

Gasunie Technical Standard

Construction Specification General

CSA-38-E

Bilingual

**Safety, health and environmental management
at construction sites**

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N.V. Nederlandse Gasunie
Postbus 19, 9700 MA Groningen (Netherlands)
Telephone +31 50 521 91 11

Intern/Internal

FOREWORD

This specification supersedes the sixteenth version of CSA-38-E.

Changes to the previous version are marked with a left margin line.

All Main Contractors are, in line with Gasunie policy, expected to make every effort to prevent accidents, incidents and environmental discrepancies or incidents. The use of this specification contributes to this. Additions to this specification in order to improve Safety, Health and Environmental aspects are much appreciated.

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1. SCOPE AND APPLICATION

The purpose of this specification is to clearly describe to all contractors the procedures relating to safety, health and the environment. The starting point is the legislation in force in the Netherlands.

This specification sets forth Gasunie's minimum safety, health and environmental requirements, relating both to the performance of work by the Main Contractor¹ and its subcontractors and to services provided by service providers.

The Main Contractor is responsible for ensuring that all its subcontractors comply with the provisions of this document.

In this document Gasunie is referred to as the Client. This includes, among other things, the person who supervises Gasunie's construction work (supervisor), site manager, job supervisor and/or work permit issuer.

If these requirements are unclear or incomplete, further information shall be sought from Gasunie. This also applies if it is necessary to depart from the requirements set forth in this specification.

If the work can be carried out in another way, maintaining at least the same level of safety, this shall be permitted following approval by Gasunie.

In case of conflicting requirements or lack of clarity compared with the Dutch version, the Dutch version shall prevail.

All contractors and service providers working within or in the vicinity of an existing installation (including third-party installations) shall familiarise themselves and comply with any specific supplementary safety regulations set by Gasunie.

1.1 Transport media

Table 1 indicates the transport media for which this specification is applicable.

Table 1: Transport media

Transport-medium ¹	Natural gas	Hydrogen	Carbon dioxide	Nitrogen	Hot water	Ammonia
	Applicable	Not judged ²	Not judged ²	Not judged ²	Not judged ²	Not judged ²

- The table is based on suitability of the transport medium concerned.
The scope and media for which this specification is suitable are not automatically the same as the scope and media of underlying specifications. The scope and suitability for a medium are described for each specification.
- Suitability shall be determined on the basis of an impact analysis. The requirements that do appear to be applicable shall be observed.

¹ Main Contractor is 'Opdrachtnemer' in Dutch.

2. REFERENCES

This specification is subject to the requirements of the documents mentioned in this section. If the documents in this specification are mentioned with a date, this specific edition is applicable.

2.1 Gasunie specification

In this specification reference is made to the following Gasunie specification:

CSE-30-N/1	Elektrische en instrumentatie-installaties (Electrical and instrumentation installations).
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2.2 Legislation

In this specification reference is made to the following Dutch legislation:

- Activiteitenbesluit (Activities Decree);
- [Arbeidstijdenwet](#) (Working Hours Act);
- Arboret ([Arbeidsomstandighedenwet](#)) and the [ARBO-besluit](#) (Arbeidsomstandighedenbesluit) (Working Conditions Act and the Working Conditions Decree enacted pursuant to that Act);
- [Besluit Melden Bedrijfsafvalstoffen en Gevaarlijke Afvalstoffen](#) (Decree on the Notification of Industrial and Hazardous Wastes);
- [Bouwbesluit](#) (Building Decree) 2012;
- [Mijnbouwwet](#) (Mining Act);
- Regeling Europese Afvalstoffenlijst ([Eural](#)) (European Waste List);
- [Warenwetbesluit Machines](#) (Machines (Commodities Act) Decree);
- [Wegenverkeerswet](#) (Road Traffic Act);
- [Wet Vervoer Gevaarlijke Stoffen](#) (Dangerous Materials Transport Act);
- [Wet Milieubeheer](#) (Environmental Management Act).

2.3 Standards

In this specification reference is made to the following standards. Any supplements and errata notices are also applicable.²

NEN 1010	Elektrische installaties voor laagspanning - Nederlandse implementatie van de HD-IEC 60364-reeks (Electrical installations for low-voltage - Dutch implementation of the HD-IEC 60364-series).
NEN 3140	Bedrijfsvoering van elektrische installaties - Laagspanning (Operation of electrical installations - Low voltage).
NEN 3840	Bedrijfsvoering van elektrische installaties - Hoogspanning (Operation of electrical installations - High voltage).

² The following applies to NEN-EN standards: Either DIN EN or BS EN, for example, shall be chosen depending on the country where the standard will be applied.

NEN 5707	Bodem - Inspectie en monsterneming van asbest in bodem en partijen grond (Soil - Investigation and sampling of asbestos in soil and soil stockpiles).
NEN 10529	Degrees of protection provided by enclosures of electrical equipment (IP Code).
NEN-EN 13000	Cranes - Mobile cranes.
NEN EN 16228-1	Drilling and foundation equipment - Safety - Part 1: Common requirements.
NEN EN 16228-4	Drilling and foundation equipment - Safety - Part 4: Foundation equipment.
NEN-EN 50110-1	Operation of electrical installations - Part 1: General requirements.
NEN-EN 50522	Aarding van hoogspanningsinstallaties van meer dan 1 kV wisselspanning (Earthing of power installations exceeding 1 kV a.c.).
NEN-EN 50525-2-51	Electric cables - Low voltage energy cables of rated voltages up to and including 450/750 V (U0/U) - Part 2-51: Cables for general applications - Oil resistant control cables with thermoplastic PVC insulation.
NEN-EN-ISO 11612	Protective clothing - Clothing to protect against heat and flame - Minimum performance requirements.
NEN-EN-IEC 60079-14	Explosieve atmosferen - Deel 14: Ontwerp, keuze en opstelling van elektrische installaties (Explosive atmospheres - Part 14: Electrical installations design, selection and erection).
NEN-EN-IEC 60825-1	Safety of laser products; Part 1: Equipment classification and requirements.
NEN-EN-IEC 60974-1	Arc welding equipment; Part 1: Welding power sources.
NEN-EN-IEC 61936-1	Sterkstroominstallaties met meer dan 1 kV wisselspanning - Deel 1: Algemene bepalingen (Power installations exceeding 1 kV a.c. - Part 1: Common rules).
NEN-ISO 45001	Occupational health and safety management systems - Requirements with guidance for use.
NPR 7910-1	Gevarenzone-indeling met betrekking tot explosie-gevaar - Deel 1: Gasexplosiegevaar, gebaseerd op NEN-EN-IEC 60079-10-1 (Classification of hazardous areas with respect to explosion hazard - Part 1: Gas explosion hazard, based on NEN-EN-IEC 60079-10-1:2009).

2.4 European Directives

The following European Directives are referred to in this specification:

- ATEX 114 (2014/34/EU): Richtlijn 2014/34/EU van het Europees parlement en de Raad van 26 februari 2014 betreffende de harmonisatie van de wetgevingen van de lidstaten inzake apparaten en beveiligings-systemen bedoeld voor gebruik op plaatsen waar ontploffingsgevaar kan heersen. (Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast)).
- ATEX 153 (99/92/EC): Richtlijn betreffende minimumvoorschriften voor de verbetering van de gezondheidsbescherming en van de veiligheid van werknemers die door explosieve atmosferen gevaar kunnen lopen. (Directive on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres).
- Machinerichtlijn (2006/42/EC) Richtlijn betreffende machines en tot wijziging van Richtlijn 95/16/EG (herschikking) (Machinery Directive (2006/42/EC) Directive on machinery and amending Directive 95/16/EC (recast)).
- Arbeidsmiddelenrichtlijn (2009/104/EG) Richtlijn 2009/104/EG van het Europees Parlement en de Raad van 16 september 2009 betreffende minimumvoorschriften inzake veiligheid en gezondheid bij het gebruik door werknemers van arbeidsmiddelen op de arbeidsplaats. (Use of Work Equipment Directive (2009/104/EC) Directive 2009/104/EC of the European Parliament and of the Council of 16 September 2009 concerning the minimum safety and health requirements for the use of work equipment by workers at work).

2.5 Other references

The following documents are referred to in this specification:

- [A-blad "Rolsteigers"](#), published by Vollandis knowledge and advice centre ("Mobile Scaffold Towers").
- [A-blad "Steigerbouwen"](#), published by Vollandis knowledge and advice centre ("Scaffolding").
- ADR (Accord européen relatif au transport international des marchandises Dangereuses par Route)(European Agreement concerning the International Carriage of Dangerous Goods by Road).
- Algemene VELIN-voorwaarden voor grondroer- en overige activiteiten (General VELIN conditions for excavation and other activities), www.velin.nl.
- Arbocatalogus Netwerkbedrijven ("Health and Safety Catalogue for Network Operators") (see <https://netwerkbedrijven.dearbocatalogus.nl/maatregel/maatregelen-medewerker-bij-verwijderen-en-afvoeren-van-ac-buizen>).
- Arbocatalogus Verticaal Transport ("Vertical Transport Health and Safety Catalogue") (see [website of the VVT](#)).
- [Beheersregime Chroom 6](#) ("Control regime Chromium 6"), Arboportaal, Ministerie van Sociale Zaken en Werkgelegenheid (Health and Safety Portal, Ministry of Social Affairs and Employment).

- BRL 7000 "Uitvoering van (water)bodemsaneringen en ingrepen in de waterbodem" ("Implementation of channel bed/soil decontamination and intervention in the channel bed").
- [Certificatieschema voor de Procescertificaten Asbestinventarisatie en Asbestverwijdering](#) (Stichting Ascert) (Certification Scheme for Asbestos Inventory and Asbestos Removal Process Certificates (Ascert Foundation for Asbestos Certification)).
- CROW 96a: "Maatregelen op autosnelwegen; Werk in Uitvoering 96a" ("Measures on motorways; Roadworks 96a").
- CROW 96b: "Maatregelen op niet-autosnelwegen; Werk in uitvoering 96b" ("Measures on non-motorway roads; Roadworks 96b").
- CROW 335: "Werken met stabiele grond" ("Working with stable earth").
- CROW 500: "Schade voorkomen aan kabels en leidingen" ("Preventing damage to cables and pipelines").
- [PGS 15](#): Opslag van verpakte gevaarlijke stoffen; Richtlijn voor opslag en tijdelijke opslag met betrekking tot brandveiligheid, arbeidsveiligheid en milieuveiligheid (The storage of packaged hazardous substances; Guidelines for storage and temporary storage in relation to fire safety, safety at work and environmental security).
- Regulations regarding "Rookverbod voor hele werkomgeving" ("Ban smoking in the entire working environment") "[Bouwend Nederland](#)".
- "Richtlijn Steigers" ("Guidelines on Scaffolding"), www.richtlijensteigers.nl/.
- Richtlijnen en specificaties voor veiligheidskleding bij wegwerkzaamheden (Guidelines and specifications for protective clothing when performing roadworks), see [Standaarden Rijkswaterstaat \(see Standards published by the Ministry of Infrastructure and Water Managements\)](#).
- VCA: VGM Checklist Aannemers (SCC, Safety Checklist Contractors).

3. DEFINITIONS AND ABBREVIATIONS

In this specification the following definitions and abbreviations are applicable.

3.1 Definitions

In this specification the following definitions will be applicable:

Accident	An unwanted event involving injury of one or more employee(s) or third parties, connected to performance of the work.
Accident involving absence	An accident which prevents the victim resuming work or alternative work within 24 hours.
Accident not involving absence	An accident which does not prevent the victim resuming the same or alternative work within 24 hours.
Alternative work	Job-related adapted activities that can be performed by the employee, if he/she has suffered injury as the result of an accident.
Client	The person or persons who is/are responsible, on behalf of Gasunie, for supervising the fulfilment of the contract in general and the execution of the work in particular.
Conductive confined space	An area mainly obstructed by metallic or other conductive components in which an individual's freedom of movement is so restricted that continuous or almost continuous contact with these conductive components cannot be avoided.
Confined spaces	Confined spaces include tanks, sewers, pipeline chambers and (deep) pits and trenches, engine sumps, gas purifiers (filter separators, gas purifiers), pipelines and the like. Confined spaces are not designed for continuous occupancy, they are generally difficult to access and/or cannot be evacuated quickly. Ventilation in these areas is usually such that safe working (inspections, cleaning, maintenance and repair) cannot always be guaranteed.
(Construction) site	A site where installation or construction work is carried out on behalf of Gasunie
Dangerous situation	An occurrence which may reasonably be considered as one in which damage, including environmental damage, exposure or injury could occur.
Gasunie construction supervisor(s)	The person or persons tasked on behalf of Gasunie with supervising compliance with the agreement in general and the conduct of the work in particular.
Hazardous activities	All activities in which an employee shall remain alert to his immediate surroundings so that he can respond promptly in the event of a sudden change in circumstances.
Hazardous materials	All materials designated as such under the Dutch " Wet Vervoer Gevaarlijke Stoffen ".

High-voltage installation	An electrical system: – with a nominal alternating current of more than 1000 V between the phases and 600 V between one of the phases and earth, or – with a nominal direct current of more than 1500 V between the poles and 900 V between one of the poles and earth.
Incident (inc. environmental)	An unwanted occurrence involving damage. Damage also includes exposure to hazardous materials and damage to the environment.
Installation	Equipment and facilities required for the production, chemical and/or physical treatment, storage or utility consumption of the gas to be transported.
Job supervisor	The contact person at Gasunie responsible for the work and for preparing the work permit.
Location	A fenced or unfenced area within which one or more stations, valves and/or installations are located.
Low-voltage installation	An electrical system with: – a nominal alternating current not exceeding 1000 V between the phases and 600 V between one of the phases and earth, or – a nominal direct current not exceeding 1500 V between the poles and 900 V between one of the poles and earth.
Main Contractor	The party with whom the contract is or will be concluded.
Naked flame	Any potential ignition source which is not adequately guarded and any non explosion-proof electrical equipment.
Non-compliance with environmental requirements	An unwanted occurrence or situation characterised by: – non-compliance with the applicable environmental legislation; – harm to or disturbance of the environment (environmental incident); – a complaint (environmental complaint).
Pipeline routes	The routes of the main transmission pipelines or regional transmission pipelines connecting locations.
Prescribed validation	Validation prescribed by the Client implying that the Main Contractor may only continue with the work, with regard to the matter concerned, following formal "acceptance" by the Client.
Protocol Area	A demarcated working area for work involving a physical separation (spherical bottoms, blind flanges and the like) from the section of the gas transport system requiring work and the existing operational gas transport system. The relevant section of the gas transport system shall be product-free and any electrical and/or pneumatic control of components in the working area shall be disconnected/blocked. The process management may not affect the working area and the construction work, including new construction work, may not cause disruption to the process management.

Site fence	Wire mesh safety barriers for temporary fencing, with a minimum height of 1,8 metres.
Site management	At a Gasunie location: the person ultimately responsible for operations, safety and the environment at the location. At a site owned by a third party: the person who is responsible for operations on that site.
Station	An installation, including any enclosure, required for the operation of a transmission pipeline.
Temporary installation	An installation installed for the duration of a construction or installation project.
Transport medium	A gaseous or liquefied substance that is transported by and/or stored in a Gasunie transport network; limited to: – natural gas; – hydrogen; – carbon dioxide; – nitrogen; – (hot) water; – ammonia. Additives and other substances used in the medium or in the processes are therefore expressly outside the scope.
Validation ³	Where expectations are matched in order to demonstrate that the intended objective is achieved, within the defined package of requirements, with this process and/or product.
Verification ⁴	Demonstrating, by providing evidence, that the product or the action corresponds to the requirements set (has the product been made correctly/has the action been carried out properly).

3.2 Abbreviations

In this specification the following abbreviations will be applicable:

ADR	A ccord européen relatif au transport international des marchandises D angereuses par R oute (European Agreement concerning the International Carriage of Dangerous Goods by Road)
CP	Cathodic Protection
CROW	Centrum voor Regelgeving en Onderzoek in de Grond-, Water- en Wegenbouw (Centre for Regulation and Research in Civil, Hydraulic and Road Engineering)
CMR	Carcinogenic, Mutagenic and Reprotoxic
HSE	Health, Safety and Environment (VGM, Veiligheid, Gezondheid en Milieu)
HVK	Hogere Veiligheidskundige (Senior Safety Officer)
IV	Installatieverantwoordelijke (volgens NEN 3140) (Individual responsible for the installation (pursuant to NEN 3140))

³ By definition, validation is initiated by the Main Contractor, except for "prescribed validation" by the Client.

⁴ Verification is initiated and/or carried out by the Main Contractor.

JSA	Job Safety Analysis
KVGM	Kwaliteit, Veiligheid, Gezondheid & Milieu (Quality, Safety, Health & Environment)
LMRA	Last Minute Risk Analysis
LOTOTO	Lock Out, Tag Out, Try Out (VLO)
LSA	Low Specific Activity (low level of radioactivity)
MoSHE	Management of Safety, Health & Environment
MVK	Middelbaar Veiligheidskundige (Intermediate Safety Officer)
NDO	Non-destructive testing
NORM	Naturally Occurring Radioactive Material
OG	Opdrachtgever (Client)
ON	Opdrachtnemer (Main Contractor)
PBM	Persoonlijke beschermingsmiddelen (Personal Protective Equipment)
PPE	Personal Protective Equipment
RI&E	Risk Inventory and Evaluation
RCB	Risk-based Contract Management
RCD	Residual-current device
SA	Safety Alert
SBG	Stichting Belangenvereniging Grondzuigen (Earth Suction Vehicles Sectoral Foundation)
SCC	Safety Checklist Contractors (VCA, VGM Checklist Aannemers)
SCC-P	Safety Checklist Contractors Petrochemical (VCA-P, VGM Checklist Aannemers – Petrochemie)
SDS	Safety Data Sheet (formerly known as MSDS)
SELV	Safety Extra Low Voltage
SIR	Stichting Industriële Reiniging (Industrial Cleaning Foundation) (see www.sir-safe.nl)
SOS-SCC	Safety for Operational Supervisors SCC (Veiligheid voor Operationeel Leidinggevenden VCA)
TB	Technical Bulletin
TCVT	Toezicht Certificatie Verticaal Transport (Supervision of Certifications in Vertical Transport)
TRA	Task Risk Analysis
VLO	Lock Out, Tag Out, Try Out (LOTOTO)
VOC	Volatile Organic Compounds
VVT	Vereniging Verticaal Transport (Vertical Transport Association)
WIK	Werkplekinstructiekaart (Construction Site Instruction Card)

4. GENERAL SAFETY, HEALTH AND ENVIRONMENTAL RULES

Contractors who are carrying out work for Gasunie shall do so in a safe and environmentally-friendly manner. Risks shall be tackled at source and any residual risks described and communicated.

Anyone performing work for Gasunie shall be familiar with Gasunie policy on Safety, Health and Environmental Management, and act accordingly.

The safety instructions shall be successfully completed before starting work. General safety information and information on the safety instructions can be found on www.gasunie.nl/vgm (choose English option).

The Main Contractor shall keep a record of its subcontractors. The Main Contractor is responsible for ensuring that subcontractors comply with Gasunie's safety policy.

Gasunie Safety Alerts and Technical Bulletins shall be applied.

4.1 Coordination of project execution

When joint activities are being carried out, the Main Contractor is responsible for:

- reporting construction work (if applicable) to inspectie SZW (Inspectorate of Social Affairs and Employment);
- coordinating work in accordance with the Arbobesluit (Occupational Health and Safety Decree), Department 5, Construction process;
- recording HSE aspects;
- supervising compliance with this specification (CSA-38-E).

4.2 Environmental protection

With regard to environmental protection, the following applies:

- prevent adverse effects on the environment;
- limit or reverse environmental damage where possible in the event of an environmental incident;
- report environmental incidents to the Client and record the incidents in the Accident log.

4.3 Safety qualifications

- PSL

All employees of contractors or suppliers of services shall have a safety passport (PSL). Courses and training sessions attended shall be recorded in this safety passport.

- SCC

Safety, health and environmental management aspects shall be dealt with in accordance with the "safety qualification" (see annex A).

Employees who hold an MVK (Intermediate Safety Officer), HVK (Senior Safety Officer) or MoSHE (Management of Safety, Health & Environment) diploma are exempted from "Basic Elements of Safety SCC" and/or Safety for Operational Supervisors SCC.

Employees who perform high-risk activities (SCC definition), shall satisfy the SSVV criteria relating to hazardous work (see SSVV training guide (Foundation Cooperation for Safety – Training Guide) on

www.vcainfra.nl/bedrijven/risicovolletaak-per-branche/ under the heading "Petrochemie").

- Young people

Employees who are younger than 18 may only work for Gasunie if they have the necessary qualifications and are also managed directly by an experienced, qualified adult colleague.

4.4 Personal conduct

All individuals shall be responsible for the safe performance of their own work.

The regulations applicable on the construction site shall be made known to every individual prior to commencement of work. This takes place:

- according to the HSE plan, or
- by using the safety work permit.

If any employees on the construction site do not speak Dutch:

- the person responsible on the construction site shall speak at least Dutch or English;
- the work permit holder shall speak at least Dutch or English and all the languages of the persons working under the work permit.

The Main Contractor shall also state:

- how the instructions are going to be given to its employees;
- how communication has been handled at the construction site;
- how it ensures that there is proper training and communication for employees who speak another language.

4.5 Emergency response team/First aid

The Main Contractor shall ensure the following:

- emergency support is guaranteed to be available at all times during the execution of the work;
- the scope of the emergency response service shall be based on the project RI&E (Risk Inventory & Evaluation);
- the following first aid kits shall be provided in the site offices and other buildings:
 - first aid box A1;
 - eyewash bottle, and
 - in the event of a possible fire risk as a result of the work to be performed: a fire blanket.
- any employee(s) who is (are) a first aider(s) or member(s) of the emergency response team shall be clearly recognisable as such;
- the HSE plan shall stipulate how official emergency services (police, fire brigade and ambulance) are to be called in;

- the emergency response/first aid organisation is part of the HSE plan implementation phase.

4.6 Working hours

Working hours shall comply with the legal framework ([Arbeidstijdenwet](#) (Working Hours Act)).

4.7 Client's duties and competences

- The Client shall supervise the Main Contractor's administrative measures relating to health, safety and the environment during the work.
- The Client will:
 - halt activities in the event of critical danger, and
 - halt activities in the event of deviations from the HSE plan without prior consultation with the Client.

4.8 Equipment

The Main Contractor shall make available the necessary equipment and ensure that it:

- is maintained according to manufacturer's instructions;
- is approved, where necessary;
- satisfies the requirements for the appropriate ATEX category in areas subject to explosion hazard ("Ex areas");
- is accompanied by a user and maintenance guide;
- is being used in accordance with the user instructions.

4.9 HSE (health, safety and environmental management) plan

The Main Contractor compiles an "HSE plan execution phase" according to article 2.28 of the Arbeidsomstandighedenbesluit (Working Conditions Decree).

The purpose of the HSE plan is to identify the appropriate safety, health and environmental aspects of the work. Work shall be performed in accordance with the validated HSE plan.

Before starting work, the HSE plan shall be submitted to the Client for validation. The Client may require additional TRAs from the Main Contractor.

If substantial changes prove necessary during the execution phase, the HSE plan shall be modified accordingly and resubmitted to the Client for validation.

The work carried out by subcontractors shall conform to the HSE plan.

4.10 Safety meeting

Before commencing work for which an HSE plan is required, the "Execution phase" coordinator will hold a safety meeting. The following individuals are present:

- the Main Contractor's authorised representative/project leader;
- the Main Contractor's safety officer for the project;
- the Client;
- the manager of the Gasunie asset.

The following individuals may be invited, but this is not a requirement:

- a representative from the Gasunie "Special Assignments" department;
- Environmental Supervision Manager (OMT)
- a representative from the connected party (power plants, industries or regional distribution network operators).

The following issues to be discussed during the safety meeting are:

- tasks, powers and responsibilities of all parties concerned;
- the access policy;
- arrangements relating to the application of work permits;
- arrangements relating to smoking places;
- arrangements relating to emergencies and reporting accidents and incidents;
- TRAs: drawing up and assessing;
- prevention of damage to cables and pipelines (ON explains method);
- the supervision to be carried out with regard to process safety;
- arrangements relating to VLO (LOTOTO);
- arrangements relating to working times;
- carrying out safety rounds and safety audits;
- the use of means of communication, such as mobile phones and walkie talkies and the use of photographic and film equipment.

4.11 Performing activities covered by a TRA

Prior to performing activities covered by a TRA, the work itself and the related TRA shall be discussed with all those involved. If there is a deviation from the original working methods, the JSA shall be adapted or a new JSA shall be drawn up.

In the event of any deviation from the original working methods, the TRA shall be adapted or a new TRA shall be drawn up. If risks become apparent during the work that were not recognised in the TRA, the activities shall be stopped and can only be resumed after the TRA has been adapted and the adapted TRA has been discussed and approved.

Comment

The creation and discussion of the TRA, as well as the performance of work in accordance with the TRA that has been drawn up, are tested in the context of risk-focused contract management.

5. ACCESS CONTROL, VEHICLES AND TRAFFIC RULES AT CONSTRUCTION SITES

5.1 Access policy

If work is carried out at an installation monitored by Gasunie's site security, access passes shall be requested for employees. The pass shall be turned in to the site security on leaving the site. Alternatively, following mutual consultation, a different system of signing in and signing out shall be applied.

If no member of the site security is present, the Main Contractor shall keep a record of employees present at and visitors to the construction site.

If the site is located on third-party premises, the access policy to be applied, including the signing in and signing out system, shall be coordinated with the system of the third party concerned.

The Main Contractor shall draw up a proposal for protecting and securing the construction site and shall submit it to the Client for validation.

5.2 Vehicles and motorised equipment

Vehicles are permitted on the construction site only after this has been agreed with the Client.

The following applies to motorised equipment and motor vehicles:

- Motorised equipment (other than aggregate units and pumps) and motor vehicles shall not be left unattended with the engine running.
- Equipment may only be transported while in "on" mode if this is necessary for performance of the work.
- Lorries and heavy wheeled equipment shall:
 - be equipped with a reversing detection system, and
 - a clearly audible reversing signal, or
 - be escorted when reversing and manoeuvring, with uninterrupted contact between driver and attendant.
- At gas-transporting sites and project sites, escorting lorries and heavy wheeled equipment is mandatory, with uninterrupted contact between driver and attendant.
- Trucks with trailers shall be equipped with rear-axle steering.
- Excavators, diggers, welding trolleys and the like shall arrive on the construction site in a clean state and be in a clean state when they leave it.

5.3 Site traffic rules

The Dutch "[Wegenverkeerswet](#)" ("Road Traffic Act") shall apply at Gasunie sites and project sites. Where the maximum speed is not indicated, vehicles may drive no faster than at walking pace.

The Main Contractor shall be responsible for ensuring that:

- the temporary roads to, from and within the site are suitable for the necessary conveyance;
- drivers shall only be permitted to drive vehicles off the road after adequate steps have been taken to protect buried cables, pipes and ducts;
- no materials shall be dragged over the roads;
- drivers shall have adequate (demonstrable) driving proficiency.
- in the case of work carried out on public roads, fencing off and signage comply with CROW 96a and CROW 96b.

The following applies to parking policy:

- "Operational" parking in the designated places.

6. TEMPORARY BUILDINGS AND FACILITIES

Temporary buildings on the construction site include:

- (site)sheds;
- canteen, changerooms and washrooms;
- storage areas such as containers and Nissen huts;
- prefab-workshops such as Nissen huts;
- areas for access control.

Temporary facilities include:

- temporary electrotechnical installations for the provision of electrical services for construction work and technical support services;
- site security;
- telephone and internet connections;
- permanent lighting systems for the site;
- drinking water and sewerage systems.

6.1 Placement

When setting up temporary accommodation at a Gasunie site, agreement shall be reached with the manager.

Traffic flows and staff accommodation areas shall be kept separate at the construction site.

6.2 General requirements

Temporary accommodation shall comply with the provisions of the Bouwbesluit (Building Decree).

In temporary buildings with more than four working areas, the escape route and the location of fire-fighting equipment and first aid kits are to be clearly shown.

The Main Contractor ensures that escape routes, emergency exits and the adjacent outdoor spaces are kept clear from obstacles.

6.3 Telephone list

The Main Contractor prepares a list of contacts and, if necessary, a description of the route for finding the following:

- emergency centre (112);
- the medical doctor(s);
- the hospital;
- the fire brigade;
- the police;
- the site manager;
- the operational site management/CCP;
- the Client;
- the operator.

This list shall be available on notice boards and in all temporary buildings.

6.4 Heating appliances

All enclosed type, permanently mounted electrical heating appliances are permitted.

6.5 Connecting sanitary facilities

There shall be toilets and washing facilities on every construction site.

Sanitary facilities at Gasunie sites shall not be connected to the existing sewer system without the written permission of the operational site management.

6.6 Storage and transport of hazardous substances

A list of all hazardous substances, including maximum quantities, shall be available at the site.

VIBs (safety information sheets) and WIKs (construction site instruction cards) shall be available at the site for all substances present.

The storage of fuel is not permitted on the construction site.

The "ADR regulations" apply to loading and unloading, transport and other transport-related activities.

The following rules apply with regard to working stocks of fuel and oil:

- storage shall be a distance of at least 10 metres from buildings and temporary accommodation.
- The tank valves shall be locked in the closed position after use.
- A snap-shut valve shall be fitted on the delivery end of the supply hoses. This cannot be locked in the open position.
- A drip tray shall be present under fuel and oil tanks having a content corresponding to at least 1,1 times the content of the largest tank. Drip trays shall be empty. There shall be sufficient absorbing material present to absorb any leakage.
- The tank installation may not be left unattended during operation.

7. WORK PERMIT REQUIREMENTS

7.1 General requirements

When working on (potentially) gas-transporting pipelines, pipeline sections or installations, and when working on electrical systems that are (potentially) live, work may only be performed on these systems if the site management has released them for work.

If valves and/or switches shall be labelled and locked (VLO/LOTOTO), it may be decided, in consultation with site management, to have an extra lock attached by the Main Contractor in addition to the lock to be attached by Gasunie. This can be especially important, when a component is part of the safeguarding for several different activities and/or projects. If applicable, more detailed agreements in this regard shall be made during the safety meeting.

7.2 Work permit

A work permit is required from the Client for work carried out on gas-transporting pipelines and/or on gas-transporting sites or project sites.

7.2.1 Preparing and issuing work permits

Site management decides which activities require a work permit.

For every job under a work permit, the Client appoints a job supervisor who:

- gathers the necessary information and coordinates the planned activities within Gasunie;
- makes contact with the person responsible for performing the work;
- discusses the work, the risks and the measures to be taken with the person responsible;
- coordinates all these issues with the Client's work permit issuer, the Main Contractor and the Main Contractor's work permit holder;
- records all the agreements made in the work permit.

The Client's work permit issuer and the Main Contractor's work permit holder discuss the activities and the necessary precautions to be taken.

The work permit holder is the person in charge of carrying out the work or who directs those actually performing the work. The work permit holder shall, as a minimum:

- hold the Basic Training (SCC) certificate;
- be able to speak Dutch and/or English;
- share a common language with all those performing the work.

The work permit holder shall:

- discuss the contents of the work permit every day with all those performing the work (start of work discussion), and
- ensure that the LMRA is performed every day at the construction site and that the work permit is initialled by all those performing the work.

A work permit:

- is only valid for the work, the location and the time shown on the permit;
- is issued for a maximum period of seven calendar days and shall be handed over every day to the issuer when work is finished. Alternative arrangements, which shall be recorded in writing, may be made following mutual consultation between the holder and the issuer.
- may be extended a maximum of six times, provided the permit is signed off every day by the issuer and the holder.

8. HAZARD AND WARNING SIGNS, FENCING AND SIGNAGE

8.1 Colour coding

The following colour combinations are prescribed for cordoning off work areas:

1. yellow/black;
2. red/white.

Re 1.

Yellow/black enclosures indicate hazardous activities that are taking place within the cordoned off area. Entering this cordoned off area is only permitted for individuals who have to carry out work within this area and only following explicit approval from the person responsible for this area.

Re 2.

Red/white enclosures indicate general danger.

8.2 Fencing and marking

A differentiation is made between the following physical types of fencing:

1. tape or link chain;
2. (linked) site fences;
3. crush barriers, barriers, ski slope safety nets.

Re 1.

Tape or link chain fencing may only be used as a safety barrier:

- for low-risk activities of a short-term duration, or
- on Gasunie sites or project sites where no other activities are being performed and only employees involved in the work are present.

Re 2.

Site fences shall be applied as semi-permanent fencing around the construction site, unattended steel sheet pile walls and where there is insufficient supervision around the entry and exit points to drilling activities.

Re 3.

Crush barriers, barriers or ski slope safety nets shall be used in all other situations requiring fencing.

Fences shall be functional and cleared away when no longer necessary.

8.3 Health and safety signs

Place health and safety signs where PPE is required and where potential hazards may occur in accordance with OSA-12-N.

8.4 Locking and labelling

Fitted locks and labels shall be respected.

Valves, electric switches and machinery that cannot or may not be operated shall be locked and labelled as such.

Scaffolding which has not yet been released for use, shall be provided with a red label at the access point stating that the scaffolding may not be entered.

As soon as the scaffolding is released for use, this shall be marked with a green label stating at least the following information:

- inspection date;
- name and signature of the inspector;
- permissible load of the scaffolding;
- name of person who applied for the scaffolding.

If activities are to be performed in a part of an installation that may or may not be gas-free, the sections nearby that are still operational shall be marked with a label stating "high-pressure gas".

9. REPORTING OF ACCIDENTS, INCIDENTS, NON-COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS AND DANGEROUS SITUATIONS

9.1 Reporting accidents, incidents, non-compliance with environmental requirements and dangerous situations

All accidents, incidents including environmental incidents, non-compliance with environmental requirements and dangerous situations at Gasunie sites or project sites shall be:

- reported to the Client with immediate effect;
- reported within 24 hours in digital form via the link:
www.gasunie.nl/organisatie/veiligheid-gezondheid-en-milieu/incident-melden.
- The information to be provided includes:
 - the project number used by Gasunie;
 - description of the incident;
 - date of the incident;
 - time of the incident;
 - place of the incident;
 - the contractor(s) concerned;
 - the contact person of the contractor(s) concerned;
 - the contact person's email address.

If an accident has occurred:

- which may involve absence from work, the contractor shall have his company doctor determine whether the individual is fit enough to take up alternative work within 24 hours and shall inform the Client accordingly;
- in which someone suffers lasting injury, is admitted to hospital or dies, a report of the incident shall be made to the Competent Authority ((Nederlandse Arbeidsinspectie (Dutch Labour Inspectorate)) by the victim's employer.

The site management is responsible for informing the Competent Authority of an accident or environmental incident occurring during work performed at an operational installation or site.

With regard to new construction and project-based activities, the report process to be followed shall be determined and recorded during the safety meeting.

9.2 Investigation

The Main Contractor:

- shall, following an accident, incident or the identification of an unsafe situation, carry out an investigation into the causes of the occurrence and report on this to the Client with a statement of the measures taken to prevent a repetition;
- shall, if a more detailed investigation is set up by an expert on behalf of the Client, cooperate in the performance of that investigation;
- shall cooperate in implementing administrative measures in order to prevent a repetition.

10. TIDINESS, CLEANLINESS AND WASTE

10.1 Tidiness and cleanliness

The following points apply with regard to tidiness and cleanliness at construction sites:

- keep the working area and/or environment tidy;
- clear away unnecessary materials and tools;
- keep paths, roads and escape routes clear and prevent slipperiness;
- temporary pipes, hoses and electrical cables shall be tied up alongside the construction work;
- place self-extinguishing waste bins in designated smoking areas outside the working area (see also the regulations set out by "Bouwens Nederland").

A layout plan, which shall be submitted to the Client for validation before being implemented, shall be made for storage facilities covering a surface area of more than 100 m². This plan shall clearly show where and how the different substances/materials are stored, as well as which activities take place, and where they take place, within the storage facility. Storage and activities shall be in accordance with the validated layout plan. VIBs (safety information sheets) and WIKs (construction site instruction cards) relating to hazardous substances shall be available and can be supplied to the Client on request.

10.2 Environment and waste

The Main Contractor is responsible for the proper handling with respect to the environment and waste (Wet Milieubeheer).

The Main Contractor is responsible for disposal in accordance with the Wet Milieubeheer and the use of coding and description of the waste materials. This includes the assessment of hazardous and non-hazardous waste in accordance with the Eural code and the submission of evidence and delivery notes regarding the waste data to the Client.

In the event of environmental incidents, the Main Contractor shall take immediate action to prevent pollution of the environment.

The occurrence of waste shall be prevented as far as possible.

Waste that is the property of Gasunie shall, in consultation with the Client, be disposed of in accordance with internal Gasunie procedures.

11. PERSONAL CONDUCT

11.1 Personal obligations and responsibilities

The following rules apply to all individuals on the construction site:

- Keep safety devices intact.
- Respect Health and Safety signs.
- Follow up instructions.
- Work constructively with contractors' and subcontractors' employees.
- Do not walk on pipelines.
- Smoking at gas-transporting and fenced-off Gasunie sites is prohibited.
- Smoking at construction sites is only permitted in designated locations (see also the regulations of "Bouwend Nederland").
- Using or being under the influence of alcohol, drugs or nitrous oxide is prohibited.
- Working under the influence of medication which can affect an individual's speed of reaction is prohibited.

11.2 Operation of components of in-service installations

When pre-commissioning or commissioning activities have been completed, only site management may operate the assets.

12. PERSONAL PROTECTIVE EQUIPMENT AND SAFETY CLOTHING

12.1 Issuing and use

The Main Contractor shall:

- provide its employees with the necessary and approved personal protective equipment and work clothing;
- instruct employees shall in the use and maintenance of the personal protective equipment;
- post instruction signs around areas where they are prescribed;
- instruct employees in the use of gas detection equipment.

12.2 Wearing of personal protective equipment and safety clothing

The following applies to wearing PPE:

- The wearing of a safety helmet, safety shoes and safety goggles is mandatory on site.
- The wearing of antistatic, flame-retardant work clothing that complies with [NEN-EN-ISO 11612](#) is mandatory when:
 - entering gas-transporting locations and being in the vicinity of gas-transporting installations (except for offices);
 - performing any maintenance, repair or new construction work on gas-transporting sections or components ("gas jobs"); apart from excavating continuous operational pipelines;
 - deep geological drilling;
 - being in the vicinity of such work as welding, grinding, cutting or burning.
- It is mandatory to carry personal gas detection equipment* at all Gasunie gas-transporting locations and while performing any maintenance, repair or new construction work on gas-transporting components ("gas jobs"); apart from excavating continuous operational pipelines.
 - * The Main Contractor shall determine the selection and use of gas detection equipment in consultation with the Client.

The PPE prescribed by Gasunie is for Gasunie-related risks. If there are no risks from Gasunie's processes or additional risks arising from a Main Contractor's work, the employee's Main Contractor shall carry out its own RI&E and the (further) measures to be taken based on the risks involved with his/her work.

12.3 Working on or in the vicinity of public roads, railways

When working on or along public roads, wear the fluorescent orange safety clothing approved by "Rijkswaterstaat" (Richtlijnen en specificaties voor veiligheidskleding bij wegwerkzaamheden).

When working on land managed by railway companies, the regulations of the authority concerned are applicable.

12.4 Working on or in the vicinity of banks of a waterway

For work carried out on the water or within a strip of 1 metre along the bank of waterways with a depth of ≥ 1 metre, an up-to-date risk inventory and evaluation shall be present.

13. CONFINED SPACES, EXCAVATION WORK, FLOOR OPENINGS AND FENCING

The following points serve to supplement the definition of "Confined spaces":

Pits and trenches qualify as confined spaces if:

- the soil has been subject to sensory contamination;
- there is a chance that methane will be given off;
- external factors may cause the occurrence of poisonous or explosive gas in the pit or trench;
- the work may cause the occurrence of a poisonous or explosive atmosphere;
- rescue of victims from a trench or pit is not straightforward (rescue from the pit or trench requires extra precautions).

13.1 Confined spaces

Prior to the commencement of the work in confined spaces and conductive confined spaces, including pipeline sections, all activities shall be coordinated with the Client.

A confined space or conductive confined space that has not yet been released for work purposes shall be cordoned off so as to prevent entry to the area. As soon as the confined space is released for work, this shall be marked with a release label.

Where work is being performed in a confined space, a certified manhole observer shall always be present at the entrance. This manhole observer shall satisfy the SSVV criteria relating to hazardous work (see SSVV training guide (Foundation Cooperation for Safety - Training Guide), on www.vcainfra.nl/bedrijven/risicovolletaak-per-branche/ under the heading "Petrochemie").

There are two possible types of work in confined spaces or conductive confined spaces:

- a confined spaces or conductive confined spaces on existing Gasunie sites;
- b confined spaces or conductive confined spaces on new construction sites and installations.

Work carried out in situations listed under "a" shall be governed by the following rules:

- prior to the commencement of the work a work permit shall be applied for from site management;
- the TRA is the guideline for the work permit;
- the risks associated with the work shall be discussed with the permit holder and recorded on the work permit.
- when working in confined spaces, a rescue plan shall be compiled and practised prior to commencement of the work.

Work carried out at a site or installation mentioned under "b" shall be governed by the following rules:

- The Main Contractor shall compile a TRA of the specific work.
- The safety measures to be taken shall be recorded.
- The risks and measures to be taken shall be discussed with the staff contracted to do the work.
- when working in confined spaces, a rescue plan shall be compiled and practised prior to commencement of the work.

13.2 Excavations

13.2.1 General requirements

The Main Contractor shall apply "The general VELIN conditions for excavation and other work" ("Algemene VELIN-voorwaarden voor grondroer- en overige activiteiten") (see www.velin.nl/).

When excavating a working pit or pipeline trench, the side slope shall be appropriate to the type of soil. The principles of a safe side slope are set out in CROW 335.

Excavation work carried out on behalf of Gasunie shall be performed in accordance with CROW 500 "Schade voorkomen aan kabels en leidingen" (Preventing damage to cables and pipelines).

Excavation work at a gas delivery station is subject to prior agreement with the connected party (power station, industry or regional network operator).

13.2.2 Steel sheet pile wall pits and constructions

For steel sheet pile wall excavations and steel sheet pile wall constructions where a height difference is created, the following points apply:

- Prepare a design drawing.
- Make a calculation for the steel sheet pile wall and strut frame.
- Prepare a layout drawing of the site and indicate on it:
 - access to and escape route from the excavation/steel sheet pile wall construction;
 - the walkways;
 - the storage and control containers;
 - the staff accommodation areas;
 - the course of cables, pipelines and hoses.
- The height of the sheet piling shall be 1,00 m – 1,10 m above ground. Recesses are permitted for access route, escape route, hoses, cables and pipelines. These recesses shall be finished in such a way that they continue to be adequately cordoned off.
- Take risk-mitigation measures if building a steel sheet pile wall excavation/construction involves a risk of falling.
- Clean the steel sheet pile wall casing during excavation.
- Weld the strutting of a steel sheet pile wall excavation/construction with the structure.

- Use steps or a staircase for access to a steel sheet pile wall excavation. A ladder may be used for the escape route.
- At the top end of the steel sheet pile wall excavation/construction, at the side where the pipeline comes into the excavation, make provisions to guard against any consequences of subsidence as a result of ground water displacement.
- A steel sheet pile wall excavation may only be entered when it has been formally released. Specific agreements shall be made with regard to this release (who, what and marking) during the safety meeting.
- Take measures to ensure that workers in the pit are not struck by falling objects.
- The following shall also apply when digging steel sheet pile wall excavations in order to use underwater concrete:
 - Design and put together the strutting in such a way that mechanical digging can take place safely.
 - Monitor the water level during the digging.
 - Check whether the sheet piling has moved out of its lock and carry out remedial work if necessary.
 - Checks are required, before and after excavation work, on surface settlements outside the work pit.
 - The quantity of earth being removed from the pit shall be monitored.

Attention:

Take measures to prevent the risk of dangerous settlements outside the work pit as a result of soil seepage into the pit.

The Main Contractor shall submit the working method to be applied for creating steel sheet pile wall excavations and constructions to the Client for validation.

13.2.3 Specific excavation guidelines

Mechanical excavation within 50 cm of gas-transporting underground pipelines is prohibited.

The following applies to gas-transporting pipelines near or within a Gasunie site or project site, and to those within underground valve stations:

- mechanical excavating within 1 m is prohibited;
- suction within 1 m is permitted.

If this is not reasonably practicable for health and safety or technical reasons, more detailed consultations with the supervisor on behalf of site management shall take place. In such cases, an alternative working method shall be set down in a TRA.

Earth suction vehicles to be used to carry out excavation work shall meet the criteria of the "Stichting Belangenvereniging Grondzuigen ([SBG](#))" (Earth Suction Vehicles Sectoral Foundation).

In addition, the following applies when using an earth suction vehicle:

- safe driving routes for the vacuum truck; screen off aboveground pipeline sections at critical points along the driving route;
- the parking position relative to the edge of the pit shall be at a distance at least equal to the depth of the working pit;
- choose the soil storage location such that the number of movements of the vacuum truck is minimised and settlement is prevented;
- the unloading point of the vacuum truck may not be in the vicinity of gas-transporting pipeline sections;
- the design of the suction arm and suction nozzle; no great force shall be transferred via the suction arm to the suction nozzle (no rigid connection); the suction nozzle shall be made of a synthetic material.

13.2.4 Requirements when performing excavation work

The following points apply when performing excavation work:

- Work according to CROW 335 and CROW 500 and start with a KLIC (Cable and Pipeline Information Centre) report.
- Excavation work shall not result in damage to nearby objects.
- Before excavating, clear the area or route of any waste.
- Prevent soil drifts.
- It shall be possible to reach and leave a working pit or pipe trench along at least two different sides. Erect an escape ladder or escape stairs on both sides of a pipe trench or working pit. If a working pit or pipe trench is left open for more than a month and needs to be entered regularly, access shall be via stairs. There may not be any obstacles on escape routes.
- If soil contamination is discovered or suspected during excavation, work shall be suspended immediately. The findings or suspicions shall be reported to the Client without delay.
- If explosive devices (bomb, grenade, mine and the like) are encountered during excavation or if there is reasonable cause to suspect their presence, work shall be suspended immediately and all personnel moved to a safe area. The police and Client shall be notified without delay.
- If any unidentified fittings are encountered during excavation at or on Gasunie's pipelines or a connected pipeline, work shall be suspended immediately and all employees moved to a safe area. The situation encountered shall be reported to the Client immediately.
- Mechanical excavation is not permitted within 50 cm of natural gas transport pipelines or high-voltage cables belonging to third parties.
- If work is to take place at a distance of less than 50 cm from buried objects such as cables, piping and the like, they shall first be exposed manually. This may not be done mechanically.

- When HDD drilling is being performed, pipelines and cables shall be dug out and protected in the event that they may be situated within the deviation of the drilling work.
- Fencing and labels shall be applied in accordance with the requirements set out in section 8.

13.2.5 Backfilling trench or work pit

The requirements of CSK-25-N apply to backfilling the trench or work pit. Using machinery for the work is subject to similar guidelines to using machinery for excavation work.

Sections of operational or non-operational installations that are, due to their design, size or position, difficult to see, meaning that there is a substantial risk of causing damage, shall be marked out prior to the backfilling work.

14. FIRE SAFETY

14.1 Fire-fighting equipment

14.1.1 General requirements

The Main Contractor is responsible for ensuring that enough fire extinguishers are present at the construction site. Fire hydrants, fire extinguishers, fire hose reels and other fire-fighting equipment shall be within easy reach at all times.

14.1.2 Fire extinguishers

Mount a fire extinguisher on the wall near the external doors of all temporary buildings. Provide all other storage rooms and temporary workrooms with at least one fire extinguisher. All fire extinguishers:

- are certified;
- are sealed;
- have a capacity of at least 6 kg.

The type of extinguisher is determined by the location and/or the work to be performed.

14.2 Fuel and oil

Work constituting a fire hazard shall be stopped within a radius of 10 m while fuel is being delivered and fire extinguishers shall be at hand. The Main Contractor is responsible for complying with this provision.

14.3 Spark arresters

Fit the exhausts of diesel engines (up to and including Euro 3) at operational locations with spark arresters.

14.4 Work involving naked flames

The following points apply during work involving naked flames:

- Fire extinguishers shall be kept within easy reach during welding, cutting, burning and similar operations.
- The Main Contractor shall ensure that his employees are familiar with the operation of the fire extinguishers.
- Keep the area in which work constituting a fire hazard takes place clear of all flammable materials. If this is not possible:
 - Cover flammable substances and materials which cannot be removed with fire blankets.
 - Appoint a fire officer.

- Site management shall supply the fire officer at operational locations or for gas jobs.

Note:

The fire officer shall hold at least fire officer category 2 qualifications and shall be familiar with the specific risks related to the work.

14.5 End of working day/end of job checks

At the end of the working day, the Main Contractor shall check that everything has been cleared and secured in such a manner that no fire can occur. If the risk of fire remains after the end of work, mitigating measures shall be put in place in response to this. These risks and measures shall be recorded in a TRA.

15. WELDING, CUTTING, BURNING, HEAT TREATMENT AND PREHEATING

Welding, cutting, heat treatment and pre-heating covers all work involving the use of:

- welding gases, such as acetylene and oxygen in the event of autogeneous welding;
- protective gases in the event of electric welding;
- propane for preheating;
- annealing mats for preheating or low-voltage annealing.

15.1 Burning, welding and cutting

Burning, welding and cutting torches shall not be connected to cylinders if stored in locked areas or buildings.

Close all valves on the gas and oxygen cylinders when work stops.

Do not leave equipment unattended.

15.2 Gas and oxygen cylinders

The following points apply to gas and oxygen cylinders:

- The use of cylinder batteries for welding, cutting, burning or preliminary heat treatment shall be recorded in the project RI&E.
- Provide damaged gas cylinders with a label ("defective") and dispose of them.
- Empty gas cylinders are subject to the same requirements as full ones.

15.2.1 Central storage site

The central storage site or storage area for gas cylinders shall satisfy the requirements of PGS 15; the following points also apply:

- A list of stored substances, including VIBs (safety information sheets) and WIKs (construction site instruction cards), shall be available. A copy of this list shall be made available to the Client.
- The storage point shall be surrounded by a fence and shall not be accessible without permission.
- Attach the necessary health and safety signs to the fence around the cylinder storage site, in accordance with the requirements of section 8.
- The storage site shall be at least 5 metres away from buildings. A distance of 10 metres shall apply if more than 2500 litres is being stored.
- Ensure that the storage site has natural ventilation.

Storage areas supplied with electrical equipment shall be zoned in accordance with the requirements of NPR 7910-1.

15.2.2 Storage

Gas cylinders in storage shall:

- be in the vertical position;
- be properly secured;
- be closed and may not be opened in the storage site;
- be provided with a protective cap.

15.2.3 Use

The following points apply with regard to the use of gas cylinders:

- The maximum working stock is the quantity required to be used over one week.
- When gas cylinders are transported over the work site, these shall be:
 - closed, and
 - provided with a protective cap.
- Remove pressure reducer valves unless they are fully shielded by the protective cap.
- The valve key of a gas cylinder that is in use shall be present on the gas cylinder. Before use, acetylene and oxygen cylinders shall be affixed to a cylinder trolley or rack, separated by a metal shield.
- Provide acetylene cylinders that are in use with a flame arrestor.
- At the end of the working day, close gas cylinders and remove the keys.
- Do not place gas cylinders in the work pit.
- If gases shall be used in a confined space, the gas cylinders shall, in any event, be set up outside the confined space. The TRA shall address the prevention of gas leaks and how to limit the consequences of a gas leak in a confined space.
- Empty gas cylinders shall be recognisable as such and shall be removed to the storage facility or supplier.

15.3 Welding clamps

Protect external welding clamps with hydraulic jacks against overload with an internal relief valve in the jack itself.

The Main Contractor has an inspection regime for welding clamps and fits each welding clamp with a unique, indelible identification mark.

Welding clamps shall be free of damage and defects when in use.

15.4 Welding transformers and generators

The following points apply to welding transformers and generators:

- They shall satisfy NEN-EN-IEC 60974-1 and be fitted with a voltage limiter.
- They shall not be located within the trajectory of falling sparks.

- Cable connections shall be insulated and shall not have any kinks or exposed wires.
- Fully unwind the cables and protect them from mechanical damage.
- Using a clamp or magnet, attach the return cable to the workpiece to be welded as close as possible to the weld to be made. If a solid pan-shaped object (earth pan) is used for this purpose, this object shall be secured in such a way that it cannot fall from the work piece.
- Provide strain relief for the connection plugs.
- In 3-phase installations, a switch shall be fitted to the female socket.

Where welding has to be performed on a work piece with more than one welding device, the minus clamps of the welding sets to be used shall be joined to the work piece prior to beginning the work.

The following points apply to welding generators combined with auxiliary voltage generators:

- If set up on a conductive work floor, fit an equipotential bonding between the frame of the generator and the work floor.
- Fit an insulation monitoring device (residual-current device) at 400 V a.c. and/or 230 V a.c., which disables the voltage as soon as an insulation fault is detected. Test the RCD before commencing work.

15.5 Electrical heat treatment equipment

When using electrical heat treatment equipment, open-circuit voltage shall be limited with a voltage limiter in accordance with NEN-EN-IEC 60974-1.

16. MACHINERY AND TOOLS

Ensure that machinery and tools are checked and maintained by a qualified individual. Keep tools, including hand tools, clean and undamaged.

Use pneumatic tools in work for which electrical hand tools cannot or may not be used. Machines and tools shall not be left running unattended.

When using machinery and tools, government requirements shall be observed with regard to noise and emissions.

16.1 Modifications to and/or repairs to (defective) machinery and tools

Modificaties to and/or repairs to machinery shall comply with the moeten voldoen aan de "Machinerichtlijn" ("Machinery Directive").

Modifications to and/or repairs to tools shall comply with the Arbeidsmiddelenrichtlijn ("Use of Work Equipment Directive").

Defective machinery and tools shall be provided with a label "DEFECTIVE" and removed from the construction site as soon as possible.

16.2 Air-powered or hydraulically-driven machinery and tools

If air-powered or hydraulically-driven machinery and tools are being used, the following requirements apply to hose connections and couplings:

- Provide each branch of the main power medium line with a valve on the main line.
- For pressures above 1 bar (e), hose connections and couplings shall be secured against loosening.
- Provide coupling systems with claw couplings and other critical applications with two couplings shall be supplied with a safety cable, chain or locking pin.
- Quick couplings in high-pressure systems (above 25 bar (e)) are not permitted, unless secured couplings equipped with a pressure relief system are used.

16.3 Electrical machinery, tools, hand tools and appliances

Electrical machinery, tools, hand tools and appliances shall:

- be demonstrably certified in accordance with NEN 3140. Where the tools' inspection dates have expired, those tools may not be used;
- be set up outside zoned areas unless they are explosion-proof;
- be switched off when not in use.

In work pits and "conductive confined" spaces, such as metal boilers, tanks, vessels, damp crawlspaces and steel sheet pile wall pits, only machinery and tools operating at a safe voltage shall be used, that is, connected to:

- S circuit i.e. an isolation transformer (230 V a.c. - 230 V a.c.), or
- a (small) safety (diesel) generator, or
- SELV circuit, i.e. a circuit with a safe voltage such as:
 - < 50 V a.c., or
 - < 120 V d.c. ripple-free, or
 - < 110 V d.c. with a maximum ripple of 1,5 %.

Electrical hand tools shall be double insulated. The connecting cable shall be fitted with a moulded plug, unless it is a hand tool that can only operate at a safe voltage (S circuit or SELV circuit).

Hand lamps shall:

- be connected to a SELV circuit, or
- be operated from batteries with a maximum voltage of 24 V d.c.

The safe voltage supply, S circuit or SELV circuit, shall be located outside the room where work is being carried out. Connect only one user to each isolation transformer.

At gas-transporting installations, electrical equipment shall only be connected to the existing voltage supply following the approval of the member of the site management team responsible for installations.

Electrical tools, which are used for work on gas-transporting installations in zoned areas, shall comply with explosion protection requirements (ATEX).

Spark-proof tools shall be used in zoned areas at hydrogen sites.

16.4 Stationary equipment

The following equipment may be used in conductive confined spaces:

- Equipment connected to SELV circuits pursuant to NEN 1010 (supply with safety extra low voltage), or
- Equipment provided with equipotential bonding and protected with earth leakage protection of 30 mA, or
- Equipment connected to S circuits (safety transformer to which only one hand tool may be connected per transformer), or
- Equipment having a protection category of II (pursuant to NEN 1010) and protected outside the area with a residual current device of 30 mA, or
- Equipment having a protection category of I (pursuant to NEN 1010) and supplied from a TN/TT system and protected outside the area with a residual current device of 30 mA.

Note:

The supply for the SELV circuits and S circuits shall be set up outside the conductive confined space.

17. USING HOISTING AND LIFTING EQUIPMENT SAFELY

17.1 Hoisting cranes and sidebooms

Fixed cranes, mobile cranes and sidebooms shall be CE marked and comply with the "Machinerichtlijn" ("Machinery Directive"). Hoisting and lifting equipment shall comply with the "Warenwetbesluit Machines" ("Machines (Commodities Act) Decree"). CE marking and the "Machines (Commodities Act) Decree" determine which documents need to be kept with the crane or sideboom, and for the marking which the crane or sideboom is required to have.

Before a caterpillar crane with an assembly jib or a fixed tower crane are commissioned at the building site, and whenever the configuration of this type of crane is changed, a set-up inspection shall be carried out by a specialist, who may not be the operator.

17.2 Hoisting and lifting gear

Hoisting and lifting gear shall comply with the "Arbeidsomstandighedenbesluit" ("Working Conditions Decree").

Hoisting and lifting gear shall:

- have a test certificate with a registration number;
- be free from damage and defects.

The working load of hoisting chains or straps shall be legibly marked on the chain or strap.

17.3 Safe hoisting

Hoisting activities shall comply with the guidelines of the "Vereniging Verticaal Transport: Arbocatalogus Verticaal Transport" ("Vertical Transport Association: Vertical Transport Health and Safety Catalogue"), see the website of the [VVT](#). Exceptions and additions to these are listed in sections 17.3.1 upto and including 17.3.6 and 17.4.

17.3.1 Multi-winch cranes

When hoisting with several winches simultaneously, a TRA shall be prepared in advance.

The hook not in use on cranes with an auxiliary jib or jib used for hoisting, shall be located high; near the top of the jib.

The currently unused hooks and cables of cranes without an auxiliary jib or jib normally used for pile-driving or driving sheet pile sections:

- shall be removed or rolled up, respectively, if work that does not require the second winch is carried out for more than one day, or
- may be attached to the uppercarriage, provided that overloading of the attachment is signaled by an audible and/or visual alarm to the driver, or
- may be attached to the uppercarriage by a dual connection, where the second connection is able to withstand the static and dynamic forces arising if the first connection breaks.

17.3.2 Piling cranes

Piling cranes shall comply with NEN-EN 16228-1 and NEN-EN 16228-4. If this type of crane is also used for hoisting activities, it shall also comply with NEN-EN 13000.

17.3.3 Mobile or immobile cranes, earth-moving machines (operating load moment/lifting capacity < 10 ton metres) and sidebooms

Crane operators in charge of mobile or immobile cranes or diggers that have a lifting function with a working load of less than 10 ton metres and sidebooms shall:

- be adequately instructed in accordance with the user instructions and have attended a specific training course. This must be demonstrated upon request.
- have a clear view of the load from the cab throughout the hoisting operation.

17.3.4 Assistance during hoisting activities

If the operator does not have a sufficiently clear view of the load, he shall be assisted by a competent person. It shall be clear to everyone in the work area who is responsible for this task. Hoisting instructions are given according to the situation, by means of standardised hand and arm signals or walkie-talkies.

Employees who secure and move loads at a Gasunie site or installation shall have taken the "Moving loads" training course in accordance with the SSVV Guide to Courses (see www.vcainfra.nl/bedrijven/risicovolletaak-per-branche/ under the heading "Petrochemie"). This requirement also applies to employees who secure and move loads elsewhere if the hoisting activities in question require a hoisting plan.

17.3.5 Specific provisions

Bypassing protective devices, such as the load moment protective device of the hoisting crane, is prohibited. Anyone seen to contravene this provision will be immediately removed from the building site.

Loose material, gas bottles and the like shall be hoisted in hoisting troughs.

If chemical anchors are used to hoist a load, they shall be tested prior to the hoisting operation. The force at which the anchors are tested shall be at least twice the weight to be hoisted by each anchor. No visible damage may occur as a result of this test.

Wet hoisting belts that are frozen shall never be used. Hoisting belts and straps with external damage shall be rejected and immediately removed from the building site.

It is prohibited to hoist, suspend, stretch and the like materials to supports, cable ducts, pipes and other installation components.

The use of safety cages and work platforms in combination with hoisting equipment shall be agreed in advance with the Client.

It is prohibited to assemble valve stations above existing free-standing gas-transporting systems.

When lifting pipeline components inserted into the pipeline route (removing chock blocks, for example) the maximum distance between the support or hoisting points (given in table 2) should not be exceeded.

Table 2: Support point/restraint distance in metres

Lifting height (mm)	Pipeline diameter					
	DN 100	DN 150	DN 200	DN 250	DN 300	DN 400
50	9	11	13	14	16	17
100	13	16	18	20	22	25
150	16	20	22	25	27	31
200	18	23	26	29	32	35

17.3.6 Hoisting above gas-transporting pipelines

Hoisting above gas-transporting pipelines shall be avoided if possible. If, however, it proves to be unavoidable, the following requirements apply:

- A Task Risk Analysis/hoisting plan shall be prepared;
- Work should only be performed with a work permit issued by/on behalf of the site management;
- The hoisting table is to be taken into account in determining the maximum load (the hoisting table contains a safety margin of 25%);
- Additional measures shall be taken (for example, extra straps – double executed, gas-transporting pipelines provided with a protective construction);
- A toolbox meeting shall be held;
- The site management shall have an emergency scenario available to ensure adequate intervention in the event of a disaster (people, resources, communication, plan).

17.4 Hoisting plan and execution plan

A hoisting plan and execution plan are required for the following situations:

- moving a load using more than one crane except for the lowering of pipes into trenches;
- hoisting over systems in operation;
- hoisting loads that are temporarily out of the operator's sight during the hoisting operation;
- hoisting special loads (combined load, load with an eccentric centre of gravity, hoisting without specific hoisting equipment).

The hoisting plan contains information about the hoisting crane to be used and the load to be hoisted. This concerns information relating to:

- summary drawing of the erection site(s);
- data relating to the hoisting cranes to be used, including their minimum deployment tonnage;
- drawing showing the mass and dimensions of the load to be hoisted, together with its hoisting points and centre of gravity;
- the information from the hoisting tables and/or crane diagrams of the hoisting cranes to be used that is relevant to the hoisting operation;
- the outrigger pressures occurring;

- the hoisting equipment to be used together with the maximum load occurring;
- maximum wind strength permitted during the hoisting operation.

The hoisting plan shall be prepared by the hoisting firm.

The execution plan contains information about the execution of the hoisting operation. This concerns information relating to:

- date and time of the hoisting operation;
- names of parties involved and contacts;
- name of the person in charge of the hoisting operation: hoisting foreman;
- tasks, responsibilities and powers of the employees taking part in the hoisting operation;
- agreements relating to the infrastructure present (e.g. underground cables and pipelines, high-voltage lines; enter in TRA if necessary);
- coordination with work being done nearby (enter in TRA if necessary);
- the strength of the subsoil;
- the hoisting movements to be performed: starting and finishing points with the route along which the load is to be moved;
- the load guidance required (steering line);
- agreements relating to communication procedures and resources (enter in TRA if necessary).

The execution plan shall be drawn up by the party in charge of the hoisting operation.

The hoisting plan and execution plan shall always be discussed with the parties concerned at a toolbox meeting held prior to the hoisting activities, and checked for completeness. The Client shall be invited to this toolbox meeting.

In the case of complex hoisting operations, a specialist from the company supplying the hoisting crane shall:

- visit the site to assess the situation;
- agree the activities to be carried out with his Client.

This also applies if hoisting activities for which a hoisting plan needs to be drawn up have to be carried out frequently at a location for a prolonged period.

18. WORKING AT HEIGHT

When working at height, use cherry pickers or scaffolding/mobile scaffolds.

When working at heights with fall hazards exceeding 2,5 m, additional safety devices are required.

When working at heights lower than 2,5 m with risk-increasing conditions, additional safety devices are necessary.

When working at height, ensure that objects cannot fall down.

Erect barriers to prevent passers by being struck by falling objects.

Openings in floors or guardrails shall be closed up or blocked off as soon as they have occurred.

Erect barriers to prevent sparks/spatter from hitting passers by when welding or cutting at height. Affix warning tape and signs to both the workplace and underneath it.

Take measures to prevent and/or control fire or damage to objects as a result of sparks/spatter when welding or cutting at height.

Fencing and boarding shall satisfy the provisions stated in section 8.

18.1 Protection against falling

When working on flat roofs or scaffolding, fall protection is mandatory. Exceptions are:

- a There is a guardrail system or fencing.
This guardrail system or fencing shall consist of an upper rail with a minimum height of 1,0 metre and a maximum height of 1,1 metres above the standing surface, a middle rail and a kickboard of a minimum of 0,15 metres;
- b The work is carried out at least 2 m from the edge or roof edge and this distance is marked with a purlin or red/white demarcation tape.

19. LADDERS, SCAFFOLDING AND CHERRY PICKERS

19.1 Ladders

- Ladders may be used to provide access to a higher platform or for inspection. Ladders may not be used to carry out work.
- Ladders shall not be used to reach heights in excess of 10 m (7,5 m standing height).
- Ladders shall extend at least one meter above the required level, shall be placed at an angle of 65°- 75° and shall be firmly fixed at the top or held at the bottom.
- A pole hoop shall be used when resting the ladder on a pole.
- Metal ladders shall not be used for electrotechnical work (see NEN 3140), or in the vicinity of electrical systems.
- Defective ladders shall be marked as such and removed from the site as soon as the defect has been identified.
- Secure ladders in trenches and pits.

19.2 Scaffolding

The Guidelines on Scaffolding (Richtlijn Steigers, see www.richtlijensteigers.nl/) apply to working with ladders.

The "Steigerbouwen" (Scaffolding Construction) A-sheet of the Vollandis knowledge and advice centre also applies.

Scaffolding shall be earthed. This also applies to mobile scaffolds. Deviation from this is possible only if no earthing is present and there is no electrical equipment or cables nearby, with written permission including a work plan and a TRA, from the individual responsible for the installation (IV).

Mobile scaffolds

Mobile scaffolds shall be used in accordance with the "[Rolsteigers](#)" (Mobile Scaffolds) A-sheet of the Vollandis knowledge and advice centre.

19.3 Mobile cherry pickers

The following requirements shall apply to cherry pickers:

- During use, it is obligatory to wear a fall arrestor which is attached to the safety cage.
- Cherry pickers whose inspection dates have expired (sticker on cherry picker) may not be used.
- The cherry picker operator shall have received training in accordance with the SSVV training guide (Foundation Cooperation for Safety - Training Guide, see <https://www.vcainfra.nl/bedrijven/risicovolletaak-per-branche/> under the heading "Petrochemie"). Working alone on a cherry picker is not permitted: there is always one person on the ground and one person in the safety cage.

- A TRA shall be compiled where two or more cherry pickers are working in the same working area.

20. STORM AND THUNDERSTORM HAZARDS

20.1 Securing against wind and storm damage

Installations, tanks, towers, cranes and the like under construction shall be guyed and braced above wind force 6 Bft.

If wind force of more than 4 Bft is experienced or forecast, loose materials shall be tied down or otherwise secured so that they cannot blow away and cause damage and/or personal injury. Also, be aware of the effect of advertising banners attached to site fences.

The Main Contractor shall ensure that the site is secure against the adverse effects of a storm and the like during weekends and holiday periods.

The following activities shall not take place at wind force in excess of 6 Bft (wind speed > 13,8 m/s):

- hoisting;
- using a ladder;
- work on mobile scaffolds;
- working from a cherry picker;
- going onto a flat roof or scaffolding without fall protection.

If work has to be stopped at lower wind forces, this shall be recorded in the relevant hoisting or working plan or the TRA.

20.2 Thunderstorms

The following points apply if there is a thunderstorm with a risk of lightning striking within 3 km (this equals ten seconds between lightning flash and thunder):

- Stop work.
- Do not remain in exposed areas or under trees.
- Find shelter in a safer environment, such as the site huts.
- On cranes, lower the boom if possible.

21. RADIOACTIVE SOURCES, LASER DEVICES AND HAZARDOUS SUBSTANCES

21.1 Radioactive sources

When using radioactive sources, the NDT contractor shall:

- demarcate its work site to prevent anyone entering the enclosed area unintentionally (see section 8);
- base its choice of protection measures on the requirement that, as a general rule, the equivalent dose (radiation level) at the demarcation shall not exceed 10 µSv per hour;
- maintain a continuous watch to prevent third parties entering the radiation zone unintentionally;
- take radiation measurements to monitor the situation;
- where the use of ionising radiation produces an additional hazard:
 - choose a different method of testing, or
 - take additional measures, such as cordoning off roads/streets, or
 - have the NDT work carried out outside normal working hours.

Motor crawlers shall be used only to move equipment, such as radioactive sources, through the pipeline; use of motor crawlers to move persons is prohibited.

21.2 Lasers

In the event that class 3A, 3B and 4 lasers (in accordance with the standard NEN-EN-IEC 60825-1) are to be used, the Main Contractor shall compile a TRA covering the following points:

- Protection of the immediate surroundings against radiation.
- Protect those working with lasers with laser goggles as a minimum.
- A ban on wearing or using shiny objects.
- Cordoning off of the area in which work is being performed with a laser (see section 8).

21.3 Hazardous substances

The use of hazardous substances on site shall be restricted to a minimum. If hazardous substances are used on the site, the VIBs (safety information sheets) relating to these substances shall be available and the WIK (construction site instruction card) shall be present on site. A list of substances to be used shall be made available to the Client. The precautionary measures mentioned in the VIBs (safety information sheets) shall be taken.

Packaging for hazardous substances, fuel, oil and the like shall:

- be reliable;
- withstand the effects of the substance concerned;
- have proper legible labels.

Chemicals shall be stored outside the working area in accordance with PGS 15.

21.3.1 CMR substances

The use of so-called CMR (Carcinogenic, Mutagenic, Reprotoxic) substances is only permitted if there are no alternatives to these substances. Compliance with the applicable legislation is required for the use of CMR substances. Justification for the use of CMR substances shall be coordinated with Gasunie department "Health, Safety and Environment".

21.3.2 Hazardous substances in the gas transport system

Work on the existing gas transport system shall take account of the possible presence of hazardous substances like LSA, natural gas condensate, odorant, mercury, mine dust, black powder and sulphur.

When opening systems, PPE as prescribed in the WIK (construction site instruction card) shall be worn.

21.3.3 LSA

The production of natural gas involves the release of small quantities of radioactive material to the soil surface. International indication for the radioactive contamination caused is:

- Naturally Occurring Radioactive Material (NORM), or
- Low Specific Activity (LSA).

Radioactive material builds up in production and transport installations and, if these installations are opened, presents a risk to man and the environment. Research has shown that LSA occurs in HTL transmission systems in places where turbulence can arise in pipeline systems.

In the event of work on HTL pipeline systems in which there is a risk of contamination (where the gas flow has been subject to turbulence, for instance when pressure regulation units and gas purifiers are used), the Gasunie Field Organisation Radiation Protection Supervisor shall be called in by the site management. The Radiation Protection Supervisor shall take control measurements and, where necessary, shall involve the Gasunie Radiation Protection Expert, whose instructions shall be followed.

Measures will concentrate on preventing LSA from being taken up in the body.

21.3.4 Natural gas condensate

When transporting natural gas, natural gas condensate can form within the transmission network. This liquid contains volatile organic compounds (VOC, including benzene). When opening systems, site management shall perform a check for the presence of gas condensate (vapours) and, if necessary, have this removed and add specific measures to the work permit if necessary.

21.3.5 Odorant

Odorant may be present in the regional distribution network. Odorant may be present in liquid form or have attached itself to the steel of the pipe wall. When opening systems, site management shall check for the presence of odorant and have it removed, if necessary, and add specific measures to the work permit if necessary.

21.3.6 Mercury

Natural gas can contain very small quantities of mercury. This mercury can become attached to the pipe wall. Mercury vapour can form as a result of the preheating of or welding onto existing pipeline systems. However various baseline monitoring exercises have shown that the limit value of the mercury is not usually reached during these activities. If there is a chance of mercury vapour being released, the site manager shall add specific measures to the work permit. Where metallic mercury is present, expert advice shall be obtained from the safety advisor.

21.3.7 Mine dust

Mine dust can occur in some parts of the regional gas transmission network in Noord Brabant and Limburg. When combined with other substances or at different temperatures, the cyanide in the mine dust can form hydrogen cyanide.

If work needs to be carried out on pipelines in which mine dust may be present, the measures to be taken shall be determined in consultation with the site manager and added to the work permit.

21.3.8 Black powder

Black powder may be present in the gas transport system. Under certain conditions and circumstances (contact with oxygen/air), this substance may ignite spontaneously. If work has to be done on pipes which may contain black powder, the measures to be taken shall be determined in consultation with the site manager and added to the work permit.

21.3.9 Sulphur

Sulphur may be encountered in the gas transport system, and particularly the control runs of gas delivery stations and metering and control stations. If sulphur is encountered it shall be prevented from spreading. The administrative measures to be taken shall be determined in consultation with the site manager and added to the work permit.

21.4 Cleaning systems

Industrial cleaning (for example, high-pressure fluid cleaning, vacuum pressure cleaning or technical chemical cleaning) shall be performed by companies affiliated to the Industrial Cleaning Foundation (SIR, www.sir-safe.nl/).

22. DEMOLITION, DISMANTLING AND ALTERATION

This section concerns the complete or partial demolition, dismantling, removal and alteration of installations and transmission pipelines.

22.1 Release of hazardous substances

22.1.1 General requirements

If there is any possibility of hazardous substances, such as mercury, natural gas condensate, mine dust, odorant, LSA, black powder, zinc, chromium-6 or sulphur being released during construction or demolition work, preliminary precautions shall be taken to protect employees, third parties and the environment (see also section 21).

22.1.2 Release of asbestos and of substances containing asbestos

The removal of asbestos-containing gaskets from process installations is exempt from the obligations of the Asbestverwijderingsbesluit 2005 (Asbestos Removal Decree 2005). In order to ensure that employees are not exposed to asbestos fibres, the removal of asbestos-containing gaskets shall be in accordance with the "Validatierapport verwijderen asbesthoudende flenspakkingen" ("Validation report on the removal of asbestos-containing flange gaskets") or the "Validatierapport verwijderen asbesthoudende pakkingen in afsluiters, actuators, tandwielkasten, etc." ("Validation report on the removal of asbestos-containing gaskets in valves, actuators, gearboxes and the like"). The reports can be obtained via Gasunie on request.

Certain actions (banging and loosening of asbestos-containing bitumen coating and sawing of pipes with asbestos-containing bitumen coating) may be carried out under risk class 1 if the guidelines and working procedures listed by the Ascert Foundation are met.

If AC cable protection pipes have to be removed, this shall be performed in accordance with the work plan from the Arbocatalogus Netwerkbbedrijven (Health and Safety Catalogue for Network Operators).

In other cases, where the presence of asbestos, for example in bitumen coating and in buildings, is suspected, an asbestos inventory shall be performed by an organisation holding an Asbestos Inventory Process Certificate prior to commencement of the work, on Gasunie's instructions. If asbestos proves to be present and removal is necessary, this shall be performed by an asbestos disposal company holding an Asbestos Removal Process Certificate. These process certificates shall comply with the Ascert Foundation's certification scheme with effect from 1 April 2019.

When performing an asbestos inventory of the bitumen coating of a gas transport pipeline, the pipeline shall be examined at least at the number of locations specified in table 3, depending on its length.

Table 3: Number of locations to be examined during an asbestos inventory

Pipeline length (m)	Number of locations to be examined
pipeline < 5	1
5 ≤ pipeline < 10	2
10 ≤ pipeline < 50	3
50 ≤ pipeline < 100	4
100 ≤ pipeline < 200	5
200 ≤ pipeline < 500	6
500 ≤ pipeline < 1000	7
pipeline ≥ 1000 m	1 extra per kilometre

Additional inventories shall be performed if there are differences in the structure or colour of the coating.

With regard to removal of bitumen coating there is an exemption for the inventory requirement; this is when the coating surface to be removed is very small (< 0,01 m²), for instance in order to apply CP to the pipeline. In this case removal shall be done by means of "banging and loosening". The coating removed shall be disposed of as "asbestos-containing" waste.

If the earth contains debris suspected of containing asbestos, [NEN 5707](#) shall be followed for the inventory. The earth shall be decontaminated by a [BRL 7000](#)-certified company.

If, despite the above, the Main Contractor encounters installation components suspected of containing asbestos, work shall be discontinued and this shall be reported to the Client. Work may only be resumed when it has been established by an expert organisation that it can be performed without any risk, or that the asbestos has been removed by an expert asbestos disposal company.

Note:

The carriage of pipeline parts with asbestos-containing coatings is exempt from the provisions of ADR. See the special provisions of ADR (chapter 3.3 "Special provision applicable to certain materials and articles", number 168), quote:

"Asbestos which is immersed or fixed in a natural or artificial binder (such as cement, plastics, asphalt, resins or mineral ore) in such a way that no escape of hazardous quantities of respirable asbestos fibres can occur during carriage is not subject to the requirements of ADR.

Manufactured articles containing asbestos that are packed in such a way that no escape of hazardous quantities of respirable asbestos fibres can occur during carriage are also not subject to the requirements of ADR."

22.1.3 Chromium-6

At Gasunie, chromium-6 mainly occurs in coating systems. Employees are generally not exposed to chromium-6. Employees may be exposed as a result of machining operations producing dust. This also applies to "old" dust that may be present in cable ducts. Prior to the commencement of work, every Main Contractor shall comply with its obligation to investigate for chromium-6.

Consideration shall also be given to how the most appropriate working method can be achieved, preferably one where dust formation is prevented. In addition, the correct collective measures and most suitable PPE shall be determined. These measures shall be agreed with Gasunie.

Management measures for working with components containing chromium-6 shall be compiled in accordance with the latest version of Beheersregime Chroom 6 (Chromium-6 Management Regime).

22.2 Removal of pipelines that are not in use

Pipelines that are not in use may still contain residues of hazardous substances. Pipelines of this kind shall be pulled using techniques in which the surface temperature remains below 100 °C and the ends of the pipeline remain open.

Levels of hazardous substances that are released during the removal of pipelines that are not in use are measured by the site manager. Exceptions to this rule are permitted only following mutual agreement (work permit) and after it has been ascertained that the Main Contractor has formalised the measurement of levels in a plan of action submitted to the Client for validation.

Contaminated parts of pipelines or appendages shall be disposed of in standard waste containers (6 metres in length). Liquid-tight containers (5,5 metres in length) are only required to be used if there is a possibility of seepage. Containers shall be set up on the work site in such a way that vapours escaping from the materials they contain cannot present a hazard to people and/or the environment.

22.3 Ceramic fibres

Ceramic fibres are sometimes used as an asbestos substitute for purposes such as heat-resistant insulation and reinforcement. If there is a possibility of ceramic fibres being released, a specialist firm shall conduct an inventory and a specialist decontamination firm shall be hired to carry out decontamination if necessary.

22.4 Blasting grit

Blasting grit can contain coating residues with hazardous substances (lead, asbestos, zinc, chromium-6). The blasting grit shall be analysed for such substances before being delivered to an approved waste processing company.

22.5 CP and potential equalisation

CP and potential equalisation shall be enforced when changes are made to an existing system. To this end, a back-up electrical connection shall be set up in advance to cover any interruption to the power supply, consisting of at least two wires of adequate cross-section (at least 10 mm²).

22.6 Location and labelling of pipelines and cables

The Main Contractor shall satisfy itself that pipelines, equipment and installation components have been released by site management for removal. In order to avoid confusion between pipelines and cables for removal and those that are not for removal, special care shall be taken in locating and labelling aboveground and underground pipelines and cables which are not to be removed.

Pipelines and/or pipeline sections may only be removed following permission from, or on behalf of, the site management.

23. ELECTROTECHNICAL SYSTEMS

23.1 Regulations

All electrotechnical systems, their components and assembly shall as a minimum comply with the applicable guidelines, standards and regulations. The principal standards relating to this specification are:

- NEN 1010;
- NEN-EN 50522;
- NEN-EN-IEC 61936-1;
- NEN 3140;
- NEN-EN-50110-1;
- NEN-EN-IEC 60079-14;
- NEN 3840.

23.2 Regulations for temporary electrical installations (installations for construction activities)

The installation of temporary electrical installations in or near to areas at risk of explosion on the work site is permitted following coordination with the Client.

The Main Contractor shall prepare the following drawings of the temporary electrical installations:

- the cable run of the buried cables, and
- an installation diagram of the complete installation.

The Main Contractor shall appoint and introduce to the Client an Installation Manager (IV) responsible for temporary electrical installations. The Main Contractor shall also submit a maintenance and inspection schedule in accordance with NEN 3140 to the Client. All documents, diagrams and drawings relating to the temporary installation shall reflect the actual situation. The person authorised to perform the work shall be designated in writing and made known to the Client in accordance with NEN 3140.

Test all earth leakage protections of the temporary installation every month and keep a record of this.

On completion of the work, dismantle the temporary electrical installation and, following consultation with the Client, restore the site and existing electrical installation to its original state.

Before a (temporary) electrical system is brought into use, this shall be inspected in accordance with the requirements of NEN 3140. The findings shall be reported on a handover report in accordance with the form listed on the summary "Project document - Pre-commissioning summary – and related GTS forms"⁵.

⁵

This form is provided upon assignment.

23.2.1 **Cabling**

Main power supply shall be provided with armour and earth conductor (shielding) in accordance with NEN-EN 50525-2-51. The armouring and earth conductor (shielding) shall be firmly connected to the safety earth.

Rubber-insulated cables which form part of fixed components of the installation, such as pumps, field distribution boxes, container-type workshop units or covered work places, shall be:

- adequately supported and not subject to being pulled;
- hung on temporary fences or on poles or props providing adequate support, and
- installed off the ground.

When crossing roads or temporary roads and/or buried infrastructure, the cables shall be laid in thick-walled plastic cable protection pipe.

If the cable cannot be laid in a cable protection pipe, it shall cross the road at sufficient height (> 4 m). A tension wire shall support the cable.

Prevent cable damage. Remove damaged cables from the construction site as soon as any damage has been identified.

Temporary voltage supplies or cables shall be fed in via cable entries and cable ducts.

23.2.1.1 *Loose wires in conduits*

Loose wires in conduits may only be used in offices and canteens. The diameter of the conduit and wiring shall be in accordance with NEN 1010.

23.2.1.2 *Cabling*

Cables with cable saddles **may** be used in staff accommodation and temporary canteens. In all other parts of installations (such as Nissen huts, container-type workshop units and shipping containers), cables **shall** be contained in conduits.

Wherever cables are led from one support to another (for example between a buried cable run and a cable duct or between a cable duct and a building lead-through), the cable shall be properly supported so that no damage can occur.

23.2.1.3 *Cable laying in the ground*

Avoid cable laying in the ground.

If burying is necessary then:

- follow the route marked on the drawing, and
- comply with the requirements of CSE-30-N/1.

23.2.1.4 *Laying cables in areas subject to a risk of explosion*

In areas subject to a risk of explosion, electrotechnical cables shall be laid in accordance with the requirements of NEN-EN-IEC 60079-14.

23.2.2 Equipment

All electric equipment shall be provided with a valid inspection mark. This inspection mark shall be made evident from a sticker on the equipment.

23.2.2.1 Diesel generator set

Where diesel generator sets are used, they shall comply with the provisions of NEN 1010 and the electrical system shall form a TN system. The entire set shall be suitable for outdoor installation (IP54 in accordance with NEN 10529).

The electrical power distribution part of the generator shall be protected by a 300 mA earth fault protection device. Where the electrical connections are not in the form of sockets, the terminal box shall be locked so that access is only available to authorised persons.

The emergency stop switch must always be recognisable, accessible and operable.

23.2.2.2 Switchgear and distribution boxes

Switchgear and distribution boxes shall be of a robust construction and have a degree of protection of at least IP54 on the outside (in accordance with NEN 10529). All operating elements shall be operable from outside. The operating elements shall be labelled to indicate their function.

Switchgear boxes, distribution boxes with fuses, field distribution boxes and other electrical equipment shall not be suspended on a cable and shall in all cases be placed on the ground or firmly fixed.

All terminated cable groups with a nominal current not exceeding 32 A shall be protected with a 30 mA earth fault protection device.

23.2.2.3 Field distribution boxes

Field distribution boxes shall be fitted with CEE-type socket outlets. Socket-outlets installed in field distribution boxes shall be protected by an earth fault protection device (≤ 32 A) with a nominal operating current not exceeding 300 mA.

In the field distribution boxes, only shock proof wall sockets with a maximum voltage and current of:

- 230 V, 16 A 2-pole, or
- 400 V, 32 A 3-pole and neutral shall be used.

If more power is required, a separate protected circuit shall be installed from the temporary main distribution assembly.

Field distribution boxes shall not be placed in areas designated as ATEX zones.

23.2.2.4 Extension cables

If it is not possible to use CEE-type coupled socket outlets on the site, the use of Schuko plug contacts is permitted if the connecting cables from CEE-type to Schuko do not exceed 40 cm in length.

Extension cables for the connection of hand tools:

- shall only be plugged into a CEE-type wall socket;
- shall be laid in such a way as to minimise the risk of damage to the cable;
- shall be used and fully extended in accordance with the user instructions;
- shall only be laid over the ground for very short periods and shall be cleared away at the end of each working day;
- shall not be of a "twin wire" type.

Regardless of the amperage, it is not permitted to through an extension cable:

- transferring a 3-phase neutral protective conductor to a 1-phase neutral protective conductor;
- transferring a 3-phase protective conductor to a 1-phase protective conductor.

23.2.2.5 Portable electrical tools

Portable electric tools shall be fitted with a power cable suitable for the current to be carried and a CEE-type plug contact and shall be connected via a 300 mA residual-current device.

23.2.2.6 Accommodation

All socket-outlets in site offices, huts or containers shall be earthed.
All circuits shall be protected by a 30 mA residual-current device.

The surface temperature of electrical appliances shall not exceed 100 °C and shall carry a CE certification mark in accordance with the Low-Voltage Directive.

Electric heating appliances shall be permanently fixed. The maximum power of each heater shall not exceed 2 kW and no more than two heating appliances or heaters shall be connected per fuse, with a maximum total power of 3 kW. All electrical equipment and domestic appliances other than heating appliances shall be switched off outside working hours.

23.2.2.7 Caravans

The electrical system in mobile or static caravans shall comply with NEN 1010. If mobile caravans are connected to a power supply, the maximum supply voltage for a mobile caravan shall be 230 V. All outlets shall be protected by an earth fault protection device with a maximum operating current of 30 mA.

23.2.3 Safety earthing

At those places where no proper safety earth connection or equipotential bonding is available, a temporary earth electrode shall be installed. The earth dissipation resistance of the electrode shall be in accordance with NEN 1010.

The earth connection shall not be used as neutral.

Extraneous conductive parts which can become live in the event of a defect shall be connected to the protective pipe (earth connection) or equipotential bonding. This shall also apply to the metal bases of temporary work sites such as a plate floor. The earth dissipation resistance may not exceed 100 Ohm, at whichever point it is measured on the plates. The measurement results shall be recorded.

Where an electrical system is installed in a steel container or a Nissen hut, the following requirements shall be met with regard to safety earthing:

- Steel containers shall be visibly connected on the exterior to the external safety earth with a yellow/green cable with a diameter of at least 25 mm².
- The steel frame/trusses in Nissen huts shall be visibly connected to the external safety earth with a yellow/green cable with a diameter of at least 25 mm².

23.3 Work on electrical installations

23.3.1 Low voltage

Electrotechnical work on a low-voltage installation or parts thereof shall not be undertaken without the written instruction of the member of the site management team responsible for installations (IV). The work shall be carried out in accordance with the provisions contained in NEN 3140.

Employees undertaking electrotechnical work on Gasunie's instructions shall be able to demonstrate to the person responsible for the installations (IV) that they are authorised to do so.

23.3.2 High voltage

For electrotechnical jobs on or in the vicinity of high voltage installations, a "high risk" work permit shall be issued by the person responsible for the installation (IV) (whose name shall be made known prior to commencement of the work) as well as a signed "Locking and Labelling Form".

The permit holder shall be a professionally skilled person (see NEN 3840).

23.4 Work in the vicinity of high-voltage lines and/or railway overhead wires

For work in the vicinity of aboveground high-voltage lines (including railway overhead) and transmitter masts, the company responsible for the line (or installation) shall be consulted in advance concerning the safety measures.

The safety measures to be taken shall be carried out by the Main Contractor and reported in writing to the Client.

ANNEX

A SAFETY QUALIFICATIONS FOR THIRD PARTY PERSONNEL

If third party personnel are hired to carry out work at Gasunie, an assessment shall be made order to determine the safety category of the activities. The qualifications linked to the risk category shall be required in the order given to the third party.

Two safety categories have been formulated to qualify the work:

– Safety category A:

This category contains exclusively activities/work which involve **limited to low safety risks**. The nature, scope and location of the activities/ work are such that it can reasonably be assumed that the risk of serious injury is low or non-existent.

– Safety category B:

This category contains both activities/work which involve limited to low safety risks and activities which involve **increased or high safety risks**.

The nature, scope and location of the last mentioned activities/work are such that, unless additional precautionary measures are taken, there is a relatively high risk of serious injury.

The activities included in safety category A can, in exceptional cases, be classified under safety category B and vice versa, if this is dictated by specific circumstances (e.g. the environmental permit or the interaction between different activities).

Note:

The abovementioned category classification is not related to the high- or low-risk classification awarded when granting the work permit.

A.1 Classification of work for safety qualifications

Each safety category includes safety qualifications (see table 4).

Table 4: Safety qualifications

Category	SCC certificate	Basic training (SCC) SOS-SCC	CSA-38-E	Work permit (incl. safety instruction)	Safety instruction
A				X	X
B	X	X	X	X	X

Explanation:

- SCC certificate: The Main Contractor concerned is SCC-certified or certified according to [NEN-ISO 45001](#). (SCC means Safety Checklist Contractor (VCA in Dutch)).
- Basic training (SCC): All employees working on the project shall have the Basic Training (Safety) certificate. Managers shall have SOS-SCC (Safety for Operational Managers SCC).
- Work permit: An appropriate work permit is required for the execution of work.
- Safety instruction: An explanation regarding the main safety aspects prior to the commencement of the work.
- CSA-38-E: This specification applies to this work.

A.1.1 Safety category A examples

- Installation maintenance such as:
 - fire extinguishers/fire hoses;
 - rollup doors, sliding doors, revolving doors;
 - water treatment;
 - audiovisual equipment;
 - floors;
 - pressuring installation (= hydrophore system);
 - building management system;
 - air ducting.
- Interior boarding;
- Communication systems and services;
- Office/technical rooms (standard) cleaning;
- Pest control;
- Measures against slipperiness;
- Interior plantation maintenance (no pots or flower arrangements);
- Painting work (simple, limited scope, not at height and the like);
- Catering;

- Visitors/delivery personnel⁶:
 - sanitary facilities;
 - mail distribution;
 - contracting library personnel;
 - contracting travel agency personnel;
 - contracting fitness personnel;
 - maintenance of plants (pots) and flower arrangements;
 - maintenance of coffee machines;
 - maintenance of office machines.

A.1.2 Safety category B examples

- Contractors/subcontractors of construction and major maintenance jobs such as:
 - construction of pipelines;
 - execution of crossings without trenches;
 - mechanical engineering installation jobs;
 - electrotechnical jobs;
 - work involving instrumentation;
 - civil engineering work;
 - architectural/constructional work.
- Technical service companies such as:
 - insulation companies;
 - scaffold building companies;
 - industrial cleaning companies;
 - installation:
 - * earthing and lightning protection;
 - * object protection;
 - * climate control.
 - inspections such as Non-Destructive Testing;
 - installation and maintenance of pipe components such as:
 - * valves;
 - * actuators;
 - * compressors.
 - Installation and maintenance of E&I components such as:
 - * power distribution systems;
 - * emergency power installations;
 - * fire and gas detection systems.
- Cleaning outside walls and indoor high spaces;
- Crane rental and other vertical transport;
- Contractors ground work such as:
 - earth moving;
 - draining by well points;
 - draining;
 - agricultural engineering;
 - soil sanitation.
- Engineering companies that provide construction management;
- Civil work of limited scope in offices/buildings;
- Cultural restoration not related to construction activities;
- Road marking and fencing (no ground work);

⁶

Does not apply to visitors/delivery personnel for offices.

- Activities involving transport and hoisting equipment;
- Normal horizontal road transport;
- Work by utility providing companies;
- Landscaping (terrain maintenance on site);
- Building installation maintenance concerning:
 - fire detection/fire-extinguishing systems;
 - sanitary installations;
 - E-installations (emergency power, weak current and the like);
 - boiler/burner installations (no modifications and the like);
 - kitchen installations;
 - cooling apparatus.
- Carpentry (coarse, long-term/frequent):
 - internal transport/moving;
 - painting work (at height, extensive scope and the like);
 - assembly, adjusting and repairing research arrangements;
 - paving work, work involving asphalt covering and the like;
 - filling and/or emptying tanks containing dangerous and toxic substances (for instance odorous substances and condensate).