LIDL LUTON - 7081

MJM CONSULTING ENGINEERS

SPECIFICATION G10

STRUCTURAL STEELWORK

REVISION C

G10 STRUCTURAL STEEL FRAMING

GENERAL REQUIREMENTS / INFORMATION

100 Where Document reference; GB-P761 LTN-PSE-ZZ-ZZ-SP-S-0005 MJM Building Specification Lidl Luton contradicts this specification the building specification takes precedence.

125 SPECIFICATION:

- Comply with the latest edition of the National Structural Steelwork Specification (hereinafter called the NSSS) unless specified otherwise in this section.
- Ensure that a copy of the NSSS is available at all times during the course of the Works at the fabrication shop and on site.

126 Unless noted elsewhere by MJMC the Execution Class derived in accordance with BS EN 1090-2 shall be EXC2A. The contractor will be required to show that he meets or exceeds this requirement.

FABRICATION GENERALLY

181 GENERAL REQUIREMENTS:

- Before fabricating, ensure that surface condition of steel, which is to be coated, complies with requirements for cleaning given elsewhere in this specification.
- Ensure that fabrication processes do not cause changes in properties of materials resulting in non-compliance with specified requirements.

190 MARKING:

- Submit details of proposed methods of identifying and recording materials and components to ensure correct use and location in the structure.
- Marks to be placed in positions such that they will be visible for checking after erection.

192 MARKING of steel that is to be blast cleaned, pickled, metal sprayed or galvanised to be done in such a way that subsequent treatment cannot obliterate the marking.

194 MARKING of shop finished steel, which is exposed to view, shall be carried out in such a manner as to be easily removed after handover of steelwork.

196 HARD STAMPING: Notwithstanding NSSS clause 4.1.3(ii), hard stamping must not be used.

201 FAYING SURFACES FOR HSFG JOINTS: Check faying surfaces of steel 25 mm thick or more for deformities such as bowing, twist or rippling that may reduce slip factor to below design limit.

211 END CONNECTIONS: Ensure that angle cleats, if used, project beyond ends of simply supported members.

216 HOLLOW SECTIONS: Ensure that insides of sections are dry and clear of debris before sealing ends and openings.

221 BASE PLATES: Make 25 mm diameter holes in all base plates more than 1 sq. m in area to allow the escape of air when grouting after erection of columns.

230 SHOP ASSEMBLY: Check fit, profile and camber before making connections in lattice girders and

trusses that are to be assembled before delivery to site.

WELDING

256 WELDING ON SITE: Notwithstanding NSSS clause 8.7, site welding is not permitted unless otherwise approved. When permitted, ensure suitable, safe working conditions. Do not weld when surfaces are wet or when the ambient temperature is below 0 deg C.

257 BUTT WELDS: Shall be full penetration without exception.

271 ADDITIONAL WELDS: Do not, without approval, make any welds (including tack welds) that are not shown on the drawings, even for temporary attachment or repair of faulty plates.

291 FINISHING WELDS: Carefully dress welds to remove slag by light hammering, wire brushing or other methods that do not deform the surface of the weld.

BOLT ASSEMBLIES

306 BOLTS AND NUTS:
Details of Manufacturer and reference to be provided by contractor on request.

307 BOLTS IN SHEAR
Bolts lengths selected shall be such that in no case is the threaded part of the bolt in shear between connected plies

326 LOAD INDICATING WASHERS:
- Manufacturer and reference:
  Details to be provided by contractor on request
- When placed under bolt head, prevent bolt turning when tightening.
- When placed under nut, protect nibs with a hardened washer and prevent both washers from turning when tightening.

336 SPRING WASHERS: To BS 4464.

346 BOLT BOXES:
Details of manufacturer and reference to be provided by contractor on request

371 GALVANIZED FINISH TO BOLT ASSEMBLIES:
To BS EN ISO 1461, applied by fastening manufacturer and passivated when no additional coatings are specified. Nuts to be tapped after galvanising.

376 SHERARDIZED FINISH TO BOLT ASSEMBLIES:
To BS 4921, Class 1, applied by fastening manufacturer and passivated.

381 ZINC PLATED FINISH TO BOLT ASSEMBLIES:
To BS EN ISO 4042 : Part 3, applied by fastening manufacturer, passivated when no additional coatings are specified, nuts tapped after plating.
Not to be used without prior agreement

391 SEALED HOLLOW SECTIONS: Seal bolt holes to prevent access of moisture. If method of sealing is not specified, submit proposals for approval.

ERECTION

420 SETTING OUT: In addition to the requirements of the NSSS, set out and erect parts of the steelwork to ensure compliance with the following permissible deviations (where applicable):

Type of dimension and location	PD
Plan dimensions at head or base of vertical cladding rail: -	
Maximum deviation from specified cladding line	+/- 5mm
Maximum deviation from adjacent rail	L/600 (where L= rail cts.)

426 MODIFICATIONS:

- Inform any defects due to detailing or fabrication errors.
- Obtain approval of methods of rectification before starting modification or remedial work.

440 COLUMN BASES:

- Raise or lower to levels specified on the drawing(s) using sawn steel packs or folding wedges not larger than necessary for the purpose.
- Position packs symmetrically around perimeter of base plate; do not use a single central pack.
- Check accuracy of erection and correct all errors before filling and bedding beneath bases and carrying out any other adjacent work.

443 GROUT FILLING/BEDDING OF COLUMN BASES:

- Completely fill the bolt pockets and spaces beneath base plates using a proprietary non-shrink or expanding grout with a compressive strength compatible with the contractors base plate design.

446 MOVEMENT JOINTS:

- Ensure that bolts are in centre of slotted holes after erection of structure and that the joint is free to move.

451 FIXING PROFILED SHEET FOR FLOOR SLABS: To BS EN 1994-1-1, clauses 4.7 and 4.8.1

452 PROPPING OF COMPOSITE FLOOR SUPPORT STEELWORK

When the composite floor is to receive a finish (e.g. screed or an adjustable access floor) the concrete is to be laid to achieve a constant thickness.

When the composite floor is to be self finished (e.g. power trowelled) and is to comply with a level tolerance then the beams supporting the floor must be propped during concreting and the concrete laid to achieve the thickness noted on the drawings. The props must remain in place until the concrete has reached its specified 28 day strength.

INSPECTION/TESTING OF STEELWORK

465 SHEAR STUD TESTING

A minimum of 5% of the studs but not less than 2 studs per beam are to be tested using the following method.

- Carry out a bend test by bending the head of the stud towards the nearer end of the beam using a steel tube placed over the stud. The stud head should be displaced laterally by a distance of one quarter of the stud height. The stud weld should not show any signs of cracking or lack of fusion.
- Tested studs are not to be straightened.

471 TESTING AUTHORITY:

All tests are to be carried out by an approved specialist company proposed by the contractor

476 PRODUCTS: When requested submit a copy of test certificates for steel.

481 DEFECTIVE WORK: As soon as possible after any part of the work or any materials are known or suspected to be defective, submit proposals for further testing, inspection or replacement and obtain instructions.

GENERAL REQUIREMENTS FOR PROTECTIVE COATING WORK

510 SURFACES NOT REQUIRING COATING:
Top flange of all beams shown as composite

515 OPERATIVES must be appropriately skilled and experienced in the use of specified materials and methods of application.

520 COATING MATERIALS:
- Wherever possible, to be from one manufacturing batch. Where more than one batch is to be used, keep separate, allocate to distinct parts or areas of the work, and inform accordingly.
- Check that all coating materials to be used are recommended by their manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other.

521 ALTERNATIVE MANUFACTURERS: Coating materials to be obtained from one reputable manufacturer unless specified otherwise.

523 COMPATIBILITY OF PRIMER WITH INTUMESCENT COATINGS:
If coating types G10/ [641-646 Inc] need to be over coated with intumescent fire protection (applied by others) then the brand of primer must be compatible with the brand of intumescent coating (see section M61), for both general and fire conditions. Obtain relevant recommendations and evidence from the intumescent manufacturer, including fire test data to BS 476: Parts 20 and 21 and submit a copy to the engineer before proceeding with priming.

524 EPA REGULATIONS
The contractor shall ensure that all coatings comply with the requirements of the Environmental Protection Act.

525 PREPARATION MATERIALS AND ANCILLARIES: Types recommended by their manufacturers and the protective-coating manufacturer for the surfaces being prepared.

530 GALVANIZING: All cutting, welding and drilling must be completed beforehand. Provide all necessary vent and drain holes in approved locations and seal to approval after galvanising.

535 INSPECTION:
- Permit coating manufacturers to inspect the work in progress, including surface preparation, and to take samples of their products if required. Do not comply with any directions or requests given by the coating manufacturer's representative unless and until confirmed
- Notify of projected dates for start of surface preparation and coating.
- Give at least 7 days notice before coated members or components leave the works.

540 HANDLING AND STORING COATED STEELWORK:
- Use methods and equipment which will minimise chafing, chipping and other damage to coated components.
- Ensure an adequate drying/curing period for each coat before handling.
- Use suitable packings, lashings, lifting harnesses, nylon slings, rubber-protected chains and chocks, etc.
- Stack coated components clear of the ground, separated by timber chocks, and so that ponding does not occur.

545 PROTECTION:
- Protect freshly applied surface coatings from damage.
- Exhibit 'Wet paint' signs and provide protective barriers where necessary.
- Protect surfaces adjacent to those being covered.

550 REMEDIAL WORK:
- Early degradation of coatings by blistering, peeling, flaking, cracking, lack of adhesion, etc. must be

made good by complete removal, preparation and reapplication of all coats, as instructed.

- Inadequate dry film thickness or surface defects due to adverse weather may, depending on the type of paint, be remedied by rubbing down and applying further coat(s), as instructed.
- Mechanical damage to coatings must be made good by local cutting back of coatings, preparation and reapplication of all coats to leave a neat, continuous and flat finish.
- Where damage to coatings or subsequent surface preparation has exposed bare metal, it must be thoroughly cleaned and primed within two hours.

PROTECTIVE COATING SYSTEM(S)

620 PROTECTION SYSTEM A (GALVANIZING)

- Use/location: External plant platforms.
- Preparation: Blast cleaning to BS EN ISO 8501-1, preparation grade Sa2 using chilled iron grit grade G24 to give a coarse surface profile, followed by acid pickling.
- Galvanising: To BS EN ISO 1461, minimum average coating thickness 85 micrometres.

641 PROTECTION SYSTEM B (INTERNAL C1) (Not applicable)

- Use/location: All internal steelwork in buildings with neutral atmospheres – life to first maintenance 25 years.
- Shop preparation: Blast clean as NSSS clause 10.2 to BS EN ISO 8501-1, preparation grade [SA 2.5]
- Shop Primer: To BS EN ISO 12944: 1998
  Dry film thickness: 80 micrometres
  Colour: To architects approval.
- Shop intermediate coat: None
- Shop top coat: None
- Special requirements: If the contractor's fabrication method results in unpainted steel being stored outside between blasting and fabrication then a suitable blast primer shall be applied.

642 PROTECTION SYSTEM C (INTERNAL C2)

- Use/location: All internal steelwork in buildings where condensation may occur – life to first maintenance 15 years.
- Shop preparation: Blast clean as NSSS clause 10.2 to BS EN ISO 8501-1, preparation grade [SA 2.5]
- Shop primer: To BS EN ISO 12944: 1998
  Dry film thickness: 120 micrometres
  Colour: To architects approval.
- Shop intermediate coat: None
- Shop top coat: None
- Special requirements: If the contractor's fabrication method results in unpainted steel being stored outside between blasting and fabrication then a suitable blast primer shall be applied.

643 PROTECTION SYSTEM D (INTERNAL C3) (Not applicable)

- Use/location: All internal steelwork in production buildings with high humidity and some pollution – life to first maintenance 15 years.
- Shop preparation: Blast clean as NSSS clause 10.2 to BS EN ISO 8501-1, preparation grade SA 2.5
- Shop primer: To BS EN ISO 12944: 1998
  Dry film thickness: 160 micrometres
  Colour: To architects approval.
- Special requirements: If the contractor's fabrication method results in unpainted steel being stored

outside between blasting and fabrication then a suitable blast primer shall be applied.

644 PROTECTION SYSTEM E (EXTERNAL C3) (Not applicable)

- Use/location: All external steelwork for buildings in rural and urban areas with low pollution – life to first maintenance 15 years.
- Shop preparation: Blast clean as NSSS clause 10.2 to BS EN ISO 8501-1, preparation grade SA 2.5
- Shop primer: To BS EN ISO 12944: 1998
  Dry film thickness: 60 micrometres.
  Colour: Grey.
- Site intermediate coat : To BS EN ISO 12944: 1998
  Dry film thickness: 80 micrometres
  Colour: To architects approval.
- Site top coat: To BS EN ISO 12944: 1998
  Dry film thickness: 50 micrometres.
  Colour: To architects approval
- Special requirements: If the contractor's fabrication method results in unpainted steel being stored outside between blasting and fabrication then a suitable blast primer shall be applied.

645 PROTECTION SYSTEM F (EXTERNAL C4) (Not applicable)

- Use/location: All external steelwork for buildings in urban and industrial areas with moderate pollution – life to first maintenance 15 years.
- Shop preparation: Blast clean as NSSS clause 10.2 to BS EN ISO 8501-1, preparation grade SA 2.5
- Shop primer: To BS EN ISO 12944: 1998
  Dry film thickness: 60 micrometres.
  Colour: Grey.
- Site intermediate coat : To BS EN ISO 12944: 1998
  Dry film thickness: 100 micrometres
  Colour: To architects approval.
- Site top coat: To BS EN ISO 12944: 1998.
  Dry film thickness: 50 micrometres.
  Colour: To architects approval
- Special requirements: If the contractor's fabrication method results in unpainted steel being stored outside between blasting and fabrication then a suitable blast primer shall be applied.

646 PROTECTION SYSTEM G (EXTERNAL C5)

- Use/location: All external steelwork for buildings in industrial or coastal areas with high pollution/salinity – life to first maintenance 15 years.
- Shop preparation: Blast clean as NSSS clause 10.2 to BS EN ISO 8501-1, preparation grade SA 2.5
- Shop primer: To BS EN ISO 12944: 1998
  Dry film thickness: 75 micrometres.
  Colour: Grey.
- Site intermediate coat : To BS EN ISO 12944: 1998
  Dry film thickness: 120 micrometres
  Colour: To architects approval.
- Site top coat: To BS EN ISO 12944: 1998.
  Dry film thickness: 50 micrometres.
  Colour: To architects approval
- Special requirements: If the contractor's fabrication method results in unpainted steel being stored outside between blasting and fabrication then a suitable blast primer shall be applied.

PREPARATION FOR PAINTING

710 OFFSITE PREPARATION AND PAINTING to be carried out under cover in properly lit, heated and ventilated conditions.

715 INACCESSIBLE SURFACES: The sequence of working must be such as to ensure that surfaces inaccessible after assembly receive the full specified treatment and coating system including, if necessary, local shop application of site coatings.

725 MANUAL CLEANING OF NEW STEELWORK:

- Remove all fins, burrs, sharp edges, weld spatter, loose rust and loose scale to leave a clean but unpolished surface to BS EN ISO 8501-1, grade St 2.
- Thoroughly degrease and clean down. If using water based cleaners, remove subsequent rusting back to grade St 2.
- Apply primer without delay.

730 PREPARATION FOR SITE WELDING OF SHOP PAINTED STEELWORK:

- Blast clean and mask weld areas before coating surrounding areas.
- Alternatively prepare and shop paint weld areas as specified, then grind off to bare steel immediately before welding.

735 TREATMENT OF SITE WELDED JOINTS IN PAINTED STEELWORK:

- After welding, and without delay, remove all scale and weld spatter from the weld areas and remove all traces of rust, wash with clean water and allow to dry.
- Prime without delay and apply further coatings to the weld areas to match the surrounding painted areas.

740 BOLTED JOINTS (NON FRICTION GRIP):

- Where steelwork is to be shop painted, ensure that the full shop specification is applied to joint faces.
- Where steelwork is to be erected with a mill finish then site painted, prepare and prime joint faces before erection and allow to dry.
- Immediately before assembling bolted joints in externally exposed steelwork, apply a further coat of primer and bring the surfaces together while still wet.
- Before applying site coatings to externally exposed steelwork, seal all crevices to bolts and joint perimeters.

745 FAYING SURFACES OF FRICTION GRIP JOINTS:

- Blast clean and mask before coating surrounding areas. The masking must adequately protect the faying surface from deterioration and contamination.
- Remove masking immediately before bolting, check faying surfaces are free from adhesive, and clean if necessary.

750 FRICTION GRIP JOINTS IN SHOP PAINTED STEELWORK:

- After final tightening of bolts, and without delay, thoroughly degrease and clean bare steel at joint edges and prime as specified.
- Seal all crevices to bolts and joint perimeters.
- Apply further coatings to surrounding areas to match adjacent shop painted areas before applying specified site coatings.

755 UNCOATED FASTENINGS: After erection, thoroughly degrease and clean and, without delay, apply coating(s) to match surrounding shop painted areas before applying specified site coating(s).

760 GALVANIZED FASTENINGS: After erection, thoroughly degrease and clean and apply a suitable

etch primer before applying specified site coating(s).

765 SITE PREPARATION OF SHOP PAINTED STEELWORK: Carry out all necessary remedial work as specified. Prepare all surfaces as recommended by manufacturer before applying coats.

770 SITE PREPARATION OF GALVANIZED SURFACES FOR PAINTING: Thoroughly degrease. If metal coating is defective obtain instructions before proceeding. Remove any white corrosion products and allow to dry before applying specified etching wash or primer.

PAINTING

810 SUITABILITY OF CONDITIONS:

- Do not apply coatings:
  - To surfaces affected by moisture or frost.
  - Unless the steel temperature is at least 3 deg. C. above the dew point with conditions stable or improving.
  - Unless the relative humidity is below 85%.
  - When heat is likely to cause blistering or wrinkling.
- Take all necessary precautions including restrictions on working hours, providing temporary protection and allowing extra drying time, to ensure that coatings are not adversely affected by climatic conditions before, during and after application.
- Application of coatings will be taken as joint acceptance by the Main Contractor and Subcontractor of the suitability of surfaces and conditions within any given area.

815 APPLYING COATINGS:

- Multiple coats of the same material must be of a different tint to ensure that each coat provides complete coverage.
- Apply coatings to clean, dust free, suitably dry surfaces in dry atmospheric conditions and after any previous coats have cured adequately.
- Apply coatings evenly to give a smooth finish of uniform thickness and colour, free from brush marks, nibs, sags, runs and other defects.
- Keep all surfaces clean and free from dust during coating and drying. Adequately protect completed work from damage.

820 FILM THICKNESS:

- Check the thickness of each coat during application in accordance with BS EN ISO 2808.
- After each coat has dried measure the total accumulated dry film thickness
- If at any stage the accumulated dry film thickness is deficient; there may be a required application of additional coat(s) at no extra cost. The dry film thickness of the topcoat must be sufficient to give an even, solid, opaque appearance.

850 JUNCTIONS WITH CONCRETE: Where exposed steelwork is partially embedded or encased in concrete, apply two coats of an approved bituminous coating locally to the steel/concrete junction.