

A- GENERAL

1.0 SCOPE OF WORKS

The Works covered in this Contract comprise the provision by the Contractor at his own risk and cost which comprise all materials, scaffoldings, tools, plants, labour, transports, water, power, profit and attendance, overhead and everything else necessary for the construction and completion of the Works to the entire approval of the Superintending Officer hereinafter referred to as the S.O.

The Conditions of Contract for the Works, which is embodied in the Form of Contract, shall be read in conjunction with this Specification. If the Tenderer considers that any of the clauses in the Conditions of Contract involves additional expenses not covered elsewhere, the Tenderer shall allow for monetary value for such clauses in his Tender, otherwise, it will be deemed to have been included.

2.0 PROGRAMME AND PROGRESS OF WORKS

Within 30 days after the acceptance of tender, the Contractor shall submit to the S.O. for his approval three (3) copies of a detailed programme in Microsoft Project format showing the time order, procedure and method in which the Contractor propose to carry out the Works, and shall whenever required by the S.O. or his representative, furnish for his information particulars in writing of the Contractor's arrangement for carrying out such work and other construction plants and temporary works if any, which the Contractor intends to supply, use or construct as the case may be. The submission to and approval by the S.O. or his representative of such programme or the furnishing of such particulars shall not relieve the Contractor of any of his duties or responsibilities under this Contract.

If at any time it should appear to the S.O. that the actual progress of the Works does not conform to the approved programme referred to herein, the Contractor shall produce, at the request of the S.O. a revised programme showing the modifications to the previously approved programme necessary to ensure the completion of the whole Works within the time set for completion.

3.0 CONSTRUCTION SITE

The location of the Site is shown on the Drawings. The Contractor shall be deemed to have inspected the Site before tendering and to take into account all the conditions there, such as means of access, facilities for transport, storage and movement of plants and materials, and any other contingencies liable to affect his tender price, as no claim for extra payment in this connection will be entertained.

The Contractor shall be liable for and shall indemnify SYABAS against any damage, expense, liability, loss, claim or proceedings whatsoever whether arising at common law or by statute in respect of personnel injury to or death of any person whomsoever or to any property arising out of or in the course of or by reason of the visit to the Site.

4.0 PREPARATION OF THE WORK AREA

4.1 Detection of Existing Utilities and Services

The Contractor shall investigate, and have full knowledge of the position of existing utilities and underground services such as drains, pipes, electric cables, culverts, etc. He shall take all necessary precaution as part of his work. He shall undertake the following:-

- i. Detailed utility detection using radio and or ultrasonic machine. The drawings must be submitted to the S.O in 2 set in A1 size, coloured to differentiate the type of services. The type of utility, size and depth shall be clearly indicated.
- ii. Where necessary, trial pits and exploration trenches to ascertain the exact portions of these services shall be excavated, well ahead of pipe repair / maintenance excavation, in places where they are known or thought to be and elsewhere and these shall be backfilled with approved materials.
- iii. All damages to the existing services shall be made good to the satisfaction of SYABAS and the relevant authorities. SYABAS shall be identified against any action taken against the Contractor/developer due to their negligence.

4.2 Isolation of Valves

Before any excavation, SYABAS' representative and the Contractor shall jointly locate all value pipelines in the area. (This is based on their working knowledge of the water distribution system or based on maps / water reticulation plan of the area and / or from their past experience).

1. Ascertain the type, size and estimated length of pipe that may be affected due to the excavation and repair works. The information will enable the maintenance team to mobilize the appropriate tools, spare parts, etc. The information will be important in estimating the volume of water loss due to pipe bursts or pipe leaks .
2. Sketch the location plan and the distribution network layout in a Record Form for updating and record purposes.
3. SYABAS' representative shall identify all isolating and scour valves affected by the pipe to be repaired as well as valves located in the vicinity. It is important to ensure that water scouring will not result in flooding of the area, in particular the area for excavation.

Prior to excavation, shut the isolating valves as identified. As a direct effect, the pipeline pressure will drop and hence, water will stop. When this has been confirmed, the scour valves may be opened to discharge the remaining water from the main prior to excavation work.

4. However, if water pressure neither drops nor leakage subsides after closing of the identified valve, then SYABAS' representative and his team may need to locate any possible unknown inter-connections.

5. When the inter-connections have been identified, the isolating valve shall be shut to facilitate repair work. Update the sketch of the pipe layout in the attached Record Form. The sketch shall then be submitted to SYABAS' representative upon completion.

4.3 Trench Excavation / Cutting of Metalled Premix Road

The trench shall be excavated by such method as allowed by SYABAS for proper maintenance and repair work.

1. Trench excavation shall be carried out by such methods and to such lines, dimensions and depths to allow for the proper construction of the works.
2. As a general guide, the approximate width of trench excavation is as per **Table1**.

Table1: Width of trench and road cutting based on pipe diameter

Pipe OD with sheathing (D) mm	Clear width of trench excavation	Clear width of metalled premix road cut
< 500 mm	D + 450 mm	D + 1050 mm
> 500 mm but < 750mm	D + 600 mm	D + 1200 mm
> 750mm	D + 900 mm	D + 1500 mm

3. Under no circumstances shall the Contractor be allowed to place excavated materials by the road-side. Excavated materials shall be carted away to a waiting lorry and transported to dump site to be determined by the Contractor.
4. In cases where the trench depth exceeds 1.5 m, sheet pile wall or strutting of trench's wall shall be provided to prevent any untoward incident such as 'cave in' from happening.

4.4 Dewatering of Trench

The Contractor shall note that certain parts of the pipeline may be laid in ground with high water table, especially in areas adjacent to the streams, river crossings and ponds.

1. The Contractor shall allow cost for dewatering and keeping all the excavations and trenches dry for the pipeline repair work to be carried in a safe manner during the execution of the work.
2. Dewatering shall be carried out using dewatering pump with long hose. The dewatering pump shall have the capacity to drain a trench (1m x 1m x 1.5m) within 5 minutes (70 igpm).

5.0 REINSTATEMENT WORK.

Reinstatement work for the following types of road shoulder are described accordingly.

1. Normal earth shoulder.
2. Shoulder with hardstanding / tiles.
3. Metalled premix road.

5.1 Normal earth shoulder

1. Excess water shall be pumped out from the trench using suitable sized pump before any maintenance and repair work is carried out.
2. Under no circumstances shall soft and unsuitable materials be used as backfill materials.
3. Approved backfill shall be compacted in layer of 150 mm thick. The plate type compactor shall be used.
4. After backfilling has reached approximately 100mm below the existing ground surface, the existing top soil is shall reinstated.
5. The finished ground level shall be slightly higher than the original ground level.
6. All surplus materials shall be removed from the site.

Please refer to Arahan Teknik No. 1 for diagrams of section and plan view of the reinstatement works.

5.2 Shoulder with hard standing / tiles

1. The affected hard standing / tiles shall be cut using road – cutter.
2. Excess water shall be pumped out from the trench using suitable sized pump before any maintenance and repair work is carried out.
3. The trench will then be backfilled with approved sand, sufficiently watered down and compacted in layers of 150 mm thick. Plate type compactor shall be used.
4. The backfilling of compacted sand shall be carried out to a level suitable to receive crusher run.
5. 300 mm thick crusher run shall be laid on top of the compacted sand. Compaction of crusher run shall be carried out using Plate type compactor.
6. Compaction of the crusher run and premix, especially on the road pavement, shall be carried out using vibratory roller.
7. Any over-break of concrete hard standing and tiles is to be cut square.
8. Concrete screed shall then be laid on top of the compacted crusher run and level adjusted to suit the existing ground level.
9. All surface finishes shall be reinstated to their original conditions.

Please refer to Arahan Teknik No. 1 for diagrams of section and plan view of the reinstatement work.

5.3 Metalled premix road

1. The affected metalled premix road shall be cut using road – cutter.
2. Excess water shall be pumped out from the trench using suitable size pump before any maintenance and repair work is carried out.
3. After the pipe has been repaired, the trench shall then be backfilled with sand, sufficiently watered down and compacted in 150 mm layers. Sand shall be laid in 150 mm layers on both sides of the pipe simultaneously and thoroughly compacted around the pipe alternately on either side of the pipe until it reached the base course of formation level. Compaction shall be carried out using Plate Compactor.
4. Crusher-run is to be laid in layers of 150 mm thick. Compactions of crusher run shall be carried out using a Plate Compactor. The crusher run shall be reinstated to the original thickness of the road, but subject to a minimum thickness of 300 mm.
5. Additional make-up crusher run shall then be added to the excavated area and compacted accordingly.
6. After the whole surface of the crusher run has been compacted, the surface shall be brushed to remove loose stones and debris.
7. A layer of bituminous tack coat shall be applied at a rate of not less than 270 ml/m², paying particular attention to all square cut edge and all around manhole to be installed where applicable.
8. The premix shall be reinstated to its original thickness ranging from 60 mm to 100 mm thick ACWC 20 depending on the Class of the road.
9. All compaction of premix shall be carried out using a Plate Compactor.
10. Make-up premix shall be added 3 days after the completion of the work to reinstate settlement.

Please refer to Arahan Teknik No. 1 for diagrams of section and plan of the reinstatement works.

6.0 SETTING OUT AND RE-SURVEY

The Contractor shall be responsible for the true and proper setting out of the Works and for the correctness of the positions, levels, dimensions and alignment of all parts of the Works as stipulated in the Conditions of Contract (Form PWD 203A-Rev.10/83).

Before the commencement of the Works, the Contractor shall undertake topographical survey of the area and forward this information to S.O, in order for S.O. to establish the lines and level of the Works. The Contractor shall verify the dimensions and levels shown in the Drawings and shall notify the S.O. of any discrepancy, which may affect the dimensions or levels of any part of the Works.

After clearing and grubbing, and before any excavation of any part of the Site is carried out or the Works thereon begun, the Contractor shall take and record level of any such parts, in the manner specified or as agreed with the S.O. shall form the basis of measurement and payment. The Contractor shall carry out to the S.O's instructions all extra surveys required to resolve any doubts, which may arise as to the correctness of any survey or record and the S.O's decisions shall be final regarding what shall be recorded as the correct dimensions and levels.

The levels and dimensions, which have been agreed by the S.O, shall form the basis of measurement for the appropriate Works.

7.0 PROVISION OF SURVEY TEAM AND CHAINMEN

The Contractor shall provide and maintain for the sole use of the S.O., a survey team led by a registered surveyor complete with instruments and chainmen. All instruments and equipment shall be in good operational condition, duly calibrated.

Thus, may call upon their services any time, to provide surveys of any site and the surveyor shall prepare the drawings in the specified format. He shall endorse the drawings he has prepared as part of his professional services.

Additional instruments to be provided and kept available by the contractor are as follows:

- Aluminium leveling staff 5 metres long in 1 sections with attached bubble, sopwith reading – 1 no.
- Flexible steel tape 4 metres long on plastic case, graduated in metres and millimeters - 1 no.
- Linen tape 30 metres long in leather graduated in metres and millimeters – 1 no.

The Contractor shall provide as many full time or part-time chainmen as may be required by the S.O.

8.0 ORDERING MATERIALS

The Contractor shall be responsible for placing his orders for all materials and articles required to be supplied by him at the earliest possible date for the completion of this Contract.

Before placing any order for materials or articles to be incorporated in the Works, the Contractor shall submit to the S.O. for his approval, a complete description of such items and the names of the suppliers from whom he propose to obtain them. Where so directed, the Contractor shall submit samples and test certificates for approval. The Contractor shall not place any order without the approval of the S.O. which may be withheld until samples have been submitted and satisfactorily tested.

The source of supply shall be approved by the S.O.

Additional testing of materials and complete pipes, fittings and specials may be carried out at any time by the S.O. Any of the materials, pipes, fittings and special not complying with this Specification shall be rejected by the S.O.

Unless specifically provided for in the Specification or the Bill of Quantities, the cost of any testing including the supply of materials, pipes and fittings carried out on

samples submitted by the Contactor shall be borne by SYABAS. If, the tests show that the materials, pipes and fittings to be not in accordance with the requirements of this Specification, the said batch of material will be rejected. The contractor shall

remove all the rejected materials out of the site immediately. For further quality control, the S.O may require testing of other materials, whether installed or not. The cost of testing shall be boned by the contractor. If results show similar trend, then the material must not be further used. The contractor must demonstrate how rectification measure can be implemented on all installed items.

9.0 MATERIALS AND WORKMANSHIP

All materials and articles to be incorporated in the Works shall be new and of the kind and quality described in the Contract and shall be at least equal to the approved samples.

In all cases where materials and articles are specified to comply with Malaysian Standards or British Standards, the Contractor shall, if required, obtain from the manufacturers and supply the S.O. the appropriate certificate of compliance with the Standard.

The Contractor shall use materials and articles of Malaysian origin to the exclusion of imported materials and articles. The Contractor shall allow for this special requirement in the Tender. Under no circumstances will the Contractor be permitted to use imported materials and articles unless the Contractor can prove to the satisfaction of the S.O. that local materials and articles are not of an acceptable standard.

If no Standard is indicated, the relevant Malaysian Standard, British Standard or other Standard shall apply in the order of priority as listed.

10.0 SUPPLY OF MATERIALS BY SYABAS

If the Contractor fails for any reason to supply any materials, which the Contractor has contracted to supply or if he fails to supply any such materials in sufficient time to enable the Contract to be completed by the agreed Date for Completion, then in either event SYABAS may supply any portion, or all of such materials.

If the Contractor fails for any reason to supply any materials, the cost in respect thereof to be borne by the Contractor shall be either the current market rate or the actual cost to SYABAS and any other charges, whichever is the greater.

The cost to be borne by the Contractor as detailed above shall be deducted from monies due or to become due to the Contractor under this Contract. No claim for lost of profit under the Conditions of this Contract shall be deemed to have arisen. No action taken by the S.O. under this clause shall, in any way, affect or modify the right of SYABAS to claim for damages in the event of the Contractor's failure to complete the Works by the agreed Date of Completion.

11.0 REQUIREMENTS OF OTHER CONTRACTOR

The Contractor shall afford every facility to other contractors on the Site and to allow them to carry out their work unhindered. The Contractor shall maintain constant and careful liaison with them to ensure the correlation of the respective Programmes of Works and the accurate laying and building-in of pipes, formation of ducts, and the likes as the Works proceed. The S.O. will do everything possible to assist in the maintenance of this liaison and co-operation and the Contractor shall be prepared to assist in the progress of the Works by other Contractors generally by carrying out construction and laying operations in the order required.

The Contractor shall take all reasonable precautions to avoid any damage to other Contractor's work and/or property. The Contractor shall be entirely responsible for making good, at his own expense, any such damage caused by, or due to, any action or lack of action on the part of the Contractor.

No claims for extra shall be entertained for any additional work, which arises through lack of co-operation between the Contractor and other Contractors.

All costs involved in complying with this Clause shall be deemed to have been covered by the Contract Rates or Sum unless specifically provided for in the Bill of Quantities.

12.0 PUBLIC UTILITIES AND OTHER SERVICE

- a. If utility is given as a guide, then the client shall not be held for any responsibility.
- b. The Contractor shall be responsible for locating all services including drains, pipes, cables and the like whether above or below ground level and shall adopt such methods of working as will ensure that no damage is caused to the services. The Contractor shall make good at his own expense any damage whatsoever to existing services resulting from his operation to the approval of and in accordance with the instructions of the authority or owner concerned and shall keep SYABAS indemnified at all times from all claims which may be brought against SYABAS for or on account of any damage to the said services.

The cost of deviating or realigning any of these services shall not be borne by the Contractor but the Contractor shall provide and maintain at his own expense any temporary works necessary to support or protect the services affected by his excavation to the satisfaction of the authorities or owners concerned.

The Contractor shall attend to the authorities or owners concerned and afford them all facilities necessary to enable them to undertake any work required to deviate those services or to prevent interruption of such services during the progress of the Works.

All costs involved in complying with this Clause shall be deemed to have been covered by the Contract Rates or Sum unless specifically provided for in the Bill of Quantities.

13.0 PUBLIC AND PRIVATE ROAD

All operations necessary for the execution of the Works and for the construction of any temporary Works shall, so far as compliance with the Contract permits, be carried out so as not to interfere unnecessarily or improperly with the convenience or the access or use and occupation of public or private roads and footpaths or to or of properties whether in the possessions of the SYABAS, the Government or of any other person and the Contractor shall save harmless and indemnify SYABAS and the Government in respect of all claims, demands, proceedings, damages, costs, charges and expenses whatsoever arising out of or in relation to any such matters.

No private road or footpath shall be blocked or obstructed by the Contractor without the prior consent of the owner/ occupier and the prior approval of the S.O.

No public road shall be blocked or obstructed by the Contractor without the prior consent of the authorities and the prior approval of the S.O.

The Contractor shall be responsible for providing, operating and maintaining all traffic signs, traffic control signals, barriers and lightings as detailed in the Drawings unless otherwise directed by the S.O. The signs, barriers and lightings shall be repositioned or removed as required during the progress of the Works.

If the Contractor fails to comply with the requirements of this Clause, the S.O. may carry out such works as he deems necessary and to charge the Contractor with the actual cost including any other charges. Such cost and charges shall be deducted from any monies due or which may become due to the Contractor under this Contract, and the Contract Sum shall be adjusted accordingly. No action by the S.O. under this Clause shall relieve the Contractor of his obligations or affect or modify the right of SYABAS under the Contract.

14.0 WORK THROUGH PRIVATE LAND

The Contractor shall be responsible for obtaining the consent of private owner and occupier to the use of such land or private roads for temporary access to the working space along the pipeline route or for other temporary purpose. Before entering private land for the purpose of commencing construction, the Contractor shall confirm in writing to the S.O. that he has obtained such consent.

The Contractor shall pay all costs, expenses, retails, compensations or any other disbursements required of him in complying with this clause. No reimbursement will be made to the Contractor in this respect. The Contractor shall note his responsibility to the Conditions of Contract shall apply to the whole of the land occupied or used by him for the purpose of the works.

15.0 CONTRACTOR'S FACILITIES

The Contractor shall, at his own expense, provide and maintain in good condition throughout the Contract Period such temporary buildings, tanks, stores, temporary sanitary conveniences, access roads and other facilities as may be necessary for the execution, completion and maintenance of the Works. The location of all such

facilities shall be subjected to the approval of the S.O. All such facilities shall comply with the requirements of the Local Authorities.

16.0 SAFETY AND SECURITY MEASURES

The Contractor shall take all necessary safety precautions on the Site and shall conduct his operations on the Site and shall conduct his operations in a manner so as to ensure the safety of the S.O. and his staff, the Contractor's employees and the public.

The Contractor shall, at his own expense, provide and maintain to the approval of the S.O. all notices, warning signboards, fencing, watching and lighting necessary to ensure the security of the Works and the safe keeping of the materials and tools stored on the site. If required by regulation or authorities, a qualified and experienced safety officer to the SO's approval shall be deployed. The rates is deemed included as part of the contract.

17.0 DAMAGES TO EXISTING WORK

The Contractor shall be responsible for any damage to road verges, drains, ditches, turfing areas, or other structures, which may result from the construction work or the passing of his vehicle, plants or equipment of whatever kind to or from the Site of the Works. The contractor shall make good such damage at his own expense immediately after it occurs to a standard acceptable to the S.O.

Any existing structures and obstructions, which are designed to be removed shall be demolished, broken up, removed and disposed off as approved by the S.O.

18.0 PROTECTION OF WORKS

From the commencement of the Works until the date stated in the Certificate of Practical Completion for the whole of the Works, the Contractor shall take full responsibility for the care thereof. In case of damage, loss or injury to the Works, or any part thereof, from any cause whatsoever, the Contractor shall, inform the S.O in writing. He shall make proposals, submit method statement for the S.O's approval. After the S.O. has consented to the work, the contractor shall at his own cost, repair and make good the same so that at completion the permanent works shall be in good order and condition in every respect as per requirements of the Contract. The contractor is not allowed to undertake any repair work until he has received specific instruction from the S.O. The S.O. shall also not delay his approval unless he has specific reasons or comments on the proposed rectification measures.

19.0 SITE DRAINAGE

The Contractor shall make proper provision for the drainage of water from the Site of the works including rainfall run-off from surrounding areas, which drain onto the Site.

The Contractor shall at no extra cost to SYABAS provide, form, fix, maintain and work as and where directed by the S.O. such pumps, chutes, walls, drains, bunds silt traps and other temporary works necessary for the proper drainage of the Site so that no flooding, silting or other damages or disturbances is caused in the areas surrounding the Works or to the Works for the duration of the Contract.

20.0 PIPE DUMPS

The Contractor shall be solely responsible to find a suitable pipe dumps and stores to store the pipes, valves and fittings supplied by or to the Contractor.

The Contractor shall allow in his Contract Rates for expenses incurred in locating, hiring, preparation and reinstatement to original condition of pipe dumps and stores.

The Contractor shall be responsible for obtaining the consent of the owner, tenants or occupier of lands to the use of such land for storing of the pipes, valves and specials. The Contractor shall pay all cost, expenses, rental, compensation or other disbursement, which may be incurred by him in negotiations with the owner, tenant or occupier and during the subsequent use by him of such land for these purposes. No reimbursement will be made to the Contractor in this respect. The full cost thereof shall be deemed to be included in the Contract Rates.

21.0 FIRST AID BOX

The Contractor shall be required to provide a complete approved first aid outfit and shall keep it in a metal box in his Site Office. The outfit shall be in the charge of either the Contractor's Site Representative or some other responsible person who will be on the Site during all working hours to ensure that the first aid outfit is available without delay at all times when work is in progress. The person in charge of the first aid box shall be trained in simple first aid duties.

22.0 CONTRACTOR'S PLANTS

All mechanical plants used by the Contractor in the execution of the Works shall be of such type, size and method of the working as the S.O. shall approve.

The S.O. shall not unreasonably withhold approval for the use of any plant but if, in the S.O.'s opinion, circumstances arises which made it desirable that the use of any plant should be suspended either temporarily or permanently, the Contractor shall change the method of performing the work affected at the Contractor's own cost and the Contractor shall have no cause for claim if any order issued by the S.O. result in any plant having to stand idle for a period of any duration whatsoever or having to be removed from the Site.

23.0 CLEARING UP AND REINSTATEMENT ON COMPLETION

On completion of the Works, the Contractor shall dismantle and remove from the Site, all his plant, equipment, temporary buildings and unused materials. The Contractor shall fill in and make good all holes and temporary excavations, dig up

and remove all temporary roads if directed, clean out all gutters, clear away all rubbish, and leave the whole of the Site of the Works in a clear and tidy condition acceptable to the S.O.

The Contractor shall clean and wash all windows, paintwork, walls and floors, and shall leave permanent buildings, tanks and other structures in a clean and tidy condition ready for use by SYABAS.

24.0 S.O.'S APPROVAL

Any S.O.'s approval given to any portion or stage of the Works shall not absolve the Contractor from his liability to make good any defects which may be discovered or occur subsequently during the Defects Liability Period of the Contract.

25.0 DAYWORK

The S.O. may order in writing that any additional or substituted work be executed on a day-work basis. The Contractor shall then be paid for such work under the conditions set out in the Day-work Schedule included in this Contract and at the rates and prices agreed to by both parties.

The Contractor shall furnish to the S.O. such receipts or other vouchers as may be necessary to prove the amounts paid and before ordering materials shall submit to the S.O. quotations for the same for the S.O.'s approval.

In respect of all work executed on a day-work basis, the Contractor shall during the continuance of such work deliver each day to the S.O. an exact list in duplicate of the names, occupation and time of all workmen employed on such work and a statement also in duplicate showing the description and quantity of all materials and plants used thereon or therefore. Upon agreement by the S.O., one copy of each list and statement shall be signed by the S.O. and returned to the Contractor. At the end of each week the Contractor shall deliver to the S.O. a priced statement of the labour, materials and plant used. All price statements, which have been agreed to between the Contractor and the S.O. shall be incorporated in the subsequent certificate or payment.

The rates shown shall include all allowances for administration and profit, all traveling and accommodation expense, statutory overheads such as EPF Contributions, SOCSO, holiday pay, annual and sick leave as appropriate where these apply. Rates shown for Plant shall be the complete compensation required by the Contractor for the operation of this Plant, including the cost of the operator, fuel and transportation and maintenance.

In the case of materials used in labour work, the Contractor shall be paid the complete "on site" cost of any materials used, plus a maximum allowance of fifteen percent to cover purchase of material and organization by the Contractor etc including profits.

Payments for day labour work will only be certified for the actual hours worked. No payment will be made for standby time caused by inclement weather.

26.0 COVERING UP OF WORK

Before any part of the Works be permanently covered up, the Contractor shall give due notice to the S.O. of his intention. The S.O. shall, without unreasonable delay, examine and measure if necessary, the said part of the Works unless the S.O. considers it unnecessary and advises the Contractor accordingly.

27.0 SIGNBOARDS

Where specified in the Bill of Quantities, the Contractor shall provide, erect, paint and maintain signboards as shown on the relevant drawing or as directed by the S.O. The signboard shall be erected at a prominent position at the site as approved by the S.O. and the Contractor shall pay all charges in connection with this, including obtaining permission, licences and fees etc.

On completion of the project, the Contractor shall dismantle and clear away the signboard as directed by the S.O.

28.0 CLAUSES RELATING TO WORK OR MATERIALS NOT REQUIRED IN THE WORKS

Any clauses in this Specification, which related to work or materials, not require in the Works shall be deemed not to apply.

29.0 EMPLOYEE'S SOCIAL SECURITY ACT

Notwithstanding anything to the contrary contained elsewhere in the Contract Documents, the Contractor shall cause all Sub-Contractors whether nominated or otherwise to comply with the requirements of the Employee's Social Security Act, 1969 as described under Clause 35 of the Conditions of Contract (PWD 203A Rev. 10/83) The Contractor shall be responsible to submit to the S.O. whether demanded or not, the Employer's Code Numbers of the Sub-Contractors and Social Security Numbers or copies of Form 2 or Form 3 if the Social Security Numbers are not yet available, of all employees employed by them.

30.0 DELAYS AND STOPPAGES

All delays and stoppages in the progress of the Work arising from disputes as to the quantity of materials, the insufficient supply of materials, plants, etc and all damage or injury caused to the work of the Contract, or to the adjoining or adjacent works, buildings, streets, land, etc, in consequence of such delays and stoppages shall be solely and entirely at the risk and cost if the Contractor.

31.0 WARRANTY

The accepted tender under this Contract shall be deemed to warrant that, notwithstanding that any part of the equipment supplied has been satisfactorily factory tested and/or inspected on site before installation, if any equipment or part thereof shall fail to perform its specified function under test or during the Contract

Defects Liability Period, and it is determined that such failures are the responsibility of the Contractor, then all costs of replacing all faulty equipment or parts thereof shall be borne by the Contractor.

For equipment supplied but not manufactured by the Contractor, a guarantee shall be provided by the Contractor that he shall arrange any necessary repair or replacement of defective equipment that fails within the warranty period of the installation, free of charge.

The operation staff, using the knowledge gained during the Contractor's training scheme and using the documentation supplied, will endeavour to identify any faulty equipment or sub-assemblies held as a spare part and will return these, at the Contractor's cost using his nominated freight carrier, for repair by the Contractor.

If the operating staff is unable to determine the cause of any system problems with telephone assistance from the Contractor, the Contractor shall dispatch at his cost within 3 days, if the system is totally inoperative, or within 10 days for a fault affecting only redundant equipment, specialist engineering staff to remedy the problem.

The Contractor is required to provide, within the Warranty period, a maximum 3 day turnaround (excluding weekends) on all repairs and/or equipment replacement. The operating staff will not undertake any repairs unless authorised by the Contractor.

32.0 STATUTORY HOLIDAYS

Extension of time will not be allowed for statutory holidays.

33.0 CONTRACT DOCUMENTS

The Contractor shall be deemed to have fully examined the Contract Documents, have read each and every Clause and all details therein and have had full opportunity to consider the same and make necessary investigations in relation thereto. He shall not make any claims or any other occasion because of misunderstanding of the Contract Document or because of lack of information.

If the Contractor considers that any of the conditions and/or instruction in the Contract Document involves additional cost, he shall allow for the same in the Tendered Price as no claim extra in this connection will be entertained.

All parts and sections of the Specification shall be read in conjunction with one another and unless particularly specified otherwise, the provisions and requirements

of any Clauses under any one section apply to the Works under the Contract where Work is of as similar nature.

Drawings are included in the Contract Document. Further drawings may be issued to the Contractor as work progresses.

34.0 EXPLANATION OF THE DOCUMENTS

In the event that additional information is required, the Contractor shall make a written request for the details required by him. A period of two (2) weeks shall be allowed by the Contractor for the details to be prepared and delivered to him.

No claims for costs arising from delays to the job will be entertained where in the opinion of the S.O. a delay has occurred through the Contractor's failure to comply with the requirements of this clause.

35.0 CONTRACTOR'S AGENT

A competent, duly authorised, and responsible site agent or representative of the Contractor shall be appointed. The agent's name, qualification and experience shall be submitted to and approved, in writing, by the S.O. prior to appointment and who shall have full authority to act for and bind the Contractor. The agent shall reside on the Site and shall have an office thereon. This agent shall attend at the S.O.'s office at all reasonable times when required to do so. He shall be fluent in Bahasa Malaysia or English and all correspondence will be conducted in either of these languages.

The agent shall be stationed on the site for the duration of the contract. If Contractor desires to replace his agent, the name of the proposed new agent shall be submitted to the S.O. for approval prior to replacement.

In the event of the agent being absent from the works for any period exceeding 3 consecutive days, he shall notify the S.O. in writing of the name of his responsible and fully authorized deputy. In any case, the agent shall always inform the S.O. in advance, should he intend to be absent from the Works.

36.0 PROJECT DIARY

The Contractor shall keep a daily project diary, which shall record the major events of each day. The format shall be approved by the S.O.'s Representative and as a minimum, it shall include:-

- Weather record for the day
- Number of operatives present on site; categorised by trade or skill
- Number of items of major plant; giving make, model and physical location on site
- The locations and description of major activities on site

At the end of each week the Contractor shall give a copy of that week's diary to the S.O. duly signed and dated.

37.0 CO-ORDINATION MEETINGS AND PROGRESS REPORTS

Meeting shall be convened by the S.O. from time to time to facilitate co-ordination of various works necessary for completion of this Contract. The Contractor shall attend the meetings when so directed in writing by the S.O.

Any person attending the meeting on behalf of the Contractor shall be deemed to act on the Contractor's behalf, and any agreements made shall be binding on the Contractor.

The Contract sum shall include allowance for attendance at monthly meetings or any other meetings called during the cause of this Contract.

At monthly intervals, the Contractor shall submit to the S.O. four (4) copies of the written detailed progress report in the form of up-dated progress chart in Microsoft Project and supported by other bar charts indicating the stages of work in all main operation as aspects, design, ordering of materials, manufacture, inspection and delivery. These reports shall be accompanied by such additional information in approved standard form, as may be required by the S.O. The report shall reach the S.O. before the seventh of each new month. The reports shall be forwarded promptly so that on receipt by the S.O., the information contained therein is not more than 7 days out of date.

38.0 TRANSPORT

The Contractor shall provide and keep available at all times during the period of construction and such times during the period of maintenance as shall be required by the S.O.'s Representative, in the performance of his duties in this Contract the following means of transport:-

- i) New 4-door four wheel drive manually geared petrol vehicles of not less than 1300cc capacity complete with air-conditioner and other necessary accessories.
- ii) New motorcycles of not less than 100 cc. Each motorcycle shall be equipped with two crash helmets.

The quantities required shall be as stated in the Bill of Quantities.

On completion of the Contract, the vehicles will be reverted to the Contractor. In the event of the vehicles breaking down or otherwise not being available, the Contractor shall within 24 hours provide alternative vehicles of a similar type.

The vehicles shall be comprehensively insured to permit the Contractor's drivers and the S.O.'s Representative to drive or ride.

The Contract Rates for transport shall cover all costs of providing running and upkeep of the transport including depreciation, taxes, comprehensive insurances, licenses, fuel, oils, lubricants, repairs and maintenance.

39.0 ASSISTANCE TO SUPERINTENDING OFFICER'S REPRESENTATIVE

The Contractor shall render all necessary assistance to the S.O.'s Representative and shall provide and maintain a sufficient supply of pegs, poles, sight rails, paint, lines, spirit levels, stores, and tool sets required for checking the setting out of the Works, as well as suitable protective clothing, rubber boots and the like. The Contractor shall provide as many full time or part time chainmen as may be required.

The cost of the labour, plant and materials required by the S.O.'s Representative's staff for checking the setting out of the Works, inspection and supervision of the Works, and for the sampling and testing of materials for which no separate item is provided in the Bills of Quantities, shall be included in the Contract Rates generally.

40.0 SUPERINTENDING OFFICER'S APPROVAL

Wherever the S.O.'s approval is given to any portion or stage of the Works before the succeeding portion or stage of the Works is allowed to be carried out, such approval shall not absolve the Contractor from his liability to make good any defects, which may be discovered or occur subsequently during the Defects Liability Period of the Contract.

41.0 TEMPORARY ACCESS ROAD

The Contractor shall at his own expense and risk provide, operate and maintain to the satisfaction of the S.O. all temporary roads used by him and his vehicles for access to the site. These access roads shall be maintained such that access to the site is possible at all times for the S.O. by means of light vehicles.

The Contractor shall also be entirely responsible for any damage caused by his staff to any other roads used for access to the site and obtaining any approval from the authorities in connection with the use of the road.

42.0 WORK OUTSIDE NORMAL HOURS

No work shall proceed outside normal working hours without the prior approval of the S.O. and such other Statutory Authorities as may be required. This applies to work before 7.00am on any day or later than 5.30pm on any day, and on Sundays, and Public Holidays. The Contractor shall be liable for payment to the S.O. for cost of any additional supervision or inspections made necessary by work outside the time specified.

It is anticipated that works may have to be carried out during the night and the Contractor shall allow all necessary cost in executing work at night.

43.0 FORMS FOR MONTHLY STATEMENTS

Monthly statements submitted pursuant to the Conditions of Contract may be proposed and prepared by the Contractor or adopted from any format approved by the S.O. Such forms shall be provided by the Contractor and shall be printed to the

approval of the S.O. as soon as practicable after the receipt of the S.O.'s Order to commence the works. Each statement shall be fully detailed and six (6) copies shall be submitted to the S.O. through his Representative.

44.0 TEMPORARY CONNECTIONS DURING CONTRACT PERIOD

The Contractor shall make his own arrangements for supply of water and power required for the Works. All costs associated with the supply of water and power supply shall be paid by the Contractor and shall be priced accordingly.

Should the Contractor wish to connect to any water mains where such mains exist, the Contractor shall obtain the express approval of the S.O. in each and every instance. The repair of damage occasioned by the Contractor to any water supply fixture of fitting shall be charged to the Contractor.

The Contractor shall arrange for and pay all costs connected with the installation of temporary power supplies for use during the Contract Period. The cost of all power used shall be borne by the Contractor.

Contractor shall be responsible to ensure water and power supply are made available all the time including during testing and commissioning. All cost incurred will be charged to the Contractor accordingly.

45.0 OBVIOUS WORK

The intent of this Contract includes the survey, preparation of detailed drawings or shop drawings, manufacture, test, supply, erection and commissioning of all pipes and fittings for the proper completion and operation of the Works. Notwithstanding that these documents have been drawn up with all possible care, if any details of the Works have not been included within this Specification or detailed on the Drawings but the necessity of which might reasonably be implied from the above stated intent, and, such details are usual or essential to the completion of the Works, the same details shall be deemed to be included within this Contract whether so particularly itemised or specified or detailed or not, at **NO** additional cost to the Contract.

The word 'approved' or 'to be approved' used in conjunction with equipment or material, the make of which is not defined, shall mean that the S.O., shall select or reject a type from samples or drawings, which the Contractor shall provide and that the S.O. decision shall be final.

46.0 STATUTORY REGULATIONS AND APPROVAL

The Works and all Plant, Equipment and materials forming part of this Contract shall comply in all respects with the relevant Malaysian Statutory Regulations, Bye-Laws and Orders currently in force; and the Contractor's attention is drawn particularly to the Regulations of the Machinery Department, Chief Electrical Inspectors Department, Tenaga Nasional Berhad, Suruhanjaya Tenaga, local authorities, JKR, etc.

The Contractor shall be responsible for obtaining the necessary approvals from the relevant Departments and Authorities for all items of Works under this Contract. It shall also be deemed that the Contract Price includes the attendance to local authorities, Chief Electrical Inspector, Fire Officer, the Machinery Inspector, etc. and all costs to ensure conformity with current regulations of the above-named Departments. The approval of Equipment and materials by the relevant authority shall not prejudice the right of the S.O. to reject such Equipment or materials which may not comply with the Specification.

The supply of all danger notices, warning notices, etc. to the requirements of the Chief Electrical Inspector and other relevant Departments or Authorities shall be included in the Contract.

The Contractor shall allow for and obtain all necessary permits and licenses, etc. required from the relevant authorities in connection with the carrying out of the works and pay all deposits, fees, royalties in connection therewith. The Contractor shall also allow for the costs of arranging for inspection by officials of Local authorities from time to time during the Contract period and defect liability period.

47.0 NOISE

The S.O. operates and enforces a policy of noise reduction. The Contractor is required to adopt this policy. Prior to the use of any plant or the commencement of any noisy work on the site, the Contractor is required to submit a noise assessment report. These are to be agreed with the S.O. and relevant authorities.

The Contractor shall comply with the NR Ratings stipulated by the Department of Environment (Kementerian Sumber Asli dan Alam Sekitar).

48.0 DELAYED TAKING OVER

If, due to circumstances beyond the control of the Contractor, the Works cannot be put into service on completion or Commissioning and Acceptance Tests cannot be carried out on completion of works, the Defects Liability Period as defined in the Conditions of Contract shall commence either from the date on which the tests on completion are carried out or from the date on which the Works are put into service, whichever is the earlier.

49.0 FIRE

All rubbish, packing, discarded or surplus materials shall be removed from the site periodically and shall not be burned on site.

50.0 SUPERVISION

The Contractor or his authorised representative shall be fully responsible to ensure all the works included in the Contract are faithfully executed and commissioned in accordance with the provisions of the Contract Documents.

The Clerk of Works, Inspector or Resident Engineer (R.E) appointed for the purpose of supervising work under this Contract will be responsible for:-

- (i) Keeping records of the progress of the work as required by the S.O.
- (ii) Inspecting the works in progress from time to time to ensure accord with the design intent.
- (iii) Verifying and recording the quantity of any works carried out by day labour under a variation order or for the purpose of monthly payment.

51.0 PIPE BALANCE AND EXCESS MATERIALS

The Contractor shall be responsible for pipe balance and excess materials. The rate for transportation and removal of excess materials to Contractor's own site is deemed to be provided for in the Bills of Quantities, unless otherwise specified.

The Contractor is required to submit in a format to be agreed with the S.O.'s Representative details of materials supplied, laid, left over and loss items, all to be incorporated in an overall "pipe balance" list. The said list shall be endorsed by the Contractor and the S.O.'s Representative and attached to the Final Certificate for submission to the S.O.

Pipe balance and excess materials shall not be measured for payment.

52.0 RIGHT TO OPERATE UNSATISFACTORY EQUIPMENT

Irrespective of accepted works testing by certificate and/or witness, the Contractor shall be responsible for ensuring that the equipment installed on site performs as guaranteed and specified. Equipment that fails to meet these requirements shall be made good at no cost to the S.O. Equipment that continues to fail to meet the required performance as guaranteed and specified shall be liable to rejection and shall be replaced by the Contractor at no cost to the S.O. The S.O. reserves the right to continue using the rejected Plant or Equipment until the replacement is available at no additional cost to the Contract.

53.0 SUPPLY OF CLEAR WATER FOR TESTING AND COMMISSIONING

Upon completion of installation, the Contractor shall supply clear water at his own cost for testing and commissioning of the works until the completed Works are handed over to the S.O.

54.0 TRAINING OF OPERATORS

Following the complete acceptance testing of all the Equipment installed under the Contract, and satisfactory commissioning of the Plant, the Contractor shall give full training to the plant operators in the proper procedures for operation and

maintenance of all items of Equipment provided under the Contract. The Contractor shall allow in his Tender Price for such training to be carried out.

55.0 LABELS

When instructed by the S.O., mechanical equipment items shall have an identification plate securely fixed to the body. The identification plates and labels shall be of approved non-corrodible metal and the data shall be engraved or stamped. Neither glue fastening nor painted nor printed on data shall be acceptable. Data required for mechanical equipment shall include the manufacturer, the date of manufacture, the country of manufacture, the operating conditions and supply conditions that might be applicable.

The direction of opening of valves shall be permanently indicated by arrows on handwheels or operating levers. All valves shall be clearly labelled with the appropriate function and identification.

56.0 APPLICATIONS FOR PAYMENT

Unless instructed otherwise by the S.O., each of the Contractor's applications for payment pursuant to the Conditions of Contract shall be numbered consecutively and shall be submitted in minimum six (6) identical copies to the S.O.'s

Claim shall be accompanied by Bill of Quantities giving the following detailed particulars: -

- (a) **Every** item for which payment (in whole or in part) is being claimed up to the date of the application, listed in the manner and in the order of the Bill of Quantities.
- (b) The amount of payment being claimed in respect of each item (quantities or percentage of Works completed to be stated where appropriate), justification of proof of completed works or stages of completion, sketches, drawings, etc.
- (c) Details of Variation Orders, if any, approved by the S.O., with the amounts to be added or deducted in respect of each,
- (d) A summary of Day-work, if any, ordered by the S.O.,
- (e) A summary (or Summaries), grouped in the same manner as in the Schedule of Prices, showing the total gross value of work done to the date of the application,
- (f) The deduction in respect of retention money, details being given where necessary,
- (g) The resulting net total amount claimed,
- (h) The deduction in respect of amount previously certified for payment,
- (i) The resulting amount claimed as payment due on the application.
- (j) The provision of pipe logs properly endorsed by all parties.

A fixed date for measurements shall be agreed upon with the S.O. on a monthly basis for which measurements for Works completed are conducted. This fixed date shall not vary from month to month without the prior and written consent of the S.O.

The application for payment shall be duly certified by the S.O.'s Representative and the Contractor's Site Agent.

57.0 REQUIREMENT OF CONSTRUCTION INDUSTRY DEVELOPMENT BOARD

The Contractor is required to be registered with the Construction Industry Development Board (CIDB) and shall undertake to pay the Board a levy on fee in accordance with the latest requirement.

58.0 ENVIRONMENTAL POLICY

58.1 General Policy

The Contractor shall implement an Environmental Quality Management (EQM) programme within one (1) month of award of the contract, the contractor shall provide details, the methodology and procedures for effective management of environmental impact during the design, construction, reclamation and maintenance of the project. The EQM Programme shall conform to SYABAS' Policy and be subject to the S.O.'s approval.

58.2 Compliance with Environmental Legislation

The Contractor shall comply with all applicable laws, regulation, guidelines and terms and condition of approvals issued by the Deputy of Environment. The EQM shall cover both the construction stage and operation stage, addressing, among other things, to submit report and the application of the Occupational Safety and Health ACT 1994, Occupational Safety and Health (Use and standards of exposure of Chemical Hazardous to Health/Regulation 2000-JKKP Dept), Environmental Quality Act and Regulation, Occupational Safety and Health (Control of Industrial Major Accident Hazards) Regulations 1996 (or CIMAHA Regulations), the Emergency Response Programme (ERP) and Erosion and Sediment Control Plan (ESCP). The Contractor shall take into account the condition of approval of the scheme issued by Jabatan Alam Sekitar when preparing the EQM.

58.3 Environmental Co-ordination Plan

The Contractor shall develop an Environmental Co-ordination Plan (ELP) that describes the environmental co-ordination procedures and implementation of the EQM programme. This Environmental Co-ordination Plan shall be submitted to the

S.O.'s Representative by Contractor, for approval. The Plan shall be for the duration of the Contract award. It will outline but not necessary be limited to:

- a) How environmental matters will be address during engineering design?
- b) How environmental protection procedures will be implemented during all phases of construction?

58.4 Environmental Audit

The Contractor, in consultation with the S.O's Representative, shall develop procedures for the audit of performance of the Work. Contractor shall permit free access at all times to S.O's Representative for the completion of environmental audits of performance. The Contractor shall expect, at anytime, worksite visits and compliance audits of regulatory terms and conditions by the Department of Environment (DOE). The Contractor shall develop procedures to address these sites visits and shall notify S.O's Representative supervisory personnel of the intent and content of any meetings, discussion and correspondence with the Department of Environment.

58.5 Environmental Training

The Contractor shall provide on site construction inspection and audit training for Engineers or Supervisors designated by S.O's Representative. The purpose of the training is to provide S.O's Representative personnel with a complete understanding of environmental inspection and co-ordination of all phases of construction reclamation and maintenance activities. The Contractor's environmental specialist will co-ordinate the training activities and report to the S.O's Representative on the status and progress of training.

58.6 Close-Out

Upon completion of work, the Contractor shall hand over all minutes of meetings, correspondence, reports and other records pertaining to discussion meetings, site visits and compliance audits by the Department of Environment (DOE).

On an on-going basis, the Contractor shall keep the S.O's Representative informed of all communications and correspondence with the Department of Environment (DOE). Upon completion of the activities, the Contractor shall hand over to S.O's Representative, copies of all minutes of meetings, correspondence, reports and records pertaining to dealing with such parties.

59.0 SURVEY WORK

The Contractor shall engage a licensed surveyor registered with the Institution of Surveyors to carry out ground survey of the work.

Complete topographical survey of the site shall be completed within 30 days after the acceptance of the tender. This information shall be forwarded to S.O. for design updating.

Survey works shall include:-

- Planimetric control
- Height control
- Monumenting
- Strip survey corridor of minimum 20m
- Longitudinal profiling

Presentation of survey data shall be according to standard pipeline survey format (plan and longitudinal section) including overall plan approved by the S.O. Three (3) sets of the drawings shall be issued in hard copy format (A1 size), three (3) sets of the drawings in A3 size and soft copy format (ACAD drawings in drawing format). All hardcopy drawing shall be signed and stamped by a registered surveyor.

The Contractor's surveyor shall update the survey data during the construction for preparation of as-built drawings, which shall include

- Recording of actual work done.

Cost for this survey works shall include provision of drawings and CDs.

59.1 Scope of Services

The scope of service to be provided by the Surveyor shall include:-

- (a) Obtaining all necessary topographical maps, certified plans, revenue sheets
- (b) Discussions with the relevant authorities before commencing the Works
- (c) Study all relevant information and maps provided/available and obtain additional data if necessary for the proper execution of the Works
- (d) Set out a control traverse connecting the above to the nearest State Grid net and provide height control from existing bench marks (BM)
- (e) Set out a control traverse for the proposal pipeline route carry out a strip survey at 1m contours and setting out of routes
- (f) Establishment of Special Types of Reference Marks
- (g) Performance of all fields survey works necessary to locate accurately the location and dimensions of the following features
 - i. Locations and description of all topographic features such as roads, tracks, mines and a description of surface features
 - ii. Location and extent of all existing grave sites, burial plots and holy ground, if these are evident on the ground
 - iii. Location and extent of all existing and proposed structures which will influence the design of the scheme to the extent that such information is available, at the time of survey, from the Local Offices of the Authorities concerned.
 - iv. Location and depth, within the specified survey of all existing service conduits both overhead and exposed such as water mains, Tenaga National Berhad (TNB) cables, drainage pipes or channels (indicating discharge direction), Telecom cables; including location of all associated chambers, valves, valve boxes, pits, inspection chambers and other similar appurtenances.
 - v. Location and extent of swampy and waterlogged areas as can be determined at the time of survey
 - vi. Bridges and culverts

The following information and details are required only where relevant to design of pipelines.

- i. Cross-section and plan views showing reduced levels of the structure, details of wing-walls, headwalls, piers, pavement width and existing service conduits. Maximum flood levels should be indicated (to the extent that this is obtained from local sources) and source of information to be advised.
 - ii. Highest known flood level of the area surveyed
 - iii. Baseline from which reference can be made, preferably to tie up with existing boundary stones.
 - iv. Any other information which may be required for design
 - v. Property boundary stones within the specified survey shall be located. If found, they should be tied to the proposed control traverse line
- (h) Preparation of drawings suitable for design.

59.2 Accuracy of Survey

All work shall conform to the standard of accuracy given below and any work found not conforming to any of the following requirements shall be rejected and re-surveyed without any additional cost.

The maximum allowable error for all measured distance shall not exceed 1 in 4,000.

The maximum allowable error in all levels shall not exceed $\pm 0.02 \sqrt{K}$ m where K is the distance in kilometer. Daily work shall be tied back to the starting point of the day.

59.3 Survey Plan and Scales

The Surveyor shall prepare the following survey plans based on the data and information of the field surveys:-

- (a) Computer drawn plans, in State Grid Net where possible to a scale of 1: 1000 or other suitable scale to fit A1 size for the incorporating all features detected.
- (b) Computer drawn location plan

60.0 AS-BUILT DRAWINGS

As built drawings shall be produced by the Contractor on a continuous basis and as soon as possible after the construction of the various system, or within one month after completion of the work. For this purpose, an item has been allowed in the Bill

of Quantities. The standard and details to which such as-built plans shall be drawn up as directed by the S.O.

The Contract Price shall be deemed to include the cost of preparation, supply and delivery of all original drawings and information duly certified by the Contractor and his surveyor as follows: -

- a) 5 full sets of drawings in paper (A1 size)
- b) 5 full sets of drawings in paper (A3 size)
- c) 1 full set of drawing in digitised format (Auto-cad in the released to be approved by the S.O)

All such printed drawings shall be well bounded with thick covers.

All drawings submitted to the S.O. shall be in accordance with the following guidelines:-

- (a) Each Drawing shall have a Title Block indicating the Title of the Job, Title of the Drawing, Scale, Date, Contractor's Name and Address, Revision Index and Drawing No.
- (b) On each Drawing, details such as pipe invert level, size, valves, bends, etc shall be indicated as clearly as possible to include all the works to be carried out on site. Such details shall be provide presented in both plan and longitudinal section.
- (c) Plan and longitudinal section of pipe profile drawings showing invert level of pipe, alignment of pipe, details of pipe particulars.
- (d) Details drawing showing air valves, washout, valves chamber, crossing pipe bedding method, jointing etc.
- (e) Each drawing shall be certified by a qualified Professional Engineer and Surveyor.
- (f) The drawing shall incorporate S.O.'s GIS mapping requirements.

Failure to observe any of the above shall delay the approval of the shop drawings and the Contractor shall be held entirely responsible for such delay and no extension of time shall be allowed.

*Standard symbols and legends for SYABAS requirement as per Standard Drawing.

61.0 MANUFACTURER'S WORKS INSPECTION AND TESTING

All items of equipment and materials: pipe, specials and valves shall be subjected to inspection and testing before despatch unless officially waived in writing by the S.O. All inspection, examination and testing at the manufacturer's works shall be carried out strictly in accordance with the appropriate Malaysian Standard, British Standard, International Standard or such other standard as may be approved by the S.O.,

unless otherwise specified to ensure that the equipment and materials being supplied meets the requirements of the Specification.

The fulfilment of the declared guarantees shall be verified at the Manufacturer's work tests.

All costs inclusive of S.O.'s travelling, accommodation and other related expenses to be incurred by the manufacturer in carrying out witness testing of the equipment and/or materials shall be included in the contract sum.

The Contractor shall give sufficient notice to the S.O. before the intended date of inspection and testing at the Manufacturer's Works as per Specification. Details of testing, measurements and recording instruments including calibration certificates shall be submitted to the S.O. for approval. All instruments shall be calibrated and certified by an approved independent testing authority not earlier than one (1) month before the tests.

The S.O. and S.O.'s representative will each nominate an authorised representative to inspect and examine the equipment and material and witness tests at the Contractor's premises or at Manufacturer's Works. The S.O.'s representative will endorse all copies of Manufacturer's Certificates of successful tests witnesses by him. When the S.O. or S.O.'s representative witnesses a test, they shall be given a copy of the test certificate immediately. When tests have been conducted in the absence of the such representative, this fact should be noted by the Contractor on the test certificate.

Upon the satisfactory completion of all tests required by the Specification for an item of equipment and materials, the Contractor shall send to the S.O., four (4) copies of particulars of the tests carried out, readings obtained, performance calculations and details of calibration certificates referred to in the previous paragraphs. Test certificate shall be submitted in booklet forms and securely bound.

No material or item of equipment and materials shall be delivered to Site until its certificate has been approved in writing by the S.O. The approved by the S.O. of the results of any inspection or test shall not prejudice the rights of the S.O. to reject the equipment and materials, if it fails to comply with the Specification when erected or to give complete satisfaction in service.