Pêches et Océans Canada
Fisheries and Oceans Canada

Garde côtière canadienne
Canadian Coast Guard

SPECIFICATIONS

REPLACEMENT OF FIXED AIDS TO NAVIGATION

Upper Champlain

FRONT LIGHT (FL) – DFO 2063

CONSTRUCTION OF CONCRETE FOUNDATIONS INCLUDING THE DISMANTLING, DEMOLITION AND DISPOSAL OF THE EXISTING TOWER AND FOUNDATIONS

CANADIAN COAST GUARD

CENTRAL AND ARCTIC REGION

INTEGRATED TECHNICAL SERVICES

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GENERAL INSTRUCTIONS, SECTION 1000

1 Background

1.1. The existing structure at the Champlain FL site (NLF 2063) is a Canadian Coast Guard (CCG) aid to navigation. The structure is showing signs of age. It has been decided to proceed with the complete replacement of this structure.

2 Description of work

2.1. The work under this mandate consists of the construction of one (1) concrete foundation and its related components. In addition, the contractor must dismantle the old steel structure and demolish the old foundation. All materials must be disposed of in an appropriate manner.

2.2. The work more specifically includes the following:

2.2.1. Mobilization/demobilization and support during the work;

2.2.2. Dismantling, demolition and disposal of a reinforced concrete foundation;

2.2.3. Construction of one (1) new reinforced concrete foundation (see plans in Appendix A);

2.2.4. Installation of grounding;

2.2.5. Site clean-up and restoration, including landscaping as described in section 5000 of the current specifications;

2.2.6. Preparation of as-built drawings and a short photographic report;

2.2.7. All other work described in these specifications and on the plans.

2.3. The specifics of the work to be performed on this site are described in detail in these specifications and on the plan in Appendix A.

3 Site location and access

3.1. The exact location of the site is described in Appendix A. The site is accessible by road.

4 Enquiries during tendering period

4.1. All enquiries, whether administrative in nature or regarding the scope of this mandate, should be directed to the Contracting Officer in the Fisheries and Oceans Canada Procurement Centre whose contact information is provided in the other tender documents.

5 Management and coordination during the work

5.1. Once the contract is awarded, the name of the CCG engineering representative in the Marine and Civil Infrastructure Division will be disclosed to the selected contractor. Frequent telephone calls with the representative will be required throughout the term of the contract. Communication will be conducted in French.

5.2. At the start of the mandate, the contractor shall provide the name of the construction manager, who the CCG departmental representative will be able to easily and quickly reach during normal business hours.

6 Documents required

6.1. One copy of the following documents must be kept on the work site:

6.1.1. Contract drawings;

6.1.2. Specifications;

6.1.3. Addenda (if required);

6.1.4. Amendments (if applicable);

6.1.5. Codes and standards listed in Paragraph 7 of this section;

6.1.6. Any other documents deemed useful or requested by the departmental representative.

7 Codes, standards and licences

7.1. Unless otherwise specified, the work must be performed in accordance with the latest versions of the applicable codes and standards, including:

- CAN/CSA–S37-18, CAN/CSA-A23.1/A23.2, CAN2-138-M80, CSA W186-FM1990 (C2016), CSA G30.18 (C2014), CSA G164-M1981, ASTM A121-81, ASTM A90-81;
- *Canadian Foundation Engineering Manual*;
- *National Building Code of Canada*;
- *Canadian Construction Safety Code*;
- *Canada Labour Code*;
- Landscaping with Plants and Landscaping - Inert Materials (Bureau de Normalisation du Québec);
- Any other applicable federal, provincial or municipal codes, standards or regulations.

8 Schedule

8.1. A Canadian Coast Guard workshop team will dismantle the existing tower during the week of September 19th 2022, prior to the demolition and to the construction works of the new concrete foundation described in the current specifications.

8.2. All work described in the current specifications must be completed by **October 22, 2021**. Works must not begin before September 26th 2022.

8.3. Within five (5) working days of contract award, a copy of the detailed schedule of work must be submitted as required by the departmental representative. The schedule will indicate the various stages of progress of the work and the anticipated completion date.

8.4. The departmental representative must be notified if the completion date of the work will be delayed due to circumstances beyond the contractor’s control. Written justification for such delay and a revised schedule must be provided.

8.5. All as-built drawings and photographic reports must be submitted within fifteen (15) working days of final acceptance of the work.

8.6. As for the earthworks these must be completed by May 2nd 2023.

9 Method of payment

9.1. The contractor must indicate a lump sum amount that will be collected once the entire mandate is completed to the satisfaction of CCG.

9.2. No payment will be made until the as-built drawings and photographic reports are received and accepted by the CCG representative. If necessary, CCG has the right to require the contractor to make corrections to the plans and reports or to have additional photographs taken if the photographs submitted are insufficient and not representative of the work performed.

10 Contractor's use of site

10.1. The contractor's movements must be limited to the areas indicated in Appendix A. The contractor must not operate in any way outside of these areas without the written permission of CCG or the owners of the land.

10.2. Throughout the period of the engagement, the contractor will:

10.2.1. Use existing access roads, construct and maintain suitable roads to allow access to the work sites as per CCG's rights of way;

10.2.2. Upon completion of the work, clean up the runways, taxiways and grounds that have been used by the contractor and restore them to their original condition to the satisfaction of the CCG representative as prescribed in Section 5000, Cleaning and Reclamation.

10.3. Unnecessary materials, equipment or residue must not accumulate on the premises. End-of-day clean-up is required on a daily basis.

10.4. The site is located on private property and may not be fenced during the work. The contractor will be responsible for the security of the unattended site.

10.5. The CCG representative has already contacted the owner of the land at #740. The owner is aware that the work will exceed part of his land. It is the Coast Guard's responsibility to follow up with this owner during the summer of 2022.

10.6. The Coast Guard has a right of way via the parking lot of the residence at civic number 736. The Contractor must contact the owner and the representative of the Coast Guard before the start of the work in order to coordinate everything. Materials provided and to be retrieved by CCG

11 Materials provided by CCG

11.1. Anchors for the structure will be provided to the contractor.

11.2. The CCG representative must be notified at least five (5) working days prior to the scheduled date to retrieve the anchors. Material pickup must be performed during the work schedule of departmental employees.

11.3. Materials provided by CCG must be verified before possession is taken, otherwise materials will be consider

11.4. ed complete and in good condition.

12 Staking out the location of the permanent structure to be built

12.1. The cen of the permanent foundation to be constructed must be positioned exactly at the centre of the existing structure. The CCG Geomatics Team will be responsible for installing the benchmarks prior to the start of construction. The contractor is responsible for locating the new foundation based on the CCG benchmarks.

12.2. Any uncertainty or ambiguity in the positioning of a structure in the field shall be immediately reported to the CCG representative prior to the commencement of work.

12.3. Accuracy of the construction of the works in relation to the location is essential. Tolerances are shown on the plans in Appendix A.

12.4. The elevation of the top of the foundation to be constructed is indicated on the plans in Appendix A.

13 Existing facilities

13.1. Before work begins, the contractor must determine the location and extent of any existing facilities, underground or otherwise, that may be damaged or displaced and must ensure that those facilities are protected.

13.2. If any facilities are discovered during the course of the work, the CCG representative must be notified immediately, and a written report of the findings must be provided within twenty-four (24) hours.

13.3. The contractor must repair and pay for any damage caused during the performance of the work.

14 Other documentation

14.1. The CCG representative may, for clarification purposes only, provide additional documents to the contractor to ensure that the work is performed correctly. These documents will have the same meaning and intent as if they were included in the contract documents.

15 English and French version

15.1. If there are ambiguities or inconsistencies between the French and English text in the specifications or on the plans, the French text will take precedence.

16 Preliminary meeting

16.1. A preliminary meeting between the contractor and the CCG representative will be arranged by the CCG representative prior to the commencement of the work.

16.2. The CCG representative will inform the contractor of the date and time of the meeting at least two (2) working days before the meeting.

17 Site visit

17.1. CCG will organize a site visit. Bidders will be notified of the exact date and time of this visit. All bidders will be acknowledged as having visited the site.

17.2. Recent photographs are attached as Appendix A for reference.

18 Safety measures

18.1. The contractor shall follow and enforce the safety measures for construction and demolition work as required by the *National Building Code*, the *Canada Labour Code*, the Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST) [labour standards, equity and occupational health and safety board], municipal statutes and agencies and any other recognized agency governing safety.

18.2. Where there is a conflict between the requirements of the above codes, standards and agencies, the more stringent requirement will be followed.

18.3. The CCG representative will conduct site visits to ensure the contractor’s compliance with these safety measures. In the event of non-compliance, the CCG representative will issue site directives. In the event of persistent non-compliance by the contractor, the representative may temporarily close the site until the situation is corrected.

18.4. Prior to the start of work, the contractor shall file and have approved by the CCG representative a health and safety plan.

19 Photographs and short photographic reports

19.1. The contractor shall take photographs at each stage of the work. A total of approximately twenty photos must be digitally submitted to the CCG representative prior to final acceptance of the work.

19.2. In addition, a short photographic report describing the work shall be provided in PDF format. This report must include dated photos with titles describing the work seen in the photo. The photos must be presented in chronological order.

20 Geodetic points

20.1. All geodetic points from Quebec’s geodetics service must be preserved. In the event of damage, the contractor shall be responsible for all applicable costs. This does not apply to CCG benchmarks.

ELECTRICITY/GROUNDING SECTION 01010

1 Grounding

1.1. In accordance with the *Canadian Electrical Code*, a 2/0 AWG conductor wire that has green insulation or is tinned will be buried or protected by PVC pipe where there is a risk of mechanical damage.

1.2. Grounding rods shall be copper, ¾ inches in diameter and 10 feet long.

1.3. Cadweld exothermic connections or an equivalent that are protected by the manufacturer's recommended coating must be used between the 2/0 cable and rods. The cable must be mechanically connected to the tower using a guy clamp instead of a joint. The cable must not be cut. The contractor must leave 10 additional feet of cable for the foundation.

1.4. The contractor shall determine and provide the length of wire required for installation.

1.5. The conductor will pass through a protective pipe in accordance with Paragraph 2.1 of this section.

1.6. The protective pipe must be securely fastened to the foundation on the top and side of the foundation to minimize the risk of damage.

QUALITY CONTROL, SECTION 2000

1 Procedure

1.1. The CCG representative and/or a laboratory representative shall have access to the work at all times. If any work is done off-site or in the workshop, it shall be accessible as the work progresses.

1.2. The contractor shall notify the CCG representative in writing at least 24 hours prior to when each sampling or quality control is scheduled.

1.3. In the event that the contractor has covered any work or allows work to be covered before it undergoes a prescribed inspection, approvals or tests, the work in question will be allowed to be uncovered, tested or inspected to the satisfaction of the authorities and then will be returned to its initial state.

1.4. The CCG may order the inspection of any part of the work that does not seem to be in compliance with the contract documents. If, after inspection, the work in question is deemed to be in non-compliance with the contract document requirements, the contractor shall take all necessary steps to render the work compliant and cover any inspection and repair costs.

1.5. The contractor shall provide the Coast Guard representative with data sheets and certificates of compliance for the backfill material issued by the supplier.

2 Mixes

2.1. Concrete batching formulas and granular material sizes must be provided to the CCG representative 72 hours before pouring.

3 Sampling

3.1. A minimum of one sample and measurement of the compaction of the granular materials being placed and compacted must be done by the CCG-contracted laboratory. The number of samples and measurements will be communicated to the contractor based on the recommendations resulting from discussions between the laboratory and the departmental representative. The contractor must allow and facilitate these measurements and samples to be taken.

3.2. Sampling of the plastic concrete must be carried out at each pour by this same laboratory.

4 Rejected work

4.1. Any defects found to be in non-compliance and rejected by the CCG must be removed, even if they already form part of the work. The work must be removed and replaced or re-executed in accordance with contract documents.

5 Work acceptance

5.1. CCG will conduct at least three (3) work acceptance visits. The first series of visits will take place while the underground work is being performed and will include an inspection of the excavations and the preparation of the base of the foundation and while the forms and reinforcement are being installed and the concrete is being poured. The second set of inspections includes cover provisional acceptance when the forms are removed. Final acceptance will take place at the very end of the project to validate that the work is correctly completed according to the list of deficiencies that will have been issued at the provisional acceptance.

5.2. The contractor shall provide at least two (2) working days of advance notice for the foundation quality control and for the CCG's provisional and final acceptances in order for the inspection visits to proceed.

SAFETY MEASURES, SECTION 3000

1 Construction safety measures

1.1. The contractor assumes full responsibility for occupational health and safety compliance while the work is being performed.

1.2. The contractor shall take the necessary measures to eliminate the risk of accidents while the work is being performed.

1.3. The contractor shall apply the safety measures prescribed by federal, provincial and municipal laws and regulations. In particular, the requirements of the *Canada Labour Code* and the Commission de la santé et sécurité au travail du Québec. In the case of conflict or discrepancy, the most stringent requirement applies.

1.4. Only persons who have successfully completed a fall protection and rescue at height training course are authorized to climb towers, whether for dismantling or any other task. Proof must be provided following the contract award.

1.5. The contractor must have a first aid kit and a first aid kit suitable for working at heights on metal scaffolding at all times on the work site. There shall be at least one person with a first aid certificate among the personnel performing the work at all times.

ENVIRONMENTAL PROTECTION, SECTION 4000

1 General

1.1. The work will inevitably impact the physical, biological and human environment. However, it is possible to reduce the impact of the work by respecting and applying certain simple measures. The contractor will have to complete and follow up with the mitigation measures monitoring form in Appendix C.

2 Work carried out near banks and the natural environment

2.1. Machinery must be kept dry at all times.

2.2. Machinery traffic zones must be limited to those shown in Appendix A.

2.3. The machinery used must create limited ruts.

2.4. Trees and their roots must be protected during the work. No trees shall be cut without the permission of the CCG representative and the property owners.

2.5. Machinery must be refuelled and repaired off site.

3 Pollution prevention

3.1. Sanitary facilities must be provided for personnel.

3.2. A mechanic must inspect the machinery and certify in writing that the equipment is in good condition and does not leak oil or other liquids that pose a risk to the environment. If a leak occurs, the equipment must be repaired immediately or removed from the job site.

3.3. An environmental response kit and absorbents for petroleum products will be available in case of accidental spills.

3.4. Fuel storage, maintenance and fuelling of various equipment shall be done in a manner that eliminates any risk of release to an aquatic environment.

3.5. Waste and dry materials will be covered to prevent wind blowing dust or debris.

3.6. Fires and burning of waste on site are not permitted.

3.7. Excavation will not be carried out during heavy rain.

3.8. All debris that accidentally enters the water must be removed as soon as possible.

3.9. In the event of an accidental spill, the contractor must:

- Characterize and dispose of any soil/sediment or water contaminated by an accidental spill in accordance with regulations prior to disposal off-site in an authorized location.
- All contaminated sediments will be placed directly in a truck or otherwise stored in a pile on a waterproof membrane and covered to prevent natural leaching and will be characterized.
- Off-site disposal of contaminated soil must be performed at an approved disposal site.

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CLEANING AND RESTORATION OF SITE, SECTION 5000

1 General

1.1. Clean up of the site and dispose of waste and demolition debris off-site must be performed in accordance with local regulations and pollution control laws.

1.2. The site must be resorted by grading the soil to as close to its natural condition as possible prior to the work.

1.3. Any area where the contractor has travelled to perform the work must be restored, including work areas and access roads.

2 Cleaning during construction

2.1. The work site and adjacent properties must be kept free of debris and trash. End-of-day clean-up is required on a daily basis. The work site and surrounding area must be safe for workers and the public.

2.2. The contractor shall, at their own expense, remove and dispose of waste and debris on site.

2.3. The contractor shall, at their own expense, provide land for the accumulation of such waste and other unnecessary materials and shall inform CCG of the location of that land.

2.4. The contractor shall not, at any time and under any circumstances, dispose of or accumulate waste or site debris outside the site lines or in the aquatic environment.

2.5. If necessary, the contractor shall be responsible for clearing snow from access roads and around the work site for the entire duration of the work.

3 Final cleaning

3.1. Final clean-up must be performed to prepare the job site for project acceptance on an interim basis or for issuance of the final certificate of completion.

3.2. Hard surface areas must be swept and other job site surfaces raked.

3.3. The site of all demolition materials, temporary facilities and equipment not salvaged by CCG must be cleared before a final inspection in requested.

4 Landscaping

4.1. The contractor must recreate landscaping that is identical to what was in place at the start of work and respect the technical landscaping standards and earthworks best practices set out by the Bureau de normalisation du Québec.

4.2. Sodding should be done with peat rolls.

4.3. As for the cedars that will inevitably have to be removed during the excavation, the Contractor will have to try to save them by temporarily replanting them further away. In the event that the cedars do not survive, the Contractor must replace them with the most mature cedars possible.

DOCUMENTS IN THE PROJECT FILE, SECTION 6000

1 Plans produced by the contractor

1.1. All engineering plans (if required) produced by the contractor must be signed and sealed by an engineer member of the OIQ and be approved by the CCG.

2 Plans on file

2.1. Shop drawings and data sheets of project components must be submitted in PDF format.

2.2. The contractor must provide CCG, upon completion of the work, with a red annotated copy of the as-built plans in PDF format.

2.3. The following information will be annotated in red:

2.3.1. Field changes to dimensions and performance details;

2.3.2. Changes made following modifications requested and orders received at the site.

DISMANTLING, DEMOLITION AND DISPOSAL, SECTION 8000

1 Description

1.1. This section details the requirements for the complete or partial demolition, removal and salvage of the various designated structures.

1.2. Specifically, dismantling, demolition and disposal work includes:

- The complete demolition of the foundation of the existing structure;
- The removal and transportation off-site of all residues, debris and equipment resulting from the demolition;

2 Condition of structures to be demolished

2.1. The structures must be demolished or removed in the condition they are in on the day the contract is awarded.

2.2. The foundation to be demolished consists of two concrete blocks. The blocks are estimated to contain approximately six (6) cubic metres of reinforced concrete. If the difference between the actual and estimated quantities to be demolished is greater than 10%, the price will be adjusted in proportion to the actual quantities demolished, both upwards and downwards. It is the contractor's responsibility to document this and prove to the departmental representative the actual quantities demolished.

3 Performance of work

3.1. The work described in paragraphs 1.1 and 1.2 of this section must be performed in accordance with the information on the plans, the directions of the CCG representative, the relevant standards and codes and the safety measures prescribed in Section 3000 Safety Measures of these specifications.

3.2. No debris or material from the dismantling or demolition work shall be allowed to fall freely or be thrown on the ground unless authorized in writing by the departmental representative. If the contractor would like to drop items during certain work, evidence must be provided that this method is appropriate and safe.

3.3. Unless otherwise specified, the site must be cleared of demolition debris in accordance with the requirements of the relevant authorities.

3.4. At the end of each work day, structures must be supported so they do not collapse or cave in.

EXCAVATION AND BACKFILL, SECTION 9000

1 Description

1.1. This section establishes the requirements for excavation and backfilling of soil and placement of granular bedding for foundations.

1.2. All recommendations for excavation and backfilling are found in Appendix A and Appendix B. As the geometric constraints inherent in the work to be built and the configuration of the land do not allow excavation according to the slopes indicated in the geotechnical report, a temporary support should be put in place to ensure the safety of workers and limit damage to the land. The recommendations from the geotechnical report presented in Appendix B referenced in Appendix A of this specification must be respected.

2 Materials

2.1. Non-swelling MG-20 granular material.

2.2. Class A sand, MG-112 or CG-14 granular material

3 Performance of work

3.1. The contractor must follow all the instructions in Section 4.3 Backfill provided in Appendix A and the geotechnical report M032438-A1 provided in Appendix B.

3.2. The bottom of the trench shall be properly cleaned of topsoil, other organic materials and any debris.

3.3. The bottom of the excavation pit must be kept dry. Pumped water must be managed according to Section 4000 Environmental Protection.

3.4. The base of the excavation must be inspected by a CCG-contracted laboratory.

3.5. Excavated material may be used in part to backfill the tower foundation. See Section 5.5 of the geotechnical report M032438-A1 provided in Appendix B.

3.6. Any unused excavation materials must be transported off-site in accordance with applicable environmental laws and regulations.

3.7. Granular materials (MG-20 and MG-112) must be placed in accordance with Section 4.3 of the plans provided in Appendix A regarding the maximum thickness of the layers and the compaction of the materials.

FOUNDATIONS, SECTION 10000

1 Description

1.1. This section establishes the requirements for the construction of the foundation of the structure to be installed.

1.2. The construction of the foundation includes the installation and removal of forms and the placement of reinforcing steel, concrete and anchor rods. The contractor must also install the tower anchors before the concrete is poured.

1.3. The contractor must install a drainage system on the site if water accumulates and must comply with the requirements of Section 4000 Environmental Protection.

1.4. The dimensions of the foundations to be constructed are shown on the plans in Appendix A.

2 Materials

2.1. **Concrete**

2.1.1. Concrete must be in compliance with CAN/CSA-A23 standard and display the characteristics established on the plan in Appendix A.

2.1.2. A maximum delay of two (2) hours is allowed between when the concrete mixer is loaded at the plant and is completely emptied. The concrete must always be kept at a temperature above 60 ^{o}C.

2.2. **Formwork**

2.2.1. Wooden forms must be made of plywood and lumber in accordance with the CAN/CSA-S269.3 standard.

2.2.2. Steel forms are also acceptable if they are clean and rust-free.

2.3. **Reinforcing steel**

2.3.1. Reinforcing steel must be sourced from a Canadian steel mill.

2.3.2. Reinforcing steel must be in compliance with CAN/CSA-G30 18M92 400R.

3 Location, orientation and elevation

3.1. Before work begins on the construction of the structure’s foundation, the departmental representative must be contacted to ensure that the centre of the foundation and its elevation can be located with certainty.

3.2. The centre of the foundation must coincide with the centre of the proposed structure as located in the field by the CCG.

3.3. The top of the foundation and anchors shall be at the elevation shown on sketch QE60620-C01. The contractor must refer to the markings placed by the Coast Guard Geomatics.

4 Excavation

4.1. Any existing foundation must be removed in accordance with the requirements of Section 8000 Dismantling, Demolition and Disposal of these specifications.

4.2. Excavation must be performed in accordance with the requirements of Section 9000 Excavation and Backfill of these specifications.

4.3. It is the responsibility of the Contractor to make sure to locate the underground pipe or wiring that could be found in the excavated portion. In this case, he must take steps to protect them during the excavation work. In the event that these are damaged during the work, the Contractor must repair them.

5 Formwork

5.1. Forms must be constructed to the shapes, sizes and levels specified on the plan in Appendix A.

5.2. Forms must be constructed to support the loads of the plastic concrete. Should the formwork break during the pouring process, the contractor is entirely responsible and liable for remedying the situation. The contractor must ensure that the shape of the foundation respects the requirements of the plans, even if the imperfection is underground.

5.3. No additional sum will be paid to the contractor in the event of formwork failure.

5.4. The interior walls of the wood or steel formwork must be oiled before the concrete is poured.

6 Reinforcing steel

6.1. Reinforcing bars must be bent mechanically when cold, if necessary.

6.2. Reinforcing bars must be installed clean and rust-free as shown on the drawings and in accordance with CAN/CSA-A23.

7 Anchor rods

7.1. The anchor rods must be fastened at the specified locations and in accordance with the requirements of CAN/CSA-A23. A template can be used that respects the dimensions indicated on the plan.

7.2. Before the concrete is poured, the departmental representative must approve the location and level of the anchor rods.

7.3. When applicable, the lower hooks of the anchor rods must face outward around each base plate.

7.4. An adjusting bolt must be added before the base plate is installed.

8 Pouring, finishing and curing concrete

8.1. Concrete must be poured in accordance with CAN/CSA CSA-A23.

8.2. Reinforcement and anchor rods must not be displaced when the concrete is being poured.

8.3. Concrete work shall be performed dry. The contractor must provide all the necessary equipment for drainage of excavations during the work.

8.4. All foundations must be poured on undisturbed and unfrozen ground.

8.5. The maximum free fall for pouring concrete is 1.5 metres.

8.6. The top of the foundation must be finished so as to allow the surface to drain to the outside.

8.7. Once the pouring is complete, forms must be left in place for at least seventy-two (72) hours and an appropriate curing agent must then be applied.

9 Precision on the positioning of the foundations

9.1. Horizontally, the maximum acceptable precision deviation is 10 mm between the crossing of the lines drawn from the stakes in place and the center of the structure to be built.

9.2. In elevation, any deviation greater than 10 mm with the elevations indicated in the plan is outside the tolerances and will be refused

LIST OF APPENDICES