	BAGUIO WATER DISTRICT BWD Compound, Utility Road, Baguio City 2600	Document No.	ADM-PUR-F003
	REQUEST FOR BIDS/QUOTATION (RQ)	Revision Date	October 29, 2019
		Revision No.	02

To: _____
(Name of Supplier)
Contact Person: _____
Address: _____
_____
Contact no.: _____

RQ No.: **01 – JO – 030**
PR / JO No.: **JO – 030**
Date of RQ: **January 30, 2024**
Purpose of RQ:
Proposed upsizing of the existing 2" Ø Distribution Line along Sariling Sikap, irisan, Baguio City (instalaltion of 4" Ø x 495M PVC Mainline)

NOTE: DATA REQUIRED MUST BE FILLED UP COMPLETELY. FAILURE TO INDICATE THE PRICE VALIDITY, TERMS, WARANTY PERIOD AND DELIVERY PERIOD SHALL MEAN OUTRIGHT DISQUALIFICATION OF BIDS

	Qty.	Description	U-Price	Total
VALIDITY DATE: _____ day **(30 days minimum)** **DELIVERY:** _____ working days _____ calendar days _____ FOB warehouse **WARRANTY** _____ calendar days upon acceptance. **TERMS:**	1 lot	Earthwork and Removal of Actual Structures / Obstruction & Surface Restoration and Paving Works – for the Proposed Upsizing of the Existing 2" Ø Distribution Line along Sariling Sikap, Irisan, Baguio City (Installation of 4" Ø x 495M PVC Mainline) Scope of work:		

Mobilization Work	1.00 lot
Signages, Safety, and Traffic Management	1.00 lot
Concrete Cutting Work	576.50 LM
Concrete Breaking Works	202.00 sq m
Excavation Works	
• Concrete Excavation	46.46 cu m
• Soil Excavation	155.54 cu m
Backfilling and Compaction Works	
• Sand Bedding and Filling of Trench	76.90 cu m
• Soil Backfilling (including temporary resurfacing)	125.10 cu m
• Compaction of Trench	125.10 cu m
Restoration Works	
• Preparation of Trench (excavation of temporary resurfacing)	46.46 cu m
• Boring of Holes (for dowel bars)	1,687.00 holes
• Cutting / Fabrication and Installation of Dowel Bars	2,802.53 kgs
• Ready-Mix Concrete Pouring	46.46 cu m
Testing of Materials (FDT, Tensile Test of Rebars, Compression Test of Concrete Cylinders, Flexural Test of Concrete Beams)	1.00 lot
Clearing, Hauling, Disposal of Unwanted Materials & Debris	123.36 cu m
Demobilozation Work	1.00 lot

Refer to the attached Terms of Reference (TOR) and drawing plans for details

Duration: 45 working days

March 6, 2024

Approved Budget Cost: ₱1,789,815.81 / lot

x x x x x

This is a two (2) envelope system:

Documents Comprising the Bid

The **first envelope (Technical Proposal)** shall contain the following:

I. **CLASS "A" DOCUMENTS**

A. LEGAL DOCUMENTS

1. Registration certificate from the Securities and Exchange Commission (SEC), Department of Trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives.
2. Mayor's/Business permit issued by the city or municipality where the principal place of business of the prospective bidder is located, or the equivalent document for Exclusive Economic Zones or Areas.
    - In cases of recently expired Mayor's/Business permits, it shall be accepted together with the official receipt as proof that the bidder has applied for renewal within the period prescribed by the concerned local government unit: *Provided*, That the renewed permit shall be submitted as a post-qualification requirement in accordance with Section 34.2 of the IRR of RA 9184.
3. Tax clearance per Executive Order No.398, series of 2005, as finally reviewed and approved by BIR.

B. TECHNICAL DOCUMENTS

1. PhilGEPS Certificate of Registration and membership in accordance with Section 8.5.2 of the IRR of RA 9184, except for foreign bidders participating in the procurement by a Philippines Foreign Service Office or Post, which shall submit their eligibility documents under Section 23.1 of this IRR: *Provided,* that the winning bidder shall register with the PHILGEPS in accordance with Section 37.1.4 of the IRR of RA9184.

2. Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid within the relevant period as provided in the Bidding Documents. The statement shall include, for each contract, the following:

a) name of the contract
b) date of the contract
c) contract duration
d) owner's name and address
e) nature of work

f) contractor's role (whether sole contractor or partner in a JV) and percentage of participation
g) total contract value at award
h) date of completion or estimated completion time
i) total contract value at completion, if applicable;
j) Percentages of planned and actual accomplishments, if applicable;
k) value of outstanding works, if applicable;
l) the statement shall be supported by the notices of award and/or notices to proceed issued by the owners; and
m) the statement shall be supported by the Constructors Performance Evaluation System (CPES) rating sheets, and/or certificates of completion and owner's acceptance, if applicable;

3. An SLCC that is similar to the contract to be bid, and whose value, adjusted to current prices using the Philippine Statistics Authority (PSA) consumer price indices, must be at least fifty percent (50%) of the ABC. Provided, however, that contractors under Small A and Small B categories without similar experience on the contract to be bid may be allowed to bid if the cost of such contract is not more than the Allowable Range of Contract Cost (ARCC) of their registration based on the guidelines as prescribed by the PCAB.

The SLCC shall be supported by an Owner's Certificate of Final Acceptance issued by the project owner other than the contractor or a final rating of at least Satisfactory in the Constructors Performance Evaluation System (CPES). In case of contracts with the private sector, an equivalent document shall be submitted.

4. Bid security in any of the following:

Form of Bid Security	**Amount of Bid Security (**Not less than the required **percentage of the ABC)**
Cash or cashier's/manager's check, issued by a Universal or Commercial bank	2%
Bank draft/guarantee or irrevocable letter of credit issued by a Universal or Commercial Bank: Provided, however, that it shall be confirmed or authenticated by a Universal or Commercial Bank, if issued by a foreign bank.	2%
Surety bond callable upon demand issued by a surety or insurance company duly certified by the insurance company duly certified by the Insurance Commission as	5%

authorized to issue such security.	
OR Bid Securing Declaration, which states, among others, that the bidder, shall enter into a Contract with the procuring entity and furnish the required performance security within ten (10) calendar days, or less, as indicated in the bidding documents, from the receipt of the Notice of Award, and committing to pay the corresponding fine and be suspended for a period of time from being disqualified to participate in any government procurement activity in the event it violates any of the conditions stated therein as required in the guidelines issued by the Government Procurement Policy Board (GPPB).	

5. Omnibus sworn statement in accordance with Section 25.3 of the IRR of RA 9184 which shall be executed by the prospective bidder or its duly authorized representative

6. Project Requirements:
   a) Organizational chart for the contract to be bid;
   b) List of contractor's personnel (viz: Project Manager, Project, Engineers, Safety Officers**,** Materials Engineers, and Foremen, etc.), to be assigned to the contract to be bid, with their complete qualifications and experience data; and
   c) List of contractor's equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be. The contractor shall have the following equipment:
      1. cargo / dump truck,
      2. rotary driller with bit,
      3. generator set, and
      4. concrete vibrator

7. Proof of payment of bidding documents in the amount of **₱5,000.00**

8. Statement of Compliance to all provisions of the Terms of Reference (manner of implementation, qualification, requirements of suppliers / installers, technical specifications)

C. FINANCIAL DOCUMENTS

1. Audited financial statements, showing, among others, the prospective bidder's total and current assets and liabilities stamped "received" by the Bureau of Internal Revenue (BIR) or its duly accredited and authorized institutions, for the preceding calendar year, which should not be earlier than two (2) years from bid submission.
2. The prospective bidder's computation of Net Financial Contracting Capacity (NFCC).

II. **CLASS "B" DOCUMENT**

If applicable, the joint venture bidders shall submit a Joint Venture Agreement in accordance with RA 4566 and its IRR. Each partner of the joint venture shall submit his or her respective PHILGEPS Certificates of Registration in accordance with Section 8.5.2 of the IRR of RA 9184. The submission of technical and financial eligibility documents by any of the joint venture partners constitutes compliance: Provided, that the partner responsible to submit the NFCC shall likewise submit the Statement of all its ongoing contracts and Audited Financial Statements.

The **second envelope (Financial Proposal)** shall contain the following:

a) Bid Form, which includes bid prices and bill of quantities
b) Detailed estimates including a summary sheet indicating the unit prices of construction materials, labor rates and equipment rentals used in coming up with the bid
c) Cash flow by the quarter and payments schedule

All Financial Proposals that exceed the ABC shall be rejected.

Pre-bid conference: February 23, 2024
9:30am via Zoom Application
Meeting ID: 452 718 8447
Password: 9Buvqr

x x x x x

By: Supplier or Authorized Representative:_____(sign over printed name)

Deadline of submission of bids: March 6, 2024 Opening of bids: **1:30 pm**

Prepared by: For: **MGLamangan** PURCHASING **Noted by:** **ATTY. MA. LUISA C. TENEDERO** BAC IN-HOUSE **ENGR. REYNALDO C. JAYCO** BAC-TECHNICAL

BWD RESERVES THE RIGHT TO REJECT BIDS &/OR DECLARE A FAILURE OF BIDDING PURSUANT TO THE PERTINENT PROVISIONS OF RA 9184
BWD DOES NOT ENGAGE IN SOLICITATION OF FUNDS FROM ANY INDIVIDUALS OR ENTITIES, AND WE STRONGLY ADVISE AGAINST RESPONDING TO ANY UNAUTHORIZED REQUESTS CLAIMING ASSOCIATION WITH OUR ORGANIZATION.

Telefax No. (074) 442-4858 (Purchasing) / 444-7246

BAGUIO WATER DISTRICT

"Serving mankind is serving God"

TERMS OF REFERENCE

EARTHWORK AND REMOVAL OF ACTUAL STRUCTURES/OBSTRUCTION & SURFACE RESTORATION AND PAVING WORKS - FOR THE PROPOSED UPSIZING OF THE EXISTING 2"Ø DISTRIBUTION LINE ALONG SARILING SIKAP, IRISAN, BAGUIO CITY (INSTALLATION OF 4"Ø X 495M PVC MAINLINE)

TECHNICAL SPECIFICATIONS

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Sections:

STANDARD TECHNICAL SPECIFICATIONS

This specific provision describes the technical requirements, which is basically the elaboration of work items within the scope of work that forms part of the Contract.

DIVISION I – GENERAL REQUIREMENTS

1.1 Mobilization / Demobilization

Mobilization shall include transportation to the site of Contractor's plant, materials provided by him, equipment, employees, furnishings and temporary facilities as defined in this Section.

Demobilization shall include dismantlement and removal from the site of Contractor's plant, materials and equipment and all temporary facilities. Demobilization shall also include clean up of the site after completion of the Contract Work as approved by the BWD Engineer and transportation from the site of Contractor's employees.

1.2 Materials Testing

An independent testing laboratory will be nominated by the Contractor which will be approved by the BWD Engineer. The approved laboratory shall undertake all testing of sample materials required under the various Sections of this Specification. All tests shall be undertaken with the presence of the BWD Engineer. The cost of all tests required in this Contract shall be borne by the Contractor.

1.3 Permit and Licenses

The procurement of all excavation permits and other permits necessary in the project implementation shall be undertaken by BWD including the Restoration Fee/Deposit, which is refundable after 1 year upon completion of the restoration works, thus, in order to have satisfactory quality of work, the Contractor is required to undertake testing of materials that will be used and installed under this Contract.

1.4 Safety and Traffic Management

The Contractor shall provide safety officers, traffic aides and watchmen/flagmen on the project site from the start until completion to ensure public safety and smooth flow of traffic.

1.5 Personal Protective Equipment (PPE)

The Contractor shall provide all his workers with complete sets of PPEs such as but not limited to heavy duty gloves, dust mask, reflectorized vest, ear plug/muff, clear safety glasses, and hard hat.

1.6 Special Items

The Contractor shall provide insurance, bonds and interest. The bonds and interests shall be secured for the entire duration of construction in order to safeguard the smooth

implementation of the contract. Cost of such insurance, bonds and interest shall be deemed to be included in the Contractor's Overhead and Profit of unit price of every item of the contract.

a) Water Supply, Power and Lighting, and Telephone

i. Water Supply - For all operations required in the execution of the Contract, the Contractor shall be responsible for providing ample water supply under a pressure sufficient for all construction purposes.

ii. Power and Lighting - The Contractor shall make all necessary applications and arrangements and pay all fees and charges for electrical energy for power and light necessary for the proper completion of this Contract during its entire progress. The Contractor shall provide and pay for all temporary wiring, switches, connections, meters and power bills.

There shall be sufficient electric lighting so that all work may be done in a workmanlike manner when there is no sufficient daylight or during night work.

b) Project Signs / COA Sign Board

The Contractor shall furnish and maintain at least two (2) sign boards in the project site in accordance with the Standard Drawings. The signs shall be installed in the locations directed by the BWD Engineer.

1.7 Terms of Payment

The Contractor may submit a request for payment for work accomplished. Such request for payment shall be verified and certified by the BWD's Representative.

The BWD shall have the right to deduct from the Contractor's progress billing such amount as may be necessary to cover third party liabilities, as well as uncorrected discovered defects in the project.

Payments shall be adjusted by deducting therefore the amounts for advance payments and retention.

1.8 Liquidated Damages

The Contractor shall pay liquidated damages to BWD for each day that the Completion Date is later than the Intended Completion Date. The applicable liquidated damages is at least one-tenth (1/10) of a percent of the cost of the unperformed portion for every day of delay. The total amount of liquidated damages shall not exceed ten percent (10%) of the amount of the contract. BWD may deduct liquidated damages from payments due to the Contractor. Once the cumulative amount of liquidated damages reaches ten percent (10%) of the amount of this Contract, BWD shall rescind or terminate this Contract, without prejudice to other courses of action and remedies available under the circumstances. Likewise, the Contract shall automatically be taken over by BWD or award the same to a qualified contractor through negotiation and the erring Contractor's performance security shall be forfeited.

1.9 Contractor's Construction Equipment, Tools and Appliances

The Contractor shall provide concrete cutter, one (1) backhoe with breaker (PC40) and one (1) mini-backhoe (PC20), vibratory type plate compactor, rotary driller with bit, generator set, service vehicle/truck, concrete vibrator, tools and appliances necessary to perform and insure a rate of progress sufficient to complete the work at the specified period and at the same time effect a satisfactory quality of work. If at any time, in the opinion of the BWD Engineer, the construction equipment and tools appear inadequate and insufficient to maintain the quality and quantity for proper execution of the work, the Contractor shall provide the additional equipment and tools at no extra cost to BWD. It is being understood and agreed upon that the cost of providing and operating all equipment and tools required and necessary for proper execution of the work and of maintaining satisfactory quality are included in the unit bid prices.

Failure of the BWD Engineer to require the Contractor to provide additional equipment to properly execute all the work under this Contract shall not relieve the Contractor of his obligations to secure the quality and quantity of the work required and of completing the work within the specified time.

1.10 Warranty

The work shall be guaranteed against workmanship defects for a period of one (1) year from BWD's date of acceptance. Defects discovered within the 1-year warranty period shall be repaired by the Contractor at his own expense within seven (7) calendar days upon receipt of the notice to be issued by BWD. The obligation for the warranty shall be covered by either retention money equivalent to at least ten percent (10%) of every progress payment. The said amounts shall only be released after the lapse of the 1-year warranty period.

DIVISION II – EARTHWORK AND REMOVAL OF ACTUAL STRUCTURES/OBSTRUCTION

2.1 General

The Contractor shall perform all earthworks required and shown on the drawings.

All works under this Section shall comply to the conditions of the Excavation/Digging Permit to be issued by the CEO and/or DPWH.

2.2 Barricades and Warning Signs

As part of safety and traffic management, the Contractor shall provide and maintain 4 units of 0.8m x 0.8m early warning signs, 8 units of reflectorized traffic cones, 4 units of battery-operated warning lights, and caution tapes at the project site. These will serve as warning signs to ensure the safety of the motorists and pedestrians during day and night activities. The said number of barricades and lights shall be turned over to the BWD after completion of the Project.

2.3 Steel Plates

The Contractor shall provide and maintain one-inch (1") thick steel plates with the ASTM A36 material specifications at the project sites. These steel plates will be used to cover the trenches and to ensure the safety of the motorists and pedestrians during pipe laying activities.

2.4 Site Work

a. Scopes

Furnish all plant, labor, equipment, materials and perform all operations in connection with demolition, clearing and grubbing, earthwork for the construction of the Water Supply System, in strict accordance with this section or the Specifications and the applicable contract Drawings, subject to the terms and condition of the contract.

b. Applicable Documents

The following specifications and Standards referred to hereinafter by basic designation shall form part of the specifications to the extent required by the reference thereto.

American Association of State Highway and Transport Officials (AASHTO)

T99-84 - Moisture-Density Relation of Soils using 5.5 lbs. Rammer and a 12-inch Drop.

T147-70 - The field determination of Density of soil in Place. American Society of Testing and Materials (ASTM) C36-84 Sieve analysis of fine and coarse aggregate.

c. Clearing and Grubbing

- Clearing

All areas within which structure or related construction has to be accomplished shall be cleared of matted roots, trees, brush, snags, vegetation, rubbish, spoils, and other objectionable matters. All combustible materials from clearing operation shall be removed from site of work and disposed of as directed by the BWD Engineer.

- Grubbing

Grubbing shall consist of the removal of tree stumps, forest growth, brush and rubbish from the work areas to be occupied by permanent structures and from other areas within the indicated clearing limits as directed by the BWD Engineer.

i. Trees and Shrubs to be retained shall be protected properly from damage,

ii. Stumps shall be removed entirely. Roots and matted roots shall be grubbed out to at least 150mm below the existing surface

2.5 Cutting and Breaking of Pavement

a. General

The Contractor shall provide all labor, materials & equipment necessary for pavement cutting and breaking.

In cutting concrete pavement for the installation of pipeline, the contractor shall commence cutting using concrete cutter before breaking the concrete pavement

with concrete breaker to assure even trench and not to extent damage of pavement. Staking of pipeline route shall be applied and preserved for the contractor's guide.

2.6 Pipeline Trench Excavation

a. General

The Contractor shall provide all labor, materials & equipment necessary for trench excavation.

Debris from excavation shall be disposed of immediately by the Contractor. The hauling and disposal of the debris shall be shouldered by the Contractor.

Unless otherwise shown or ordered, excavation for pipelines shall be open – cut trenches. Except when otherwise shown or ordered by the Engineer, the bottom of the trench shall be excavated uniformly to the grade of the bottom of the pipe. The trench bottom shall be given a final trim using a string line for establishing grade, such that each pipe section when first laid will be wholly in contact with the ground or bedding along the extreme bottom of the pipe. Rounding out the trench to form a cradle will not be required.

As stipulated early under this Clause, barricades and warning lights shall be provided and maintained for all trenches left overnight. Heavy steel plates, capable of supporting vehicular traffic, shall be furnished by the Contractor as directed by the BWD Engineer.

The Contractor shall furnish such traffic flagmen and guards necessary to give adequate warning to the public of any dangerous conditions to be encountered; and it shall furnish, erect, and maintain such fences, barricades, lights, signs and other devices necessary to prevent accidents and avoid damage or injury to the public.

The Contractor shall at all times conduct his operations so as to interfere as little as possible with existing water distribution facilities and existing works of any other governmental or private utility. Work that is likely to interfere with any existing facility shall be programmed in cooperation with the BWD Engineer. The Contractor shall conduct exploratory excavation to determine underground obstruction and existing mains so that needed changes in grade can be made. No additional compensation will be allowed for exploratory excavations. Moreover, all information regarding existing water mains and other facilities, as shown on the Drawings are based on existing records and BWD assumes no responsibility for accuracy of such information or for any additional cost incurred by the Contractor as a result of such inaccurate information. In view thereof, all existing water facilities and other private utility facilities that were damaged during the execution of the excavation activity shall be repaired or replaced by the Contractor at his own expense.

b. Trench Over – Excavation to Clear Obstructions

Trenches shall be over – excavated to a depth approved by the BWD Engineer for pipeline clearance of obstructions. All work specified in this sub–section shall be performed by the Contractor at his own expense when the over – excavation plus the cover of the pipe measured to the existing ground surface does not exceed 1.50 meters; when the additional over – excavation plus the cover of the pipe measured

to existing ground surface exceeds 1.50 meters, additional payment will be made to the Contractor for that portion of work located below said depth. Said additional payment will be made under separate unit price bid items for over – excavation if such bid items have been established; otherwise, payment will be made in accordance with negotiated prices.

c. Trench Over – Excavation When Ordered

Trenches shall be over – excavated beyond the depth shown when ordered by the BWD Engineer. Such over – excavation shall be to the depth ordered. The trench shall then be refilled to the grade of the bottom of the pipe with either selected granular material obtained from the excavation, sand, or crushed rock, at the option of the BWD Engineer. When crushed rock bedding is ordered, well-graded material of 40-mm (1.6-in.) maximum size shall be used. Bedding material shall be placed in layers, brought to optimum moisture content, and shall be thoroughly compacted up to the compaction acceptable to the BWD Engineer. Payment will be made under separate unit price bid item for furnishing and installing bedding and backfill if such bid items have been established; otherwise, payment will be made in accordance with negotiated prices.

d. Over-Excavation Not Ordered, Specified, or Shown

Any over-excavation carried below the grade ordered specified or shown shall be refilled to the required grade with suitable selected granular material by the Contractor at his own expense. Such material shall be moistened as required and thoroughly compacted up to the compaction acceptable to the BWD Engineer.

e. Disposal of Excess Excavated Material

The Contractor shall remove and dispose all excess excavated material at his own expense and in a manner approved by the BWD Engineer.

f. Excavation in Vicinity of Trees

Except where trees are shown on the drawings to be removed, trees shall be protected from injury during construction operations; and no tree is to be removed without permission from the BWD Engineer. No tree roots over 50 mm (2 in.) in diameter shall be cut without the permission of the BWD Engineer. Trees shall be supported during excavation as may be directed by the BWD Engineer.

g. Rock Excavation

Rock excavation shall include removal and disposal of the following: (1) all boulders measuring 0.25 cubic meter (0.33 yd^3) or more in volume; (2) all rock material in ledges, bedding deposits, and unstratified masses which cannot be removed without systematic drilling and blasting.

Said rock excavation whether shown or not shown in the drawing, but it is ordered by the BWD Engineer shall be performed by the Contractor to the specified depth and line of grade.

h. Stockpile of excavated materials

- Where space permits, stockpile of excavated materials shall be between the excavation and the traffic.

- In no case shall the stockpiled excavated materials create traffic.
- If sandy soil is encountered, it shall be placed separately from other materials to use as backfilling material after the sand backfill.
- Place of stockpile of excavated materials about 1200mm from the edge of the trench to prevent cave-ins. In no case should any materials be stockpiled closer than 600mm from the edge of the trench.

2.7 Sand Bedding & Backfill, Soil Backfilling, and Compaction

a. General

The Contractor shall provide all labor & equipment necessary for backfilling and compaction works.

Where the backfill is required to be compacted to a specified density, tests shall be made by accredited laboratory at the expense of the Contractor. All field density tests shall be performed in accordance with the tests procedure specified in the "Method of Test for Density of Soil in Place by the Sand Cone Method" (ASTM 1556).

The Filed Density Test shall be conducted in three (3) holes for every 100m of pipeline trench.

All newly laid pipes shall be backfilled at the end of each day.

b. Backfill Around and Beneath Proposed Structures and Paved Areas

Except where otherwise specified for a particular structure or ordered by the Engineer, backfill placed around and beneath proposed structures and paved areas shall be placed in horizontal layers not to be exceed 200 mm (8 in.) in thickness, as measured before compaction, where compaction is attained by means of sheepsfoot rollers. Where the use of sheepsfoot rollers is impractical, the layers shall not be exceed 150 mm. (6 in.) in thickness before compaction, and compaction shall be attained by means of hand-operated power driven tampers. The backfill shall be brought up evenly with each layer moistened and compacted by mechanical means to a specified density to conform to the Compaction Test stated previously.

c. Pipeline Trench Backfill

c.1. Pipeline trenches shall be backfilled (bedding) to a level of 150mm (6 in.) below the pipe and 150mm (6 in.) above the top of the pipe with sand material.

c.2. After the initial portion of backfill has been placed as specified above, the remainder of the trench shall be backfilled. When compaction of the initial portion of backfill is obtained with excess water, not less than four (4) hours shall have elapsed between the placement of initial backfill and subsequent backfill. The remainder of the backfill shall be selected material obtained from the excavation and shall be placed in horizontal layers. Each layer shall be no more than 400 mm (16 in.) in depth. Layers shall be moistened, tamped, puddled, rolled, or otherwise compacted to:

a. Ninety five percent (95%) of maximum dry density where the trench is located under proposed structures;

b. Ninety percent (90%) of maximum dry density where trench is located under existing or proposed asphalt or concrete surface;
c. Eighty percent (80%) of maximum density where the trench is located under unpaved shoulders, gravel roadways or dirt roads;
d. One hundred percent (100%) of the natural density of the surrounding areas where the trench is located in unimproved right-of-way.

If the backfill material is sandy or granular in nature and the trench is not located under a structure, the layer construction may be eliminated; and compaction may be obtained by flooding and jetting are permitted, provided this latter method is approved by the agency having jurisdiction over the highway or street. If flooding and jetting are permitted, the remaining backfill shall be placed in layers not exceeding 900 mm (36 in.) thickness. Each layer shall be flooded, jetted, and rodded to secure complete saturation of the material before placing the next layer.

c.3. Immediately upon completion of backfilling of the trench or excavation on paved areas, the Contractor shall place a temporary resurfacing over all disturbed areas of the streets, paved driveways, alleys, and other travelled places where the original surface has been disturbed by his operation. The temporary pavement shall be of a character satisfactory in all respects and safe for public travel. The temporary surfacing may consist of compacting broken stone at such depth as is necessary to withstand the traffic to which it is subjected. The surface of all temporary resurfacing shall conform to the street grades. The temporary resurfacing shall be placed and maintain by the Contractor at no additional cost to BWD until permanent surfacing is completed. Upon completion of substantial parts of the project but not before the pipeline has been tested, the temporary resurfacing shall be replaced with permanent resurfacing.

d. Embankment Fill

The area where an embankment is to be constructed shall be cleared of all vegetation, roots and foreign materials. Following this, the surface shall be moistened, scarified to a depth of 150mm (6 inches) and rolled or otherwise mechanically compacted to a specified density conforming to Compaction Test. Embankment shall be placed in horizontal layers not to exceed 200 mm (8 inches) in thickness, as measured before compaction, where compaction is attained by means of hand-operated power- driven tampers. The backfill shall be brought up evenly with each layer moistened and compacted by mechanical means to maximum density. The top 500mm (20 in) of backfill or embankment shall consist of loamy earth free of rocks larger than 25mm (1 in) on maximum dimension.

e. Slope Stabilizing

Unless otherwise specified, all embankment slopes steeper than three (3) units horizontal to one (1) unit vertical shall be stabilized by sodding as directed by the BWD Engineer. Strips of sod not less than 300mm (12 in) wide shall be placed along sloped banks.

Sods shall be taken only from fields not less than three (3) years old and have been previously rolled and mowed at least once. Sods taken from wild field that have not been mowed will not be acceptable. Sod shall be of sufficient thickness to prevent

excessive breakage and shall be stripped in the largest practicable widths and lengths. It shall be tamped in place, properly leveled and immediately well sprinkled. All sods not in good condition after being tamped in place shall be removed and replaced.

Immediately after setting of grass sod, sod shall be covered with 6mm (0.24 in) of screened top soil which has been well mixed with 460 grams (1 lb) of grass seed per 100 square meters (1,076 sq. ft.). Sod shall be replaced with the same kind of surfacing or better in accordance with the latest specifications; re-sodding shall continue until acceptance.

2.8 Dewatering

a. General

The Contractor shall provide all labor, materials & equipment necessary for dewatering. It shall have on hand, at all times, sufficient pumping equipment and machinery in good working condition and shall have available, at all times, competent workmen for the operation of the pumping equipment. Adequate standby equipment shall be kept available at all times to ensure efficient dewatering operation and maintenance during power failure.

Dewatering for structures and pipelines shall commence when groundwater is first encountered and shall be continuous until such times as water can be allowed to rise and the work situation so permits.

At all times, site grading shall promote drainage. Surface runoff shall be diverted from excavations. Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps, and be pumped or drained by gravity from the excavation to maintain a bottom free from standing water.

Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation.

If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with drain rock at no additional cost to the BWD.

The Contractor shall maintain the water level below the bottom of excavation in all work areas where groundwater occurs during excavation, construction, backfilling, and up to acceptance.

Flotation shall be prevented by the Contractor by maintaining a positive and continuous removal of water. The Contractor shall be fully responsible and liable for all damages, which may result from failure to adequately keep excavations dewatered.

If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sand packed and/or other means used to prevent pumping of fine sands or silts from the subsurface. A continual check by the Contractor shall be maintained to ensure that the subsurface soil is not being removed by the dewatering operation.

The Contractor shall dispose of water from the Work in a suitable manner without damage to adjacent property. The Contractor shall be responsible for obtaining any permits that may be necessary to dispose of water. No water shall be drained into work built or under construction without prior consent of the BWD Engineer. Water shall be filtered using an

approved method to remove sand and fine-sized soil particles before disposal into any drainage system.

The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures, pipelines, and sewers.

b. Equipment

Dewatering, where required, may include the use of well points, sump pumps, temporary pipelines for water disposal, rock or gravel placement, and other means. Standby pumping equipment shall be maintained on the job site.

DIVISION III – SURFACE RESTORATION AND PAVING

3.1 General

The work to be undertaken under this Section shall include all labor, materials, equipment, plant and other facilities and the satisfactory performance of all works necessary to complete all pavement restoration/concreting which shall be provided by the Contractor.

The length of un-hydrotested installed pipelines shall not exceed 500m. No further pipelaying shall be allowed if this provision is not being complied. The surface restoration and paving works shall be immediately undertaken after hydrotesting of a pipe segment.

The excavated temporary resurfacing shall be disposed of immediately by the Contractor before the concrete pouring. The hauling and disposal of excavated temporary resurfacing and other debris shall be shouldered by the Contractor.

All works under this Section shall comply to the conditions of the Excavation/Digging Permit to be issued by the CEO/DPWH.

The Contractor shall notify BWD three (3) days prior to concrete pouring for the latter to secure a Concrete Pouring Permit from the CEO/DPWH. If the Contractor failed to notify BWD which resulted to failure to secure the Concrete Pouring Permit, the Contractor shall be required to secure again the necessary Excavation/Digging Permit at his own cost in case CEO/DPWH rendered the original as null and void due to the violation.

3.2 Materials of Concrete

a. Cement

Except as may be otherwise provided in these specifications, cement shall conform to the "Standard Specifications for Portland Cement" (ASTM C–150, Latest Revision) and shall be Type I.

b. Concrete–Aggregates

Concrete aggregates shall be well graded, clean, hard particles of gravel or crushed rock conforming to the "Standard Specifications for Concrete Aggregates" (ASTM C–33, Latest Revision).

c. Water

Water used in mixing concrete shall be clean and free from injurious amounts of oils, acids, alkali, organic materials, or other substances that may be deleterious to concrete or steel.

d. Admixture

At the Contractor's option or at the request of the Engineer, but in either case at the expense of the Contractor, an admixture may be added to the concrete to control the set, effect water reduction, and increase workability. Such admixture may be either a hydroxylated carboxylic and acid type or a hydroxylated polymer type, but shall contain no calcium chloride. The required quantities of cement shall be used in the mix regardless of whether or not any admixture is used. The quantity of admixture used and the method of mixing shall be in accordance with the manufacturer's instructions. Where the air temperature at the time of placement is expected to be consistently over 26.7°C (80°F), such admixture shall be Super Concrete Emulsion's "Plastiment", "Master Builder's", "Pozzolith 300R", or substitute.

3.3 Controlled Strength of Concrete

a. Concrete for structural elements such as the road pavement shall develop a 3–days compressive strength of 24.13 MPa (3,500 psi) and a flexural strength of 3.80 MPa (550 psi).

3.4 Method of Determining Strength Trial Batch

The Contractor shall submit design mixes and test results of samples (at least 3 specimens) made in accordance with "Standard Method of making and Curing Concrete Compression and Flexure Test Specimens in the Laboratory" (ASTM C–192, Latest Revision) and "Standard method of Test for Compressive Strength of Molded Concrete Cylinders" (ASTM Designation C–39) for each strength required, stating the proposed slump and the proportional weights of cement, saturated surface dry aggregates, and water. These mixes shall be proved by preliminary tests thirty (30) days before concreting. No substitution shall be made in the materials or mixed without additional tests to show that the quality of concrete is satisfactory. The trial mixes shall be at the expense of the Contractor.

3.5 Concrete Proportion and Consistency

a. The proportions of aggregate to cement for any concrete shall be such as to produce a mixture which will work readily into the corners and angles of the

forms and around reinforcement with the method of placing employed on the work but without permitting the materials to segregate, or excess free water to collect on the surface. The combined aggregates shall be of such composition of sizes that when separated on the Number 4 standard sieve, the weight passing the sieve (fine aggregate) shall not be less than thirty percent (30%) of the total, except that these proportions do not necessarily apply to lightweight aggregates.

b. Slump test shall be conducted on site before concrete pouring and shall be within the following limits:

Portion of Structure	Slump	
	millimeter	Inches
Road pavement, slabs on grade	50 – 80	2 – 3

Slumps shall be according to "Test of Slump for Portland Cement Concrete" (ASTM C–143).

c. Job mix adjustments on water content shall be allowed only with the Engineer's permission and provided that cement is also added to maintain the original water–cement ratio of the design mix.

3.6 Exclusion of Water

No concrete shall be placed in any structure until all water entering the space to be filled with concrete has been properly cut off or has been diverted by pipes, or other means, and carried out of the forms, clear of the work. No concrete shall be deposited under water without the explicit permission of the Engineer, and then only in strict accordance with his directions; nor shall the Contractor, without explicit permission, allow still water to rise on any concrete until the concrete has attained its initial set. Water shall not be permitted to flow over the surface of any concrete in such a manner and at such velocity as will injure the surface finish of the concrete. Pumping or other necessary dewatering operations for removing ground water, if required, will be subject to the approval of the Engineer.

3.7 Ready-Mixed Concrete

a. All concrete for structural elements shall be ready-mixed meeting the requirements as to materials, batching, mixing, transporting, and placing as specified herein and in the requirements of the "Specifications for Ready-Mixed Concrete" (ASTM C-94), including the supplementary requirements specified in Subsections (b) through (g) herein.

b. Ready-mixed concrete shall be delivered to the site of the work, and discharge shall be completed within one hour after the addition of the cement to the aggregates or before the drum has been revolved 250 revolutions, whichever is first. In hot weather, or under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 29.44°C (85°F) or above, the time between the introduction of the cement to the aggregates and discharge shall not exceed forty-five (45) minutes.

c. Truck mixers shall be equipped with electrically actuated counters by which electrically actuated counters by which the number of revolutions of the drum or blades may be readily verified may readily verify the number of revolutions of the drum or blades. The counter shall be of the resettle, recording type and shall be amounted in the driver's cab. The counters shall be actuated at the time of starting mixers at mixing speeds.

d. Each batch of concrete shall be mixed in a truck mixer for not less than seventy (70) revolutions of the drum or blades at the rate of rotation designated by the manufacturer of the equipment as agitating speed. All materials including mixing water shall be in the mixer drum before actuating the revolution counter for determining the number of evolutions of mixing.

e. Truck mixers and their operation must be such that the concrete throughout the mixed batch as discharged is within acceptable limits of uniformity with respect to consistency, mix, and grading. If slump tests taken at approximately the ¼ and ¾ points of the load during discharge give slumps differing by more than 25 mm (1 in.) when the specified slump is more than 76 mm (3 in.) or less, or if they differ by more than 50 mm (2 in.) when the specified slump is more than 76 mm (3 in.), the mixer shall not be used on the work unless the causing condition is corrected and satisfactory performance is verified by additional slump tests. All mechanical details of the mixer, such as water measuring and discharge apparatus, condition of the blades, speed rotation, general mechanical condition of the unit, and clearance of the drum, shall be checked before a further attempt to use the unit will be permitted.

f. Each batch of ready-mixed concrete delivered at the job site shall be accompanied by a ticket furnished to the Engineer and showing volume of concrete, the weight of cement in kilograms (pounds), and total weight of all ingredients in kilograms (pounds). The ticket shall also show the time of day at which the materials were batched.

g. The use of non-agitating equipment for transporting ready-mixed concrete will not be permitted. Combination truck and trailer equipment for transporting ready-mixed concrete will not be permitted. The quality and quantity of materials used in ready-mixed concrete and in batch aggregates shall be subject to continuous inspection at the batching plant by the BWD Engineer.

3.8 Mixing Concrete

a. Hand mixing shall only be allowed for non–structural elements such as cradles, unreinforced encasements, thrust blocks, and partition walls.

b. Re–tempering, i.e., re–mixing with the addition of water to concrete that has been partially hardened will not be permitted.

3.9 Preparation of Surfaces for Concreting

a. Earth surfaces shall be thoroughly wetted by sprinkling prior to the placing of any concrete, and these surfaces shall be kept moist by frequent sprinkling up to the time of placing concrete thereon. The surface shall be free from standing water, mud, and debris at the time of placing concrete.

b. Concrete surfaces upon or against which concrete is to be placed, where the placement of the old concrete has been stopped or interrupted so that, in the opinion of the Engineer, the new concrete cannot be incorporated integrally with that previously placed, are defined as constructions joints. The surfaces of horizontal joints shall be leveled with a wooden float to provide a reasonably smooth surface. A surface consisting largely of coarse aggregate shall be avoided. Except where the drawings call for joint surfaces to be painted, the joint surfaces shall be cleaned of all laitance, loose or defective concrete, and foreign material. Such cleaning shall be accomplished by sandblasting followed by thorough washing. All pools of water shall be removed from the surface of construction joints before the new concrete is placed. After the surfaces have been prepared to the satisfaction of the BWD Engineer, all approximately horizontal construction joints shall be covered with a layer of mortar approximately 25 mm (1 in) thick. The mortar shall have the same proportion of cement and sand as the regular concrete mixture, unless otherwise directed by the Engineer. The water cement ratio of the mortar shall be suitable for placing and working and a manner hereinafter specified. The mortar shall be spread uniformly and shall be worked thoroughly into all irregularities of the surface, and wire brooms shall be used where possible to scrub the mortar into the surface. Concrete shall be placed immediately upon the fresh mortar.

c. When the placing of concrete is to be interrupted long enough for the concrete to take a set, the working face shall be given a shape by the use of forms or other means that will secure proper union with subsequent work, provided that the construction joints shall be made only where approved by the BWD Engineer.

3.10 Dowel Bars

a. The Contractor shall furnish the materials, labor and equipment in the installation of dowel bars in accordance to the plans.

b. The reinforcing bar which shall be used as dowel bar shall have a minimum yield strength of 40,000 psi (280 MPa).

c. Drilling of holes to the existing concrete pavement for the installation of 16mmØ dowels bars shall have a depth of 75mm both sides.

d. The dowel bars, spaced at 0.30m on center bothways, shall be installed with structural epoxy to bond the existing concrete pavement and the reinforcing bar.

e. Tensile test for the reinforcing bar shall be undertaken in an accredited laboratory at the expense of the Contractor. The samples shall be taken from the project site and the required number of samples shall be based on the total weight of rebars to be installed (at 1.0 meter per 1,000kg). The tests shall be witnessed by BWD representatives.

3.11 Placing Concrete

a. Concrete which upon or before placing is found not to conform with the requirements specified herein shall be rejected and immediately removed from the work. Concrete which is not place with the accordance with these specifications, or which is of inferior quality, as determined by the Engineer, shall be removed and replaced by and at the expense of the Contractor. No concrete shall be placed except in the presence of a duly authorized representative of the BWD Engineer. Concrete shall not be placed when unsuitable heat or wind conditions will prevent proper placement and curing, as determined by the BWD Engineer. Prior to placing any concrete, the contractor shall give the BWD Engineer twenty-four (24) hours written notice.

b. Concrete shall be deposited in its final position without segregation, re-handling, or flowing. Placing shall be done preferably with buggies, buckets, or wheelbarrows. No chutes will be allowed except to transfer concrete from hoppers to luggies, wheelbarrows, or buckets in which case, they shall not exceed six (6) meters (20 ft) in aggregate length.

c. Placing of the concrete with a free drop or fall more than 1.20 meters (4 ft) shall not be allowed, except when approved by the BWD Engineer and when approved sheet metal conduits, pipes, or “elephant trucks” are removed. When employed, these conveyors shall be keep full of concrete and the ends kept buried in the newly placed concrete as pouring progresses.

d. Concrete in forms shall be deposited in uniform horizontal layers not deeper than 450 mm (18 in) and care shall be taken to avoid inclined layers or inclined construction joints except where such are required for sloping members. Each layer shall be placed while the previous layer is still soft. The rate of placing concrete in forms shall not exceed 1.5 meters (5 ft) of vertical rise per hour.

3.12 Construction of Joints

a. General

Construction joints shall be provided where shown on the drawings. Special care shall be used to prepare concrete surfaces at joints where bonding between two sections of concrete is required. Unless otherwise indicated on the drawings, such bonding will be required at all horizontal joints in walls. Surfaces shall be prepared in accordance with section 21.10. Except where otherwise shown is specified, at all joints where waterstops are required, the joint face of the first pour shall be coated with an approved bond breaker applied in accordance with the recommendations of the manufacturer. It shall contain a coloring agent so that areas of applications will be readily distinguishable for a six-month period in sunlight. The surfaces of the groove for the sealant shall not be coated. Concrete next to waterstops shall be placed in accordance with Subsection 21.16 (b).

b. Construction Joint Sealant

Construction joints shall be poured with asphalt to serve as a sealant. For proper bonding, tapered grooves shall be created along the surface of the joints prior to pouring of asphalt sealant.

3.13 Tamping and Vibrating

As concrete is placed in the forms or in excavations, it shall be thoroughly settled and compacted throughout the entire depth of the layer which is being consolidated, into a dense, homogenous mass, filling all corners and angles, thoroughly embedding the reinforcement, eliminating rock pockets, and bringing only a slight excess of water to the exposed surface of concrete during placement.

3.14 Care and Repair of Concrete

The Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance by the owner. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete to be damaged or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the complete work, or which departs to the final acceptance of the complete work, or which departs from the established line or grade, or which for any other reason does not conform with the Specifications, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the Contractor's expense.

3.15 Finish of Concrete Surfaces

a. All finished or formed surfaces shall conform accurately to the shape, alignment, grades and sections as indicated on the plans or as prescribed by the Engineer. Surfaces shall be free from fins, bulges, ridges, offsets, honeycombing, or roughness of any kind, and shall present a finished, smooth, continuous hard surface.

b. Except as otherwise provided herein, unformed top surfaces of concrete shall be brought to uniform surfaces and worked with suitable tools to a reasonably smooth wood float finish. Excessive floating of surfaces while the concrete is plastic will not be permitted.

3.16 Test on Concrete

a. At least one (1) set of samples consisting of three (3) concrete cylinders, 150mm x 300mm in size, and three (3) concrete beam specimens shall be taken from each batch of concrete placed each day, and each set to represent not more than 75 cubic meter of concrete.

Samples shall be secured and molded in accordance with “Standard Method of Sampling Fresh Concrete” (ASTM C-172 – Latest Revision) and “Standard Method of Making and Curing Test Specimens in the Field” (ASTM C-31 – Latest Revision). Strength test shall be made in accordance with the “Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens” (ASTM C-39 – Latest Revision).

The Contractor shall provide the samples to be taken at the place of deposit and as specified by the BWD Engineer and shall also box samples for shipment, packing them to prevent damage from sharp blows. The Contractor together

with the BWD Engineer shall transport the test cylinders to a laboratory for testing.

The required compressive strength and flexural strength of the concrete shall be 3,500psi and 550 psi, respectively, at 3-days curing period.

b. All three (3) specimens of a set of samples shall be subjected to the 3-day test requirement and all must attain the target design strength. If one specimen fails to give the required minimum strength, the BWD shall have the right to order the "remove and replace" of poured concrete.

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OIC – AGM Technical

Approved by:

SALVADOR M. ROYECA
General Manager

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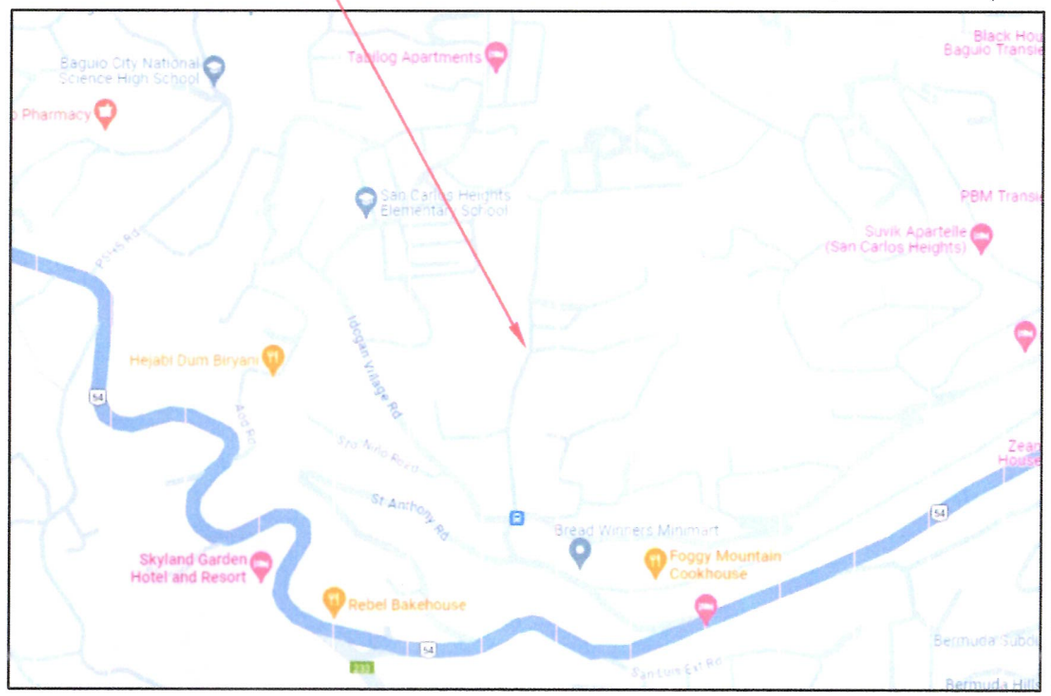
GENERAL NOTES:

1. IN THE INTERPRETATION OF THESE DRAWINGS, INDICATED DIMENSIONS SHALL GOVERN AND DISTANCES OR SIZES SHALL NOT BE SCALED FOR CONSTRUCTION PURPOSES. ALL DIMENSIONS ARE IN MILLIMETERS (MM) UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS AND CONDITIONS MUST BE VERIFIED IN THE FIELD. ANY DISCREPANCIES SHALL BROUGHT TO THE ATTENTION OF THE DESIGN ENGINEER BEFORE PROCEEDING WITH AFFECTED PART OF THE WORK.
3. ALL WORKS, SUCH AS PLUMBING, WELDING, MASONRY, AND CARPENTRY, SHALL BE DONE IN A BEST MANNER OF TRADES AND BY COMPETENT PLUMBERS, WELDERS, MASONS, AND CARPENTERS, RESPECTIVELY, UNDER THE SUPERVISION AND DIRECTION OF THE CONTRACTOR'S SUPERVISING ENGINEER AND/OR BWD FIELD ENGINEER.
4. NO ACTIVITIES SHALL COMMENCE WITHOUT PRIOR SITE SURVEY BETWEEN THE CONTRACTOR AND THE BWD FIELD ENGINEER. OTHERWISE, ERROR/S ON THE LAY-OUT WIHTOUT THE CONDUCT OF THE AFOREMENTIONED SITE SURVEY IS/ARE SUBJECT TO REMOVAL OR REPAIR WITH CONTRACTOR'S EXPENSE.
5. INSTALL TARPAULIN BEFORE AND DURING THE CONSTRUCTION.
6. PROPER SIGNAGES AND BARRICADES DURING CONSTRUCTION.
7. PROVIDE MIXING BOARD PRIOR FOR CONCRETE POURING.
8. CONTRACTOR MUST PROVIDE 1" THK. STEEL PLATES FOR DRIVEWAYS AFFECTED BY EXCAVATION WORKS.
9. OBSERVE SAFETY PRACTICE AND CLEANLINESS THROUGHOUT THE DURATION OF THE PROJECT.
10. SITE MUST BE FREE FROM EXCESSS AND WASTE MATERIALS BEFORE FINAL INSPECTION/SITE CLEARING.
11. OBSERVE QUALITY OF WORKMANSHIP AND QUALITY OF CONSTRUCTION MATERIALS.



LOCATION MAP

SCALE NTS

BAGUIO WATER DISTRICT 1975

PREPARED BY:

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REVIEWED BY:

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RECO. APPROVAL BY:

REYNALDO C. JAYCO
OIC, ADM FOR TECHNICAL OPERATIONS

APPROVED BY:

SALVADOR M. ROYECA
GENERAL MANAGER

PROJECT TITLE AND LOCATION:

PROPOSED UPSIZING OF THE EXISTING 2"Ø DISTRIBUTION LINE ALONG SARILING SIKAP, IRISAN, BAGUIO CITY (INSTALLATION OF 4"Ø X 495M PVC MAIN LINE)

IRISAN, BAGUIO CITY

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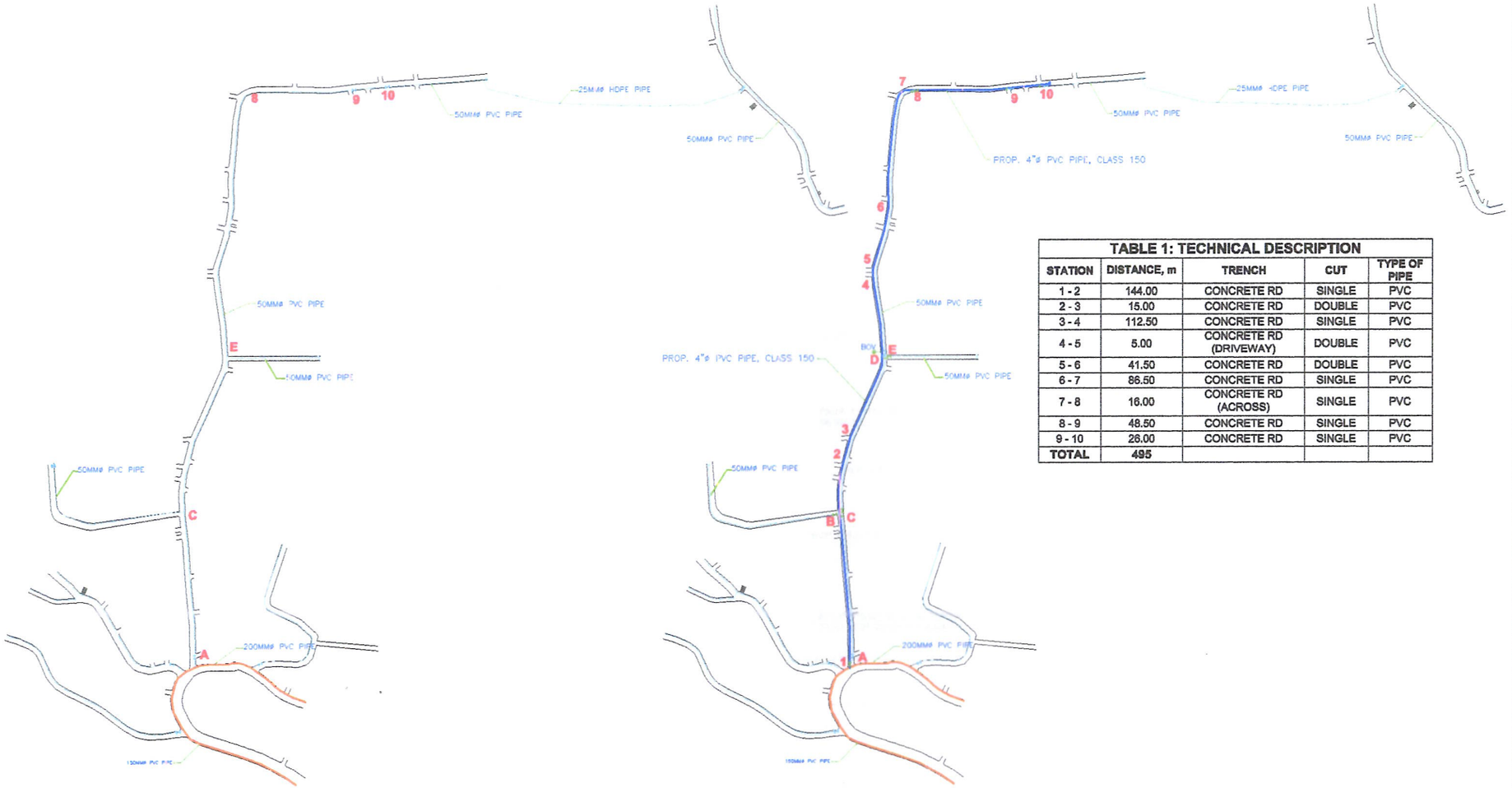

TABLE 1: TECHNICAL DESCRIPTION

STATION	DISTANCE, m	TRENCH	CUT	TYPE OF PIPE
1 - 2	144.00	CONCRETE RD	SINGLE	PVC
2 - 3	15.00	CONCRETE RD	DOUBLE	PVC
3 - 4	112.50	CONCRETE RD	SINGLE	PVC
4 - 5	5.00	CONCRETE RD (DRIVEWAY)	DOUBLE	PVC
5 - 6	41.50	CONCRETE RD	DOUBLE	PVC
6 - 7	86.50	CONCRETE RD	SINGLE	PVC
7 - 8	16.00	CONCRETE RD (ACROSS)	SINGLE	PVC
8 - 9	48.50	CONCRETE RD	SINGLE	PVC
9 - 10	26.00	CONCRETE RD	SINGLE	PVC
TOTAL	495			

EXIST. PIPELINE LAYOUT
SCALE NTS

PROP. PIPELINE LAYOUT
SCALE NTS

BAGUIO WATER DISTRICT 1975

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PROJECT TITLE AND LOCATION:
PROPOSED UPSIZING OF THE EXISTING 2"Ø DISTRIBUTION LINE ALONG SARILING SIKAP, IRISAN, BAGUIO CITY (INSTALLATION OF 4"Ø X 495M PVC MAIN LINE)

IRISAN, BAGUIO CITY

SHEET CONTENTS:
EXIST. PIPELINE LAYOUT
PROP. PIPELINE LAYOUT

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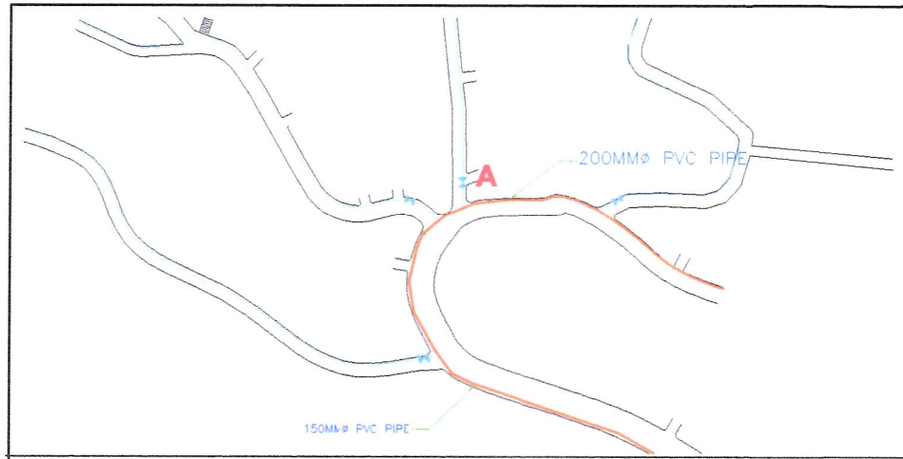

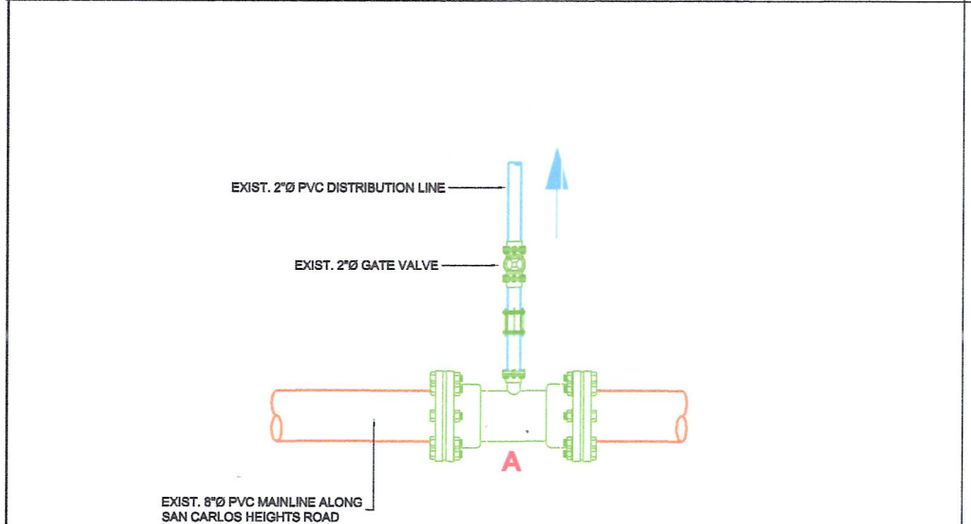

EXISTING INTERCONNECTION DETAILS @ STA. A

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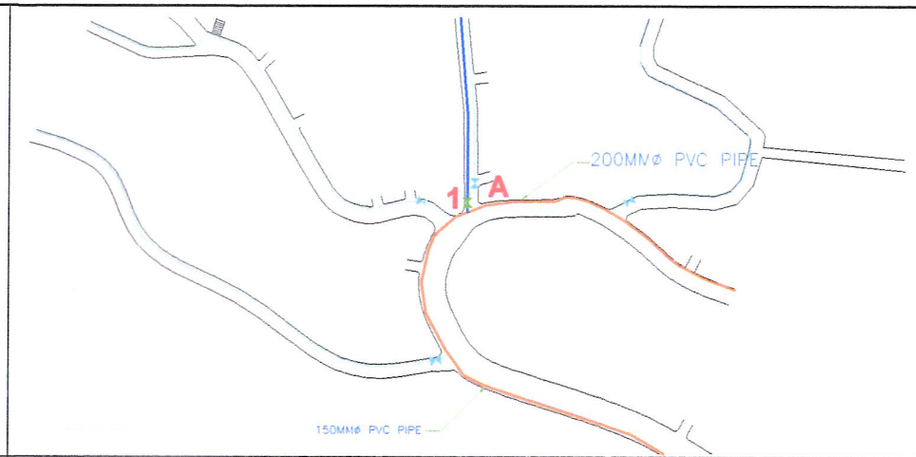
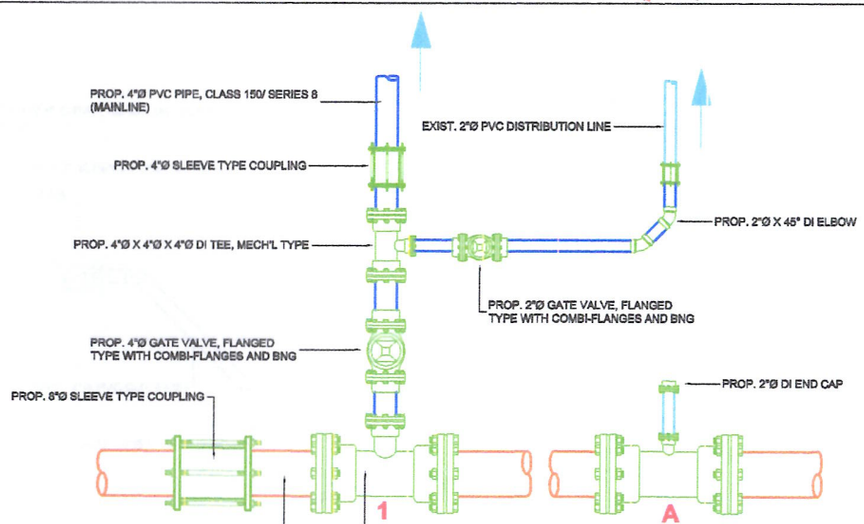


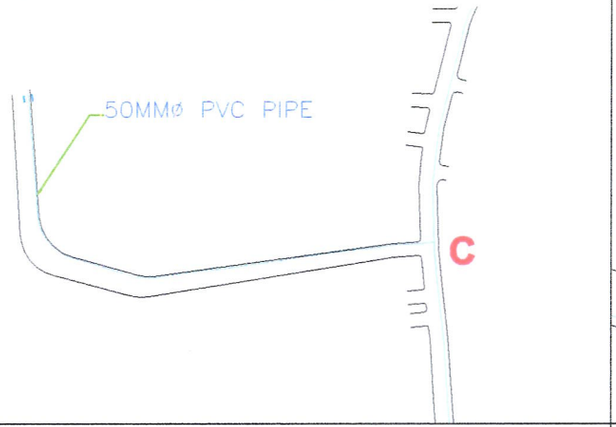


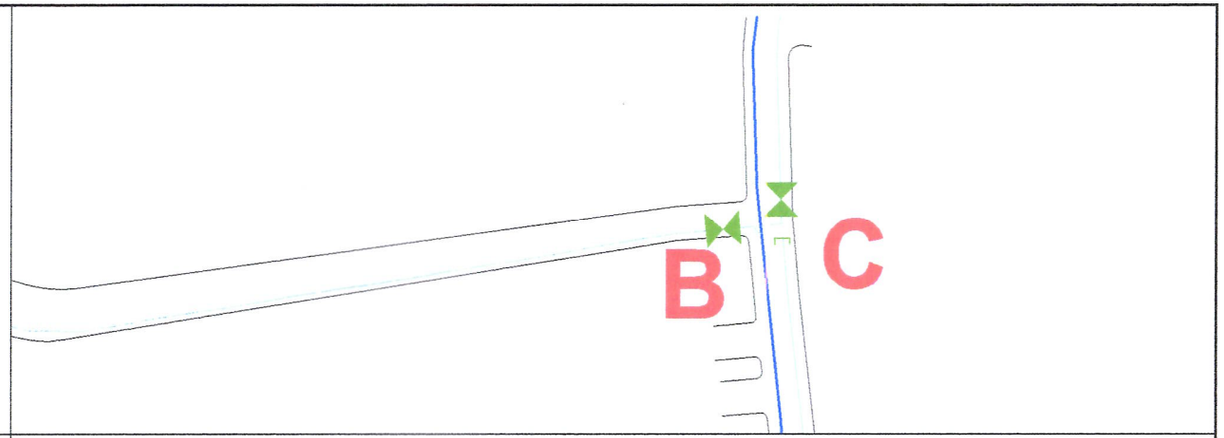
INTERCONNECTION # 1 (STA. 1-A)

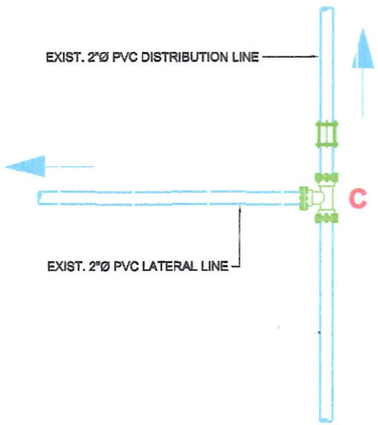
SCALE NTS

BAGUIO WATER DISTRICT 1975

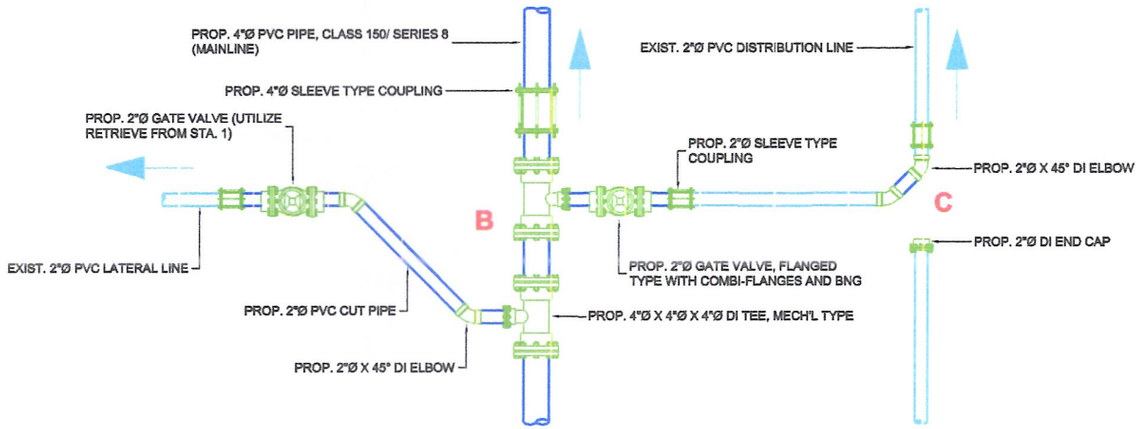
PREPARED BY:	REVIEWED BY:	APPROVED BY:	PROJECT TITLE AND LOCATION:	SHEET CONTENTS:	SHEET NO.:
JANELL BALANGCOD CIC, P&D SECTION SUPERVISOR	EDMUNDO Q. LLANES / NORIEL G. CALPITO P&C DIVISION MANAGER / P&D DIVISION MANAGER RECO. APPROVAL BY: REYNALDO C. JAYCO OIC, MGR FOR TECHNICAL OPERATIONS	SALVADOR M. ROYECA GENERAL MANAGER	PROPOSED UPSIZING OF THE EXISTING 2"Ø DISTRIBUTION LINE ALONG SARILING SIKAP, IRISAN, BAGUIO CITY (INSTALLATION OF 4"Ø X 495M PVC MAIN LINE) IRISAN, BAGUIO CITY	EXIST. INTERCONNECTION DETAILS @ STA. A INTERCONNECTION # 1 DETAILS (STA. 1-A)	3 11





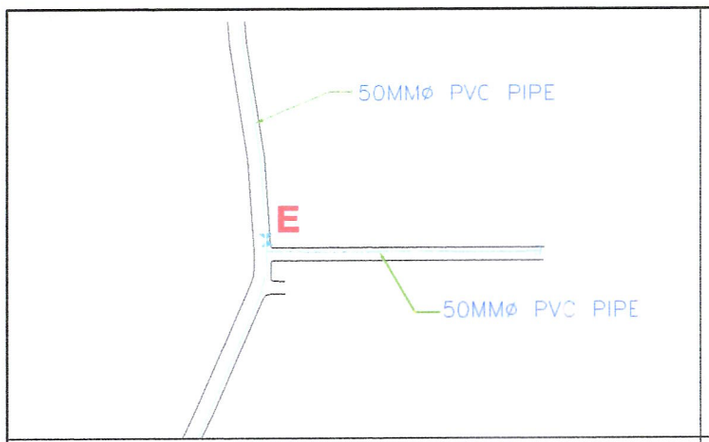


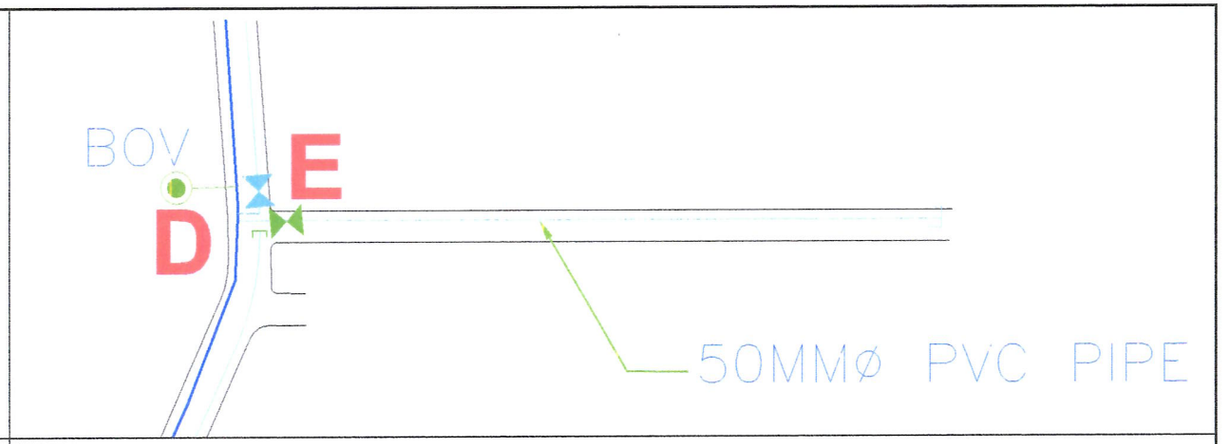
EXISTING DETAILS @ STA. C
SCALE NTS

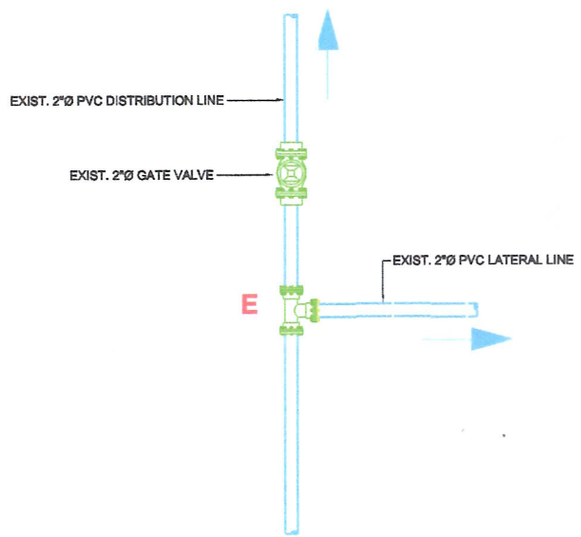


INTERCONNECTION # 2 (STA. B-C)
SCALE NTS

BAGUIO WATER DISTRICT 1975	PREPARED BY: JANEL J. BALANGCOD, OIC, PIPE SECTION SUPERVISOR	REVIEWED BY: EDMUNDO Q. LLANES / NORIEL C. CALPITO, P&D DIVISION MANAGER / R&D DIVISION MANAGER; RECO. APPROVAL BY: REYNALDO C. JAYCO, OIC, AGM FOR TECHNICAL OPERATIONS	APPROVED BY: SALVADOR M. ROYECA, GENERAL MANAGER	PROJECT TITLE AND LOCATION: PROPOSED UPSIZING OF THE EXISTING 2"Ø DISTRIBUTION LINE ALONG SARILING SIKAP, IRISAN, BAGUIO CITY (INSTALLATION OF 4"Ø X 495M PVC MAIN LINE) IRISAN, BAGUIO CITY	SHEET CONTENTS: EXIST. DETAILS @ STA. C; INTERCONNECTION # 2 DETAILS (STA. B-C)	SHEET NO.: 4 / 11

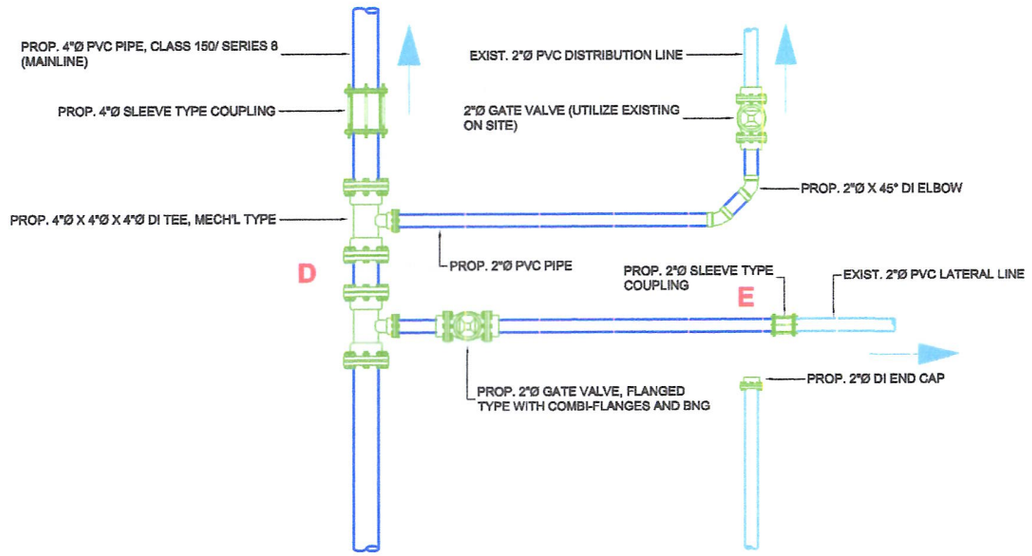






EXISTING DETAILS @ STA. E

SCALE NTS

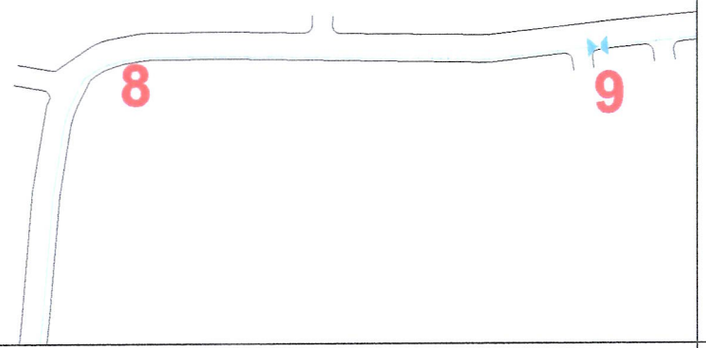


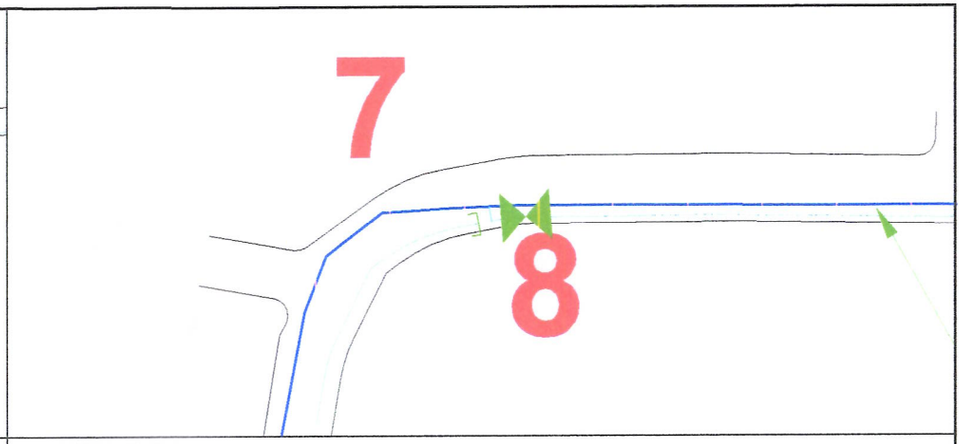
INTERCONNECTION # 3 (STA. D-E)

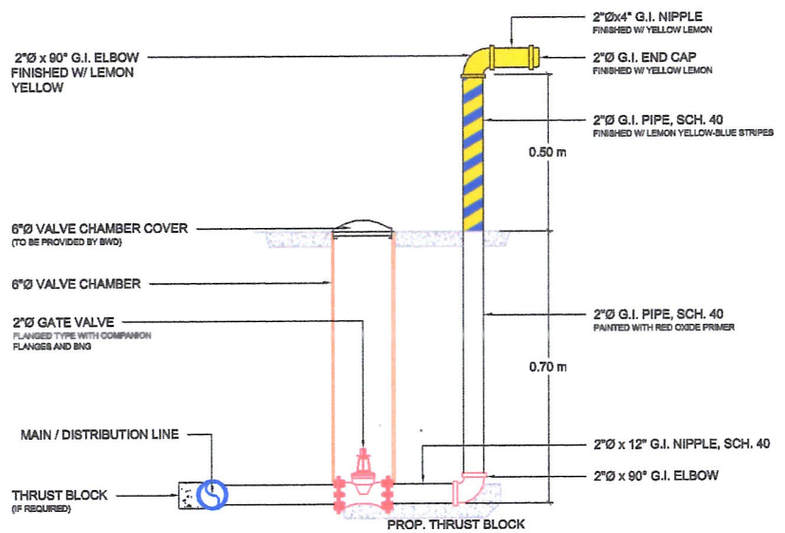
SCALE NTS

BAGUIO WATER DISTRICT 1975

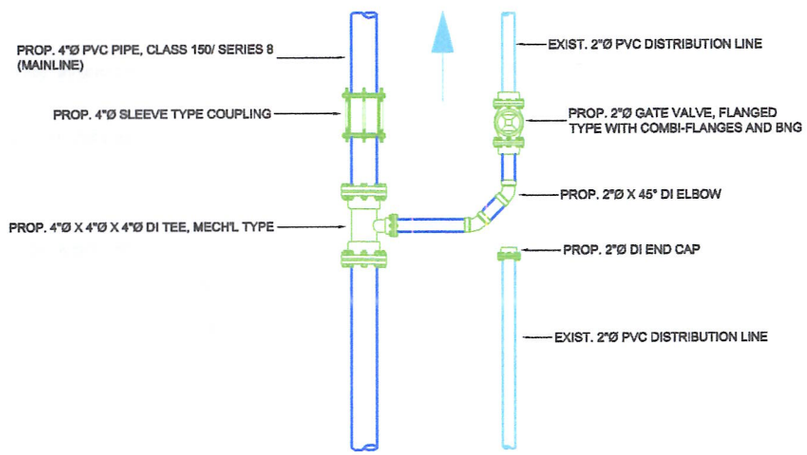
PREPARED BY:	REVIEWED BY:	APPROVED BY:	PROJECT TITLE AND LOCATION:	SHEET CONTENTS:	SHEET NO.:
DANELO B. BALANGCOD OIC, P&D SECTION SUPERVISOR	EDMUNDO C. LLANES / NORIEL C. CALPITO P&C DIVISION MANAGER / P&D DIVISION MANAGER RECO. APPROVAL: REYNALDO C. JAYCO OIC, ACTING DEPUTY GENERAL MANAGER FOR TECHNICAL OPERATIONS	SALVADOR M. ROYECA GENERAL MANAGER	PROPOSED UPSIZING OF THE EXISTING 2"Ø DISTRIBUTION LINE ALONG SARILING SIKAP, IRISAN, BAGUIO CITY (INSTALLATION OF 4"Ø X 495M PVC MAIN LINE) IRISAN, BAGUIO CITY	EXIST. DETAILS @ STA. E INTERCONNECTION # 3 DETAILS (STA. D-E)	5 11







BLOW-OFF-VALVE (BOV) DETAILS
SCALE NTS



INTERCONNECTION # 4 (STA. 8)
SCALE NTS

BAGUIO WATER DISTRICT 1975

PREPARED BY:
JANELL L. BALANGCOD
ORG. C&D SECTION SUPERVISOR

REVIEWED BY:
EDMUNDO Q. LLANES / NORIEL C. SALPITO
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RECO. APPROVAL BY:
REYNALDO C. JAYCO
ORG. ASST. OIC TECHNICAL OPERATIONS

APPROVED BY:
SALVADOR M. ROYECA
GENERAL MANAGER

PROJECT TITLE AND LOCATION:
PROPOSED UPSIZING OF THE EXISTING 2"Ø DISTRIBUTION LINE ALONG SARILING SIKAP, IRISAN, BAGUIO CITY (INSTALLATION OF 4"Ø X 495M PVC MAIN LINE)
IRISAN, BAGUIO CITY

SHEET CONTENTS:
BLOW-OFF-VALVE (BOV) DETAILS
INTERCONNECTION # 4 DETAILS (STA. 8)

SHEET NO.:
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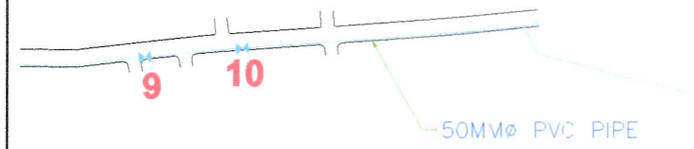
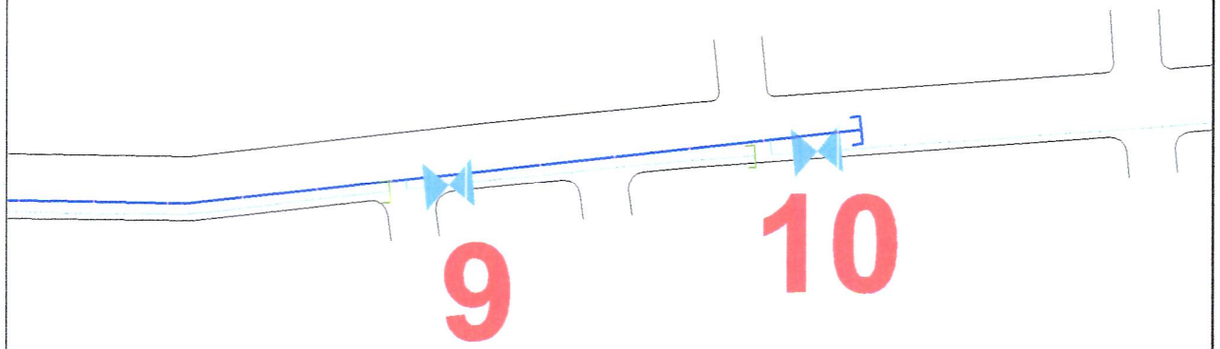
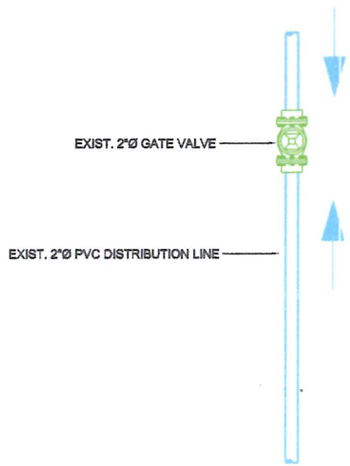
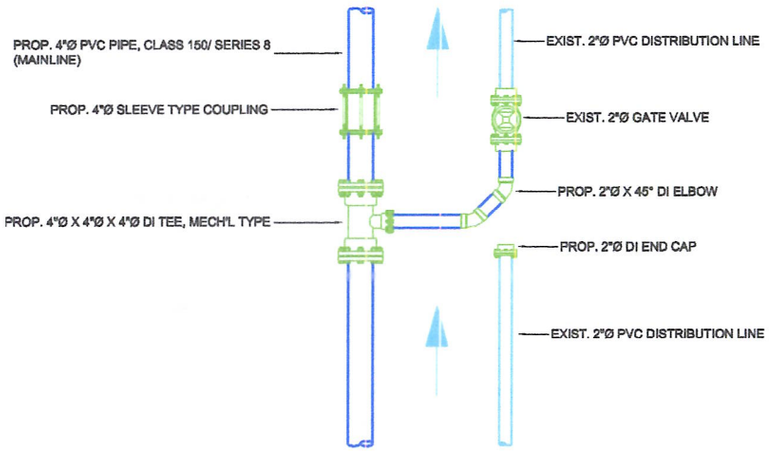






EXISTING DETAILS @ STA. 9

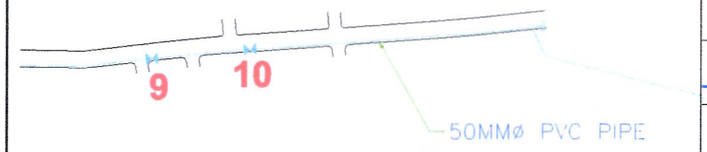
SCALE NTS

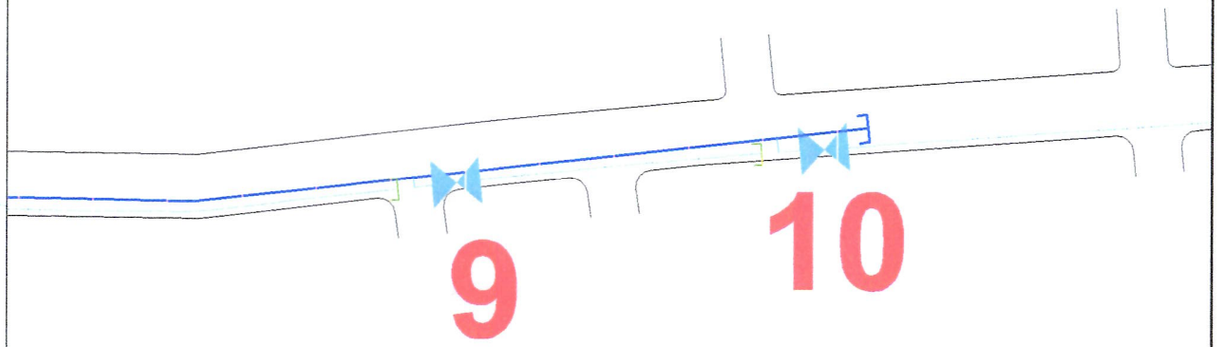


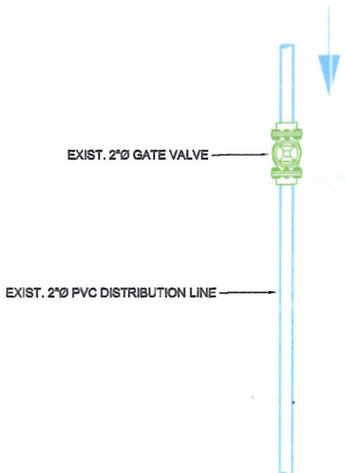
INTERCONNECTION # 5 (STA. 9)

SCALE NTS

BAGUIO WATER DISTRICT 1975	PREPARED BY: JANEL A. BALANGCOD, OIC, P&D SECTION SUPERVISOR	REVIEWED BY: EDMUNDO Q. LLANES / ANDRIEL C. GALPITO, P&C DIVISION MANAGER / P&D DIVISION MANAGER RECO. APPROVAL BY: REYNALDO C. JAYCO, OIC, ADM FOR TECHNICAL OPERATIONS	APPROVED BY: SALVADOR M. ROYECA, GENERAL MANAGER	PROJECT TITLE AND LOCATION: PROPOSED UPSIZING OF THE EXISTING 2"Ø DISTRIBUTION LINE ALONG SARILING SIKAP, IRISAN, BAGUIO CITY (INSTALLATION OF 4"Ø X 495M PVC MAIN LINE) IRISAN, BAGUIO CITY	SHEET CONTENTS: EXISTING DETAILS @ STA. 9 INTERCONNECTION # 5 DETAILS (STA. 9)	SHEET NO.: 7 / 11

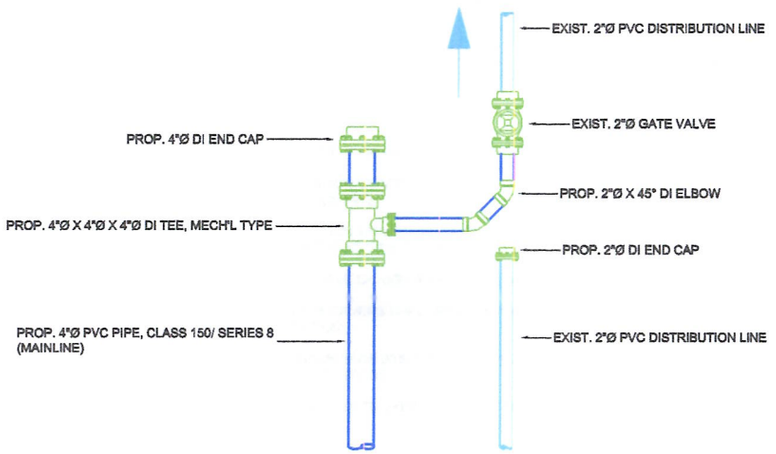






EXISTING DETAILS @ STA. 10

SCALE NTS



INTERCONNECTION # 6 (STA. 10)

SCALE NTS

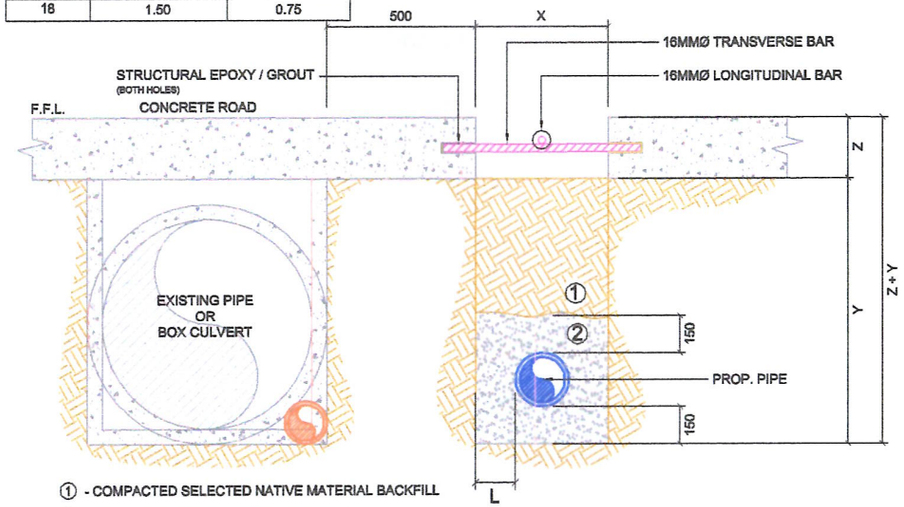
BAGUIO WATER DISTRICT 1975	PREPARED BY: JANEL J. BALANGCOD, OIC - TECH SECTION SUPERVISOR	REVIEWED BY: EDMUNDO Q. LLANES / NORIEL C. CALPITO, PDC DIVISION MANAGER / PAD DIVISION MANAGER; RECO. APPROVAL BY: REYNALDO C. JAYCO, OIC - MGR FOR TECHNICAL OPERATIONS	APPROVED BY: SALVADOR M. ROYECA, GENERAL MANAGER	PROJECT TITLE AND LOCATION: PROPOSED UPSIZING OF THE EXISTING 2"Ø DISTRIBUTION LINE ALONG SARILING SIKAP, IRISAN, BAGUIO CITY (INSTALLATION OF 4"Ø X 495M PVC MAIN LINE) IRISAN, BAGUIO CITY	SHEET CONTENTS: EXISTING DETAILS @ STA. 10; INTERCONNECTION # 6 DETAILS (STA. 10)	SHEET NO.: 8 / 11

TABLE 2: TRENCH DIMENSION IN METERS

PIPE SIZE, inches	TRENCH DEPTH, m (Z + Y)	STD. WIDTH, m (X)
1/2 - 3	0.85	0.35
4	1.00	0.40
6	1.05	0.45
8	1.10	0.50
10	1.15	0.55
12	1.35	0.60
14	1.40	0.65
16	1.45	0.70
18	1.50	0.75

TABLE 3: CONCRETE THICKNESS OF THE PROPOSED TRENCH ROUTE

NATIONAL ROAD	0.28 m
CITY/BRGY ROAD	0.23 m
SUBDIVISION ROAD	0.20 m
CURB AND GUTTER	0.15 m
SIDEWALK AND DRIVEWAY	0.10 m



① - COMPACTED SELECTED NATIVE MATERIAL BACKFILL

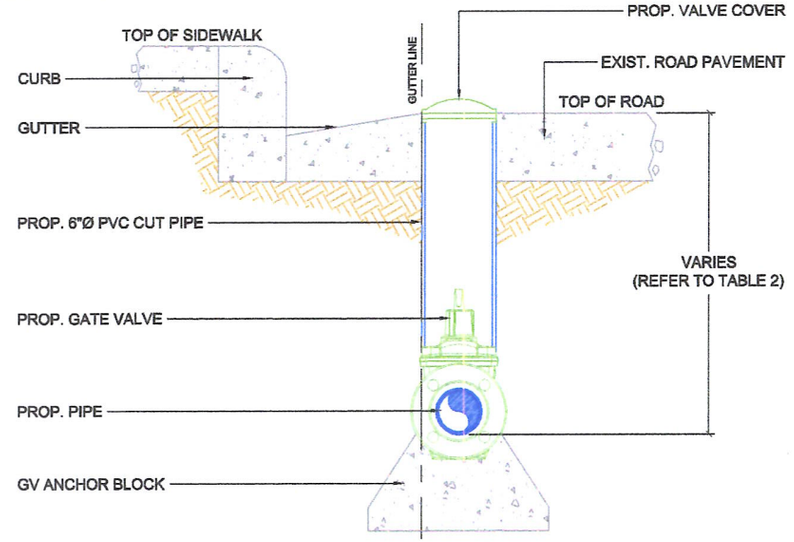
② - APPROVED SAND BEDDING AND FILLING

NOTES:

1. FOR TWO OR MORE PARALLEL PIPES, PROVIDE 0.15M. CLEAR SPACING. DISTANCE "L" BETWEEN THE SIDE OF TRENCH AND ADJACENT PIPES MUST BE WITHIN THE RANGE OF 0.15M (MIN.) AND 0.30M (MAX.).
2. STANDARD THICKNESS OF CONCRETE (Z) FOR NATIONAL/CITY ROAD AND BARANGAY ROAD SHALL BE 0.30M AND 0.25M, RESPECTIVELY.
3. ONE (1) SQ. M. TRENCH EXCAVATIONS SHALL BE RESTORED WITH 16MMØ DOWEL BARS.
4. CONCRETE BREAKING ALONG NATIONAL ROAD ARE MINIMUM OF 1.50 METER WIDE AND PARALLEL TO THE CONSTRUCTION JOINTS.

STANDARD TRENCH DETAIL

SCALE NTS



NOTES:

1. ISOLATION VALVES SHALL BE INSTALLED WITH A VALVE BOX AND COVER.
2. ISOLATION VALVES SHALL BE ENCASED WITH AT 150mm Ø PVC OR ANY SIMILAR TYPE OF PIPE.
3. ISOLATION VALVES INSTALLED ALONG NATIONAL OR BUSY ROADS SHALL BE CONSTRUCTED WITH VALVE CHAMBER.
4. ALL VALVE CHAMBERS SHALL BE BACK FILLED WITH SAND.
5. VALVE COVERS SHALL BE COORDINATED AND FABRICATED BY THE VALVE REHAB SECTION.
6. CAST IRON OR STEEL COVER SHALL BE ADEQUATELY DESIGNED TO CARRY TRAFFIC LOADS.
7. TYPE OF GATE VALVE MAY VARY BASED ON THE PROPOSED TYPE OF PIPE.

STANDARD VALVE CHAMBER DETAIL

SCALE NTS

BAGUIO WATER DISTRICT 1975

PREPARED BY:

JANEL J. BALANGSOD
DIC, P&D/QUEZON SUPERVISOR

REVIEWED BY:

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P&D DIVISION MANAGER / P&D DIVISION MANAGER

RECO. APPROVAL BY:

REINALDO C. JAYCO
DIC, AM FOR TECHNICAL OPERATIONS

APPROVED BY:

SALVADOR M. ROYECA
GENERAL MANAGER

PROJECT TITLE AND LOCATION:

PROPOSED UPSIZING OF THE EXISTING 2"Ø DISTRIBUTION LINE ALONG SARILING SIKAP, IRISAN, BAGUIO CITY (INSTALLATION OF 4"Ø X 495M PVC MAIN LINE)

IRISAN, BAGUIO CITY

SHEET CONTENTS:

STANDARD TRENCH DETAIL
STANDARD VALVE CHAMBER DETAIL

SHEET NO.:

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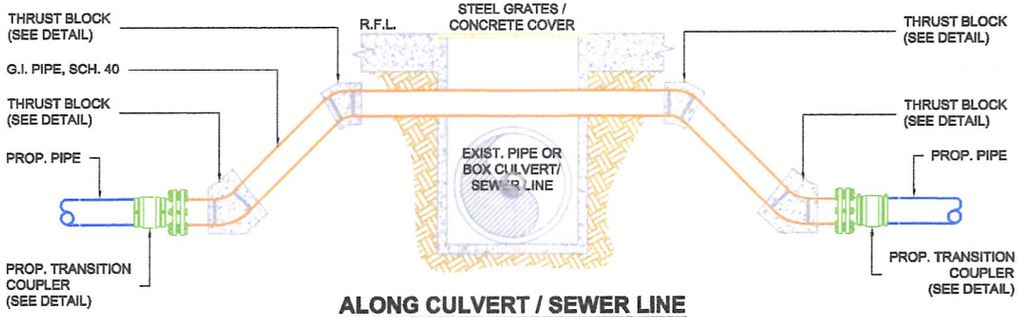
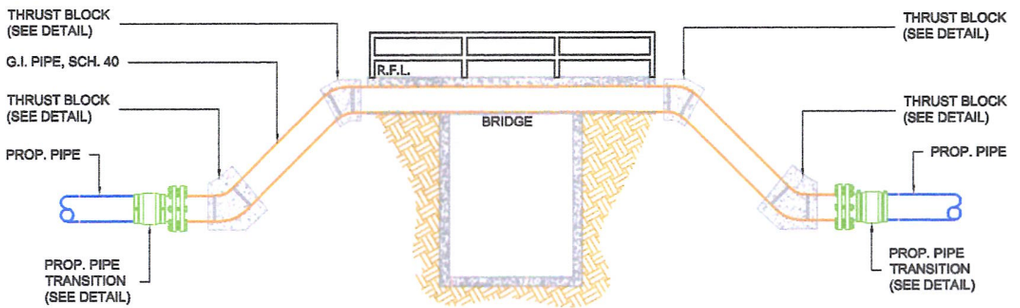


ALONG CULVERT / SEWER LINE



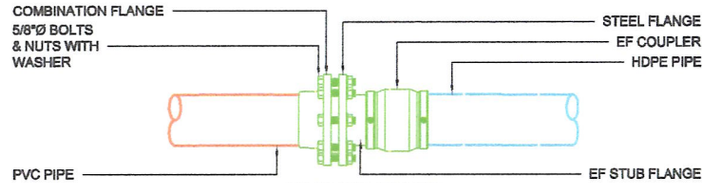
ALONG BRIDGE

NOTE:

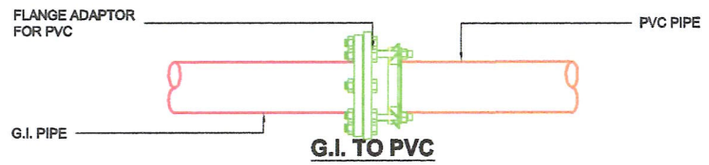
1. WHENEVER A PROPOSED PIPE ENCOUNTERS AN OBSTRUCTING CULVERT/SEWER LINE, SUCH PIPE SHALL BE DEFLECTED ABOVE THE CULVERT WITH AT LEAST 75mm CLEARANCE FROM THE BASE OF THE CONCRETE PAVEMENT.
2. WHENEVER A PROPOSED PIPE IS ADJACENT TO AN EXISTING CULVERT/SEWER LINE, A MINIMUM SPACING OF 500mm SHALL BE OBSERVED. PIPE JOINTS SHALL BE GROUTED TO PREVENT POSSIBLE INTRUSION OF WASTE WATER.
3. STEEL/GI PIPES SHALL BE PAINTED WITH FOOD GRADE PAINT.
4. TYPE OF TRANSITION COUPLER MAY VARY BASED ON THE TYPE OF PROPOSED PIPE.
5. SIZE OF GI PIPE MAY VARY BASED ON THE SIZE OF PROPOSED PIPE.
6. HDPE PIPE AND ELECTROFUSION FITTINGS SPECIFICATIONS: SDR 9, PE100, PN20
7. ALL GI PIPE MUST BE SCH. 40, PLAIN ENDS.
8. PROVIDE PIPE SUPPORT ALONG BRIDGES IF NEEDED.

STANDARD CROSS-OVER CONNECTION

SCALE NTS



PVC TO HDPE

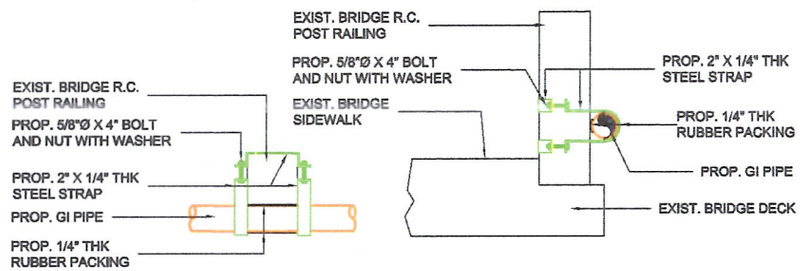


G.I. TO PVC

G.I. TO HDPE

PROP. PIPE TRANSITION DETAILS

SCALE NTS



PLAN **SECTION ELEVATION**

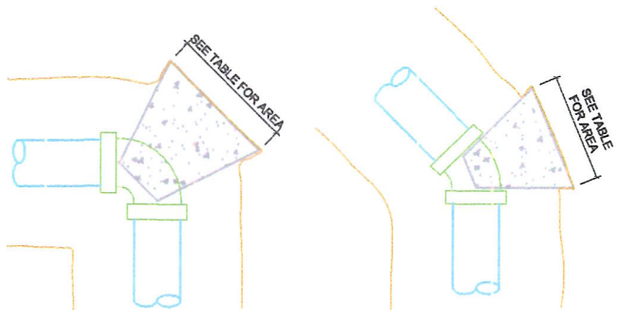
PROP. PIPE SUPPORT ALONG BRIDGE

SCALE NTS

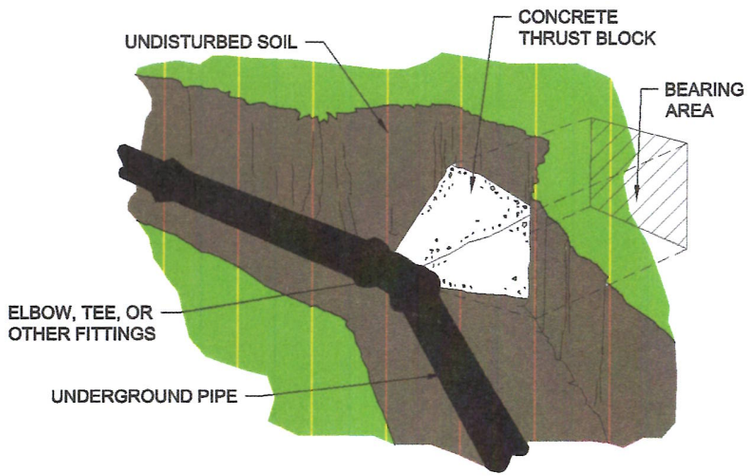
BAGUIO WATER DISTRICT 1975	PREPARED BY: JANET J. BALANGCOD, LDD PROJECTION SUPERVISOR	REVIEWED BY: EDMUNDO Q. LLANES / NORIEL C. CALPITO, PROJECTION MANAGER / LDD DIVISION MANAGER; RECO. APPROVAL BY: REYNALDO C. JAYCO, OIC-MANAGER TECHNICAL OPERATIONS	APPROVED BY: SALVADOR M. ROYECA, GENERAL MANAGER	PROJECT TITLE AND LOCATION: PROPOSED UPSIZING OF THE EXISTING 2"Ø DISTRIBUTION LINE ALONG SARILING SIKAP, IRISAN, BAGUIO CITY (INSTALLATION OF 4"Ø X 495M PVC MAIN LINE) IRISAN, BAGUIO CITY	SHEET CONTENTS: STANDARD CONNECTION ALONG CULVERT/SEWER LINE; PROP. PIPE TRANSITION DETAIL; PROP. PIPE SUPPORT ALONG BRIDGE	SHEET NO.: 10, 11

TABLE 4: MINIMUM THRUST BLOCK BEARING AREA IN SQUARE METERS FOR PIPE SIZES 75mmØ TO 300mmØ				
PIPE SIZE (Inches)	TEE AND DEAD END	90° BEND	45° BEND	22.5° BEND
3	0.05	0.07	0.04	0.02
4	0.09	0.12	0.07	0.04
6	0.20	0.28	0.15	0.08
8	0.35	0.50	0.27	0.14
10	0.55	0.77	0.42	0.21
12	0.79	1.11	0.60	0.31

TABLE 5: ANCHOR BLOCK DIMENSION			
PIPE SIZE, Inches	HEIGHT, m	WIDTH, m	THICKNESS, m
1/2 - 3	0.35	0.45	0.20
4	0.40	0.50	0.20
6	0.45	0.55	0.25
8	0.50	0.60	0.25
10	0.55	0.65	0.25
12	0.60	0.70	0.30
14	0.65	0.75	0.30
16	0.70	0.80	0.35
18	0.75	0.85	0.35



PLAN



PERSPECTIVE

STANDARD THRUST BLOCK DETAIL

SCALE NTS

NOTES:

1. ABOVE AREAS ON AN ASSUMED SOIL BEARING PRESSURE OF 96 KPa (2000psi).
2. REDUCE OR INCREASE AREA PROPORTIONALITY TO SUIT ACTUAL FIELD CONDITION UPON APPROVAL OF FIELD ENGINEER.
3. CONCRETE FOR THRUST BLOCK AND ANCHOR BLOCK SHALL BE 13.8 Mpa (2000 psi).
4. ALL CONCRETE SHALL BE POURED TO AVOID INTERFERENCE WITH JOINTS.
5. THRUST BLOCKS NOT REQUIRED ON STEEL PIPELINE WITH WELDED OR FLANGED JOINTS OR ON SOLVENT WELDED PVC PIPE.
6. WHERE PIPE CONNECTS TO A FITTING IN A STEEL PIPELINE, THE STEEL PIPELINE SHALL BLOCKED AS SHOWN HEREON.
7. BEARING AREAS BASED ON INTERNAL PRESSURE OF 106 m (150 psi).

BAGUIO WATER DISTRICT 1975

PREPARED BY:	REVIEWED BY:	APPROVED BY:	PROJECT TITLE AND LOCATION:	SHEET CONTENTS:	SHEET NO.:
JANEL J. BALANGCOD OIC, P&D SECTION SUPERVISOR	EDMUNDO Q. LLANES / NORIEL C. GALPITO P&D DIVISION MANAGER / P&D DIVISION MANAGER RECO. APPROVAL BY: REYNALDO C. JAYCO OIC-DEPUTY FOR TECHNICAL OPERATIONS	SALVADOR M. ROYECA GENERAL MANAGER	PROPOSED UPSIZING OF THE EXISTING 2"Ø DISTRIBUTION LINE ALONG SARILING SIKAP, IRISAN, BAGUIO CITY (INSTALLATION OF 4"Ø X 495M PVC MAIN LINE) IRISAN, BAGUIO CITY	STANDARD THRUST BLOCK DETAIL	11 11