Project Management Plan

Creston BC Fiber To The Home (FTTH)

Project Management Training Program
Calgary Immigrant Educational Society (CIES)

Final Project

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Executive Summary Executive Summary

Telus provided a contract to Hero Engineering to Produce de Engineering design and supervision of FTTH deployment in the City of Creston, BC.

This Project Management Plan document includes a detailed description of the project from the initiating through planning, executing to closing.

All process has been creates according with the best practices of PMI.

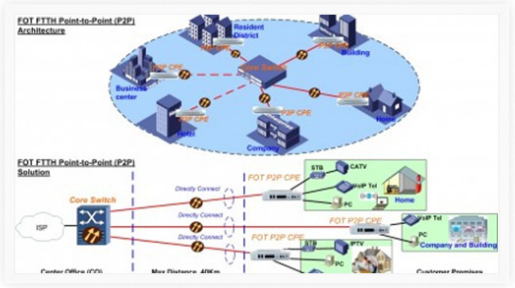
With an estimation of $ 300.000 for the engineering services, this project can be completed in a 12 month period.

The Hero Engineering experience within Out Side Plant (OSP) projects is guaranty that his project will be a total success.

1- Initiating Process

1.1- Background:

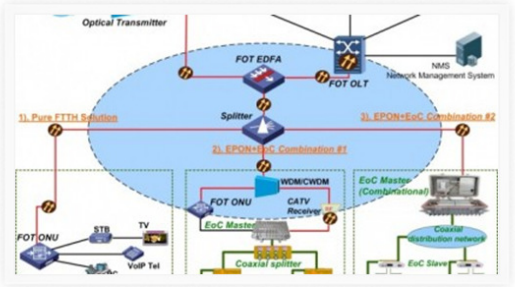
Over the past 20 years new technologies in telecommunication have made the Telecom Companies providers to shift from copper networks to Fiber Optics and coax networks or a mix of both.



P2P: Your Another FTTH Solution

- Easy to configure and plan.
- Future proof.
- Offers subscribers dedicated bandwidth.
- For residential and business customers.
- Flexible, combination of other topologies.
- Long reach.

Read More



EoC-Ethernet over Coax + FTTH EPON/GPON solution

- Traditional HFC (Hybrid Fiber Coaxial) solution.
- Fiber to the building + LAN in home solution.
- Fiber mixed with Copper,Competitive cost.
- EoC master to combine the CATV and Ethernet signal.
- Active/Passive EoC + FTTH EPON/GPON solution.

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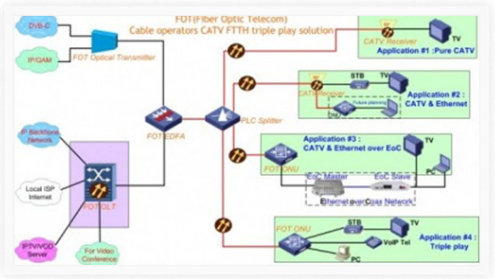
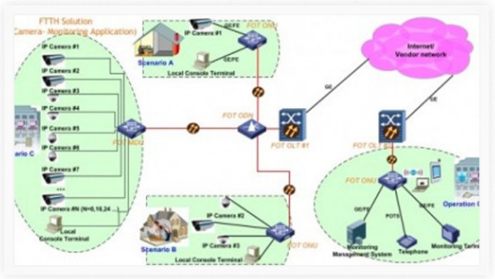


Cable operators CATV FTTH triple play solution

- Four Different CATV Application Scenarios in FTTH Solution.
- Pure CATV service application.
- CATV and Ethernet service application.
- HFC CATV and Ethernet service application.
- Ethernet+VoIP+CATV triple play FTTH application.

Read More



IP camera monitoring fiber optic network solution

- FTTH Solution with IP camera monitoring application.
- Intelligent IP Monitoring equipment location(Front-end solution).
- HQ or Remote Operation Center(Back-end solution).
- Various Application Scenario,based on demand.
- FOT EPON ONU/MDU(1,2,4,8/16/24...Ports).
- FOT ODN/PLC Splitter(1:4/1:8/1:16/1:32/1:64).
- Customerization solution.

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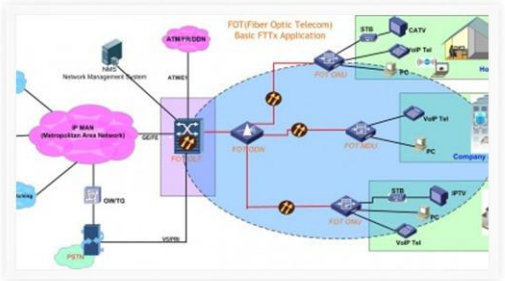
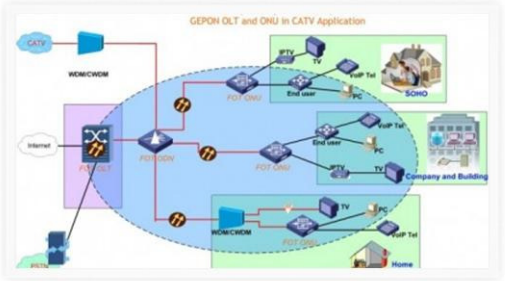


Basic FTTx Networks

- Internet/IMS/SoftSwitching,PSTN or ATM/FR/DDN intergration.
- EPON provides high upstream bandwidth.
- High-end residences/villas/houses or apartments(FTTH).
- Office or business(FTTO/FTTB).
- Internet Access, Voice, Video Conferencing.

Read More



GEPON OLT, ONU, ODN in FTTH application

- GEPON OLT, ONU, ODN in FTTH application.
- Internet Access,Voice,CATV service.
- VoIP, Video Conferencing,Multimedia service.
- Basic structure:OLT,ODN and EPON ONU..
- FTTH Field Trial & Deployment.
- FTTH Application Scenarios:CATV,VoIP,Monitoring etc.
- E-Home and E-Office Intelligent System

Read More

Telus has chosen the GPON technology to modernize its network in all Canadian provinces. GPON is a passive optical access network providing fiber directly to the home, capable of 80 Mbps downstream and 40 Mbps upstream.

This network technology enables the positioning of new and innovative TELUS broadband services at a competitive advantage.
Twisted pair copper is eliminated as the transmission medium as fibre cable will now connect TELUS network equipment directly to equipment in a broadband subscriber's home.

This will allow Telus offer new and better services to their subscribers.

Because Telus are interested in develop this technology rapidly in all BC urban areas, Telus has contracted some engineering companies to prepare the engineering, procurement and supervision of construction of some city areas.

HERO engineering has been hired by Telus to prepare the engineering of FTTH project in the city of Creston BC.

Business Need

In 2013, providers of telecommunications service provided retail services to over 12 million households and over one million businesses. Services are provided on a wholesale basis to over 800 providers of telecommunications service.

The market is gigantic and the competition is wild. So the few large players must move quickly to provide better services if they want to keep and increase their subscribers.

While the old fix line is replaced by the mobile phones, demande for high speed Internet and TV users have grown in small towns so the market must be satisfy by Telus.

1.2.- Project Charter:

Project Title: Creston BC Fiber To The Home (FTTH)
Project Sponsor: Homer Simpson (Telus BC) **Date Prepared:** 2014-12-10
Project Manager: Hernando Romero (Hero Engineering)
Project Customer: Telus BC

1.2.1 - Purpose and Justification:

According with Telus BC assessments, Creston wil be the 3th city in BC to develop the FTTH technology.

The advantages offered this technology is:

Fiber mixed with Copper,Competitive cost.

GPON is best suited for 'Greenfield' areas, that is, new areas with conduit directly to the home.

GPON can also be used for 'Brownfield' areas, which are, existing areas with aerial plant or conduit directly to the home, or areas with chronic cable problems.

The additional bandwidth capability will allow TELUS to protect and grow its Consumer revenue streams in the face of competition.

1.2.2. Project Description:

The project objective is

Designing the best option time/cost to connect the every single house in the city of Creston , BC with the Telus central office through a Fiber Optic Cable.
Provide an alternative option of connection.
Negotiate and prepare all legal constrains and permissions needed to install the new network.
Supervise the construction to ensure all technical aspects are respected.

The objective of this project is to build
Since engineering department at Telus BC has been loaded with an explosion of projects, Telus BC has decided to give the engineering services in outsourcing.

HERO engineering consultants has been hired by Telus to prepare the engineering of FTTH project in the city of Creston BC.

GPON architecture will be designed by Hero Engineering following the Telus Practices.

1.2.3-High Level Scope

Project consists in preparing the FTTH engineering services in order to deploy the FO cables and equipment in the city of Creston BC. Also include the supervision of construction.
List of *deliverables*

For each FSA

Preliminary drawings and reports to be approved by Telus.
All drawings and forms of right of way already accepted.
Construction drawings, reports and BMO sealed by licenced Engineer.
Supervision report and as built drawings.
Update report of client GSI.

Out-of-scope.:

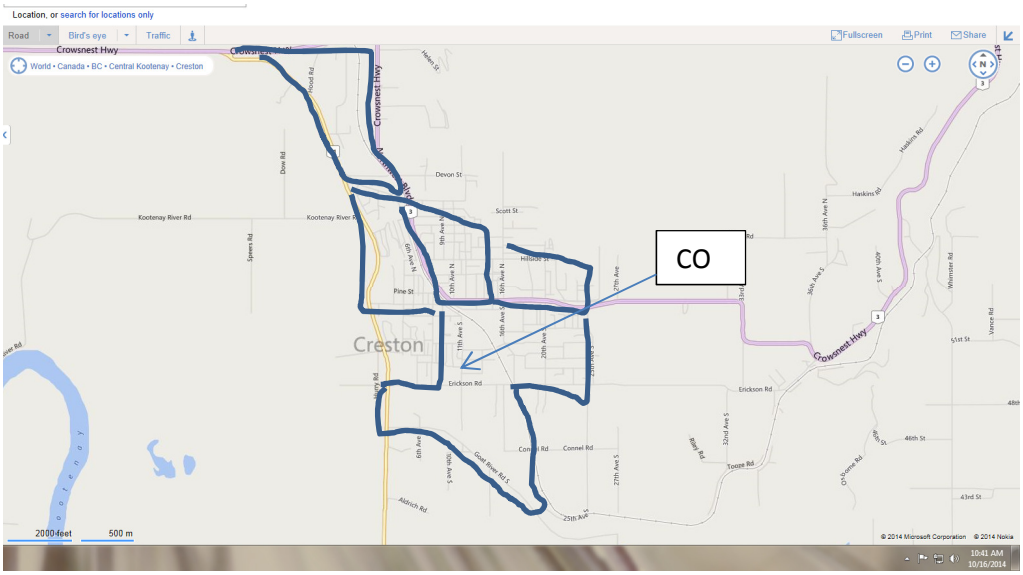
Construction services.

Construction materials.

1.2.4. Project and Product Requirements

Following general requirements must be respected
Since the project is an engineering service this not includes the construction itself.
Telus practices must be respected.
Al deliveries must be electronic according to Telus protocols.

Project will be divided in 6 FSA (fiber service area) to be designed and constructed. Each FSA will be schedule in a progressive manner. Construction of FSA 1 will be started while the other FSA are in design.



Telus provide HERO Engineering access to its data base to consult the Telus practices and to fed the Telus GSI and SAP systems

1.2.5. Acceptance Criteria:

Hero Engineering follow the technical constrains established by Telus for this type of projects.

Safety Telus policies must be respected.

Legal compliance: Complete project without permit violations.

Quality: All deliverables pass the final QC by HERO Engineering person in charge and by Telus QC. According with the standards and practices of Telus and CSA.

All the drawings reports and BOM must be sealed by a BC registered P.Eng.

All rights of way must be prepared and accepted before summit a delivery construction design.

1.2.6. Initial Risks: According with HERO Engineering experience, we ca identified the following risks

List of Possible Risks	Likelihood H/M/L	Impact H/M/L	What can we do about it?	Person Responsible
Right of way denied.	M	M	Change route	Designer
Telus system access interrupted.	M	M	Paper deliverables	PM
Access to the private or public property denied.	M	M	No service provided	Sponsor

1.2.7. Summary Milestones:

FSA 1:	
Delivery of draft report and drawings.	2015-04-01
All rights of way obtained.	2015-05-01
Delivery of final reports an construction drawings.	2015-06-01
Construction ends	2015-8-01
FSA 2:	
Delivery of draft report and drawings.	2015-05-01
All rights of way obtained.	2015-06-01
Delivery of final reports an construction drawings.	2015-07-01
Construction ends	2015-9-01
FSA 3:	
Delivery of draft report and drawings.	2015-06-01
All rights of way obtained.	2015-07-01
Delivery of final reports an construction drawings.	2015-08-01
Construction ends	2015-10-01
FSA 4:	
Delivery of draft report and drawings.	2015-06-01
All rights of way obtained.	2015-07-01
Delivery of final reports an construction drawings.	2015-08-01
Construction ends	2015-11-01
FSA 5:	
Delivery of draft report and drawings.	2015-07-01
All rights of way obtained.	2015-08-01
Delivery of final reports an construction drawings.	2015-09-01
Construction ends	2015-12-01
FSA 6:	
Delivery of draft report and drawings.	2015-07-01
All rights of way obtained.	2015-08-01
Delivery of final reports an construction drawings.	2015-09-01
Construction ends	2016-01-01

1.2.8. Estimating

This project is estimated to require $300.000 for the engineering services wish is about 10% of construction cost of the project. This estimation is based on previously done similar project and meetings with subject matter experts.

1.2.9. Project Manager Authority Level

	Name	**Role**	**Responsible for** (may reference main component or phase)
Sponsor	Homer Sipmsom Telus	Allocate Financial resources. Sing of scope changes. Technical verification.	
Project Manager	Hernando Romero	The Project Manager is responsible for developing, in conjunction with the Project Sponsor, the project charter. The Project Manager ensures that the project is delivered on time, within budget, and to the required quality standards	Manage and lead the project team. Manage the coordination of the partners and the working groups. Develop and maintain a detailed project
Team Member 1	Bart Simpson	Civil works design	Calculations and civil drawings.
Team Member 2	Lisa	Telecom design	Calculations and telecom drawings.
Team Member 3	Mou	Right of way	Negotiation right of way

Approvals:

Project Manager Signature — Sponsor or Originator Signature

Project Manager Name — Sponsor or Originator Name

Date — Date

2- Planning process

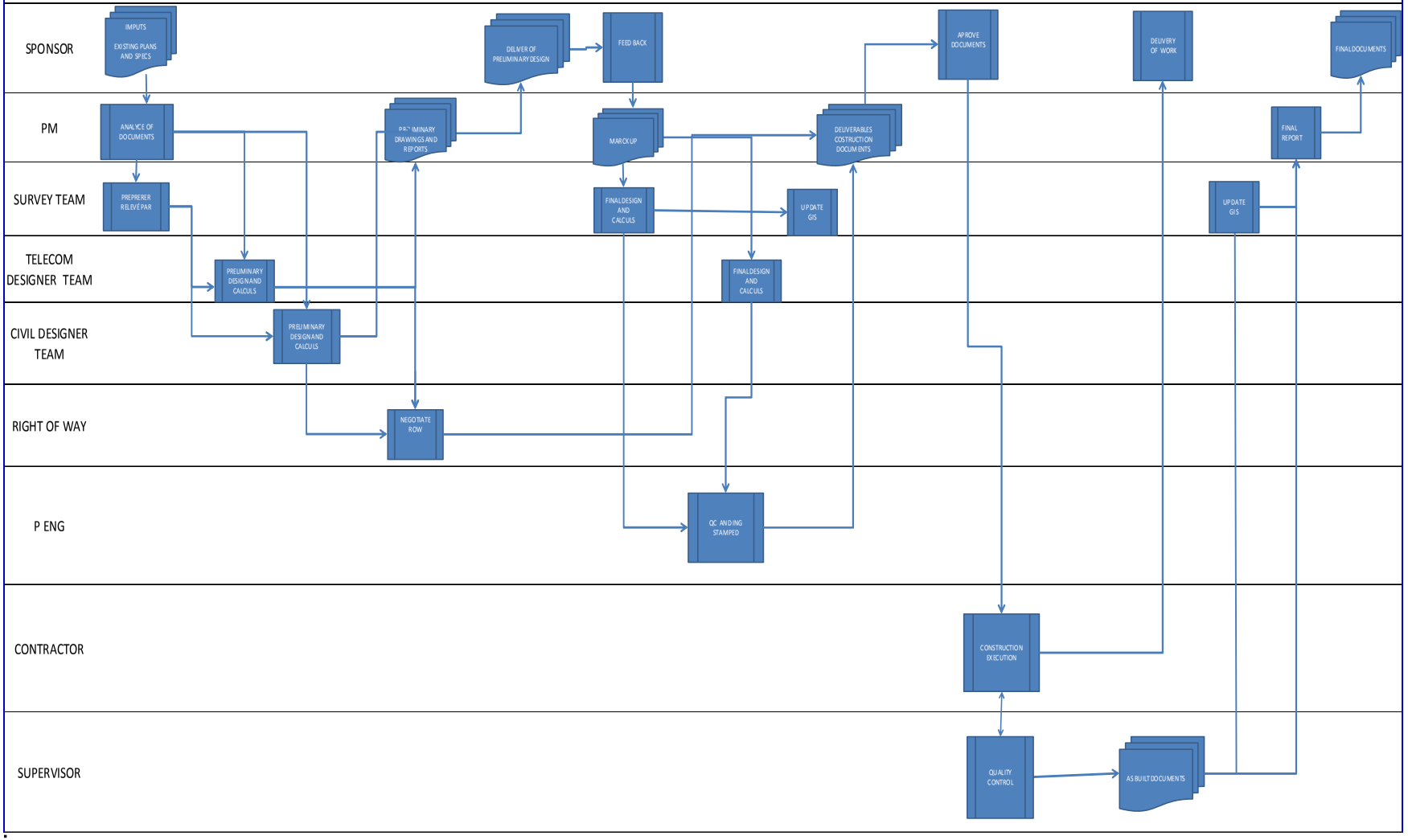
2.1 Integration Management

In this project, project manager from HERO engineering work together with sponsor who is Telus project manager to complete achieve objective.

2.1.1. Integration Management Approach

First, the project manager prepare the project charter to provide a formal authorization.
Kickoff meeting has been scheduled on January 30, 2015 at 10AM at Telus office to communicate responsibilities of key stakeholders, presente the documentation of the initial requirements, needs and specifications. After the project charter is signed by both the project manager and the project sponsor, the project manager will use the project charter for organizing all the required resources for the successful completion of the project.
See a flow chart to understand the integration management approach.

FTTH CRESTON PROJECT FLOW CHART



2.1.3. Manage Change

Project Changes**:** to allow the project to proceed on schedule and to provide a fully functional facility. The change may
be generated as a result of differing site conditions, errors in the design, or changes in the equipment specifications.

Changes requested can be the result of external changes or internal changes because the original aims of the project were not clearly understood in that case a form is designed to request ani change,

The Change Management Form is used to define, review, resolve and track changes.

CHANGE MANAGEMENT FORM

LOG # _____ REQUESTER: _____

DESCRIPTION OF REQUESTED SCOPE CHANGE

ANTICIPATED BENEFIT(S) OF THE CHANGE

-
-
-

IMPLICATION OF *NOT* MAKING THE CHANGE

IMPACT ANALYSIS OF THE CHANGE

- SCHEDULE _____
- COST _____
- QUALITY _____
- RESOURCES _____

OTHER ALTERNATIVES

-
-
-

DECISION

TASKS TO IMPLEMENT

TASKS	DUE DATE
_____	_____
_____	_____
_____	_____

2.2. Scope Management Plan

2.2.1. Scope Statement

The scope of the activities will be as follows:

HERO Eenginering is to provide survey and design services to TELUS that will include the following activities:

- Survey of the 6 FSA;
- Design of Fibre Distribution network for the 6 FSA;
- Pole line review with subsequent design, new strand & associated hardware (e.g. anchors);
- New main way Conduit (40-50mm) & service conduit (20mm);
- Service Vault & Boxes;
- Aerial Flex-Nap design, buried and underground distribution fibre cables, splice and NAP's
- Preparation of a list of material (BOM);
- Preparation and negotiate of right of way as needed.
- FTTH Construction Quality Assurance (contract inspector)

Methodology
To comply with TELUS' aggressive schedule, Dessau will mobilize a team of 6 skilled resources (4 designers and 2 surveyors) that will immediately start on 2 feeder routes and 2 FSA FTTH design. If necessary, 2 other resources will be added to the team beginning of April.

List of Deliverables
Dessau will deliver the following documents for each FSA that will be completed:

- Complete FSA design drawings including:
    - FSA base map (supplied by TELUS);
    - Long tail NAP location;
    - Long tail NAP port assignement;
    - Cable route design and size;
    - Splice location;
    - Cable numbering;
    - Fibres assignment information;
    - FDH location;
    - Strand and anchor requirements based on survey;
- List of material (BOM)
- Sag and clearance for existing strand with 60% rule
- Full pole load calculation on poles with anchor for new strand installation

The FTTH cable design will be provided in AutoCad format.

Out-of-scope.

Construction services.
Construction materials.

2.3. Time Management

2.3.1. Develop Schedule

The overall duration of the project is estimated at 14 months, starting on of February 1, 2015 And finishing on Mars 30, 2016, for the whole city.

Construccion of each FSA will be schedule separately and could. The pert diagram shown in the appendix presents the project schedule. Activity sequencing is used to determine the order of work packages and assign relationships between project activities. Activity duration estimating is used to calculate the number of work periods required to complete work packages.

2.3.2. Control Schedule

Schedule has been created using SmartSheet by the PM project team and any resources. The project team and resources must agree to the proposed work package assignments, durations, and schedule. The project schedule will be reviewed and updated as necessary on a weekly basis. The project manager is responsible for holding bi-weekly schedule updates/reviews; determining impacts of schedule variances; submitting schedule change requests; and reporting schedule status in accordance with the project's communications plan. The project team is responsible for participating in bi-weekly schedule.

2.4. Cost Management

The project manager will be responsible for managing and reporting on the project's cost throughout the duration of the project. During the monthly project status meeting, the PM will meet with the sponsor and executive manager to present and review the project's cost performance for the preceding month. Performance will be measured using earned value. The PM is responsible for accounting for cost deviations and presenting the project sponsor with options for getting the project back on budget. The project sponsor has the authority to make changes to the project to bring it back within budget. Payments will be allocated for each FSA as follow:

25% of estimating cost of engineering service as the beginning.
25/% at the delivery of the preliminary design.
25% at the time of delivery for construction documents.
And final balance will be paid at the end of construction as per unit price approved in initial offer:

- Aerial design including:
  - 3rd Party CSA - Neutral Down Pole Profiles, Client Strand Tension/Sag, Anchor/Guy requirements
  - $4,20/meter

- Underground:
  - $3,60/meter

- Permit preparation
  - Anchor municipality consent:$400.00
  - Fortis pole make ready:$400.00
  - Hand hole – service box replacement: $800.00
  - Crossing hydro – gas – railways: $2250.00
  - New poles line – MOT (max 2 km): $1000.00
  - Poles stacking (more than 5 poles): Hourly rate

Hourly rate for civil design:

The rates in the MSA with Dessau will apply as follows:

ATI activity definition	Hourly rate
OB Design Clerical	$45.00
OB Design Draftsperson	$50.00
OB Design Field Technician	$50.00
OB Design OPE Tech	$65.00
OB Design Professional Licensed	$95.00

Other terms of contract, outlining service level guarantees (performance, response, capacity etc.) and penalties will be defined in the contract.

2.5. Quality Management

2.5.1. Assure Quality

A “0A”version of the design (preliminary) will be provided to TELUS engineering department. Then, following a review, HERO Engineering will send the final “00” version.

Internal QC are performed by a P .Eng before delivery to the clent.

2.6. Human Resource Management

2.6.1. Roles and Responsibilities

	Name	**Role**	**Responsible for** (may reference main component or phase)
Sponsor	Homer Simpson Telus	Allocate Financial resources. Sing of scope changes. Technical verification.	
Project Manager	Hernando Romero	The Project Manager is responsible for developing, in conjunction with the Project Sponsor, the project charter. The Project Manager ensures that the project is delivered on time, within budget, and to the required quality standards	Manage and lead the project team. Manage the coordination of the partners and the working groups. Develop and maintain a detailed project
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Team Member 2	Lisa	Telecom design	Calculations and telecom drawings.
Team Member 3	Mou	Right of way	Negotiation right of way

Team Members 1, 2 and 3 select the team and internal environment that can influence the project.

2.7. Communications Management

STAKEHOLDER ANALYSIS WORKSHEET					
STAKEHOLDER	**COMMUNICATIONS NEEDS**		**CHALLENGES**	**COMMUNICATIONS PLAN**	
	OUR NEEDS	**THEIR NEEDS**		**VEHICLE**	**FREQUENCY**
Homero (Sponsor)	Special considerations to be approved if needed	Pricing variations and time delays	Not having lot of time to share with the team as he travels a lot	Mails any time / previously booked meeting	nce a week every Tuesday
Hernando (PM)	Follow up on progress / bridge with the team and legal department for permission requests	Constant feed back from team members	Operation of resear to be held in other province	Phone calls / Skype conferences / meeting with the team in place	Available to travel to place three days out of seven
Municipality	Approval drawings and other informations	Final construction plans	Respect phisycals restraints	Mails any time / previously booked meeting	any time
Hydro	Infrastructure disponibilitys	Joint use application	Find a good way whit the actual infrastructure	Mails any time / previously booked meeting	any time

3. Executing, Monitoring and Controlling Process

Controlling will be performed by Project manager. A monthly meeting is scheduled to evaluate the advancement and performance of team project. An evalution of team will be based on following criteria.

Team members feedback
Progress reports
Change requests
Risk identification reports
Schedule variances

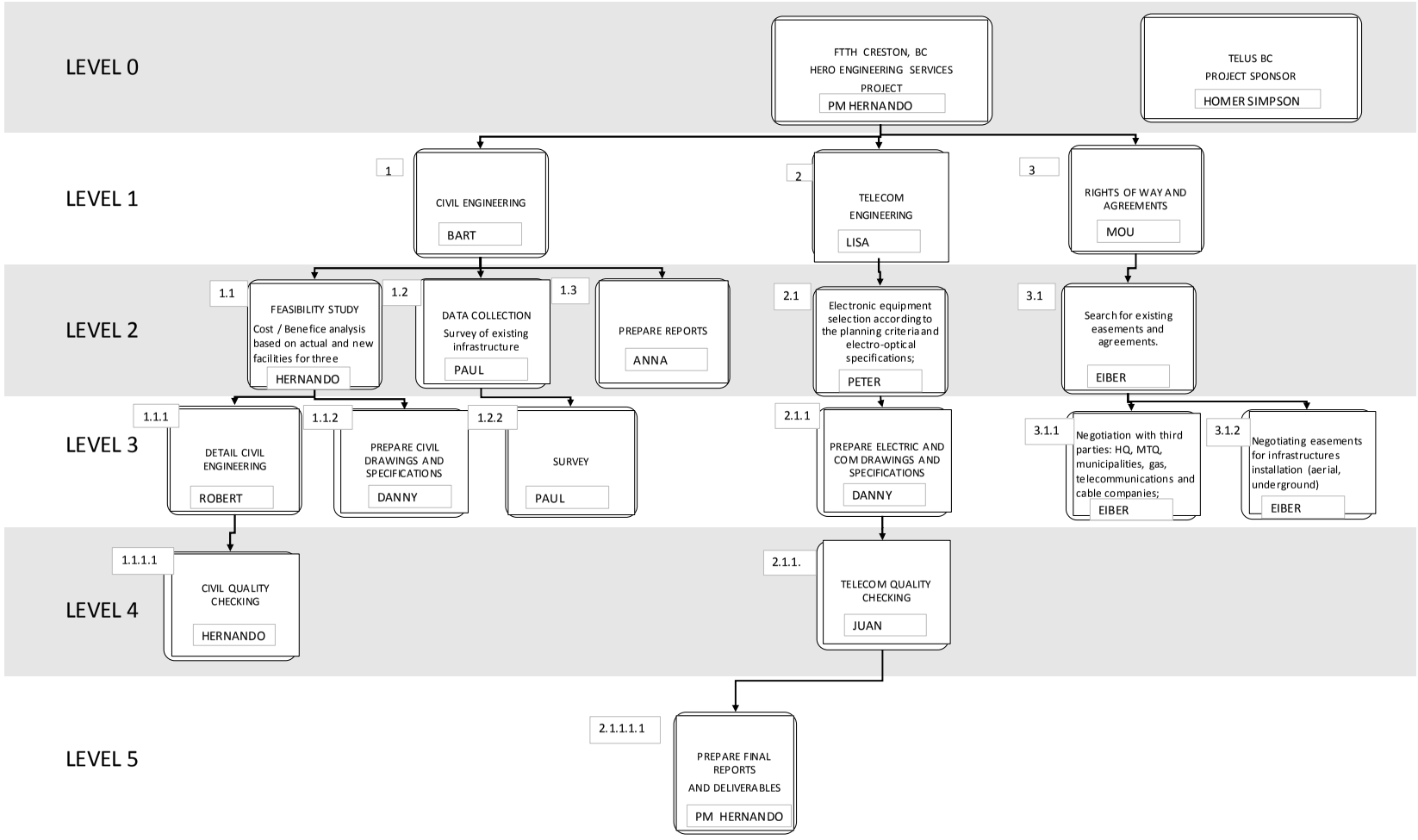
4.4. Contracts Closure

Project manager will work with the sponsor to ensure formal closing of all FSAs as soon as it is finish and close any contract agreements established for the project.

Appendix

WBS

Chart


LEVEL 0
FTTH CRESTON, BC
HERO ENGINEERING SERVICES
PROJECT
PM HERNANDO
TELUS BC
PROJECT SPONSOR
HOMER SIMPSON
LEVEL 1
1
CIVIL ENGINEERING
BART
2
TELECOM
ENGINEERING
LISA
3
RIGHTS OF WAY AND
AGREEMENTS
MOU
LEVEL 2
1.1
FEASIBILITY STUDY
Cost / Benefice analysis
based on actual and new
facilities for three
HERNANDO
1.2
DATA COLLECTION
Survey of existing
infrastructure
PAUL
1.3
PREPARE REPORTS
ANNA
2.1
Electronic equipment
selection according to
the planning criteria and
electro-optical
specifications;
PETER
3.1
Search for existing
easements and
agreements.
EIBER
LEVEL 3
1.1.1
DETAIL CIVIL
ENGINEERING
ROBERT
1.1.2
PREPARE CIVIL
DRAWINGS AND
SPECIFICATIONS
DANNY
1.2.2
SURVEY
PAUL
2.1.1
PREPARE ELECTRIC AND
COM DRAWINGS AND
SPECIFICATIONS
DANNY
3.1.1
Negotiation with third
parties: HQ, MTQ,
municipalities, gas,
telecommunications and
cable companies;
EIBER
3.1.2
Negotiating easements
for infrastructures
installation (aerial,
underground)
EIBER
LEVEL 4
1.1.1.1
CIVIL QUALITY
CHECKING
HERNANDO
2.1.1.
TELECOM QUALITY
CHECKING
JUAN
LEVEL 5
2.1.1.1.1
PREPARE FINAL
REPORTS
AND DELIVERABLES
PM HERNANDO

WBS

Projet FTTH CRESTON