

BYCN GUIDELINES

STABILITY OF WORKS AND STORAGE

Summary



1 Objective and Scope

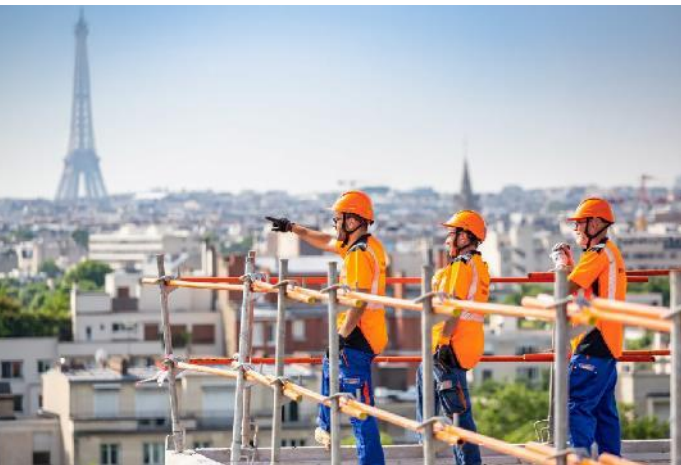
2 Lines of Defence

3 Life Saving Rules

A background image showing a line of construction workers wearing orange hard hats and high-visibility safety vests. The workers are looking towards the right. A white circular graphic element is overlaid on the image, partially framing the workers' faces.

1

Objective and Scope



Objectives

The objective of this document is to describe Bouygues Construction's requirements for **ensuring stability of works and storages**.

It applies to all Bouygues Construction sites, irrespective of the party performing the work including:

- Internal employees
- External partners
- Subcontractors.

In the context of JV projects, specific project procedures include at least the provisions described in this document, as well as the non-contradictory provisions of our partners. They are adopted prior to launching production.

Lines of Defence and Life Saving Rules mentioned in these guidelines are to be **part of Unique Operational Manuals** established by each BYCN Entity / Business Unit.

In instances where any part of this document conflicts with or is of a lower standard than local regulations, the more stringent local regulations will take precedence.

Each BYCN Entity / Business Unit **inform and train their personnel** on the content of their Unique Operational Manual to maintain a high standard of safety and operational efficiency.



STORAGE & SUPPORTS

Safe storage, supporting systems.

Permanent works are parts of a construction project that will remain in place for a long time. This includes buildings and structures such as bridges, roads, retaining walls, etc. The erection of most types of permanent works will require the use of some form of temporary works.

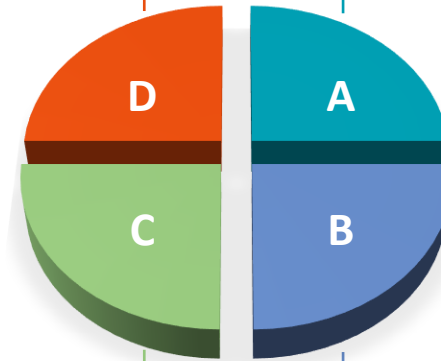
PERMANENT WORKS

TEMPORARY WORKS

Temporary works are elements that are erected to facilitate the construction of the permanent works. They will, most often, be removed once construction is completed.

Ground support for plant/structures.

GROUND / OTHER



In this 1st version, this document will only deal with risks related to the stability of temporary works.

SCOPE



Temporary works are defined as the following:

- works to stabilize or protect an existing building or structure that are not identified to be permanent.
- works undertaken during construction but not required to form part of the final completed construction works.
- permanent works operating under temporary conditions outside the parameters of their initial design.

INCLUDING



Earthworks: support to trenches, excavations, temporary slopes and stockpiles, open batters

Structures:

All load bearing temporary structures,
Formworks (vertical and horizontal),
Reinforcement cage,
Shoring / propping / falseworks / bracing,
Installing Precast concrete elements
(columns, beams, slabs, walls, segments, etc.),
Steelwork under erection or dismantling.



The list provided is not exhaustive and temporary works shall be considered and identified as part of risk analysis and method statements produced for each specific construction works activity

SCOPE



INCLUDING



Equipment and plant foundation:

Ground bearing capacity (machinery, shoring, traffic routes, etc.),
Crane supports and foundations.

Temporary structures :

Access bridges/roads, roofs,
Suspended Platform / Cantilever Platform / Podium / scaffolding.

Any other high-risk item necessitating a design and a check of construction as per design.



The list provided is not exhaustive and temporary works shall be considered and identified as part of risk analysis and method statements produced for each specific construction works activity

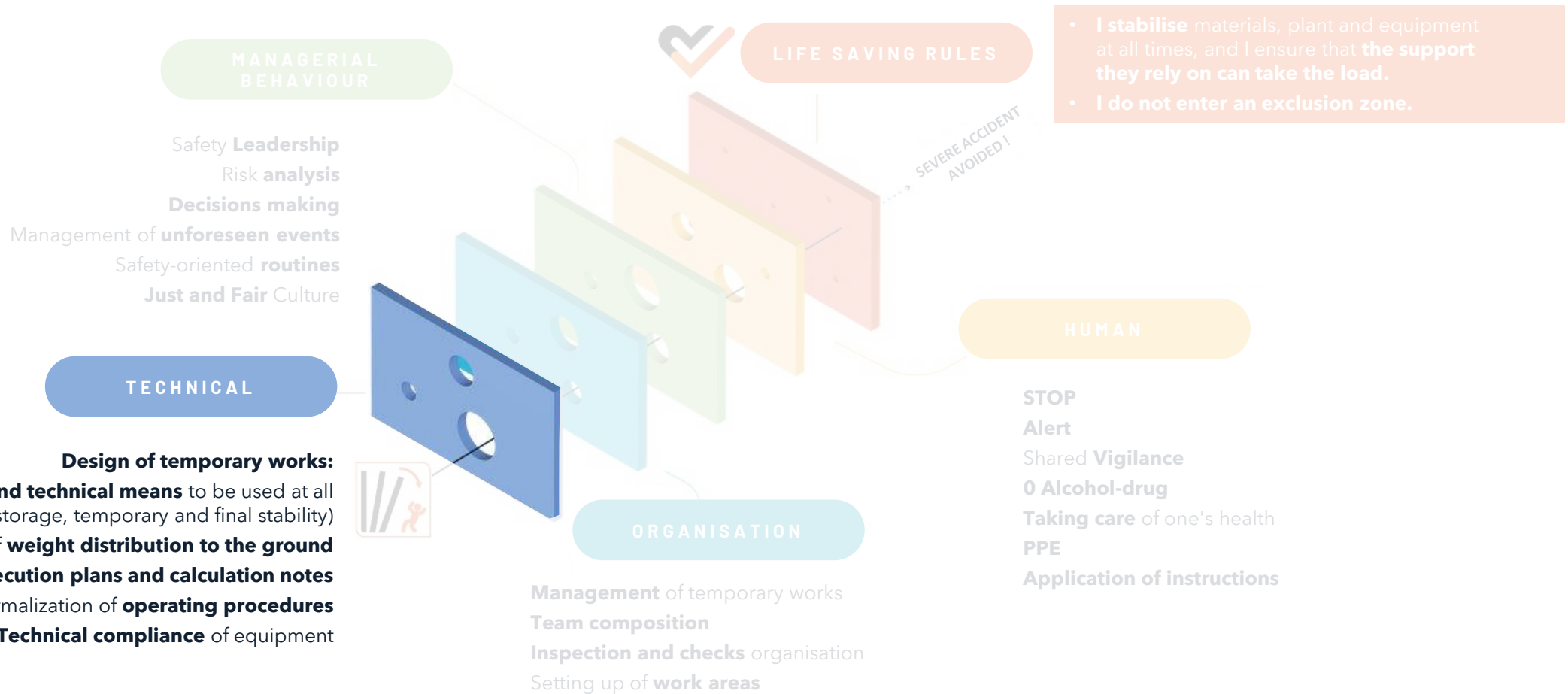
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Lines of Defence

LINES OF DEFENCE STABILITY OF WORKS AND STORAGE

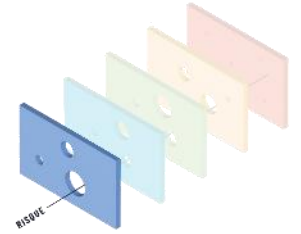


LINES OF DEFENCE STABILITY OF WORKS AND STORAGE



LINES OF DEFENCE

STABILITY OF WORKS AND STORAGE

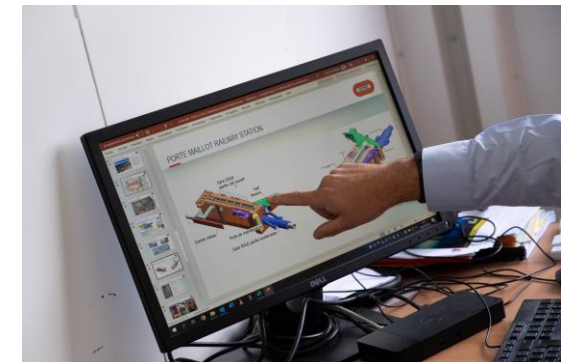


TECHNICAL



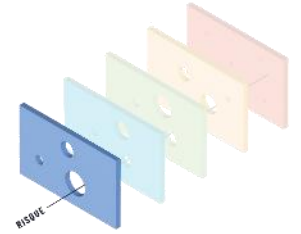
Design of temporary works

- **Each temporary work is subject to a design** that includes:
 - The **sizing of structures and technical means** to be used at all phases (unloading, storage, temporary and final stability),
 - The **dimensioning of weight distribution to the ground** according to the ground resistance,
 - The drawing up of **layout plans, execution plans and calculation notes**,
 - The formalization of **operating procedures**,
 - The **technical compliance of equipment** contributing its stability: study of equipment validated locally, complying with the technical data to be considered (e.g., load resumption), with local regulations and in a good state of preservation.
- This design is issued by a competent member of the Technical Department or by a specific design office.



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TECHNICAL



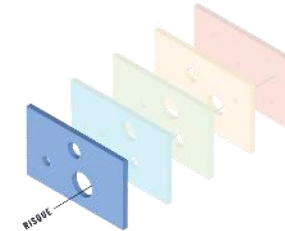
Design of temporary works

- **The design of excavations takes into consideration:**
 - The potential hazard of collapse of material around the perimeter of the excavation,
 - Soil type and stability valuation provided by a civil engineer,
 - Stability calculations indicating the type of protective systems (i.e. slope angles, shoring, benching, shielding),
 - The necessity for a well-point system or a sump pump to dewater,
 - Access / egress provisions.



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TECHNICAL



Design of temporary works

- **Standard solution of temporary works involving the use of equipment are covered by the equipment's technical manual or assembly plan.** Temporary works involving scaffolding, formwork, etc. are not subject to a specific design provided that:
 - The site conditions do not conflict with the scope or limitations of these chosen standard solutions.
 - Configurations involving their use are covered by the technical manual or supplier instructions.
- **When work is entrusted to subcontractors,** the latter provide studies justifying the stability conditions of the temporary works. The BYCN production team **checks that the calculation assumptions used are correct** before BYCN employees or temporary workers have access to the temporary work structure or equipment.



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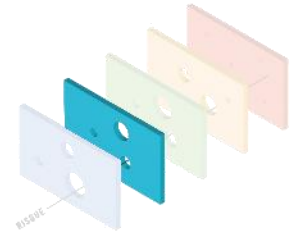
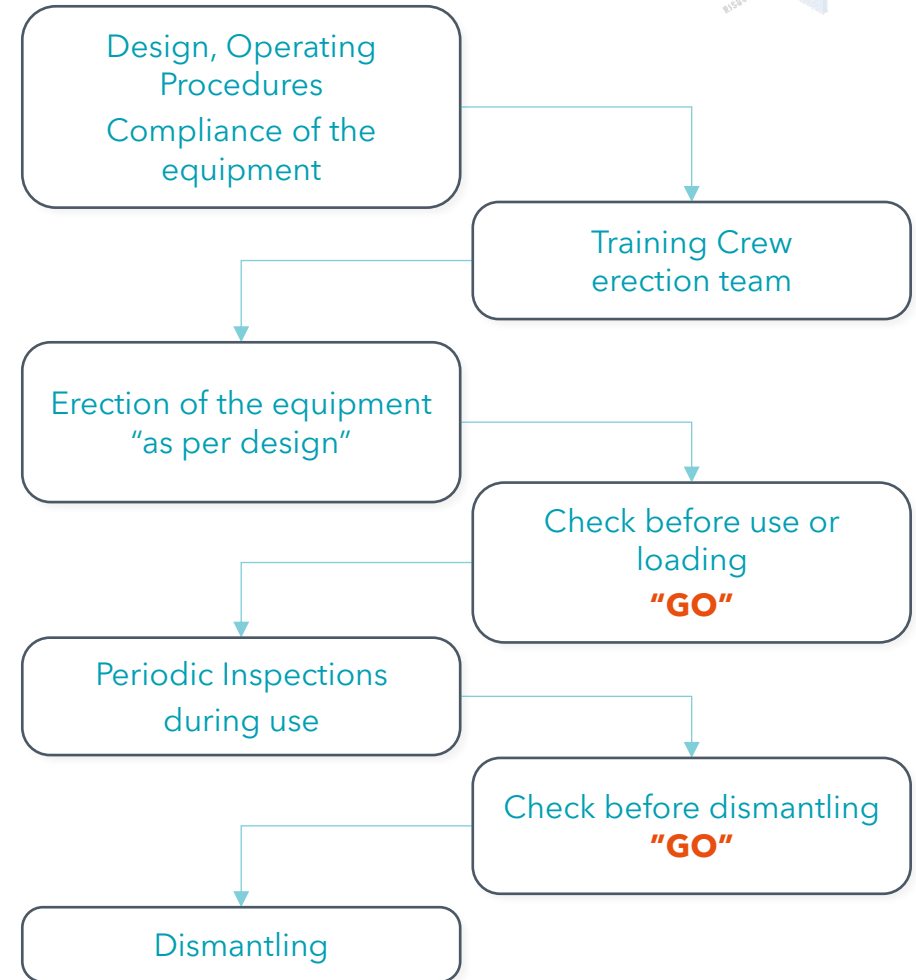
STABILITY OF WORKS AND STORAGE

ORGANISATION



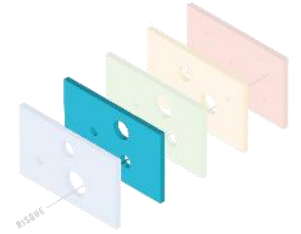
Management of temporary works

- The project implements an organisation to ensure that **all temporary works on site are planned, designed, checked, erected and dismantled in complete safety, at the right time by competent persons.**
- The project defines **the checks to be carried out and the frequency of inspections** to ensure that the measures planned to ensure the stability of the works are compliant.
- For subcontracted works or equipment, a procedure defining roles and responsibilities is in place (verification, acceptance, GO NO GO) for each stage (installation, modification, stripping, etc.).



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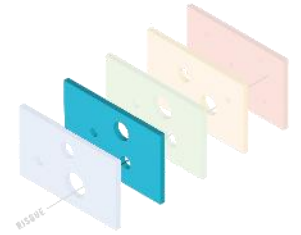
Team composition

- For each type of temporary work:
 - **the roles of design, inspections and checks before use or loading or dismantling** are carried out by **competent people who are clearly identified** in the project organisation.
 - People involved in **the erection, the use, the access or the loading** of a temporary structure have sufficient knowledge with regards to the **stability of the structure in each phase**.



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ORGANISATION



Inspection and checks organisation

- **Inspections during erection**

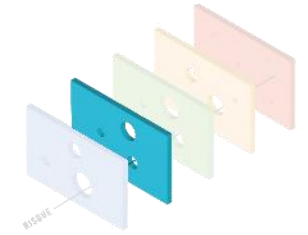
- Regular targeted inspections are organised on site to ensure that the erection is undertaken in accordance with operating procedures.
- Where Temporary Works are being installed by more than a single team, e.g., Night and Day Shifts, a handover briefing between the teams is held by the Production-in-charge to discuss the status of the installation against the design and any possible risks to the installation team taking over due to partially completed works.

- **Checks before use, loading or dismantling**

- All equipment, materials and machines are stabilized in accordance with technical provisions, operating procedures and validated methods: support, verticality, number and position of stability devices (anchors, bracing, etc.)
- Work areas people will access to are completed including collective protections (guardrails in place, hatches closed..)
- No access to / no loading of the equipment can be granted without validation that it has been assembled in accordance with the design.
- No dismantling of stability equipment without the formal agreement of the competent person.
- Procedures within the managerial perimeter define which of these controls need to be formalised and how.

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ORGANISATION

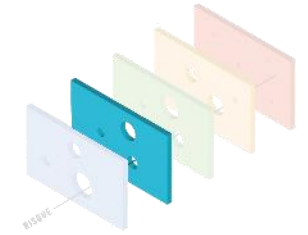


Inspection and checks organisation

- **Periodic inspections during use**
 - **Regular targeted inspections** are organised on site to ensure operating procedures are followed and that equipment is maintained in good condition and free of defects (cracks, corrosion, deformation).
 - **Specific inspections are undertaken** before the work to resume **following severe weather conditions** (wind, rain, frost, etc.) which may affect the condition and the stability of structures and equipment.
- **Alterations or deviations**
 - During inspections and checks, **any alteration or deviation to the design** is identified and reported for subsequent consultation and fixing.
 - **Temporary Works Installations, still under construction** or which have failed during inspection and require modifications, **are made inaccessible (exclusion zone)** and identified with clear signage.
- **Factory or supplier inspections:** for prefabricated elements, inspections of the manufacturing sites are organised according to the project risk analysis. These visits are an opportunity to ensure that our suppliers have put in place quality controls on critical points in the manufacture of the elements (for example, on the use of reinforcement, lifting inserts, fixing sleeves for shoring, the quality of concrete, etc.).

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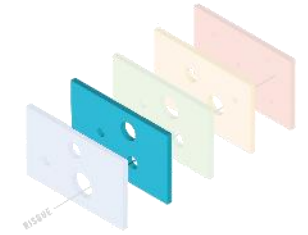
Inspection and checks organisation



- **Permit to load:** in certain working environments, the complexity of the work and the regulation in place may require the establishment of a Permit to Load.
 - This permit shall be signed and issued by the designated and competent person.
 - A single permit-to-work may be issued for multiple identical operations covered by the same design, on the basis that each operation is appropriately checked prior to the operation commencing.
- **Permit to Dig:** a permit to work is established before commencing any excavation work, if one of the following risks have been identified:
 - Possibility of water ingress
 - Presence of foundations close to the excavation or adjacent structures
 - Loose rock or soil (including soil previously excavated)
 - Presence of utilities in the ground (gas, electricity, water)
 - Possibility of contaminated soil (hazardous substances or unexploded devices)
 - Presence of simultaneous operations, and the possibility of cave-ins (considering the following potential events: sliding, toppling, bulging, heaving, boiling of the ground, and flooding).

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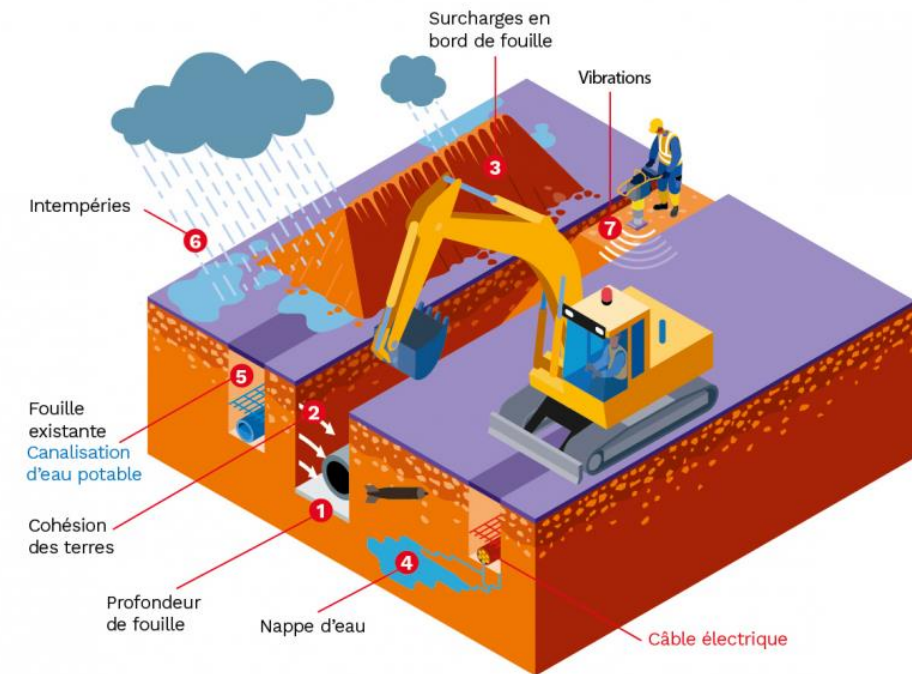


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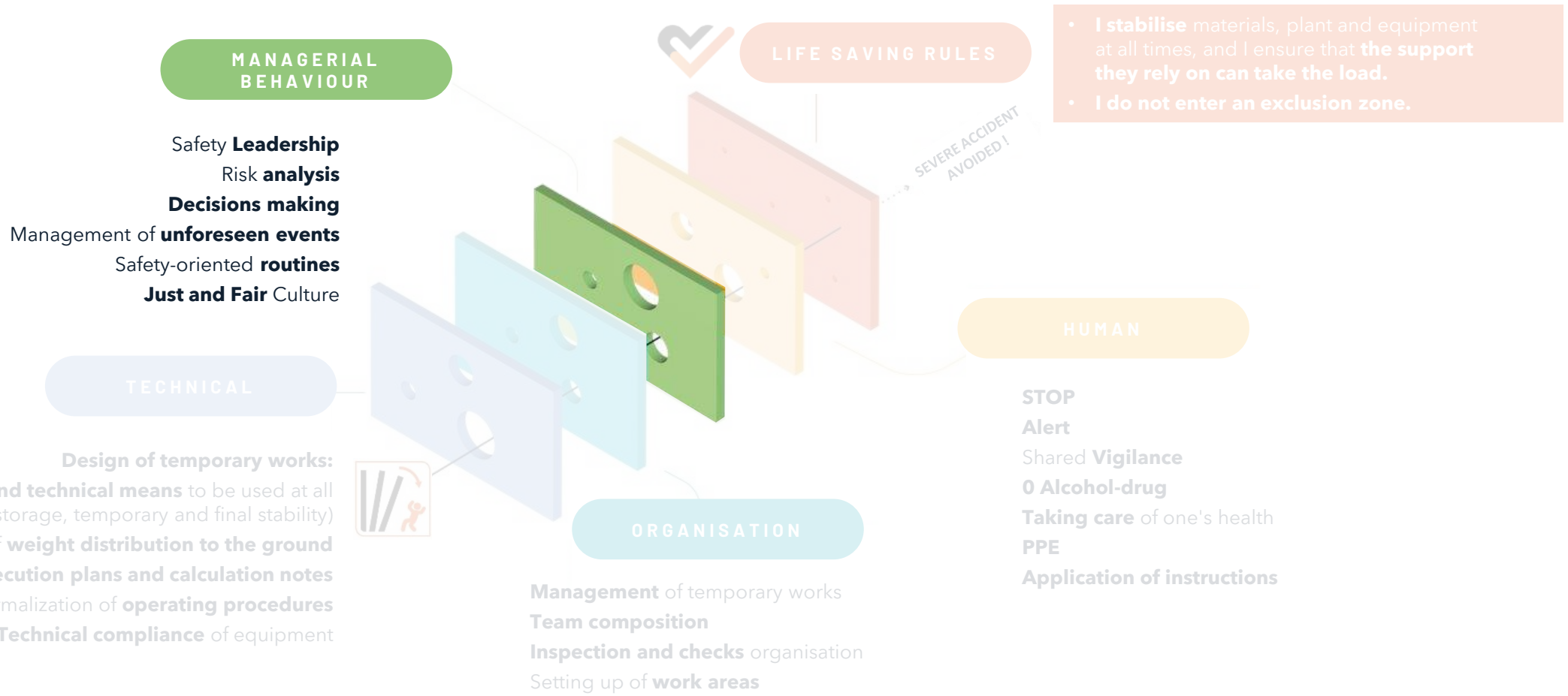
Setting up of work areas

- **The surroundings of an excavation are protected from any overloading. Unless other distances are defined by an authorised civil engineer :**
 - All storage materials are kept at least at 1m / 3.3ft from the edge of the excavation.
 - Vehicle movement are kept at 3m / 9ft from the edge of the excavation.
 - Outriggers are placed at a minimum distance at least equal to the depth of the excavation.
- **Tenches are provided with access and egress** available every 15m / 50ft.



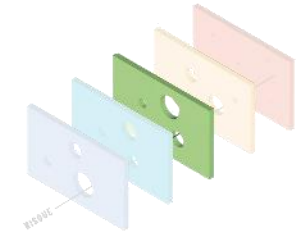
The works inside the trench are stopped if water is flowing into the trench or deformation or cracks are detected in the surrounding of the excavation.

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MANAGERIAL BEHAVIOUR



Safety Leadership

- Works Managers, Supervisors and Managers carry out visits as Safety Leaders
 - Focusing on Major Risks,
 - Engaging with people,
 - Saying STOP in the case of deviations,
 - Applying the Five Stars method,
- All managers and stakeholders on the and visiting the site respect and apply the organizational rules.

ENG

REINFORCING SAFE BEHAVIOUR

Start intervention

- ★ Intervene calmly and firmly
- ★ Open conversation

Hello, (Mark) I was on my way to...

Target the act

- ★ Describe what you see

*I notice you are (wearing)...
I see the area is (tidy)...*

Agree approved methods

- ★ Confirm approved methods

(Wearing)...is exactly what is required

Reinforce safe behaviour

- ★ Show why this behaviour is positive

You're setting an excellent example to the new members...

Self-impact

- ★ Ask what are the positive consequences for them personally
- ★ Give an example

*What's the benefit for you...
Yesterday I heard a case of someone who didn't (wear)...and he...*

Every situation is different, Every person is different, Adapt to the situation and the individual.
© LHS Foundation

ENG

DEALING WITH AN UNSAFE ACT

Start intervention

- ★ Intervene calmly and firmly
- ★ Open conversation

Hello, (Mark) I was on my way to...

Target the act (not the person)

- ★ Describe what you see avoiding judgement of the person

*I notice you are not (wearing)...
I see the area is (untidy)...*

Agree approved methods

- ★ Ask the person to describe how the task should be done safely
- ★ Inform them of approved methods

*What is the procedure for...?
As you know,...are required...*

Reason behind unsafe behaviour

- ★ Get them to explain why they were acting in this way
- ★ Listen and show you have understood
- ★ Ask them to identify solution

*Why are you (not wearing)...?
I see, if I understand you...
What can be done to (resolve)...*

Self-impact

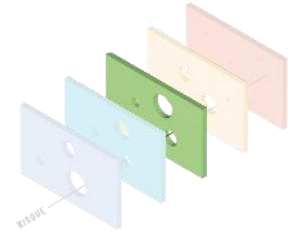
- ★ Ask how the negative consequences of this behaviour can impact on them
- ★ Give an example

*What could happen if you don't (wear)...?
And how would that impact on (your family)...?
For example, I saw a safety alert that...*

Every situation is different, Every person is different, Adapt to the situation and the individual.

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MANAGERIAL BEHAVIOUR



Risk analysis

- Project Managers ensure that:
 - All temporary works and equipment are identified in anticipation and designed taking into consideration risks analysis.



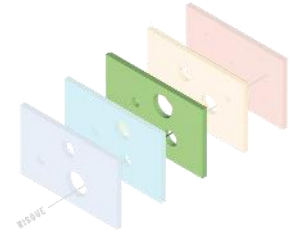
Decision making

- Project managers make decisions taking into consideration potential impacts on:
 - Stability of structures: loading of these structures is to remain consistent with their design.

They put in place mitigation measures accordingly.

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MANAGERIAL BEHAVIOUR



Management of unforeseen events

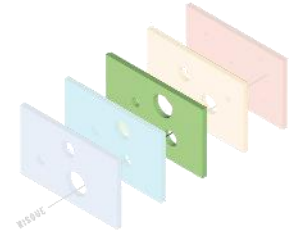
Project managers create favourable conditions for the safe management of unforeseen events, by:

- Identifying these situations and training their teams to identify them,
- Encouraging team members to bring these situations to their attention,
- Stopping activities for the necessary time to define ways to resume work safely,
- Creating an environment that stimulates questioning and collective thinking,
- Collectively analysing the situation safety wise, relying on support services and/or their hierarchy, if necessary,
- Prioritizing safety in decision-making,
- Communicating the chosen solution to their teams and any additional measures put in place,
- Sharing the encountered situations and decisions made to improve the company's processes, if applicable.



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MANAGERIAL BEHAVIOUR



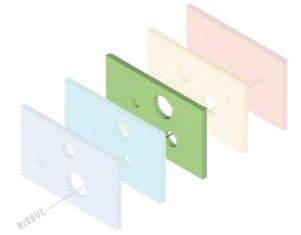
Safety-oriented routines

- Every management meeting starts with a safety focus
- Before starting work, the team leader organizes the daily warm-up
- Briefing/debriefing:
 - Before starting work, the team leader gathers the team (including temporary workers) for a short debriefing/briefing. He questions and reviews the activities of the previous day.
 - They review the tasks to be performed, including potential risks protection measures in place. The leader ensures that everyone understands their role and responsibilities and has the necessary means to work safely.
 - A briefing is also conducted in case of simultaneous activities, including with subcontractors.
- Tool-box meetings are regularly held for Bouygues Construction employees, temporary workers and subcontractors, to share information, encourage feedback, raise awareness about specific risks, and react to situations observed on the site.



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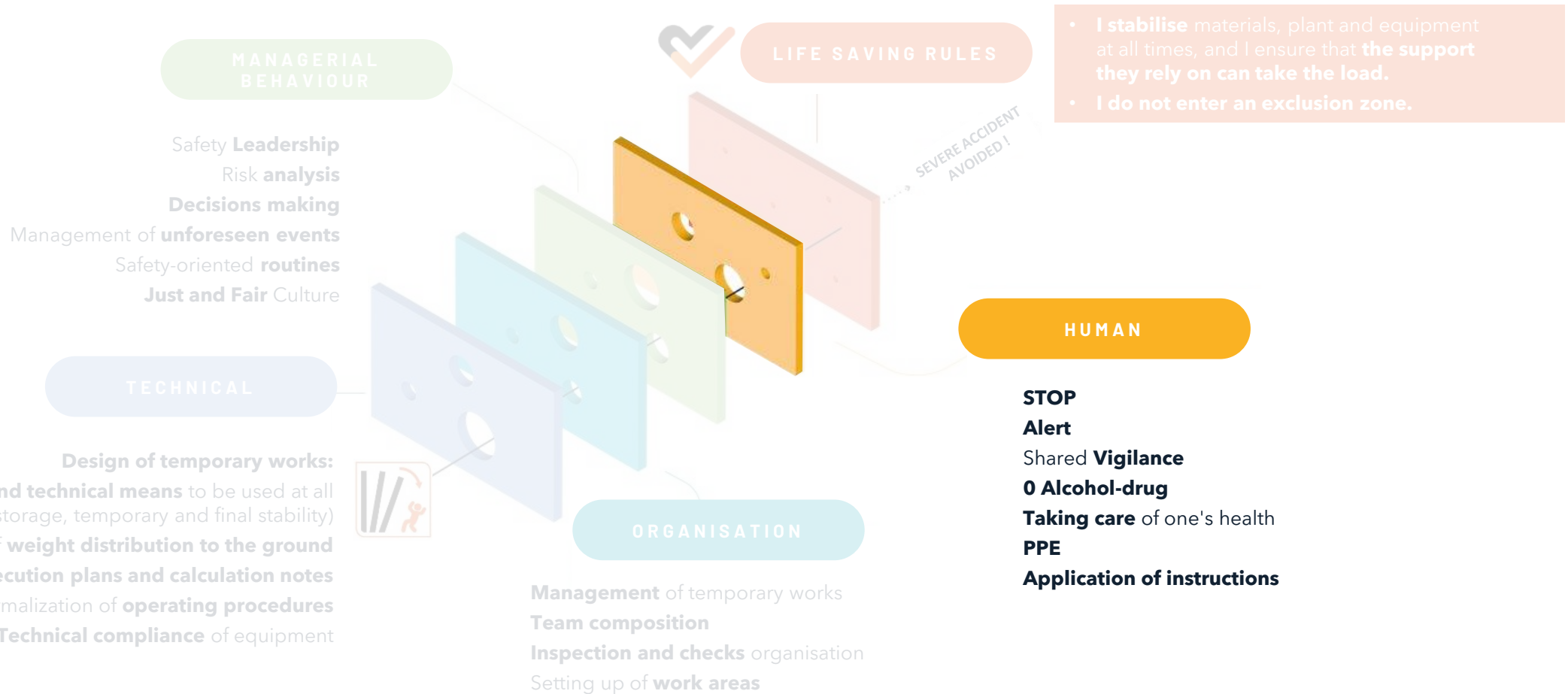


Just and Fair culture

- Project managers apply the Just and Fair referential that has been approved within their perimeter as close as possible to the action (safety visit, incident investigation..):
 - Recognizing expected behaviours
 - Sanctioning unacceptable behaviours
- The reporting of near misses is valued.
- More moderate managerial reactions are issued when investigations following spontaneous near-miss reports highlight unacceptable behaviours, in order to encourage transparency.

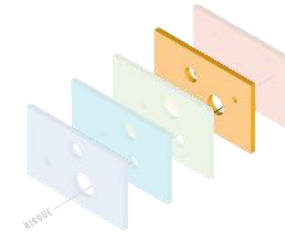
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HUMAN



Stop - Alert

- In a situation that would put themselves or others in danger, **it is everyone's duty to say "STOP" and to ALERT** their management to find a solution to resume activity safely.
- **Everyone respond positively to an alert** that is reported to them.

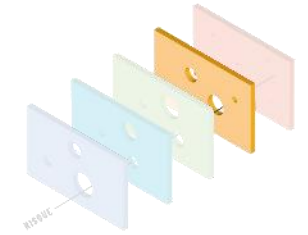


Shared vigilance

- **Each person acts as a protective factor for their colleague or for the person working around them** by staying attentive and vigilant:
 - towards younger employees and temporary workers who are new to our company,
 - towards a colleague who is less alert or distracted,
 - and by intervening with this person or their management in case of risk.
- **360° or Take 5:** before starting or resuming a task everyone carry out a brief analysis of the working conditions around them, a 360° check, to ensure that no risks are present, that the equipment is adequate, and that they are equipped with the proper PPE to work safely.

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HUMAN

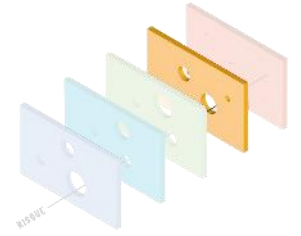


0 alcohol - drug

- **Possession** or **distribution** of drugs or alcohol at work or being under the influence of drugs or alcohol at work is prohibited.
- **Any employee who has any issue with drug or alcohol dependence** is encouraged, at any time, to request support to break the dependence. This support is paid for by the company, without prejudice to the remuneration or career of the employee concerned.
- **Each new temporary worker is tested** on the first day before starting their job.
- **Crane operators and machine drivers are tested** on the first day on site before starting their job, and then quarterly.
- A **random testing campaign** is organized on each project, covering all types of personnel at the workplace.
- **Any employee, subcontractor, temporary worker, on site or in offices can be tested** as part of this campaign, as well as in cases of suspicion or following an incident.
- **Penalties** may be applied to labour agencies and subcontractors whose employees test positive.
- **This constitutes a minimal standard:** the frequency of tests may be increased based on the results of previous tests.

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HUMAN

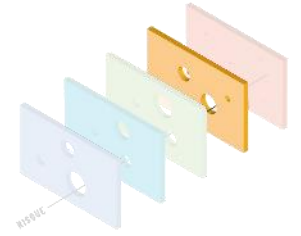


Taking care of one's health

- Adopt **wise principles** with regards to your sleep, diet, and lifestyle.
- **Attend warmup sessions** before starting work.
- **Never lift alone** manually any load weighing more than 25kg.
- Before handling, **make sure that the path is free** from obstacles.
- **Always ensure that proper manual lifting practices** are applied to protect from back injuries.
- **Properly set up your workstation**, seeking advice from ergonomists, doctors, or safety advisors if necessary.

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HUMAN

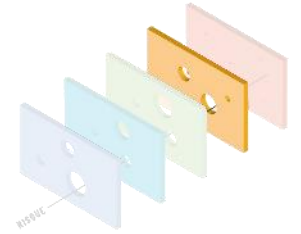


PPE

- **No one access a construction site without wearing the following standard PPE:**
 - Safety helmet with chin strap,
 - Safety spectacles,
 - Safety gloves,
 - Safety boots,
 - High visibility clothing.
- **Always carry hearing protections.**
- **Wearing hearing protection is mandatory** when noise intensity in the environment exceeds 80 dB(A): at a minimum, but not limited to, during hammering work, concrete vibrating, demolition, pumping, injection, and near construction equipment, machines, or power tools.
- **On operated sites** (e.g. premises operated by customers such as plant, factory, buildings under Facility Management contract, apartments occupied by inhabitants, etc), the PPE requirements are adapted to the site and to the risk assessment.
- **The standard PPE is to be complemented by specific PPE** adapted to the nature of the tasks, depending on the results of the risk assessment.

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HUMAN



Application of instructions

- **Apply instructions given** with regards to the erection, the use, the access or the loading of a temporary structure.
- Before loading a structure or an equipment, **check that the loads to be applied do not exceed the design limits** and **check the distribution of loads** to avoid the risk of imbalance or overloading.
- Unless a specific instruction is given, apply the **"1/3 rule"**: stabilize any structure or storage when its height (H) is greater than 3 times the smallest width (L).

3

Life Saving Rules

LIFE SAVING RULES

STABILITY OF WORKS AND STORAGE



RISK STABILITY

✔ I **stabilise** materials, plant and equipment at all times, and I ensure that the **support they rely on can take the load**

✔ I do not enter an **exclusion zone**

IN CASE IT IS IMPOSSIBLE TO RESPECT ONE OF THESE RULES, I « STOP » AND ALERT MY HIERARCHY

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CONSTRUCTION