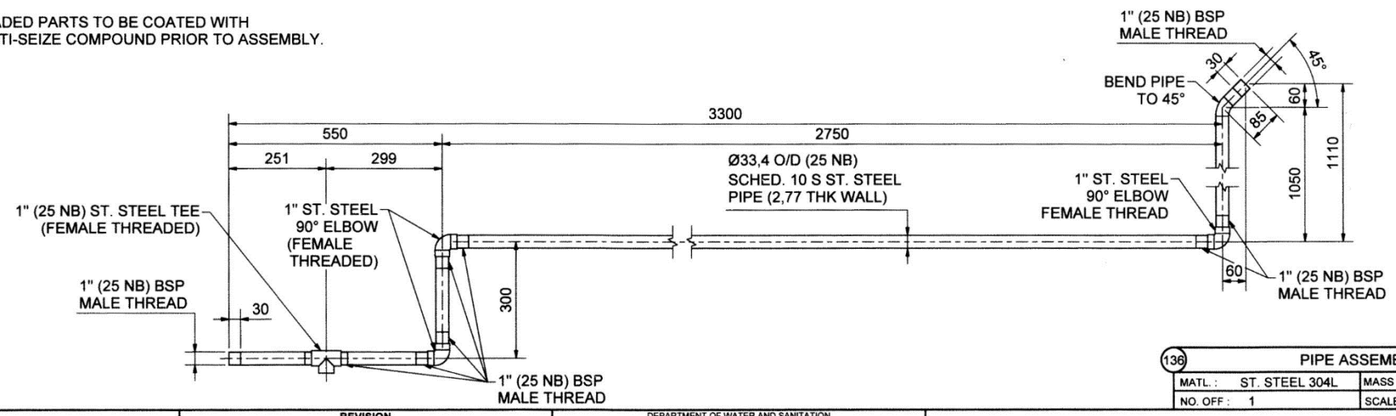
NOTE 'C'
ITEM TO BE UNCOATED. THIS ITEM SERVES AS A SPARE PART FOR SITE.

(134) STRAIGHT PIPE			
MATL. :	ST. STEEL 304L	MASS :	305 kg
NO. OFF :	1	SCALE. :	1:20



(135) STUB END			
MATL. :	ST. STEEL 304L	MASS :	1 kg
NO. OFF :	2	SCALE. :	1:2

NOTE 'D'
ALL THREADED PARTS TO BE COATED WITH NICKEL ANTI-SEIZE COMPOUND PRIOR TO ASSEMBLY.



(136) PIPE ASSEMBLY			
MATL. :	ST. STEEL 304L	MASS :	10,6 kg
NO. OFF :	1	SCALE. :	1:8

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

GENERAL MANUFACTURING NOTES:
-PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
-FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT)
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- ITEM 133 & 134 TO BE DELIVERED TO SITE UNCOATED.
- PICKLE & PASSIVATE ITEM 132, 135 & 136.

0 5 10 SCALE (mm) 100

PROJECTION (U.O.S.)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | ROUND ALL EDGES TO A 2 mm RADIUS

REVISION				
MOD No.	DATE	DESCRIPTION	FOR	DWA
0	08/17	ISSUED FOR CONSTRUCTION		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

HEAD OFFICE
MECH. /ELEC. ENG.
PRIVATE BAG X313
PRETORIA 0001

SEDIBENG BUILDING
185 FRANCIS BAARD STREET
PRETORIA
(012) 336-7500

Mr. D.M. MASHITISHO
DIRECTOR GENERAL

CHECKED:	02/08/2017 DATE:	DESIGN: J.J THERON	
ENGINEER:	12/9/2017 DATE:	DRAWN: J.J THERON	
CHIEF ENGINEER / APP (Pr. Eng):	03/11/2017 DATE:	EXT. APPROVAL (DESIGN CHECKED):	12/12/2017 DATE:
		DIRECTOR (Pr. Eng):	12/01/2018 DATE:

OLIFANTS-DOORN WATER RESOURCE PROJECT

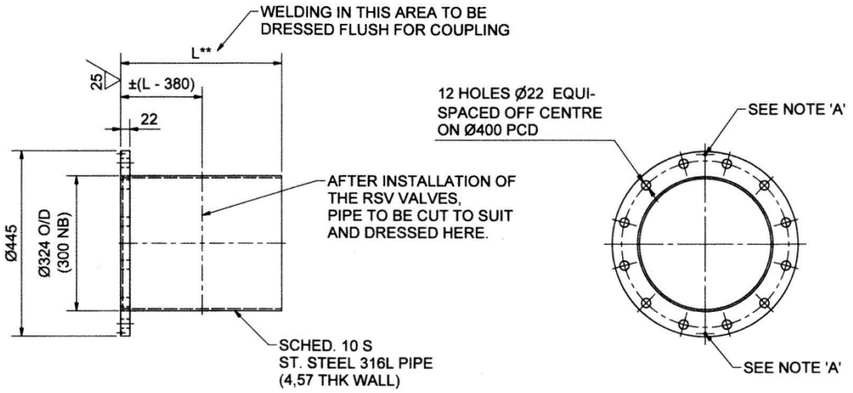
RAISING OF CLANWILLIAM DAM

OUTLET WORKS

PIPES & SPECIALS

-DETAILS-

PROVINCE: WESTERN CAPE	DISTRICT: CLANWILLIAM	KEYCODES	OUW	PPB	PIP	DET		OTHER NUMBER CWD 7047
LOCALITY No.: E100-02	TENDER/ CONTRACT No.	SHEET 48 OF	REG No. 169365/13 ME					REV No. 0
CALCULATION FILE: ME/E100-02								

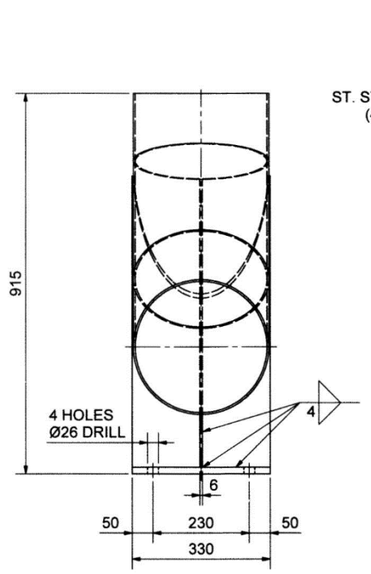


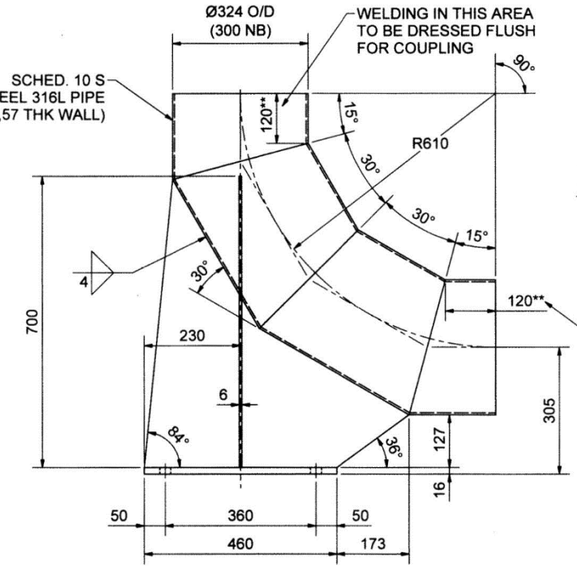
(137) CLOSER PIPE (L = 563)			
MATL. :	MILD & ST. STEEL	MASS :	32,4 (18,4) kg ea.
NO. OFF :	2	SCALE. :	1:7,5

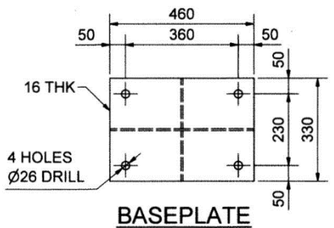
(138) CLOSER PIPE (L = 620)			
MATL. :	MILD & ST. STEEL	MASS :	34.5 (20,5) kg ea.
NO. OFF :	3	SCALE. :	1:7,5

(139) CLOSER PIPE (L = 658)			
MATL. :	MILD & ST. STEEL	MASS :	36 (22) kg ea.
NO. OFF :	2	SCALE. :	1:7,5

(140) CLOSER PIPE (L = 765)			
MATL. :	MILD & ST. STEEL	MASS :	40 (26) kg ea.
NO. OFF :	11	SCALE. :	1:7,5

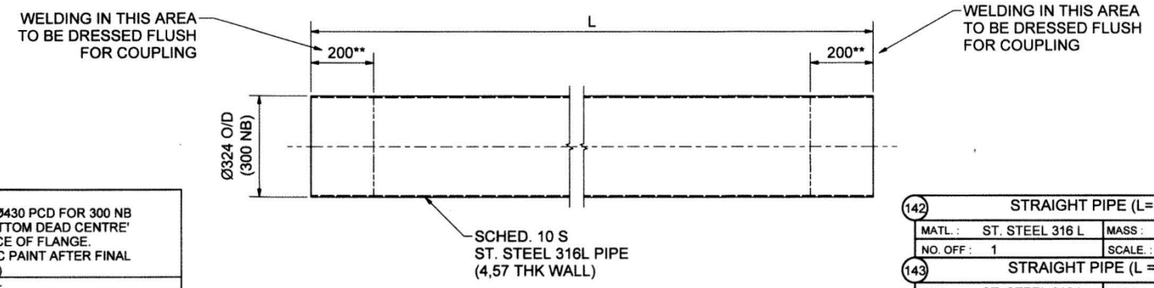






BASEPLATE DETAILS
SCALE 1 : 10

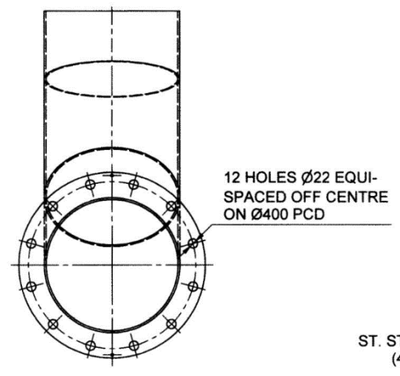
(141) 90° DUCKFOOT BEND			
MATL. :	MILD & ST. STEEL	MASS :	72 kg ea.
NO. OFF :	7	SCALE. :	1:7,5

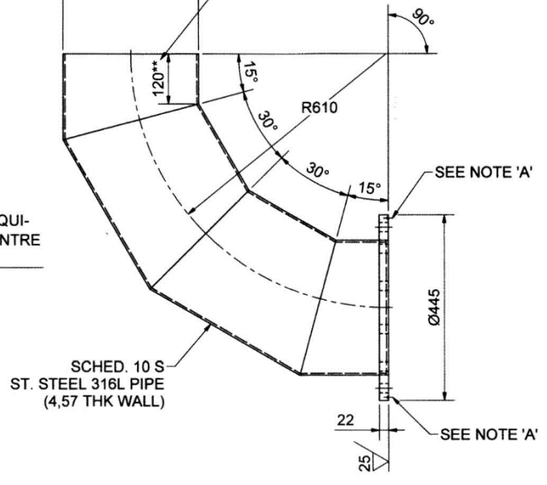


(142) STRAIGHT PIPE (L= 4560)			
MATL. :	ST. STEEL 316 L	MASS :	168 kg
NO. OFF :	1	SCALE. :	1:10

(143) STRAIGHT PIPE (L = 4770)			
MATL. :	ST. STEEL 316 L	MASS :	176 kg
NO. OFF :	1	SCALE. :	1:10

(144) STRAIGHT PIPE (L = 5005)			
MATL. :	ST. STEEL 316 L	MASS :	185 kg ea.
NO. OFF :	1	SCALE. :	1:10





NOTE 'A'
Ø6 x 3 mm DEEP HOLE ON Ø430 PCD FOR 300 NB FLANGE ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE B.

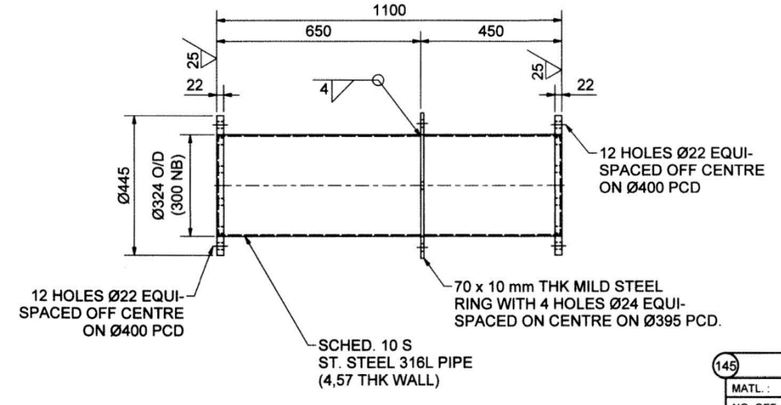
GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS SHALL ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

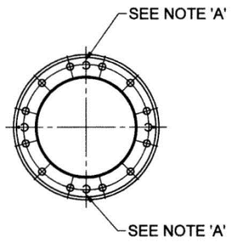
FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 316L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.





(145) STRAIGHT PIPE			
MATL. :	MILD & ST. STEEL	MASS :	70,5 kg ea.
NO. OFF :	2	SCALE. :	1:10

(146) 90° BEND			
MATL. :	MILD & ST. STEEL	MASS :	48 kg
NO. OFF :	1	SCALE. :	1:7,5

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 3 mm DEVIATION ON DIAMETER OF PIPE ENDS FOR 300 NB.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

ALL DIMENSIONS IN MILLIMETRES

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT) PLUS A TOP COAT OF PURE ALIPHATIC POLY-URETHANE (25 µm DFT) OVER ALL THESE ITEMS.
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

SURFACE FINISH (REMOVAL OF MATERIAL): X
X = SURFACE ROUGHNESS IN MICROMETRES

DO NOT SCALE DRAWING

0 5 10 SCALE (mm) 100

PROJECTION (U.O.S.)

ROUND ALL EDGES TO A 2 mm RADIUS

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWA
0	09/17	ISSUED FOR CONSTRUCTION		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
HEAD OFFICE
MECH. /ELEC. ENG.
PRIVATE BAG X313
PRETORIA 0001
SEDIBENG BUILDING
185 FRANCIS BAARD STREET
PRETORIA
(012) 336-7500
Mr. D.M. MASHITISHO
DIRECTOR GENERAL

CHECKED:	DATE: 19/09/2017	DESIGN: J.J THERON	
ENGINEER:	DATE: 19/9/2017	DRAWN: J.J THERON	
CHIEF ENGINEER / APP (Pr. Eng):	DATE: 02/11/2017	EXT. APPROVAL / DESIGN CHECKED:	DATE: 12/12/2017
		DIRECTOR (Pr. Eng):	DATE: 16/11/2016

OLIFANTS-DOORN WATER RESOURCE PROJECT

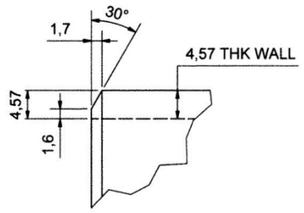
RAISING OF CLANWILLIAM DAM

OUTLET WORKS

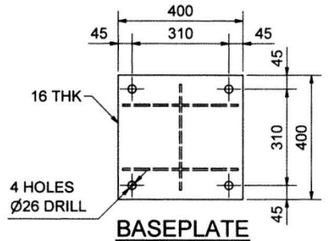
PIPES & SPECIALS

-DETAILS-

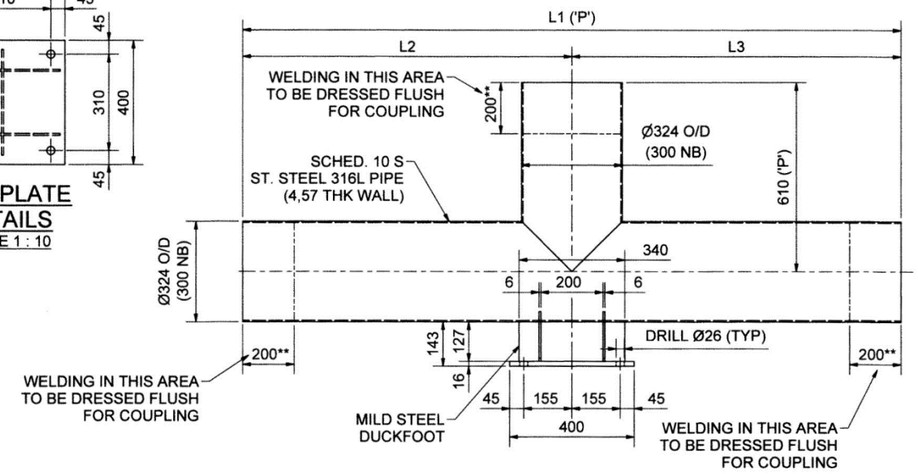
PROVINCE: WESTERN CAPE	DISTRICT: CLANWILLIAM	KEYCODES:	OUW	PPB	PIP	DET		OTHER NUMBER CWD 7048
LOCALITY No.: E100-02	TENDER/ CONTRACT No.	SHEET	REG No.					REV No.
CALCULATION FILE: ME/E100-02		49 OF	169366/13 ME					0

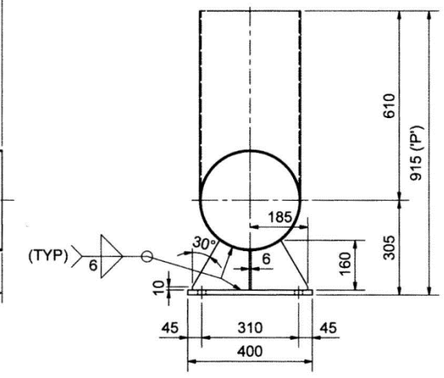


DETAIL Z
TYPICAL DETAIL OF WELD PREPARATION FOR 300 NB PLAIN END PIPES
SCALE 2 : 1



BASEPLATE DETAILS
SCALE 1 : 10





TEE DIMENSIONS			
ITEM NO.	L1	L2	L3
147	4315	1435	2880
148	3318	883	2435
149	2110	1055	1055
150	730	365	365

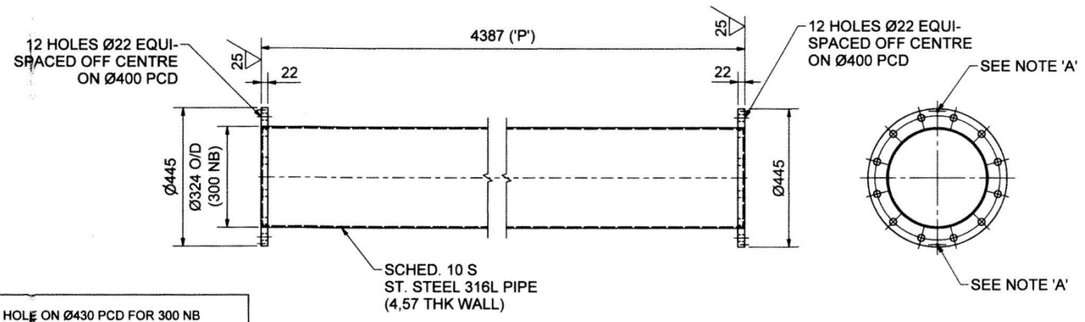
FOR ('P') SEE CORROSION PROTECTION NOTES.

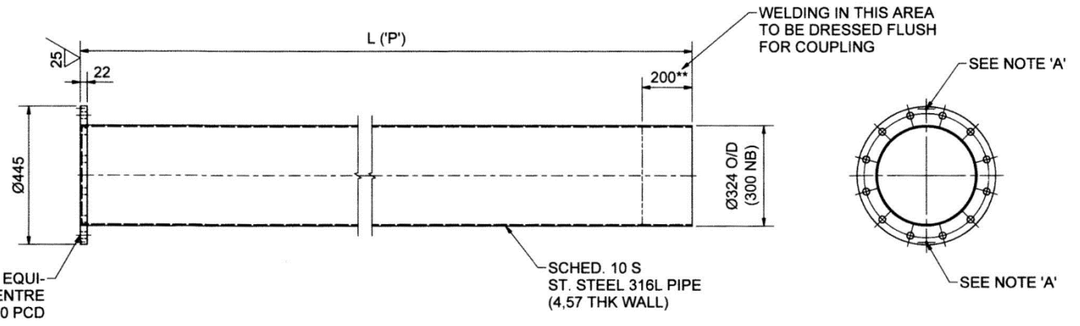
147	TEE		
MATL. :	MILD & ST. STEEL	MASS :	200 kg
NO. OFF :	1	SCALE. :	1:10

148	TEE		
MATL. :	MILD & ST. STEEL	MASS :	163 kg
NO. OFF :	1	SCALE. :	1:10

149	TEE		
MATL. :	MILD & ST. STEEL	MASS :	118 kg ea.
NO. OFF :	2	SCALE. :	1:10

150	TEE		
MATL. :	MILD & ST. STEEL	MASS :	68 kg ea.
NO. OFF :	2	SCALE. :	1:10





FOR ('P') SEE CORROSION PROTECTION NOTES.

NOTE 'A'
Ø6 x 3 mm DEEP HOLE ON Ø430 PCD FOR 300 NB FLANGE ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE B.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS SHALL ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 316L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

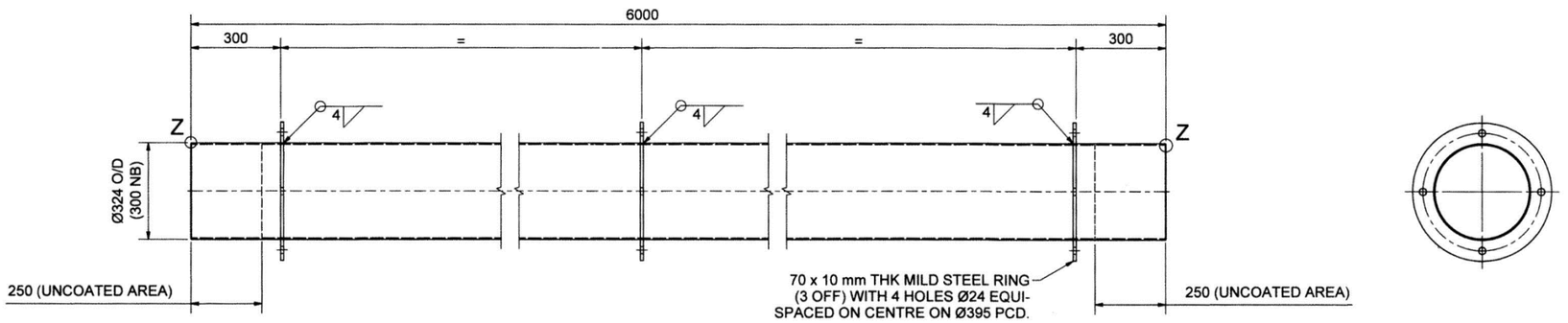
151	STRAIGHT PIPE		
MATL. :	MILD & ST. STEEL	MASS :	185 kg
NO. OFF :	1	SCALE. :	1:10

FOR ('P') SEE CORROSION PROTECTION NOTES.

152	STRAIGHT PIPE (L = 2410)		
MATL. :	MILD & ST. STEEL	MASS :	100 kg ea.
NO. OFF :	1	SCALE. :	1:10

153	STRAIGHT PIPE (L = 3005)		
MATL. :	MILD & ST. STEEL	MASS :	122 kg ea.
NO. OFF :	2	SCALE. :	1:10

154	STRAIGHT PIPE (L = 6005)		
MATL. :	MILD & ST. STEEL	MASS :	233 kg
NO. OFF :	1	SCALE. :	1:10



155	STRAIGHT PIPE		
MATL. :	MILD & ST. STEEL	MASS :	241 kg ea.
NO. OFF :	4	SCALE. :	1:10

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 3 mm DEVIATION ON DIAMETER OF PIPE ENDS FOR 300 NB.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

ALL DIMENSIONS IN MILLIMETRES

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLY-URETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'P' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

SURFACE FINISH (REMOVAL OF MATERIAL): X
X = SURFACE ROUGHNESS IN MICROMETRES

DO NOT SCALE DRAWING

0 5 10 SCALE (mm) 100

PROJECTION (U.O.S.)

ROUND ALL EDGES TO A 2 mm RADIUS

REVISION				
MOD No.	DATE	DESCRIPTION	FOR	DWA
0	09/17	ISSUED FOR CONSTRUCTION		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

HEAD OFFICE
MECH /ELEC. ENG.
PRIVATE BAG X313
PRETORIA 0001

SEDIBENG BUILDING
185 FRANCIS BAARD STREET
PRETORIA
(012) 336-7500

Mr. D.M. MASHITISHO
DIRECTOR GENERAL

CHECKED: DATE: 13/09/2017 DESIGN: J.J THERON
DRAWN: J.J THERON
ENGINEER: DATE: 19/9/2017 EXT. APPROVAL / DESIGN CHECKED: DATE: 6/12/2017
CHIEF ENGINEER / APP (Pr. Eng): DATE: 02/11/2017 DIRECTOR (Pr. Eng): DATE: 16/01/2018

OLIFANTS-DOORN WATER RESOURCE PROJECT

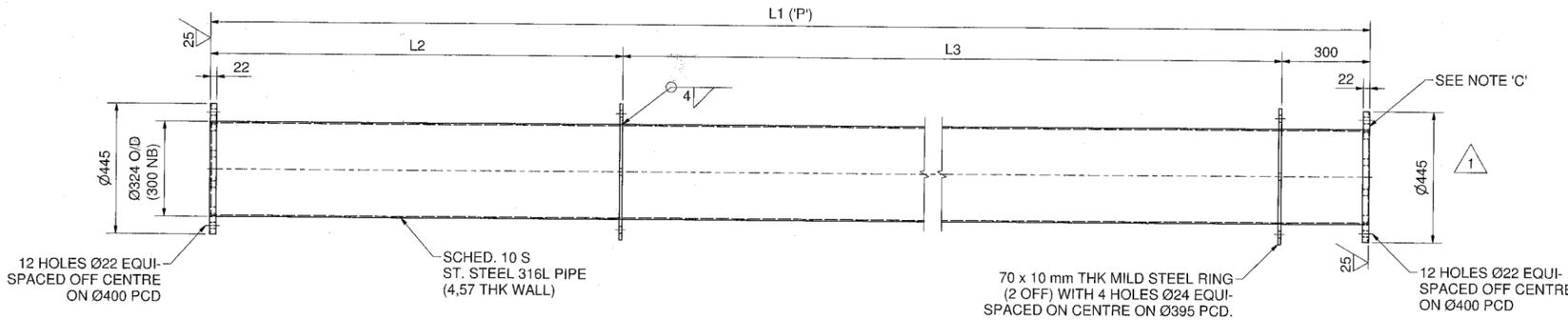
RAISING OF CLANWILLIAM DAM

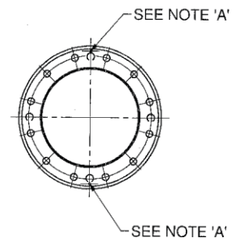
OUTLET WORKS

PIPES & SPECIALS

-DETAILS-

PROVINCE: WESTERN CAPE	DISTRICT: CLANWILLIAM	KEYCODES:	OUW	PPB	PIP	DET		OTHER NUMBER CWD 7049
LOCALITY No.: E100-02	TENDER/ CONTRACT No.	SHEET: 50 OF	REG No.: 169367/13 ME					REV No. 0
CALCULATION FILE: ME/E100-02								





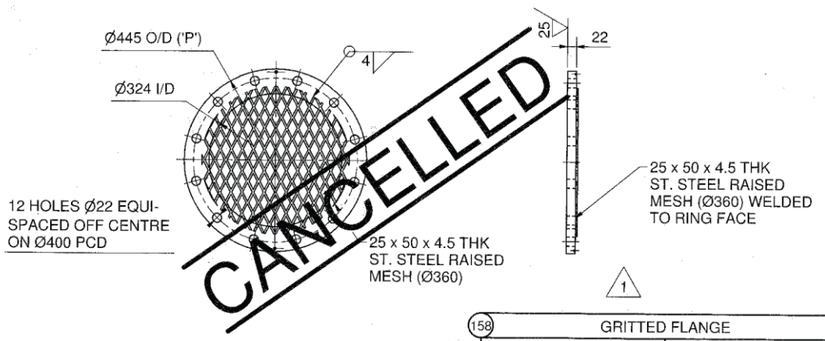
DIMENSIONS			
ITEM NO.	L1	L2	L3
156	4721	1410	3011
157	3700	1010	2390

1 NOTE 'C':
2 OFF ITEM 156 TO BE PROVIDED PLAIN ENDED AT THIS EDGE (I.E. WITHOUT A FLANGE).

156	STRAIGHT PIPE (L1 = 4721)		
MATL.:	MILD & ST. STEEL	MASS:	210 (200) kg ea.
NO. OFF:	3	SCALE.:	1:10

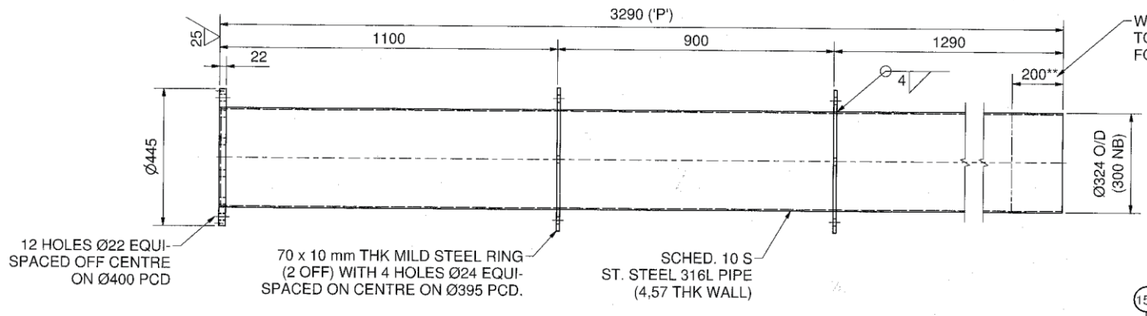
157	STRAIGHT PIPE (L1 =3700)		
MATL.:	MILD & ST. STEEL	MASS:	173 kg
NO. OFF:	1	SCALE.:	1:10

FOR ('P') SEE CORROSION PROTECTION NOTES.



158	GRITTED FLANGE		
MATL.:	MILD & ST. STEEL	MASS:	13 kg
NO. OFF:	3	SCALE.:	1:7,5

FOR ('P') SEE CORROSION PROTECTION NOTES.



159	STRAIGHT PIPE		
MATL.:	MILD & ST. STEEL	MASS:	146 kg
NO. OFF:	1	SCALE.:	1:10

FOR ('P') SEE CORROSION PROTECTION NOTES.

NOTE 'A'
Ø6 x 3 mm DEEP HOLE ON Ø430 PCD FOR 300 NB FLANGE ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)
NOTE 'B'
SEE TYPICAL WELD PREPARATION DETAIL 'Z' ON DRG. CWD 7049.

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS SHALL ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 316L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

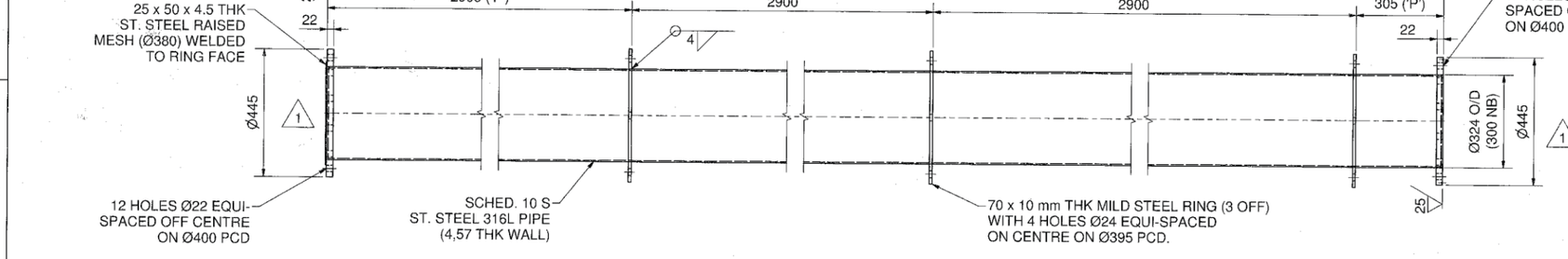
SURFACE FINISH (REMOVAL OF MATERIAL): X
X = SURFACE ROUGHNESS IN MICROMETRES

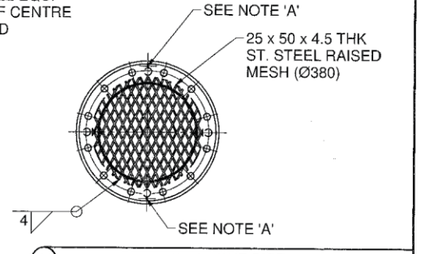
GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 3 mm DEVIATION ON DIAMETER OF PIPE ENDS FOR 300 NB.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

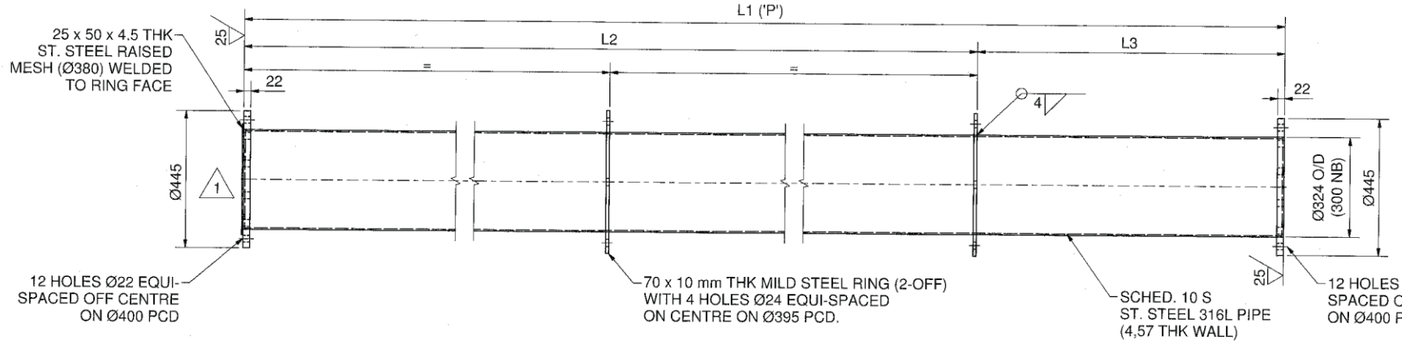
ALL DIMENSIONS IN MILLIMETRES

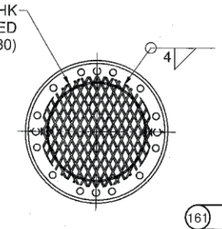




160	STRAIGHT PIPE		
MATL.:	MILD & ST. STEEL	MASS:	376 kg ea.
NO. OFF:	3	SCALE.:	1:10

FOR ('P') SEE CORROSION PROTECTION NOTES.





DIMENSIONS			
ITEM NO.	L1	L2	L3
161	5070	4420	650
162	5520	4520	1000

1

161	STRAIGHT PIPE (L = 5070)		
MATL.:	MILD & ST. STEEL	MASS:	225 kg ea.
NO. OFF:	3	SCALE.:	1:10

162	STRAIGHT PIPE (L = 5520)		
MATL.:	MILD & ST. STEEL	MASS:	241 kg
NO. OFF:	1	SCALE.:	1:10

FOR ('P') SEE CORROSION PROTECTION NOTES.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLY-URETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'P' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 250 mm FROM OPEN ENDED PIPE ENDS (WITH WELD PREPS) TO BE UNCOATED.
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

DO NOT SCALE DRAWING

SCALE (mm) 0 5 10 100

PROJECTION (U.O.S.)

ROUND ALL EDGES TO A 2 mm RADIUS

REVISION				
MOD No.	DATE	DESCRIPTION	FOR	DWA
0	09/17	ISSUED FOR CONSTRUCTION		
1	01/19	ITEM 161 QTY INCREASED FROM 2 TO 3. ITEM 156, 157, 160, 161 & 162 ALTERED. ITEM 158 CANCELLED.		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

HEAD OFFICE
MECH. /ELEC. ENG.
PRIVATE BAG X313
PRETORIA 0001

SEDIBENG BUILDING
185 FRANCIS BAARD STREET
PRETORIA
(012) 336-7500

DIRECTOR GENERAL

CHECKED:	11/01/2019 DATE:	DESIGN: J.J THERON	
ENGINEER	11/01/2019 DATE:	DRAWN: J.J THERON	
CHIEF ENGINEER / APP (Pr. Eng)	25/2/2019 DATE:	EXT. APPROVAL / DESIGN CHECKED: DIRECTOR (Pr. Eng)	14/01/2019 DATE: 21/01/2019 DATE:

OLIFANTS-DOORN WATER RESOURCE PROJECT

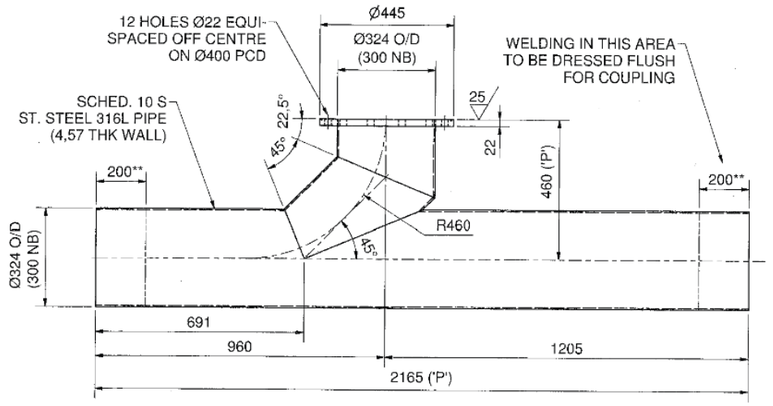
RAISING OF CLANWILLIAM DAM

OUTLET WORKS

PIPES & SPECIALS

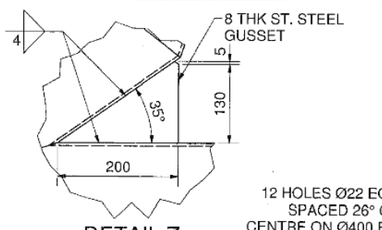
- DETAILS -

PROVINCE: WESTERN CAPE	DISTRICT: CLANWILLIAM	KEYCODES: OUW	PPB	PIP	DET	OTHER NUMBER: CWD 7050
LOCALITY No.: E100-02	TENDER/ CONTRACT No.	SHEET: 51 OF 92	REG No.: 169368/13 ME			REV No.: 1
CALCULATION FILE: ME/E100-02						

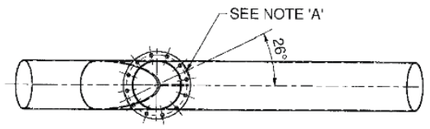


FOR ('P') SEE CORROSION PROTECTION NOTES.

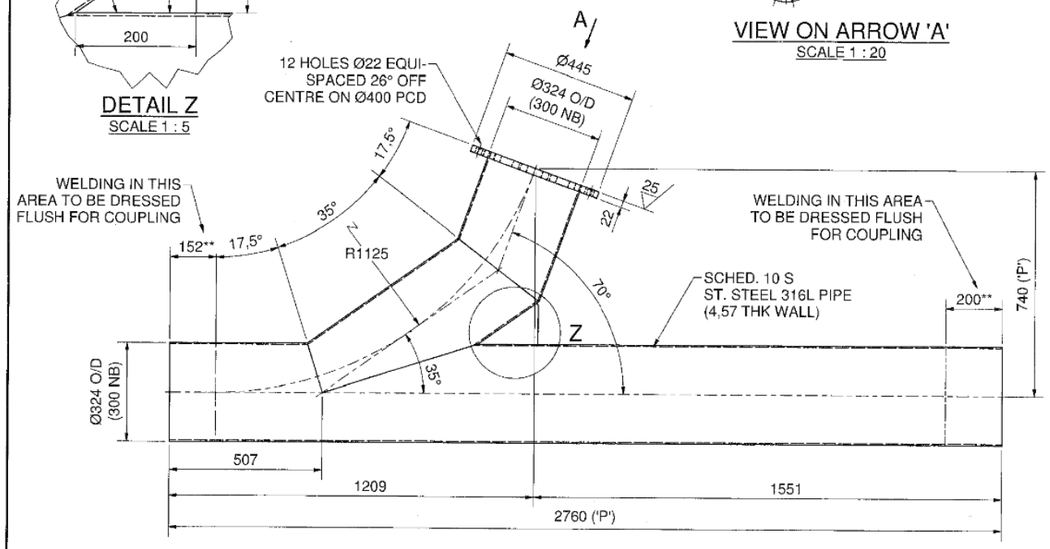
(163)	SWEEP TEE	
MATL.: MILD & ST. STEEL	MASS: 102 kg	
NO. OFF: 1	SCALE.: 1:10	



DETAIL Z
SCALE 1 : 5



VIEW ON ARROW 'A'
SCALE 1 : 20



FOR ('P') SEE CORROSION PROTECTION NOTES.

(164)	SWEEP TEE	
MATL.: MILD & ST. STEEL	MASS: 140 kg	
NO. OFF: 1	SCALE.: 1:10	

NOTE 'A'
Ø6 x 3 mm DEEP HOLE ON Ø430 PCD FOR 300 NB FLANGE ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES WELDING: B.S. 806 TYPE 6.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

OVALITY TOLERANCE: ± 3 mm DEVIATION ON DIAMETER OF PIPE ENDS FOR 300 NB.
OUTSIDE DIAMETER TOLERANCE: ± 1,6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

ALL DIMENSIONS IN MILLIMETRES

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 316L UNLESS OTHERWISE STATED.
- ALL FLANGES, COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/ EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT), (*PLUS A TOP COAT OF PURE ALIPHATIC POLYURETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'P' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 250 mm FROM OPEN ENDED PIPE ENDS (WITH WELD PREPS) TO BE UNCOATED.
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

SURFACE FINISH (REMOVAL OF MATERIAL): X
X = SURFACE ROUGHNESS IN MICROMETRES

DO NOT SCALE DRAWING

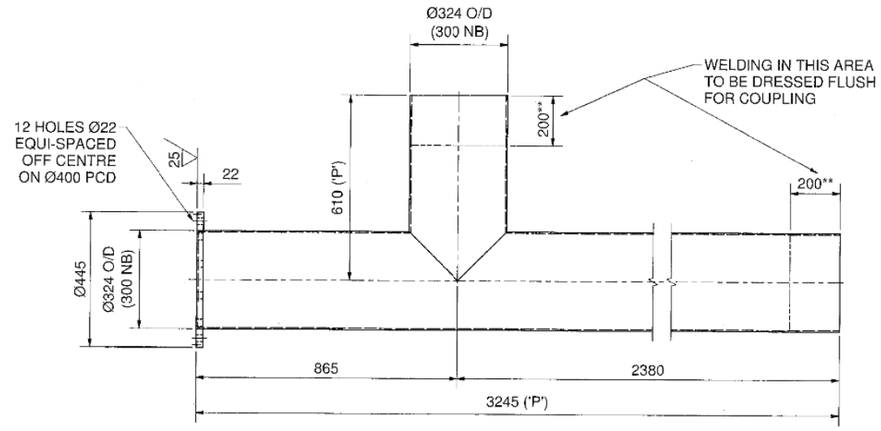
GENERAL MANUFACTURING NOTES:
- HOLES IN PUDDLE COLLARS SHALL ALLIGN.
- PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
- FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

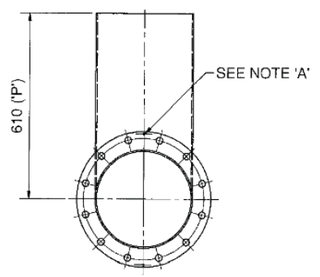
FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- FLANGE THICKNESS AS PER DRAWING DETAIL.

0 5 10 SCALE (mm) 100

PROJECTION (U.O.S.)

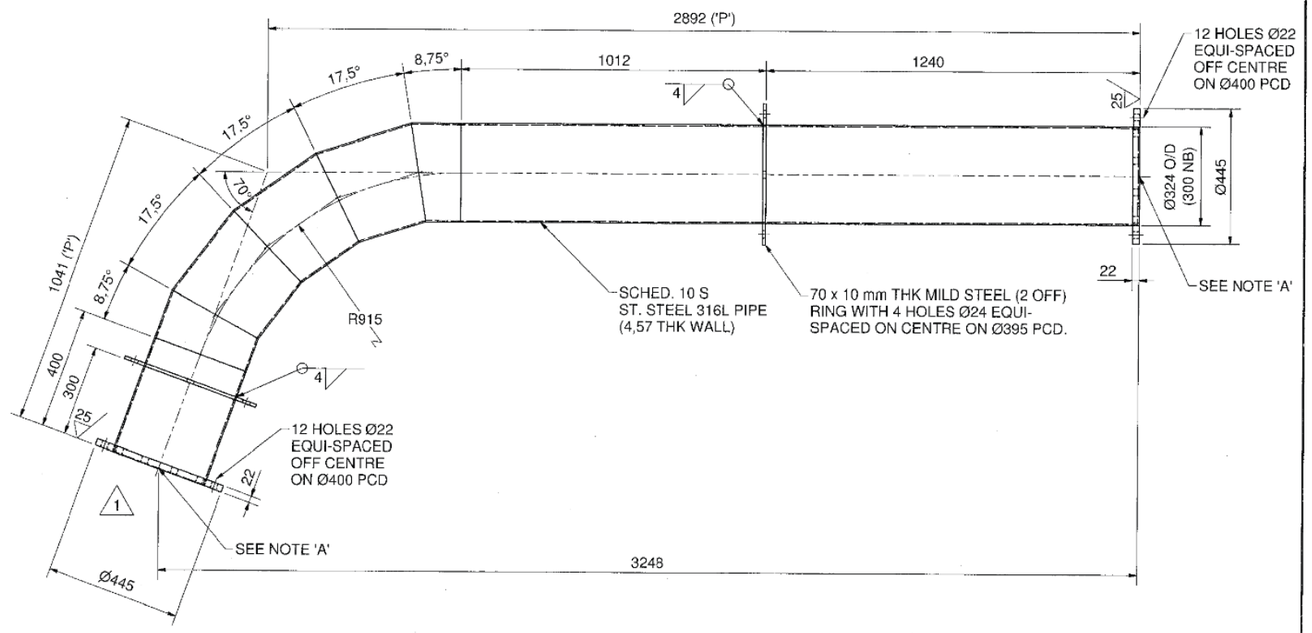
ROUND ALL EDGES TO A 2 mm RADIUS





FOR ('P') SEE CORROSION PROTECTION NOTES.

(165)	TEE	
MATL.: MILD & ST. STEEL	MASS: 146 kg ea.	
NO. OFF: 2	SCALE.: 1:10	



FOR ('P') SEE CORROSION PROTECTION NOTES.

(166)	70° BEND	
MATL.: MILD & ST. STEEL	MASS: 164 kg	
NO. OFF: 1	SCALE.: 1:10	

REVISION			
MOD No.	DATE	DESCRIPTION	FOR	DWA
0	02/18	ISSUED FOR CONSTRUCTION		
1	01/19	ITEM 166 ALTERED.		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

HEAD OFFICE:
MECH. (ELEC. ENG.
PRIVATE BAG X313
PRETORIA 0001

SEBRENG BUILDING
185 FRANCIS BAARD STREET
PRETORIA
(012) 336-7500

DIRECTOR GENERAL

CHECKED:	DATE: 11/01/2019	DESIGN: J.J THERON	
ENGINEER:	DATE: 11/01/2019	DRAWN: J.J THERON	
CHIEF ENGINEER (APP (Pr. Eng):	DATE: 21/12/2018	EXT. APPROVAL / DESIGN CHECKED:	DATE: 14/01/2019
		DIRECTOR (Pr. Eng):	DATE: 21/01/2019

OLIFANTS-DOORN RESOURCE PROJECT

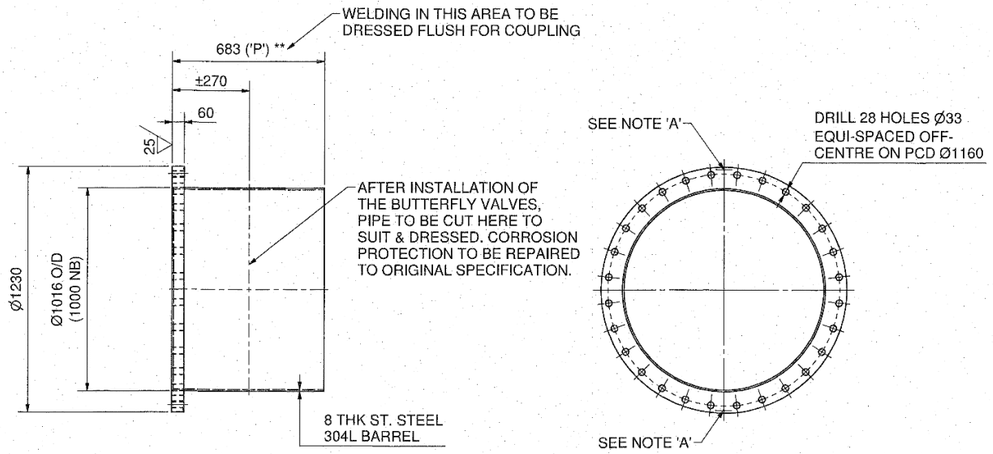
RAISING OF CLANWILLIAM DAM

OUTLET WORKS

PIPES & SPECIALS

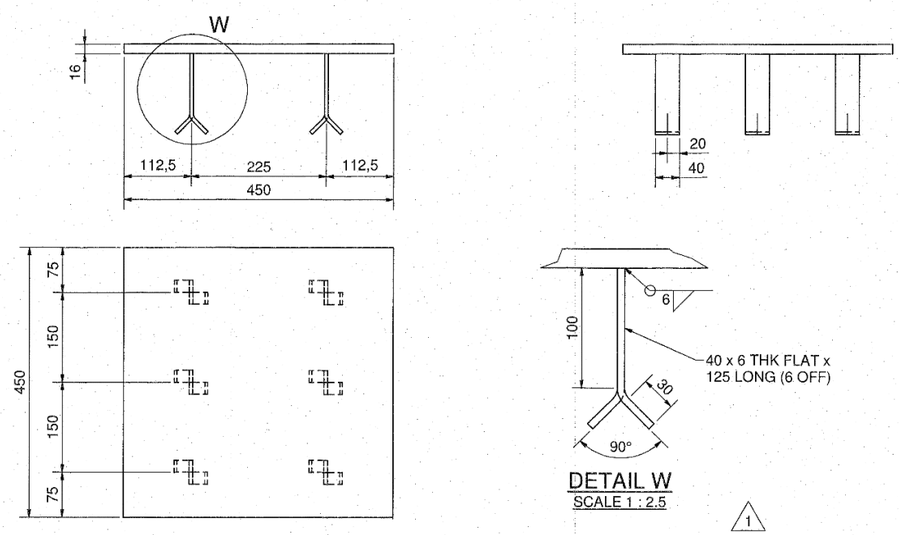
- DETAILS -

PROVINCE: WESTERN CAPE	DISTRICT: CLANWILLIAM	KEYCODES:	OUW	PP3	PJP	DET		OTHER NUMBER: CWD 705:
LOCALITY No.: E100-02	TENDER/ CONTRACT No.	SHEET	DEO No.					REV No.
CALCULATION FILE: ME/E100-02		52 OF 92	169369/13 ME					1



FOR ('P') SEE CORROSION PROTECTION NOTES.

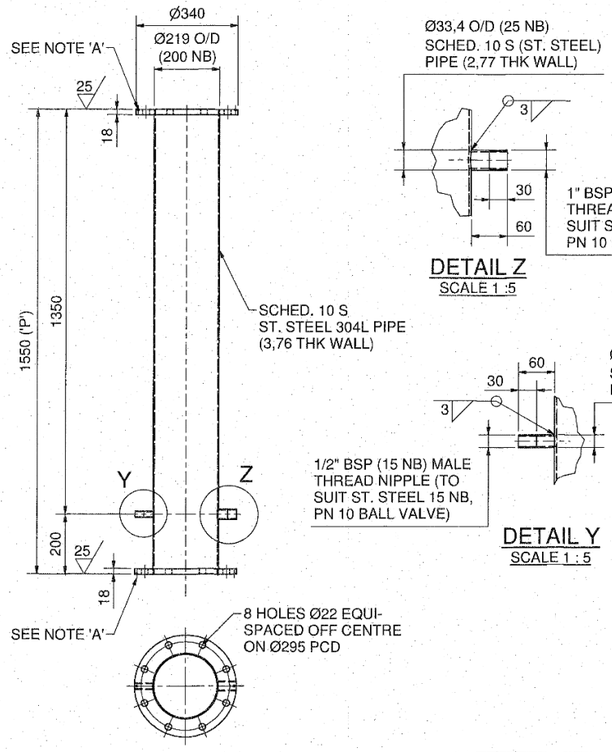
168	CLOSER PIPE		
MATL. :	MILD & ST. STEEL	MASS :	306 (±222) kg
NO. OFF :	1	SCALE. :	1:15

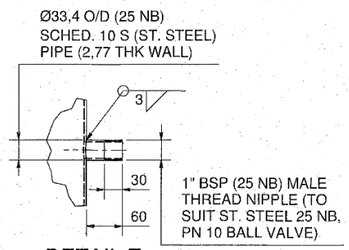


DETAIL W
SCALE 1 : 2.5

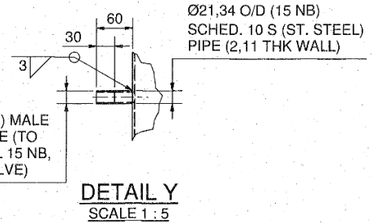
NOTE 'C'
CORROSION PROTECTION: TWO PACK EPOXY (250 µm DFT) OVER ITEM EXCLUDING TOP FACE. TOP FACE TO BE PRIMER COATED ONLY.

169	ANCHOR PLATE		
MATL. :	MILD STEEL	MASS :	27 kg ea.
NO. OFF :	29	SCALE. :	1:5





DETAIL Z
SCALE 1 :5



DETAIL Y
SCALE 1 : 5

NOTE 'A'
Ø6 x 3 mm DEEP HOLE ON Ø1205 PCD FOR 1000 NB FLANGE (Ø325 PCD FOR 200 NB FLANGE) ON 'TOP-' AND 'BOTTOM DEAD CENTRE' ON MACHINED GASKET FACE OF FLANGE. (FILL WITH SIGNAL RED PVC PAINT AFTER FINAL CORROSION PROTECTION.)

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.
- FLANGES TO BE WELDED ON PIPES IN ACCORDANCE WITH B.S. 806 TYPE 6.

FLANGES:
- ALL FLANGES SHALL BE FLAT FACED WITH A GRAMOPHONE FINISH.
- ALL FLANGES, EXCLUDING 1800 NB, SHALL BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/3.
- 1800 NB FLANGES: OD, PCD, HOLE DIA AND NO-OFF BOLT HOLES TO BE IN ACCORDANCE WITH SANS 1123 TABLE 1000/1B.
- FLANGE THICKNESS AS PER DRAWING DETAIL.
- HOLES IN PUDDLE COLLARS SHALL ALLIGN.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 304L UNLESS OTHERWISE STATED.
- ALL FLANGES (> 200 NB), COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/ EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

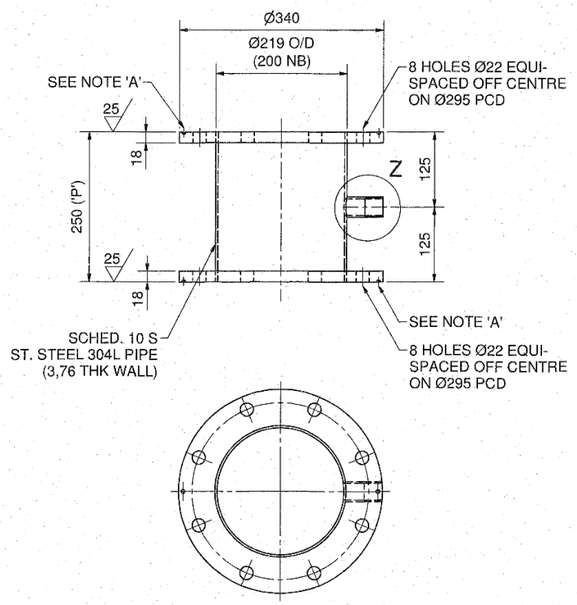
PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

SURFACE FINISH (REMOVAL OF MATERIAL): X = SURFACE ROUGHNESS IN MICROMETRES

170	STRAIGHT PIPE WITH OFFTAKE		
MATL. :	ST. STEEL 304L	MASS :	46 kg ea.
NO. OFF :	2	SCALE. :	1:10

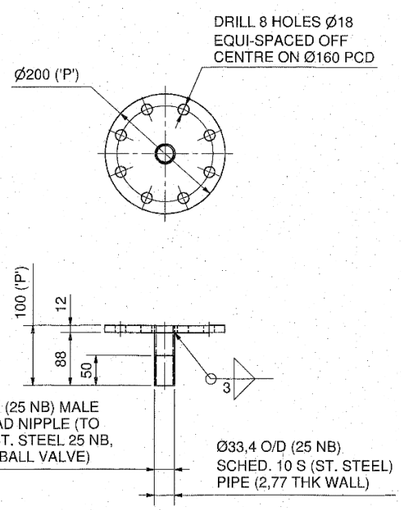
FOR ('P') SEE CORROSION PROTECTION NOTES.



NOTE 'B'
REFER TO ITEM 170 FOR DETAIL 'Z'

171	STRAIGHT PIPE WITH OFFTAKE		
MATL. :	ST. STEEL 304L	MASS :	20 kg ea.
NO. OFF :	12	SCALE. :	1:5

FOR ('P') SEE CORROSION PROTECTION NOTES.



172	BLANK WITH OFFTAKE		
MATL. :	ST. STEEL 304L	MASS :	3 kg ea.
NO. OFF :	7	SCALE. :	1:5

FOR ('P') SEE CORROSION PROTECTION NOTES.

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

GENERAL MANUFACTURING NOTES:
-PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
-FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLY-URETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'P' ON DETAIL). THREADS ARE NOT TO BE COATED.
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 250 mm FROM OPEN ENDED PIPES TO BE UNCOATED (THIS EXCLUDES ENDS WITH FLANGES. ONLY OPEN ENDED PIPES EXCEPT ITEM 168).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

0 5 10 SCALE (mm) 100

PROJECTION (U.O.S.)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | ROUND ALL EDGES TO A 2 mm RADIUS

REVISION				
MOD No.	DATE	DESCRIPTION	POR	DWA
0	02/18	ISSUED FOR CONSTRUCTION		
1	06/18	ITEM 171 QTY CHANGED FROM 11 TO 12 ITEM 169 QTY CHANGED FROM 28 TO 29.		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

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CHECKED: DATE: 19/05/2019 DESIGN: J.J THERON
ENGINEER: DATE: 20/05/2019 DRAWN: J.J THERON
CHIEF ENGINEER / APP (Pr. Eng): DATE: 12/11/2019 EXT. APPROVAL / DESIGN CHECKED: DATE: 01-10-2019
DIRECTOR (Pr. Eng): DATE: 07/10/2019

OLIFANTS-DOORN WATER RESOURCE PROJECT

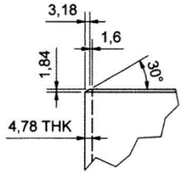
RAISING OF CLANWILLIAM DAM

OUTLET WORKS

PIPES & SPECIALS

-DETAILS-

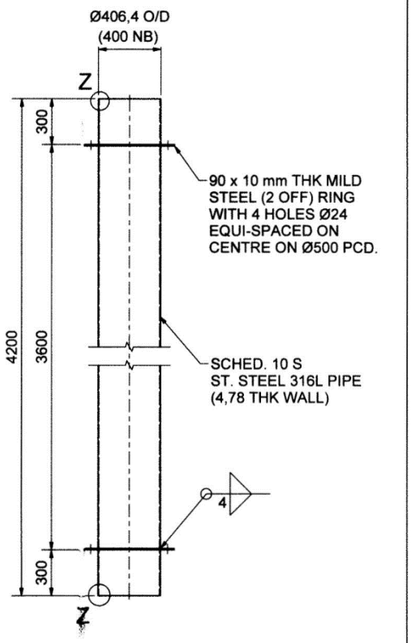
PROVINCE: WESTERN CAPE	DISTRICT: CLANWILLIAM	KEYCODES:	OUW	PPB	PIP	DET	OTHER NUMBER: CWD 7052
LOCALITY No.: E100-02	TENDER/ CONTRACT No.	SHEET	53 OF 92	RFQ No.	169370/13 ME		REV No. 1
CALCULATION FILE: ME/E100-02							



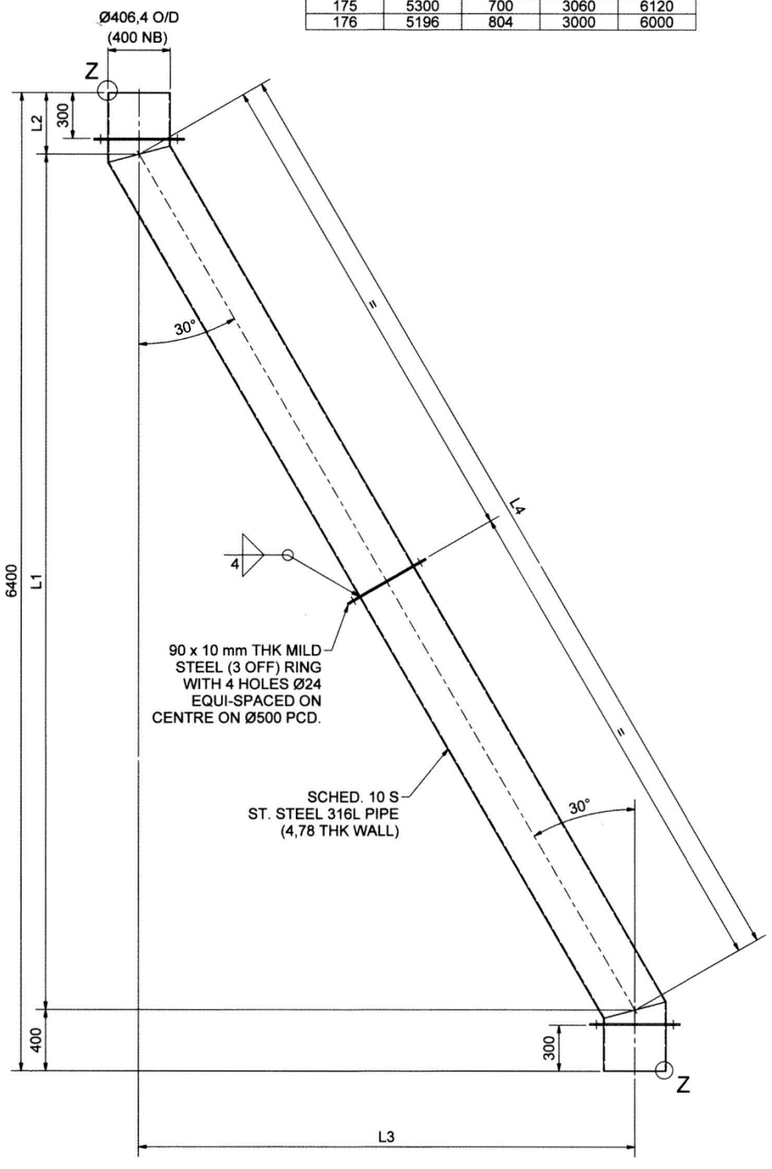
DETAIL Z

TYPICAL DETAIL OF WELD PREPARATION FOR 400 NB PLAIN END PIPES
SCALE 1 : 2

PIPE DIMENSIONS				
ITEM NO.	L1	L2	L3	L4
174	5596	404	3231	6462
175	5300	700	3060	6120
176	5196	804	3000	6000



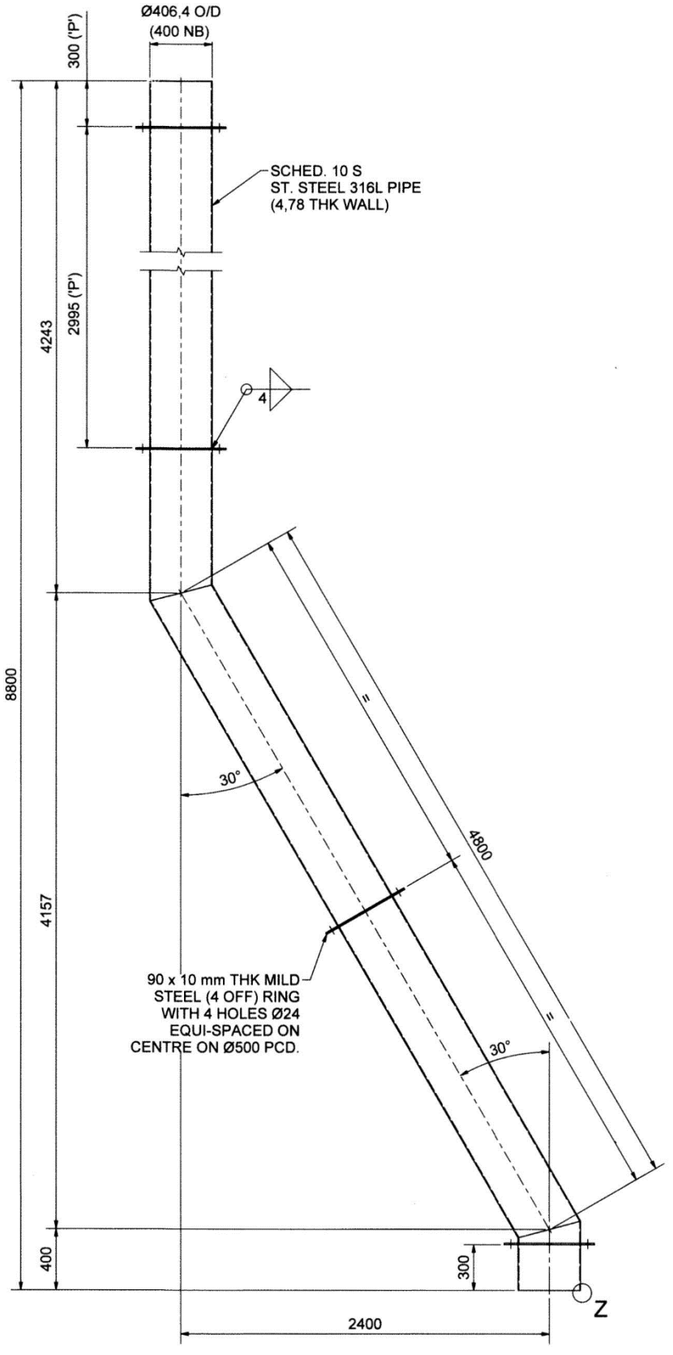
173 VENTILATION PIPE			
MATL :	MILD & ST. STEEL	MASS :	225 kg ea.
NO. OFF :	15	SCALE. :	1:20



174 VENTILATION PIPE			
MATL. :	MILD & ST. STEEL	MASS :	385 kg ea.
NO. OFF :	2	SCALE. :	1:20

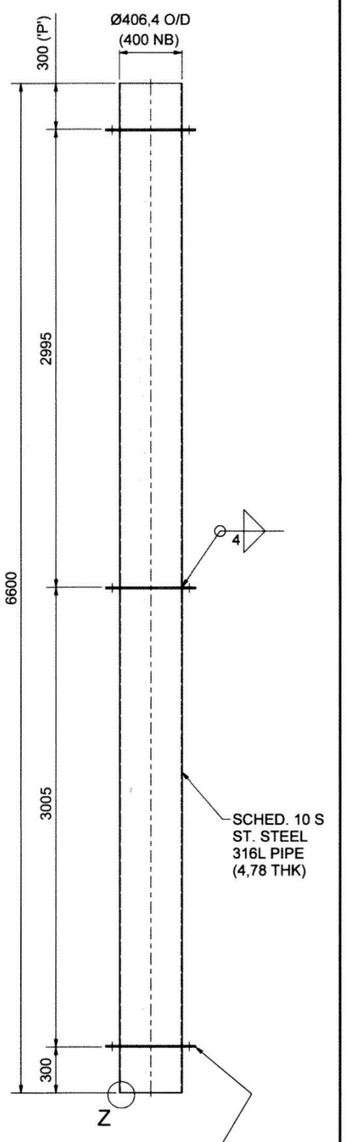
176 VENTILATION PIPE			
MATL. :	MILD & ST. STEEL	MASS :	382 kg ea.
NO. OFF :	2	SCALE. :	1:20

175 VENTILATION PIPE			
MATL. :	MILD & ST. STEEL	MASS :	382 kg ea.
NO. OFF :	2	SCALE. :	1:20



FOR ('X') SEE CORROSION PROTECTION NOTES.

177 VENTILATION PIPE			
MATL. :	MILD & ST. STEEL	MASS :	501 kg ea.
NO. OFF :	1	SCALE. :	1:20



FOR ('X') SEE CORROSION PROTECTION NOTES.

178 VENTILATION PIPE			
MATL. :	MILD & ST. STEEL	MASS :	353 kg ea.
NO. OFF :	6	SCALE. :	1:20

GENERAL WELDING NOTES:
- PERFORM NECESSARY WELD PREPARATION.
- IDENTICAL WELDS SYMBOLISED ONCE ONLY.
- ALL WELDS SHALL BE CONTINUOUS FULL PENETRATION WELDS. REMOVE WELD SPATTER.
- WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH ASME IX FOR THE RELEVANT SCOPE OF WELDS SPECIFIED.

MATERIAL
- PIPE BARRELS TO BE ST. STEEL GRADE 316L UNLESS OTHERWISE STATED.
- ALL FLANGES (>200 NB), COLLARS, CROTCH PLATE REINFORCEMENT, GUSSETS, SADDLES & RINGS SHALL BE MILD STEEL (U.O.S).
- MILD STEEL TO BE IN ACCORDANCE WITH SANS 50025/ EN 10025 GRADE S355JR OR SANS 1431 GRADE 350WA.

PIPES AND SPECIALS: PRESSURE RATING
- WORKING PRESSURE: 600 kPa
- HYDRAULIC TEST PRESSURE: 900 kPa

TESTING OF PIPES AND SPECIALS:
ALL PIPES AND SPECIALS SHALL BE HYDRAULICALLY PRESSURE TESTED TO 900 kPa. RADIOGRAPHIC TESTING SHALL BE PERFORMED WHERE HYDRAULIC PRESSURE TESTING IS NOT POSSIBLE.

GENERAL DIMENSIONAL TOLERANCES (U.O.S)

DIMENSIONS UP TO 120:	± 0,3 mm
DIMENSIONS ABOVE 120 TO 400:	± 0,5 mm
DIMENSIONS ABOVE 400 TO 1000:	± 0,8 mm
DIMENSIONS ABOVE 1000:	± 2 mm
FLATNESS TOLERANCE:	3 mm/m WIDE

GENERAL MANUFACTURING NOTES:
-PIPE MANUFACTURING AND TOLERANCES SHALL BE IN ACCORDANCE WITH SANS 719.
-FABRICATION TO BE IN ACCORDANCE WITH PARTICULAR SPECIFICATION CWD 44 - PIPES AND SPECIALS.
-HOLES IN PUDDLE COLLARS SHALL ALLIGN.

CORROSION PROTECTION NOTES:
- IN ACCORDANCE WITH DWS STANDARD SPECIFICATION DWS 9900.
- PIPE COATING: APPLY TWO PACK EPOXY (150 µm DFT). (*PLUS A TOP COAT OF PURE ALIPHATIC POLY-URETHANE (25 µm DFT) OVER INDICATED AREA MARKED 'P' ON DETAIL).
- PIPE LINING: APPLY TWO PACK EPOXY (250 µm DFT).
- PUDDLE COLLAR COATING: TWO PACK EPOXY (300 µm DFT).
- AREA 250 mm FROM OPEN ENDED PIPES TO BE UNCOATED (THIS EXCLUDES THE ENDS MARKED 'P' ON ITEM 177 & 178).
- FLANGE FACE: APPLY TWO PACK EPOXY (60 - 90 µm DFT).

0 5 10 SCALE (mm) 100

PROJECTION (U.O.S.)

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | ROUND ALL EDGES TO A 2 mm RADIUS

REVISION				
MOD No.	DATE	DESCRIPTION	FOR	DWA
0	09/17	ISSUED FOR CONSTRUCTION		

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

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Mr. D.M. MASHITISHO
DIRECTOR GENERAL

CHECKED	DATE: 13/09/2017	DESIGN: J.J THERON	
ENGINEER	DATE: 19/9/2017	DRAWN: J.J THERON	
CHIEF ENGINEER / APP (Pr. Eng):	DATE: 02/11/2017	EXT. APPROVAL / DESIGN CHECKED: DIRECTOR (Pr. Eng):	DATE: 12/12/2017 / DATE: 10/01/2018

OLIFANTS-DOORN WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS

PIPES & SPECIALS

-DETAILS

PROVINCE: WESTERN CAPE	DISTRICT: CLANWILLIAM	KEYCODES	OUW	PPB	PIP	DET		OTHER NUMBER	CWD 7053
LOCALITY No.: E100-02	TENDER/ CONTRACT No.	SHEET	REG No.						REV No.
CALCULATION FILE: ME/E100-02		54 OF	169371/13 ME						0

APPENDIX B: SITE LAYOUT

Initial _____

APPENDIX C: SITE INSTALLATION OF PIPE – WELDING & CORROSION PROTECTION

Initial _____

OLIFANTS-DOORN WATER RESOURCES PROJECT

RAISING OF CLANWILLIAM DAM

-PIPEWORK-

SITE INSTALLATION OF PIPES – WELDING & CORROSION PROTECTION

water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

NWRI
Engineering Services

Initial _____

OLIFANTS-DOORN WATER RESOURCES PROJECT

RAISING OF CLANWILLIAM DAM

DOCUMENT CONTROL SHEET

Report no:	20/2/E100-02/C/1/25/1/1/3 (7)
Title:	PIPEWORK
Subtitle:	SITE INSTALLATION OF PIPES – WELDING & CORROSION PROTECTION

9 MAY 2024

Rev No	Date of Issue	Originator		Reviewed by	
		Name	Signature	Name	Signature
0	09/05/2024	JD VAN SCHALKWYK		JS POTGIETER	

APPROVED		
Initials	**Signature**	**DATE**
E Manhimanzi		24/05/2024

Initial _____

1. Scope of Work

The following report contains details, instructions, guidelines and recommendations pertaining to the site installation of the Outlet Works pipes i.e. installation, welding, pressure testing and corrosion protection of stainless steel pipework for the conveyance of water. The Contractor shall provide the Dept. of Water and Sanitation Engineer with a method statement detailing all installation aspects for approval.

This document shall be read in conjunction with Particular Specification CWD 44 and all references therein. Refer to drawing numbers 169318/18ME – 169397/19ME & 175234/17ME – 175251/17ME (CWD 7000 - CWD 7079 & CWD 7270 – CWD 7287).

2. Installation

Horizontal pipework ≥ 600 mm NB are installed on steel trestles and tied down with either steel wire ropes or cargo straps. All pipe connections encased in concrete shall be connected using welding as a joining method. Figure 1 below illustrates 1800-, 1000- and 600 mm NB pipes installed on trestles (located and positioned at pipe ring positions a.k.a. puddle collars) and their individual installed heights above the ground level/ poured concrete level. The trestles are slightly adjustable and provide access to the bottom for welding. Note that the cofferdam pipe trestles (Item 41) differ from the illustrated trestles below. The sequence of installation shall be: pipe placement, alignment, tie-down, welding, pressure testing, corrosion protection and only then can concrete encasement follow.

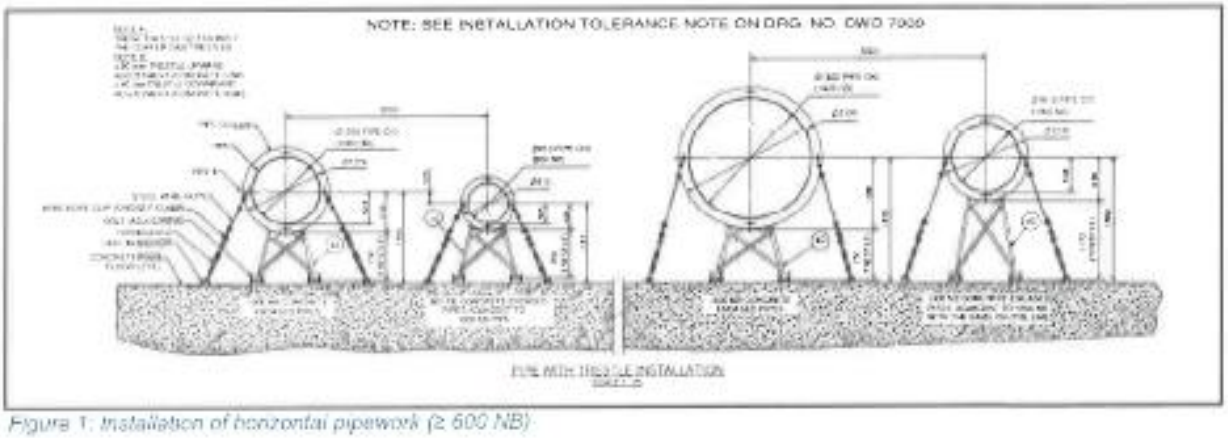


Figure 1: Installation of horizontal pipework (≥ 600 NB)

3. Type of Welds

The welds required are circumferential butt welds on pipe joints in the vertical and horizontal plane (isolated cases of diagonal welds are also present). The parent metal is austenitic stainless steel 304L and also 316L. The abovementioned welding is required for 1800-, 1000- and 600 mm NB pipes with a 10-, 8- and 6 mm wall thickness respectively.

Refer to drawing 169326/13ME (*CWD 7008*) *(Rev 1)* for the weld detail (size, sequence, pipe wall thickness and weld preparation) for 1800 mm NB and 1000 mm NB pipes. Figure 2 below indicates the typical welding of a 1000 mm NB pipe.

Circumferential butt welding in the form of purge welding is required for smaller diameter (i.e. 600 mm NB, 400 mm NB, 300 mm NB, 100 mm NB and 80 mm NB) stainless steel 304L and 316L pipework not accessible from the inside. The welded section may be blanked off at each end using *'vetter bags'* inside the pipe to isolate the inert gas (note Argon has a higher density than that of air). To reduce the use of inert gas, copper backing may be used in 600 mm NB pipes instead of gas purging.

The type, position and size of welds required on site are not necessarily limited to the welds mentioned in this report, but shall comply with CWD 44.

Initial _____

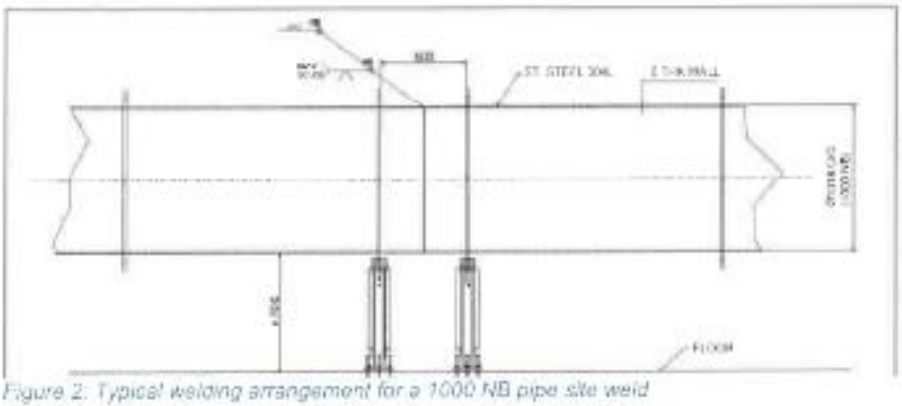


Figure 2: Typical welding arrangement for a 1000 NB pipe site weld

4. Access

Adjacent horizontal pipework shall be supported on trestles ± 700 mm above the concrete floor (refer to drawing 16920/13/ME (CWD 7002) and Figure 2 above). Vertical pipework shall be supported adequately and have suitable access to perform the required welds (i.e. platform or man-cage for the 1800 NB stacks in the intake tower).

No person shall coat or weld inside a pipe with a diameter smaller than 800 mm (Government Gazette No. 37305 dated 7 Feb 2014). Ventilation is required where welding on the inside of the pipe takes place to ensure adherence to the OHS-Act. Pipes smaller than 800 NB shall be blasted and lined using machinery to gain access (limited to ± 20 to 25 m straight sections depending on machinery and contractor).

5. Welder Qualification

All welds and repair welds shall only be undertaken by welders qualified under the latest issue of the ASME "Boiler and Pressure Vessel Code", Section IX for the relevant scope of weld required. The qualified welder is responsible for using the correct welding rod (filler material) and process suitable for the scope of the weld. The scope of the weld is defined as the type of weld, filler material (welding rods), parent material, position, orientation and environment of the weld.

It is recommended that a *Welding Procedure* be qualified at an approved institution for the welding required on site. Copies of all approved *Welding Procedures* and *Welder Qualifications* Certificates shall be submitted to the Engineer of the Directorate: Mechanical and Electrical Engineering. Also refer to the Particular Specifications CWD 44: Pipes and Specials (note sub-section CWD 44.5.1.2 Welding of Pipes and Specials).

Other welding qualifications such as: API 5L (API 1104), AWS B.1.1 or SANS 15614-1:2007 (ISO 15614-1:2004)) may also be accepted if the Engineer approves.

6. Welding Notes

All notes and specifications on drawings pertaining to welding shall be strictly adhered to. A recommendation from the welder is required with regard to the ambient temperature range suitable for welding to obtain the desired welds as required on site. Welding shall not be performed in wet or damp environments or with a wind velocity ≥ 8 km/h at the weld area.

The recommended method of site welding is 'Stick'-welding or 'Flux-core self-shielded (roll)'. TIG-welding shall be used for the root run. M/G welding is not a preferred method.

7. Pipe Alignment

Adjacent pipe ends that are to be welded, shall be aligned using the pipe chain clamps. These clamps shall also be used to obtain the desired ovality tolerance and the line-up of adjacent pipe ends that are to be welded together. Refer to the attached pipe chain clamp data sheet. Any other proposed method for the alignment of the pipes shall be described in the method statement for the installation of pipework. This method statement is to be submitted timeously to the Engineer for approval.

8. Pipe Protection

Conveyer belts are to be placed inside pipes to protect the surrounding lining against the movement of personnel and weld spatter. Acceptable methods are required for the protection of the lined and coated pipes. Rejection of equipment due to damage shall severely impact the project program

9. Testing of Weld Testing

All pipes and specials shall be hydraulically pressure tested to 1.5 x design pressure (i.e 900 kPa for 600kPa rated pipes). Radiographic testing shall only be performed where hydraulic pressure testing is not possible and only with the approval of the Design Engineer. Magnetic particle testing shall not be used due to the low magnetic properties of un-cold worked austenitic stainless steel.

10. Specific Cases

This section describes detailed requirements required for specific cases found on site that may deviate from the normal methodology and general specification/ layout.

10.1 Intake Tower - 400 mm NB Aeration pipes

Installation setup: Vertical pipes (3 to 6 m segment tied down using cables), concrete encased, 4.78 mm thick stainless steel 316L.
Estimated welds: ± 28 off
Connection: Purge welded (with Inert gas). Welding from the outside only (no access to the inside).
Corrosion protection: Grit blasting, coating and lining of ± 300 mm long uncoated segments on the outside, and with the use of suitable equipment to gain access, to the inside of the pipes. It is recommended that only after complete installation of all connecting 400 mm NB vertically installed straight pipes (i.e. welding, testing, coating of outside and concrete encasement) that the lining of uncoated segments on the inside is applied.
Test method: Visual inspection, with NDT (Dye penetrant testing) upon request of the Engineer prior to encasement.
Inspection of Lining: To be performed by a video camera

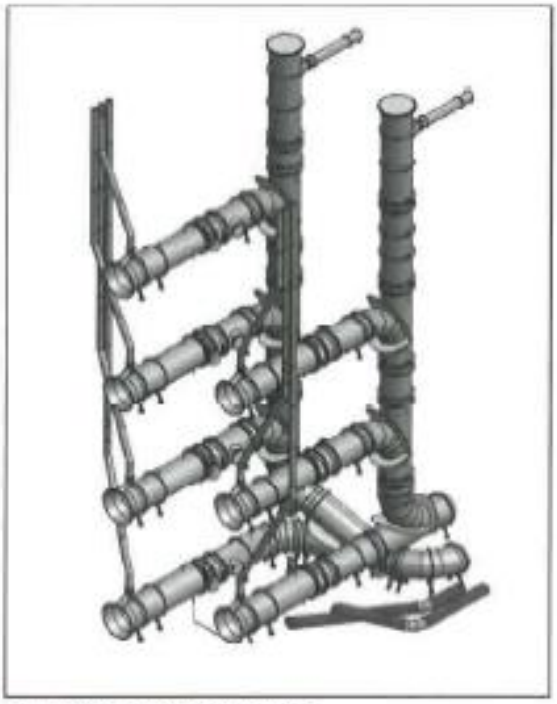


Figure 2: Intake tower pipework

Initial _____

10.2 Intake Tower – 1800 mm NB Vertical Stacks

Installation setup:	Vertical pipes (± 6 m segments tied down using cables), concrete encased, 10 mm thick stainless steel 304L.
Estimated welds:	± 14 off.
Connection:	Welded inside and outside. Access platform and/or man-cage required to perform inside welding.
Corrosion protection:	Grit blasting, coating and lining of ± 300 mm long uncoated segments on the inside and outside. It is recommended that only after complete installation of all 1800 mm NB pipes (i.e. welding, hydraulic testing, coating of outside and concrete encasement) that the lining of uncoated segments on the inside is applied.
Test method:	Hydraulic pressure testing.
Inspection of Lining:	Visual + DFT compliance.

10.3 Drainage pipes - 300 NB

Installation setup:	Horizontally laid pipes (± 6 m segments tied down), concrete encased, 4,57 mm thick stainless steel 316L.
Estimated welds:	Left bank 6 off, right bank 1 off.
Connection:	Purge welded (with inert gas). Welding from the outside only (no access to the inside).
Corrosion protection:	Grit blasted, lining & coating of ± 300 mm long uncoated segments using equipment to gain access.
Test method:	Hydraulic pressure testing.
Inspection of Lining:	To be performed by a video camera.

10.4 Gallery Air & Wash Water Pipes (80 NB)

Pressure rating:	16 bar
Installation setup:	Horizontal, vertical & diagonal laid pipes (± 6 m sections), concrete encased, 3,05 mm thick stainless steel 304L.
Estimated welds:	± 100 off.
Connection:	Purge welded (with inert gas). Welding from the outside only (no access to the inside).
Corrosion protection:	Lining: Un-lined and not pickled and passivated. Coating: pickle and passivate only.
Test method:	Hydraulic pressure testing prior to encasement (Blanking-off method to be supplied by the Main Contractor). Final hydraulic pressure testing of the complete system after complete installation and concrete encasement.

11. Weld Locations

The following table indicates the approximate number of welds for each pipe size as well as the location of these welds. Figure 4 displays the pressure testing sections and the color-coding used in Table 1.

Table 1: Weld Quantities

	Weld Quantities -Summary of Main Pipes							
	Colour Designation	1800 NB	1000 NB	600 NB	400 NB	300 NB	100 NB	80 NB
Cofferdam	Pink	2	—	—	—	—	—	—
Intake tower	Yellow	24	—	2	28	—	1	—
Tunnel	Maroon	10	—	—	—	—	—	—
Tunnel end to hydro-electric powerplant	Light Blue	27	—	—	—	6	—	—
Tunnel end to river outlet	Army Green	10	2	—	—	1	—	—
Left bank off-take chamber to the left-hand side of overspill	Pink & Green	—	22	—	—	—	—	—
Overspill & gallery	Blue	—	22	—	—	—	—	100
Right-hand side of overspill to right-hand side cross-over	Red	—	13	—	—	—	—	—
Right-hand side Cross-over	Purple	—	2	—	—	1	—	—
Right-hand side cross-over to canal outlet	Orange	—	19	—	—		—	—
River extension	N/A	—	—	—	—	—	—	—
	Total:	73	79	2	28	8	1	100

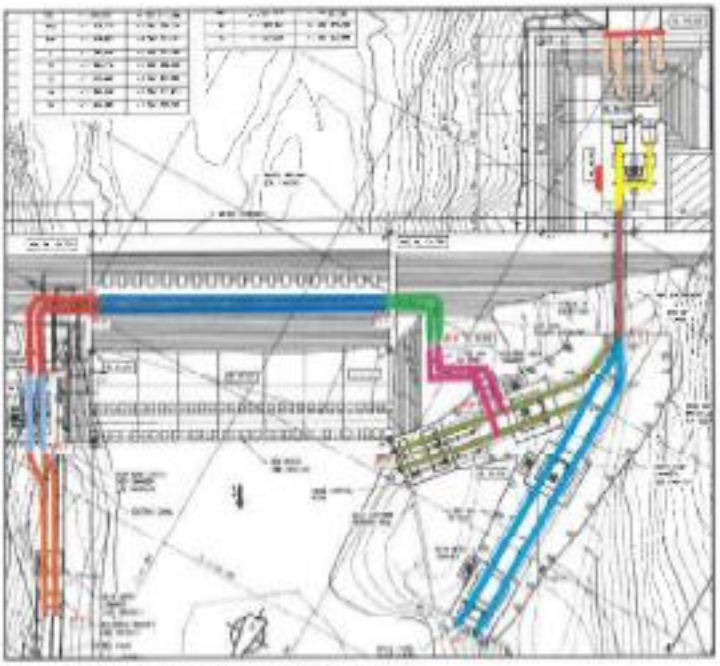


Figure 4. Colour designations of test sections

Initial _____

12. Coating system

The latest version of DWS 9900 shall be used for the corrosion protection of the site welds to coating thicknesses as per CWD 44. Only stainless steel-, glass- and aluminium oxide grit are to be used when blasting stainless steel. Garnet (contains ferrous salts) or platinum slag shall not be used. Grit shall also not be reused when blasting stainless steel during the final blast.

DWS 9900 STANDARD SPECIFICATION: CORROSION PROTECTION
C3: CORROSION PROTECTION OF VALVES, FLOWMETERS AND OUTLET PIPES

5.4.2 ENCASED IN CONCRETE

ENVIRONMENT	MATERIAL	SURFACE	SYSTEM	MINIMUM DFT (µm)
Encased in concrete	3CR12 (See note 5) MS (See note 10)	Lining	1. Two pack Epoxy	400
			2. FBE	300
			3. Epoxy/zinc Polyurethane	2 coats
	3CR12 MS	Coating	1. Two pack Epoxy	250
			2. FBE	200
		Coating	1. Two pack Epoxy	250
			2. FBE	200
	SS 304 or SS 316 See note 8	Lining	1. Two pack Epoxy	300
			2. FBE	175
			3. Two pack Polyurethane	1 coat
		Coating	1. Two pack Epoxy plus sealant of Polyurethane or Polysulphide – See note 7	150
			2. FBE plus sealant of Polyurethane or Polysulphide – See note 7	150
			3. Paddle and perimeter – See note 3	

Figure 5: Corrosion protection of encased pipes

Annexure

- Reference to latest version: Drawing 169324/13ME (CWD 7006) - General assembly
- Reference to latest version: Drawing 169320/13ME (CWD 7002) - Installation tolerance guide
- Reference to latest version: Drawing 169326/13ME (CWD 7008) - Detail of Site welded joint.
- Pipe chain clamp datasheet.
- Sketch D: Concrete pour levels that were used for design of pipe work in the intake tower.

'E-Z FIT' PIPE CHAIN CLAMPS

Heavy Duty Alignment and reforming clamps for Pipe and Vessels.

RANGE: 1"-72"

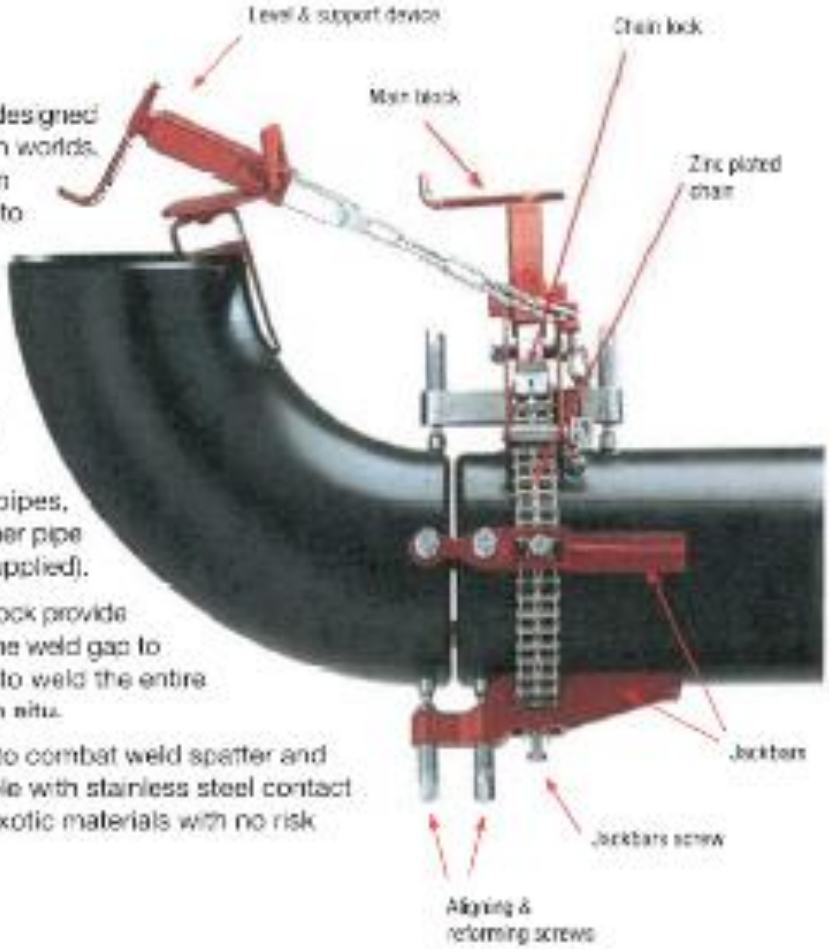
Our 'E-Z Fit' Pipe Chain Clamps have been designed to offer the welder/ pipe fitter the best of both worlds. A robust pipe clamp with the strength to align and reform, that is also lightweight and easy to operate.

Traditional methods for aligning heavy wall pipe, such as ratchet cable pullers, lugs and bottle jacks are time consuming and inconsistent in the results they achieve, making them unsuitable for the majority of critical alignment applications.

One clamp can fit up a variety of sizes of pipes, elbows, tees, flanges end caps and most other pipe fittings (using the level and support device supplied).

The heavy duty high rise Jackbars and main block provide the strength to reform the pipe either side of the weld gap to eliminate "Hi-Lo", whilst enabling the welder to weld the entire circumference of the pipe with the clamp in situ.

Our chain and screws are zinc passivated, to combat weld spatter and corrosion. All E-Z Chain Clamps are available with stainless steel contact points and chain to enable the welding of exotic materials with no risk of contamination.



Features and advantages:

- **Precision Alignment** – The double jackbars, spaced around the outside diameter of the pipe, provide concise alignment and reforming of the internal or external diameters of both pipes within 0.5mm.
- **Extremely Tough** – Reforms pipes on both sides of the weld joint to Schedule 40 pipe and aligns any wall schedule of pipe, elbows, tees and other fittings.
- **Adaptable** – The Chain Clamp can be used to align, and reform elbows, tees and other fittings that a cage clamp can not manage. One Chain Clamp covers the range of eight (8) cage clamps
- **High Rise Independent Jackbars** – Double jackscrew 'high rise' jackbars have extra clearance enabling easy access with welding torch/rod. Each Jackscrew has independently pivoting feet to cope with uneven surfaces.
- **Safe** – Elbows, tees and other fittings can be held safely and securely in place during alignment with the level and support device.

Initial _____

'E-Z Fit' Pipe chain clamp versatility

Some examples of fit-ups with the 'E-Z Fit' Pipe Chain Clamp. Each clamp is supplied with all accessories to carry out any fit-up and includes a steel storage box

Our jackbars are cast from the highest quality alloy steels Lightweight design and construction make them strong and durable yet user-friendly. All jackbars have two aligning screws allowing reforming pressure to be applied to both pieces of pipe.

Additional jackbars can be used if extra pressure is required between the standard jackbars. The jackscrew pads independently pivot to handle uneven surfaces.

Spacing screws can also be added for precise weld gap adjustment.

Standard or heavy duty chain is available according to reforming requirements

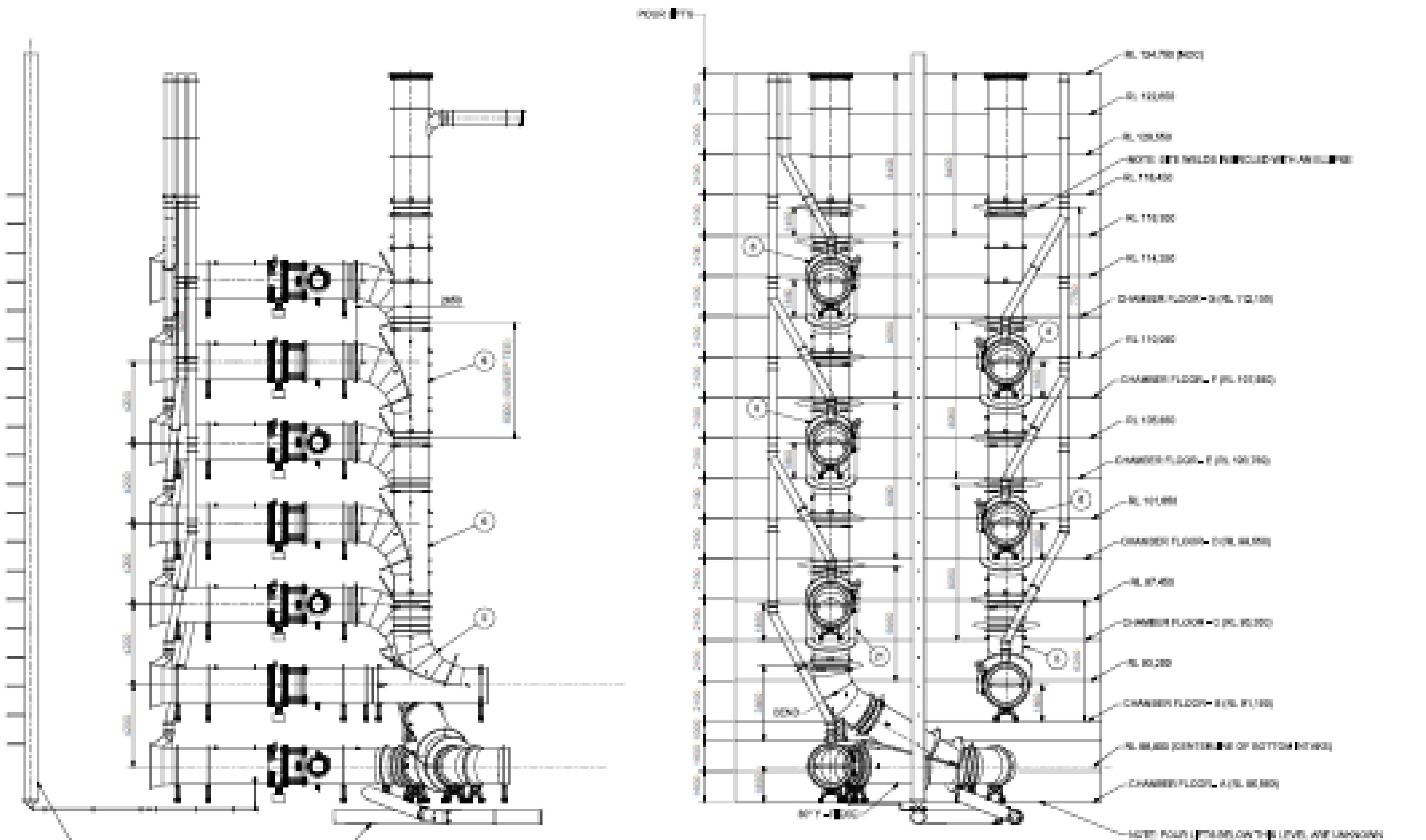
'E-Z Fit' Pipe Chain Clamps Include:

- Length of chain required for the pipe range
- Double jackscrew jackbars listed for the pipe range
- Main block
- Fine adjustment
- Level and support device
- Jackscrew wrench
- Parts and operating manual
- Metal Storage box

The jackbars are designed to allow clearance around the pipe for any welding torch or rod.

PART No.	PIPE DIAMETER RANGE "/mm	NO. OF JACKBARS	REFORMS PIPE TO SCHEDULE	CLAMP WEIGHT KG	SHIPPING WEIGHT KG / LBS
EZPCC/1-8	1-8 / 25-203	3	40	9 / 20	12 / 27
EZPCC/1-8 SS	1-8 / 25-203	3	40	9 / 20	12 / 27
EZPCC/4-20	4-20 / 102-500	7	40	25 / 55	33 / 72
EZPCC/4-20 SS	4-20 / 102-500	7	40	25 / 55	33 / 72
EZPCC/10-36	10-36 / 254-914	8	40	35 / 77	67 / 144
EZPCC/10-36 SS	10-36 / 254-914	8	40	35 / 77	67 / 144
EZPCC/10-54	10-54 / 254-1372	13	40	45 / 99	82 / 180
EZPCC/10-54 SS	10-54 / 254-1372	13	40	45 / 99	82 / 180
EZPCC/10-72	10-72 / 254-1829	16	40	55 / 122	90 / 199
EZPCC/10-72 SS	10-72 / 254-1829	16	40	55 / 122	90 / 199

Initial _____



ALL DIMENSIONS IN MILLIMETRES

DO NOT SCALE DRAWING

PRELIMINARY DRAWING

3rd DRAFT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS

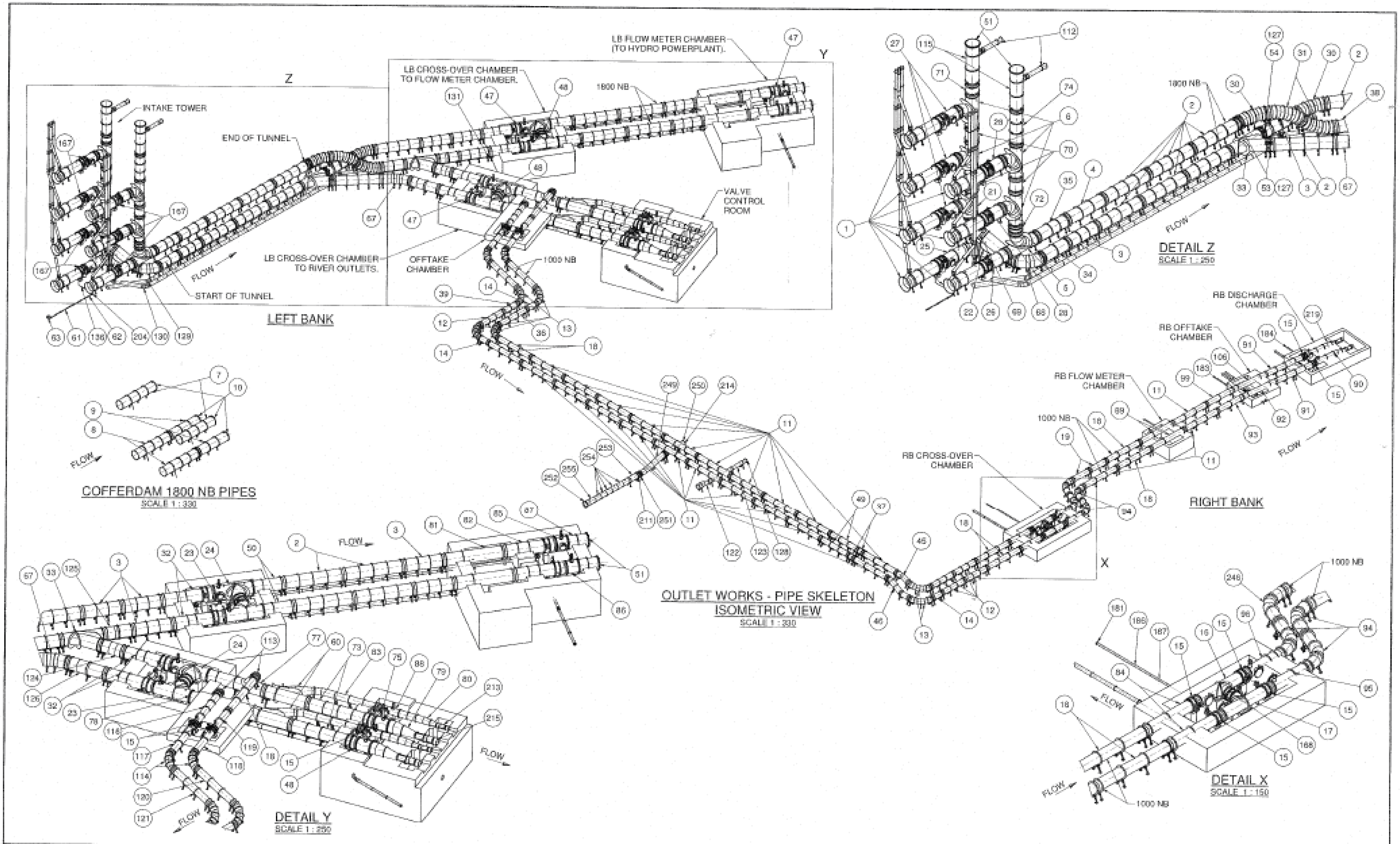
SKETCH D

APPENDIX D : PIPE ASSEMBLY DRAWINGS

CWD7006

CWD7002

Initial _____



GENERAL NOTES:
EXTRA LENGTH / MAKE UP PIECES:
- ITEM 33 - (200 mm UPSTREAM)
- ITEM 30 - (200 mm UPSTREAM)
- ALL CLOSER PIPES (ITEM 47, 48, 167, 15 & 168)
- ITEM 111 - (250 mm UPSTREAM OR DOWNSTREAM)
- ITEM 120 & 121 - (±150 mm UPSTREAM)
- ITEM 77 - ON OFFTAKE
SPARE ITEMS:
- ITEM 133 (1800 NB)
- ITEM 134 (1000 NB)

CONCRETE DETAILS:
- CONCRETE BETWEEN CHAMBERS OMITTED FOR CLARITY & SIMPLIFICATION PURPOSES.
DRAWING LEVEL OF DETAIL:
THIS DRAWING ONLY INDICATES THE MAIN PIPE ITEMS.

ALL DIMENSIONS IN MILLIMETRES

DO NOT SCALE DRAWING

SCALE (mm)

PROJECTION

REVISION: ISSUED FOR CONSTRUCTION

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA
DIRECTOR GENERAL

DESIGN: J.J THERON
DRAWN: J.J THERON

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS

PIPES & SPECIALS

-GENERAL ARRANGEMENT & ISOMETRIC LAYOUT-

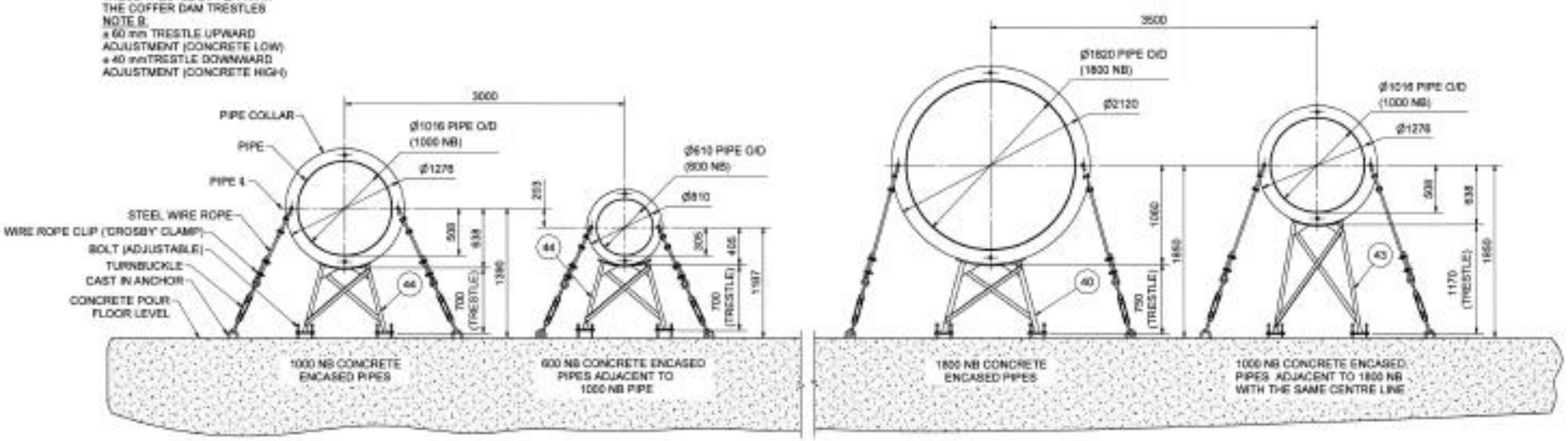
PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM

SHEET 7 of 92 | 169324/13 ME | REV 0

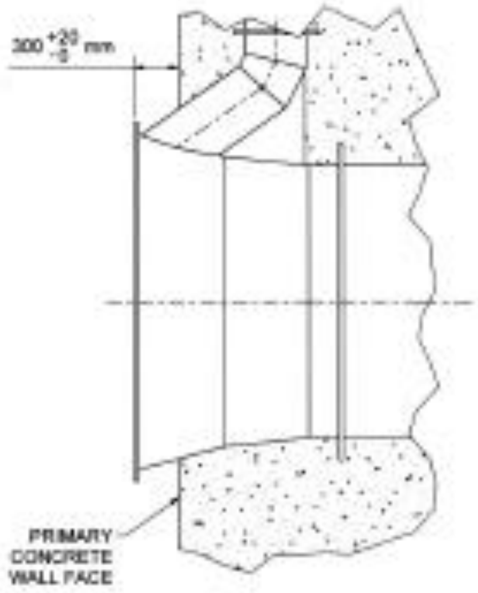
GUIDE FOR PIPE INSTALLATION TOLERANCES

NOTE: SEE INSTALLATION TOLERANCE NOTE ON DRG. NO. CWD 7000

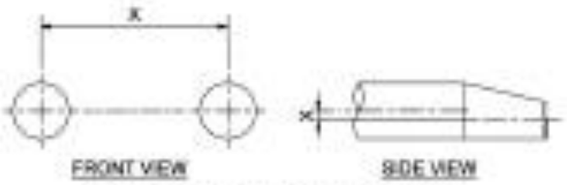
NOTE A:
THESE TRESTLE DIFFER W.R.T
THE COFFER DAM TRESTLES
NOTE B:
± 60 mm TRESTLE UPWARD
ADJUSTMENT (CONCRETE LOW)
± 40 mmTRESTLE DOWNWARD
ADJUSTMENT (CONCRETE HIGH)



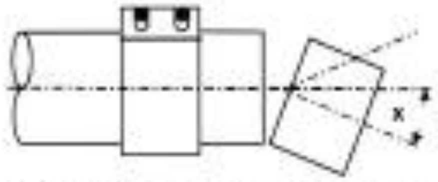
PIPE WITH TRESTLE INSTALLATION
SCALE 1 : 25



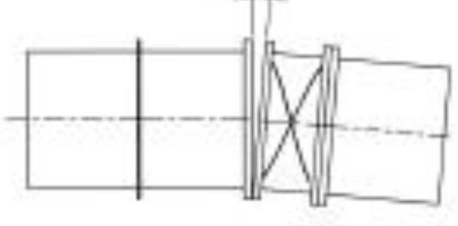
PROJECTION OF BELLMOUTH
SCALE 1 : 25



HORIZONTAL AND VERTICAL ALLIGNMENT TOLERANCE: 3 - 5 mm

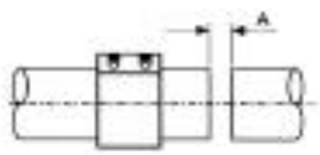


ANGULAR DEFLECTION IN ANY DIRECTION OF PIPE ENDS IN FLEXIBLE COUPLINGS: < 1500 NB = 2°, ≥ 1500 NB = 1°



VALVE FLANGES SHALL BE ALIGNED EXACTLY WITH THE PIPES:
(NO MISSALIGNMENT OR GAPS TO BE TAKEN UP AT THE VALVE TO PIPE JOINTING)

COUPLING WIDTH (mm)	A - GAPS SPECIFIED (mm)	
	NO INTERNAL BAND	WITH INTERNAL BAND
95	5	15
140	10	15
200	15	15



GAPS SPECIFIED FOR FLEXIBLE PIPE COUPLINGS: ± 5mm TOLERANCE

GENERAL DIMENSIONAL TOLERANCES (U.O.S)
DIMENSIONS UP TO 120: ± 0.3 mm
DIMENSIONS ABOVE 120 TO 400: ± 0.5 mm
DIMENSIONS ABOVE 400 TO 1000: ± 0.8 mm
DIMENSIONS ABOVE 1000: ± 2 mm
FLATNESS TOLERANCE: 3 mm/m WIDE
OVALITY TOLERANCE: ± 6 mm DEVIATION ON DIAMETER OF PIPE ENDS
OUTSIDE DIAMETER TOLERANCE: + 1.6 mm USING A DIAMETER TAPE OVER A DISTANCE OF 150 mm FROM THE PIPE END.
PIPE END ROOT FACE SHALL NOT DEVIATE FROM SQUARENESS TO THE PIPE AXIS BY MORE THAN 3 mm.

ALL DIMENSIONS IN MILLIMETRES | DO NOT SCALE DRAWING | ROUND ALL EDGES TO A 2 mm RADIUS

SCALE (mm)
PROJECTION (U.O.S.)

REVISION
0 ISSUED FOR CONSTRUCTION
1 ITEM NUMBER BALLOONS ADDED

DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA

OLIFANTS-DOORN RIVER WATER RESOURCE PROJECT

RAISING OF CLANWILLIAM DAM

OUTLET WORKS
PIPES & SPECIALS
-INSTALLATION TOLERANCE GUIDE-

PROVINCE: WESTERN CAPE | DISTRICT: CLANWILLIAM | CWD 7000

SHEET 3 | 169320/13 ME | 1

APPENDIX E : HISTORICAL WEATHER DATA

Weather Conditions

The Clanwilliam Dam site is situated in the Western Cape province in the winter rainfall region with hot summers and cold wet winters. Average summer maximum and minimum temperatures are in the order of 39°C and 11°C respectively. Corresponding winter temperatures are 31°C and 4°C.

Relevant detailed meteorological information was obtained for the site from Weather Station No 00846710 at Clanwilliam Dam, situated at RL 103 m. Average monthly minimum and maximum temperatures obtained from that station are listed in Table 1. These records will be used for tender purposes and will be compared to information from a weather station to be installed at the dam site before construction commence. The prevailing wind direction(s) is South East and North West.

Table 1: Average Minimum and Maximum Temperatures (°C) Measured at Clanwilliam

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max	41	40,5	39	37	32	27	26	29	33	35	40	41
Min	13,5	13	11	8	5	3	2	2,5	5	7	10	12

The Clanwilliam Dam catchment has a mean annual precipitation (MAP) of 575 mm. The area has a winter rainfall pattern.
Water levels in Clanwilliam Dam are fluctuating throughout the year. Below figure show the average dam levels in Clanwilliam Dam from January to December.

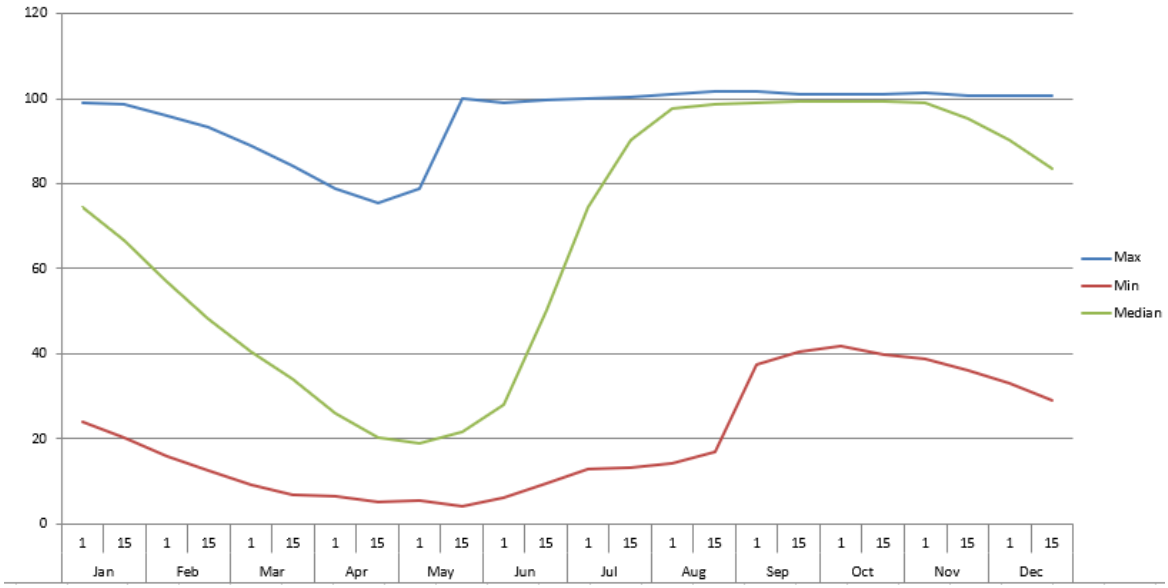


Figure: Average Water Levels in Clanwilliam Dam for January to December.

Initial _____

Rainfall data

The rainfall data to be used for extension of time arising from abnormal rainfall is presented in the below table: rainfall record.

Table: Rainfall Record

Rainfall Station No:00846710 Clanwilliam Period: 1992-2012

Month	AVE	STD DEV	N DAY RAIN	NUM MON	MAX R DAY	MAX RAIN DATE
January	0,0	0.26	0,05	19	13,8	5/1/2004
February	0,25	0.53	0.11	20	10,8	23/2/2010
March	0,45	0.89	0.14	20	29	26/3/1997
April	0,85	1.38	0.33	20	21.4	26/4/2007
May	2,05	3.05	0.76	19	25	8/5/1998
June	3,03	3.98	1.35	18	54.5	8/6/1997
July	2,67	3.23	1.05	18	29.4	26/7/2007
August	2,03	2.80	0.58	18	27.8	18/8/2003
September	0,95	1.35	0.37	18	11.5	12/9/1996
October	0,52	0.91	0.22	18	12.6	19/10/2011
November	0,67	1.16	0.21	18	29.4	8/11/2009
December	0,52	1.11	0.21	18	19.6	24/12/2007

Explanation of headings:

'AVE' represents the average rainfall for the month = Rn

STD DEV' represents the standard deviation from the normal

'N DAY RAIN' represents the average number of rain days per month exceeding 10 mm = Nn

'NUM MON' represents the number of months used in the calculation

'MAX R DAY' represents the maximum rainfall that occurred over a 24-hour period (08:00-08:00)

'MAX RAIN DATE' represents the date on which the maximum 24 hour rainfall occurred

Extension of time arising from abnormal rainfall

Extension of time in terms of the Conditions of Contract arising from abnormal rainfall shall be calculated separately for each calendar month or part thereof in accordance with the formula given below. It shall be calculated for the whole period until completion of the contract including any extension thereof only for the time that work is happening on site:

$$V = (N_W - N_n) + \left(0{,}050 \times (R_w - R_n)\right)$$

If V is negative and it absolute value exceeds Nn then V shall be taken as equal to minus Nn.

The symbols shall have the following meanings:

V = Extension of time in calendar days in respect of calendar month under consideration.

Nw = Actual number of days during the calendar month on which a rainfall of 10 mm or more has been recorded.

Rw = Actual rainfall in mm for the calendar month under consideration.

Nn = Average number of days, as derived from existing rainfall records provided in Table 1.12.1, on which a rainfall of 10 mm or more has been recorded for the calendar month.

Rn = Average rainfall in mm for the calendar month, as derived from the rainfall records supplied in Table 1.12.1

Initial _____

The total extension of time shall be the algebraic sum of the monthly totals for the period under consideration. Extensions of time for part of a month shall be calculated using pro rata values of Nn and Rn.

The factor (Nw - Nn) shall be considered to represent a fair allowance for variations from the average number of days during which rainfall exceeds 10 mm.
The factor 0,050 (Rw - Rn) shall be considered to represent a fair allowance for variations from the average in the number of days during which the rainfall does not exceed 10 mm but wet conditions prevented or disrupted work.
Accurate rain gauging shall be taken at the weather station to be supplied by the Employer's Agent at a suitable point on Site.

Initial _____

APPENDIX F : GENERAL REQUIREMENTS FOR STORAGE OF MECHANICAL EQUIPMENT ON-SITE

GENERAL REQUIRMENTS FOR STORAGE OF MECHANICAL EQUIPMENT ON-SITE

Initial _____

COMPILED BY: Chief Directorate: Engineering Services
Department of Water and Sanitation
Office 329
Sedlberg Building
185 Francis Baard Street
Pretoria

Private Bag X313
Pretoria
0001

ENQUIRIES: T. de Lange
Sub-Directorate: Mechanical Design

Tell: (012) 336-8617
Email: DelangeT@DWS.Gov.za

June 2024

Initial _____

INDEX TO STORAGE OF MECHANICAL EQUIPMENT SPECIFICATION

GENERAL REQUIREMENTS FOR STORAGE OF MECHANICAL EQUIPMENT ON-SITE

1 SCOPE

1.1 Objectives

This document is a comprehensive guideline that defines the standards and practices for the proper storage of mechanical equipment used in dam / water infrastructure. This document outlines the procedures and requirements to ensure that all equipment is stored in a manner that preserves its integrity, functionality and lifespan. The document covers the entire storage process, from the receipt of equipment to its installation, including both open and secured storage requirements. Additionally, the document details proper handling and transportation procedures for equipment, including lifting, moving and placement protocols. It establishes regular inspection and maintenance requirements to ensure that equipment remains in optimal condition while in storage.

1.2 Target date for delivery

Compliance with this storage specification is mandatory before delivery to the Site of any mechanical items listed in this document.

2 GENERAL STORAGE REQUIREMENTS

Mechanical items shall in general be handled with care such that the corrosion protection is not damaged in any way. Where acceptable, broad band slings shall be used to handle items. Regardless of being stored indoors or outdoors, items shall not be stored directly on the floor. Wooden crates, balks of timber and / or saw-dust filled bags may be used to support the items on soil, concrete and / or other hard surfaces. Where stacking is permitted, the same materials are suitable and shall be used as an intermediary between items.

2.1 Off-Loading at Site

The Engineer shall be notified within 21 days of the delivery date and of any requirements regarding off-loading and storage at Site.

The supplier shall be responsible for the transportation and supervision during off-loading of the equipment and other small components at the delivery Site. Unless otherwise specified, the Department will provide at no extra cost cranage on Site for off-loading purposes, provided that this is arranged by the Contractor with the Resident Engineer at the Site at least two weeks in advance.

Under no circumstances shall coated equipment be allowed to rest directly on the ground. The final delivery inspection and acceptance of equipment supplied shall be undertaken by the Engineer on Site after off-loading has been completed. The Engineer has the right to reject any damaged equipment, components and materials that have been delivered and off-loaded at Site.

2.2 Stacking and Storage

The Contractor shall provide all the necessary balks of timber and sawdust bags used to support the equipment and components on soil, concrete or other hard surface and to separate them from each other during storage.

Grass or other vegetation shall not be allowed to grow in the storage area within three metres of the components.

Stacking of equipment on top of each other shall not be allowed if this leads to deformation of equipment.

Items delivered by specialist suppliers (such as lifting equipment, valves, security doors, etc.) shall be stored in the supplier's original packaging. For inspection upon delivery, this packaging may be carefully opened in a manner that the packaging may be reused or sealed accordingly.

2.3 Storage Register and Packaging Requirements

The following minimum details shall be legibly, indelibly and durably marked on the packaging:

- Item Name and Description
- Item Number
- Serial Number / Drawing Number
- Supplier's Name and Contact Details
- Quantity and Size where applicable

Items having openings such has hollow steel sections shall in general have open ends covered, eliminating ingress of dust, debris, moisture, vermin, etc. This cover shall in no way damage the lining or coating of the item.

A storage register (soft copy and hard copy) shall be implemented in order to keep track of the location and installation of the mechanical items. The following minimum information shall be listed for completion in the storage register:

- Item Name and Number
- Drawing Number / Serial Number
- Storage Location
- Date delivered / stored
- Name of recipient
- Supplier
- Date removed from storage.

Items having dissimilar metal composition shall not be stored adjacent to each other. Where space limitations are present, intermediary non-conductive material may be used to isolate the dissimilar metals from each other. Direct contact between dissimilar metals shall not be accepted.

No manufacturing, welding, cutting and / or other metal works shall be conducted in the storage area. The Contractor shall be responsible for rectification of any damages caused to mechanical items during storage, as well as handling if applicable.

3 STORAGE CATEGORIES

Three types of on-Site storage categories will be used throughout this document and are described below.

3.1 Open Area Storage (Outdoor)

A level and clean area clear of bushes, shrubs and weeds shall be provided for items suitable for storage in an open area. Items shall be suitably supported such that no contamination from the surrounding ground is experienced. Items having UV sensitive corrosion protection coatings or parts shall be adequately covered with UV protective sheets or shall ideally be stored under a covered structure. Access to this storage area shall be strictly monitored and controlled. Requirements mentioned under Clause 3 shall be applicable to this category. Any deviation from these requirements shall be submitted to the Engineer for approval in writing.

3.2 Semi-Secure Storage (Indoor)

A well-ventilated, lockable shed or workshop like structure with concrete floor shall be suitable for semi-secure storage requirements. Items requiring controlled environments and no exposure to the elements are intended for this storage category. Requirements mentioned under Clause 3 shall be applicable to this category. Any deviation from these requirements shall be submitted to the Engineer for approval in writing.

3.3 Secure Storage

A secure and well-ventilated lockable container (typically a shipping container) with secure controlled access shall be made available for items that are more susceptible to theft and vandalism. Should multiple containers or similar secure storage facilities be used, these shall be clearly identified in accordance with the Storage Register. Electrical and electronic items, as well as smaller items such as fasteners, keys, radio pendants, etc. shall be stored inside this Secure Storage facility. Requirements mentioned under Clause 3 shall be applicable to this category. Any deviation from these requirements shall be submitted to the Engineer for approval in writing.

4 VALVES

4.1 General Valve Storage Requirements

The general storage requirements shall be relevant to all valves.

- Large diameter valves shall only be moved with broad band slings of sufficient strength or by integral lifting lugs, without damaging the coatings or linings.
- Valves shall be stored in a vertical (upright) position unless otherwise specified (U.O.S.).
- Valves with foot pieces / floor mounting brackets shall be positioned on these features.
- Valves shall be stored on top of skids or wooden blocks (pallets) to prevent contact with the floor, taking cognisance of the mass of such valves.
- Valves shall not be stored in the vicinity of electrical equipment or high-voltage lines.
- Valves shall be stored with end covers as per DWS 9900 and supplied by the original supplier.
- Valves shall be stored in a well-ventilated temperature and humidity controlled, secure storage facility preferably between 5°C and 40°C.
- Valves shall be thoroughly cleaned with compressed air before installation to ensure they are free from dust or any foreign matter.
- Valves shall not come into direct contact with each other (use hardboard / cardboard for separation).
- Any additional requirements as recommended by the original valve manufacturer shall apply.
- Valve manufacturer shall inspect the storage facilities and give approval thereof in writing.

4.2 Rubber Gaskets

Gaskets shall be delivered to the Site promptly prior to the scheduled installation time, to the extent feasible. Should gaskets require storage on Site, they shall be kept in a secure storage facility, laid flat and suitably supported to prevent sagging during storage.

4.3 Valve Transport Trolley

Valve support trolleys shall be stored safely in a secure storage facility.

4.4 Operating Actuators and Control Gear

Electrical actuators and control gear shall be stored in a secure storage facility. Electrical actuators and control gear shall only be removed and stored in marked wooden crates by the original supplier.

4.5 Butterfly Valves

Butterfly valves shall be stored with the blade in a slightly open (cracked) position in order to not compress the disc seal.

4.6 Sleeve Valves

Sleeve valves shall be stored upright, standing on the flange face. The flange face shall not be in direct contact with any hard surface to protect the surface finish. The sleeve valve shall be kept in a 10% open (cracked) position with the actuators safely locked in place. The sleeve valve's hydraulic ports shall be plugged prior to storage.

4.7 Wedge / Knife Gate Valves

Gate valves shall be stored in the fully closed position to prevent ingress of dirt.

4.8 Other Valves

All other valves of smaller diameter i.e. air valves, ball valves, non-return valves and RSV valves, etc. shall conform to all general valve storage requirements and be stored in wooden crates supplied by the original supplier.

4.9 Storage of All Valves

- All small diameter valves (300 mm NB and smaller), trolleys, accessories, etc. shall be stored in a secure storage facility.
- All large diameter valves (larger than 300 mm NB), including heavy valve accessories shall be stored in a semi-secure storage facility.

5 PIPES AND SPECIALS

Pipes, specials, fittings and miscellaneous pipe-related items awaiting installation, shall be protected against damage and ingress on the Site by conforming to the following:

- A dedicated suitable level, cleared and clean area clear of bushes and weeds shall be provided for the storage of pipes and specials to prevent damage by veld fires, rain, flood erosion, etc.
- Pipe coatings shall be protected from ultra-violet (UV) rays by covering pipes with UV protective sheets e.g. Bidim or similar.
- Pipe items shall be stored on dry sandbags or padded wooden beams, high enough to prevent the items from being in contact with the earth.
- Pipe items shall be adequately supported to prevent excessive deflection (± 1,5 m from pipe ends with a maximum interval of 3 m). It is recommended that the supports coincide with the puddle collars of the pipes where fitted.
- Pipe items exerting magnetic properties (carbon steel) must not be stored in a North-South direction to prevent magnetisation of the pipe ends.
- Pipe items shall not be stored on top of each other, unless approved by the Engineer.
- Pipe items shall be stored with their identification clearly visible (Item Number).
- Pipe ends, with the exemption of flanged ends or ends with puddle collars less than 300 mm form the end, shall be internally cross braced to ensure roundness during handling, transportation and storage. Cross bracing is to be supplied by the manufacturer of the items.
- All pipe ends shall be fitted with end covers once corrosion protected to keep dust, rain, vermin and any other critters out.
- Desiccant bags shall be placed inside of pipe items to prevent moisture build-up inside of the pipe item.
- Pipe items shall not be stored near or parallel to high-voltage lines (induced voltage can cause electric shocks).
- Pipe items of different materials (mild steel and stainless steel) shall be stored in separate dedicated areas to prevent any contamination. Also, stainless steel pipes shall not be stored where mild steel pipes have been stored previously.
- Pipes with puddle collars shall only be lifted at holes in the puddle collars or dedicated lifting lugs. Inner puddle collars shall be used to lift pipes where more than two lifting points exist to prevent deformation.
- Only padded slings shall be used to position pipe items in the storage position. No contact with any sharp or abrasive objects is allowed. No chains, wire rope, etc. may be used.
- Storage of bulk components to be in accordance with DWS 1601, Section 12. This entails that items be marked as follows and shall be clearly visible:
    - The bags and crates shall be tagged using metallic tags according to the general storage requirements above.

Table 1: Dedicated Storage Categories for Pipes

Item	Storage Category	Special Requirements
Large diameter pipes	Open Area Storage	
Small diameter pipes	Open Area Storage	
Blank flanges and test pieces	Secure Storage	
Couplings	Secure Storage	Stored in OEM packaging
Fasteners	Secure Storage	Stored in OEM packaging
Gaskets	Secure Storage	

6 HYDRO-MECHANICAL EQUIPMENT

- A dedicated suitable level, cleared and clean area clear of bushes and weeds shall be provided for the storage of hydro-mechanical equipment to prevent damage by veld fires, rain, flood erosion, etc.
- Items of different materials (mild steel and stainless steel) shall be stored in separate dedicated areas to prevent any contamination. Also, do not store stainless steel items where mild steel items have been stored previously.
- All items shall be stored on top of sandbags or wooden pallets.
- Coated items, plastics and items with rubber seals shall be protected from ultra-violet (UV) rays by covering them with UV protective sheets e.g. Bidim or similar.
- Storage of bulk components to be in accordance with DWS 1601, Section 12. This entails that items be marked as follows and shall be clearly visible:
    - The bags and crates shall be tagged using metallic tags according to the general storage requirements above.
- Identical components shall be stored together.
- Small and / or valuable items shall be securely stored in a lockable, secure storage facility (see table below).

Table 2: Dedicated Storage Categories for Hydro-Mechanical Equipment

Item	Storage Category	Special Requirements
Primary built-in parts	Semi-Secure Storage	
Secondary built-in parts	Open Area Storage	
Emergency gate	Open Area Storage	
Fine screens	Open Area Storage	
Grapple beams	Semi-Secure Storage	

7 LIFTING EQUIPMENT

Lifting Equipment shall at best be installed once delivered to Site. The specialist crane supplier shall communicate with the Engineer and / or the Contractor to coordinate the logistics of the lifting equipment. Items received in clearly labelled packaging from the Original Equipment Manufacturer (OEM) shall be stored only if permitted by the OEM and installation is due at a later stage. The specialist crane supplier shall supervise the offloading, unpackaging and handling of the lifting equipment. Handling requirements stated by the crane specialist supplier shall be adhered to at all times. The following items may be kept in storage until installation thereof is due:

Table 3: Dedicated Storage Categories for Lifting Equipment

Item	Storage Category	Special Requirements
Monorail beams	Open Area Storage	
Cast-in anchor plates	Semi-Secure Storage	
Radio Pendants	Secure Storage	Stored in OEM packaging
Personnel Cage	Semi-Secure Storage	
Cable ties, end stops, fasteners, padlocks etc.	Secure Storage	Stored in OEM packaging
Depth Indicator Mimic Diagram	Secure Storage	
Hoist Units / Chain blocks	Secure Storage	Stored in OEM packaging
Spreader Beams	Semi-Secure Storage	
Lifting Slings	Secure Storage	
Vacuum Cleaner	Secure Storage	
Electrical Control Panels	Semi-Secure Storage	Stored in OEM packaging
Lights	Secure Storage	

The Contractor shall communicate with the OEM and Engineer for approval with regards to stacking of items. Stacking guidelines under 'General' shall be adhered to if the OEM does not prescribe any stacking measures.

8 MISCELLANEOUS MECHANICAL EQUIPMENT

Items such as security doors, louvered ventilators, couplings and fasteners shall be stored in the OEM's packaging. The Contractor shall ensure that the packaging is clearly labelled with the information listed under "General Storage Requirements". Stacking of these items shall only be permitted upon approval from the OEM and Engineer.

8.1 Inlet / Outlet Ventilators

Inlet / Outlet ventilators shall in general be stored in accordance with guidelines set forth under "Pipes and Specials". Inlet / Outlet ventilators may be stacked with an intermediary non-metal material in between.

8.2 Manhole Covers

Manhole covers comprising of cast in frames, covers, keys and locks shall be stored in complete individual sets to prevent misplacing of items. The Contractor shall provide suitable packaging to prevent damages, ingress of dust debris and moisture as well as safekeeping of the complete set.

8.3 Gratings

Gratings of similar materials may be stacked, however, the Contractor shall ensure that no damage is caused to the gratings. The Contractor may opt to use an intermediary non-metal material (durable plastic, timber, etc.) placed in between gratings. Stainless steel and mild steel gratings shall be handled with padded slings only and shall not be brought in contact with each other at any time.

8.4 Stainless Steel Cast-In Support Frames

Stainless steel cast-in support frames for gratings are fragile by nature and shall be handled and stored in such a manner that no damage is caused to the shape and structure of the frame and / or fishtails. Stainless steel cast-in support frames for gratings may be stacked, however, the Contractor shall ensure that no damage is caused to the frames. Stacking the frames shall be exercised with caution. Frame stiffeners supplied with cast-in frames shall only be removed after installation is completed.

8.5 Ladders

Ladders manufactured from dissimilar materials shall not be stored together. Ladders shall be laid flat and supported on their mounting brackets. Caged ladders shall only be stacked if a suitable intermediary item is used to prevent deformation of the cage.

Ladder stringers manufactured from hollow sections shall be suitably covered with plastic end caps or an alternative equivalent.

8.6 Handrail Tubing

Handrail tubing supplied in bundles shall remain in such bundles until installation. Handrail stanchions and / or tubing of dissimilar materials shall not be stored together. Long sections of handrail tubing shall be suitably supported to minimize sagging. Openings to hollow sections shall be closed with end covers or other suitable methods to prevent ingress of dust, debris, moisture and/or vermin etc.

8.7 Stainless Steel Cladding Plates

Stainless steel cladding plates shall be stored with flat faces adjacent to each other and fishtail ends adjacent to each other. Cladding plates shall be handled with padded slings. Stacking of mild steel items on stainless steel cladding plates shall in no way be permitted.

Removable roof slabs having stainless steel cladding plates cast in shall have an intermediary non-metal material protecting the stainless steel from contamination and / or damages.

8.8 Bolt-on Kickplates

Bolt-on kickplates shall be laid flat and suitably supported to prevent sagging during storage. Kickplates of dissimilar materials shall not be stored together. Accompanying U-bolts shall be labelled and stored in the supplier's packaging alongside other fasteners.

8.9 Fasteners and Anchors

Fasteners and anchors shall be kept in the supplier's packaging until installation thereof. Chemical anchors shall be kept strictly in accordance with the guidelines set by the supplier. Isolating spark gaps, complete with brackets and fasteners, shall be labelled and stored in the packaging provided by the supplier.

8.10 Lifelines

Should the lifeline require storage on Site, the lifeline and all the accompanying equipment shall be kept in a secure storage facility.

Tabulated below is storage category required for the Mechanical Miscellaneous items listed under Particular Specification CWD-42.

Table 4: Dedicated Storage Categories for Miscellaneous Equipment

Item	Storage Category	Special Requirements
Security Doors	Semi-Secure Storage	Stored in OEM packaging
Louvered Ventilators	Semi-Secure Storage	Stored in OEM packaging
Inlet / Outlet Ventilators	Secure Storage	Stored in OEM packaging
Anchor plates	Semi-Secure Storage	
Manhole covers	Open Area Storage	
Gratings	Open Area Storage	
Cast-in support frames	Semi-Secure Storage	
Ladders and valve access pedestals	Open Area Storage	
Handrail tubing and stanchions	Semi-Secure Storage	
Stainless steel cladding plates	Open Area Storage	
Bolt-on kickplates	Open Area Storage	
Couplings, gaskets and fasteners	Secure Storage	Stored in OEM packaging
Fasteners and anchors	Secure Storage	Stored in OEM packaging

9 HANDLING AND TRANSPORT

The Contractor shall provide all the necessary balks of timber and sawdust bags used to support the components on soil, concrete or other hard surface and to separate them from each other during storage.

The Contractor shall be deemed to have included in the pricing schedule or the Bill of Quantities for all materials and packing cases necessary for the safe packing and storage of the equipment.

All crates, packages, steel fabrications and machinery shall be clearly marked with a waterproof material to show the weight, the position to which slings may be attached and shall have an indelible identification mark relating them to the packing lists. In addition, all packages shall be clearly painted with a distinctive site identification colour and sign, so that the final location of each item can be easily identified at the Site in order to avoid delay, double handling or loss. These special identification marks shall be in addition to the normal shipping and transport marks.

Machined flanges of pipes, valves and fittings shall be protected by wooden discs attached by means of service bolts (which shall not be used on the Works) or by other approved means.

Wherever possible, lifting of painted items shall be from approved lifting attachments. All coated items shall only be lifted by means of broad band slings that shall not damage the coating. Slings shall not be less than 50 mm wide or as approved by the Engineer.

Stainless steel items shall be handled and packed in a way that prevents contamination.

The use of ropes, wire ropes or chains without suitable padding is expressly forbidden.

When loading onto vehicles, precautions shall be taken to support and chock the components to prevent movement. Components shall be firmly lashed or chained with padded lashing, supported on sawdust bags. The area of padded surfaces shall be adequate to prevent damage to the coating.

Any repairs necessary shall be to the cost of the Contractor. Any damage that occurs during the handling and storage of equipment and components at the storage shall be repaired by the Contractor at his own cost, in accordance with the Specification and to the approval of the Engineer.

Damage repair to corrosion protection shall only be carried out by a specialist corrosion protection applicator.

APPENDIX A

10 STORAGE SPACE REQUIREMENTS BY AREA

Storage space requirements shall be calculated for each individual project by the Contractor. The table below shall be used as a guideline thereof:

Item	Qty	Storage Area per Item [m²]	Total Storage Area [m²]	Special Requirements
Lifting Equipment				
Monorail Beams				
Cast-In Anchor Plates				
Radio Pendants				
Personnel Cage				
Cable Ties, End Stops, Fasteners, Padlocks, etc.				
Depth Indicator Mimic Diagram				
Hoist Units / Chain Blocks				
Spreader Beams				
Lifting Slings				
Vacuum Cleaner				
Electrical Control Panels				
Lights				
Miscellaneous Equipment				
Security Doors				
Louvered Ventilators				
Inlet / Outlet Ventilators				
Anchor Plates				
Manhole Covers				
Gratings				
Cast-In Support Frames				
Ladders and Valve Access Pedestals				
Handrail Tubing and Stanchions				
Stainless Steel Cladding Plates				
Bolt-On Kickplates				
Fasteners and Anchors				
Hydro-Mechanical Equipment				
Primary Built-In Parts				
Secondary Built-In Parts				
Fine Screens				
Emergency / Service Gates				
Grapple Beams				

Item	Qty	Storage Area per Item [m²]	Total Storage Area [m²]	Special Requirements
Pipes, Specials and Fittings				
Large Diameter Straight Pipes				
Small Diameter Straight Pipes				
Large Diameter Pipe Specials: • Bends				
• T-Pieces / Sweep-T's				
• Cross Connections				
Small Diameter Pipe Specials: • Bends				
• T-Pieces / Sweep-T's				
• Cross Connections				
Blank Flanges and Test Pieces				
Couplings				
Gaskets				
Fasteners				
Valves and Accompanying Items				
Butterfly Valves				
Knife Gate Valves				
Sleeve Valves				
All Other Small Diameter Valves				
Electrical Actuators and Gearboxes				
Valve Transport Trolleys				
Gaskets				
Fasteners				
Additional Items not mentioned above				
Total Storage Area Required				
Open Area Storage				
Semi-Secure Storage				
Secure Storage				