



**Project : ASU No 9 Košice**  
**IA.Z Rüdiger**

**for the ready-to-operate erection  
of the piping system**

**for the Air Liquide AGS Air Separation Unit Project  
at the site of US Steel Košice  
in Košice, Slovakia**

<b>Project :</b>	<b>ASU No.9</b>	
<b>Projectnumber :</b>	<b>K70101</b>	
<b>Date of :</b>	<b>11/11/2004</b>	
<b>Revision :</b>	<b>FOR QUOTATION</b>	
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**1 Projectdescription**

An air separation unit will be erected on the site of US Steel in Kosice, Slowakei for production of gaseous oxygen (GOX), nitrogen (GAN) and argon (GAR) as well as liquid oxygen (LOX), nitrogen (LIN) and argon (LAR).

The plant basically consists of the following main individual components

1. Air compressor ( ASU , later on )
  - Air suction pumps
  - Air suction filter house
  - Air compressor (MAC)
  - Booster air compressor (BAC)
  - 2 GAN Compressor
2. Direct contact after cooler system with pumps ( ASU , later on )
3. Chill tower with pumps ( ASU , later on )
4. Molecular sieve station ( ASU , later on )
  - Vessels 1 and 2
  - Air filter
  - Stack
5. Cold box area ( ASU , later on )
  - Cold box
  - Main heat exchanger
  - Cooler
  - 2 expansion turbines / generators
  - 2 LOX-process pumps
  - 2 LIN-process pumps
  - LAR-back up pump
  - 2 LIN-back up pumps
  - Main product vaporizer
- 6 Tank farm
  - connecting pipelines , ready-to-operate erection
  - LIN tank : erection by other supplier
  - LOX tank : erection by other supplier
  - LIN MP tank: erection by other supplier
  - GAN Reservoir : erection
  - 3 waterbath vaporizers for LIN, steam heated/ nat.gas heated / LOX, steam heated :  
erection
  - 4 air vaporizer for HP LIN : erection
  - 5 x Back up pumps LIN : erection
  - 4 x Back up pumps LOX : erection
7. Cooling tower system ( ASU , later on )
  - Cooling water pipe system, on piperack underground lines



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## **2 Scope of delivery and service**

The scope of delivery and service of the contractor includes the ready-to-operate erection of the connecting pipelines and the corresponding documentation for the plant as described in chapter 1.6 in accordance with this specification, the enclosed documents (as per chapter 8) and the detailed estimates.

### **2.1 Completeness of delivery and service**

The completeness of delivery shall be done within the agreed scope, so that the complete piping structure allows an operation of the plant, even if individual parts are not mentioned or described expressively.

### **2.2 Not included in the scope of supply**

The following works are not included in the scope of the supply of the contractor:

- Earth, concrete, and masonry works,
- Final painting,
- Internal piping of the cold box  
Internal piping of the tanks  
Internal piping of the vaporizer

### **2.3 Purchase of material**

General contractor to submit as part of this tender a detailed list of which material can be purchased direct or via subcontractor in Slovakia.

This answer is expected in **two weeks of this bid period.**

**3 Implementing provisions****3.1 General requirements****3.1.1 With regard to ready-to-operate pipelines**

Pipelines shall be made in accordance with the technical documentation so that they safely resist the mechanical, chemical, and thermal stresses to be expected due to the proposed operating mode and so that they remain leak-tight.

In particular,

1. They must be equipped with all devices (e.e. safety valves, expansion joints etc.) required for safe operation as well as safe designed for the required operation.
2. They must be made of material, which
  - a) Will have the required mechanical characteristics for the finished parts
  - b) Will not be destroyed by the fluid in a dangerous manner and will not have dangerous connections, even if the material is in contact with the fluid.
  - c) Is not corrosive or protected against corrosion as long as they have corrosive interfaces
3. They must be laid out as to cause no danger to employees or third parties.
4. Fit lengths must be arranged so that any tolerance variations can be compensated (that is incl. flange connections and the connections to keep machinery stress free).

All documents shall be checked for above mentioned parts by the contractor, and any deviation must be agreed to with Air Liquide AGS.

The contractor has to enter all welding seams and fit lengths into the isometric duratings supplied by Air Liquide AGS and to request for approval by Air Liquide AGS site management.

Dimensional deviations of the pipe routing from the design are not allowed.

**3.1.2 Technical rules and regulations**

The national statutory and governmental regulations and acknowledged rules of technology shall apply.

Guarantees and liabilities shall not be affected by this provision.

The contractor's responsibility and liability shall in no way be limited or annulled by proposals or provisions made by Air Liquide AGS, unless other written agreements are made at a later time.

Even the fact that Air Liquide AGS has made no objections to calculations, proposals or drawings from the contractor which later prove to be unsuitable and faulty shall not relieve the contractor of its responsibility and liability.

For installation work, materials and quality control as well as for the design and drawings, which might be provided by the Tenderer, all aspects of the

**AirLiquide AGS STANDARDS** will apply.



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### **3.1.3 Prevention of accidents and environmental protection**

The contractor shall make arrangements and take measures for the prevention of accidents and for environmental protection in accordance with the generally accepted rules of safety, the environment and industrial medicine.

Prior to starting the installation works, the contractor shall seek information from **Air Liquide AGS** and **US Kosice Working Order** about any national additional provisions for the prevention of accidents, the protection of labour and the environment as well as any other statutory provisions to be observed for the site and shall give Air Liquide AGS written confirmation of this.

The contractor shall inform its subcontractors and subsuppliers about these obligations in writing.

The parties hereto shall exchange lists of persons in charge.

The regulations for works safety customary in the country as well as the regulations of US Kosice must be strictly observed on the whole building site.

The contractor shall assume responsibility for any and all duties to safeguard traffic as well as obligations based on public-law regulations within his site area for the time of construction in the country of deployment.

In particular, the contractor undertakes to ensure that his employees and subcontractors are informed of any operational hazards involved with a view to preventing accidents in the use of energies and the site water. (Site safety meetings to be held once/week.)

The contractor shall ensure observance of the generally accepted rules of technology within his area to guarantee safe and environmentally friendly working conditions.

Protective devices must be neither removed nor damaged.

Any orders given by the site manager or the works manager in this respect must be complied with. The Air Liquide AGS site manager shall be entitled to set the contractor deadlines for remedying safety or environment-related defects. In the event of any danger to life, limb or the environment, work may be stopped on demand.

The contractor shall not be entitled to claim damages or the reimbursement of costs caused by the execution of these orders.

### **3.2 Piping parts, piping materials, piping construction**

- General: It is the intend to use EN/DIN material and specifications wherever possible. Contractor to submit to Air Liquide AGS in writing that material is available to start prefabrication, fabrication and execution.

#### **3.2.1 Employed pipe classes**

The pipes, fittings, seals etc. to be used for the ready-to-operate erection of the connecting pipelines are described and defined by pipe classes (s. annex).

Any deviation from these specifications must be agreed with Air Liquide AGS.

The contractor is responsible that all piping parts are suitable to inspection protocols and testing protocols.

**3.2.2 Pipe supports and constructions****3.2.2.1 Supporting and suspension systems**

Supports and suspensions shall be arranged and designed so as to avoid any transmission of structure-borne sound from pipelines to buildings and plant parts.

The contractor undertakes to check whether the number and design of the supports and suspensions are sufficient and to ensure that no inadequacies can arise during operation.

In case of discrepancies or doubts, the contractor shall submit to Air Liquide AGS alternative proposals in a finely fashion.

**3.2.2.2 Bleeding, draining, cleaning and flushing connections**

To ensure proper bleeding and draining, an adequate number of the required bleeding, draining or purging connections shall be provided. Details shall be proposed by contractor and agreed by Air Liquide AGS.

No dead spaces, water or air pockets shall be formed to avoid corrosion due to the accumulation of gas or water.

The contractor must check any documents handed over to him accordingly and complete or revise them where required.

**3.3 Execution of permanent connections**

All welding works executed on the premises shall require a written welding permit, which shall be requested from Air Liquide AGS site management.

In addition, the statutory regulations for the prevention of accidents and for protection of the environment customary in the country shall be strictly observed.

**3.3.1 Welder qualification and welding works**

The contractor must fulfil the requirements according to DIN/EN719 and DIN/EN729 Part 2. Welders must have valid qualification certificates. The certificates shall be submitted to the Air Liquide AGS site management prior to starting works.

Welding works must be executed only by skilled and qualified welders exercising utmost care and using suitable equipment and approved welding filler materials.

Welders must be tested according to EN 287-1 for steel welds and according to EN 287-2 for aluminium welds (if available). These certificates shall be submitted to Air Liquide AGS site management, prior to starting works.

If aluminium welding works are within the scope of supply every aluminium welder will additionally be approved by Air Liquide AGS site management. The test and the approval will be carried through as a welding seam on site in a constrained welding position.

All pipe seams shall be marked. The mark shall be placed near the seam permanently and is included in the documentation.

When welding works are performed in the cable tray area, the cables must be covered with metal sheets of an adequate width 3 m on both sides of the weld. The cable trays must not be walked on or used for other supports or fasteners.

Any damaged insulations shall be replaced by the contractor free of charge.

**3.3.2 Weld preparation**

The weld ends shall be prepared in accordance with the acknowledged rules of technology.

Any deviations in the pipe inner diameter shall be eliminated by grinding or turning out. The operating rules set forth in AD-Merkblatt HP 5/1 shall apply.

When the work aid is removed, care must be taken that no notches are produced. Seam residues shall be removed by grinding.

**3.3.3 Carbon steel piping****3.3.3.1 Welding execution**

For all carbon steel pipes TIG welding shall be done for the root. Cover passes may also be executed with electric processes. Backing rings are not permitted.

In all carbon steel pipelines the root bead must be executed using the TIG process only. Lines  $\geq$  NW 700 may be welded using the manual electrical weld process; slag and weld spatter on the inside must be removed by grinding.

The welds must show a complete fusion. There must be neither cracks nor non permissible undercuts, lacks of fusion or major slag inclusions. The weld surfaces should be smooth and without coarse ripples.

The longitudinal seams of two pipe ends must be offset to avoid cross joints.

**3.3.3.2 Weld inspection**

- The quantity of radiographic tests is given by Air Liquide AGS. In principle at least one weld of each dimension shall be tested. Air Liquide AGS identifies which welds shall be examined by radiography.
- Welds shall be subjected to a radiographic test at the expense of the contractor
- In the event that the assessment of such tests reveals rejection values of 10 % and more, Air Liquide AGS shall have all welds examined at the expense of the contractor. Any costs incurred for repair and repeat testing shall be borne by the contractor.
- The assessment shall be made in accordance with EN 25817, evaluation class B, in accordance with AD-HP 5/1 (external findings) and AD-HP 5/3 (internal findings).
- Ongoing documentation available to site management must show the status and acceptance of all tests performed.

**3.3.4 Aluminium piping**

It is the intent of this specification to include the aluminium piping scope. This may be added at a later time.

**3.3.4.1 Welding execution**

All pipes shall be welded using the TIG process.

The welds must show a complete fusion.

The longitudinal seams of two pipe ends must be offset to avoid cross joints.

### 3.3.4.2 Weld inspection

The quantity of radiographic tests is given by Air Liquide AGS. In principle at least one weld of each dimension shall be tested. Air Liquide AGS identifies which welds shall be examined by radiography.

Welds shall be subjected to a radiographic test at the expense of the contractor.

In the event that the assessment of such tests reveals rejection values of 10% and more, AGS shall have all welds examined at the expense of the contractor. Any costs incurred for repair and repeat testing shall be borne by the contractor.

The assessment shall be made in accordance with EN 30052, evaluation class B.

### 3.3.5 Stainless steel piping

#### 3.3.5.1 Welding execution

Welding for stainless steel pipes shall be done using the TIG-process. The cleaning of welds shall be done by pickling or with austenitic steel brushes.

The maximum allowed root-heightness shall be in diviation to DIN/EN 25817, evaluation class B according to the following table:

Pipe dimension	maximum allowable root-heightness Nr. 16 of EN 25817
6 x 1 mm	0,5 mm
10,2 x 2,3 mm	0,5 mm
13,5 x 2,9 mm	1 mm
17,2 x 3,2 mm	1 mm
21,3 x 4,5 mm	1 mm
26,9 x 4,5 mm	1 mm
33,7 x 6,3 mm	1 mm
44,5 x 4 mm	1 mm

The lines must always be kept under shielding gas.

The longitudinal seams of two pipe ends must be offset to avoid cross joints (min offset 45°).

All pipeends have to be centered before tacking.

#### 3.3.5.2 Weld inspection

A X-ray testing from the executed weldings will be done to all above ground lines at Air Liquide AGS cost according to DIN 54111 Sheet 1.

The assessment of the films follows to DIN/EN 25817, evaluation class B.

If any errors occur, this will require a replacement of more than 10% of the weldings done by a certain welder, all welds done by this welder need to be checked at the contractor's costs.

For all other irregularities according to DIN/EN 25817 evaluation class B is valid without exeption. In general Air Liquide AGS reserves the right to change the testing volume at his discretion.

**3.3.6 Soldering**

Soldering works shall only be done by skilled personnel with greatest care and with use of suitable solders and flux.

All soldered joints shall be marked permanently by a chloride and sulphurfree pencil.

Filler materials for all soldered joints shall be fixed by the contractor and will be released by Air Liquide AGS.

Only hard soldered connection are accepted. Execution shall be according to DIN 2856.

Flux remains shall be removed.

Leak soldered joints shall be replaced completely.

**3.4 Handling of pipes****3.4.1 Cleaning of pipes**

Prior to transportation to the site, all oxygen-bearing pipe parts shall be sandblasted from the inside with dry and oilfree compressed air or shall be pickled (degree of purity Sa 2,5).

Pickling is permitted for pipe parts of stainless steel and aluminium. After pickling, the parts must be passivated. All piping must be capped during transport.

Pickling on the building site must be executed under strict observance of environmental regulations.

Cleaning of technical plants for oxygen shall be in accordance with IGC rule 33/86/D and Standard 06402 or similar.

After this treatment, silica gel packs are inserted in the internally clean pipes, the ends of which are plugged with plastic caps which shall not be removed until shortly before installation.

On completion or stoppage of the works, open pipe ends must be plugged with plastic caps. All pipe material must be installed and handed over clean and free from contaminations.

Oxygen-bearing pipes must always be free from oil, grease and slip additive (Standard 06401).

**3.4.2 Blowing the pipes**

Prior to commissioning ready installed pipes shall be blown with the medium of use, dried and cleaned air or nitrogen, when they cannot be walked on.

All test media shall be provided by the contractor.

Where examination is impossible, ready installed pipes shall be blown with nitrogen prior to commissioning.

Ready installed gas pipes shall be disconnected from the machines and units. Where required, provisional blowing lines leading to the open air shall be installed. The openings of machines and units shall be closed with plugs or caps.

The provided orifices shall be replaced by orifice exchange rings.

All detachable control valves shall be replaced by fitting pieces.

The provisional blowing lines, exchange rings, blanks, and the fitting pieces remain the property of the contractor.

In general, the blowing procedure is as follows:

- The pipe is blown several times for 15 to 30 minutes using the max gas rate for a short time.
- To improve the blowing effect, welds are tapped with a hammer. Damage of pipes is to be avoided.

Once the last blowing run is completed, all valves, water separators, etc. in the pipe are opened and cleaned. The orifice exchange rings must be replaced by orifices.

This procedure shall be reviewed with Air Liquide AGS in particular cases.

### **3.4.3 Flushing the cooling water-bearing pipes**

Prior to commissioning, the cooling water systems must be flushed several times. Downstream of the machines, units, etc. the pipes shall be equipped with a provisional bypass between supply and return flow. Flush until cleanliness of the water pipes is ensured.

Once the last flushing run is completed, all bleeding, draining, and purging connections as well as the filter systems shall be opened and flushed.

### **3.4.4 Priming of lines**

All pipes, pipe parts, pipe supports, clamps, slides, etc. of carbonsteel shall be supplied derusted and with a priming coat on an alkyd resin basis, incl. aftertreatment in the weld area and repair of defects. This aim is not suitable for galvanized parts.

- Derusting
- Steel derusting degree of purity Sa 2,5 in accordance with DIN 55928, Part 4  
The average surface roughnesses must be between 40 µm and 70 µm. Only abrasives in accordance with the latest regulations and environmental regulations are permitted.  
The blasted surfaces must be freed from dust using compressed air before applying the priming coat.
- Priming, priming coat  
Application method: brushing, rolling or airless spraying  
One-component-PVC-alkyd resin, zinc phosphate coating (high-build system)  
Dry film thickness: min. 80 µm in accordance with DIN 55928, Part 5

## **3.5 Checking the pipes**

### **3.5.1 Visual check prior to the pressure test**

Prior to the pressure test, the contractor must check whether the piping system is ready to operate and is safe, and in particular, whether:

- All flange connections have been done properly;
- All assembly welds are in accordance with the regulations;
- All connections have been remade after blowing or flushing and all valves, steam traps, etc. are reclosed;
- All supports, fixed points and sliding bearings are available and fixed;

- The lines are installed with the specified inclination;
- Sags are not greater than 5 mm;
- The lines are installed so as to permit unimpeded thermal expansion, taking account of the position of the fixed points;
- All drains and vents required or specified in the drawings are installed to ensure safe operation;
- All lines are internally clean and dry before they are closed.

### **3.5.2 Pressure test and tightness test**

All required work (e.g. welding of caps or sheets, testing nozzles, interconnecting lines etc.), materials and testing media for pressure and leakage tests are supplied by the contractor at his costs.

First, all gas-bearing pipes must be subjected to a leak test at approx. 0.5 bar using nitrogen.

The pipes must be leak-tested using leak detecting spray (make Wobst or equivalent).

Next, a pressure and resistance check is performed at 1.1 x the perm. operating overpressure using either flow medium or oil-free compressed air. Gas pressure must remain constant for three hours.

All water-bearing lines shall be checked with water at 1.3 x the perm. operating overpressure; here, pressure must remain constant for three hours as well.

A suitable report shall be drawn up on the pressure test and signed by the responsible assembly manager of the contractor and the Air Liquide AGS site manager.

The pressure tests shall be recorded over the complete test period.

The reports shall be added to the documentation.

### 3.6 Extent of radiographic testing

Medium	DN	PN	X-Ray Test in % Weld	Rootheight above pipe		
				Acc. <del>DIN EN</del> <del>ISO 5817</del> or <del>30042</del>	Exceptions for Steel	Exceptions for Aluminium*
Cooling Water	25 bis 50 > 50	bis 25 bis 25	min. 10% min. 10%	B ≤ 3 mm	≤ 1,2 mm	
Condensate	25 bis 50 > 50	bis 25 bis 25	min. 10% min. 10%	B ≤ 3 mm	≤ 1,2 mm	
Piping for Product Lines per Material and Pipe Classification	25 bis 50 50 bis 100 ≥ 100	bis 25 bis 25 bis 25	min. 10% min. 10% min. 10%	B ≤ 3 mm	≤ 1,2 mm ≤ 2,0 mm	≤ 2,0 mm ≤ 2,5 mm
	25 bis 50 50 bis 100 ≥ 100	≥ 40 ≥ 40 ≥ 40	min. 50% min. 50% min. 50%	B ≤ 3 mm	≤ 1,2 mm ≤ 2,0 mm	
O2-Piping according pipe classification	25 bis 50 50 bis 100 ≥ 100	bis 25 bis 25 bis 25	100% 100% 100%	B ≤ 3 mm	≤ 1,2 mm ≤ 2,0 mm	≤ 2,0 mm ≤ 2,5 mm
	25 bis 50 50 bis 100 ≥ 100	≥ 40 ≥ 40 ≥ 40	100% 100% 100%	B ≤ 3 mm	≤ 1,2 mm ≤ 2,0 mm	
Steam Piping	25 bis 50 > 50	≤ 25 ≤ 25	50% 50%	B ≤ 3 mm	≤ 1,2 mm	
	25 bis 50 > 50	≥ 40 ≥ 40	100% 100%	B ≤ 3 mm	≤ 1,2 mm	

Odd local discrapensis up to 3 mm are allowed with Alu- piping, but not for carbon steel piping.

**4 Erection, execution of erection****4.1 Erection**

The contractor undertakes to make sure that all plant components are erected in accordance with the technical documentation. In case of any deviations, the contractor shall inform Air Liquide AGS in time.

Installation includes the complete, ready-to-operate erection of the piping system within the scope of delivery as well as service and transportation of the delivery parts to the building site to the place of installation.

The contractor should inform himself about the specific local conditions at the building site prior to conclusion of the contract.

The contractor shall provide personnel for the installation and all required devices, tools, materials, etc. for the ready-to-operate erection of the piping system on schedule.

The contractor shall provide all scaffolds, platforms and cranes.

**4.2 General installation instructions**

The contractor is responsible for the erection of the installation site to allow performance of the contractual services. The installation staff employed by the contractor shall not enter areas and places other than those required to execute the work. The contractor undertakes to make sure that Air Liquide AGS operations are not affected by the installation works.

Any and all supplementary works such as excavation of trenches, beating in of anchors in the ground, fixing of auxiliary structures, etc. are subject to written approval by the Air Liquide AGS site manager.

Exception permits shall be applied in writing from the Air Liquide AGS site manager.

The contractor is responsible for the surveillance and security of the site huts, scaffolding, equipment, material, etc. within his scope of delivery and service; this shall also apply to any items made available or supplied by Air Liquide AGS. The contractor shall be liable for any lost or damaged equipment, materials, etc. and other losses.

**4.3 Installation devices and tools**

Any installation devices and tools introduced to the premises by the contractor shall be clearly marked with a property sign.

Later marking on the premises is only permitted as an exception and with the express prior approval of the Air Liquide AGS site manager.

Air Liquide AGS reserves the right to make our agreement conditional on the presence of a supervisor named by Air Liquide AGS during the marking.

Upon the introduction of any installation devices and tools to the site, the contractor shall submit Air Liquide AGS a list stating all introduced devices and tools and their marks.

Any materials, installation devices and tools which are removed from the site area must always be accompanied by an outgoing slip made out by the Air Liquide AGS site manager. We reserve the right to check the property mark.

Air Liquide AGS devices may only be used by the contractor with the approval of Air Liquide AGS and at the contractors own risk and responsibility.

**4.4 Project-, site- and erectionmanagement**

The contractor shall provide a responsible erection manager for the period of erection.

**4.5 Prefabrication of pipes**

Prior to start of prefabrication work, the contractor shall check whether the pipeline planning is in accordance with local conditions.

Should the contractor find any deviation, he shall inform AGS accordingly and the deviations shall be taken into consideration in the prefabrication work as agreed with Air Liquide AGS.

The manufacturing tolerances of the individual trades shall be taken into account in prefabrication work (e.g. fit lengths).

**4.6 Time schedule, installation plan**

The contractor shall submit a detailed installation schedule showing the working and calendar days for the beginning and end of each individual manufacturing section with a statement of the interdependencies no later than 14 days after the placement of order.

The installation schedule must indicate the date when the essential items in the scope of delivery and service are delivered, installed and checked by the contractor. It must also show the planned crane and installation locations. The contractor shall arrange the installation sequence so as not to interfere with any follow-up supplies.

The installation plan and time schedule shall be updated at regular intervals and reviewed with Air Liquide AGS.

To guarantee the planned completion dates, Air Liquide AGS reserves the right to supervise the progress of the contractor's scope of delivery and service.

Air Liquide AGS shall have the right to check the progress of work in the premises and workshops of the contractor and its subcontractors or have it checked by a representative. The contractor agrees to provide any necessary information and allow inspections and shall instruct his subcontractors accordingly.

**4.7 Isometrics**

This is to remind contractor that isometrics have been prepared for all lines, but lines smaller as DN 25 have to be field run.

It is further the responsibility of this contractor to dimensionally check all welds per isometrics at site.



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## **5 Documentation**

The contractor shall receive in time from Air Liquide AGS all piping plans, schematics and construction drawings required for its delivery and service.

The contractor shall perform the following services:

Checking or completing the isometrics and piping schematics according to the actual pipe routes on completion of the installation works (as-built documentation).

The as-built isometrics shall include the welder, weld, and test weld no's.

The contractor shall deliver all certificates, test certificates, etc., in particular material certificates (3-fold) in the requested number as required for approval by the authorities.

The contractor shall submit to AGS the complete documentation (as-built, certificates, material certificates, etc.) no later than 4 weeks after completion of the installation works.

**6 Billing mode**

Billing for the complete contract, incl. excess and short services, shall be by means of a quantity survey (made by the contractor and AGS) (handling and settlement as mentioned below) at the agreed unit prices set forth in the detailed estimate.

**6.1 Pipes and pipe parts**

Pipes by actual pipe length; i.e. fittings, valves are not measured.

**6.2 Fittings, valves, welds, separating cuts, etc. by the piece****6.3 Pipe supporting and fixing material**

Structural steel parts are billed on the basis of parts lists and weight.

The weight is determined by theoretical weights without extra charges for waste and small parts.

**6.4 Outages, supplemental hours requested by the site management**

from ½ h on shall be entered in Air Liquide AGS work sheets by the contractor and confirmed by the Air Liquide AGS site manager.

**6.5 Difficulty allowances**

of any kind - incl. seasonal influences of weather - are included in the unit prices of the detailed estimate.

**6.6 Additional pay**

for works outside regular working hours shall be subject to a special agreement with Air Liquide AGS.

**6.7 Provisional takeover**

Provisional takeover of the ready-to-operate connecting pipes shall take place upon completion of the agreed scope of delivery and supply of the contractor.

An adequate report incl. annexes (list of defects, as-built documentation, etc.) shall be drawn up upon the provisional takeover and signed by the contractor and Air Liquide AGS.



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## **7 Site regulations**

The contractor shall observe the QM - Verfahrensanweisung Ingenieurtechnik Baustellenordnung QM 501 (Procedural Instruction Technical Engineering Site regulations) and US Steel Kosice Control Documentation ( Binding upon External Entities) 2<sup>nd</sup> edition. (See annex)

### **7.1 Deliveries**

Delivery, freight prepaid, to foundation or installation site, incl. packing.

Deliveries shall be made by the contractor only when a chief erector of the contractor is present on the site.

Deliveries made in the absence of the chief erector of the contractor shall not be accepted by the Air Liquide AGS site manager.

In the event that, by way of an exception, the contractor is unable to provide a chief erector, the Air Liquide AGS site manager shall be informed in writing no later than 3 days prior to delivery with an indication of the time of arrival.

For all express deliveries, the contractor shall ensure that the Air Liquide AGS site management is informed in advance by telephone or fax.

Heavy-load transports shall be announced to our site manager in writing at least 8 days prior to arrival on the site stating the type of delivery.

The exact time of arrival (day and hour) shall be faxed to our site management 24 hours prior to arrival of the delivery.

### **7.2 Storage and stockkeeping**

The contractor shall be responsible for storage and stockkeeping.

The parts supplied by AGS shall be taken over by the chief erector of the contractor, transported to the place of installation and installed. After takeover, the contractor shall be liable for any loss and damages.



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## **Deadlines**

Start of erection: **13.12.2004** (Vaporizer: 4x Air Vap. and 3x water bath vap.)  
W74101 – W74401 ; 38-41  
W64001 ;33  
W73001 ;46  
W73101 ;47

Start of erection: **13.12.2004** (MP LIN Storage Tank and HP GAN Reservoir)  
B73001 ;44  
B73002 ;45

Start of erection: **27.1.2005** (Connecting pipelines)

Mechanical completion: **13.05.2005**

Documentation: **4 weeks after mechanical completion**

The date of mechanical completion is penalized deadlines.

**8 Supplied documents**

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Tank farm area, ASU No. 9 Kosice

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**10 Price bids**

Till there is no Detail engineering done for that plant, a lump sum price is requested for the offers.

**10.1 Unit rates**

For all qualities of material, certificates of material, testing procedures, site installation, machines, delivery to the site, and all additional costs, a unit rate shall be given for material and for erection as well.

**10.2 Fixed price for blowing and flushing**

A fixprice shall be given for blowing and flushing of the pipes according to 3.4.2.

**10.3 Fixed price for pressure testing and tightness test**

Fixprice for work according to chapter 2.

**10.4 Support construction**

At the basis of the given quantities of supporting material unit rates are required:

Support construction St37.2      \_\_\_\_\_. per kg

Included in this specific price per kg is the erection and all erection material like dowels, PTFE sheets, screws etc.

**10.5 Site preparation**

The complete site preparation including the transportation to and from the site is as well included as cranes, hoists, machines, tools, transportation devices.

**10.6 Additional work, extension of scope**

which may be required by Air Liquide AGS or a third party during the erection period, shall only be done with an agreement of Air Liquide AGS. We are requesting for a quotation of unit rates for:

engineer:      \_\_\_\_\_. per hour

technician:      \_\_\_\_\_. per hour

welder:      \_\_\_\_\_. per hour

fitter:      \_\_\_\_\_. per hour

helper:      \_\_\_\_\_. per hour

The cost for macinery shall be included in that rates.