CITY OF LANGFORD

'REQUEST FOR PROPOSAL'

(RFP)

for
the Staining of
Starlight Stadium
in the
City of Langford, BC

Mandatory Site Meeting
July 19, 2023 at 10:00 AM
Location: Starlight Stadium
3024 Glen Lake Rd

Issued: July 6, 2023

Submission Deadline: July 27, 2023 at 2:00pm

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CITY OF LANGFORD
REQUEST FOR PROPOSAL
for
the Staining of Starlight Stadium
at
1089 Langford Pkwy, Langford, BC

1. INTRODUCTION

Through this Request for Proposal (this "RFP"), the City of Langford ("City") is soliciting proposals from any interested party ("Contractor") to stain the wood frame grandstands at Starlight Stadium. Site safety is of the utmost importance.

The objective of this request for proposal is to provide the City with qualified proponents capable of carrying out the work herein defined. The subsequent proponent submissions will form the basis for evaluation and selection.

It is intended that this RFP will be used to identify a single Contractor who will work with the City to complete this project on time and on budget. Proponents are advised that the City will not necessarily accept any Proposal and the City reserves the right to reject any or all Proposals at any time without further explanation or to accept any Proposal considered advantageous to the City.

This document outlines the scope of work envisaged by the City, sets out the requirements for the RFP, and specifies the process to be used by the City of Langford to select a Contractor.

2. SUBMISSION DETAILS

One (1) copy of each submission must be submitted in a sealed envelope, at the office of the City of Langford, 2nd Floor, 877 Goldstream Avenue, Victoria, B.C., V9B 2X8 clearly marked as:

City of Langford
REQUEST FOR PROPOSAL
Starlight Stadium Staining RFP
Attention: Yari Nielsen, Director of Parks, Recreation and Facilities
2nd Floor, 877 Goldstream Ave
Langford, BC
V9B 2X8

On or before:

Tender closing time: 14:00 local time

Tender closing date: July 27, 2023

Late tenders will not be accepted or considered and will be returned unopened.

3. GENERAL CONDITIONS

A mandatory site meeting will be held on July 19, 2023 at 10:00 am. Please meet at the parking lot at 3024 Glen Lake Road. Inquiries regarding this RFP can be made by calling Yari Nielsen at the Parks and Recreation Department at 250-857-0588.

By responding to this RFP, the Contractor acknowledges and agrees that:

(a) they have read, understood, and agree to the provisions of this document;
(b) the City reserves the right to reject any or all 'Requests for Proposals' submitted in response to this RFP;
(c) the City reserves the right to waive any irregularity of any 'Request for Proposal', to request clarification and/or additional information, and to negotiate modification of any 'Request for Proposal';
(d) the City takes no responsibility for the accuracy or completeness of any information supplied for this project and, further, will not be responsible for any costs incurred in responding to this RFP.

4. PROJECT DESCRIPTION

The City of Langford is seeking professional Contractors to stain the Rubner wood grandstand structures at Starlight Stadium. The glulam structure consists of main and secondary glulam beams, steel connections and membrane layers for the insulated roof's package (sandwich panels).

The Contractor will sand down the glulam structures prior to staining. The staining will be made in two stages with protective wood preservative, water-based, non-excessive film forming, resistant to weathering, for protection of wood against biological agents (AQUA PROFILASUR or similar). The application must be carried out in the absence of excessive moisture (see Appendix A). Please refer to Appendix B for a more detailed description of requirements.

5. DELIVERABLES

(a) Project schedule
(b) Methodology and description of understanding of the implementation of the works as laid out in Section 4 - Project Description above
(c) Safety plan
(d) Construction safety fencing and staging preparations
(e) Construction operations review (weekly meetings during construction)
(f) Cleanup operations (please be advised that the stands will be in use for sports games so care must be provided to ensure cleanliness throughout the project)

6. GENERAL

This 'Request for Proposal' will assist the City in determining whether the selected Contractor:

(a) has done similar work for projects of similar size and scope;
(b) can provide references;
(c) has fully understood the requirements as stated in this RFP;
(d) guarantees a high level of service;
(e) will be fully accountable and responsible with respect to completing the work on time and on budget;
(f) will be fully accountable and responsible with respect to the provision of services, as described in this RFP document and the attached drawings;
(g) acknowledges that any proposal be subject to a full assessment to the satisfaction of the City and other relevant agencies if necessary; and
(h) the retained Contractor will be required to prepare a **"Contract Price"** for the implementation of the works contained in Section 4. Project Description.

7.DEFINITIONS

The terms below shall have the following meanings:

"Award" The acceptance of a bid, quotation, or proposal by the City.

"Bid" means an offer or submission received from a Respondent in response to a request for quotation, tender, proposal or other Call for Bids, which is subject to acceptance or rejection.

"Bid Price" means the bid price excluding taxes, inclusive of disbursements.

"City" means the City of Langford.

"Closing Time" means the date and time, as identified in this Bid document, by which all submissions shall be received and stamped by the City.

"Consultant(s)" means the individual, firm, company or corporation that has, been selected by the City to provide specific consulting services to the City on the projects.

"Contract" means a legally binding agreement between two or more parties that creates an obligation to supply Goods, Services or Construction in return for money or other consideration.

"Contract Price" means the total bid price inclusive of disbursements and taxes.

"Contractor" means the individual, firm, company or corporation, authorized to work in the Province of British Columbia that has, by means of the Request for Proposal and tendering process, undertaken to provide the goods/services required by this submission.

"Construction Management Team" means the Contractor, along with the Owner and the Consultant.

"**Council**" means the elected Council for the City of Langford.

"Department" means any Department of the City the operation for which a Department Head, or Director is responsible.

"Department Head, Director" means the appropriate Department Head or Director of the applicable Department of the City.

"Manager" means the appropriate Manager of the applicable Department of the City.

"May" used in this document denotes permissive.

"**Owner**" means SD62 and The City of Langford.

"Prime Member" means the "Team Member" who proposes to be the primary contractual entity responsible for the design/build model.

"Project" means the base preparation for the installation of an artificial turf field at the North Langford Elementary school

"Request for Proposal" (RFP) means the formal document used to solicit proposals from Respondents to provide Goods, Services and/or construction to the City, where it is not practical and/or possible to prepare precise specifications, or where "alternatives" to detailed specifications will be considered, which may be subject to further negotiation. This process allows Respondents to propose solutions to arrive at the end product, and allows for evaluation on criteria **other than price**. An RFP may include provision for negotiation and **may be a single step or two step process** as determined by the City of Langford at its sole discretion.

"Respondent" means the legal entity submitting a response to this Request for Proposal.

"Responsible Respondent" means a Respondent, as the context requires, that is fully capable and qualified to meet all the requirements of the call for bid, or other process, and shall be duly authorized to enter into a subsequent contract agreement on behalf of the named submitter, as may be applicable. Such Respondent shall possess the capacity and ability, including financial and technical, to perform as contractually required and, shall

be able to provide credible and acceptable documented evidence to ensure good faith performance.

"Responsive" means a submission that meets the requirements of the RFP, includes all documentation, is of timely submission, and has the appropriate authorized signatures as required on each document.

"Selected Respondent" means the Respondent whose submission has been selected by the City for further consideration.

"Shall and Will" used in this document denotes imperative.

"Sole Discretion" means the sole, absolute and unfettered discretion of the City, which may be arbitrarily exercised.

"Team" means a company, firm, consortia or a group of such, which can offer **complete** response to this RFP.

"Trade Contractor" means a company, authorized to work as described in this RFP in the Province of British Columbia that is contracted by the City. The awarded Contractor is accountable for the work performed by the Trade Contractor(s), including the collection and maintenance of performed workplace safety insurance board certifications, applicable insurance certificates and any other required and/or applicable certificates.

"Treasurer" means the Director of Finance/Treasurer for the City as appointed by Council or their Designate(s).

"Unresolved Litigation" means any dispute between the Respondent and any other party adverse in interest, including third party and cross-claims, where either a legal proceeding has been commenced for an injunction, a mandatory order, a declaration or the recovery of money, or a threat of legal action has been made in writing.

"Work/Works" means the provision of goods and services as required by the Contract.

8. REQUIREMENTS

8.1 Cost

The Respondent is required to submit a **"Contract Price"** for works described in Section 4 Project Description. The Contract Price shall be the entire compensation owing to the Contractor for the Work and this compensation shall cover and include all profit and all costs of supervision, labour, material, equipment, overhead, financing, and all other costs and expenses whatsoever incurred in performing the Work.

8.2 Flexibility

The Contractor is expected to work with a high degree of flexibility and must be able to work around the user schedule of Starlight Stadium.

(a) Start work: On or around August 2, 2023
(b) Completion of the work by September 30, 2023

8.3 Insurances

The Contractor is to provide Commercial General Liability Insurance, in a minimum the amount of $5,000,000 (with the City of Langford, Performance Plus Hockey and CCGF Event Services Inc. named as additional insured) and Builder's Risk Insurance policies. Policies currently in effect are to be supplied with the RFP submission. Deductible amounts to be clearly identified for each policy.

8.4 Non-binding Price Estimates

While the pricing information provided in proposals will be non-binding prior to the execution of a written agreement, such information will be assessed during the evaluation of the proposals and the ranking of the Respondents.

Any inaccurate, misleading or incomplete information, including withdrawn or altered pricing, could adversely impact any such evaluation or ranking or the decision of the City of Langford to enter into an

agreement for the Work required by this RFP.

8.5 Governing Law and Interpretation

The terms and conditions of the RFP Process:

(a) are intended to be interpreted broadly and independently (with no particular provision intended to limit the scope of any other provision);
(b) are non-exhaustive and will not be construed as intending to limit the pre-existing rights of the parties to engage in pre-contractual discussions in accordance with the common law governing direct commercial negotiations; and
(c) are to be governed by and construed in accordance with the laws of the province of British Columbia and the federal laws of Canada applicable therein.

9. PROJECT SCHEDULE

A schedule for the RFP process is as follows:

Issue RFP	July 6, 2023
Mandatory Site Meeting	July 19, 2023 at 10:00 am
RFP Closing	2:00 pm on July 27, 2023
Evaluation of RFP	July 28, 2023
Award Project	August 1, 2023
Project Completion	on or before September 30, 2023

10. EVALUATION OF RFP'S

It is intended that this RFP will be used to identify a single Contractor to work with the City of Langford to complete the Project on time and on budget.

In the event that the Contractor fails to meet the City's timeline and requirements then the City may approach an alternate Contractor (i.e. Contractor who was not selected initially as the Contractor) to complete the required work so as to keep the project on time and on budget. Nothing in this RFP shall be binding on Contractors to agree to engage in such work.

Evaluation: The 'RFP' will be evaluated on the basis of how well Respondents respond to the requirements of the RFP documents. Each submission will be assessed using a matrix scoring system as set out below. The marks shown in the other boxes indicate the maximum number of marks that can be given for that subject.

No.	Subject	Total Possible	Total Score
A	Financial Proposal	55	
B	Demonstrated Experience	20	
C	Team and Organization	15	
D	Management Plan and Control Systems	10	
	TOTALS	100	

11. SUBMISSION REQUIREMENTS

Submissions must **specifically and fully** address the following:

(a) **Financial Costs**

The Respondent must identify all costs as identified in the RFP. The Respondent must also demonstrate their financial capacity and stability as a Company that would be necessary to complete the project on time and within their budget. In addition, please supply the following information at a minimum:

1. **"Contract Costs"** for services and costs described in this RFP.
2. Provision of written confirmation from an insurer (acceptable to City Council) that general liability coverage (minimum of $5,000,000) and Builder's Risk insurance coverage for the purposes intended, and will be maintained for the life of the project. The City will require the insurer to include the City and Consultants as an "Additional Insured".

(b) **Contractor**

The Respondent must supply the following information.

1. Corporate Information: A description of the Company as it relates to the project, including a description of all Owners and employees.
    a. An outline of the intended (or existing) corporate presence of the Company/s in the southern Vancouver Island region, together with a description of how such presence will manifest itself in relation to assisting the City in successfully completing the Site Preparation.
    b. A description of relevant local (southern Vancouver Island) experience of the Company.
    c. The Company is in good standing with the City of Langford.
2. Personnel Information: An organization chart with resumes of the key project team members and a brief description of the intended responsibilities of each member.
3. Experience: A list of similar projects the Respondent has completed that are similar in scope. The following details of completed projects must be submitted.
    a. Location, nature and scope of other projects of comparable scope & complexity.
    b. Full references / contact details for an owner / client representative on these projects that can be contacted for further information.

(c) **Systems Approach**

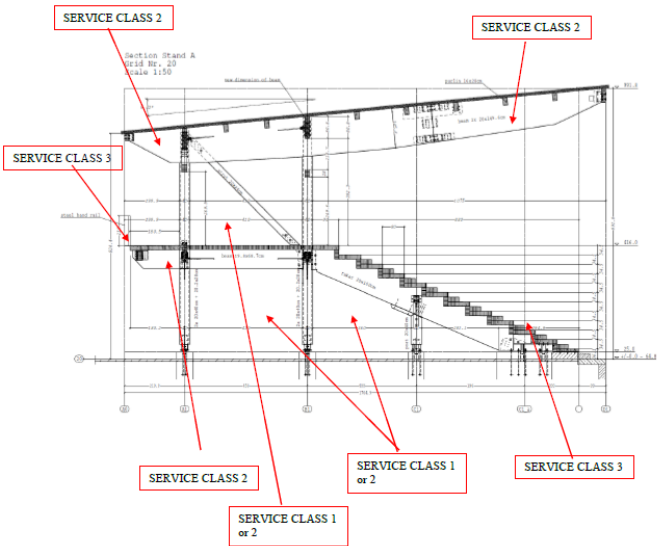
1. Provide a management plan and project management control systems proposed for this project.

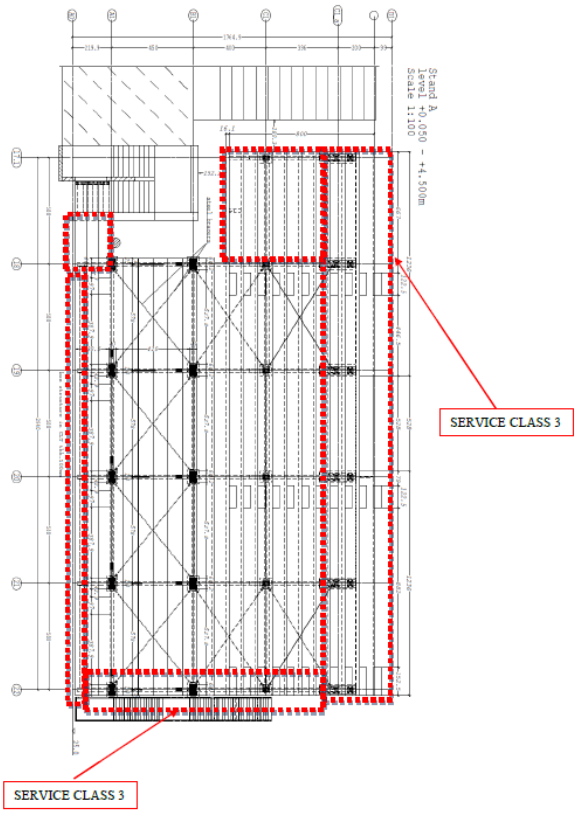
APPENDIX A

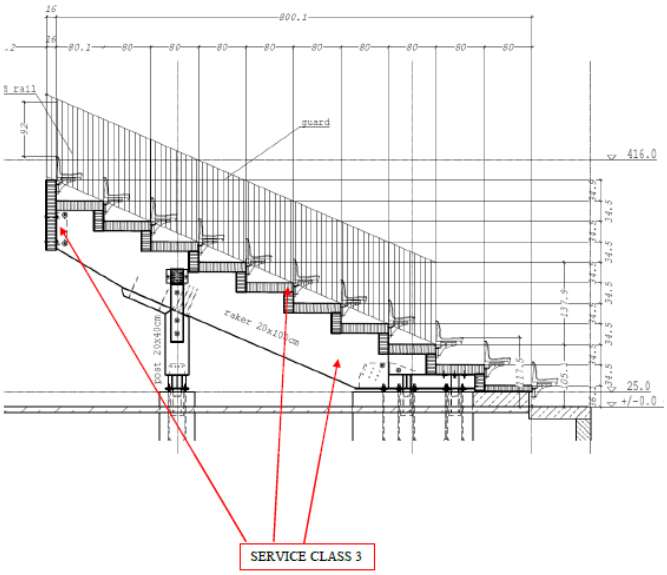
The glulam structure consists of main and secondary glulam beams, steel connections, membrane layers for insulated roof's package (sandwich panels). The different *Services Class* is determined between the outside exposed structures, without any kind of protection against the rain and sun effect, and the inner parts or the parts not directly exposed that are protected. See manual for breakdown of Service Classes.

The internal structures are considered Use Class 1 and the external structures Use SUB Class 3.2:

Use Class	General service situation	Description of exposure to wetting in service	Biological agents
1	Interior Covered	Dry Frequently <12%	Wood boring beetles
3 *SERVICE CLASSES SCHEMA*	3.2 exterior, above ground, unprotected	Occasionally wet Frequently >20%	+ Disfiguring fungi + Decay fungi







SCHEDULE OF MAINTENANCE (Section 4 in the manual)

During the manufacturing process, all glulam elements were treated with the protective coating, Ammon Aquaprofilasur. To restore the treatment, remove any poorly bonded paint or varnish; clean and sand down the surface to improve adhesion. Then treat 1 - 2 x AQUA PROFILASUR (refer to data sheet included in the manual).

MAINTENANCE OF THE GLULAM STRUCTURES

The glulam structure needs to be cleaned prior to any re-staining. The re-staining of the glulam should be made in two stages with protective wood preservative, water-based, non-excessive film forming, resistant to weathering, for protection of wood against Biological agents (AQUA PROFILASUR). The staining must be carried out in the absence of excessive moisture.

For the structures in Service Class 2, after the first **2 years** and then every 3 years, the glulam surfaces need to be sanded down before the re-staining. Refer to the service manual regarding sanding grit requirements (section 2.1).

For the structures in Service Class 3, after the first **1 year** and then every 2 years, the glulam surfaces need to be sanded down before the re-staining. Refer to the service manual regarding sanding grit requirements (section 2.1).

elements treated with special protective product - waterproofing.

Inspect and maintain the fasteners points - periodical apply the appropriate wood stain where needed.

MAINTENANCE OF THE SUPPORTS

The supports are to be cleaned every 3 years for structures of Service Class 1, every 2 years for structures of Service Class 2 and **every year for facilities in Service Class 3**.

APPENDIX B

Rubner Holzbau Spa
Via A. Ammon, 12
39042 – Bressanone (BZ) ITALY
Phone + 39 0472 822666
Fax: + 39 0472 822 600
holzbau.brixen@rubner.com
www.holzbau.rubner.com

RUBNER holzbau

USER MANUAL AND MAINTENANCE PLAN

PROJECT NAME	***WESTHILLS STADIUM***
PROJECT NO.	***374121***
CLIENT	***CITY OF LANGFORD***

Bressanone (Italy): *30/09/2019*

The Producer

THE PRESENT REPORT IS COMPOSED BY N° 60 PAGES

INDEX

1 INTRODUCTION

This maintenance plan is prepared in accordance with EN 1990 – Basis of structural design and EN 1995 Parts 1 and 2 - Design of timber structures.

The structure has been designed such that deterioration during its design working life does not impair the performance of the structure below what intended, taking in consideration its environmental conditions and the anticipated level of maintenance.

In order to achieve an adequately durable structure, the following aspects have been considered in the design:

- the intended use of the structure;
- the required design criteria;
- the expected environmental conditions;
- the composition, properties and performance of the materials and products;
- the properties of the soil;
- the choice of the structural system;
- the shape of members and the structural detailing;
- the quality of workmanship, and the level of control;
- the particular protective measures;
- the intended maintenance during the design working life.

The environmental conditions has been identified at the preliminary design stage so that their significance can be assessed in relation to durability and adequate actions can be taken for the protection of the structural and not structural materials.

The degree of any deterioration has been considered according the EN 1995 Service Classes.

2 DURABILITY OF THE STRUCTURAL ELEMENTS

The glulam structure supplied by Rubner Holzbau S.p.A. for Westhill stadium Project, consists of main and secondary glulam beams, steel connections, membrane layers for insulated roof's package (sandwich panels);

Service Class

It is important to distinguish between the outside exposed structures, without any kind of protection against the rain and sun effect, and the inner parts or the parts not directly exposed that are definitely protected.

The attribution of the Service Classes is done according to European Standard EN 1995-1-1:2014 [Design of timber structures – Part 1-1: General Common rules and rules for buildings].

- **Service Class 1** is characterised by a moisture content in the materials corresponding to a temperature of 20°C and the relative humidity of the surrounding air only exceeding 65 % for a few weeks per year.
- **Service Class 2** is characterised by a moisture content in the materials corresponding to a temperature of 20°C and the relative humidity of the surrounding air only exceeding 85 % for a few weeks per year.
- **Service Class 3** is characterized by climatic conditions that can lead to higher moisture content than Service Class 2, or where timber is directly exposed to sun and/or rain as specified in the following table:

Service class	Description	Timber moisture content	Temperature
1	Interior Dry	< 12%	< 50°C
2	Interior Humid, Exterior Protected	< 20%	Any
3	Exterior Exposed	>20%	Any

Use Class

About the durability of the wood, according to european standard [EN 335-1 Durability of wood and wood-based products – Definition of use classes – Part 1: General] we need to consider the Use Class (similar to Service Class but different). This code defines 5 use classes and two severities levels for the classes 3 and 4. These classes take into account the vulnerability of the material from biological attack. In this project, for the internal structures we considered the Use Class **1** and for the external structures the Use SUBClass **3.2** taken into consideration.

Use Class	General service situation	Description of exposure to wetting in service	Biological agents
1	Interior Covered	Dry Frequently <12%	Wood boring beetles

Use Class	General service situation	Description of exposure to wetting in service	Biological agents
3	3.2 exterior, above ground, unprotected	Occasionally wet Frequently >20%	+ Disfiguring fungi + Decay fungi

2.1 TYPE OF TREATMENT

In order to ensure the durability of the glulam, contrarily to the regular maintenance, the following cycle of impregnation will be executed in the manufacturing process at the production plant:

- All glulam elements are treated with protective product type Ammon Aquaprofilasur;

Moreover, to minimize the possible effects of the service class 3, the following measures have been adopted:

- Protection of the main beams from direct rain and sunlight, with waterproofing system (see BASF / RADA Resurfacing documentation)
- Details designed to prevent water condensation between the wood elements and between the wood elements and the steel elements facilitating ventilation and drying of all the wood surfaces.

It is advisable to check the status of the exterior paints according to the attached time schedule, especially that of the most exposed facing artefacts, and to renew them if necessary.

In the event of renewal, remove any loose parts by sanding with 100 grit, then brush along the grain with a non-iron bristle brush to remove any decomposed lignin.

Clean and remove the dust from surface and then apply one or two coats of the last product used in the painting cycle, namely 2 x AQUA PROFILASUR or similar.

If a maintenance cycle has not been carried out just in time and the surface is degraded by bad weather conditions, it will be necessary to sand on living wood, first sanding with 60 - 80 grit and then with 150 grit.
Then brush along the grain with a brush with hard non-iron bristles to remove any decomposed lignin and then clean and remove the dust from the surface before applying the protective primer.

Then proceed with the application of one or two coats of the last product used in the painting cycle.

USER MANUAL

This manual of use of glulam structures is an integral part of the final design of the structures. Information about loads applied to the structures and the service classes of the elements are given in the calculation report.

Any changes which might be done to the structure (specifically static model, applied loads, holes/notches, etc.) must be verified and evaluated beforehand by professionals and/or technical specialists.

Structures

The structural elements are represented in the as build drawings made by Rubner Holzbau S.r.l. which, together with the calculation report and the present manual of maintenance, make up the construction project.

The structural system must not be changed, even in part of it, and cannot be practiced openings, holes, notches and in general any type of invasive intervention which could alter the static scheme of the structures or the performance of a structurla element.

The design loads are indicated in the Calculation Report of glulam structures.

Can not be executed interventions that will change the size and distribution of the loads. In these cases it will be must to do a verification and a preliminary assessment by specialized professionals authorized by RUBNER Holzbau s.r.l..

Checks

Inspections should be conducted on the various elements that make up the structure, whether in wood or metal structure, according to the deadlines set out in the following CHECKS program (look *paragraph Inspection Plan*).

Maintenance

During the program of maintenance procedures, it is a must to follow the instructions of the following maintenance plan.

Abnormalities

If irregularities are noticed, it is necessary to check promptly and accurately in order to establish if an extraordinary maintenance should be carried out according instructions designed by technical specialists.

4 MAINTENANCE PLAN

This document provides instructions for the ordinary maintenance of glulam structures including steel parts. If during the checks/verifications, for any reason, an extraordinary maintenance work seems necessary, this one has has to be planned, designed and executed to meet the specific structural and/or aesthetic requirements.

4.1 Maintenance of the wood

Wood is one of the most durable materials, but over extended periods of time it may be subject to deterioration from decay, insect attack, or mechanical damage. Timber structures must be periodically maintained or rehabilitated in order to keep them in a condition, which will give optimum performance and service life. Effective maintenance programs improve public safety, extend the service life of the structure, and reduce the frequency and cost of repairs. The objective is not only to repair existing deficiencies, but also to take corrective measures to prevent or reduce future problems. When tied to a competent inspection program, regular maintenance represents the most cost-effective approach for achieving long service life from existing structures. Unfortunately, maintenance is often neglected until critical problems develop that require major restoration or replacement of the structure. In times of declining budgets, the first program reduced as a money-saving measure is often maintenance, when, in fact, reduced maintenance substantially increases long-term costs.

In general terms, maintenance includes those activities necessary to preserve the utility of a structure and ensure the safety of road users. In practice, all maintenance is either preventative or remedial. Maintenance activities are divided into categories that vary in definition and scope. In this chapter, timber maintenance is divided into the three following categories:

1. **Preventative maintenance** involves keeping the structure in a good state of repair to reduce future problems. At this stage, decay or other deterioration have not started, but the conditions or potential are present.
2. **Early remedial maintenance** is performed when decay or other deterioration is present but does not affect the capacity or performance of the structure in normal service. At this stage, more severe structural damage is imminent unless corrective action are taken (they must be assessed case by case from a qualified technical).
3. **Major maintenance** involves immediate corrective measures that restore a structure to its original capacity and condition. Deterioration has progressed to the point where major structural components have experienced moderate to severe strength loss and repair or replacement is mandatory to maintain load-carrying capacity.

4.2 Maintenance of the Structural Glulam members

The glulam structures are delivered already protected depending on the service classes (look following service class schema) or protected by on site by a waterproofing system (see BASF / RADA Resurfacing documentation):

Service class 1: Elements treated with hand applied by brush to paint water-based color (AQUA PROFILASUR). The processing performed in the factory protects wood from mold and blue fungi, while also ensuring a preventive protection against insect attack lignivorous:

- For glulam elements with heat and humidity conditions that lead back the property in Service Class 1 do not need special maintenance on the wood if not for purely aesthetic reasons.

Service class 2-3: For glulam elements with heat and humidity conditions that lead back to the property in the Service Classe 2 and 3, total impregnation (= application of appropriate wood stain) of glulam parts will be performed by qualified staff, prior surface cleaning; The impregnation should be made in two stages with protective wood preservative, water-based, non-excessive film forming, resistant to weathering, for protection of wood against Biological agents (AQUA PROFILASUR). The impregnation must be carried out in the absence of excessive moisture;

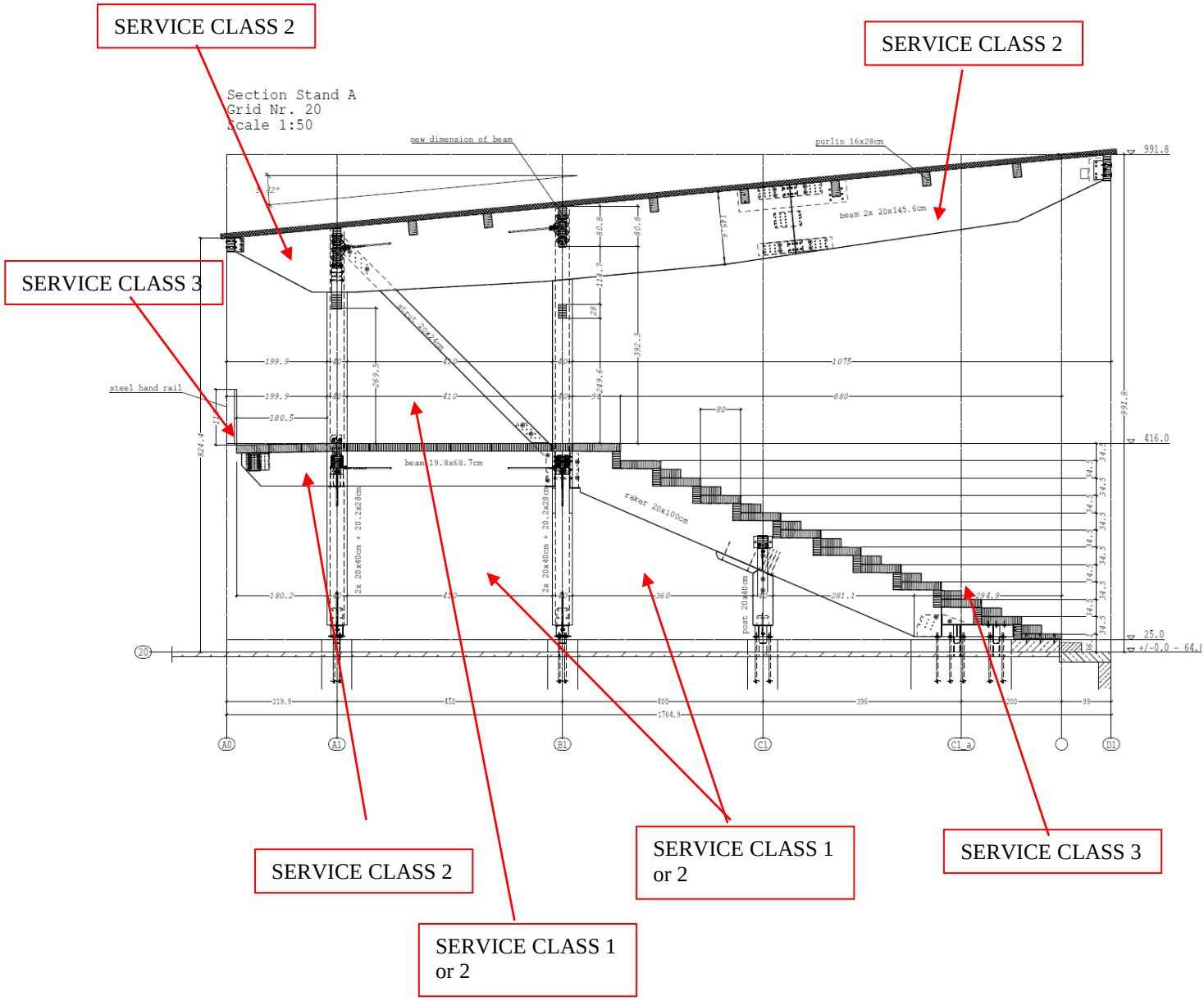
- **For the structures in Service Class 2, after the first 2 years and then every 3 years (**as per following ***Preventive Maintenance Plan***)**, the glulam surfaces need to be sanded down before the first hand of impregnation.**
- **For the structures in Service Class 3, after the first 1 years and then every 2 years (**as per following ***Preventive Maintenance Plan***)**, the glulam surfaces need to be sanded down before the first hand of impregnation.**
- elements treated with special protective product - waterproofing (see BASF / RADA Resurfacing documentation).

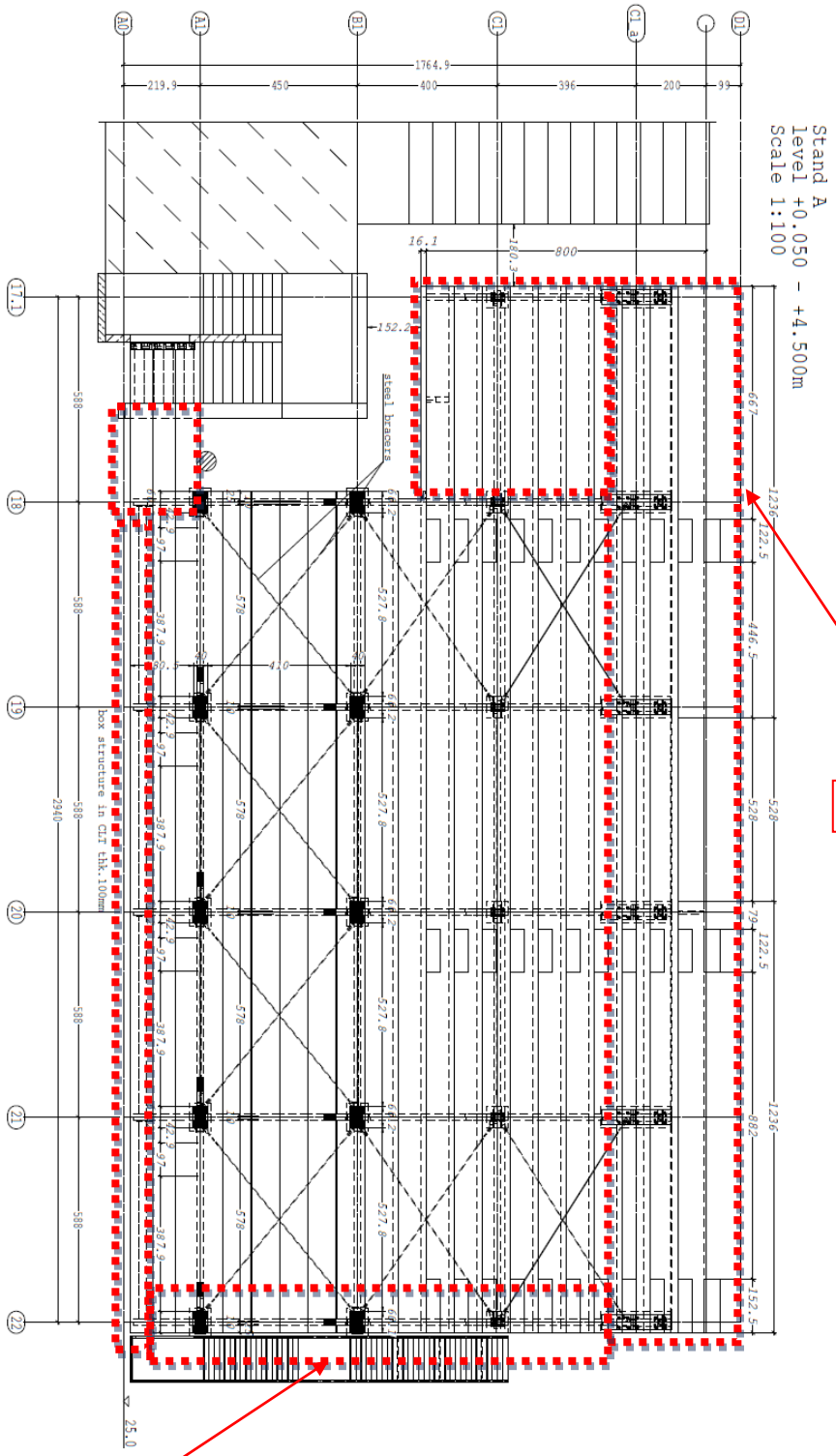
The fasteners in dowel type connection, according to the European codes, are inserted into calibrated holes. The top and the bottom of the steel elements are set back from the edge of the timber elements few millimeters in order to prevent cracks during the mounting phases.

According to our experience this detail does not affect the durability of the structure, because air ventilation quickly restores the operating humidity (service class 2)

However, during the inspection these points, as the rest of the connection, must be carefully inspected and the maintenance operation should be carried out with particular attention (periodical application of appropriate wood stain).

SERVICE CLASSES SCHEMA

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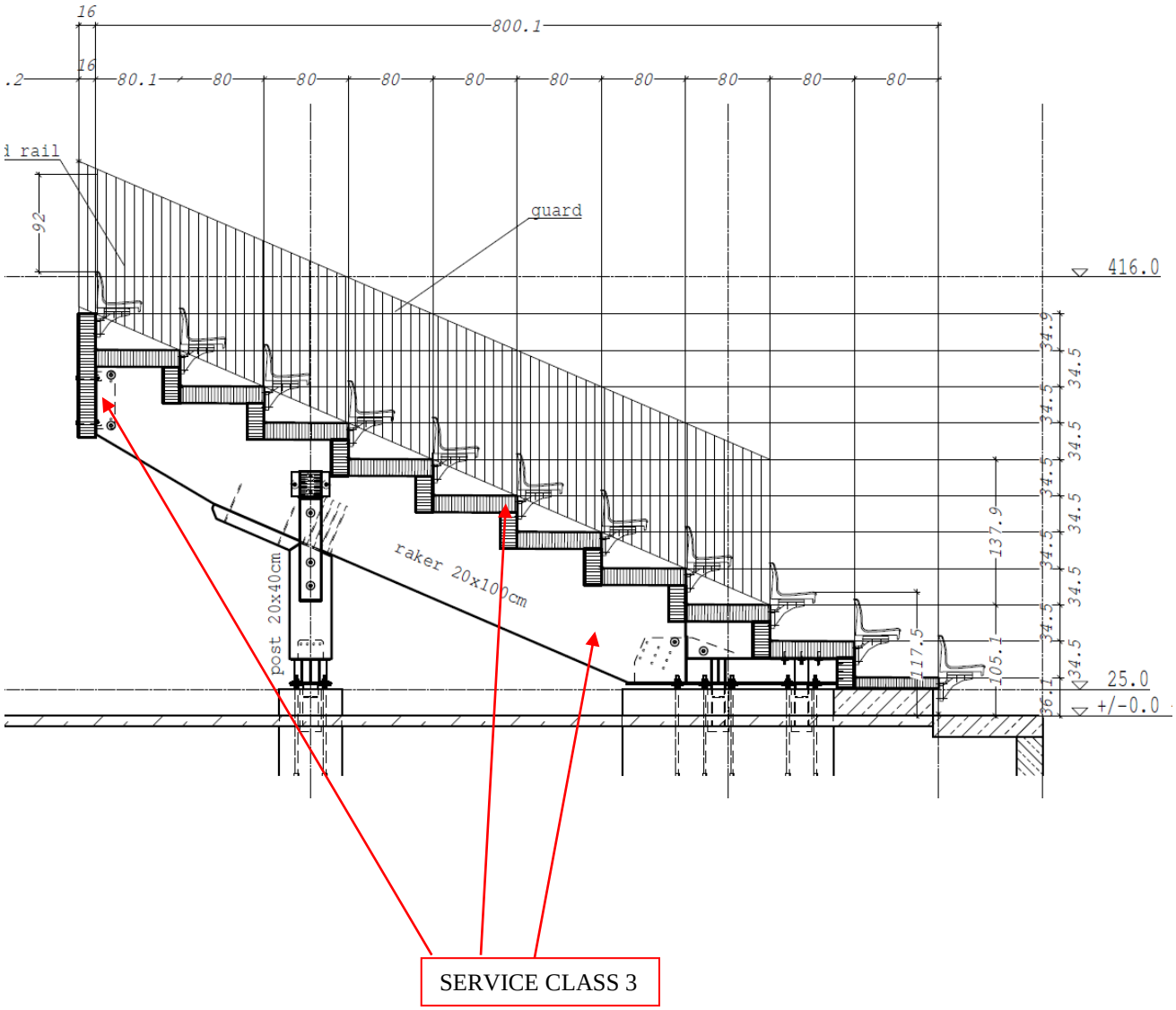
SERVICE CLASS 3
SERVICE CLASS 3


16
800.1
16
80.1
80
80
80
80
80
80
80
80
80
80
guard
416.0
raker 20x100cm
post 20x40cm
137.9
117.5
105.1
34.5
25.0
+/-0.0
SERVICE CLASS 3

4.3 *Maintenance of the supports*

The supports of beams and columns must be kept clean of dirt in order to avoid possible accumulations of moisture and to allow the timber to maintain the proper hygrometric balance. The cleaning of the supports must be done every 3 years for structures of Service Class 1, every 2 years for structures of Service Class 2 and ***each year for facilities in Service Class 3***.

4.4 *Maintenance of the Steel components*

All bolts must be properly tightened, the steel wind bracing must be well tensioned. All threads must be free of rust. Any rusty steel parts must be treated with special anti-rust products. After one year from the end of the installation all the bolts have to be re-tightened after the first intervention, this operation must be repeated every three years.

Tightening of non-preloaded bolts (steel to steel connections): the connected components shall be drawn together such that they achieve firm contact. Shims may be used to adjust the fit. For constituent products with $t \geq 4$ mm for plates and sheeting and $t \geq 8$ mm for sections, unless full contact bearing is specified, residual gaps of up to 4 mm may be left at the edges on condition that contact bearing is achieved at the central part of a connection.

Each bolt assembly shall be brought at least to a snug-tight condition, with special care being given to avoid over-tightening especially short bolts and M12. The tightening process shall be carried out from bolt to bolt of the group, starting from the most rigid part of the connection and moving progressively towards the least rigid part. To achieve a uniform snug-tight condition, more than one cycle of tightening may be necessary.

The term "snug-tight" can generally be taken as that achievable by the effort of one man using a normal sized spanner without an extension arm, and can be set as the point at which a percussion wrench starts hammering. The bolt shall protrude from the face of the nut after tightening not less than one full thread pitch.

Tightening bolts (steel to timber connections): Bolts and lag screws should be tightened so that the members fit closely, and they should be re-tightened if necessary when the timber has reached equilibrium moisture content to ensure that the load-carrying capacity and stiffness of the structure is maintained."

After one year from the end of the installation steel wind bracing have to be tensioned if present and all the threads must be protected through cold galvanizing, after the first intervention this operation must be repeated every three years. Rusted steel parts must be cleaned and brushed every 2 years, through treatments with special products anti-rust.

4.5 Maintenance of the metal roofing system

The occurrence of damages or malfunction can be prevented by regular maintenance operation, according to a fixed time schedule.
This section of the manual show the operation on:

- Roof cover (sanhwich panels)
- Flashings
- Downpipe
- Metal scupper

Every intervention on the roof must be carried out with expert personnel, trained and equipped with adequate fall protection systems, even if these systems are not included in the following manual.

For the entire roofing a regular maintenance is needed. The operetion should be divided into two main phases:

- Cleaning of the single component
- Control of the components

The reference standard for roofing is UNI 10372: 2004
The reference standard for rainwater drainage system is the UNI 10724: 2004

Cleaning of the single component

Cleaning means the removal of all objects eventually carried by the wind or even bird nests etc., and also the moss and / or mud, leaves and / or small branches.

All this obstructions can cuauses the not proper work of the rainwater collection lines and downpipes.

It is reported that the guano of birds is corrosive and can produce damage to the metal, even if "clogging" is not produced.

The cleaning of the roof surface should be done with water (not high pressure) and soft bristle to prevent scratch on the painted surfaces.

Attention must be payed during the cleaning of the gutter. In this case the material is stainless steel so any scratches is not an issue, but during the operation the siliconic seals and the expansion joints should be protected and must be handled with care.

Time schedule:

At least two cleaning should be done every year (spring and autumn), and after exceptional event (windstorm etc) for:

- gutter
- cover

WARNINGS:

- In case of subsequent installation of photovoltaic panels on the roofs it is recommended not to clean only the photovoltaic panels, leaving the residues "downstream" of the plant areas accumulated on the roofing slabs.

- If cleaning is carried out with detergents, rinse several times with water.
- Pay attention to the indications and methods of use on detergent detergents.
- Avoid using products containing acetone, diluents or similar solvents and products containing abrasives that can damage metals.
- If possible, avoid the use of pressure guns that can accidentally convey water below the overlap of the covers and also damage the protective paintwork of the sheet.

Use and maintenance manual

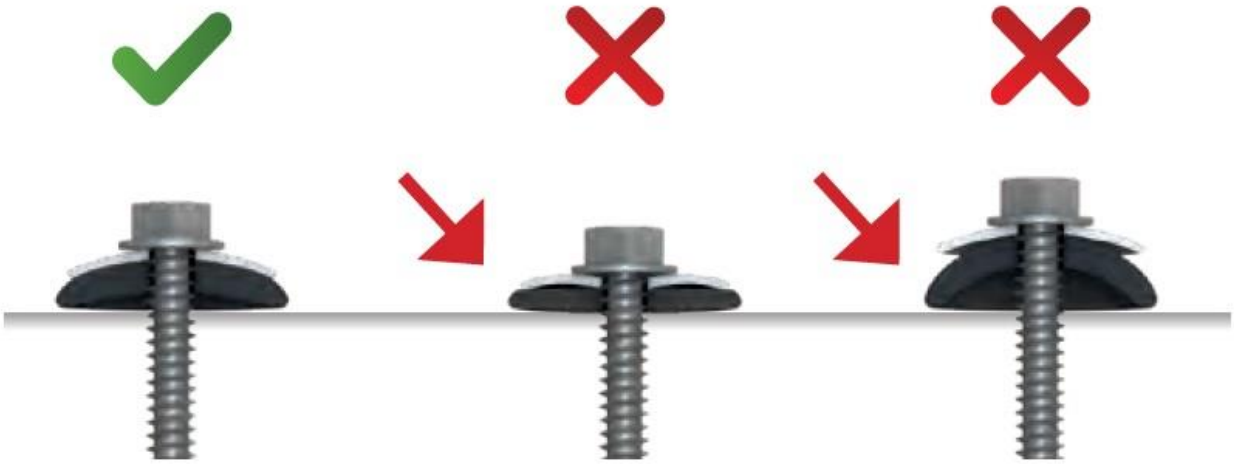
Roof panels

All the roofing panels are walkable for maintenance without special devices, taking care to avoid concentrated loads higher than the single person. Prolonged storage of equipment on the roofs can generate corrosive oxides.

The roof is made of sandwich panels in rock wool and pre-painted steel sheets, equipped with visible stainless steel fasteners with epdm seals. These components must be checked both for epdm status and the tightening of the screws.

If the fastener has the correct tightening the epdm should be compressed for 3-4mm.

The gasket in the correct status should guarantie unaltered softness, absence of cracks and a good adherence to the covering sandwich panel.

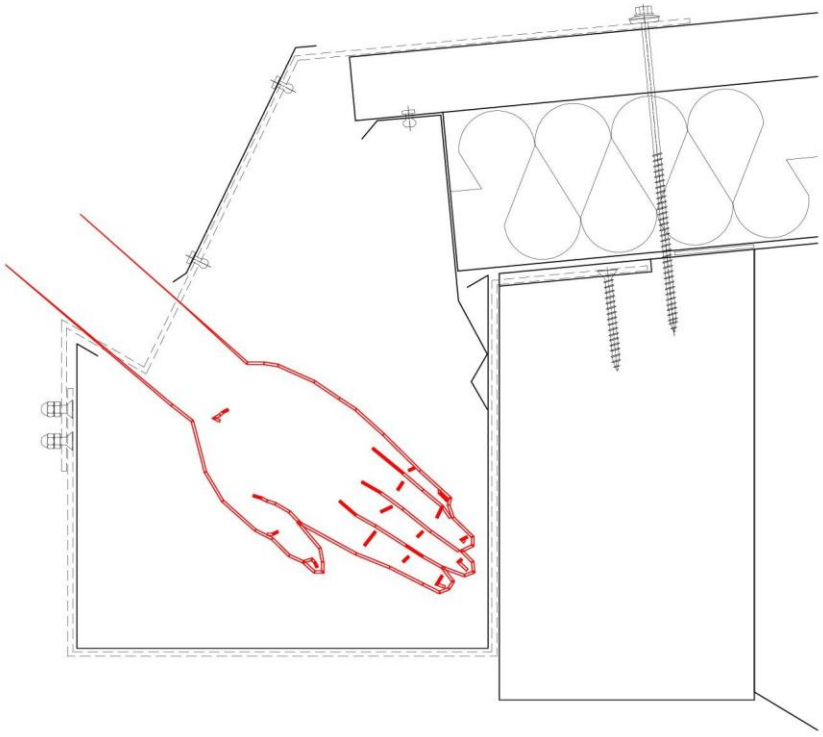


FLASHINGS

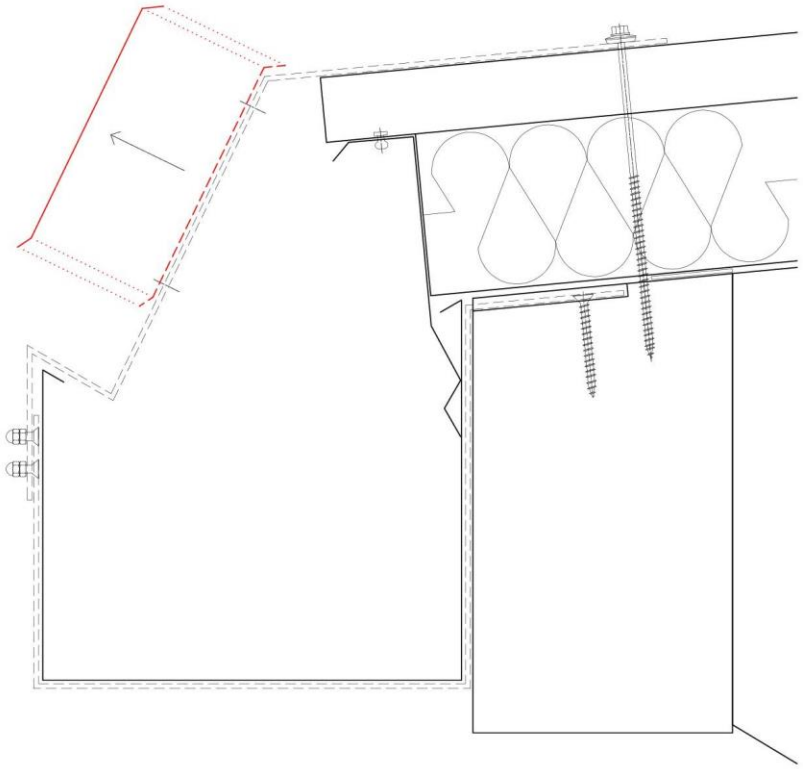
All the flashings are not walkable.

The top of the roof and the flashings along the side of the roof are fixed to the timber structure through stainless steel screws with EPDM seal. The tightening and the EPDM status should be checked.

The gutters, supported by stainless steel brackets and rods,are not walkable. The cleaning operation could be done as shown in the picture:



For the maintenance of the seal it is possible to remove the front flashings by removing the rivets fixed to the tie rod as shown in the figure below.



Once operations are completed, the front flashing must be refitted to the tie with stainless steel rivets in the original position, rivets possibly equipped with washers (if the hole has been enlarged).

In addition to the general check, special attention must be paid to the following individual components:

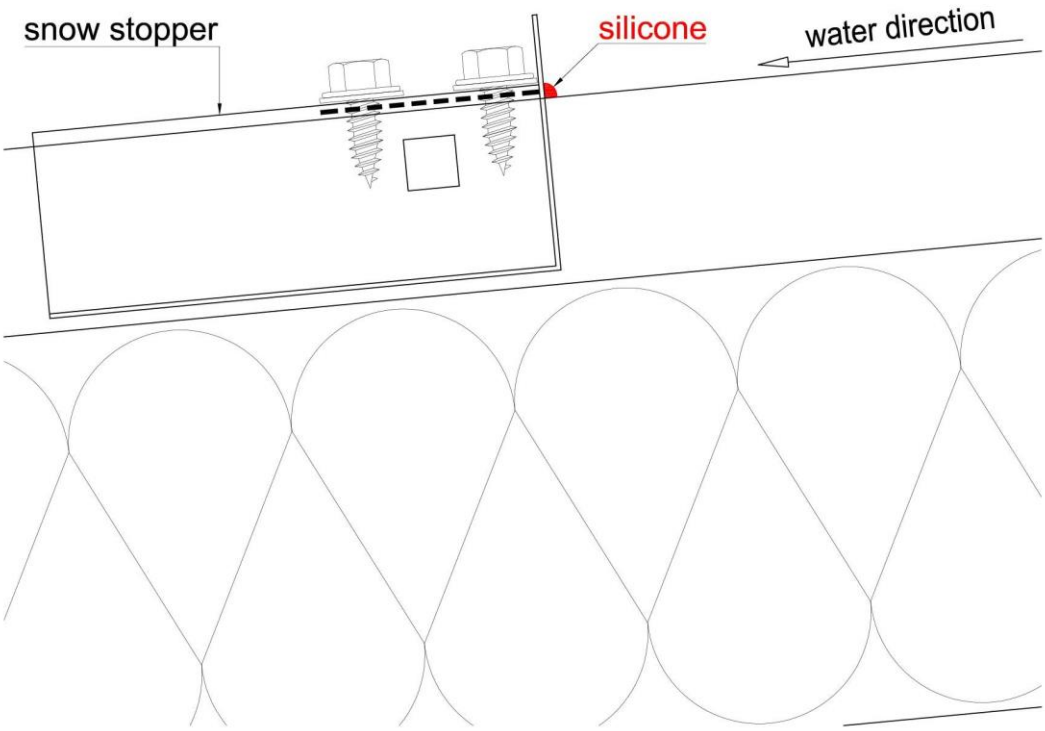
- 1 The joints of tinsmithery (gutters, ridges and sheet metal gutters) must be coplanar and the fastenings must be close-fitting, not raised or broken.
- 2 Silicone seals (gutters, ridges and sheet metal tins) must be soft to the touch and not detached from the metal.
- 3 Expansion joints (gutters) see points 1 and 2.
- 4 Rainwater inlets (gutters) see points 1 and 2.
- 5 The fastenings of the snow noses must be checked for the state of tightness and conservation of the gasket. The gasket placed between the snow nose and the sandwich panel must be intact and not cracked.

ATTENTION: since the fastening screws of the nose guard are screwed onto the rib of the steel sandwich panel having a thickness of 0.6 mm, it is essential to use a screwdriver with clutch to possibly check their

tightening, without this the bolt of the screw will be pullout from the panel rib and the water seal will be compromised.

The control and scheduled maintenance are aimed at verifying the state of conservation and the conditions of functionality of the roof, following the instructions given below:

A : Verification of rain pipes: each pipe must be completely free of obstructions such as birds' nests or other; if there are any doubts, make sure introducing water in the upper part and observe the flow of an inspection pit open to the ground.
B : Verification of gutter channels: the channels must be clean and free from solid obstructions, especially near the downpipes and close to the overfloow drain. If significant water stagnations are not present, the stability of the structure is assumed.
C: The seals must be soft, intact and well adherent to the metal, that is difficult to remove even with a blade (try on a small surface); if this were not the case, the seals must be completely rebuilt; removing the existing ones, removing all the residues, perfectly cleaning and degreasing the metal area involved in the renovation. In this case the suitable type of sealant to be used must be checked, which must be “Torggler” type silicone or equivalent.
D. General state of the metal of the eaves and of the flashing: it must be substantially free from corrosion or from the consequences of chemical attack.
E: If the watertightness of the snow nose is compromised proceed with a seal upstream of the snow nose as shown in the figure below. Sealing must be carried out by perfectly cleaning and degreasing the metal area concerned. In this case the suitable type of sealant to be used must be checked, which must be “Torggler” type silicone or equivalent.



Maintenace Schedule:

Roofing and complement (flashing)

- Visual check and cleaning: every six month
- Water tightness control every six month

CANALI DI GRONDA

- Visual check and cleaning: every six month
- water tightness control every six month

4.6 Preventive Maintenance

Preventative maintenance involves keeping the structure in a good state of repair to reduce future problems. At this stage, decay or other deterioration have not started, but the conditions or potential are present.

In order to ensure the best durability of structures, it is essential to perform the inspections to be programmed according to this manual and to intervene regularly to maintain the condition of protective for the structures:

For the structures in service **class 1**, protected inside the rooms and / or coated (so not subject to significant moisture stress), it will be necessary to simply perform regular inspections and cleaning activities. It is also important to check the tightness of the roof and that no moisture inside into the structure.
The treatment must be repeated only on the visible parts of the structures with impregnating protective when needed. In particular the following structures structural parts must undergo this level of maintenance

- Structures inside the building

For structures in service **class 3**, not protected from atmospheric agents and/or subjected to stress-humidity, it is important to perform the treatment with protective impregnating at least once every year from the time of installation, in addition to accurate inspections and frequent cleaning activities. In particular it is considered to be subjected to this level of maintenance the following structures / structural parts:

- Roof elements and columns , Wooden Bridge;
- Roof edge elements, placed along the border of each building's roof.

An exaustive report (including pictures and drawings) of the investigation and of maintenance, will be transmitted for information to the provider (Rubner Holzbau Srl) at the end of each inspection. If anomalies were to be detected during inspections, the suppliers of the structures must be promptly contacted.

4.6.1 Preventive Maintenance Plan

SCHEDULE OF PREVENTIVE MAINTENANCE OPERATIONS - Service Class 2

Year	*Structures in service class 2*
2019	
2020	
2021	Preventive maintenance operations
2022	
2023	
2024	Preventive maintenance operations
2025	
2026	
2027	Preventive maintenance operations
2028	
2029	
2030	Preventive maintenance operations

SCHEDULE OF PREVENTIVE MAINTENANCE OPERATIONS - Service Class 3

Year	*Structures in service class 3*	*Glulam treatment*
2019		
2020	Preventive maintenance operations	prior surface cleaning/preparation 2 x AQUA PROFILASUR or similar
2021		
2022	Preventive maintenance operations	prior surface cleaning/preparation 2 x AQUA PROFILASUR or similar
2023		
2024	Preventive maintenance operations	prior surface cleaning/preparation 2 x AQUA PROFILASUR or similar
2025		
2026	Preventive maintenance operations	prior surface cleaning/preparation 2 x AQUA PROFILASUR or similar
2027		
2028	Preventive maintenance operations	prior surface cleaning/preparation 2 x AQUA PROFILASUR or similar
2029		

In-situ preservative treatment

In-place treating involves the application of preservative chemicals to prevent or arrest decay in existing structures. Two types of treatments are commonly used: surface treatments and fumigants. Surface treatments are applied to prevent infection of exposed wood, whereas fumigants are used to treat internal decay.

- Surface tratment

  Surface treatment is most effective when applied before decay begins and is commonly used for treating checks, splits, delaminations, mechanical damage, or areas that were field-fabricated during construction. The ease of application and effectiveness of surface treatments work as barriers make them useful in preventive maintenance; however, the shallow penetration limits their effectiveness against established internal decay.

  Conventional liquid wood preservatives are applied by brushing, squirting, or spray-flooding the wood surface.

- Fumigants

  Fumigants are specialized preservative chemicals in liquid or solid form that are placed in prebored holes to arrest internal decay. Over a period of time, the fumigants volatilize into toxic gases that move through the wood, eliminating decay fungi and insects. Solid fumigants provide increased safety, reduce the risk of environmental contamination, and permit fumigant use in previously restricted applications.

  To be most effective, fumigants must be applied to sound wood: when applied in very porous wood or close to surfaces, some of the fumigant is lost by diffusion in the atmosphere. The amount of chemical and the size and number of treatment holes depends on the member size and orientation. Additional information and recommended dosages for fumigants may be obtained from the chemical manufacturers.

Mechanical repair

Mechanical methods of repair use steel fasteners and additional wood or steel components to strengthen or reinforce members. The three methods of mechanical repair discussed in this section are member augmentation, clamping and stitching, and stress laminating.

- Member reinforcements

  Member reinforcements involves the addition of material to reinforce or strengthen existing members. The additional pieces, commonly wood or steel plates attached with bolts, serve to increase the effective section and thus load capacity. The two most widely used methods of member augmentation are splicing and scabbing.

  Although the distinction between the two is rather vague, splicing generally applies to a defined location where load transfer is restored at a break, split, or other defect. Scabbing is more frequently

associated with strengthening members where existing capacity is insufficient and may involve adding reinforcing pieces over a substantial portion or even over the entire member length. In both cases, a thorough structural analysis is required to ensure the capacity of the repair and to verify stress distribution in the members. Situations that introduce eccentric loads or tension perpendicular to grain must be avoided. When using splices, it is recommended that the defective member be cut entirely through to more equally distribute loads to splice plates.

- Clamping and stitching

  A typical problem associated with timber members is the development of longitudinal splits. These splits commonly develop in sawn lumber as the member seasons and checks in place. To a lesser degree, splits may also develop in glulam if delamination occurs at the glue lines, although this problem has become very rare with the introduction of waterproof adhesives. In both sawn and glulam members, splits can also develop from overloads or poor design details that introduce tension perpendicular to grain at connections. When splitting is detected it must be determined whether the splits are the result of normal seasoning or the result of a more serious structural problem.

  Clamping and stitching are maintenance operations that use fasteners and steel assemblies to arrest cracks, splits, or delaminations in timber members. The objective is not to close the split or check, but rather to prevent its further development by drawing the two parts together. Clamping uses bolts with steel-plate assemblies, while stitching uses bolts or screws through the member. Although both methods have been used effectively, it is generally preferable to use methods which don´t imply reduction of timber section. There are no specific design criteria for clamping and stitching, and the configuration, number, and size of fasteners must be based on designer judgment on a case by case basis.

Component replacement (if preventive maintenance has not been performed correctly or beyond the guarantee period)

There are situations where a lack of maintenance or other causes lead to deterioration, sometimes so severe that the replacement of the member is the only economically viable alternative. In these cases, the structure must be temporarily supported (when required), the old member removed, and a new one installed in its place. Before replacing members, the cause of deterioration in the original member must be determined and corrected. If the problem is structural, an increased capacity for the replacement may be warranted. If decay is the source of deterioration, corrective measures should be taken to exclude moisture from newly installed members. Whenever a member is replaced, it is advisable to thoroughly inspect all adjacent and contacting components for decay that may not have been apparent when the member was in place. Confirmed or suspected areas of decay should be treated in place before the new member is installed. Remember that failure of the original member resulted from a specific cause that could also cause premature failure or high maintenance costs for the replacement.

On some structures it may be impractical to replace a member because of difficulties with removing the old member or positioning a new member in its place. An alternative solution is to add a sister member that is structurally capable of resisting the loads previously applied to the original member. The use of sister members is most applicable when damage occurs from overloads or other mechanical damage. When existing members are decayed, appropriate steps must be taken to eradicate the infection and prevent its spread to the new component. The decayed portions of the member should be removed and the remaining portions treated in place. Again, the source of moisture that provided the suitable decay conditions must also be eliminated.

5 MONITORING AND INSPECTION ACTIVITIES

5.1 General Considerations

The fundamental purpose of any inspection is to provide the information necessary to assess the condition (capacity, safety, and rate of deterioration) of a structure.
Inspections are classified according to the objectives. These include:

- Baseline: to obtain data on a structure that has not been inspected. This inspection involves the greatest "pre-inspection" effort.
- Routine: to obtain data on general condition, confirm drawings, estimate repair costs, etc.
- Design Survey: to obtain data for specifications or for detailed cost estimates.
- Acceptance: to obtain data confirming that a repair has been completed according to plan or specification.
- Research: to obtain data on deterioration rates, etc.

The usefulness of an inspection depends on establishing a clear and complete record. Although the level of inspection will determine the extent of information to be provided, in general the inspection will address the:

- Identification and description of all major damage and deterioration of the structure.
- Description of facilities inspected including updated layouts (which occasionally differ significantly from the drawings available at the activity).
- Documentation of types and extent of marine growth, if applicable.
- Assessment of general physical condition including projected load capacities.
- Recommendations for required maintenance and repair.
- Budgetary estimates of costs of this maintenance and repair, including examples of how estimates were derived.
- Identification of any problems associated with mobilization of equipment, personnel, and materials to accomplish repairs/maintenance.
- Estimate of expected life of each structure.
- Recommendations for types and frequencies of future inspections.

As required in the maintenance plan, normally (unless special circumstances) it will proceed with the following necessary checks:

Document and design

Verify that the applied loads are compatible with those of project
Verify that the destination of use has not been modified
Verify that the service class structures have not been changed compared to the plan specifications

Any changes on the structural elements

Check if there are new openings into the panels
Check if there are changes on the loads or there are changes on how these are applied
Check if structures initially designed closed, were open or viceversa. Also Check if structures initially planned uncovered, were covered or viceversa.
Check if the climate conditions have changed.
Check if the glulam beams are in ventilated conditions and that no stagnant water or excessive moisture

Geometry of the structure

Check that there is a correspondence between the geometry of the project and the real construction
Checking the deformations verify/ check
Verification of the verticality for beams, panels and columns

Visual specialized checks / special visual controls

The presence of stains due to moisture
Checks of the pluvial, drains and flashings
Check if there is corrosion on metal components and on welds
Discoloration of wood
Weeds, insects or fungal attack

Cracks

Detection of cracks by measuring the width, depth, length, number and placement
Measurement of the depth of the slots with a sheet steel of a thickness of 2/10 mm
Relative humidity measurement of wood with special instrument at various depths
Relative humidity measurement of wood in the most significant parts of the construction
Relative humidity measurement of wood inside and outside the building

5.2 Levels of inspection

For any inspection objective, three levels of inspection effort are used for inspecting structures:

- **Level I** - General Visual Inspection. This inspection involves no cleaning of any structural elements and, therefore, is the most rapid of the three types of inspections. The purpose of the Level I inspection is to confirm as built structural plans, provide initial input for an inspection strategy, and detect obvious major damage or deterioration due to overstress, impacts, severe corrosion, or extensive biological growth and attack.

- **Level II** - Close Up Visual Inspection. This inspection is directed toward detecting and identifying damaged or deteriorated areas that may be hidden by surface biofouling or deterioration and obtaining a limited amount of deterioration measurements. The data obtained should help estimate the facility's load capability. Level II inspections will often require cleaning the structural elements. Since cleaning is time consuming, it is generally restricted to areas that are critical or which may be representative of the entire structure. The amount and thoroughness of cleaning to be done is governed by what is necessary to determine the general condition of the overall facility.

- **Level III** - Highly Detailed Inspection. This inspection will often require the use of non destructive testing (NDT) techniques. It may also require using partially destructive techniques, such as core sampling of wood structures, physical material sampling, or surface hardness testing. The purpose of this type of inspection is to detect hidden or interior damage, loss in cross sectional area, and material homogeneity. A Level III examination will normally require cleaning. The use of NDT techniques are usually limited to key structural areas, areas that may be suspect, or structural members that may be representative of the structure. Level III inspections require more experience and training than Level I or Level II inspections, and should be done by qualified personnel.

5.3 Inspections

- Documents

  For proper maintenance of the structures, it is important to keep all project documents: calculation reports, drawings, material certificates.

- Causes of deteriorations

  Wood deterioration is a process that adversely alters wood properties. In broad terms, it can be attributed to two primary causes: biotic (living) agents and physical (nonliving) agents. In most cases, wood deterioration is a continuum, whereon the degrading actions from one or more agents alter wood properties to the degree required for other agents to attack. The inspector's familiarity with the agents of deterioration is one of the most important aids in effective inspection. With this knowledge, inspection can be approached with a thorough understanding of the processes involved in deterioration and the factors that favor or inhibit its development. During the visits of inspection, the structures should be thoroughly inspected, it is very important to check the presence of:

- **Streaks or spots due to moisture** (look also at next section: *inspection of the timber structures*): this may indicate areas with stagnant water. In the long term it can cause the physical deterioration of wood;
- **Insects**. Termites are the most destructive wood-destroying insects found on waterfront structures (not expected in the current project). Other insect pests include: wood-boring beetles, ants, and bees. An insect frequently associated with damage to piers and docks is the wharf-borer, Nacerda, a beetle about 8 mm long, yellowish-brown to dark red in color. Some insects, such as termites, require wood for food and shelter; others, such as carpenter ants, require wood for nesting only. Most wood-destroying insects thrive under damp conditions.
- **Mechanical damage**: is probably the most significant physical agent of timber sructure deterioration. It is caused by a number of factors and varies considerably in its effects on the structure. Most commonly, mechanical damage is from user abrasion, which produces worn or marred surfaces and reduces the effective wood section. Obvious examples of this damage occur in the walkways area where abrasion produces the faster degradation.
- **Ultraviolet Light Degradation**: some of the most visible wood deterioration results from the action of the ultraviolet portion of sunlight, which chemically degrades the lignin near the wood surface. Ultraviolet degradation typically causes light woods to darken and dark woods to lighten, but this damage penetrates only a short distance below the surface.The damaged wood is slightly weaker, but the shallow depth of the damage has little influence on strength except where continued removal of damaged wood eventually reduces the member dimensions.
- **Corrosion**: wood degradation from metal corrosion is frequently overlooked as a cause of deterioration. This type of degradation can be significant in some situations, particularly in marine

environments where saltwater galvanic cells form and accelerate degradation. Corrosion begins when moisture in the wood reacts with iron in a fastener to release ferric ions that in turn deteriorate the wood cell wall. As a fastener which deteriorates the cell wall. As corrosion progresses, the fastener becomes an electrolytic cell with an acidic end (anode) and an alkaline end (cathode). Although the conditions at the cathode are not severe, the acidity at the anode causes cellulose hydrolysis and severely reduces wood strength in the affected zone. Wood attacked in this fashion is often dark and appears soft. In many wood species, discoloration also occurs where iron contacts the heartwood. In addition to the deterioration caused by corrosion, the high moisture conditions associated with this damage can initially favor the development of fungal decay. As corrosion progresses, the toxicity of the metal ions and the low pH in the wood eventually eliminate fungi from the affected zone, although decay may continue at some distance away from the fastener. The effect of wood metal corrosion can be limited by using galvanized or noniron fasteners.

- **Chemical Degradation**: in isolated cases, the presence of strong acids or bases can cause substan-tial damage to wood. Strong bases attack the hemicellulose and lignin, leaving the wood a bleached white color. Strong acids attack the cellulose and hemicellulose, causing weight and strength losses. Wood damaged by acid is dark in color and its appearance is similar to that of wood damaged by fire. Strong chemicals will normally not be in contact with a timber unless accidental spills occur.
- **Fungi**. Three categories of wood-decay fungi are: white rot, which tends to bleach the affected wood; brown rot, often termed "dry rot," which produces a brown, crumbling type of decay; and soft rot, which softens the wood. Slight strength reduction of infected wood can be caused by stain fungi, which produce bluish black to steel gray or brownish discoloration of the wood. Molds also produce a discoloration of the wood surface and are regarded as merely a blemish, but their presence indicates that conditions may be favorable for decay organisms. Most wood-destroying fungi require damp conditions for growth.
- **Abrasion**: mainly due to the combined action of water, wind and sun.
- **Overload**: due to additional loads improperly applied.
- **Connection Failure**. When a timber connection fails, the structure is free to move and will eventually fail. If untreated wood is exposed, connection failure may first allow the entry of insects and fungi.
- **Cracks**: cracks up to about 4mm in width are a natural phenomenon of wood and are caused by the variation of the thermo-hygrometric conditions of the wood due to the variation of temperature and humidity of the environment. In case of abnormal deformations is appropriate to perform a detection of cracks by a competent technical specialist. The cracks must be measured in both length and in depth. To detect the depth of the crack, a graduated metal sheet should be used with a thickness of 2/10 mm.

The followung must be carefully evaluated:

- Cracks in zones where there is a perpendicular to the grain state of tensile stress;
- Cracks near supports and End-notched beams.

- Inspection of the timber structures

Moisture control Moisture control is the simplest, most economical method of reducing the hazard of decay in timber structures. It can be used as an effective and practical maintenance technique to extend the service life of many existing structures. When exposure to wetting is reduced, members can dry to moisture contents below that required to support most fungal and insect growth (approximately 20 percent). Moisture control was the only method used for protecting many structures constructed of untreated timber, some of which have provided service lives of 100 years or more. Although modern timber structures are protected with preservative treatments, decay can still occur in areas where the preservative layer is shallow or broken. This damage is the major cause of deterioration in timber structures.

Moisture control involves a common sense approach of identifying areas with visible wetting or high moisture contents, locating the source of water, and taking corrective action to eliminate the source. For example, drainage patterns on approach roadways can be rerouted to channel water away from the structure. Cleaning dirt and debris from the structure surface, drains, and other horizontal components also reduces moisture trapping and improves air circulation. Where possible, one of the most effective approaches to moisture control is restricting or preventing water passage through the structure. Those parts that are impervious to moisture penetration will protect critical structural members and substantially reduce the potential for decay.

Cracking may result from a number of causes but is typically caused by differential deck deflections at panel joints or at deck ends. Cracks of this type should be thoroughly cleaned with a stiff brush and compressed air, then filled with appropriate products. If the deck is broken or missing, it must be removed and replaced.

Exterior deterioration is the easiest to detect because it is often readily accessible to the inspector. The ease of detection depends on the severity of damage and the method of inspection. The four methods or tools most commonly used include visual inspection, probing, the pick test, and the Pilodyn. When areas of exterior deterioration are located by these methods, further investigation by other methods is required in order to confirm and define the extent of damage.

- **Visual Inspection**: the simplest method for locating deterioration is visual inspection. The inspector observes the structure for signs of actual or potential deterioration, noting areas for further investigation. Visual inspection requires strong light and is suitable for detecting intermediate or

advanced surfacedecay. It will not detect decay in the early stages, when control is mosteffective, and should never be the only method employed.

- **Fruiting bodies** provide positive indication of fungal attack, but do not indicate the amount or extent of decay. Some fungi produce fruiting bodies after small amounts of decay have occurred, while others develop only after decay is extensive. Because fruiting bodies are not common on this type of structures, they almost certainly indicate serious decay problems when they are present.
- **Localized surface depressions** can indicate underlying decay. Decay voids or pockets may develop close to the surface of the member, leaving a thin, depressed layer of intact, or partially intact, wood at the surface.
- **Staining or discoloration indicates** that members have been subjected to water and potentially high moisture contents suitable for decay. Rust stains from connection hardware are also a good indication of wetting.
- **Insect activity** is visually characterized by holes, frass, powder posting, or other signs previously discussed. The presence of insect activity may also indicate the presence of decay.
- **Plant or moss growth in splits**, cracks, or soil accumulations on the structure indicate that adjacent wood has been at a relatively high moisture content suitable for decay for a sustained period of time.

- **Probing**: probing with a moderately pointed tool, such as an awl or knife, locates decay near the wood surface by revealing excessive softness or a lack of resistance to probe penetration. Although probing is a simple inspection method, experience is required to interpret results. Care must be taken to differentiate between decay and water-softened wood that may be sound but somewhat softer than dry wood.
- **Pick Test**: the pick test is one of the simplest, yet most widely used, methods for detecting surface decay. A pointed pick, awl, or screwdriver is driven a short distance into the wood and used to pry out a sliver. The wood break is examined to determine if the break is brash (decayed) or splintered (sound). Sound wood has a fibrous structure and splinters when broken across the grain. Decayed wood breaks abruptly across the grain or crumbles into small pieces. Several studies indicate that the pick test is reasonably reliable for detecting surface decay. The only drawback to this method is having to remove a large sliver of wood for each test.
- **Pilodyn test**: like the pick test, the Pilodyn is also used to detect surface damage. The Pilodyn is a spring-loaded pin device that drives a hardened steel pin into the wood. The depth of pin penetration is used as a measure of the degree of decay. The Pilodyn is used extensively in Europe, where soft rot attack is more prevalent. It is also used to measure the specific gravity of wood for tree improvement programs. Where surface damage is suspected, the Pilodyn can produce an accurate assessment, provided corrections are incorporated for moisture content and the wood species tested.

Unlike exterior deterioration, interior deterioration is difficult to locate because there may be no visible signs of its presence. Numerous methods and tools have been developed to evaluate internal damage

that range in complexity from sounding the surface with a hammer to sophisticated sonic or radiographic evaluation. In addition, such tools as moisture meters are used to help the inspector identify areas where conditions are suitable for development of internal decay.

- **Sounding**: sounding the wood surface by striking it with a hammer or other object is one of the oldest and most commonly used inspection methods for detecting interior deterioration. Based on the tonal quality of the ensuing sounds, a trained inspector can interpret dull or hollow sounds that may indicate the presence of large interior voids or decay. Although sounding is widely used, it is often difficult to interpret because factors other than decay can contribute to variations in sound quality. In addition, sounding provides only a partial picture of the extent of decay present and will not detect wood in the incipient or intermediate stages of decay. Nevertheless, sounding still has its place in inspection and can quickly identify seriously decayed structures. When suspected decay is encountered, it must be verified by other methods such as boring or coring.
- **Moisture Meters**: as wood decays, certain electrolytes are released from the wood structure and electrical properties of the material are altered. Based on this phenomenon, several tools can be used for detecting decay hazard by changes in electrical properties. One of the simpler tools is the resistance type moisture meter. This unit uses two metal probes (pins) driven into the wood to measure electrical resistance, and thus, moisture content. Moisture meters must be corrected for temperature and are most accurate at wood moisture contents between 12 and 22 percent. The measurement should be taken in the direction perpendicular to the fibers. The measurement should be carried out superficially (insert at 2 cm depth) and in depth (insert at least 5 cm deep). For beams facade or for any beams which separate environments with different classes of service, it is important to perform a measurement on both sides of the element. The humidity of the glulam must be measured in sample: taking at least three for every thermo hygrometer significantly different situation.
- **Sonic Evaluation**: sophisticated sonic tests for evaluating wood condition have been developed in recent years. Several of these methods, including sonic wave velocity, acoustic emission, and stress wave analysis have been investigated. The simplest of the sonic techniques uses an instrument to measure the velocity changes of a sound wave moving across the wood. The earliest versions of these tools were used with mixed results on utility poles. More recent efforts have concentrated on measuring how the sonic wave is altered by wood defects. The altered sonic wave or fingerprint can be used to determine the exact size and nature of a defect. Several sonic methods are nearing commercialization and offer a significant advancement in decay detection capabilities; however, where defects are detected, other methods must still be used to determine the cause.
- **Shigometer**: the Shigometer, a device that has been compared to the moisture meter, uses a pulsed current to measure changes in electrical conductivity associated with decay. A small hole is drilled into the wood, and a twisted wire probe connected to a meter is inserted into the hole. As the probe

encounters zones of decreased resistance, the meter reading drops. Zones of large meter declines (50 to 75 percent of that indicated for sound wood) are then bored or drilled to determine the nature of the defect. The Shigometer has performed very well in detecting decay in living trees, but wood in service is normally too dry to permit the use of this instrument. Nevertheless, several studies show that the Shigometer is a reasonable method for detecting decay if it is used under proper conditions by trained operators who understand its operation and interpretation.

- **Drilling and Coring**: are the most common methods for detecting internal deterioration. Both techniques are used to detect the presence of voids and to determine the thickness of the residual shell when voids are present.

- Visual inspection of the steel structures

Although exposure to the atmosphere, severe temperature changes, and wind erosion all contribute to the deterioration of steel in waterfront facilities, exposure to saltwater is the major concern. Corrosion rates of metals exposed to seawater are much higher than those of similar metals exposed to freshwater. In this case steel elements are not in direct contact with the seawater.

Biological fouling, the growth of marine organisms on the steel, also contributes to increased corrosion.

- Carbon steel is an alloy of iron and carbon with a carbon content less than 2 percent and this grade is suitable for welding. Carbon steel will corrode in all exposure zones, but the most severe corrosion occurs in the splash zone. Coatings and cathodic protection are necessary to prevent excessive corrosion of steel in the waterfront environment.
- Stainless Steels. Stainless steels have application in the marine environment under certain conditions. They do well when exposed to wind, rain, sun, or high-velocity conditions in seawater. In calm or stagnant waters, salt spray zones, or in buried conditions, corrosion is likely to occur. Except in certain atmospheric environments, stainless steels should only be used for specialized applications where performance experience has been superior to more commonly used materials to justify the high cost.

There are five major types of steel structure deterioration to watch for in the marine environment:

- Corrosion
- Abrasion
- Loosening of structural connections
- Overloading
- Loss of foundation material

Generally, visual inspections will detect most forms of deterioration of steel structures.

In the event that more detailed NDT techniques are required under a Level III inspection, a plan and sampling techniques must be developed and tailored to the specific areas of concern.

Some types of corrosion, however, may not be detected by visual inspections. For example, inside steel pipe piling, anaerobic bacterial corrosion caused by sulfate-reducing bacteria is difficult to detect by visual inspection. Cathodic protection systems need to be closely monitored both visually and electrically for signs of loss of anodes, wear of anodes, disconnected wires, damaged anode suspension systems, and low voltage.

- Geometry of the structure

  The wooden structures can present behaviors deformation deferred over time. It is so important to check that the deformations always correspond to the project.

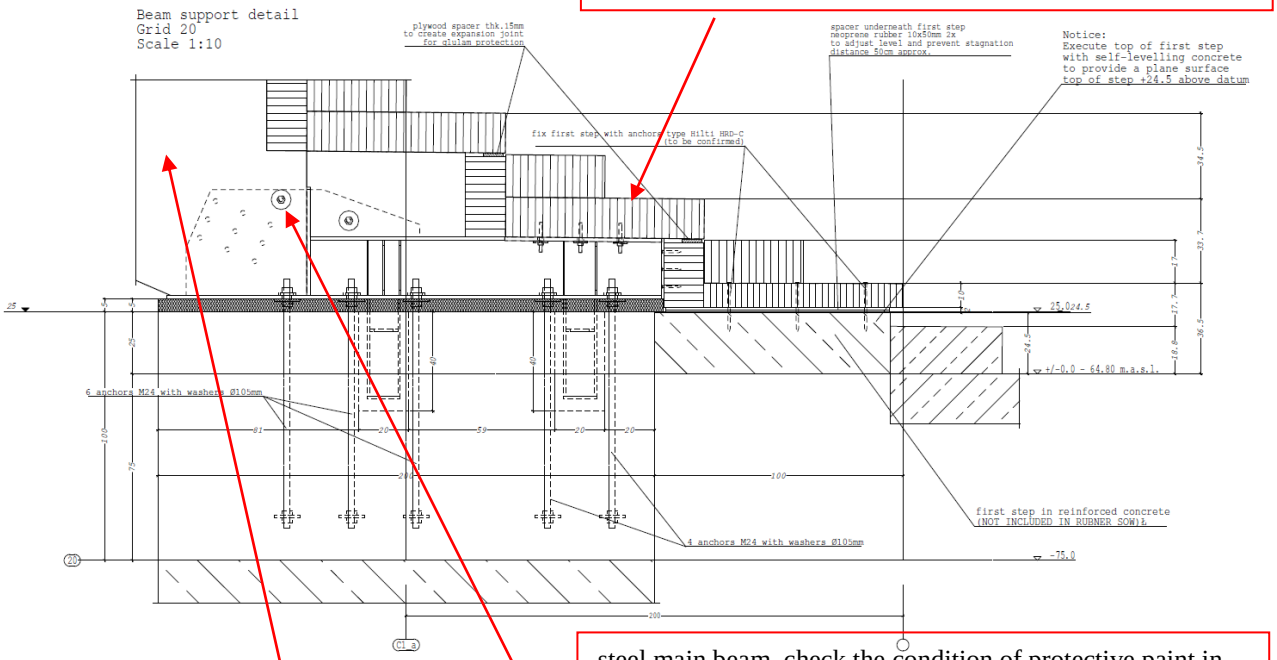
  Horizontal measurements (beams, and floor) are performed stretching a wire from one end of the element to be detected then measuring the deviation between the beam and the wire.

  The measurements for the vertical (pillars) are performed by means of level (if necessary) to check the verticality of the elements.

5.4 Main activities of inspection for details most vulnerable

In this detail (to consider in service class 2/3) can be seen the support of the main beams (Rakers) of and glulam bleachers:

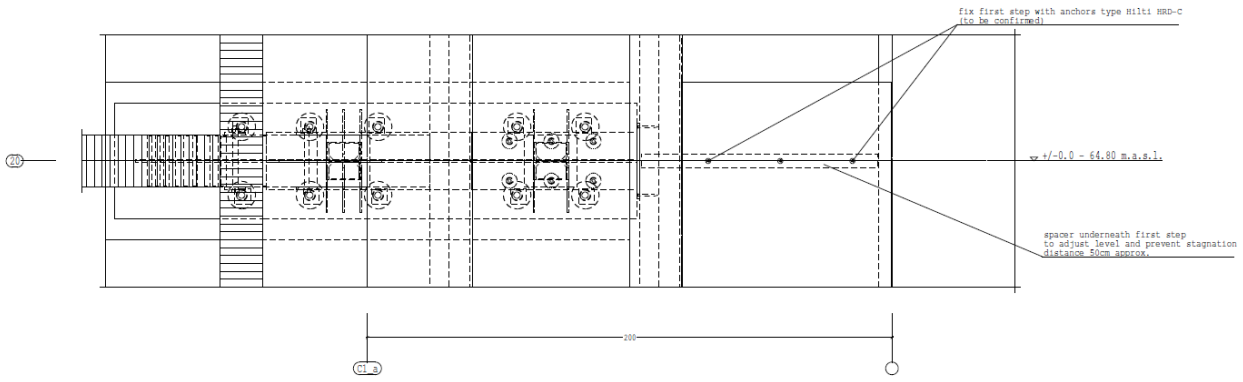
Glulam floor, check the condition in each inspection and make re-application of the waterproofing (Polyurethanic) by hand when necessary.



steel main beam, check the condition of protective paint in each inspection (if necessary can be repainted)

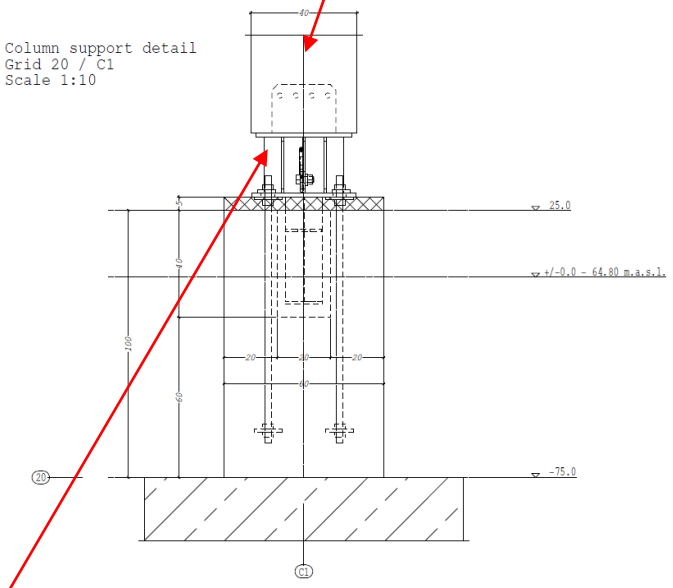
bolts, check the tightness and the conditions in each inspection (if necessary can be replaced)

glulam main beam, check the condition in each inspection and make re-impregnation by hand when necessary.



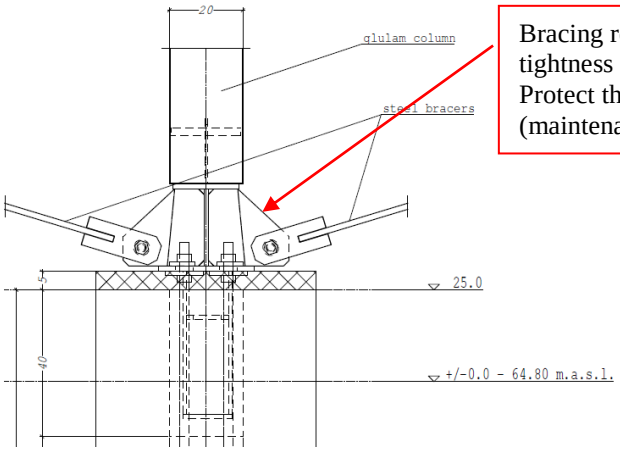
In this detail (to consider in service class 2) can be seen the support of the main glulam columns:

Glulamcolumns , check the condition in each inspection and make re-impregnation by hand when necessary. Check the dowels condition.



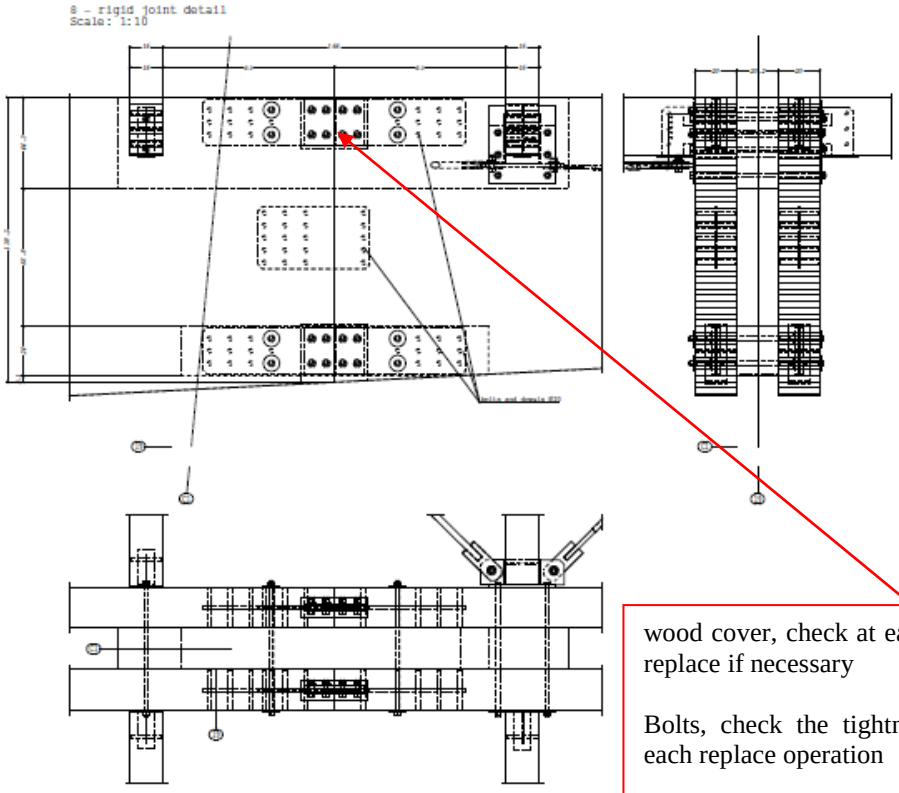
Steel base, check the condition of protective paint in each inspection (if necessary can be repainted)

bolts, check the tightness and the conditions in each inspection (if necessary can be replaced)



Bracing rods system. Check the tesnsion in the bars and the tightness of the bolts.
Protect the threads throughcold galvanizing when necessary (maintenance schedule).

In this detail (to consider in service class 2) rigid joint of the roof main beams:



wood cover, check at each inspection and possibly replace if necessary

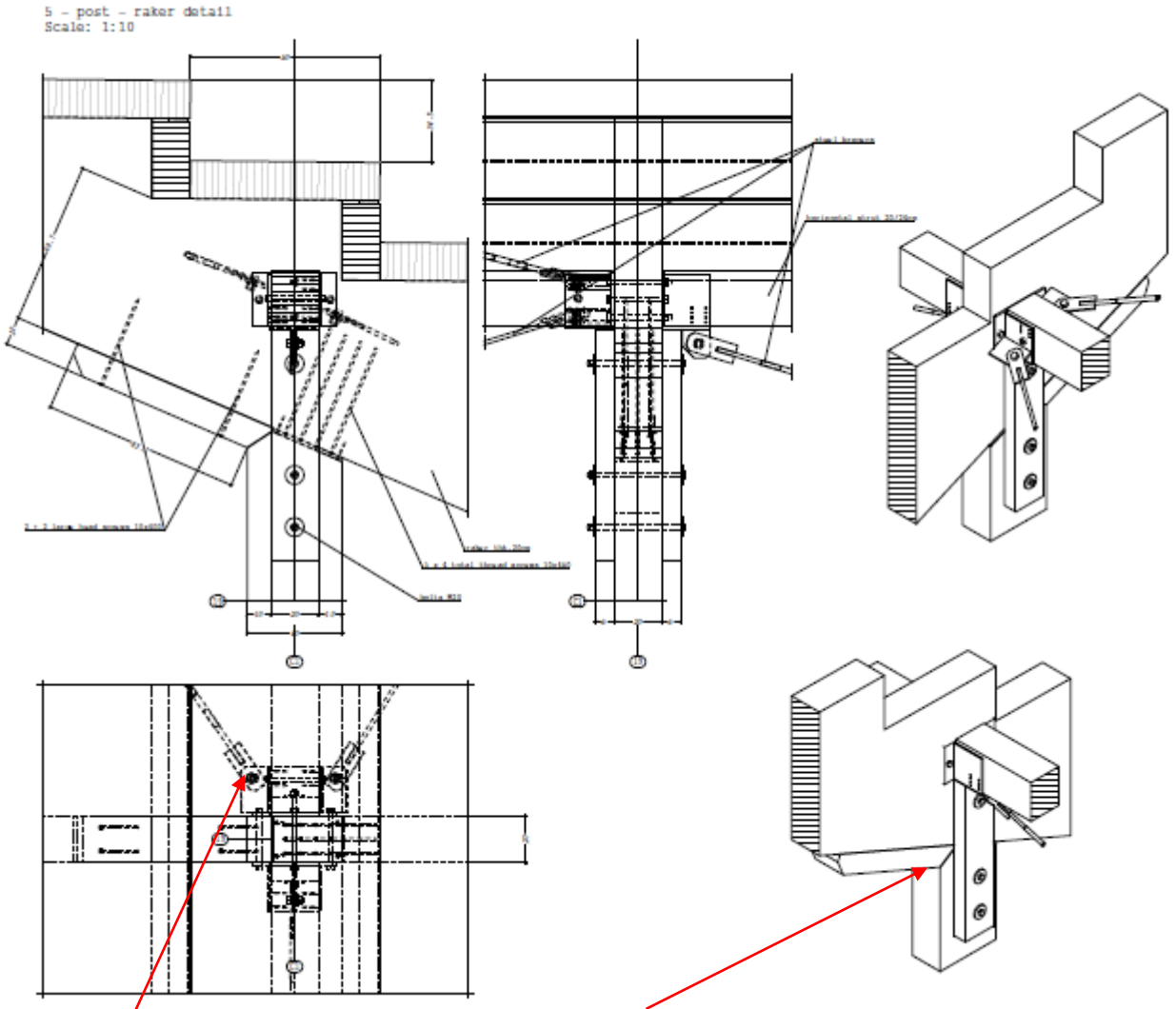
Bolts, check the tightness and the conditions in each replace operation

Dowels, check the conditions at each inspection

glulam edge and secondary beams, check the condition in each inspection and make re-impregnation by hand when necessary

support steel-glulam, check the status and the cleaning in each inspection

In this detail (to consider in service class 1/2) support of main beams (raker):



Bracing rods system. Check the tesnsion in the bars and the tightness of the bolts.

Protect the threads throughcold galvanizing when necessary (maintenance schedule).

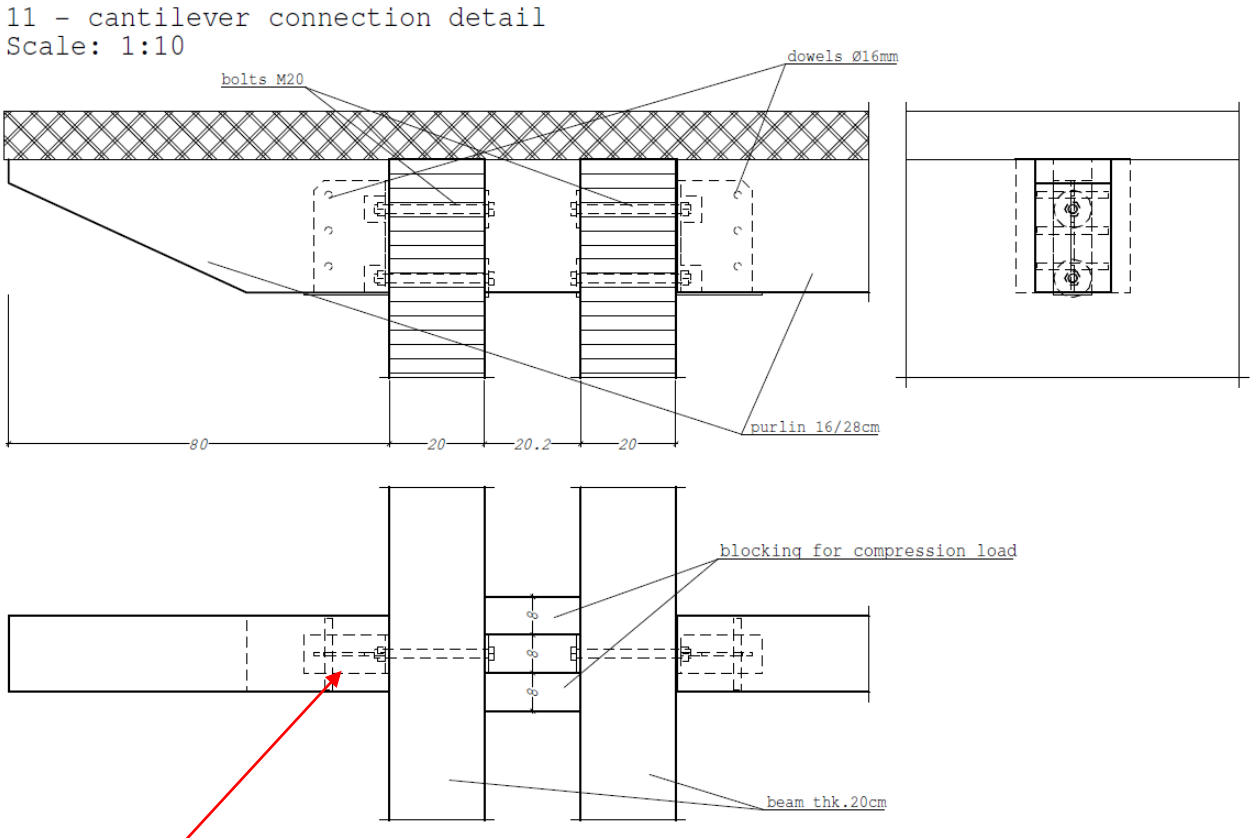
Bolts, check the tightness and the conditions in each inspection.

Dowels, check the conditions at each inspection.

Glulam edge and secondary beams, check the condition in each inspection and make re-impregnation by hand when necessary.

Support steel-glulam, check the status and the cleaning in each inspection.

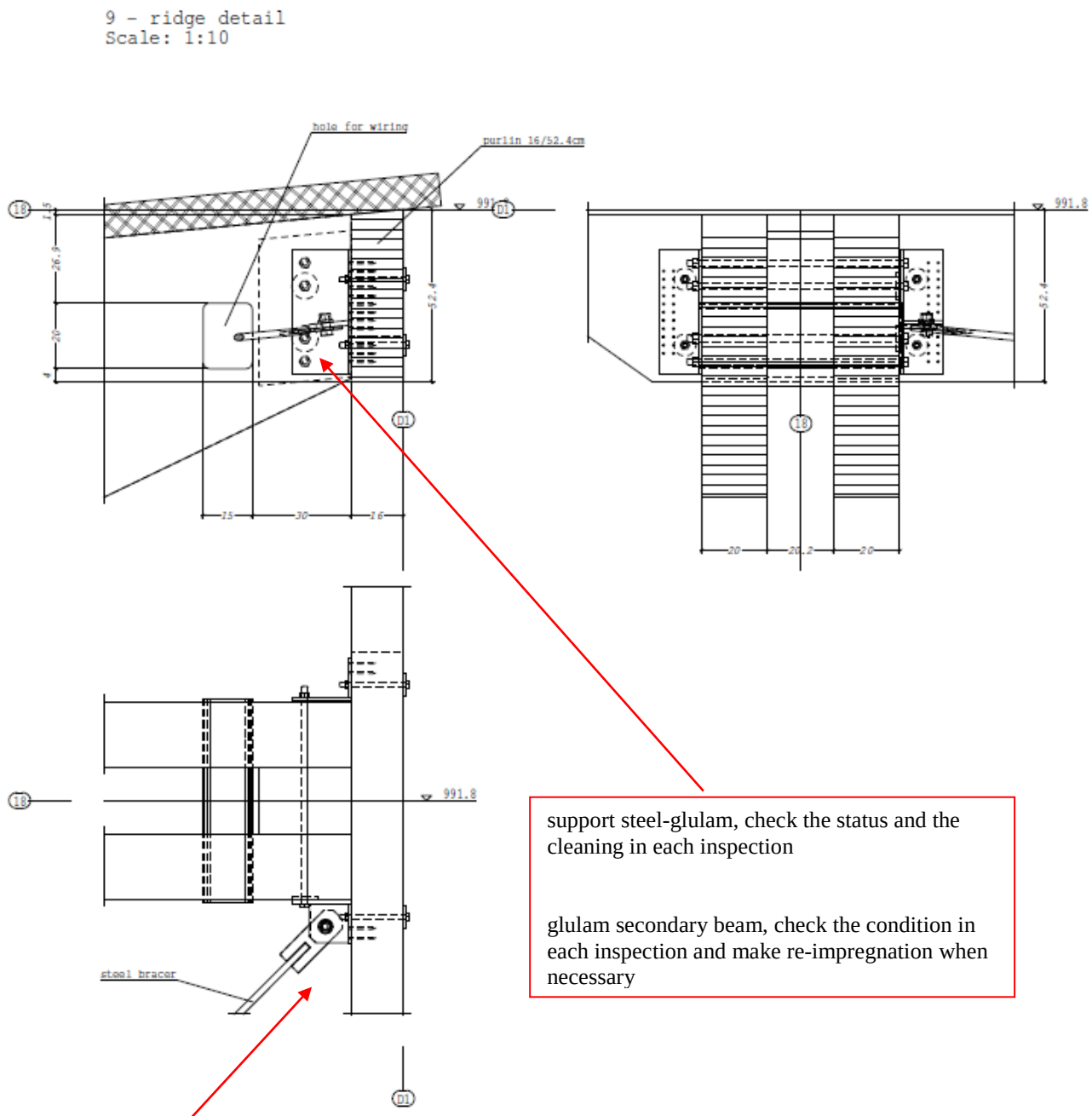
In this detail (to consider in service class 2) can be seen the support of the secondary beams (cantilever):



Support steel-glulam, check the status and the cleaning in each inspection

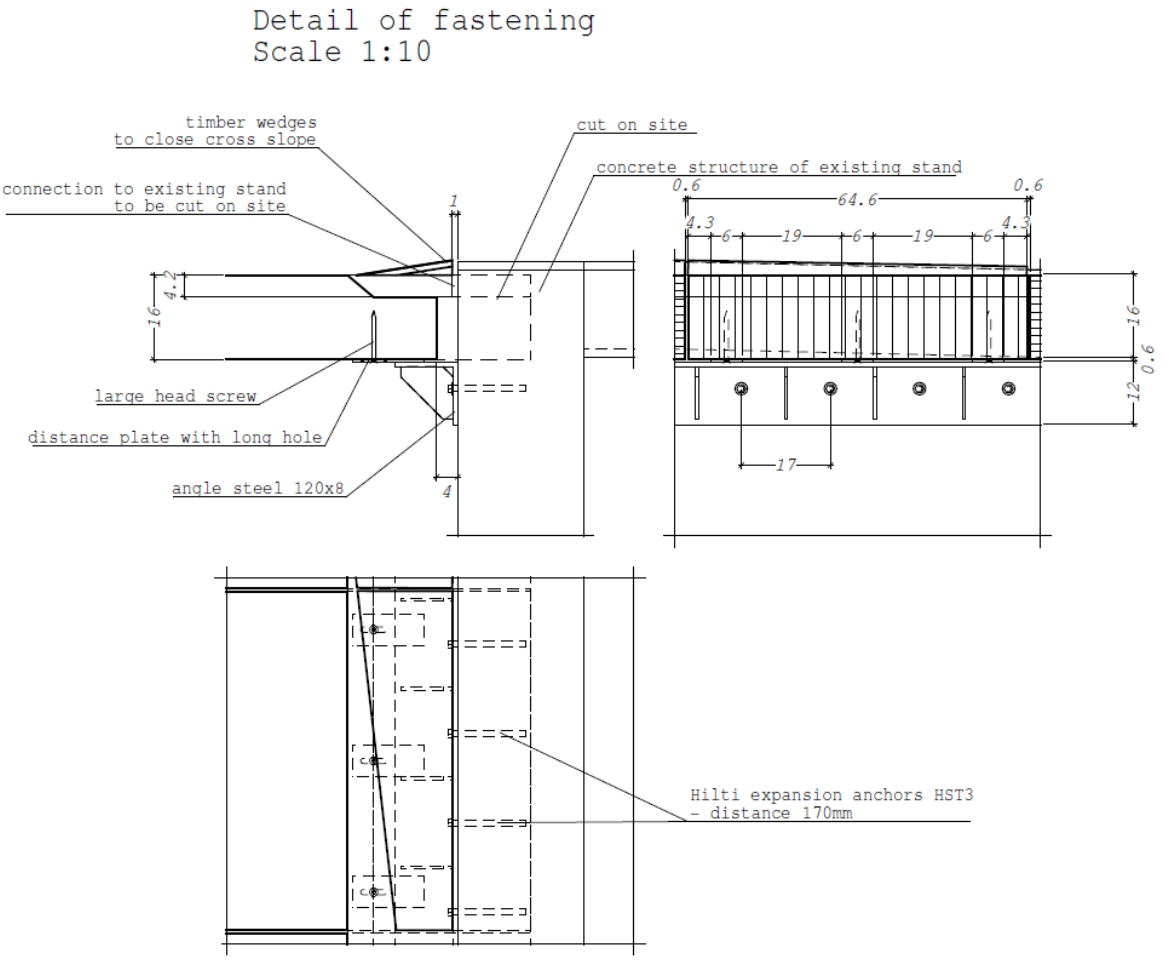
Glulam secondary beam, check the condition in each inspection and make re-impregnation when necessary

In this detail (to consider in service class 2/3) can be seen the support of the ridge beams:



In this detail (to consider in service class 3) can be seen the support of the bridge main beams:

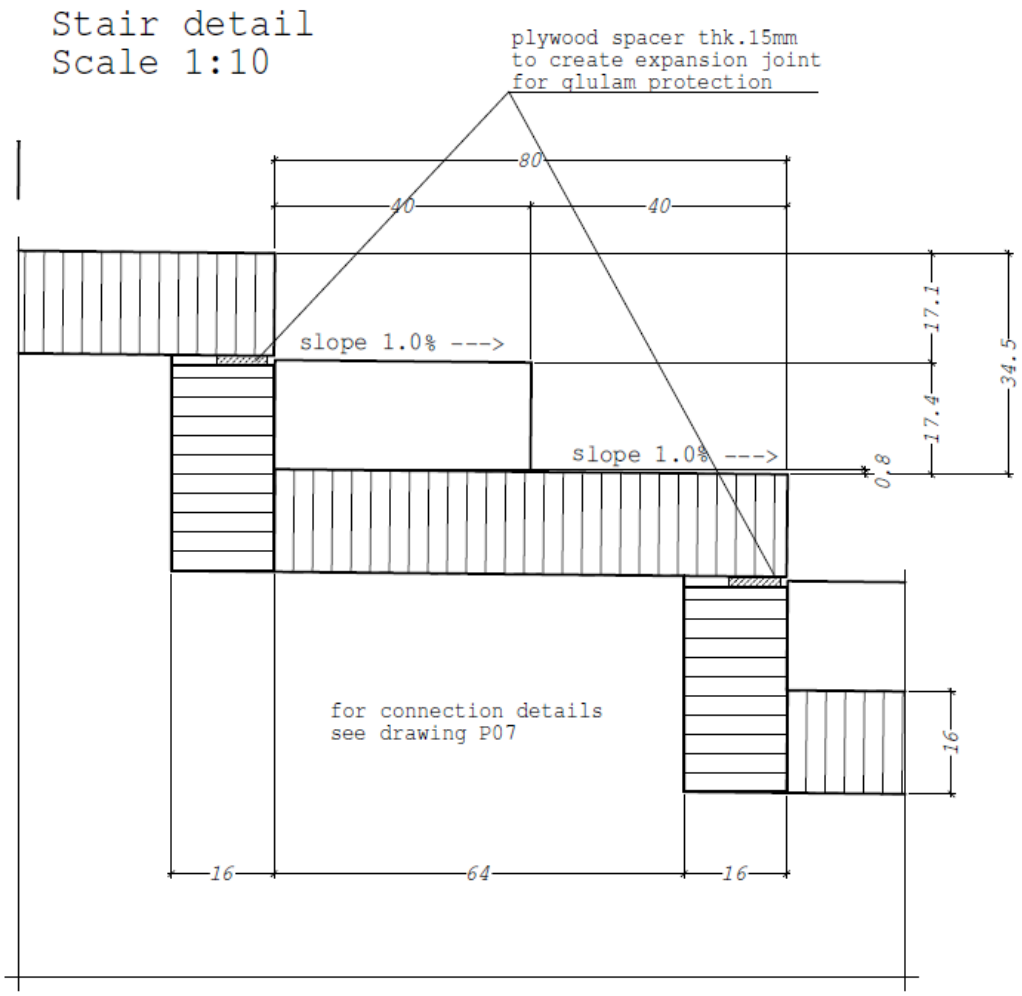
Glulam floor, check the condition in each inspection and make re-application of the waterproofing (polyurea) by hand if necessary.



Steel L-shape profile , check the condition of protective paint in each inspection (if necessary can be repainted)

screws, check the tightness and the conditions in each inspection (if necessary can be replaced)

In this detail (to consider in service class 3) can be seen the bleachers:

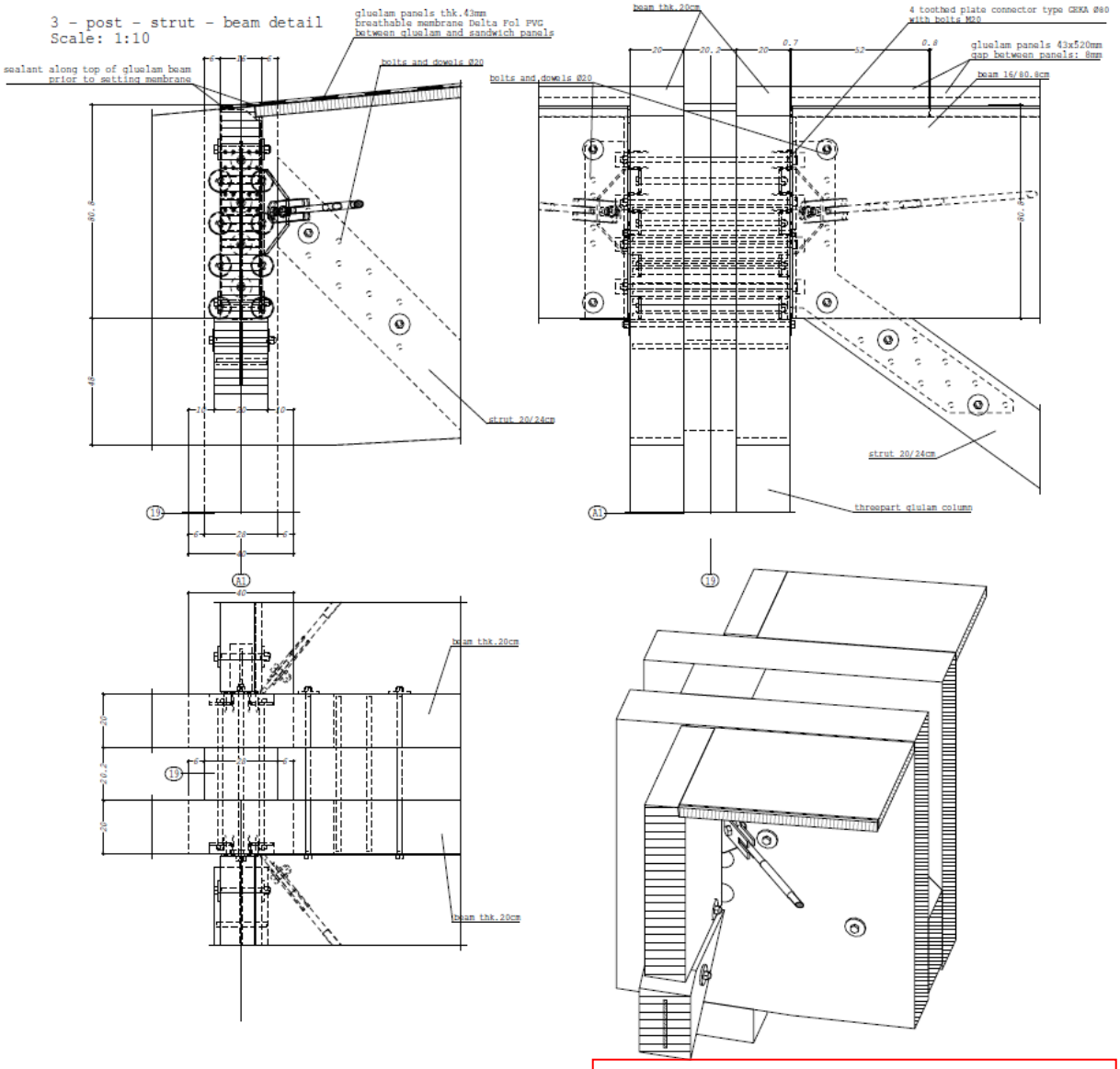


Glulam floor, check the condition in each inspection and make re-application of the waterproofing (polyurethan) by hand if necessary.

In this detail (to consider in service class 2) can be seen the connection of the main beams of the roof and floors on the columns:

Bracing , check the condition of protective paint in each inspection

bolts, check the tightness and the conditions in each inspection (if necessary can be replaced)



Bracing rods system. Check the tesnsion in the bars and the tightness of the bolts.

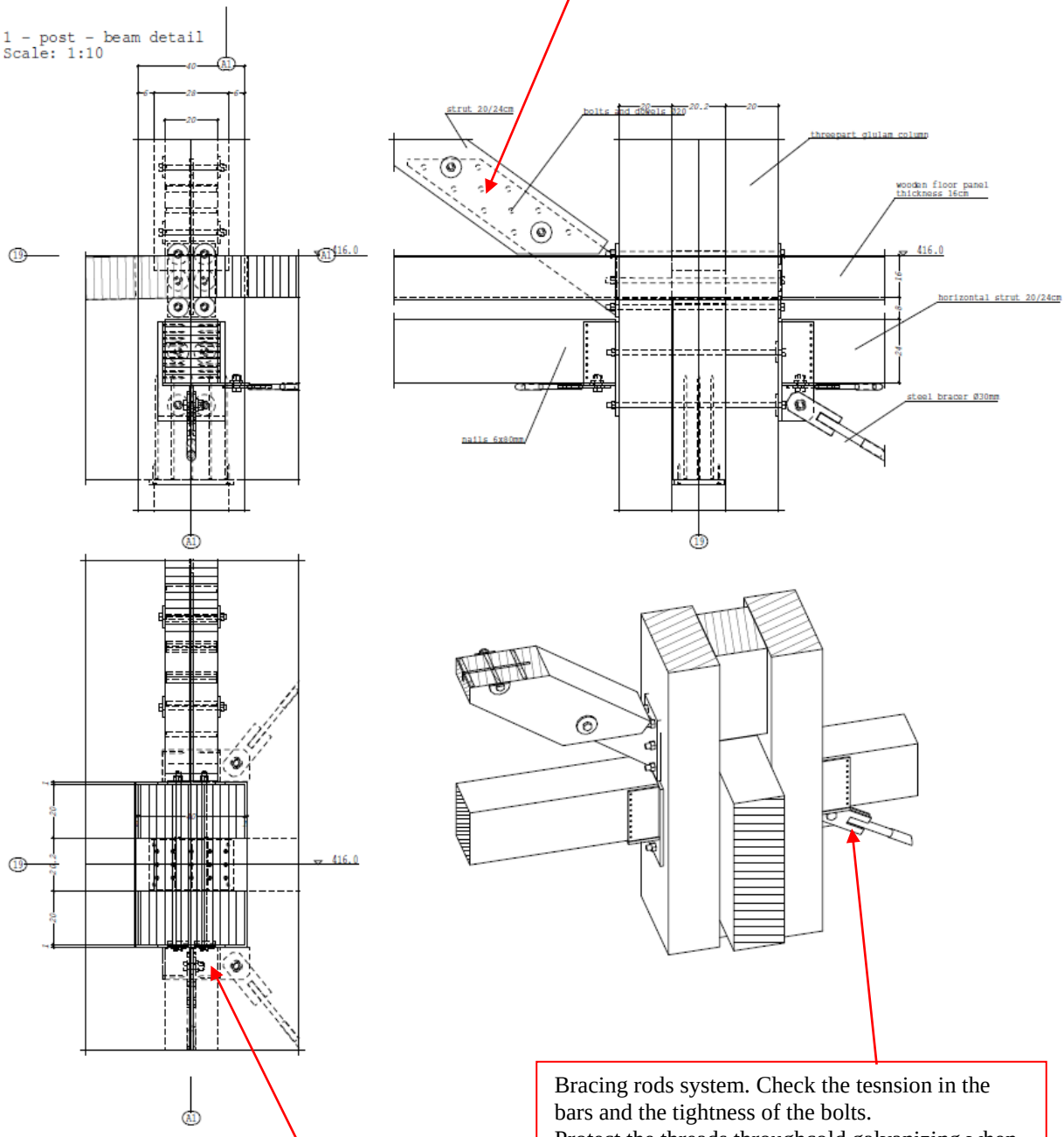
Protect the threads throughcold galvanizing when necessary (maintenance schedule).

support glulam, check the status and the cleaning in each inspection

glulam secondary beam, check the condition in each inspection and make re-impregnation when necessary

Bracing , check the condition of protective paint in each inspection

bolts, check the tightness and the conditions in each inspection (if necessary can be replaced)



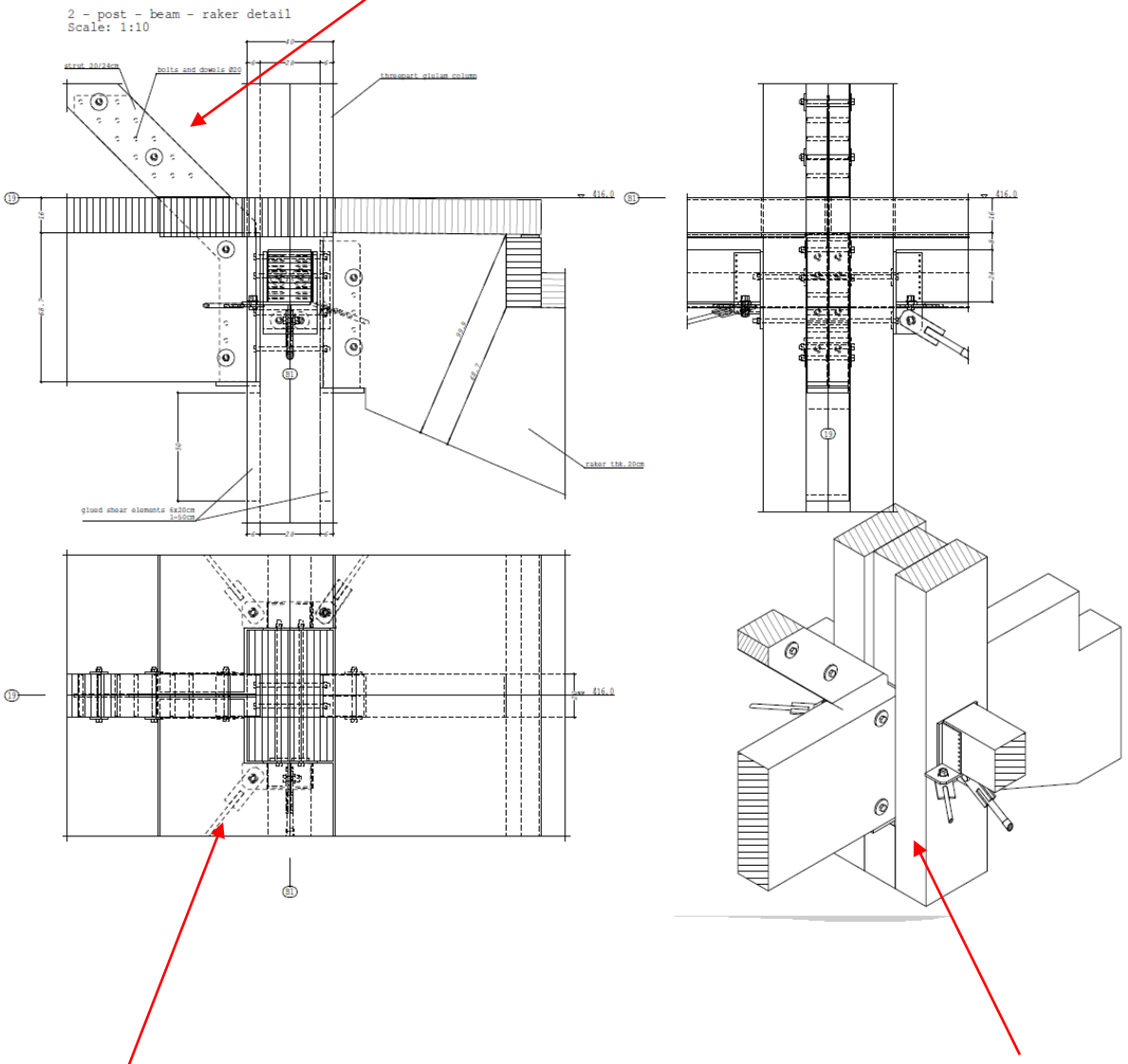
Bracing rods system. Check the tesnsion in the bars and the tightness of the bolts.
Protect the threads throughcold galvanizing when necessary (maintenance schedule).

support glulam, check the status and the cleaning in each inspection

glulam secondary beam, check the condition in each inspection and make re-impregnation when necessary

Bracing , check the condition of protective paint in each inspection

bolts, check the tightness and the conditions in each inspection (if necessary can be replaced)



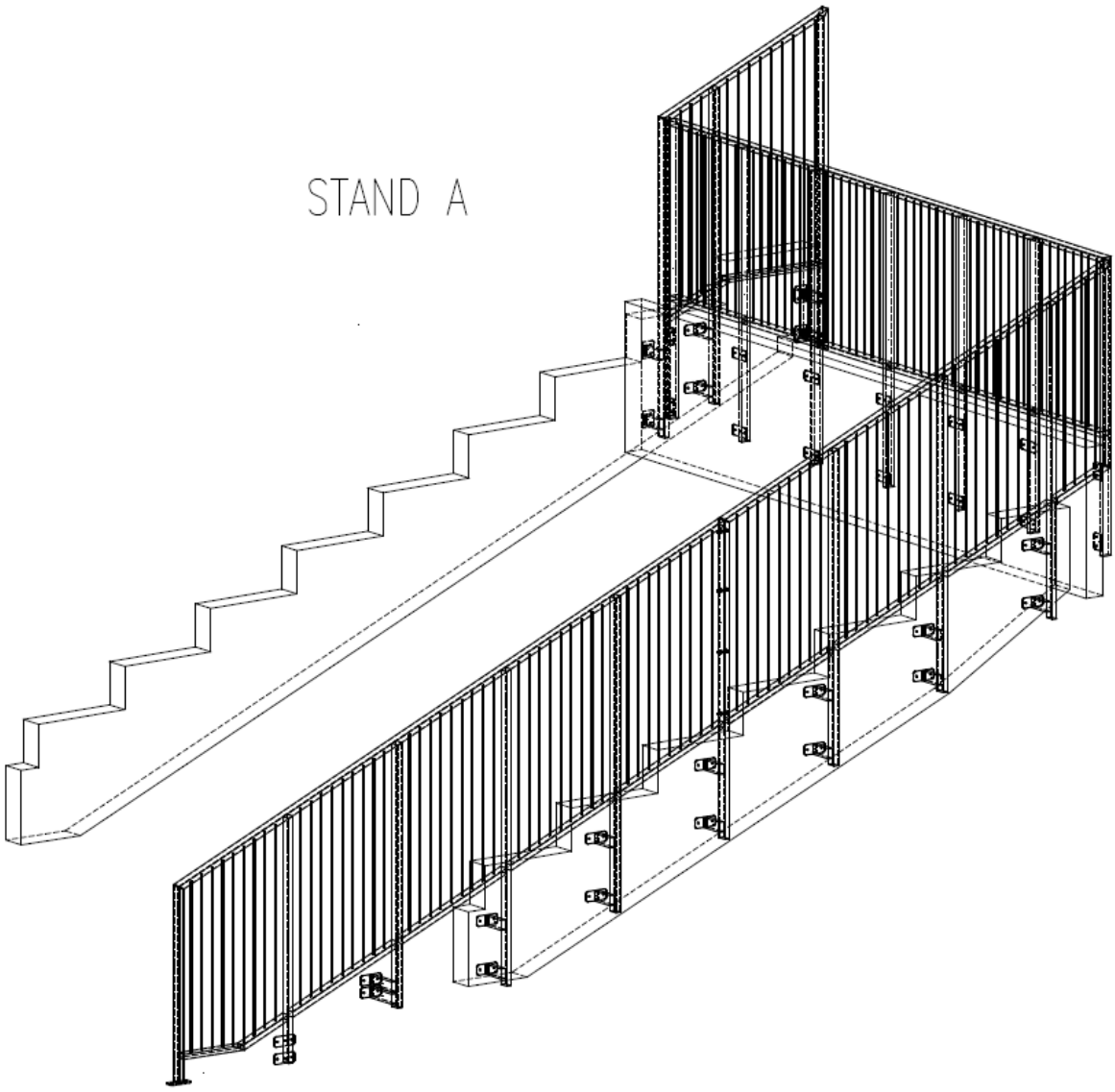
Bracing rods system. Check the tesnsion in the bars and the tightness of the bolts.

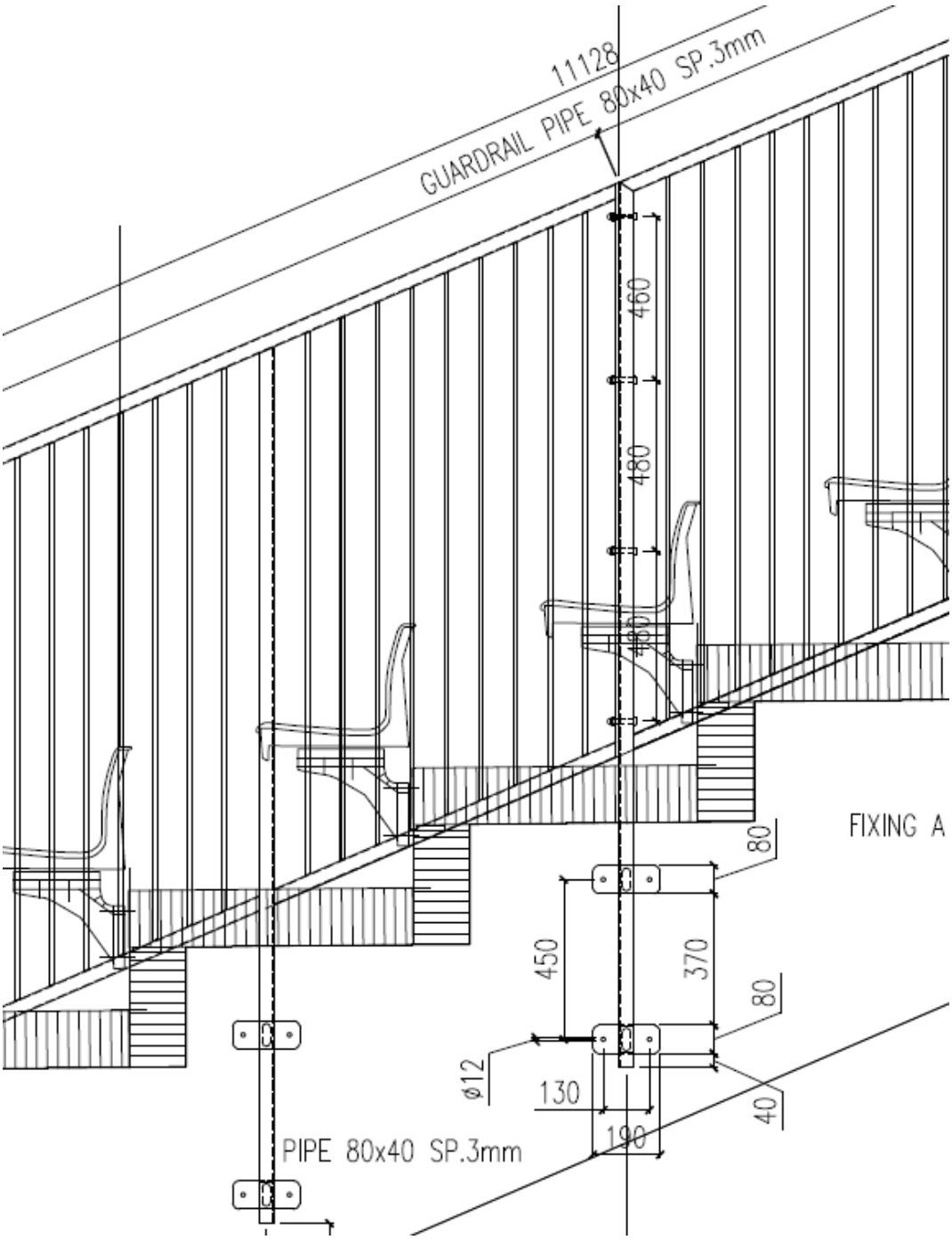
Protect the threads throughcold galvanizing when necessary (maintenance schedule).

support glulam, check the status and the cleaning in each inspection

glulam secondary beam, check the condition in each inspection and make re-impregnation when necessary

In this detail (to consider in service class 2/3 (timber)) can be seen the support of the guard on the timber structure:



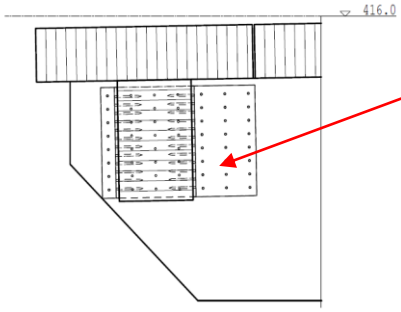


Glulam beam, check the status and the cleaning in each inspection

Steel components, check the condition of protective threatments in each inspection (if necessary can be recoated)

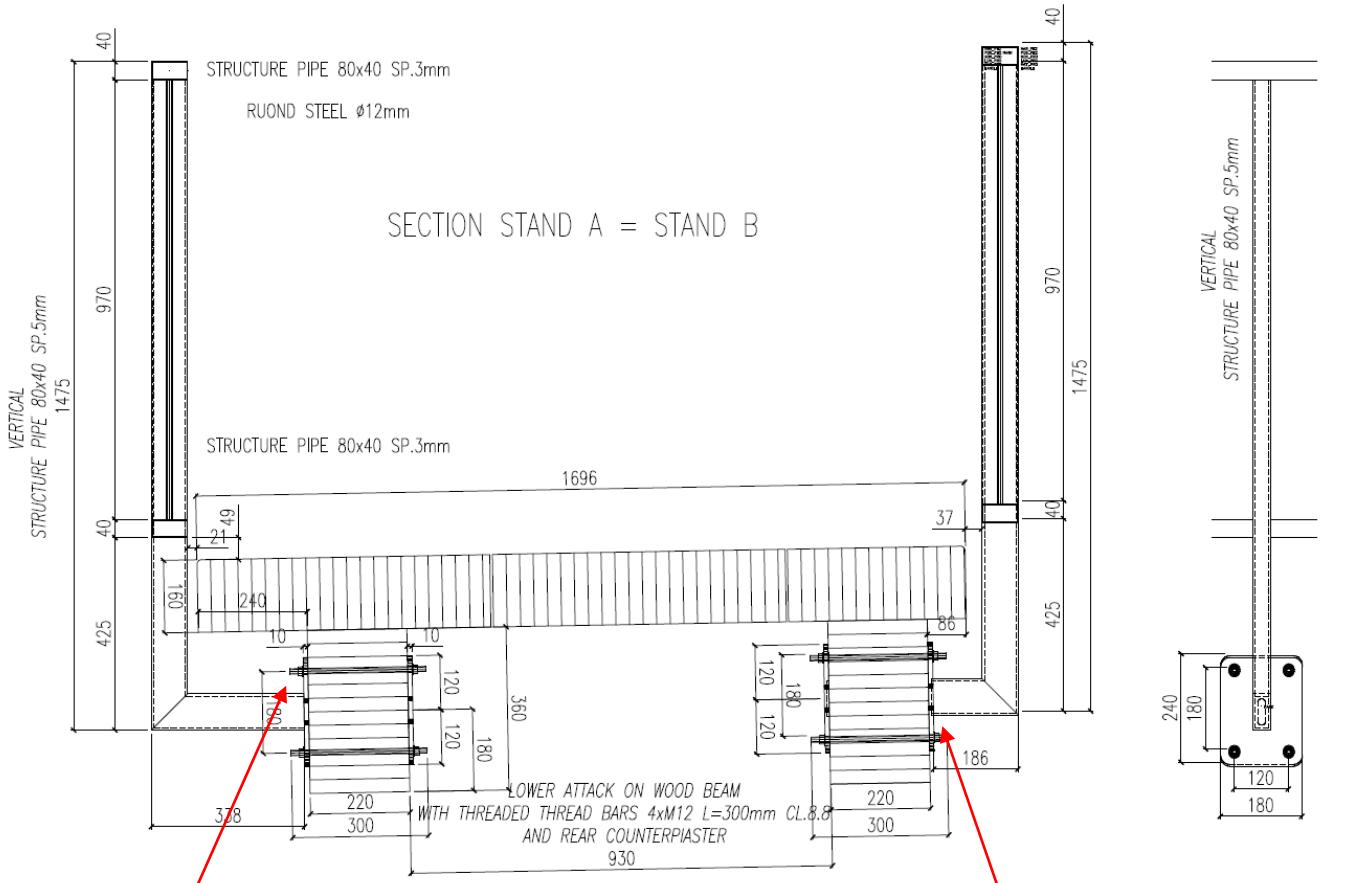
Bolts/screws, check the tightness and the conditions in each inspection.

In this detail (to consider in service class 2/3 (timber)) can be seen the support of the guard on the timber structure on the external walkway:



support glulam, check the status and the cleaning in each inspection

glulam secondary beam, check the condition in each inspection and make re-impregnation when necessary

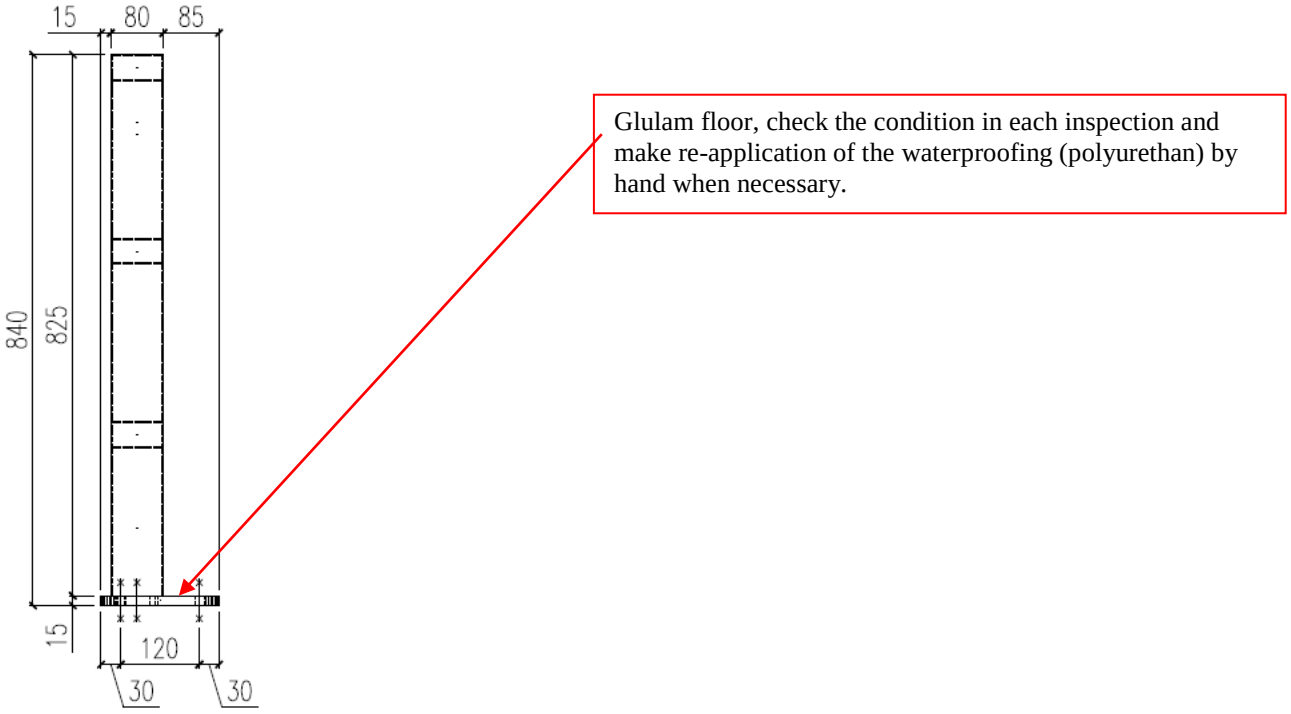


Steel components, check the condition of protective threatments in each inspection (if necessary can be recoated)

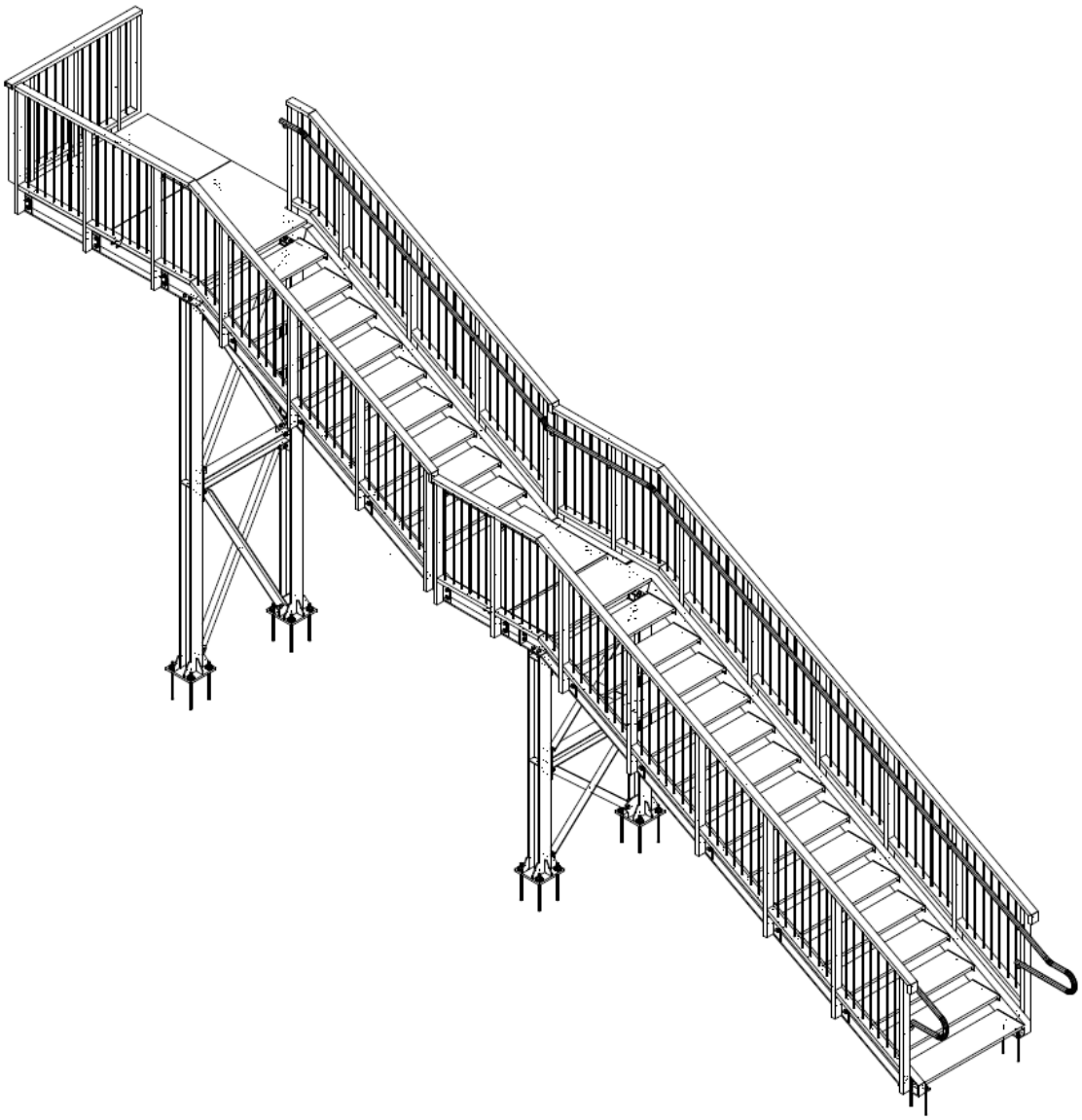
Bolts/screws, check the tightness and the conditions in each inspection.

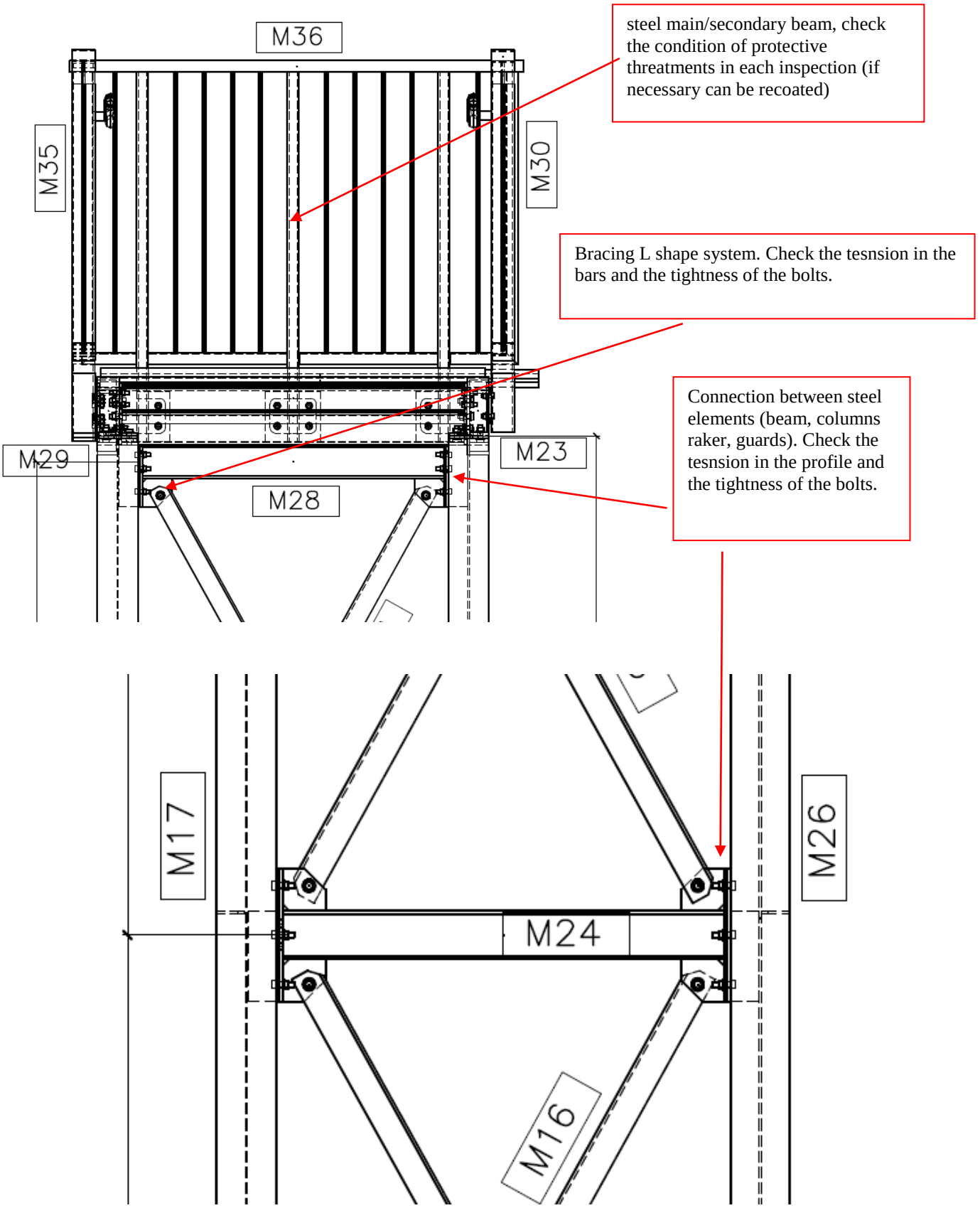
Glulam beam, check the status and the cleaning in each inspection

In this detail (to consider in service class 1/2 (timber)) can be seen the support of the guard on the top of the stand:



In this detail can be seen the support of the steel stair:



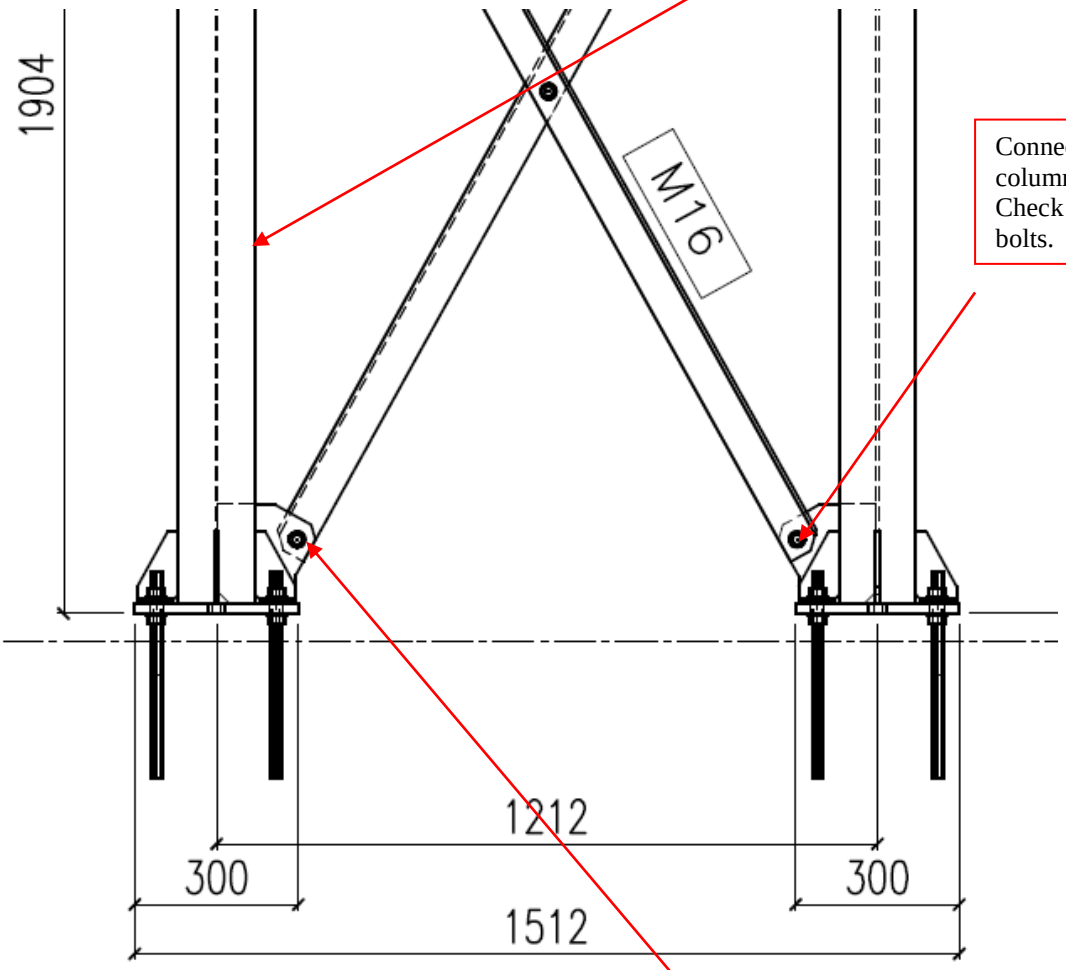


steel main/secondary beam, check the condition of protective threatments in each inspection (if necessary can be recoated)

Bracing L shape system. Check the tesnsion in the bars and the tightness of the bolts.

Connection between steel elements (beam, columns raker, guards). Check the tesnsion in the profile and the tightness of the bolts.

steel main/secondary beam and columns, check the condition of protective threatments in each inspection (if necessary can be recoated)



Connection between steel columns and foundation Check tightness of the bolts.

Bracing L shape system. Check the tesnsion in the bars and the tightness of the bolts.

5.5 Developing Inspection Plan

Once the information about the facility structure and environment has been collected, an inspection plan is developed. The plan is based on the inspection objective and the level of inspection required to meet that objective. It is important to select enough inspection areas per structural member. However, they must be controlled critical areas in the vicinity of the structural nodes and angles. Particularly critical are the areas between the inside and outside.

Inspection Frequency

The frequency of routine or periodic inspections will depend on whether the inspection is on or under (at the sea level) the surface of structure, and the expected rate of deterioration and damage. The frequency and level of inspection should, therefore, be closely tied to the historical deterioration rate of the facility. As a general guide, recommended frequencies of inspection for the different types of waterfront structures are:

a. All superstructure above the waterline, including the splash and tidal zones (Service Class 3), should be inspected annually.
b. All superstructure above the waterline in Service Class 2, should be inspected at least every 3 years and, as above, more frequently and intently as deterioration is discovered.

5.5.1 Inspection Plans

SCHEDULE OF INSPECTIONS OPERATIONS - Service Class 1

Year	***Structures in service class 1***
2019	
2020	Check and inspections operations
2021	
2022	
2023	Check and inspections operations
2024	
2025	
2026	Check and inspections operations
2027	
2028	
2029	Check and inspections operations

SCHEDULE OF INSPECTIONS OPERATIONS - Service Class 3

Year	***Structures in service class 3***
2019	Check and inspections operations
2020	Check and inspections operations
2021	Check and inspections operations
2022	Check and inspections operations
2023	Check and inspections operations
2024	Check and inspections operations
2025	Check and inspections operations
2026	Check and inspections operations
2027	Check and inspections operations
2028	Check and inspections operations
2029	Check and inspections operations

The inspection objectives (i.e., baseline, design survey, repair acceptance, research) should be clearly defined. A site survey of the facilities should be obtained, or conducted if doing a first time inspection. A site survey accelerates the planning process and will help determine the levels of inspection to be used. The time and effort required to carry out the three different levels of inspection are quite different. The time required also depends on whether the inspection is on or under (at the sea level) the surface of structure; on environmental factors, such as visibility, currents, wave action, water high, tides; and on the inspector's skill and experience.

Level	Purpose	Detectable Defects	
		Steel	Wood
I	General visual to confirm as-built conditions and detect severe damage	Extensive corrosion Severe mechanical damage	Broken elements Severe abrasion Fungi and insects infestation Cracks Moisture streaks
II	Detect surface defects normally obscured by waste	Moderate mechanical damage Major pitting	External dimensions reductions Loss of bolts and fasteners Early borer and insect infestation
III	Detect hidden and imminent damage	Reduced thick-ness of material	Internal damage due to insects, fungi, internal voids Decrease in material strength (based upon section loss as determined by either non-destructive and/or destructive testing)

Collecting Inspection Plan Data

Before starting an inspection, all available information about the facility should be gathered. This includes prior maintenance and inspection records, facility drawings and site survey reports, general background information, and environmental data, including:

- Atmospheric temperature range
- Atmospheric air relative humidity range

The inspection plan should include calculation reports and CADD drawings showing individual structural members. A legend should be created to represent such things as the:

- Degree of deterioration of individual structural members
- Level of inspection given to designated portions of a facility
- Shape of individual members
- Type of materials
- Condition of bollards and bitts

6 ANNEX

6.1 Annex A - Technical Datasheet Waterproofing System

(see in the following)

VDA | ARCHITECTURE LIMITED

Shop Drawing Review

Project: Westhills Stadium Expansion
Project #: 2018-25
Date: 2019-04-04
VDA Ref.: 07.05.01
Reviewed by: Rob Barnum
Submitting: Rubner

☒ **Reviewed**
☐ **Reviewed as Modified**
☐ **Revise and Re-Submit**
☐ **Not Reviewed**

This review is for the sole purpose of ascertaining conformance with the general design concept. This review does not relieve the Contractor of the responsibility for errors or omissions or for meeting all requirements of the Contract Document. The Contractor is responsible for conformation and correlation of all dimensions on site.

Distribution: (via email only)

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☒	Colette Miller	City of Langford	cmiller@langford.ca
☒	Keith Gillam	Gillam Group	kgillam@gillamgroup.com
☒	Luca Gatta	Gatta Piotti Solutions	luca.gatta@rubner.com

Tag/Item #	Comments	Status
Roofing	**VDA Architecture Limited Reviews**	
BASF MasterSeal Traffic 1500	Refer to attached.	**Reviewed**

End of Review

Kevin Klippenstein | Principal
ARCHITECT AIBC AAA, MRAIC, LEED AP
3388A Tennyson Avenue,
Victoria, BC V8Z 3P6
250-477-4255
www.vda.ca

BASF

We create chemistry

Technical Data Guide

7 | 07 18 00
Traffic Coatings

MasterSeal® Traffic 1500

Polyurethane waterproofing, traffic-bearing membrane systems for vehicular and pedestrian areas

FORMERLY SONOGUARD®

PACKAGING
- MasterSeal P 222:
  5 gallon (18.93 L) pails
- MasterSeal P 220:
  - 4 gallon (15.14 L) units in
  - 5 gallon pails (18.93 L)
- MasterSeal M 200,
  (self-leveling and slope-grade):
  - 5 gallon (18.93 L) pails
  - 55 gallon (208 L) drums
- MasterSeal TC 225:
  - 5 gallon (18.93 L) pails
  - 55 gallon (208 L) drums
- MasterSeal 914: 1 pint (473 mL) cans
- MasterSeal 915 (for recoat applications):
  0.5 pint (236 mL) cans

YIELD
See chart on page 3

COLORS
Gray, Charcoal, Tan, Dark Tan

STORAGE
Store in unopened containers in a cool, clean, dry area

SHELF LIFE
- MasterSeal M 200 and TC 225:
  5 gal pails, 1 year when properly stored
- MasterSeal 914: pint cans:
  2 years when properly stored
- MasterSeal 915:
  1 year when properly stored
- MasterSeal 900:
  5.5 years when properly stored

DESCRIPTION
MasterSeal Traffic 1500 waterproofing systems are composed of:
- MasterSeal M 200, a one-component, moisture-curing polyurethane.
- MasterSeal TC 225, a one-component aliphatic moisture-curing polyurethane.
- MasterSeal TC 225 Tint Base
  Note: MasterSeal TC 225 Tint Base is intended for pedestrian use only and are not suitable for vehicular traffic.

For projects requiring primer, two choices are available:
- MasterSeal P 222, a one-component solvent-based primer and sealer,
- MasterSeal P 220, a two-component waterborne epoxy primer and sealer.

PRODUCT HIGHLIGHTS
- MasterSeal 941DR aggregate is free of respirable crystalline silica.
- Primer coat not typically required which helps to reduce labor and material costs
- Waterproof which helps to protect concrete from freeze/thaw damage; protects occupied areas below from water damage
- Excellent chloride resistance provides protection against chloride intrusion; extends the life of reinforcing steel
- Seamless elastomeric membrane offers excellent durability and superior abrasion resistance, has no seams that may result in leaks
- Provides skid resistance to increase safety and offers excellent durability and superior abrasion resistance
- Multiple systems available, making MasterSeal Traffic 1500 ideal for various vehicular or pedestrian traffic solutions
- Repairable and recoatable to extend the useful life of the system
- Four standard colors: gray, charcoal gray, tan and dark tan
- For TC 225 Tint Base: 40 standard colors utilizing MasterSeal 900 color packs (Pedestrian use only)

VOC CONTENT
- MasterSeal M 200:
  - Self-leveling grade:
    196 g/L less water and exempt solvents
  - Flash/slope grade: 71.0 g/L
    less water and exempt solvents
- MasterSeal TC 225: 209 g/L
  less water and exempt solvents.

VDA Architecture Limited

REVIEWED	✔
REVIEWED AS MODIFIED	
REVISE AND RESUBMIT	
NOT REVIEWED	

This review is for the sole purpose of ascertaining conformance with the general design concept. This review does not relieve the Contractor of the responsibility for errors or omissions or for meeting all requirements of the Contract Document. The Contractor is responsible for conformation and correlation of all dimensions on site.

Project: Westhills Stadium Expansion
Reviewed By: RWB Date: 2018-04-04

This product is approved for use on the timber bleachers and gangways.

MASTER® BUILDERS SOLUTIONS

Technical Data

Composition

MasterSeal Traffic 1500 is a moisture-curing polyurethane membrane.

Compliances

- UL 790 Class A Fire Rating
- ASTM C 957
- ASTM E 108
- ASTM E 84
- CSA S413

SEALANT • WATERPROOFING & RESTORATION INSTITUTE

Issued to: BASF Corporation
Product: MasterSeal Traffic 1500

ASTM D 412: Tensile Strength of Top Coat
MasterSeal TC 225 Top Coat: Tensile Strength: 2,409 psi; Elongation: 487% Pass ✓

ASTM D 4541: Adhesion of Base Coat
MasterSeal M 200 Base Coat
Pull-off Adhesion: 400 psi + Pass ✓

ASTM D 4060: Abrasion Resistance of Top Coat
MasterSeal TC 225 Top Coat: Abrasion Resistance: 1.05 mgms loss – mgms loss/1,000 cycles Pass ✓

Validation Date: 3/1/18-2/28/23

No. 318B1500 *Copyright © 2018*

DECK COATING VALIDATION
www.swrionline.org

Test Data

PROPERTY*	RESULTS M 200	RESULTS TC 225	TEST METHOD
Weight per gallon, lbs (kg)	9.9 (4.5)	9.1 (4.1)	ASTM D 1475
Specific gravity, kg/L	1.19	1.09	
Solids			ASTM D 1259
By weight, %	84	77	
By volume, %	81	75	
Viscosity, cps	4,000–9,000	2,000–4,000	ASTM D 2393
Flash Point, °F (°C)	104 (40)	105 (40.5)	ASTM D 56

*Uncured material

PROPERTIES OF CURED MEMBRANES

PROPERTY	RESULTS M 200	RESULTS TC 225	TEST METHOD REQUIREMENTS
Hardness, Shore A	60	89	ASTM D 2240
Tensile strength, psi (MPa)	752 (5.2)	2,500 (17.2)	ASTM D 412
Elongation, %	595	502	ASTM D 412
Tear strength, PIT	74	199	ASTM D 1004
Weight loss, %	16	17	Max: 40
Low temperature flexibility and crack bridging	No Cracking	No Cracking	No Cracking
Adhesion in peel after water immersion, pli,			
Primed mortar	43	N/A	5
Plywood	34	N/A	5
Adhesion (Pull-off), psi			
Base Coat	275	N/A	ASTM D 4541

CHEMICAL RESISTANCE TENSILE RETENTION (ASTM C 957)

CHEMICAL	RESULTS M 200	RESULTS TC 225	REQUIREMENTS
Ethylene glycol	88	92	Min: 70
Mineral spirits	47	60	Min: 45
Water	96	83	Min: 70

Test results are averages obtained under laboratory conditions. Reasonable variations can be expected.

Test Data, cont.

	LIGHT TO MEDIUM TRAFFIC & PEDESTRIAN	HEAVY DUTY (REFUSAL METHOD)	EXTRA HEAVY DUTY (REFUSAL METHOD)
Weight per gallon, lbs (kg)	9.9 (4.5)	9.1 (4.1)	ASTM D 1475
Base coat			
Wet mils (mm)	25 (0.64)	25 (0.64)	25 (0.64)
Dry mils (mm)	20 (0.5)	20 (0.5)	20 (0.5)
Coverage[1]	55–60 (1.35–1.5)	55–60 (1.35–1.5)	55–60 (1.35–1.5)
Mid coat			
Wet mils (mm)	None	20 (0.5)	25 (0.64)
Dry mils (mm)	None	15 (0.4)	20 (0.5)
Coverage[1]	None	75–80 (1.83–1.97)	55–60 (1.35–1.5)
Finish coat			
Wet mils (mm)	25 (0.64)	20 (0.5)	20 (0.5)
Dry mils (mm)	20 (0.5)	15 (0.4)	15 (0.4)
Coverage[1]	55–60 (1.35–1.5)	75–80 (1.83–1.97)	75–80 (1.83–1.97)
Aggregate[2]			
lbs per 100 ft^2 (kg/m^2)	18–30 (0.8–1.5)	23–40 (1.15–2.0)	23–40 (1.15–2.0)

Coverage rates are approximate and may vary due to the application technique used.
Actual coverage rate will also depend on finish and porosity of the substrate.
[1] Coverage is ft^2/gal (m^2/L)
[2] Combined amount of aggregate, mid & topcoat (16–30 mesh rounded silica sand or proportional equivalent)

INDUSTRIES/SECTORS

- Stadiums
- Balconies
- Parking Garages
- Commercial Construction
- Building and Restoration
- Plywood decks/balconies
- Plaza decks

HOW TO APPLY

SURFACE PREPARATION

CONCRETE

1. Concrete must be fully cured (28 days), structurally sound, clean and dry (ASTM D 4263). All concrete surfaces (new and old) must be shot blasted to remove previous coatings, laitance and all miscellaneous surface contamination and to provide profile for proper adhesion. Abrasive shot blasting must occur after concrete repair has taken place. Acid-etching is not permitted. Proper profile should be a minimum of ICRI CSP-3 (as described in ICRI document 03732.) For balconies and other pedestrian areas with limited space or access for shot-blasting, alternative mechanical methods can be used to achieve the recommended surface profile.
2. Repair voids and delaminated areas with BASF branded cementicious and epoxy patching materials. For application when fast-turn repairs are required, MasterSeal 350 can be used to repair patches up to 1.5" in depth when used in aggregate slurry mix. Please refer to the MasterSeal 350 Technical Data Guide for proper application techniques.
3. All units must be applied within the specified pot life.

SURFACE PRE-STRIPPING AND DETAILING

1. For nonmoving joints and cracks less than 1/16" (1.6 mm) wide, apply primer when required, followed by 25 wet mils (0.6 mm) pre-striping of MasterSeal M 200. MasterSeal M 200 must be applied to fill and overlap the joint or crack 3" (76 mm) on each side. Feather the edges.
2. Dynamic cracks and joints 1/16" (1.6 mm) and greater wide must be routed to a minimum of ¼ by ¼" (6 by 6 mm) and cleaned. Install bond breaker tape to prevent adhesion of sealants to the bottom of joint. When required, primer all joint faces only with MasterSeal P 173 (see Form No. 1017962). Fill joints deeper than ¼" (6 mm) with appropriate backer rod and MasterSeal SL 1™/ SL 2™ (slope grade or self-leveling) or MasterSeal NP 1™/ NP 2™ sealants. For cracks, sealant should be flush with the adjacent concrete surface. For expansion joints, sealant should be slightly concave. Once the sealant is cured the lines should be prestriped with base coat MasterSeal M 200, overlap the joint 3" (76 mm) on each side.
3. Sealed joints 1" (25 mm) or less can be coated over with MasterSeal Traffic 1500. Expansion joints exceeding 1" (25 mm) wide should not be coated over with MasterSeal Traffic 1500 so that they can perform independently of the deck coating system.
4. Where the coating system will be terminated and no wall, joint or other appropriate break exists, cut a ¼" x ¼" (6 x 6 mm) keyway into the concrete. Fill and coat keyway during application of MasterSeal M 200.
5. Form a sealant cant into the corner at the junction of all horizontal and vertical surfaces (wall sections, curbs, columns). Prime with MasterSeal P 173 and apply a ½–1" (13–25 mm) wide bead of MasterSeal NP 1 or MasterSeal NP 2 sealants. Tool to form a 45 degree cant. Apply masking tape to the vertical surfaces 4–5" (102–127 mm) above the sealant cant to provide a clean termination of the vertical detail coat. After the sealant has cured, apply 25 mils (0.64 mm) of MasterSeal M 200 over the cured cant up to the masking tape and 4" (102 mm) onto deck surface.
6. In locations of high movement such as wall and slab intersections, a reinforcing fabric is required. After the sealant cant bead is applied and cured, apply 25 wet mils of MasterSeal M 200 over the sealant and embed MasterSeal 995 reinforcing fabric into the wet detail coat.

UNCOATED METAL SURFACES

1. Remove dust, debris, and any other contaminants from vent, drain-pipe and post penetrations, reglets and other metal surfaces. Clean surfaces to near white per SSPC-NACE2 and prime immediately with MasterSeal P 173. Provide appropriate cant with MasterSeal NP1/NP2. Apply a detail coat of 25 wet mils of Masterseal M 200 over the primed metal and sealant.

PLYWOOD

1. All plywood must be smooth-faced, APA-stamped and exterior grade tongue and groove. Construction must conform to code, but plywood must not be less than 23/32" (20 mm) thick. Plywood spacing and deck construction must follow APA guidelines.
2. Surfaces must be free of contaminants. Priming is not necessary on clean, dry plywood.
3. All seams must be caulked with MasterSeal NP 1 or MasterSeal NP 2 sealants. Pre-stripe 4–6" (102–152 mm) wide with 25 wet mils (0.64 mm) of M 200. Reinforce all seams between plywood sheets and between flashing and the plywood deck by embedding MasterSeal 995 Reinforcing Fabric into the pre-striping.

HOW TO APPLY

COLOR

1. All of the 40 standard colors from the Popular Palette for Sealants and Waterproofing require the use of 2 NP 2™ color packs per 5 gallon pail of Sonoguard® Tint-Base.
2. A second aesthetic Top Coat of 10–15 wet mils (0.2–0.4 mm) is required with all Tint-Base colors to achieve a uniform appearance.

MIXING

1. Transfer entire contents of pigment cans into Sonoguard® Top Coat Tint-Base. Use a spatula or knife to remove all the pigment from the container.
2. With a slow-speed drill and Jiffy mixer, mix 4–6 minutes. The paddle blade must be kept below the surface of the Tint-Base to avoid whipping air into it.
3. To ensure consistent color throughout the pail, pour contents into separate container and continue mixing until all Tint-Base has dispersed.
4. When using multiple units, all units must be boxed to ensure color consistency.

APPLICATION OF PRIMER

PRIMER

NOTE: When primer is required on a job, follow these steps. When applying Traffic 1500 without using a primer, proceed to Application.

1. After thoroughly vacuuming the surface, apply MasterSeal P 222 or P 220 to all the properly prepared deck surfaces at the rate of 200–250 ft²/gal (4.9–6.1 m²/L). Using a roller pan and a short- to medium-nap roller cover, force the primer into pores and voids to eliminate pinholes. Do not apply over pre-striping. Use only solvent-resistant tools and equipment.
2. Allow primer to dry until tack-free. M 200 must be applied the same working day.

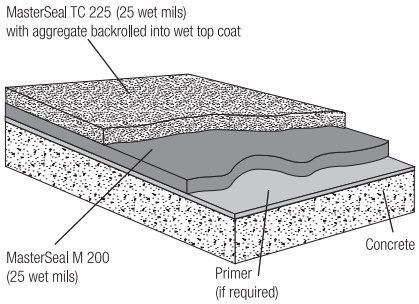
MASTERSEAL M 200

1. All preparatory work must be completed before application begins. Be certain the substrate is clean, dry, stable and properly profiled. Sealants and pre-striping should be properly cured. Apply the base, mid and finish coats with a properly sized squeegee to arrive at the required mil thicknesses.
2. Apply MasterSeal M 200 at 25 wet mils thick (0.64 mm) using a proper notched squeegee to entire deck surface, and back roll, overcoating the properly prepared cracks, joints and flashings. For sloped areas, use slope-grade MasterSeal M 200. Do not coat expansion joints over 1" (25 mm) wide. Slope grade product should be used on a slope greater than 15%.
3. Allow curing time of overnight (16 hour minimum). Extend the curing time in cool or dry weather conditions. The surface of MasterSeal M 200 should have a slight tack. If the coating has been exposed for a prolonged period, consult Technical Service for recommendations.

APPLICATION METHODS OF SYSTEMS

MasterSeal Traffic 1500 can be installed in several configurations, depending upon the degree of traffic to which the system is exposed. In areas of extreme traffic (turning lanes, pay booths, entrances and exits), apply the Extra Heavy-Duty Traffic System. The following summary briefly describes each configuration. All coverage rates are approximate.

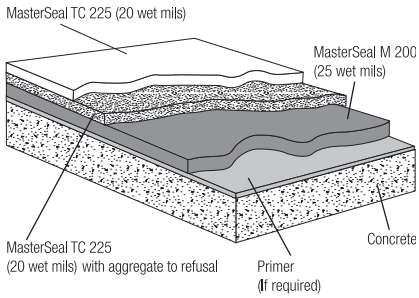
LIGHT TO MEDIUM DUTY TRAFFIC AND PEDESTRIAN SYSTEM



LIGHT- TO MEDIUM- DUTY TRAFFIC & PEDESTRIAN SYSTEM

1. Prime concrete substrate (if required).
2. Apply 25 (0.64 mm) wet mils of MasterSeal M 200 using a proper notched squeegee at 55–60 ft²/gal (1.35–1.47 m²/L). Immediately backroll to level base coat. Allow to cure overnight.
3. Apply 25 wet mils (0.64 mm) MasterSeal TC 225 using a proper notched squeegee at 55–60 ft²/gal (1.35–1.47 m²/L). Immediately backroll to level MasterSeal TC 225 material. While the coating is still wet, broadcast MasterSeal 941/941 DR or equivalent 16–30 rounded silica sand at 15–25 lbs/100 ft²/gal (0.75–1.25 kg/m²), then backroll into the coating to fully encapsulate.
4. When installing the MasterSeal TC 225 Tint Base, a second coat may be required for proper hiding. A mock up should be performed to address any aesthetic expectations.

HEAVY DUTY TRAFFIC SYSTEM (Aggregate to refusal method)



HEAVY-DUTY TRAFFIC SYSTEM

1. Prime concrete substrate (if required).
2. Apply 25 (0.64 mm) wet mils of MasterSeal M 200 or using a proper notched squeegee at 55–60 ft²/gal (1.35–1.47 m²/L). Immediately backroll to level base coat. Allow to cure overnight.

3. Apply 20 wet mils (0.51 mm) MasterSeal TC 225 using a notched squeegee at 75–80 ft²/gal (1.83–1.97 m²/L). Immediately backroll to level MasterSeal TC 225. The next step, #4, can utilize either method described in 4A or 4B.

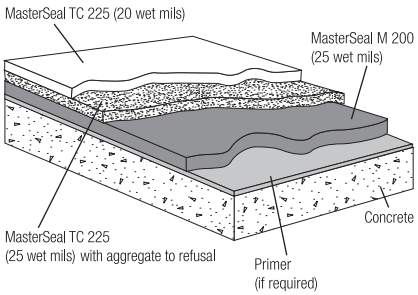
4A. AGGREGATE TO REFUSAL METHOD
Immediately broadcast MasterSeal 941/941 DR or equivalent 16–30 mesh, rounded silica sand into the wet coating at the rate of 20–35 lbs/100 ft² (1.0–1.75 kg/m²). Immediately after the aggregate broadcast and while the coating is still wet, blow any excess aggregate via a portable blower forward into the wet coating. Do not over apply aggregate; it is acceptable to have localized wet spots in the aggregate surface after completion of this method. This process requires coordination between all of the members in the work crew. The blower operator, wearing clean spiked shoes, should blow the excess aggregate forward towards the freshly applied and back rolled topcoat. In this method, the coating should not accept additional sand, minimal excess aggregate is on the surface, less aggregate is used and the textured appearance should be fairly uniform.

4B. BROADCAST AND BACKROLL METHOD
Immediately broadcast MasterSeal 941/941 DR or equivalent 16–30 mesh, rounded silica sand into the wet coating and backroll to encapsulate the aggregate. Evenly broadcast aggregate at the rate of 15–20 lbs/100 ft² (0.75–1.0 kg/m²). Allow to cure overnight.

5. Ensure there is no moisture on the surface of the aggregate/membrane before application of topcoat. Remove all loose aggregate, then apply 20 wet mils using a flat squeegee at 75–80 ft²/gal (1.84–1.96 m²/L). Immediately backroll to level MasterSeal TC 225.

6. For additional slip resistance, immediately broadcast MasterSeal 941/941 DR or equivalent 16–30 rounded silica sand at a rate of 3–5 lbs/100 ft² (0.15–0.25 kg/m²) and backroll to encapsulate.

EXTRA HEAVY-DUTY SYSTEM
(Aggregate to refusal method)



EXTRA-HEAVY DUTY SYSTEM

1. Prime concrete substrate (if required).

2. Apply 25 (0.64 mm) wet mils of MasterSeal M 200 using a proper notched squeegee at 55–60 ft²/gal (1.35–1.47 m²/L). Immediately backroll to level base coat. Allow to cure overnight.

3. Apply 25 wet mils (0.64 mm) MasterSeal TC 225 or using a properly notched squeegee at the rate of 55–60 ft²/gal (1.35–1.47 m²/L). Immediately backroll to evenly level topcoat. The next step, #4, can utilize either method described in 4A or 4B.

4A. AGGREGATE TO REFUSAL METHOD
Immediately broadcast MasterSeal 941/941 DR or equivalent 16–30 mesh, rounded silica sand into the wet coating at the rate of 20–35 lbs/100 ft² (1.0–1.75 kg/m²). Immediately after the aggregate broadcast and while the coating is still wet, blow any excess aggregate via a portable blower forward into the wet coating. Do not over apply aggregate; it is acceptable to have localized wet spots in the aggregate surface after completion of this method. This process requires coordination between all of the members in the work crew. The blower operator, wearing clean spiked shoes, should blow the excess aggregate forward towards the freshly applied and back rolled topcoat. In this method, the coating should not accept additional sand, minimal excess aggregate is on the surface, less aggregate is used and the textured appearance should be fairly uniform

4B. BROADCAST AND BACKROLL METHOD
Immediately broadcast MasterSeal 941/941 DR or equivalent 16–30 mesh, rounded silica sand into the wet coating and backroll to encapsulate the aggregate. Evenly broadcast aggregate at the rate of 15–25 lbs/100 ft² (0.75–1.25 kg/m²). Allow to cure overnight.

5. Ensure there is no moisture on the surface of the aggregate/membrane before application of topcoat. Remove all loose aggregate, then apply 20 wet mils using a flat squeegee at 75–80 ft²/gal (1.84–1.96 m²/L). Immediately backroll to level MasterSeal TC 225.

6. For additional slip resistance, immediately broadcast MasterSeal 941/941 DR or equivalent at a rate of 3–7 lbs/ 100 ft² (0.15–0.25 kg/m²) and backroll to encapsulate. IMPORTANT NOTE: All coverage rates are approximate and may vary due to the application technique used. Coverage rates are affected by substrate texture, choice and distribution of aggregate, intermediate coat aggregate load and environmental conditions. Application methods and conditions are not under the control of BASF. Ensure that an adequate amount of aggregate is utilized to achieve desired slip resistance.

MOCKUP

Provide mockup of at least 100 ft² (9.3 m²) to include surface profile, sealant joint, crack, flashing and juncture details and allow for evaluation of slip resistance and appearance of MasterSeal Traffic 1500 system.

1. Install mockup with specified coating types and with other components noted.

2. Locate where directed by architect.

3. Mockup may remain as part of work if acceptable to architect. For recoat applications, see MasterSeal Traffic 1500 technical bulletin #24.

CURING TIME

Allow curing time of 72 hours before vehicular use and 48 hours before pedestrian use. Extend the curing time in cool-weather conditions. To reduce the time period in which MasterSeal Traffic 1500 might be vulnerable to inclement weather or to reduce the time between coats, use MasterSeal 914.

MAINTENANCE

1. Portions of the membrane that exhibit wear are considered a maintenance item, and are not considered a warrantable item.

2. Surfaces may be cleaned with commercial detergents. BASF recommends that a maintenance agreement be established between the owner and applicator.

3. Periodic inspection and repair of damaged surfaces will greatly prolong the performance and life of the system.

4. Remove all sharp debris such as sand, gravel and metal on a regular basis to avoid damage to the coating.

5. When removing snow, avoid the use of metal blades or buckets that may damage the coating.

CLEAN UP

Clean all tools and equipment with MasterSeal 990 or xylene.

FOR BEST PERFORMANCE

- MasterSeal NP 100 and MasterSeal NP150 should not be used in conjunction with this urethane deck coating system due to potential for curing issues.
- If vapor drive is present or suspected, please consult with your local BASF representative prior to system application.

- Concrete should have a minimum compressive strength of 3,000 psi (20.7 MPa) and be cured for a minimum of 28 days.
- Do not apply to concrete that is out-gassing
- Be sure to allow for movement in the deck by the proper design and use of expansion and control joints.
- When applying sealants, use backing materials according to industry standards.
- Do not apply when substrate temperatures are over 110 °F (32 °C) or under 40 °F (4 °C).
- When applying MasterSeal 1500 at interior or contained spaces, provide adequate ventilation with a minimum of six air changes per hour.
- When adequate ventilation for use of MasterSeal Traffic 1500 cannot be maintained, consider the use of MasterSeal 2500 Traffic coating system, Form No 1017917.
- Be certain that all aggregate not properly encapsulated is thoroughly removed.
- On steep ramps in excess of 15%, contact your local BASF representative.
- Substrate temperature must be more than 5 degrees above dew point during application and cure.
- MasterSeal TC 225 Tint Base is intended for pedestrian use only and are not suitable for vehicular traffic.
- MasterSeal TC 225 Tint Base should be mixed with 2 BASF MasterSeal 900 color packs per 5 gallons in order to achieve the desired color tint.
- Do not apply MasterSeal Traffic 1500 to concrete slabs on grade, unvented metal pan decks and split slab applications with a membrane between slabs.
- Select the proper amount of aggregate to promote slip resistance.
- The best method to ensure average wet film thickness is the use of a grid system. Divide the surface area to be coated into grids and calculate the square footage of each. For example, one pail of MasterSeal M 200 applied at 55–60 ft^2/gal should cover approximately 275–300 sq ft or a minimum grid of 16 x 16 ft at 25 wet mils. The wet film thickness can also be verified with a wet film thickness gauge. Verify coverage via site mockup.
- Pre-stripe to level out recessed sealant joints (less than 1" [25 mm]) for optimal aesthetic appearance.
- Avoid application of MasterSeal Traffic 1500 when inclement weather is present or imminent.
- Do not apply MasterSeal Traffic 1500 to damp, wet, or contaminated surfaces.
- MasterSeal Traffic 1500 is not suitable for use where chained or metal-studded tires will be used.
- Proper application is the responsibility of the user. Field visits by BASF personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.
- CAD & PDF deck coating details are available for download from our website; BASF Customer Service can direct you to the site.

FOR BEST PERFORMANCE: TC 225 TINT BASE ONLY

- Avoid whipping air into Tint-Base.
- Mix pigment cans thoroughly into Tint-Base.
- Always do a test area to assure acceptable color appearance and slip resistance.
- Do not apply Sonoguard® Tint-Base heavier than the recommended 25 mil (0.6 mm) application.
- Colors exposed to direct sunlight may fade over a period of time. Darker colors potentially fade at an increased rate.
- Apply only to pedesterian traffic areas.
- Aggregate and substate conditions may affect color and appearance.

HEALTH, SAFETY AND ENVIRONMENTAL

Read, understand and follow all Safety Data Sheets and product label information for this product prior to use. The SDS can be obtained by visiting www.master-builders-solutions.basf.com, e-mailing your request to basfbscst@basf.com or calling 1(800)433-9517. Use only as directed.

For medical emergencies only, call ChemTrec® 1(800)424-9300.

LIMITED WARRANTY NOTICE

BASF warrants this product to be free from manufacturing defects and to meet the technical properties on the current Technical Data Guide, if used as directed within shelf life. Satisfactory results depend not only on quality products but also upon many factors beyond our control. BASF MAKES NO OTHER WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PRODUCTS. The sole and exclusive remedy of Purchaser for any claim concerning this product, including but not limited to, claims alleging breach of warranty, negligence, strict liability or otherwise, is the replacement of product or refund of the purchase price, at the sole option of BASF. Any claims concerning this product must be received in writing within one (1) year from the date of shipment and any claims not presented within that period are waived by Purchaser. BASF WILL NOT BE RESPONSIBLE FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFITS) OR PUNITIVE DAMAGES OF ANY KIND.

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www.master-builders-solutions.basf.us
Customer Service 1(800)433.9517
Technical Service 1(800)243.6739

AQUA PROFILASUR

Water-based industrial impregnating treatment

3051-a. May 2016

Description

Product: AQUA PROFILASUR is a water-based impregnating-decorative protective treatment for wood, weather-resistant. It is particularly recommended for use in industrial, artisan and carpentry sectors, applied with an impregnating machine or spray. AQUA PROFILASUR contains active ingredients that protect the film from micro-organisms.
Applications: for the transparent treatment of outdoor and indoor wood, not subject to dimensional stability and not in constant contact with the soil or water, for example for coverings, wooden houses, beams, roofing and woodwork in general. The new structuring makes the product capable of minimising the phenomenon of wood silvering and special coloured pastes provide a more even, uniform surface. AQUA PROFILASUR regulates the exchange of moisture between the air and the wood and provides good UV radiation protection.
Colours: 00 colourless, 01 oak, 02 larch, 03 chestnut, 04 walnut, 07 ebony, 09 rosewood, 10 light walnut, 11 mahogany, 13 pine, 27 teak, 35 wenge, 42 green, 48 medium walnut, 51 sheer white. 71 semi-covering white and 91 covering white
Packaging: 25l – 100*l - 200*l and 1000*l (*by order only). (5 litres only available for colours 51, 71 and 91).

Technical data

Specific weight: approx. 1.05 g/cm³ at +20 °C
Flash point: >100 °C.
Viscosity: 46-52s,/ DIN cup 2 mm at +20 °C
Drying time after about 2 hours according to the type of wood, the quantity of paint applied and the atmospheric conditions. In low temperatures and/or high humidity the drying time is prolonged proportionally.
Odour: very weak odour; odourless once dry.
Storage: 3 years in intact containers. Store at a cool temperature protected from frost. Close partially used tins carefully; if there is a particularly large air space transfer to smaller containers.

How to apply

General: mix the product well before use. Do not work at temperatures below +10°C (environment, surface or product).
Application systems: impregnating machine, brush.
Surface preparation: the wood to be treated must be dry and free from dust and grease. Do not apply to wood with a moisture content over 18%. Completely remove any old film-forming paint or varnish because this will hinder the product penetrating the wood.
Application of a wood-protection primer such as colourless Hydrogrund Plus provides the surface with biological protection as well as producing more even colouring without too much difference between the appearance of hard and soft grain. However, using this method will produce a lighter final colour.
The inner substances in some types of tropical wood, for example iroko, can slow down drying, therefore these should first be cleaned with paint thinner.
Application advice: if large surfaces or highly absorbent types of wood are to be treated, moisten the wood with a damp sponge before application. To avoid leaving re-start marks, treat the surface along its total length following the direction of the grain. End-grain wood should be treated with more coats of AQUA PROFILASUR to reduce water-absorption as much as possible.
Metal fixings (nails, screws, hinges) and other metal parts that may come into contact with the product must be in a corrosion-proof material.

Recommended treatments:

- New outdoor wood:	1 – 2 x HYDROGRUND PLUS 1 – 2 x AQUA PROFILASUR

AQUA PROFILASUR

Water-based industrial impregnating treatment

3051-a. May 2016

- Restoration:	Remove any poorly bonded paint or varnish; clean and sand down the surface to improve adhesion. Then 1 - 2 x AQUA PROFILASUR If the wood has been restored as new, follow the instructions for new wood.

Colourless AQUA PROFILASUR does not contain any pigments and therefore does not provide UV radiation protection. It is therefore advisable to use this outdoors only as a top coat on coloured paint or to lighten dark shades.
The effect of individual colours will vary with the type of wood and therefore it is always advisable to do a test application. We recommend checking the state of outdoor paint 2 years from application, particularly for items with south-west exposure and restore these if necessary.
If using white paint it is essential to apply at least 2 coats of the product to minimise the wood yellowing effect. The choice of a covering paint and a higher number white considerably prevents the original colouring of the wood reappearing.
Please note that colour 51, sheer white, produces a lightly veiled, non-showy transparent look that does not substantially change the natural colour of the wood. Ideal for a transparent finish and when the aim is to emphasise the natural colouring of the wood while minimising yellowing.

Consumption: 10 - 14 m²/l per coat, according to the absorption of the wood. Run a test to work out the exact quantity.
Dilution: AQUA PROFILASUR is ready to use and must not be diluted. If using impregnating machine, tap water can be used to dilute to a maximum of 3%.
Tool cleaning: with water immediately after use.

Special instructions

Do not apply to wood liable to come into contact with food, animal feed or drinking water. Not suitable for beehives, saunas. The product is toxic for fish and fish-eating animals. Do not apply the product in unprotected places. Do not apply in the immediate vicinity of water courses. The product must not be thrown into water. Do not pour onto plants. Not to be sold loose.
During use ensure the face, hands and eyes are adequately protected and that the working area is properly ventilated. Mask electric switches and cabling and protect them from short circuits.
When cleaning surfaces painted with AQUA PROFILASUR, do not use alcohol or solvent-based products or those that are acidic or alkaline. Use only water with neutral soap or light, neutral detergents.
Clean the tools used with Amonn Detergent and tap water.
ADR/RID: not applicable.
In the event of product escape or spills, mop up the liquid with absorbent material and dispose of according to current regulations. Do not dispose of with domestic waste, do not throw the product into the sewer system.
European waste catalogue number 08 01 12.

The above instructions are consistent with the most recent information on the development and use of our product. Because we have no control over the onsite use and application of the product, we may only be held liable for the quality of the product as supplied. If in doubt please contact our technical consultancy service.

6.2 Annex B - table of checks service class 1 (examples) control data sheet

Section 1	***Result***	
	Positive	Positive
Verify that the applied loads are compatible with those of project		
Verify that the destination of use has not been modified		
Verify that the service class structures have not been changed compared to the plan specifications		
Check if there are new openings into the panels or holes, groove, cuts or other reduction in the cross section of the members		
Check if there are changes on the loads or on how these are applied		
Check if structures initially designed closed, were open or viceversa. Also Check if structures initially planned uncovered, were covered or viceversa		
Check if the glulam beams are in ventilated conditions and that no stagnant water or excessive moisture		
Check if the climate conditions have changed.		
The presence of stains due to moisture		
Check if there is corrosion on metal components and on welds		
Discoloration of wood		
Section 2	***Result***	
	Positive	Negative
Check if that there is a correspondence between the geometry of the project and the real / construction		
Checking the deformations		
Verification of the verticality for beams, panels and columns		
Checks of the downpipes, drains and flashings		
Weeds, insects or fungal attack		
Detection of cracks by measuring the width, depth, length, number and placement		
Measurement of the depth of the slots with a sheet steel of a thickness of 2/10 mm		
Relative humidity measurement of wood with special instrument at various depths		
Relative humidity measurement of wood in the most significant parts of the construction		
Relative humidity measurement of wood inside and outside the building		
Date of the checks	Sign	

6.3 Annex C - table of checks service class 3 (examples) control data sheet

Section 1	***Result***	
	Positive	Positive
Verify that the applied loads are compatible with those of project		
Verify that the destination of use has not been modified		
Verify that the service class structures have not been changed		
Check if there are new openings into the panels		
Check if there are changes on the loads or there are changes on how these are applied		
Check if structures initially designed closed, were open or viceversa. Also Check if structures initially planned discoveries, were covered or viceversa		
Check if the glulam beams (especially those of the walkway below the concrete slabs) are in ventilated conditions and that no stagnant water or excessive moisture		
Check if the climate conditions have changed.		
The presence of stains due to moisture		
Check if there is corrosion on metal components and on welds		
Discoloration of wood		
Section 2	***Result***	
	Positive	Negative
Check if that there is a correspondence between the geometry of the project and the real		
Checking the deformations		
Verification of the vertical for beams, panels and columns		
Checks of the pluvial, drains and flashings		
Weeds, insects or fungal attack		
Detection of cracks by measuring the width, depth, length, number and placement		
Measurement of the depth of the slots with a sheet steel of a thickness of 2/10 mm		
Relative humidity measurement of wood with special instrument at various depths		
Relative humidity measurement of wood in the most significant parts of the construction		
Relative humidity measurement of wood inside and outside the building		
Date of the checks	Signature	