



Specification

Subject	2 – Purchasing Terms			
Specification	2.5 – Structural Engineering Specifications			
Publishing Unit	MAT	Date: 14.2.2005	by	Herman Hovland
Prepared	BYG		by	Guttorm Røstbø
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Attachment:

No.	Subject
0	Excavation permit
1	Drawing no 24479 Assembly instructions Fireproofing of cable penetrations and cable trays
2	Procedure for unerathing of cables

Purchaser in document is Sør-Norge Aluminium AS



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1. Fireproofing of penetrations and sectioning

1.1. General

FLAMMASTIK is to be used for fireproofing, manufacturer: Jak. J. Alveberg AS or equivalent from other sources. Sealing of perforations and application of paint must be in accordance with Vendor's description. All sealings shall have the same fire rating as the part of the building where sealing is performed, unless otherwise prescribed. The Purchaser shall approve the product and the method of application prior to execution.

1.2 Cable Runs

Cable Trays or bridges shall be terminated 50 cm from the penetration to ensure adequate sealing and access. Drawing no. 24479, Attachment 5, shows penetrations with fire ratings A60 and A120 respectively, as well as fire sectioning with painting of horizontal, vertical and crossed cable runs.

1.3 Duct and Air Vent Penetrations

To be sealed with rock wool and flame retardant paint, FLAMMASTIK or equivalent from other sources, or other approved fire retardant sealant whenever this is expedient. Joint or construction foams must not be used.

1.4 Marking

All places where sealing has been done must be clearly marked in accordance with instructions from the designated person in charge.

1.5 Documentation

Product sheets and MSDS sheets shall be delivered by Supplier to Purchaser prior to the delivery of any materials to same.



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2. Calculations and drawings

2.1. General

Static calculations shall be made for all supporting structures. The Supplier shall submit a complete set of static calculations to the Purchaser. All drawings and calculations shall be submitted to the Purchaser for approval prior to the start of construction work. A complete set of drawings shall be submitted for all components and flexible strips.

Complete assembly and detail drawings with parts list shall be enclosed with the technical documentation.

2.2 Drawings

A complete drawing list shall be delivered.

Complete assembly and detail drawings with parts list shall be enclosed with the technical documentation. The drawings shall be in standard format and be delivered as specified below. In agreement with the Purchaser from case to case transparent copies in quality Polyester film 75 - 100 μ may be accepted if CAD files are unavailable.

The drawings shall be done in CAD, preferably *Auto-CAD*, alternatively Inventor. Drawing formats DXF and IGES as well as FONT files (.shx) are also acceptable. The drawings shall be delivered on CD, 3.5" diskette or email, and must be free from data viruses. Unless otherwise agreed, the drawings shall be organized according to the Purchaser's drawing arrangement as specified below:

Purchaser's drawing arrangement for construction drawings to be used unless otherwise agreed:

Layer Name:	Line Type:	Color:
Drawing frame	Solid	White
Title field	"	White
Heading of title field	"	Red
Text in title field	"	White
Text in drawing	"	White
Measurement figures	"	Yellow
Text in part lists	"	Yellow
Leader text	Solid	Yellow
Outer geometry	"	White (adapted to font type)
Hidden lines	Dotted	Magenta
Auxiliary lines	Solid	Green
Center/symmetry lines	Dot-dash	Cyan
Hatching	Solid	Red
Measurement lines	"	Green
Parts list, outer frame	"	White



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Parts list, division lines	"	Red
Reference lines, balloons	"	Green
Reinforcements	"	To be agreed upon

3. Procedure for unearthing of cables and wires

3.1 General

This procedure applies to earth laying of cables and wires, unless otherwise specified or agreed in writing. The procedure also applies to tidying up in excavated trenches.

3.2 Marking

Before permission is given to excavate, electrical cables and wires must be located (as far as possible) beforehand by the Purchaser. The ground is to be marked with spray paint. Responsible contact person: Officer in Charge.

3.3 Notice and Permission

Prior to any digging, a notice must be submitted to and permission must be obtained from the Purchaser (Excavation Permission), see Appendix. Responsible contact person: Officer in Charge.

3.4. Excavation

When excavating in trenches for cables and wires, the utmost caution must be exercised in order to avoid damages to the cables and wires. In the absence of any other written permission, the following procedure must be followed:

3.4.1 Machine Excavation

Excavation with machine excavator is allowed only as far down as the marking strip / protective cable rock or the top of the cable bedding. If the marking strip / protective cable rock or the cable bedding cannot be found, a special agreement must be made. See figure 4.4.1, Attachment 2. Machine excavation is also permitted in parallel to an existing trench. Machine excavation is not allowed into the cable sand / cable bedding of an existing trench. Parallel digging must not be so deep as to cause avalanching out of the existing trench. Excavator buckets without teeth are allowed only.

During machine excavation, another representative *of the Supplier* must be present in the trench in addition to the machine operator. It is the duty of this representative to ensure that digging is not done too close to an existing trench and that no other damage occurs.

3.4.2 Hand Digging

Marking strip, protective cable rock, cable sand and cable bedding in the existing trench must be removed by hand digging. The cable sand and the cable bedding should be placed alongside the existing trench and may, if necessary, be lifted out of the trench by machine. See figure 4.4.2, Attachment 2.

3.4.3 Search for Unmarked Cables or Water Mains

In existing trenches with no marking strips, protective cable rock or layered cable bedding, hand digging shall be used to locate the cable.

3.5 Laws and Regulations

In carrying out the work, the Supplier is obliged to adhere to all applicable procedures, laws and regulations.

3.6 Fencing and Safety

Whenever necessary, the trench should be fenced, marked and signposted. Signs shall be posted. When dark, the fencing must be marked with reflecting material or yellow, blinking lights.

3.7 Safety

Safety permits must be obtained in each single case. SJA procedures must be performed before work commences. An excavation permit shall be obtained prior to the start of any excavation work.

3.8 Surveying of Pipes and Cables

3.8.1 General

Surveying of pipes and cables should reduce the risk of unwanted excavation damage to pipes and cabling, and facilitate digging when faults occur in the system.

3.8.2 Documentation:

New Constructions.

In construction work involving alterations to terrain, roads, buildings or the laying of pipes/cables, the Supplier shall survey the work for documentation in the VG maps prior to covering the trench.

Existing Constructions

In construction work involving unearthing of pipes or cables, surveying of existing constructions not already documented in the VG maps shall always be done.

3.8.3 Requirements for Surveying:

Surveying shall be carried out with equipment allowing the measured results to be directly imported into the VG maps, either as SOSI file, KOF file or GSI file. The description of the surveyed data shall be in accordance with the SOSI standard and as described in Section 5.



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4. Basis for “as built” drawings (mark up)

4.1.1 Application and Purpose:

To ensure As Built documentation of buildings, constructions, piping and cabling.

4.1.2 General

As Built drawings of all buildings, constructions, piping and cabling in the project shall be prepared. For As Built documentation of VA and cabling additional special directions apply, see the following page. For roads and open spaces the directions described in Attachment “Basis for As Built documentation of roads and open areas”, dated 26.11.01, also apply.

4.1.3 Contractor/Performing Party:

As a basis for As Built drawings, mark-ups should be made on all drawings of any work carried out in a manner that differs from what is shown in the most recently approved drawing revision. Drawings without alterations should also be marked with mark-ups.

The contractor/performing party shall do the mark-ups by drawing with a visible red color (drawing ink, pen or pencil) on a paper copy of the drawing of the relevant buildings and constructions. The words “MARK UP” shall be written on the front side.

If considered more practical, a sketch/drawing of the realized work can be made. Any such sketches shall be marked with the relevant drawing. The sketch shall be attached to the drawing copy.

Mark-up drawings shall be signed and dated by the contractor.

Mark-ups and sketched alterations shall be submitted by the contractor/performing party to the Officer in Charge.

4.1.4 Officer in Charge:

The Officer in Charge is responsible for procuring mark-up drawings from the contractor/performing party. Drawings must be roughly checked. Project name, object no., and reference to any contractor’s workshop drawings shall be stated on the consulting engineer’s drawings.

The Officer in Charge shall sign and submit the mark-up to the consulting engineer for updating.

4.1.5 Consulting Engineer:

The consulting engineer shall implement the mark-ups in a completely new set of drawings marked AS BUILT.



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4.2. Supplement for As Built Documentation for VA and Cable Networks:

4.2.1 General

This supplementary procedure applies to surveying and registration of fresh and waste water systems, and cable networks.

4.2.2 System and Theme Codes:

The types of cable, wires and terminations to be used have been defined.

A specific theme code table suited to the specific types of wires and cables used by the Purchaser has been prepared and must be adhered to. A specific theme code table has been prepared and must be adhered to (see below).

4.2.3 Surveying and Registration:

The Supplier shall carry out surveying and registration. The Supplier shall implement any measured data into his mapping program. Surveyed coordinates shall be submitted to the Purchaser and to the civil engineering consultant, as agreed with the Purchaser.

The measured data shall be submitted in the form of a SOSI or a KOF file.

Submitted coordinates shall be given as a SOSI or KOF file. In addition, an XLS file should be submitted.

The following pattern for file names should be used:

- Measured 10-shortdescriptivetext.sos
- Measured 10-shortdescriptivetext.xls
- Measured 10-shortdescriptivetext.kof (alt.)

- Measured 11-shortdescriptivetext.sos
- Measured 11-shortdescriptivetext.xls
- Measured 11-shortdescriptivetext.kof (alt.)
- Etc

4.2.4 As Built Drawings:

For existing wires and cables (built prior to this construction period) drawings shall be updated based on surveyed points and crossings. Revised locations shall be incorporated into all revised drawings.

Drawings for planned wires and cables shall not be updated until the project is finished and accepted by the Purchaser. This is essential in order to keep track of any deviations from the plan.

The Supplier must distinguish clearly between points for existing wires "VA" and cables, and those of the new project.



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Theme Codes (SOSI Standard) to be used:

6323	Sewage Purification Plant
8000	Cabling Data
8001	Electr. Cable lines Low voltage
8003	Electr. Cable lines High voltage
8004	Cable pipes
8201	Water mains pipes
8203	Waste water pipes
8204	Surface water pipes
8250	Man-hole
8253	Drain
8254	Hydrant
8270	Sand coffer dam
8271	Septic tank
8303	TELE fiber line
8401	Remote heating pipe
11201	Potable water line
11202	Industrial water line
11203	Sea water line
11208	Sea water pump line

The above list should be extended when needed. Contact the Purchaser's Officer in Charge.

4.2.5 Other Considerations:

To be agreed upon as required.



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Attachment 0

EXCAVATION PERMIT

APPLICATION FOR:

Excavation Permit For:		
Planned Start Date:	Planned Completion Date:	
Company/Contractor:	Machine Operator:	SØRAL Officer in Charge:

CABLES IN WORKSITE:

Quantity and Type:

Cable Path (s) are marked with:

Date:	Searching/Marking of Cables done by:

PIPES IN WORKSITE:

Quantity and Type:

Pipe Path (s) are marked with:

Date:	Registration/Marking of Pipes done by:

TERMS:

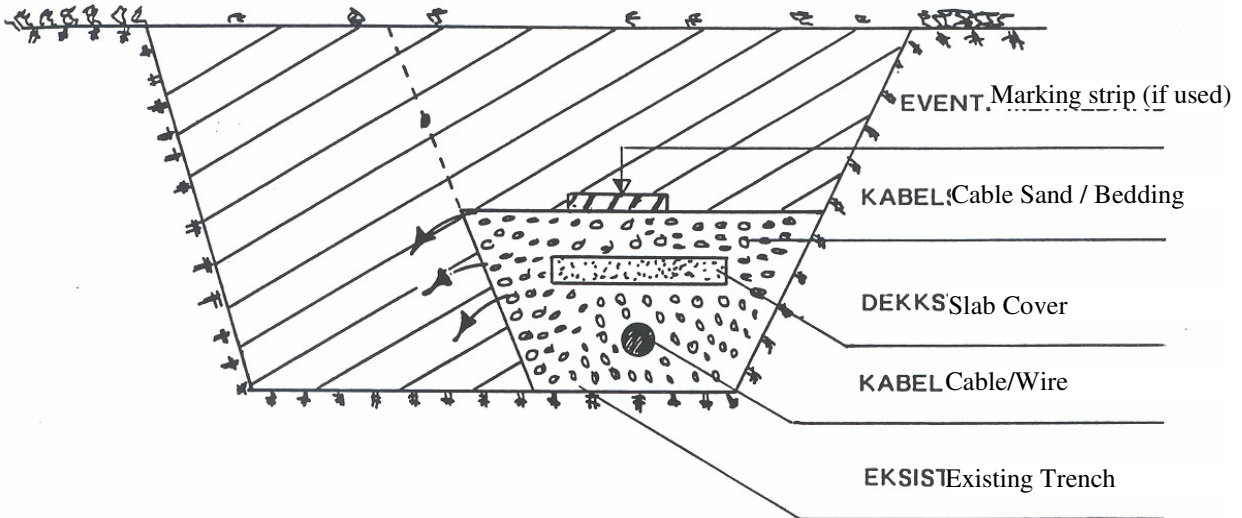
Date for start of work:		Has Safe Job Analysis been completed?:	Yes:	No:
References –Other terms or comments:				

PERMIT ISSUED BY:

Normal Operation:	
For Operations Organization: (BYG):	For Operations Organization: (ELT):
Project/New Construction:	
For Project (ground/buildings):	For Project (electrical):

INST Procedure for unearthing of cables

FIG. Fig. 4.4.2



 **MASI** EXCAVATOR DIGGING

 **HAN** HAND DIGGING

FIG. 4.4.1

