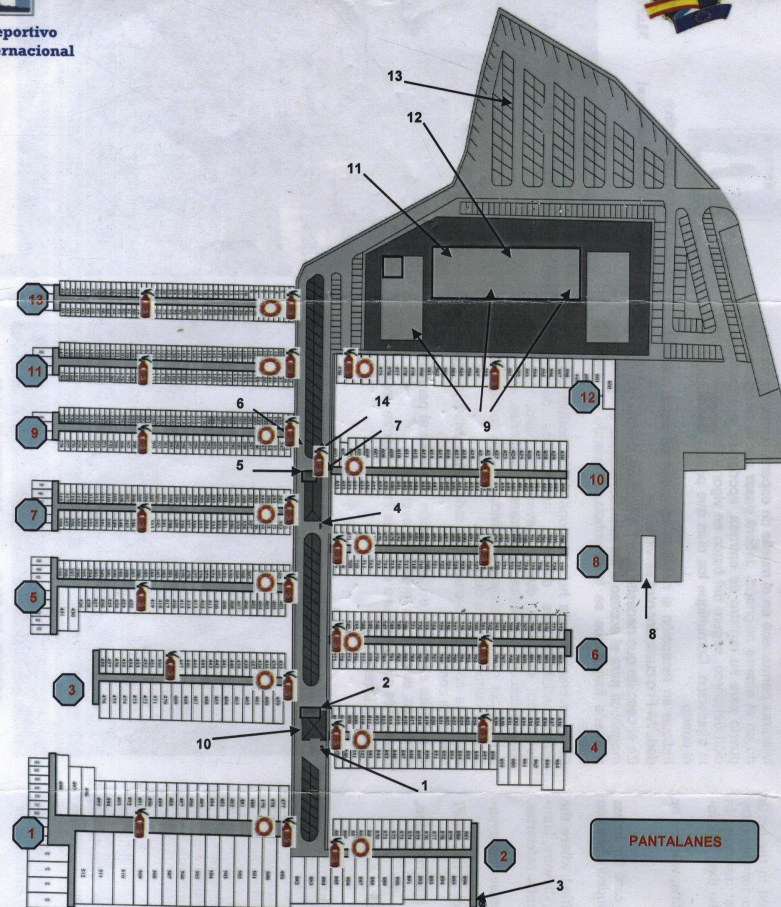




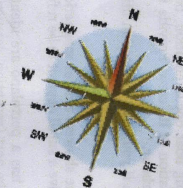
**Puerto Deportivo
Marina Internacional**

PORTULANO

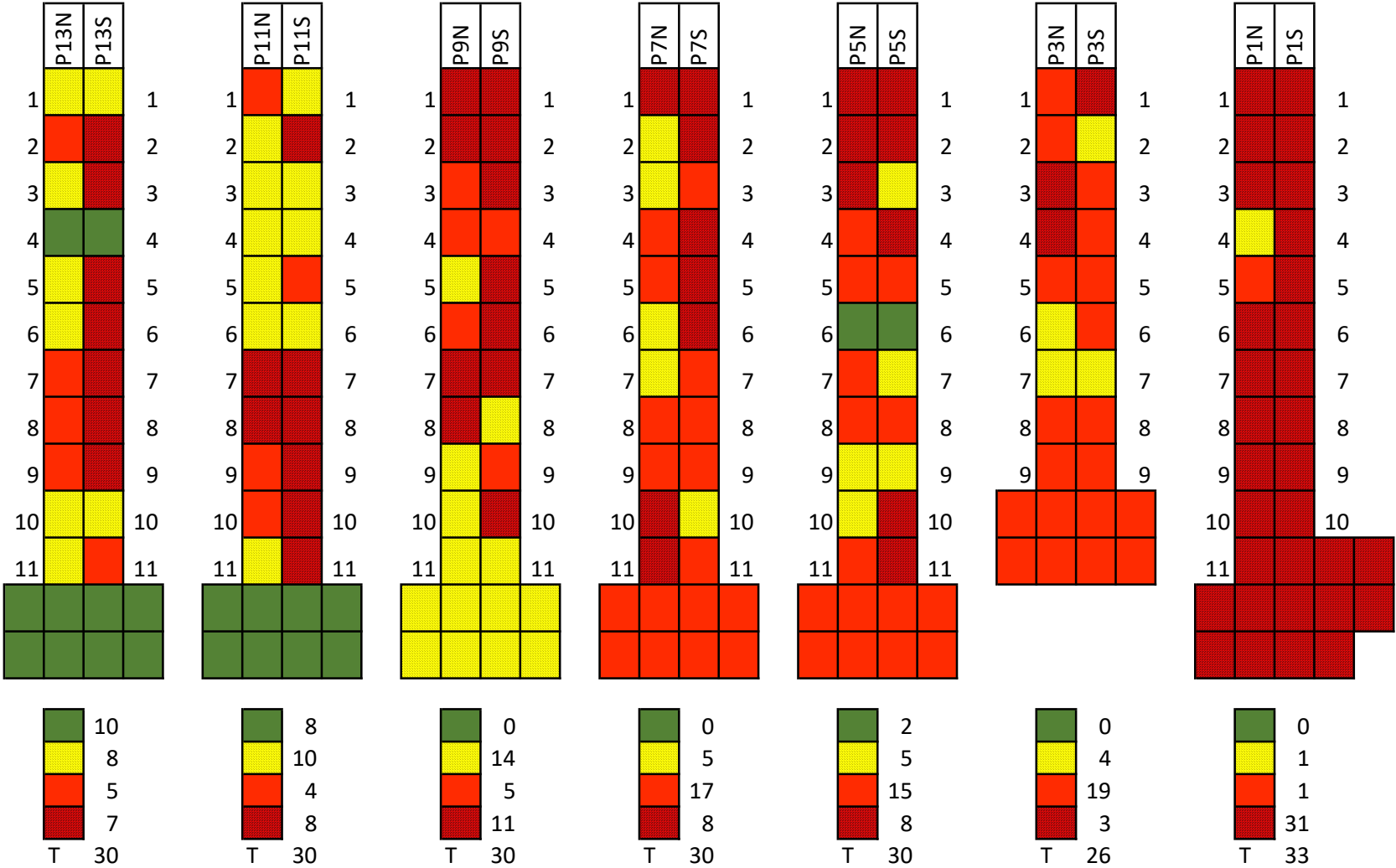
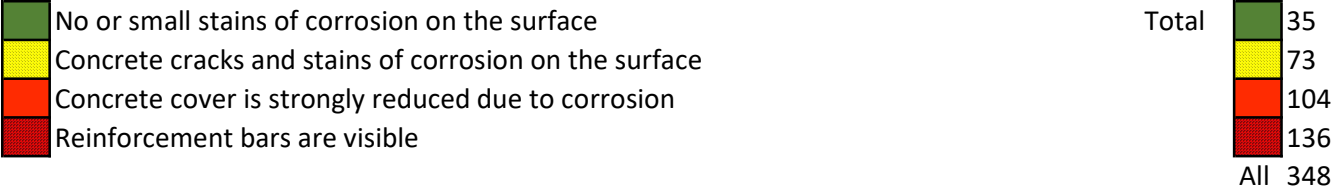


PANTALANES

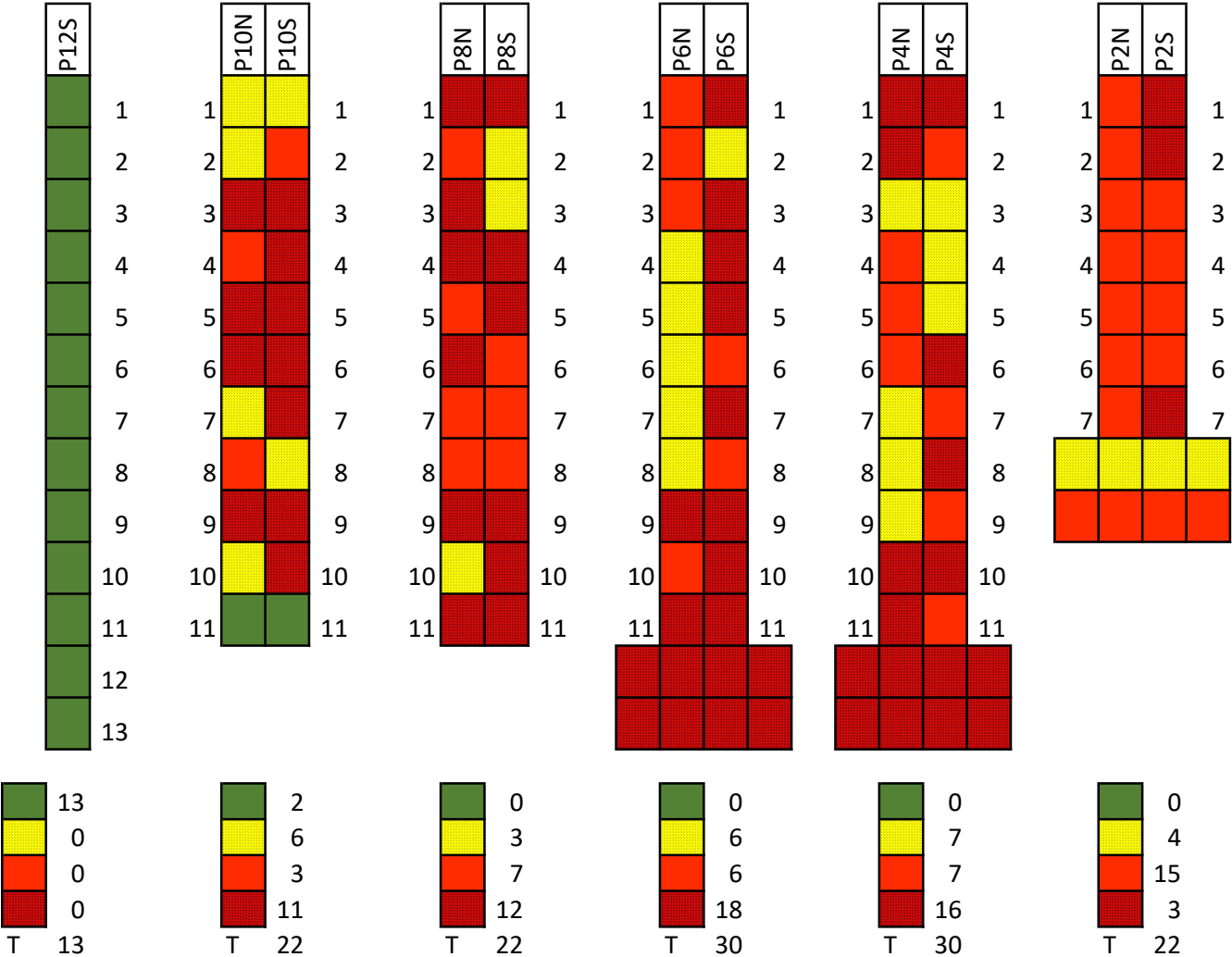
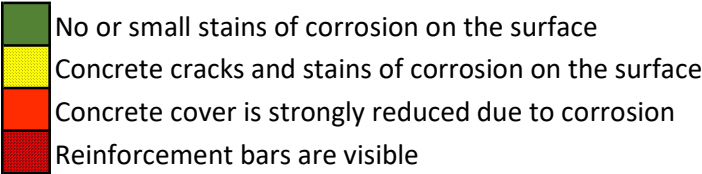
- 1 Capitania / Captaincy / Kapitänsbüro
- 2 Marineria / Seamen / Marineverwaltung
- 3 Muelle de espera / Waiting Pontoon / Wartesteg
- 4 Duchas / Showers / Dusche
- 5 Aseo discapacitados / Disabled toilet / Behindertentoilette
- 6 Maquinas autoservicio / Self Service machines / Selbstbedienung
- 7 Auto lavandería / Automatic laundry / Waschsalon
- 8 Travelift, varadero / Travelift, shipyard / Kran zum bootslippen
- 9 Restaurantes, bar / Restaurants, bar / Restaurants, stab
- 10 Aula del mar / Sea classroom / Aula des meeres
- 11 Tienda náutica / Nautical shop / Nautisches geschäft
- 12 Apartohotel / Apartohotel / Apartohotel
- 13 Parking / Parking / Parken
- 14 Punto Limpio / Clean Point / Recycling Punkt



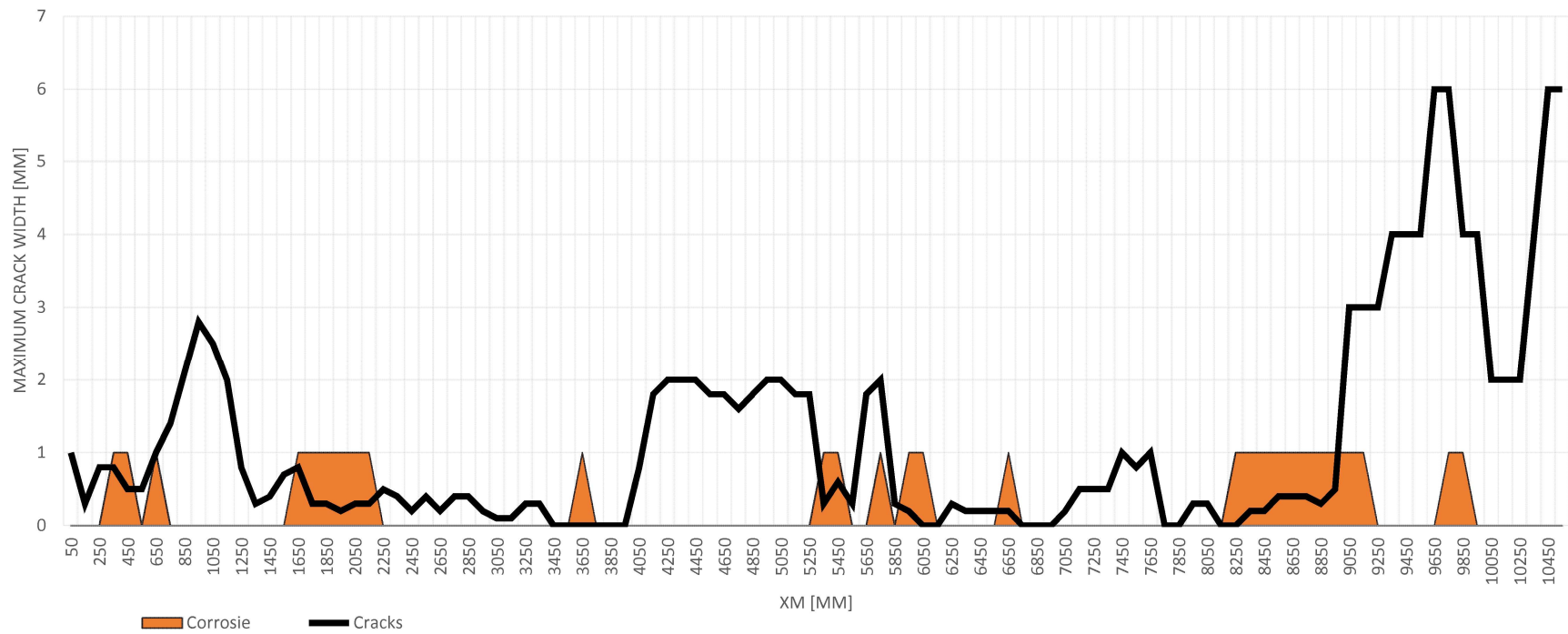
Division of the isostatic parts of the pontoons in corrosion categories - odd numbers



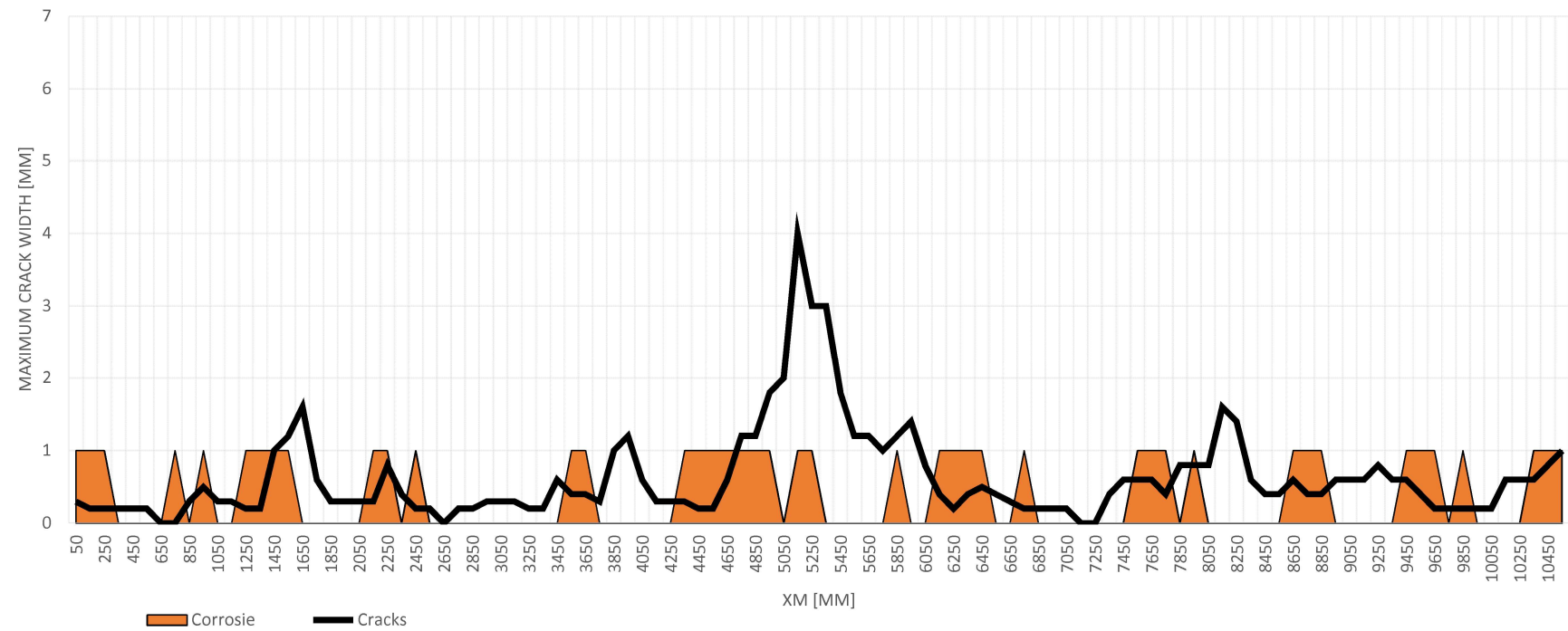
Division of the isostatic parts of the pontoons in corrosion categories - even numbers



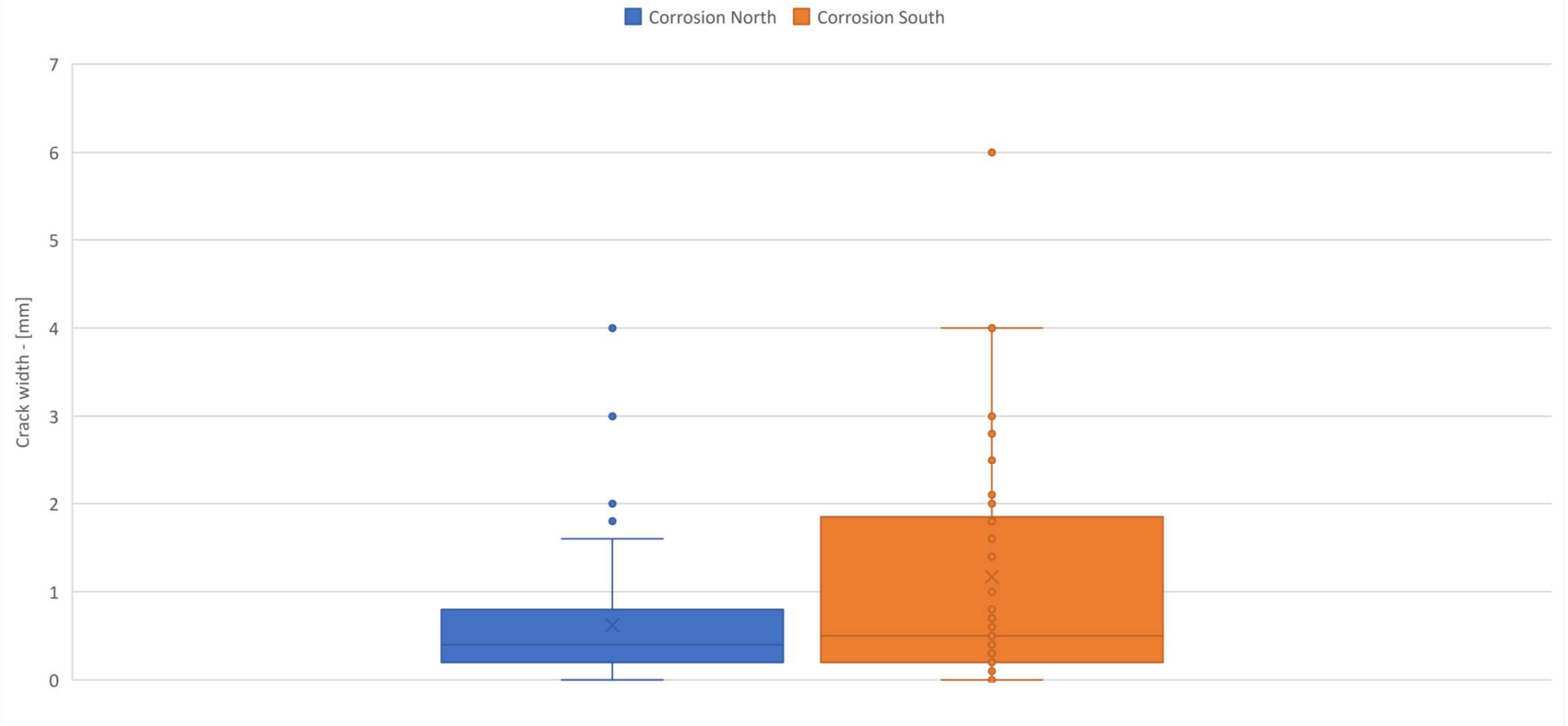
MAXIMUM CRACK WIDTH AND APPEARANCE OF CORROSION STAINS PER INTERVAL OF 100 MM - SOUTH



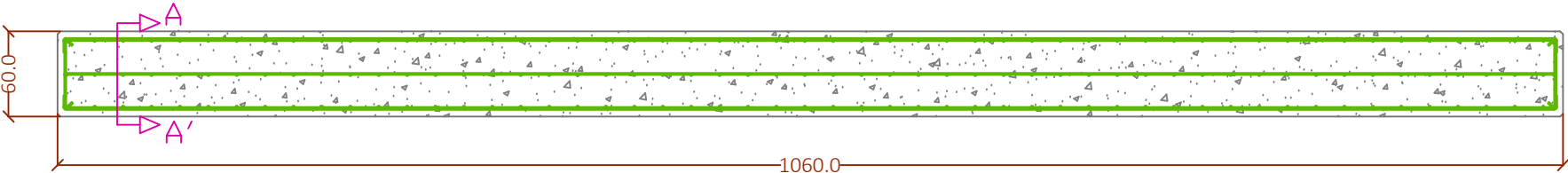
MAXIMUM CRACK WIDTH AND APPEARANCE OF CORROSION STAINS PER INTERVAL OF 100 MM - NORTH



Box plot of the crack width results

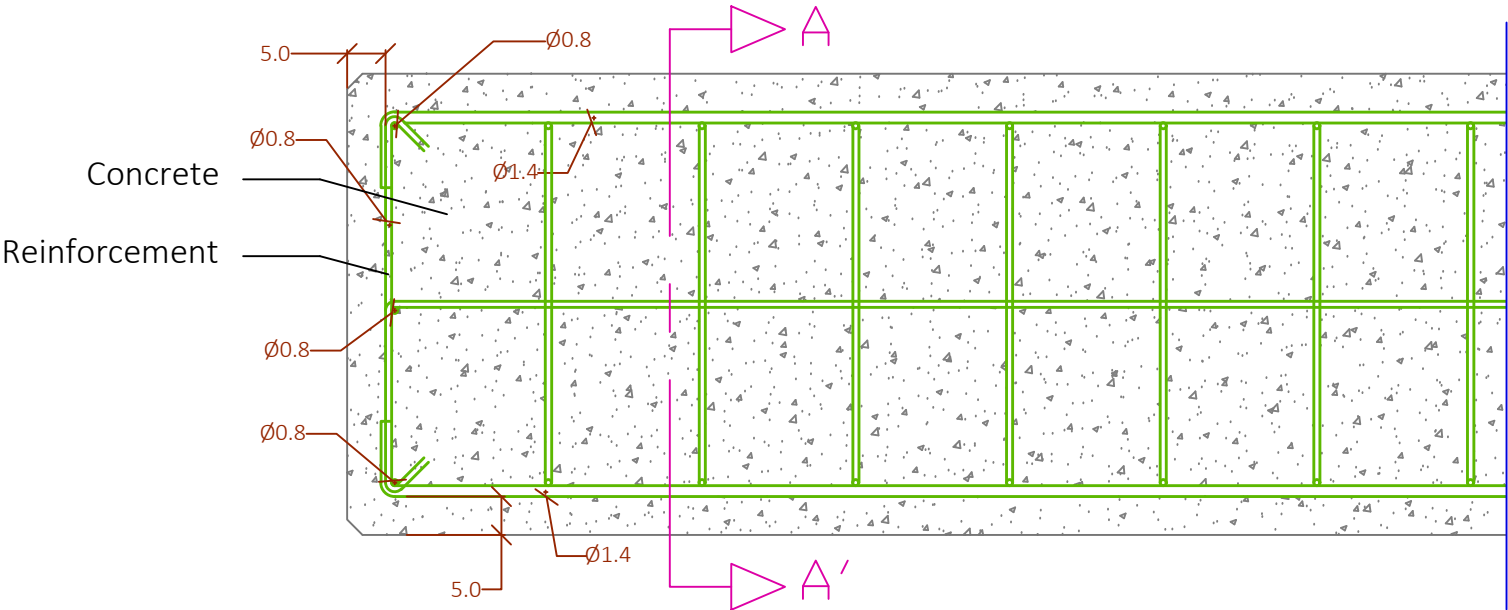


Section B-B' of the original concrete slab - Dimensions of the concrete slab



Scale: 1/120

Section B-B' of the original concrete slab - Dimensions of the reinforcement



Scale: 1/25

Estimation of the constructive design of the pontoons in 'Marina Internacional'

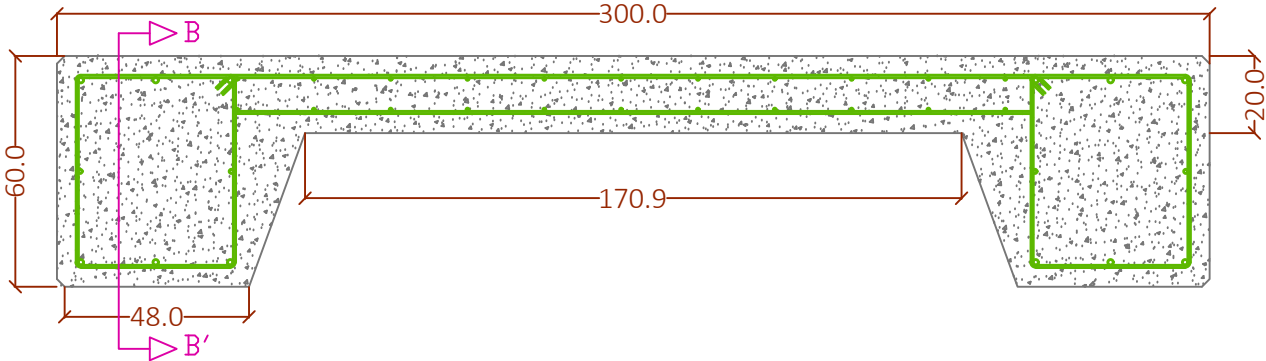
This design is an estimation of the current state of the pontoons in harbour Marina Internacional based on measurements. The author does not want to claim any right over the correctness of completeness about the current state of the construction.

Author:
Louis Nollet

Scale:
Indicated

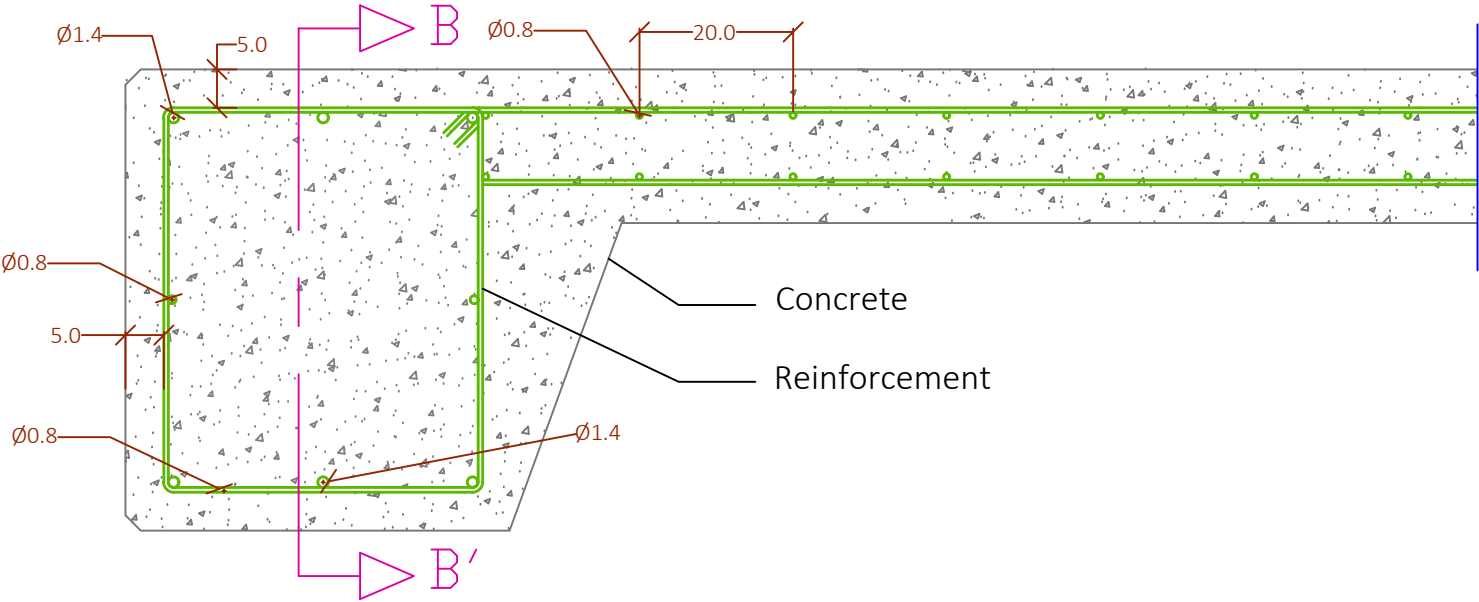
Date
June 2017

Section A-A' of the original concrete slab - Dimensions of the concrete slab



Scale: 1/50

Section A-A' of the concrete slab - Dimensions of the reinforcement



Scale: 1/25

Estimation of the constructive design of the pontoons in 'Marina Internacional'

This design is an estimation of the current state of the pontoons in harbour Marina Internacional based on measurements. The author does not want to claim any right over the correctness of completeness about the current state of the construction.

Author:
Louis Nollet

Scale:
Indicated

Date
June 2017

Product Data Sheet

Edition 08/12/2016

Identification no:

020302040030000143

Sika® MonoTop-614F



Sika® MonoTop-614F

R4 Flowable Cementitious Repair Mortar

Product Description

Sika® MonoTop -614F is a cement based, one component flowable repair mortar (High Flow) containing shrinkage compensators and high range water-reducing agents, meeting the requirements of Class R4 of BS EN 1504-3.

Uses

- Horizontal or vertical repairs
- Bridges
- Marine structures
- Tunnels
- Buildings
- Fire damaged structures
- For exterior and interior use
- In place of R1, R2 & R3 mortars

Characteristics / Advantages

- One component, ready to use
- Low shrinkage
- High mechanical properties
- Good flow properties
- Repair depths upto 150 mm in one application
- Can be poured or pumped
- Overcoatable with Sika reprofiling/levelling mortars and coatings

Tests

Approval / Standards

Conforms to the requirements of BS EN 1504-3 R4 Classification
Complies generally with the Highways Agency specifications for repairs to highways structures.

Product Data

Form

Appearance /Colours Grey powder

Packaging 25 kg bag

Storage

Storage Conditions/ Shelf-Life

6 months from date of production if stored properly in original unopened, sealed and undamaged packaging in dry and cool conditions.



Technical Data	All below values carried out at ~ 20°C unless otherwise stated	
Chemical Base	Portland cement type Cem I, selected aggregates and additives.	
Density	Cured mortar density: ~ 2300 – 2400 Kg/m ³	(BS EN 12190)
Grading	D _{max} : 4.0 mm	
Layer Thickness	15 mm min. / 150 mm max.	
Initial Set	~ 4 – 5 hours	(BS EN 13294)
Final Set	~ 7 – 8 hours	(BS EN 13294)
Coefficient of Thermal Expansion	~ 14 x 10 ⁻⁶ m/m °C	(BS EN 1770)
Micro Silica Content %	~ < 2.0	
Cement Content	~ 517 Kg/m ³	
Water Cement Ratio %	~ 0.39	
Air Content %	~ 1.80	(BS EN 12350-7)
Equivalent Sodium Oxide Content	~ 2.3 Kg/m ³	(BS EN 196-2)

Mechanical / Physical Properties

Compressive Strength (20°C)	1 day ~ 27 N/mm ² 7 days ~ 65 N/mm ² 28 days ~ 85 N/mm ²	(BS EN 12190)
Flexural Tensile Strength	28 days ~ 8 N/mm ²	
Electrical Resistivity (kohm.cm)	~ 24	(Wenner Test @28days)

CE Requirements

Requirements as per BS EN 1504-3 Class R4

	Results	Requirements (R4)
Compressive Strength (20°C/5°C)	~ 85 / 77 N/mm ² (MPa)	> 45 N/mm ² (MPa)
Chloride Ion Content	~ 0.01%	< 0.05%
Adhesive Bond	~ 2.61 N/mm ² (MPa)	≥ 2.0 N/mm ² (MPa)
Elastic Modulus	~ 41 kN/mm ² (GPa)	≥ 20 kN/mm ² (GPa)
Capillary Absorption	~ 0.5 kg.m ⁻² .h ^{-0.5}	< 0.5 kg.m ⁻² .h ^{-0.5}
Coefficient of Thermal Expansion	~ 14 x 10 ⁻⁶ m/m °C	Declared Value
Dangerous Substances	Complies with 5.4	Complies with 5.4
Reaction to Fire	Class A1	Class A1

(NPD) = No Performance Determined

Flow Properties

(BS EN 13395-3)

Temperature	Time (mins)	Flow in 30 Secs
5°C	0	~690
5°C	20	~690
20°C	0	~970
20°C	20	~970

Application Details

Consumption

This depends on the substrate roughness and thickness of layer applied.
As a guide, 1 bag yields approximately 11.5 litres of mortar

Substrate Quality

Concrete

The concrete shall be free from dust, loose material, surface contamination and materials which reduce bond or prevent suction or wetting by repair materials.

Steel reinforcement

Rust, scale, mortar, concrete, dust and other loose and deleterious material which reduces bond or contributes to corrosion shall be removed to a minimum standard of SA2½.

Reference should also be made to BS EN1504-10:2003 for specific requirements.

Shutter/Formwork:

Where formwork is to be used, all formwork should be of adequate strength, treated with release agent and sealed to prevent leakage. Ensure formwork includes outlets for extraction of the pre-soaking water. A header box/hopper should be constructed on one side of the formwork so that a head of 150-200 mm can be maintained during the pouring operation.

Substrate Preparation / Bonding Primer/ Reinforcement Coating

Concrete:

Delaminated, weak, damaged and deteriorated concrete and where necessary sound concrete shall be removed by suitable mechanical or very high pressure waterblasting [up to 110 mPa (16500 psi)] techniques.

Tying wire fragments, nails and other metal debris embedded in the concrete should be removed where possible.

The edges where concrete is removed should be cut at a minimum angle of 90° to avoid undercutting and a maximum angle of 135° to reduce the possibility of debonding with the top surface of the adjacent sound concrete and should be roughened sufficiently to provide a mechanical key between the original material and Sika® MonoTop -614F repair mortar.

Ensure sufficient concrete is removed from around reinforcement to allow coating and compaction of the repair material.

The concrete substrate should be pre-soaked with clean potable water continuously for 2 - 6 hours prior to repair mortar application.

Immediately before pouring repair mortar, remove *all* excess or standing water from within repair area, any formwork, cavities or pockets.

Steel reinforcement:

Surfaces should be prepared using abrasive blast cleaning techniques or high pressure waterblasting [up to 60 mPa (9000 psi)] techniques.

Where exposed reinforcement is contaminated with chloride or other material which may cause corrosion, the reinforcement shall be cleaned by low pressure waterblasting [up to 18 mPa (2700 psi)].

Reinforcement corrosion protection coating:

Where a coating is required as a barrier, apply to the whole exposed circumference two coats of Sika® MonoTop -610 or SikaTop® Armatec-110 EpoCem®. (Refer to the relevant Product Data Sheet).

Reference should also be made to BS EN1504-10:2003 for specific requirements.

Application Conditions / Limitations

Substrate Temperature +5°C min. / +30°C max.

Air Temperature +5°C min. / +30°C max.

Application Instructions

Mixing *Water : mortar powder = 0.093 parts by weight. (2.30 – 2.35 litres of water per bag).*

Mixing Tools Place the water into a forced action mixer or in a clean drum. Slowly add complete bag of Sika® MonoTop -614F into the water and continuously mix for 3 minutes in mixer to achieve a uniform and lump free consistency. Alternatively use a slow speed drill (200-500 rpm) and spiral paddle mixer.

Application Method Pour the mixed Sika® MonoTop -614F into the prepared repair area as soon as it has been mixed to maintain flow properties and no more than 30 mins to benefit from the shrinkage compensating properties. Ensure continuous mortar flow during the complete pouring operation to avoid trapping air.

For cold weather working consider using warm water to assist with achieving strength gain & other physical properties.

Reference shall be made to BS EN1504-10:2003 for specific requirements and any other guidelines that are specific to the structure.

Cleaning of Tools Clean all tools and application equipment with water immediately after use. Hardened/cured material can only be mechanically removed.

Notes on Application / Limitations Refer to recommendations provided in BS EN 1504-10.

Avoid application in direct sun and/or strong wind and/or rain.

Pour or pump from one side only when using shutters / formwork

Do not use vibrating pokers

Do not add water over recommended dosage.

Apply only to sound, prepared substrates.

Do not add additional water during the surface finishing as this will cause discoloration and cracking.

Protect freshly applied material from freezing.

Curing Details

Curing Treatment It is essential to cure the repair mortar immediately after application for a minimum of 3 days to ensure full cement hydration and to minimise cracking. Use polythene sheeting taped down at the edges or other approved method.

Curing compounds shall not be used when they adversely affect subsequently applied products and systems.

Reference shall also be made to BS EN1504-10:2003 for specific requirements.

Value Base	All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.
Local Restrictions	Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.
Health and Safety Information	For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.
Legal Notes	The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

CE Labelling

The harmonised European standard EN 1504-3 “Products and systems for the protection and repair of concrete structures – Definitions, requirements, quality control and evaluation of conformity – Part 3 Structural and non-structural repair” specifies the identification, performance (including durability) and safety of products and systems to be used to repair concrete surfaces (either building or civil engineering structures).

Non-structural repair fall under this specification – they need to be CE-labelled as per Annex ZA.2, table ZA.2 conformity 2+ and fulfil the requirements of the given mandate of the EU Construction Products Directive (89/106/CE).

Also refer to Declaration of Performance certificate



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SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006
Sika MonoTop®-614 F



Revision Date 23.11.2016

Version 1.0

Print Date 23.11.2016

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : Sika MonoTop®-614 F

1.2 Relevant identified uses of the substance or mixture and uses advised against

1.3 Details of the supplier of the safety data sheet

Company : Sika Limited
Watchmead
Welwyn Garden City
Hertfordshire AL7 1BQ
United Kingdom

Telephone : +44 9(0)1707 394444

1.4 Emergency telephone number

Emergency telephone number : +44 (0)1707 363899 (available during office hours)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture


Type of product : Mixture

Classification (REGULATION (EC) No 1272/2008)

Skin irritation, Category 2	H315: Causes skin irritation.
Serious eye damage, Category 1	H318: Causes serious eye damage.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms : 

Signal word : Danger

Hazard statements	: H315	Causes skin irritation.
	H318	Causes serious eye damage.

Precautionary statements	: Prevention:	
	P264	Wash skin thoroughly after handling.
	P280	Wear protective gloves/ eye protection/ face protection.

Response:

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P302 + P352 IF ON SKIN: Wash with plenty of water.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously
with water for several minutes. Remove
contact lenses, if present and easy to do.
Continue rinsing. Immediately call a
POISON CENTER/doctor.
P332 + P313 If skin irritation occurs: Get medical advice/
attention.
P362 + P364 Take off contaminated clothing and wash it
before reuse.

Hazardous components which must be listed on the label:

- 266-043-4 Cement, portland, chemicals

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Hazardous components

Chemical name CAS-No. EC-No. Registration number	Classification (REGULATION (EC) No 1272/2008)	Concentration [%]
Cement, portland, chemicals 65997-15-1 266-043-4	Skin Irrit.2; H315 Eye Dam.1; H318 STOT SE3; H335	>= 10 - < 20
Substances with a workplace exposure limit :		
Quartz (SiO ₂) 14808-60-7 238-878-4		>= 50 - <= 100
Limestone 1317-65-3 215-279-6 Contains: Quartz (SiO ₂) <5µm >= 0,1 %		>= 10 - < 20

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.

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- | | |
|-------------------------|---|
| If inhaled | : Move to fresh air.
Consult a physician after significant exposure. |
| In case of skin contact | : Take off contaminated clothing and shoes immediately.
Wash off with soap and plenty of water.
If symptoms persist, call a physician. |
| In case of eye contact | : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Keep eye wide open while rinsing. |
| If swallowed | : Do not induce vomiting without medical advice.
Rinse mouth with water.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person. |

4.2 Most important symptoms and effects, both acute and delayed

- | | |
|----------|--|
| Symptoms | : Excessive lachrymation
Erythema
Dermatitis
See Section 11 for more detailed information on health effects and symptoms. |
| Risks | : irritant effects

Causes skin irritation.
Causes serious eye damage. |

4.3 Indication of any immediate medical attention and special treatment needed

- | | |
|-----------|--------------------------|
| Treatment | : Treat symptomatically. |
|-----------|--------------------------|

SECTION 5: Firefighting measures

5.1 Extinguishing media

- | | |
|------------------------------|---|
| Suitable extinguishing media | : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
|------------------------------|---|

5.2 Special hazards arising from the substance or mixture

- | | |
|-------------------------------|--|
| Hazardous combustion products | : No hazardous combustion products are known |
|-------------------------------|--|

5.3 Advice for firefighters

- | | |
|---|--|
| Special protective equipment for firefighters | : In the event of fire, wear self-contained breathing apparatus. |
|---|--|



Further information : Standard procedure for chemical fires.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Avoid breathing dust.
Deny access to unprotected persons.

6.2 Environmental precautions

Environmental precautions : Try to prevent the material from entering drains or water courses.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : Pick up and arrange disposal without creating dust.
Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Avoid exceeding the given occupational exposure limits (see section 8). Do not get in eyes, on skin, or on clothing. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Follow standard hygiene measures when handling chemical products

Advice on protection against fire and explosion : Avoid dust formation. Provide appropriate exhaust ventilation at places where dust is formed.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Store in accordance with local regulations.

Other data : Keep in a dry place. No decomposition if stored and applied as directed.

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7.3 Specific end use(s)

Specific use(s) : No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters *	Basis *
Quartz (SiO ₂)	14808-60-7	TWA	0,1 mg/m ³	GB EH40
Cement, portland, chemicals	65997-15-1	TWA	10 mg/m ³	GB EH40
		TWA	4 mg/m ³	GB EH40
Limestone	1317-65-3	TWA	10 mg/m ³	GB EH40
		TWA	4 mg/m ³	GB EH40

general dust value

Form of exposure	Value type	Control parameters	Basis
Inhalable	TWA	10 mg/m ³	GB EH40
Respirable	TWA	4 mg/m ³	GB EH40

8.2 Exposure controls

Personal protective equipment

- Eye protection : Safety glasses with side-shields conforming to EN166
Eye wash bottle with pure water
- Hand protection : Chemical-resistant, impervious gloves complying with an approved standard must be worn at all times when handling chemical products. Reference number EN 374. Follow manufacturer specifications.
- Recommended: Butyl rubber/nitrile rubber gloves.
Contaminated gloves should be removed.
- Skin and body protection : Dust impervious protective suit
Protective clothing (e.g. Safety shoes acc. to EN ISO 20345, long-sleeved working clothing, long trousers). Rubber aprons and protective boots are additionally recommended for mixing and stirring work.

Respiratory protection : Respirator selection must be based on known or anticipated

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exposure levels, the hazards of the product and the safe working limits of the selected respirator.

particulate filter P

P1: Inert material; P2, P3: hazardous substances

Ensure adequate ventilation. This can be achieved by local exhaust extraction or by general ventilation. (EN 689 - Methods for determining inhalation exposure). This applies in particular to the mixing / stirring area. In case this is not sufficient to keep the concentrations under the occupational exposure limits then respiration protection measures must be used.

Environmental exposure controls

General advice : Try to prevent the material from entering drains or water courses.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	: powder
Colour	: grey
Odour	: odourless
Odour Threshold	: No data available
Flash point	: Not applicable
Autoignition temperature	: No data available
Decomposition temperature	: No data available
Lower explosion limit (Vol-%)	: No data available
Upper explosion limit (Vol-%)	: No data available
Flammability	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
pH	: No data available
Melting point/range / Freezing point	: No data available
Boiling point/boiling range	: No data available

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Vapour pressure	: No data available
Density	: ca.1,480 g/cm3 at 20 °C
Water solubility	: insoluble
Partition coefficient: n-octanol/water	: No data available
Viscosity, dynamic	: No data available
Viscosity, kinematic	: Not applicable
Relative vapour density	: No data available
Evaporation rate	: No data available

9.2 Other information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

The product is chemically stable.

10.3 Possibility of hazardous reactions

Hazardous reactions : Stable under recommended storage conditions.

10.4 Conditions to avoid

Conditions to avoid : No data available

10.5 Incompatible materials

Materials to avoid : No data available

10.6 Hazardous decomposition products

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Not classified based on available information. #

Skin corrosion/irritation

Causes skin irritation. #

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Print Date 23.11.2016

Serious eye damage/eye irritation

Causes serious eye damage.#

Respiratory or skin sensitisation

Skin sensitisation: Not classified based on available information.#

Respiratory sensitisation: Not classified based on available information.#

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

Not classified based on available information.#

Reproductive toxicity

Not classified based on available information.

STOT - single exposure

Not classified based on available information.#

STOT - repeated exposure

Not classified based on available information.#

Aspiration toxicity

Not classified based on available information.#

SECTION 12: Ecological information

12.1 Toxicity

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher..

12.6 Other adverse effects

Product:

Additional ecological information : There is no data available for this product.



SECTION 13: Disposal considerations

13.1 Waste treatment methods

- | | | |
|------------------------|---|---|
| Product | : | The generation of waste should be avoided or minimized wherever possible.
Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way.
Dispose of surplus and non-recyclable products via a licensed waste disposal contractor.
Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.
Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. |
| Contaminated packaging | : | 15 01 10* packaging containing residues of or contaminated by dangerous substances |

SECTION 14: Transport information

ADR

Not dangerous goods

IATA

Not dangerous goods

IMDG

Not dangerous goods

14.6 Special precautions for user

No data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Prohibition/Restriction

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)	:	Not applicable
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REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	None of the components are listed (=> 0.1 %).
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SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Sika MonoTop®-614 F



Revision Date 23.11.2016

Version 1.0

Print Date 23.11.2016

REACH - List of substances subject to authorisation (Annex XIV) : Not applicable

REACH Information: All substances contained in our Products are
- preregistered or registered by our upstream suppliers, and/or
- preregistered or registered by us, and/or
- excluded from the regulation, and/or
- exempted from the registration.

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.
Not applicable

VOC-CH (VOCV) : < 0,01 %
no VOC duties

VOC-EU (solvent) : < 0,01 %

If other regulatory information applies that is not already provided elsewhere in the Safety Data Sheet, then it is described in this subsection.

Health, safety and environmental regulation/legislation specific for the substance or mixture: : The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002
Control of Substances Hazardous to Health Regulations 2002
The Management of Health and Safety at Work Regulations 1999
Health and Safety at Work Act 1974
Environmental Protection Act 1990 & Subsidiary Regulations

Other regulations : This product contains cement. Wet cement or mortar may cause alkali burns if in direct and/or prolonged contact with the skin. Wear protective clothing at all times when working with cement based products.

15.2 Chemical safety assessment

This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

Full text of H-Statements

H315 Causes skin irritation.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.

Full text of other abbreviations

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Sika MonoTop®-614 F



Revision Date 23.11.2016

Version 1.0

Print Date 23.11.2016

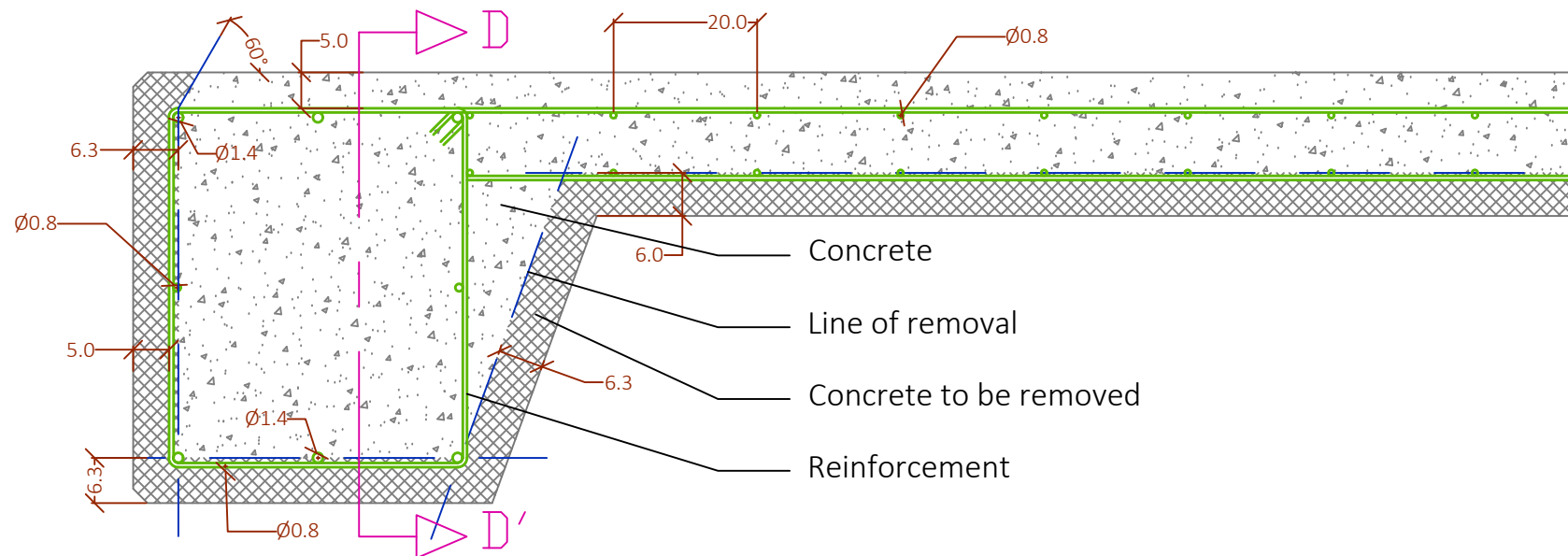
Eye Dam.	Serious eye damage
Skin Irrit.	Skin irritation
STOT SE	Specific target organ toxicity - single exposure
ADR	Accord européen relatif au transport international des marchandises Dangereuses par Route
CAS	Chemical Abstracts Service
DNEL	Derived no-effect level
EC50	Half maximal effective concentration
GHS	Globally Harmonized System
IATA	International Air Transport Association
IMDG	International Maritime Code for Dangerous Goods
LD50	Median lethal dose (the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals)
LC50	Median lethal concentration (concentrations of the chemical in air that kills 50% of the test animals during the observation period)
MARPOL	International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978
OEL	Occupational Exposure Limit
PBT	Persistent, bioaccumulative and toxic
PNEC	Predicted no effect concentration
REACH	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency
SVHC	Substances of Very High Concern
vPvB	Very persistent and very bioaccumulative

The information contained in this Safety Data Sheet corresponds to our level of knowledge at the time of publication. All warranties are excluded. Our most current General Sales Conditions shall apply. Please consult the product data sheet prior to any use and processing.



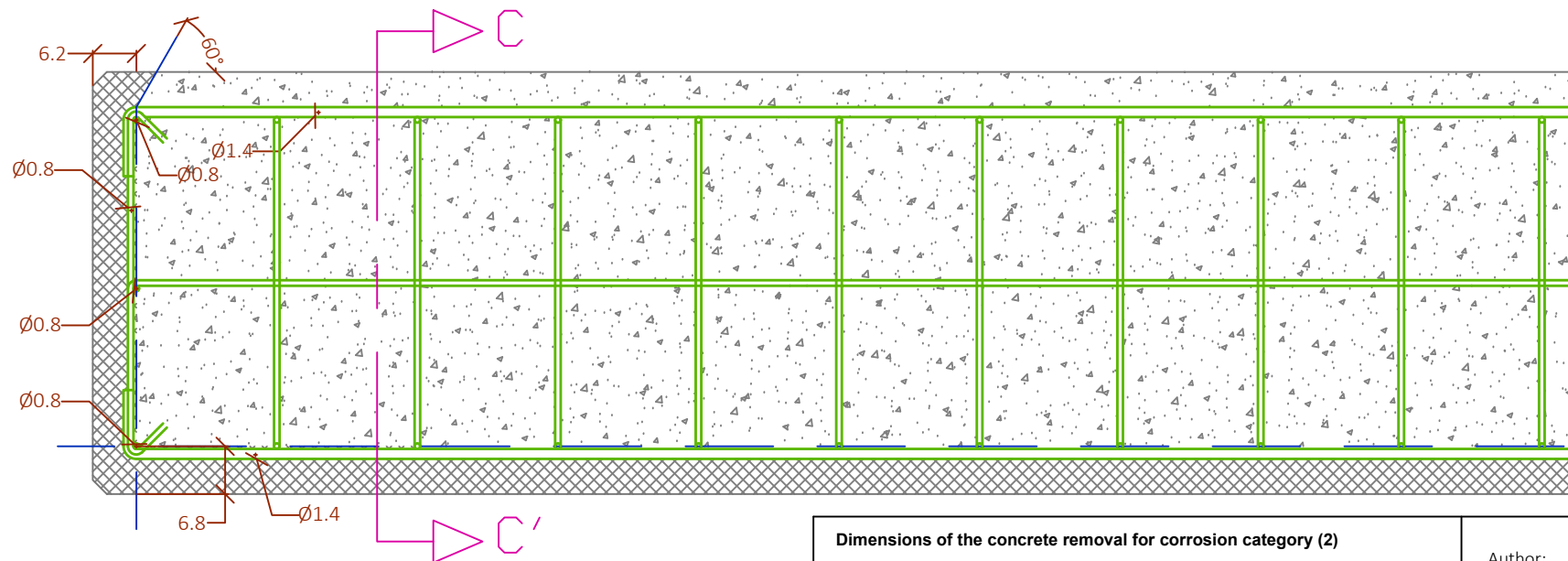
Changes as compared to previous version !

Section C-C' of the concrete slab - [mm]



Section D-D' of the concrete slab - [mm]

Scale: 1/25



Scale: 1/25

Dimensions of the concrete removal for corrosion category (2)

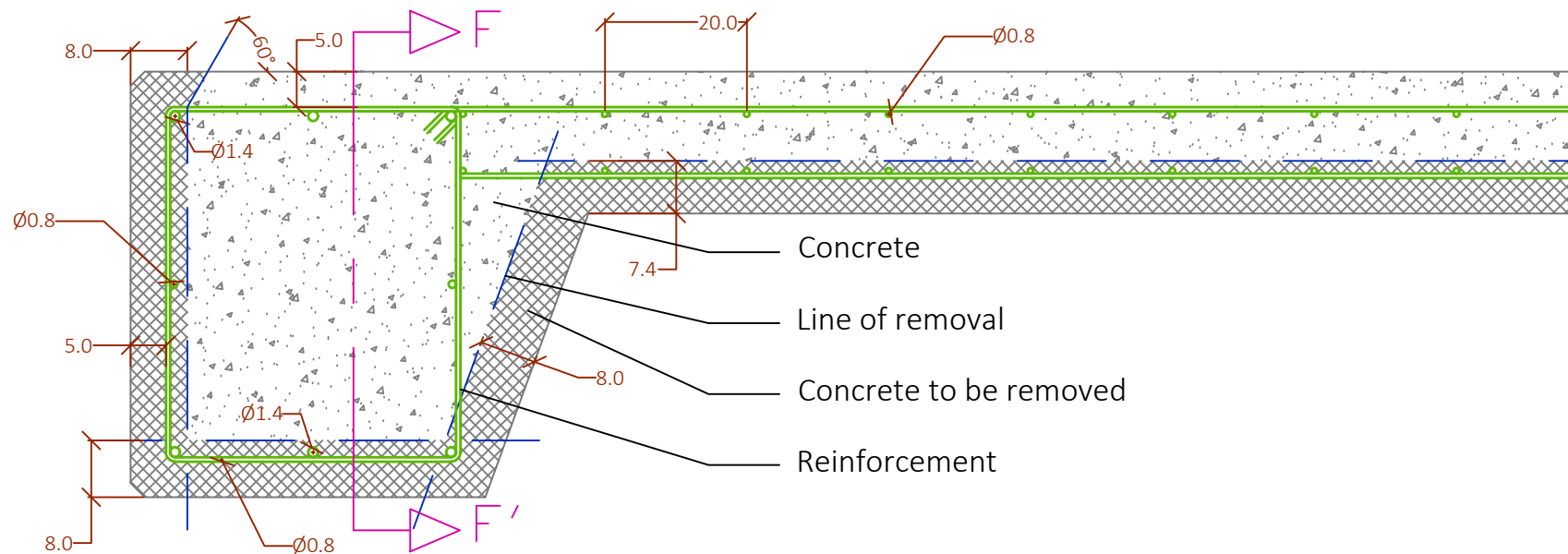
This design implies an estimation of the current state of the pontoons in harbour Marina Internacional based on measurements. The author does not want to claim any right over the correctness of completeness about the current state of the construction.

Author:
Louis Nollet

Scale:
Indicated

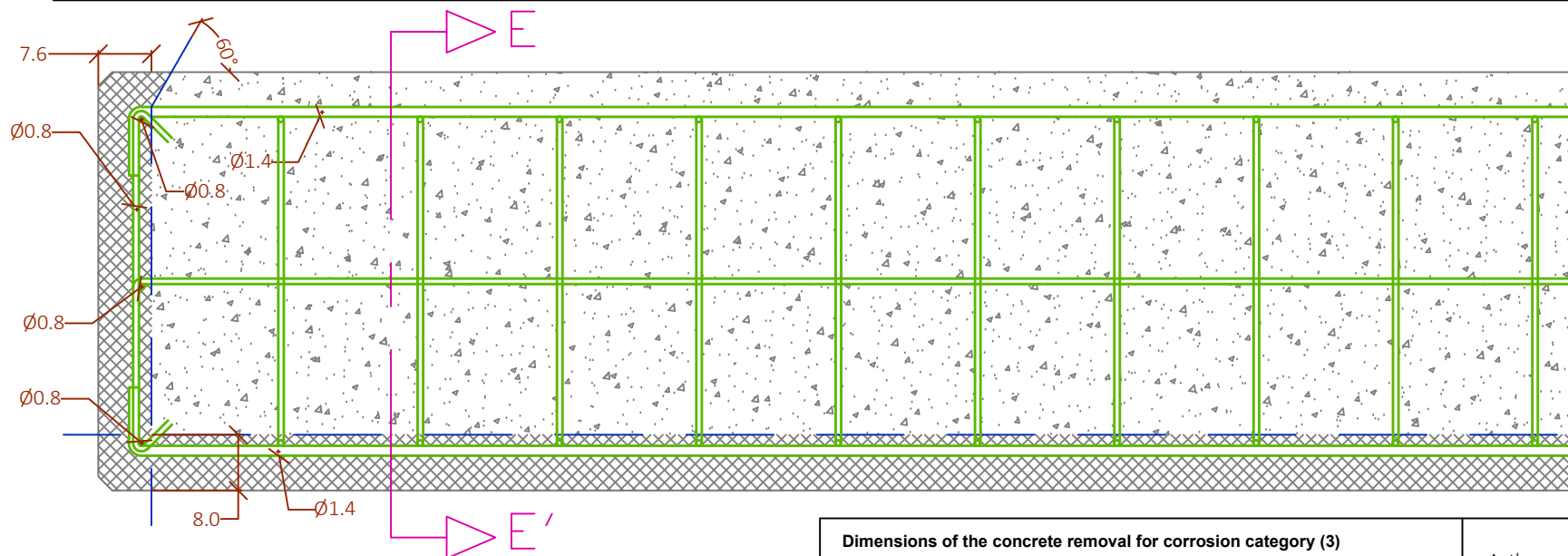
Date
June 2017

Section E-E' of the concrete slab - [mm]



Section F-F' of the concrete slab - [mm]

Scale: 1/25



Scale: 1/25

Dimensions of the concrete removal for corrosion category (3)

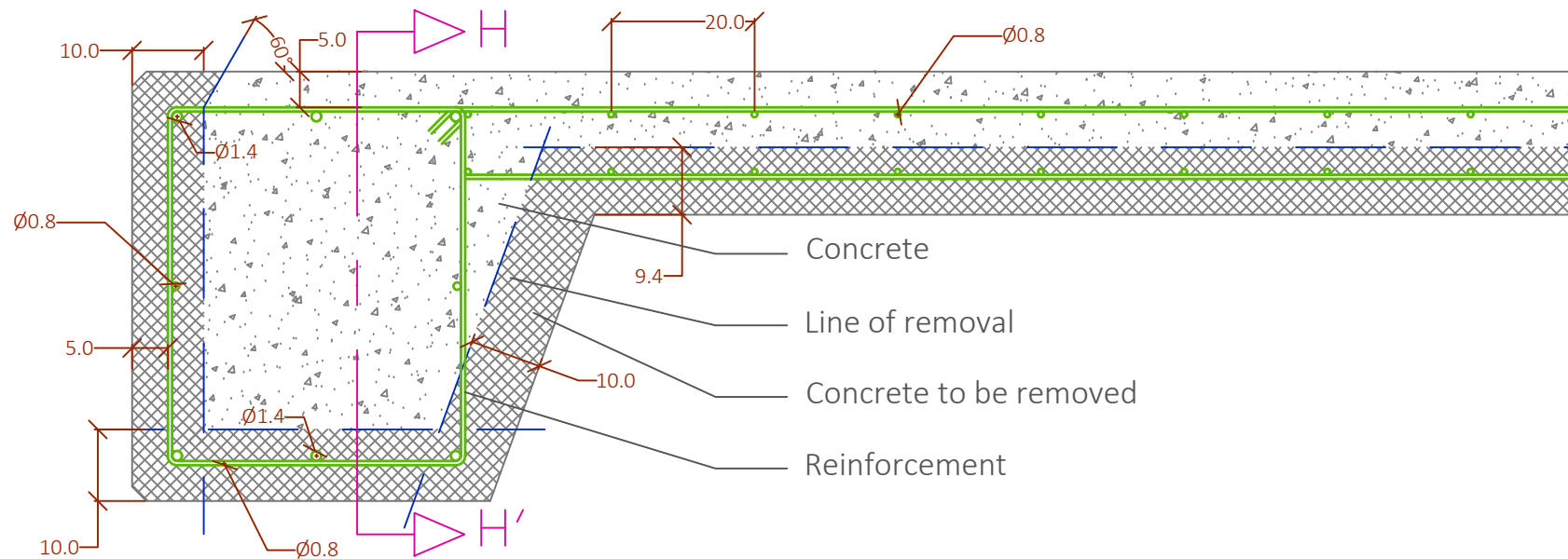
This design implies an estimation of the current state of the pontoons in harbour Marina Internacional based on measurements. The author does not want to claim any right over the correctness of completeness about the current state of the construction.

Author:
Louis Nollet

Scale:
Indicated

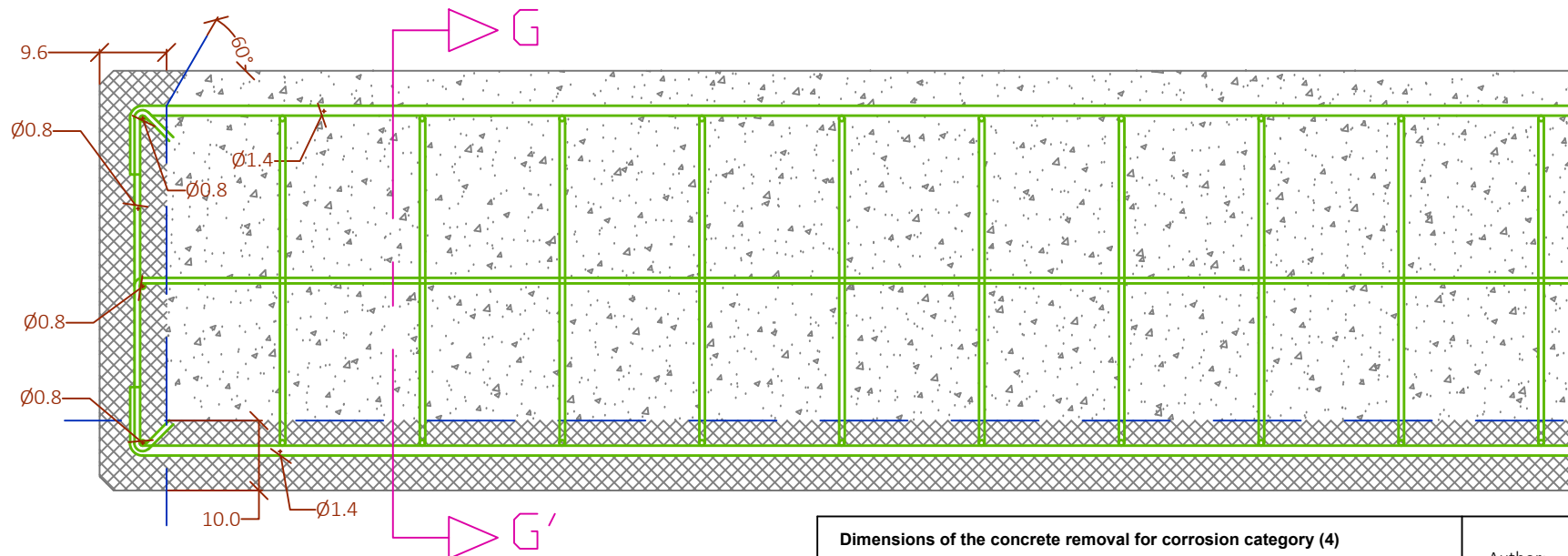
Date
June 2017

Section G-G' of the concrete slab - [mm]



Section H-H' of the concrete slab - [mm]

Scale: 1/25



Scale: 1/25

Dimensions of the concrete removal for corrosion category (4)

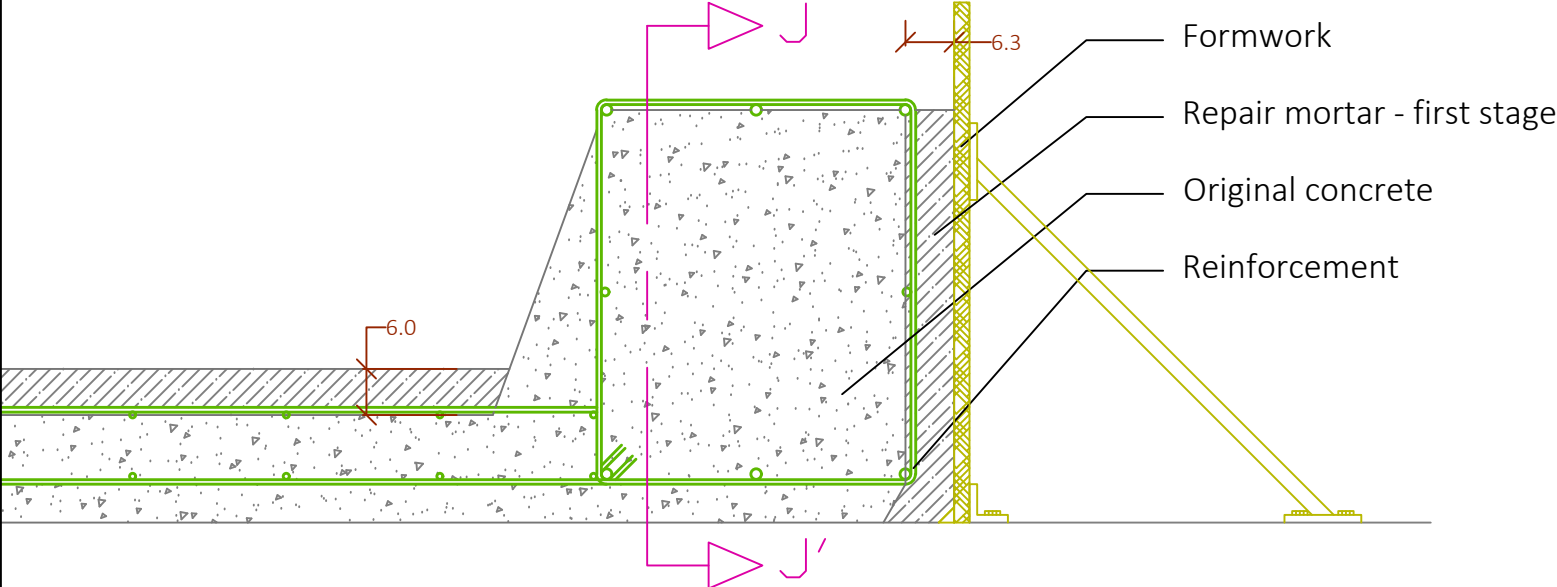
This design implies an estimation of the current state of the pontoons in harbour Marina Internacional based on measurements. The author does not want to claim any right over the correctness of completeness about the current state of the construction.

Author:
Louis Nollet

Scale:
Indicated

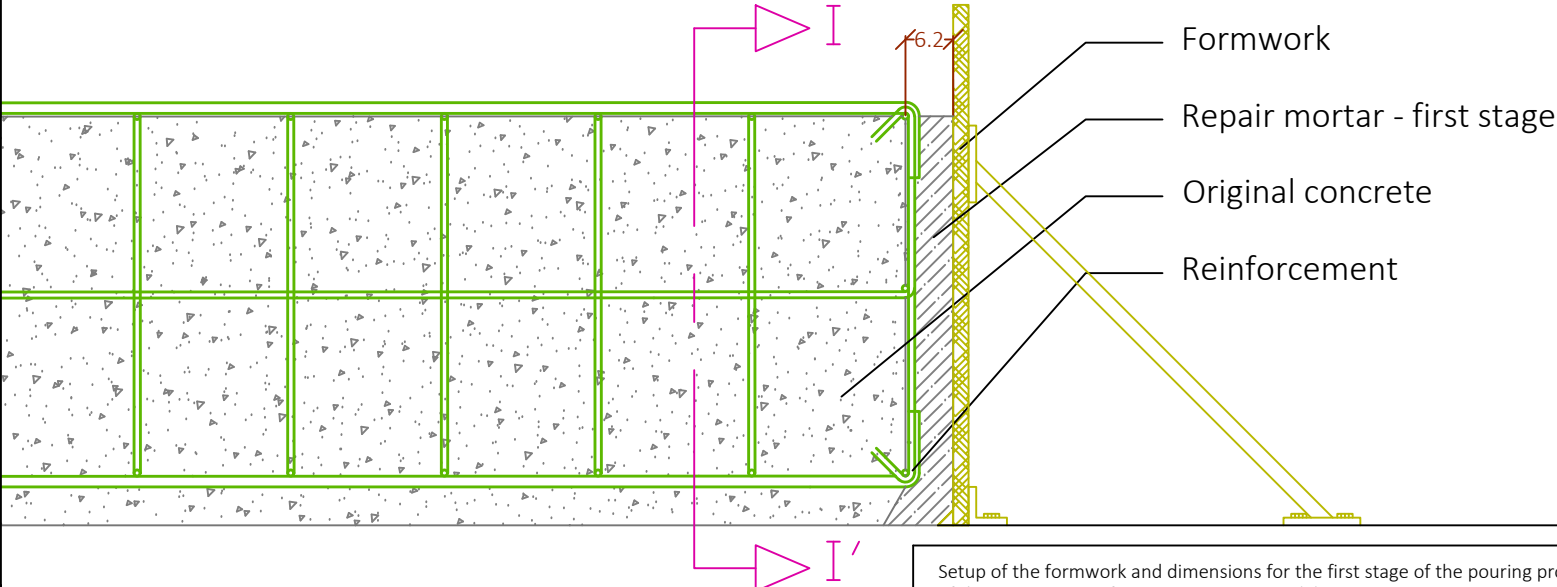
Date
June 2017

Section I-I' of the concrete slab - [mm]



Section J-J' of the concrete slab - [mm]

Scale: 1/25



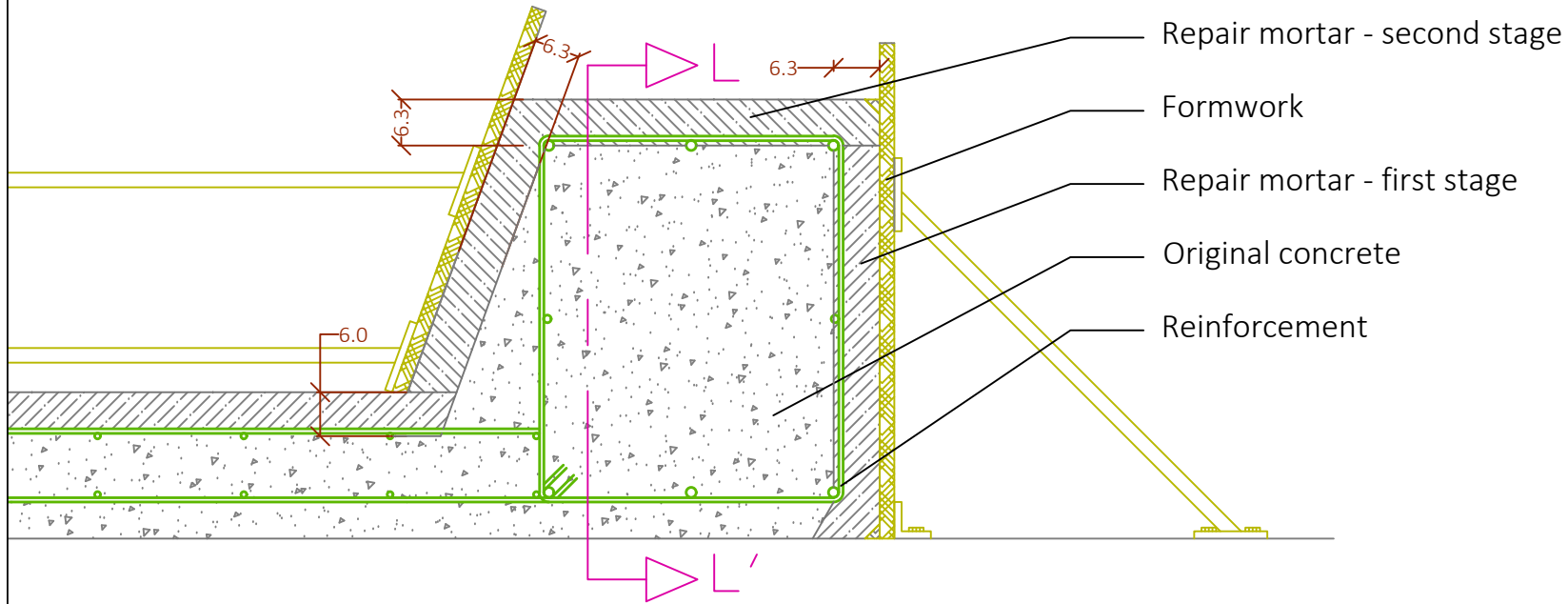
Scale: 1/25

Setup of the formwork and dimensions for the first stage of the pouring process of the repair mortar for corrosion category (2)
This design implies an estimation of the current state of the pontoons in harbour Marina Internacional based on measurements.
The author does not want to claim any right over the correctness of completeness about the current state of the construction.

Author:
Louis Nollet

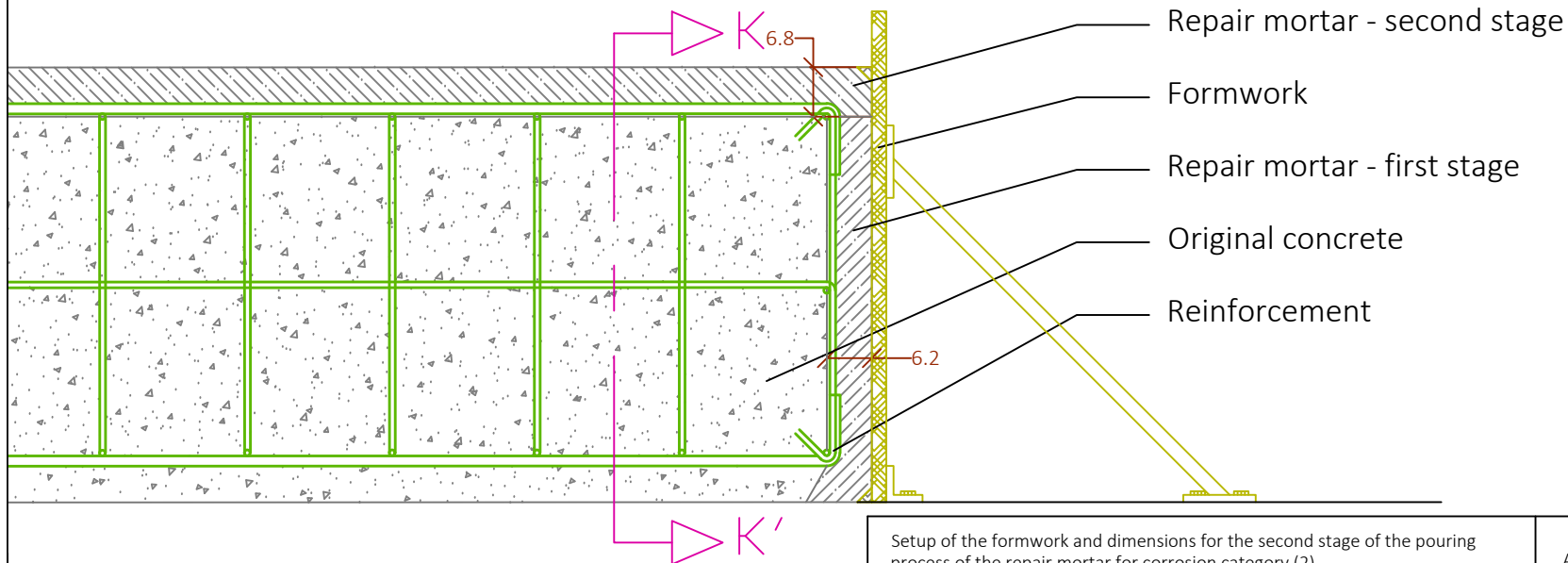
Scale: Indicated
Date: June 2017

Section K-K' of the concrete slab- [mm]



Scale: 1/25

Section L-L' of the concrete slab- [mm]



Scale: 1/25

Setup of the formwork and dimensions for the second stage of the pouring process of the repair mortar for corrosion category (2)

This design implies an estimation of the current state of the pontoons in harbour Marina Internacional based on measurements. The author does not want to claim any right over the correctness of completeness about the current state of the construction.

Author:
Louis Nollet

Scale:
Indicated

Date
June 2017

Calculation of quantities

1.1 Standard parameters slab

Description parameters

Code	Description
L	The length of the slab
W	The width of the slab
H	The hight of the slab
Wb	The width of the principal beams
Ws	The width of the subsurface of the slab
Hb	The height of the inclined surface
Ai	The angle of the inclined surface
A	The area of the slab in section A-A'
V	The volume of the slab
ρ_c	The density of reinforced concrete
m	The weight of the slab

Measurements

Code	Value	Unit
L	10,600	m
W	3,000	m
H	0,600	m
Wb	0,480	m
Ws	1,709	m
Hb	0,400	m
Ai	70	°
ρ_c	2,500	ton/m ³
A	1,057	m ²

Calculations

Code	Value	Unit	Equation
V	11,209	m ³	$L \cdot A$
m	28,022	ton	$V \cdot \rho_c$

2.1 Removal of the deteriorated concrete

Corrosion category (2)

Description parameters

Code	Description
A2	The area of the concrete layer to be removed in section C-C'
T2	The thickness of the concrete layer to be removed in section D-D'
V2	The volume of the concrete layer to be removed for a half a slab
n2	The number of half slabs belonging to corrosion category (2)
Tn2	The total volume of concrete layer to be removed for all half slabs belonging to corrosion category (4)

Measurements

Code	Value	Unit
A2	0,144	m ²
T2	0,062	m
n2	73	½ pc

Calculations

Code	Value	Unit	Equation
V2	0,822	m ³	$(A_2 \cdot (L - 2T_2) + 2T_2A)/2$
Tn2	59,991	m ³	$V_2 \cdot n_2$

Corrosion category (3)

Description parameters

Code	Description
A3	The area of the concrete layer to be removed in section E-E'
T3	The thickness of the concrete layer to be removed in section F-F'
V3	The volume of the concrete layer to be removed for half a slab
n3	The number of half slabs belonging to corrosion category (3)
Tn3	The total volume of concrete layer to be removed for all half slabs belonging to corrosion category (3)

Measurements

Code	Value	Unit
A3	0,358	m ²
T3	0,076	m
n3	104	½ pc

Calculations

Code	Value	Unit	Equation
V3	1,949	m ³	$(A_3 \cdot (L - 2T_3) + 2T_3A)/2$
Tn3	202,705	m ³	$V_3 \cdot n_3$

Corrosion category (4)

Description parameters

Code	Description
A4	The area of the concrete layer to be removed in section G-G'
T4	The thickness of the concrete layer to be removed in section H-H'
V4	The volume of the concrete layer to be removed for half a slab
n4	The number of half slabs belonging to corrosion category (4)
Tn4	The total volume of concrete layer to be removed for all half slabs belonging to corrosion category (4)

Measurements

Code	Value	Unit
A4	0,446	m ²
T4	0,096	m
n4	136	½ pc

Calculations			
Code	Value	Unit	Equation
V4	2,420	m ³	$(A_4 \cdot (L - 2T_4) + 2T_4A)/2$
Tn4	329,144	m ³	$V_4 \cdot n_4$

2.2 Cleaning of the reinforcement

Corrosion category (2), (3) and (4)			
Description parameters			
Code	Description		
RL1	The length of the main rebars		
RL2	The length of the transverse rebars		
RL3	The length of the vertical rebars at both ends		
Rn1	The amount of main rebars		
Rn2	The amount of transverse rebars		
Rn3	The amount of vertical rebars at both ends		
RTL	Total length of the revealed rebars for half a slab		
Measurements			
Code	Value	Unit	
RL1	10,500	m	
RL2	3,600	m	
RL3	0,500	m	
Rn1	19	pc	
Rn2	53	pc	
Rn3	12	pc	
Calculations			
Code	Value	Unit	Equation
RTL	396,300	m	$(R_{L1} * R_{n1} + R_{L2} * R_{n2} + R_{L3} * R_{n3})$

2.3 Placement formwork

Corrosion category (2), (3) and (4)		
Description parameters		
Code	Description	
As	The area of one side	
Ae	The area of one end	
Am	The area of one inclined surface	
AT	The total area of formwork needed	
n5	The number of slabs belonging to corrosion category (2), (3) and (4)	
Tn5	The total area of formwork needed for all the slabs belonging to corrosion category (2), (3) and (4)	
Measurements		
Code	Value	Unit
As	5,300	m²
Ae	1,800	m²
Am	4,558	m²
n5	157	pc

Calculations

Code	Value	Unit	Equation
AT	23,316	m ²	$2(A_s + A_e + A_m)$
Tn5	3660,612	m ²	$AT \cdot n_5$

2.3 Application of the repair mortar

Corrosion category (2)

Description parameters

Code	Description
A2	The area of application in section C-C'
T2	The thickness of application in section D-D'
V2	The volume of repair mortar for half a slab
n6	The number of half slabs belonging to corrosion category (2)
Tn6	The total volume of repair mortar to be applied for all half slabs belonging to corrosion category (2)

Measurements

Code	Value	Unit
A2	0,144	m ²
T2	0,062	m
n6	73 ½	pc

Calculations

Code	Value	Unit	Equation
V2	0,822	m ³	$(A_2 \cdot (L - 2T_2) + 2T_2A)/2$
Tn6	59,991	m ³	$Tn_6 \cdot n_6$

Corrosion category (3)

Description parameters

Code	Description
A3	The area of application in section E-E'
T3	The thickness of application in section F-F'
V3	The volume of repair mortar for half a slab
n7	The number of half slabs belonging to corrosion category (3)
Tn7	The total volume of repair mortar to be applied for all half slabs belonging to corrosion category (3)

Measurements

Code	Value	Unit
A3	0,358	m ²
T3	0,076	m
n7	104 ½	pc

Calculations

Code	Value	Unit	Equation
V3	1,949	m ³	$(A_3 \cdot (L - 2T_3) + 2T_3A)/2$
Tn7	202,705	m ³	$Tn_7 \cdot n_7$

Corrosion category (4)

Description parameters

Code	Description
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A4	The area of application in section G-G'
T4	The thickness of application in section H-H'
V4	The volume of repair mortar for half a slab
n8	The number of half slabs belonging to corrosion category (4)
Tn8	The total volume of repair mortar to be applied for all half slabs belonging to corrosion category (4)

Measurements

Code	Value	Unit
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A4	0,446	m ²
T4	0,096	m
n8	136	½ pc

Calculations

Code	Value	Unit	Equation
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V4	2,420	m ³	$(A_4 \cdot (L - 2T_4) + 2T_4A)/2$
Tn8	329,144	m ³	$Tn_8 \cdot n_8$

Calculation of costs

Code	Quantity	Unit	Resume	Price	Amount
01	Demolition				
01.01		pc	Preparation of the slabs pc (concrete slab). Removal of the electricity, water supply and the equipment; indirect costs.		
mO01OA070	0,25	H	Ordinary workman	17,45 €	4,36 €
			Sum		4,36 €
			Indirect costs	4,00%	0,17 €
			Total		4,54 €
01.02		½ pc	Removal of the deteriorated concrete - corrosion category (2) pc (concrete slab). Removal of the deteriorated concrete layer of the slabs belonging to corrosion category (2); cleaning of the subsurface; indirect costs.		
mO01OA060	3	H	Skilled workman	17,56 €	52,68 €
mM06MI030	3	H	Pneumatic jackhammer	3,01 €	9,03 €
mO01OA070	1	H	Ordinary workman	17,45 €	17,45 €
			Sum		79,16 €
			Indirect costs	4,00%	3,17 €
			Total		82,33 €
01.03		½ pc	Removal of the deteriorated concrete - corrosion category (3) pc (concrete slab). Removal of the deteriorated concrete layer of the slabs belonging to corrosion category (3); cleaning of the subsurface; indirect costs.		
mO01OA060	5	H	Skilled workman	17,56 €	87,80 €
mM06MI030	5	H	Pneumatic jackhammer	3,01 €	15,05 €
mO01OA070	1,5	H	Ordinary workman	17,45 €	26,18 €
			Sum		129,03 €
			Indirect costs	4,00%	5,16 €
			Total		134,19 €

01.04	½ pc	Removal of the deteriorated concrete - corrosion category (4)		
		pc (concrete slab). Removal of the deteriorated concrete layer of the slabs belonging to corrosion category (4); cleaning of the subsurface; indirect costs.		
mO01OA060	6 H	Skilled workman	17,56 €	105,36 €
mM06MI030	6 H	Pneumatic jackhammer	3,01 €	18,06 €
mO01OA070	2 H	Ordinary workman	17,45 €	34,90 €
Sum				158,32 €
Indirect costs			4,00%	6,33 €
Total				164,65 €

01.05	½ pc	Removal of corrosion - category (2)		
		½ pc (concrete slab). Removal of the corroded material from a half concrete slab belonging to corrosion category (2) with water blasting technique; indirect costs.		
mO01OA060	0,6 H	Skilled workman	17,56 €	10,54 €
/	0,5 H	Water blasting machine	110,00 €	55,00 €
mP01D130	0,4 m³	Water	1,11 €	0,44 €
Sum				65,98 €
Indirect costs			4,00%	2,64 €
Total				68,62 €

01.06	½ pc	Removal of corrosion - category (3) and (4)		
		½ pc (concrete slab). Removal of the corroded material from a half concrete slab belonging to corrosion category (3) and (4) with water blasting technique; indirect costs.		
mO01OA060	1 H	Skilled workman	17,56 €	17,56 €
/	0,8 H	Water blasting machine	110,00 €	88,00 €
mP01D130	0,8 m³	Water	1,11 €	0,89 €
Sum				106,45 €
Indirect costs			4,00%	4,26 €
Total				110,71 €

02	Transport			
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02.01	pc	Transport of the slabs to the sheltered workshop		
		pc (concrete slab). Removal of slab from its position to trailer, transport to sheltered workshop and unloading; indirect costs.		
mM07CB060	1 H	Trailer capacity of 40 t.	60,90 €	60,90 €
mO01OA050	0,5 H	Helper	18,19 €	9,10 €
mO01OA080	1 H	Driver	18,41 €	18,41 €
Sum				88,41 €
Indirect costs			4,00%	3,54 €
Total				91,94 €

02.02	pc	Transport of the slabs to the harbour		
		pc (concrete slab). Removal of slab from the sheltered workshop to the harbour; installation in its original place; indirect costs.		
mM07CB060	1 H	Trailer capacity of 40 t.	60,90 €	60,90 €
mO01OA050	0,5 H	Helper	18,19 €	9,10 €
mO01OA080	1 H	Driver	18,41 €	18,41 €
Sum				88,41 €
Indirect costs			4,00%	3,54 €
Total				91,94 €

03	Composition of construction materials			
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03.01	m³	Composition of the repair mortar		
		m³. Mix of repair mortar with water in concrete mixer; indirect costs.		
/	2,17 ton	Repair mortar	1 000,00 €	2 173,91 €
mP01D130	0,202 m³	Water	1,11 €	0,22 €
mO01OA080	1 H	Concrete mixer	18,41 €	18,41 €
mM07CB060	0,05 H	Trailer capacity of 40 t. - transport repair mortar	60,90 €	3,31 €
mO01OA060	0,1 H	Skilled workman	17,56 €	1,76 €
Sum				2 197,61 €
Indirect costs			4,00%	87,90 €
Total				2 285,52 €

04	Application of construction materials			
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04.01	pc	Application of the repair mortar		
		pc (concrete slab). Installation and preparation of the formwork; pouring of repair mortar in two different layers; removal of the formwork; post-treatment repair mortar; indirect costs.		
/	23,32 m²	Formwork (material;	47,88 €	1 116,37 €
mO01OA060	2 H	Skilled workman	17,56 €	35,12 €
mO01OA050	3 H	Helper	18,19 €	54,57 €
/	28 dd	Storage of concrete slab during	18,00 €	504,00 €
Sum				1 710,06 €
Indirect costs			4,00%	68,40 €
Total				1 778,46 €

05	Inspection			
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05.01	pc	Inspection of reinforcement bars		
		pc (concrete slab). Inspection of reinforcement bars with focus on deteriorated sections;		
mO01OC540	0,30 H	Qualified inspector	25,00 €	7,50 €
Sum				7,50 €
Indirect costs			4,00%	0,30 €
Total				7,80 €

05.02	pc	Inspection of finished structure		
		pc (concrete slab). Inspection of the repaired slab when placed back in its position; indirect		
mO01OC540	0,15 H	Qualified inspector	25,00 €	3,75 €
Sum				3,75 €
Indirect costs			4,00%	0,15 €
Total				3,90 €

05.03	E.C.	Inspection of safety and health		
		Inspection of safety and health before and during the repair works; indirect costs.		
mO01OC070	E.C.	Technical assessor of Safety	24,20 €	968,00 €
Sum				968,00 €
Indirect costs			4,00%	38,72 €
Total				1 006,72 €

Resuming tendering

Code	Unit	Resume	Quantity	Price	Amount
01 Demolition					
01.01	pc	Preparation of the slabs	157	4,54 €	712,31 €
01.02	½ pc	Removal of the deteriorated concrete - category (2)	72	82,33 €	5 927,50 €
01.03	½ pc	Removal of the deteriorated concrete - category (3)	104	134,19 €	13 955,34 €
01.04	½ pc	Removal of the deteriorated concrete - category (4)	136	164,65 €	22 392,78 €
01.05	½ pc	Removal of corrosion - category (2)	72	68,62 €	4 940,58 €
01.06	½ pc	Removal of corrosion - category (3) and (4)	240	110,71 €	26 569,42 €
Subtotal					74 497,94 €
02 Transport					
02.01	pc	Transport of the slabs from the harbour to the sheltered workshop	157	91,94 €	14 434,77 €
02.02	pc	Transport of the slabs from the sheltered workshop to the harbour	157	91,94 €	14 434,77 €
Subtotal					28 869,54 €
03 Composition construction materials					
03.01	m³	Composition of the repair mortar - corrosion category (2)	60	2 285,52 €	137 110,32 €
03.02	m³	Composition of the repair mortar - corrosion category (3)	203	2 285,52 €	463 285,65 €
03.03	m³	Composition of the repair mortar - corrosion category (4)	329	2 285,52 €	752 263,84 €
Subtotal					1 215 549,49 €
04 Application construction materials					
04.01	pc	Application of the repair mortar - corrosion category (2), (3) and (4)	157	1 778,46 €	278 329,38 €
Subtotal					278 329,38 €
05 Inspection					
05.01	pc	Inspection of the reinforcement bars	157	7,80 €	1 220,70 €
05.02	pc	Inspection of the finished structure	157	3,90 €	610,35 €
05.03	E.C.	Inspection of safety and health		1 006,72 €	1 006,72 €
Subtotal					2 837,77 €

Global tendering

Code	Chapter	Amount
	01 Demolition	74 497,94 €
	02 Transport	28 869,54 €
	03 Composition construction materials	1 215 549,49 €
	04 Application construction materials	278 329,38 €
	05 Inspection	2 837,77 €
	Total execution project	1 600 084,11 €
	VAT - 21.00%	336 017,66 €
	TOTAL BUDGET CONTRACT	1 936 101,77 €