業務指示書

パナマ国パナマ首都圏都市交通3号線整備事業支援（SAPI）

第１　指示書の適用

本指示書は独立行政法人国際協力機構(JICA)が実施する標記業務のうち、民間コンサルタント等（以下「コンサルタント」という。）により実施する業務に関する内容を示すものです。コンサルタントはこの業務指示書及び貸与された資料に基づき、本件業務に係るプロポーザル等をJICAに提出するものとします。

なお、本指示書の第２「業務の目的・内容に関する事項」、第３「業務実施上の条件」は、この内容に基づき、コンサルタントがその一部を補足又は改善し、プロポーザルを提出することを妨げるものではありません。

本指示書に係る質問期限：２０１６年2月１７日　１２時　まで (※)
問合せ先：調達部契約第一課　高橋　由徳　Takahashi.Yoshinori@jica.go.jp
質問に対する回答：２０１６年2月２４日　までにJICAホームページ上に行います。

(※)この期限内に今回に提出された質問に対しては、都度、回答を掲載することとします。この回答に対する質問も、この期限内であれば受け付けます。

第２　業務の目的・内容に関する事項－－－－－別紙のとおり

第３　業務実施上の条件－－－－－－－－－－－－別紙のとおり

第４　共同企業体の結成並びに補強の可否等

業務の規模が大きく、一社単独では望ましいレベルの業務従事者を確保することが困難であるか、又は業務の内容が広範にわたるため、業種又は分野ごと得意な社同士で共同企業体を結成することが望ましい案件について、競争を促進するために、必要最低限の範囲で共同企業体の結成を認める場合があります。

（各項目の（　）に○を付したものが、指示内容です。）

1　共同企業体の結成の可否

（　）認めません。
（　）認めます。
（○）認めます。ただし業務主任者（総括）は、共同企業体の代表者の者とします。
（　）　者までの共同企業体の結成を認めます。ただし業務主任者（総括）は、共同企業体の代表者の者とします。
（　）協力準備調査、その他先に行われた調査参加コンサルタント

は、構成員にはなれません。

注１）資格停止期間中のコンサルタントは、構成員になれません。
注２）共同企業体構成員との再委託契約は認めません。
注３）共同企業体の結成にあたっては、結成届をプロポーザルに添付し、プロポーザルに共同企業体結成の必要性を記載してください。

2　補強の可否

自社の経営者若しくは自社と雇用関係にある（原則、当該技術者の雇用保険や健康保険の事業主負担を行っている法人と当該技術者との関係をいう。複数の法人と雇用関係にある技術者の場合、主たる賃金を受ける雇用関係があるものをいう。）技術者の他業務従事状態から望ましいレベルの業務従事者を確保することが困難であるか、又は自社では確保が困難な担当分野である場合、自社と雇用関係のない技術者の「補強」を認める場合があります。

（各項目の（　）に○を付したものが、今回の指示内容です。）

（　）全ての業務従事者について、補強を認めません。

（○）以下の要件で、補強を認めます。

1）共同企業体でプロポーザルを提出する場合は、代表者及び構成員ともに、現地業務に従事するそれぞれの業務従事者数（通訳団員の配置を認める場合はそれらを除く）の１／２まで補強を認めます。

2）共同企業体を結成しない場合に限り、現地業務に従事する全業務従事者数（通訳団員の配置を認める場合はそれらを除く）の３／４まで補強を認めます。

【業務主任（総括）について】

（○）業務主任者（総括）については補強を認めません。

（　）業務主任者（総括）について補強を認めます。ただし、業務主任者が補強の場合には、副業務主任者（副総括）の配置は認めません。

【その他の業務従事者について】

（　）次の団員については補強を認めません。

（　）協力準備調査、その他先に行われた調査参加コンサルタント

からの補強は認めません。

注１）共同企業体を結成する場合、その代表者または構成員となる社は他社の補強になることは認めません。
注２）複数の社が同一の者を補強することは、これを妨げません。
注３）資格停止期間中のコンサルタントからの補強は認めません。
注４）評価対象業務従事者の補強にあたっては同意書をプロポーザルに添付してください。
　　評価対象外業務従事者については、契約交渉時若しくは補強を確定する際に同意書を提出してください。
注５）補強として参加している社との再委託契約は認めません。
注６）通訳については、補強を認めます。

3　外国籍人材の活用

（各項目の（　）に○を付したものが、今回の指示内容です。）

（○）外国籍人材の活用を認めます。

（　）業務主任者を除き、外国籍人材の活用を認めます。ただし、当該業務全体の業務従事者数及び業務従事人月のそれぞれ２分の１を超えない範囲において認めます。

（　）業務主任者を除き、外国籍人材の活用を認めます。ただし、当該業務全体の業務従事者数及び業務従事人月のそれぞれ４分の１を超えない範囲において認めます。

注）外国籍人材とは以下に該当する人材とします。
・プロポーザルを提出する法人に在籍する外国籍の人材で、常用の雇用関係を有するもの又は嘱託契約を締結しているもの
・プロポーザルを提出する法人の外部からの補強として当該業務に従事させる外国籍の人材。

第５　プロポーザルに記載されるべき事項

１　コンサルタントの経験、能力等

（１）類似業務の経験

（２）業務実施上のバックアップ体制等

（３）その他参考となる情報

注）類似業務：大規模公共公益運輸交通インフラ事業監理経験

２　業務の実施方針等

（１）業務実施の基本方針等

（２）業務実施の方法

（３）作業計画

（４）要員計画

（５）業務従事者毎の分担業務内容

（６）現地業務に必要な資機材

（７）実施設計・施工監理体制（無償資金協力を想定した協力準備調査の場合のみ）

（８）その他

注１）（１）と（２）を併せた記載分量は、 40ページ以下としてください。

注２）（４）要員計画について、評価対象外業務従事者の氏名及び所属先の記載は不要とし、契約交渉時、または遅くとも各業務従事者の作業開始時期までに双方で打合簿により確定するものとします。
なお、評価対象外業務従事者についての補強や外国籍人材の活用等については、契約交渉時、もしくは業務実施過程において、業務指示書で定める制限が遵守されていることを確認するものとします。

３　業務従事予定者の経験、能力等

業務にかかる総括責任者として、業務主任者（総括）を業務従事者の中から指名してください。なお、業務主任者に代えて、業務主任者と副業務主任者（副総括）を業務管理グループとして配置することを認める場合があります。

（１）業務管理グループ

業務主任者と副業務主任者の配置計画を併せて業務管理グループを提案する場合、その配置の考え方、両者の役割分担等の考え方等について記載願います

（各項目の（　）に〇を付したものが、指示内容です。）

（　）業務管理グループ（副業務主任者の配置）を認めない。

（〇）業務管理グループ（副業務主任者の配置）を認める（ただし、副業務主任者を補強とすることは認めない）。副業務主任者は1名を上限とする。

注）業務管理グループを認める全案件（業務指示書にて総括を1号以上としている案件を除く）においては、業務管理グループとしてシニア（46歳以上）と若手（35～45歳）が組んで応募する場合、３点の加点を行います。（「第９　プロポーザルの評価」参照）。

（２）評価対象業務従事者の経験、能力等

【業務主任者（総括／事業管理）】

（業務管理グループにおける副業務主任者（副総括）も同様の項目）

１）類似業務の経験：大規模公共公益インフラに係る事業管理に関する各種業務

２）対象国又は同類似地域：パナマ 及び全世界での業務の経験

３）語学力（語学は認定書（写）を添付）：英語

4）業務主任者等としての経験
5）学歴、職歴、取得学位、資格、研修受講実績等（照査技術者については必要資格の認定書（写）を必ず添付して下さい。）
6）特記すべき類似業務の経験（類似職務経験を含む。）

【業務従事者：担当分野　鉄道計画・設計総括】
1）類似業務の経験：モノレール事業計画に係る各種業務
2）対象国又は同類似地域：パナマ 及び全世界での業務の経験
3）語学力（語学は認定書（写）を添付）：英語
4）学歴、職歴、取得学位、資格、研修受講実績等（照査技術者については必要資格の認定書（写）を必ず添付して下さい。）
5）特記すべき類似業務の経験（類似職務経験を含む。）

【業務従事者：担当分野　鉄道駅建築計画・設計①】
1）類似業務の経験：鉄道駅舎計画に係る各種業務
2）対象国又は同類似地域：パナマ 及び全世界での業務の経験
3）語学力（語学は認定書（写）を添付）：英語
4）学歴、職歴、取得学位、資格、研修受講実績等（照査技術者については必要資格の認定書（写）を必ず添付して下さい。）
5）特記すべき類似業務の経験（類似職務経験を含む。）

【業務従事者：担当分野　橋梁計画調整】
1）類似業務の経験：橋梁計画に係る各種業務
2）対象国又は同類似地域：パナマ 及び全世界での業務の経験
3）語学力（語学は認定書（写）を添付）：英語
4）学歴、職歴、取得学位、資格、研修受講実績等（照査技術者については必要資格の認定書（写）を必ず添付して下さい。）
5）特記すべき類似業務の経験（類似職務経験を含む。）

第６　プロポーザルの提出手続き等

１　プロポーザルの提出期限、提出場所、提出物
（１）期限：　2016年3月11日　　１２時
（２）場所：JICA本部１階　調達部受付
（３）提出物：プロポーザル　正１部　　写　７部
　　見積もり　　正１部　　写　１部（次項第７参照）

２　プロポーザルの無効
次の各号のいずれかに該当するプロポーザルは無効とします。
（１）提出期限後にプロポーザルが提出されたとき
（２）提出されたプロポーザルに記名がないとき

（３）同一提案者から２通以上のプロポーザルが提出されたとき
（４）プロポーザル提出者（共同企業体構成員を含む）が全省庁統一資格結果通知書を取得していない、またはJICAの事前の資格審査を受けていないとき
（５）既に受注している案件、契約交渉中の案件及び選定結果未通知の案件と業務期間が重なって同一の業務従事者の配置が計画されているとき
（６）JICAが定める「独立行政法人国際協力機構契約競争参加資格停止措置規程」（平成20年規程（調）第42号）に基づく資格停止を受けている期間中である者又は当該者が構成員となる共同企業体からプロポーザルが提出されたとき（なお、プロポーザルの提出後であっても本指示書第８．２による審査結果の通知前に資格停止を受けたものを含みます。）
（７）虚偽の内容が記載されているとき
（８）前号に掲げるほか、本指示書又はコンサルタント契約関連規程に違反したとき

第７　見積価格及び内訳書

本件業務を実施するのに必要な経費の見積り（消費税を含まない）及びその内訳書正１部と写１部を密封して、プロポーザルとともに提出して下さい。見積書の作成に当たっては「コンサルタント等契約における見積書作成ガイドライン」を参照してください。
（URL：http://www.jica.go.jp/announce/manual/guideline/consultant/quotation.html）
（各項目の（　）に○を付したものが、指示内容です。）

（　）本業務における一般業務費の見積りについては、定率化方式とし、一般業務比率の上限は、

（○）契約全体が複数の契約期間に分かれるため、各期間分及び全体分の見積りをそれぞれに作成して下さい。
（　）第２、第３で記載した事項のうち下記については、分けて見積って下さい。

（　）現地の治安状況が不安定であることから、業務従事者に対し、戦争保険（戦争危険担保特約）あるいはこれに相当する保険を付保することができます。付保する場合は、その経費を見積もって下さい。

（○）航空運賃及びエクセス料金については、別見積りとしてください。
航空運賃を見積る場合には、ZONE-PEX運賃を上限の単価として見積りを行って下さい。「業務実施契約等における正規割引航空運賃の利用について／通知(PR)第9-27004号」によりビジネスクラスの利用が認められる業務従事者の渡航については、ビジネスクラス正規割引運賃までを上限の単価として見積りを行ってください。
なお、実際の航空券の手配にあたっては、上記見積額を上限としつつも、業務実施上の必要による経路の変更、予約の変更等の必要な緊急時の対応も考慮しつつ、より効率的であるとともに経済的な航空券の手配に努めてください。

（　）航空運賃及びエクセス料金については、別見積りとしてください。
航空運賃を見積る場合には、エコノミークラス普通運賃と制限付エコノミークラス（Y2）を比較のうえ、より安価な運賃を上限の単価として見積りを行って下さい。「業務実施契約等における正規割引航空運賃の利用について／通知(PR)第9-27004号」によりビジネスクラスの利用が認められる業務従事者の渡航については、ビジネスクラスの正規運賃までを上限の単価として見積りを行って下さい。

注）外貨交換レートは以下のレートを使用して見積もってください。
（ US$1 = 120.300 円 , EUR1 = 131.900 円）

第８　プレゼンテーション

プロポーザルを評価する上で、より効果的かつ適切な評価をおこなうために、業務主任者等から業務の実施方針等についてプレゼンテーションを求める場合があります。

(各項目の（　）に○を付したものが、指示内容です。)

（　）プレゼンテーションは実施しません。

(○) プロポーザル評価の一環として、以下の要領でプレゼンテーションを行っていただきます。その際、

（　）業務主任者がプレゼンテーションを行ってください。ただし、業務主任者以外に１名の出席を認めます。

（○）業務主任者又は副業務主任者、若しくは両者が共同してプレゼンテーションを行ってください。なお、業務主任者または副業務主任者のみがプレゼンテーションを行う場合は、業務主任者または副業務主任者以外に１名の出席を認めます。

（１）実施時期：　３月１７日(木)　　９:３０ ～ １２:００

(各社の時間は、プロポーザル提出後、別途指示します。)

（２）実施場所：JICA本部（麹町）２階　　２０８ 会議室

（３）実施方法：

１）一社あたり最大、プレゼンテーション10分、質疑応答15分とします。

２）プロジェクタ等機材を使用する場合は、コンサルタント等が準備するものとし、プロポーザル提出時、使用機材リストを調達部契約第一課・第二課まで報告するものとします。
機材の設置に係る時間は、上記１）の「プレゼンテーション10分」に含まれます。

（以下、各項目の（　）に○を付したものが、指示内容です。）

（　）上記（２）の実施場所以外からの出席を認めません。

（○）海外在住・出張等で当日JICAへ来訪できない場合、下記の何れかの方法により上記（２）の実施場所以外からの出席を認めます。実施日時は上記（１）で指定された日時です。

ａ）テレビ会議システム

ISDN回線を用いてコンサルタント等からJICA-Netに接続します。テレビ会議システムの準備はコンサルタント等が行うものとし、接続にかかる費用は、コンサルタント等の負担とします。
プロポーザル提出時に、接続先等（接続先名、ISDN番号、使用機器のメーカー名・銘柄、担当者のアドレス・電話番号）を調達部契約第一課・第二課まで報告するものとします。

注）JICA在外事務所のJICA-Netを使用しての出席は認めません。ただしJICA在外事務所主管案件の場合は、当該主管事務所からの出席を認めます。

ｂ）Web会議システム　(http://jica.webex.com/)

インターネット回線を用いてJICAが提供するWeb会議システムに接続します。接続先のURLや接続に係る初期設定については、調達部契約第一課・第二課より連絡します。

注）Skype等のIP通信サービスは利用できません。

ｃ）電話会議

上記ａ）、ｂ）とも不可の場合、通常の電話のスピーカーオン機能による音声のみのプレゼンテーションを認めます。コンサルタント等からJICAが指定する電話番号に指定した日時に電話をしてください。通話にかかる費用は、コンサルタント等の負担とします。

第９　プロポーザルの評価

１　プロポーザルの評価基準

本件業務では別紙のプロポーザル評価表に従いプロポーザルの評価（技術評価）を行います。
業務管理グループにおける副業務主任者（副総括）は業務主任者（総括）と同様の項目・基準で評価を行います。

注）業務管理グループを認める全案件（業務指示書にて総括を1号以上としている案件を除く）においては、業務管理グループとしてシニア（46歳以上）と若手（35～45歳）が組んで応募する場合（どちらが総括でも可）、一律３点の加点（若手育成加点）を行います。なお、45歳以下でも上位格付認定により1号以上となる場合は「シニア」とみなし、「若手」と組んだ場合は加点対象とします。（年齢は当該年度4月1日時点での満年齢とします。）ただし、「１．コンサルタント等の法人としての経験・能力」、「２．業務の実施方針」、「３．業務従事予定者の経験能力」の合計が70点未満の場合は、加点は行いません。

技術評価及び若手育成加点の結果、各プロポーザル提出者の評価点について第１順位と第２順位以下との差が僅少である場合に限り、第7により提出された見積価格を参考として交渉順位を決定します。
具体的には、技術評価点及び若手育成加点の合計の差が第1位の者の点数の2.5%以内であれば、見積価格が最も低い者に価格点として最大2.5点を加点し、その他の者に最低見積価格との差に応じた価格点を加点します。

（１）評価対象とする業務従事者の担当分野

総括／事業管理
鉄道計画・設計総括
鉄道駅建築計画・設計①
橋梁計画調整

（２）評価対象とする業務従事者の予定人月数

130.00 M／M

２　評価結果の通知

提出されたプロポーザルはJICAで評価・選考の上、　２０１６年３月３１日(木)　までにプロポーザルを特定し、各プロポーザル提出者に契約交渉順位を通知します。

３　評価結果の公表

評価結果については、以下の項目をJICAホームページに公開することとします。

（１）プロポーザルの提出者名

・契約交渉順第１位の者の名称のみを公開し、第２位以下の者の名称は非公開とする。

（２）プロポーザルの提出者の評価点

・以下の評価項目別小計及び合計点を公表する。
①コンサルタント等の法人としての経験・能力
②業務の実施方針等
③業務従事予定者の経験・能力
④若手育成加点＊
⑤価格点＊
＊④、⑤は該当する場合のみ（若手育成加点及び価格点については「第９　プロポーザルの評価　１　プロポーザルの評価基準」参照）。

・基準点に達しない者については「基準下」とのみ記載する。

第１０　その他

１　配布・貸与資料

JICAが配布・貸与した資料は、本件業務のプロポーザルを作成するためのみに使用することとし、複写又は他の目的のために転用等使用しないで下さい。

２　プロポーザルの報酬

プロポーザル及び見積書の作成、提出に対しては、報酬を支払いません。

３　プロポーザルの目的外不使用

プロポーザル及び見積書は、本件業務の契約交渉順位を決定し、また、契約交渉を行う目的以外に使用しません。

４　プロポーザルの返却

不採用となったプロポーザル（正）及び見積書（正）は、各プロポーザル提出者の要望があれば返却しますので選定結果通知後２週間以内に受け取りに来て下さい。また、不採用となったプロポーザルで提案された計画、手法は無断で使用しません。

５　虚偽のプロポーザル

プロポーザルに虚偽の記載をした場合には、プロポーザルを無効とするとともに、虚偽の記載をしたプロポーザル提出者に対して資格停止措置を行うことがあります。

６　プロポーザル作成に当たっての資料

プロポーザルの作成にあたっての参考情報は以下のとおりです。

（１）「プロポーザル作成ガイドライン」：

ＪＩＣＡホームページ「調達情報」中「調達ガイドライン、様式>>調達ガイドライン コンサルタント等の調達>>コンサルタント等契約におけるプロポーザル作成ガイドライン」

(URL: http://www.jica.go.jp/announce/manual/guideline/consultant/proposal.html)

（ハードコピーでの販売・配布は行っておりません）。

（２）業務実施契約に係る様式：

同上ホームページ「調達情報」中「調達ガイドライン、様式>>様式 コンサルタント等の調達 業務実施契約」

(URL：http://www.jica.go.jp/announce/manual/form/consul_g/index_since_201404.html)

（３）規程：

同上ホームページ「調達情報」中「調達ガイドライン、様式>>規程」

(URL：http://www.jica.go.jp/announce/manual/guideline/common/index.html)

（４）調達ガイドライン（コンサルタント等契約）：

同上ホームページ「調達情報」中「調達ガイドライン、様式>>調達ガイドライン コンサルタント等の調達」

(URL: http://www.jica.go.jp/announce/manual/guideline/consultant/index.html)

７　密接な関係にあると考えられる法人との契約に関する情報公開について

契約先に関する以下の情報をJICAホームページ上で以下のとおり公表することとしますので、本内容に同意の上で、プロポーザルの提出及び契約の締結を行っていただきますようご理解をお願いいたします。なお、案件へのプロポーザルの提出及び契約の締結をもって、本件公表に同意されたものとみなさせていただきます。

（１）公表の対象となる契約相手方取引先（共同企業体を結成する場合は共同企業体の構成員を含む。）

次のいずれにも該当する契約相手方を対象とします。

ア．当該契約の締結日において、JICAで役員を経験した者が再就職していること、又はJICAで課長相当職以上の職を経験した者が役員等(注)として再就職していること

注）役員等とは、役員のほか、相談役、顧問その他いかなる名称を有する者であるかを問わず、経営や業務運営について、助言することなどにより影響力を与え得ると認められる者を含みます。

イ．JICAとの間の取引高が総売上又は事業収入の３分の１以上を占めていること

（2）公表する情報

契約ごとに、物品役務等の名称及び数量、契約締結日、契約相手方の氏名・住所、契約金額とあわせ、次に掲げる情報を公表します。

ア．対象となる再就職者の人数、再就職先での現在の職名、JICAでの最終職名（氏名は公表しない。）

イ．契約相手方の直近の財務諸表におけるJICAとの取引高

ウ．総売上高又は事業収入に占めるJICAとの間の取引割合

エ．一者応札又は応募である場合はその旨

（3）JICAの役職員経験者の有無の確認日

当該契約の締結日とします。

（4）情報の提供

契約締結日から1ヶ月以内に、所定の様式にて必要な情報を提供頂くことになります。

8　本体事業からの排除

以下、各項目の（　）に〇を付したものが、指示内容です。）

（　）本件受注コンサルタント（ＪＶ構成員及び補強を含む。）は、本業務（協力準備調査）の結果に基づきJICAによる無償資金協力が実施される場合は、設計・施工監理契約以外の役務及び財の調達から排除される（その場合は、受注コンサルタント等が製造、販売する資機材も排除される）見込みです。

（　）本件受注コンサルタント（ＪＶ構成員及び補強を含む。）及びその関連会社／系列会社（親会社を含む。）は、本業務（詳細設計）の結果に基づきJICAによる有償資金協力が実施される場合は、施工監理業務（調達補助を含む。）以外の役務（審査、評価を含む。）及び財の調達から排除されます。

以　上

プロポーザル評価表
パナマ国パナマ首都圏都市交通3号線整備事業支援（SAPI）

評価項目	配点	
1．コンサルタント等の法人としての経験・能力	(10.00)	
（1）類似業務の経験	6.00	
（2）業務実施上のバックアップ体制等	4.00	
2．業務の実施方針等	(30.00)	
（1）業務実施の基本方針の的確性	12.00	
（2）業務実施の方法の具体性、現実性等	12.00	
（3）要員計画等の妥当性	6.00	
（4）その他（実施設計・施工監理体制）		
3．業務従事予定者の経験・能力	(60.00)	
（1）業務主任者の経験・能力／業務管理グループの評価	(24.00)	
	業務主任者のみ	業務管理グループ
①業務主任者の経験･能力　総括／事業管理	(19.00)	(10.00)
ア）類似業務の経験	7.00	4.00
イ）対象国又は同類似地域での業務経験	2.00	1.00
ウ）語学力	4.00	1.00
エ）業務主任者等としての経験	4.00	3.00
オ）その他学位、資格等	2.00	1.00
②副業務主任者	(—)	(6.00)
カ）類似業務の経験	—	2.00
キ）対象国又は同類似地域での業務経験	—	1.00
ク）語学力	—	1.00
ケ）業務主任者等としての経験	—	1.00
コ）その他学位、資格等	—	1.00
③体制、プレゼンテーション	(5.00)	(8.00)
サ）業務主任者等によるプレゼンテーション	5.00	4.00
シ）業務管理体制	—	4.00
（2）業務従事者の経験・能力：鉄道計画・設計総括	(12.00)	
ア）類似業務の経験	6.00	
イ）対象国又は同類似地域での業務経験	1.00	
ウ）語学力	2.00	
エ）その他学位、資格等	3.00	
（3）業務従事者の経験・能力：鉄道駅建築計画・設計①	(12.00)	
ア）類似業務の経験	6.00	
イ）対象国又は同類似地域での業務経験	1.00	
ウ）語学力	2.00	
エ）その他学位、資格等	3.00	
（4）業務従事者の経験・能力：橋梁計画調整	(12.00)	
ア）類似業務の経験	6.00	
イ）対象国又は同類似地域での業務経験	1.00	
ウ）語学力	2.00	
エ）その他学位、資格等	3.00	
（5）業務従事者の経験・能力：	( )	
ア）類似業務の経験		
イ）対象国又は同類似地域での業務経験		
ウ）語学力		
エ）その他学位、資格等		
総合評点	[100.00]	

第２　業務の目的・内容に関する事項

１．業務の背景

パナマ首都圏人口は約 170 万人（2010 年）であり、同国総人口の約２分の１が集中している。パナマ首都圏の都市交通システムは整備が立ち遅れており、都市バス或いは中距離バスは十分に都市交通ニーズに対応できていない。中南米地域の中でも、特に高い経済成長を背景とした自動車保有比率の高まりによる自家用車の通勤利用が増加の一途をたどっている。加えて、首都圏中心地の地価高騰により居住地域は辺縁部に拡大しており、首都圏中心地と辺縁居住地域との間で朝夕のピーク時間帯を中心に深刻な交通渋滞を発生しており、都市機能の麻痺を招いている。

パナマ首都圏は南側にパナマ湾を配し、東部・北部・西部に拡大してきているが、西部地域はパナマ運河渡河を要するため、居住地域としての開発は後発であったが、現在パナマ首都圏西部地域には総人口の約 12%が居住しており、近年の住宅開発を通じ急速に人口が増加している。特にパナマ運河西側から首都圏中心部の東側に向かう道路は片側 2 車線の一本道であり、アメリカ橋を中心とした朝夕のピーク時の深刻な交通渋滞が常態化しており、バスに代わる効率的な大量輸送公共交通システムの導入が急務となっている。

パナマ政府は「パナマ戦略計画 2015－2019」（国家開発計画）において、重点分野の一つに社会開発（生活の質向上）を掲げ、都市交通整備プログラムとして、メトロ公社による大量輸送交通システム整備を進めており、既に北側への都市交通１号線（MRT 方式）を 2014 年４月に運開し、目下東側への都市交通２号線（MRT 方式）の整備を進めている。西側に関する都市交通３号線の整備は、メトロ公社は我が国との合意によりモノレール方式により進めることを決定している。パナマ首都圏都市交通３号線整備事業（以下「本事業」という。）は、首都圏中心部と西側の主要都市であるラ・チョレーラまでをつなぐ都市交通 3 号線のうち、第一フェーズとして首都圏中心部のアルブルックターミナルから車両基地が建設されるシウダ・デル・フトゥーロまでの約 26 km を整備するものであり、前政権に引き続き、バレラ大統領政権の優先プロジェクトに位置付けられている。

本事業については、2014 年３月岸田外務大臣がデ・ソトパナマ外務大臣（当時）と外相会談を行った際に、円借款のプレプレッジが実施済みであるのに加えて、2016 年１月本事業に関する Memorandum of Cooperation（以下「MOC」という。）に両国政府間で署名し、本事業における本邦技術の活用、及び本事業の事業監理に対する支援の検討を確認した。

本業務は、本事業に関する入札準備から建設、供用開始まで事業実施主体で

あるパナマメトロ公社が行う事業の実施監理業務（プロジェクトマネージメント）を支援する。従って、技術移転を目的に行われる技術協力及び詳細設計等を供与することを目的に実施される D/D とは異なり、調査報告書を提供することを目的とする業務ではなく、事業実施主体であるパナマメトロ公社が行う必要な業務（プロジェクトマネージメント）自体を支援するものである。本業務を通じて、パナマ首都圏都市交通３号線整備事業が円滑に進捗し、事業効果が早期に発現することが期待される。

２．円借款事業の概要（案）

本件業務の対象となる円借款事業の概要は以下の通り。

(1) 事業名：パナマ首都圏都市交通 3 号線整備事業

(2) 事業概要

① 事業目的：本事業は、パナマ首都圏西部地域と中心部をつなぐ都市交通3号線を、十分な安全かつ信頼性のある都市交通システムとしての商業運行実績を有する質の高いモノレールの車輌及びシステムの導入を通じて整備することにより、パナマ首都圏の都市交通の円滑化を図り、もって交通渋滞及び大気汚染の緩和を通じた都市環境の改善及び気候変動緩和に寄与するもの。

② 事業内容

1）都市交通 3 号線に係るモノレール車両・関連機器調達（十分な安全かつ信頼性のある都市交通システムとしての商業運行実績を有する質の高い調達先を指定）

2）都市交通 3 号線第一フェーズに係る軌道（アルブルック～シウダ・デル・フトゥーロ間約 26 km）・駅舎等整備に係る土木工事（パナマの調達制度に基づくデザイン・ビルド方式）（なお、上記 1）及び 2）は基本的に一つの契約パッケージとなる想定。）

3）コンサルティング・サービス（基本設計、入札図書作成、調達支援、施工監理、及び第 4 架橋とのインターフェイス調整等）（本業務）

(3) 事業対象地域：パナマ首都圏西部

(4) 事業実施機関：パナマメトロ公社（Metro de Panama, S.A.）（以下、「メトロ公社」という。）

３．業務の目的

本業務は本事業に係る基本設計作成、入札図書作成支援、入札準備、入札評価支援からデザイン・ビルド方式による建設期間中の施工監理、第 4 架橋とのインターフェイス調整、事業実施に係る関係機関との調整、モノレールの供用開始に至るまで本事業の円滑な進捗を支援するもの。

４．業務の範囲

コンサルタントは「３．業務の目的」を達成するために、「５．業務実施上の留意事項」を踏まえた上で、「６．業務内容」に示す業務を実施すること。なお、本業務実施期間中に作成される文書については、メトロ公社の承認を受け、メトロ公社による承認証明及び作成された文書を JICA に提出すること。

５．業務実施上の留意事項

5.1 本業務に係る合意文書

メトロ公社と JICA は、本業務開始に先立ち、本業務に係る合意文書を締結予定である。本業務を実施するにあたっては、同合意文書を理解し、設計条件、設計範囲、設計の詳細等を含め合意の内容を満たす提案及び業務を実施すること（本業務指示書を構成する文書として、同合意文書に添付される本案件の TOR（英文）を別添（ANNEX1）のとおり添付する）。

また、本業務への提案書作成に際しては、締結予定の同合意文書（案）も含む本業務に係る協議録（英文）を配布資料として配布する。

5.2 基本設計について

基本設計には、線形、支障物リストの作成、迂回路の基準及び仕様の設定、駅舎、変電システム、軌道、車両基地への経路及び車両基地、バス、タクシー等他の陸上交通とモノレールとの乗継所、関連施設（安全、モノレールの機能性の観点から必要な設備）、都市交通（鉄道）との効率的な接続の検討、各種技術要件の設定、積算及び事業実施スケジュールの検討、シウダ・デル・フトゥーロからラ・チョレーラまでの延伸（第二フェーズ）の概念レベルの検討等が含まれる。

5.3 第 4 架橋整備事業との調整

都市交通 3 号線はパナマ運河に建設予定の第 4 架橋（斜張橋）を渡る計画である。第 4 架橋にモノレールが問題なく走行できるよう、本業務において公共事業省（第 4 架橋建設事業の実施機関）及び第 4 架橋建設事業の支援コンサルタント、第 4 架橋のコントラクターと、橋梁の設計基準、仕様、技術要求等必要な調整を行い、橋梁建設期間中も本事業の目的達成のために必要な調整を行うこと。

5.4 都市交通 3 号線の延伸計画、沿線開発、及び対象地域の都市化考慮

都市交通 3 号線は将来的にシウダ・デル・フトゥーロからラ・チョレーラまで

の延伸が計画されており、延伸に対応できる基本設計及び設計仕様の設定を行うこと。また、線形計画、駅舎の位置提案、駅舎の設計等では、将来的な沿線開発、都市化を考慮した上で行うこと。また事業監理においてもコントラクターによりこの点が履行されていることを確認すること。特にアルブルック駅の基本設計では、本事業建設中に都市交通 1 号線の運行を妨げることなく、完成後はスムーズに旅客が乗り換え等移動できるように考慮した設計とすること。

5.5 安全性及び快適性

本事業の安全性、快適性、災害・停電・火災等の非常時への対策（対応）を考慮の上、基本設計、仕様設定を行うこと。特に、都市交通 3 号線は高架のモノレールとなるため、非常時の対策については複数の案を検討しメトロ公社と入念に相談を行った上で基本設計を行い、事業監理においてもコントラクターによりこの点が履行されていることを確認すること。

5.6 広報

日本及びパナマにおいて、本業務が JICA の支援により実施されていることの積極的な広報を行うよう工夫すること。

5.7 本業務コンサルタントの責任範囲

本業務コンサルタントの責任は以下「6. 業務内容」の範囲となる。本業務コンサルタントは主に基本設計作成、入札図書作成支援、入札準備、入札評価支援、本事業の施工監理、第 4 架橋整備事業との調整等を行う。施工監理業務は、デザイン・ビルド方式で実施される建設契約について、コントラクターの履行確認を行うものである。本事業の設計・施工に係る責任はコントラクターが負い、事業支援コンサルタントが数量計算・設計等に係る責任を負うことはない。

5.8 本業務コンサルタントの管理体制

(1)指示系統

メトロ公社が本業務コンサルタントに日々の業務指示を行い、本業務コンサルタントの作成文書（設計図等技術文書含）への承認及び業務承認を行う。同承認を以て事業の進捗確認とし、JICA は本業務コンサルタントに支払いを行う。他方、メトロ公社からの依頼及び指示が通常の大規模都市交通インフラに求められる水準に比して過大であり、契約書特記仕様書の範囲を逸脱すると考えられる場合、あるいは、メトロ公社の依頼及び指示により本契約金額の増額が必要な場合には、作業を開始する前に、JICA エルサルバドル事務所乃至中南米部に相談すること。

(2)品質管理体制
本業務コンサルタントは業務の品質管理のため、基本設計の照査を行い、コンサルタント内部の品質管理・検査体制を確立する。また、JICA は円借款案件監理に加え、本業務コンサルタントの業務管理のため、短期・長期の有償資金協力専門家の派遣や職員等による定期的な監査の実施を行う予定。本業務コンサルタントは JICA の雇用する専門家及び職員等から求められた場合、適切に情報を提供し専門家等の協力すること。
(3)文書の使用権利
メトロ公社は本業務コンサルタントの作成文書を承認した時から、同文書の使用権利を有する。作成文書には下記「7. 本業務コンサルタントによる作成文書」に記載された全文書が含まれる。

5.9 本事業の入札形態
本事業に係るコントラクターの入札について、基本的に都市交通 1 号線、2 号線と同様の入札方法が採られる予定である。本業務コンサルタントは、JICA と確認しつつ、最適な入札方式を提案し、メトロ公社の検討を支援すること。

5.10 本業務は事業に附帯する技術支援である。本事業中止となる場合は、本業務の対応について JICA と協議の上決定すること。

5.11 作成する図面の種類、縮尺等については、業務開始時にメトロ公社と調整、合意したものを用いること。

5.12 メトロ公社がサプライヤー（Nominated Subcontractor）と締結予定の技術合意（同コントラクターが提供する機器等について規定された文書）について、合意文書作成支援を行うこと。

5.13 瑕疵担保責任及び善管注意義務について
（1）前期の業務に関して、受注者は瑕疵担保責任を負います。瑕疵担保責任の期間は、メトロ公社による成果品の承認及び JICA の確認（検査合格）の日から 1 年 6 か月とします。以下の契約書ひな形の（瑕疵担保等）の条文を参照下さい。
http://www.jica.go.jp/announce/manual/form/consul_g/ku57pq00001mp316-att/ind_cont_keiyaku_140801.pdf
（2）後期の業務に関して、受注者による善管注意義務違反については、JICA はその是正を求め、是正ができない場合には損害の賠償を求めることができる

こととします。後期の業務に関する契約締結時に以下の条文を盛り込む予定です。

【契約書の条文案】

（債務不履行） 第〇〇条　受注者の責に帰すべき理由により、受注者による本契約の履行が本契約の本旨に従った履行と認められない場合、又は、履行が不能になった場合は、発注者は受注者に対して、完全な履行を請求し、又は履行に代え若しくは履行とともに損害の賠償を請求することができる。

5.14　契約書について

（１）前期の契約は、成果品（基本設計等）の完成に対して対価を支払う請負的性格を有することを踏まえ、業務実施契約約款に瑕疵担保等に関する条項を追加した契約書とする。

（２）後期の契約は、主たる業務が施工監理という役務提供であり、委任的性格を有することから、そのような性格と整合するよう業務実施契約約款に所要の修正を加える予定。

（３）前期及び後期の契約に規定される「第三者に及ぼした損害」に関する条項（業務実施契約約款第 10 条を参照）において、「第三者」にはメトロ公社を含むものとします。

６．業務内容

6.1 業務実施計画書の作成

本業務（基本設計及び施工監理）の基本方針、項目と内容、行程、手順、実施スケジュールなどを検討し、業務実施計画書を作成する。なお、内容に関しては JICA との協議を行うものとする。

6.2 インセプションレポート（以下「IC/R」という。）の作成

既存 F/S、既存関連資料、調査対象地域における関連計画、関連情報の分析・検討を行い、本円借款事業の全体像を把握する。併せて、メトロ公社と JICA が合意した本業務内容を理解し、同内容を踏まえた本業務の基本方針、項目と内容、行程、手順、実施スケジュールなどを検討し IC/R を作成する。メトロ公社に対し IC/R を説明・協議し、JICA と確認をしながら、メトロ公社の合意を得るものとする。

6.3 本円借款事業の協力準備調査及び関連調査のレビュー

既存協力準備調査で検討されたパナマ首都圏における都市交通整備事業計画、路線計画、事業実施計画をレビューし、計画の概要を把握する。第 4 架橋建設事業に係る既存協力準備調査及び最新の事業計画を確認し、本事業実施のために必要な技術的調整を検討する。

6.4 技術文書作成

本事業を実施するコントラクターの選定に用いる入札図書作成に必要となる技術文書を作成する。同文書には、コントラクターの業務、技術仕様・技術要件、設計仕様、基本設計、土木及び据え付けの仕様、鉄道システム及び機器の機能的及び技術的仕様、数量計算等の設計に係る補足文書、及びメトロ公社とサプライヤーが締結予定の合意文書案が含まれる。（設計仕様及び基本設計については下記 6.5～6.7 を参照）

6.5 設計基準の設定

(1) 土木構造物

土木構造物の設計基準の設定にあたって、以下に示す技術諸元を定めると共に、設計荷重、構造細目等が記されている準拠すべき設計基準を決定することとする。

1)車両限界　2)建築限界　3)平面曲線半径　4)緩和曲線長　5)緩和曲線間の直線長　6)最急勾配　7)縦断曲線　8)施工基面幅　9)プラットホーム形式

(2) 鉄道システム

電気・信号・通信・車両の設計基準の設定にあたって、以下の設備について、維持管理及び将来計画との整合性を考慮した設計基準を作成する。

1)車両　2)信号設備　3)通信設備　4)自動運賃収受設備　5)変電設備　6)配電設備　7)架線設備　8)軌道　9)車両検収設備　10)駅設備（照明、垂直移動設備、空調換気設備、プラットホームドア、衛生設備、防災設備）　11)保守設備

(3) 設計基準設定時の留意点

土木構造物及び鉄道システムの設計基準設定に際しては、都市交通 3 号線の機能性のみならず、安全基準、品質、快適性、コストの合理性、地形、環境、規制（マルコス・A・ヘラレルベルト空港による航空制限等）、事業実施地域における地震、他の交通機関への接続、及び第 4 架橋への擦り付け等を考慮した上で作成すること。設計基準の一部として、都市交通規則、航空規則、建設規則等本事業実施に際する関連規則をまとめること。

6.6 設計仕様書の提案

(1) 土木構造物

6.5.(1)を整理した結果を踏まえ、高架、駅舎、車両基地等の設計仕様書・土木構造物編（案）を提案するものとする。

(2) 設計仕様書の提案（鉄道システム設備）

6.5.(2)を整理した結果を踏まえ、鉄道システム、駅設備等の設計仕様書（鉄道システム設備編）（案）を提案するものとする。

6.7 基本設計

本業務の業務計画で設定された期間及び上記 6.6 の設計仕様に基づき、基本設計を行うこと。設計の際には、過去のデータに基づき 100 年に 1 度の頻度で起こる大雨の表面流出量やその他自然災害の影響も考慮し、鉄道システムと土木工事の取り合い（インターフェイス）、各システムの運営維持管理等のために必要な方法を提案すること。また、第 4 架橋への擦り付けを考慮した設計とすること。なお、基本設計で作成を想定している図面等のリストをプロポーザルにて提案すること。

基本設計には以下の項目が含まれ、以下に含まれていないものについても、都市交通 3 号線の安全で適切な運行にあたり必要と思われる事項がある場合、メトロ公社及び JICA に説明し合意を得た上で、該当事項の基本設計を行うこと。

(1) 線形

全ルート高架、第 4 架橋については橋梁の構造に基づき検討。アルブルック駅で都市交通 1 号線と円滑に接続されるよう、線形を分析すること。

第 4 架橋との擦り付けについて、第 4 架橋の線形及び支柱の構造を考慮し検討すること。第 4 架橋のアプローチ及び上部工の設計仕様は第 4 架橋のプロジェクト・ユニット及び橋梁の設計者（コントラクター）と調整されること。

(2) 支障物リストの作成

本事業実施のために移転が必要となる支障物（水道管、電話線、排水管等）のリストを作成すること。また、本事業実施のために必要な仮設工事等の調査及び計画を検討すること。

(3) 迂回路の基準及び仕様の設定

本事業実施に係る道路網の一時的乃至恒久的な変更について道路調査を行い、本事業のコントラクターが交通管理計画を作成するための基礎となる基準及び仕様を設定すること。また、公共交通の構造及び設備への影響、並びに変更のために必要な方法及び構造物を分析すること。その際に、既存の交通（網）への影響を最小限とし、道路関係機関によって設定されている基準、及びパンアメリカン道路の拡張計画を考慮に入れること。

(4) 駅舎
設計の際は、数量計算及び空間の要件、本事業で求められる基準に基づき、技術的及び地理的条件、利便性、都市化の必要性等を考慮の上、平面計画・断面計画・デザイン計画を行い、駅舎の位置を分析すること。なお、駅舎の設計については、コントラクターによる詳細設計段階で大幅な変更がされることは想定されていないため、ある程度詳細な設計とすること。駅舎には、駅の運営に必要な設備が全て含まれること。（照明、垂直移動設備、空調換気設備、プラットホームドア、衛生設備、防災設備、電気設備、排水、他の都市交通との乗り換え場所等）
アルブルック駅の設計については、都市交通 1 号線との効率的な連結を特に考慮し、1 号線の運営に影響を与えない建設に必要とされる事項を検討すること。またアルブルック駅の必要な追加工事及び設備について設計すること。
(5) 変電システム
必要な変電システムの設置場所、通常運行及び複数の変電システムに支障がある状態での運行を想定した上で、必要とされる変電システムの数を検討すること。数量計算、配線図に基づき、駅舎も含め運行に必要な電気システムの配電量を設定すること。電気の供給が絶たれた場合、部分運行を可能とするバックアップシステムについても検討し、メトロ公社と部分運行の方法について合意すること。
(6) 軌道
基本設計を行い、モノレールの桁及び支持構造の条件を設定すること。鉄道システムに接続するために必要な空間も含み、技術条件、自然条件等による振動も考慮すること。
全ルート乃至必要な箇所に避難路を設置すること。
(7) 車両基地への経路及び車両基地
（車両基地の規模、配置等）将来の延伸を考慮した設計とすること。
(8) バス、タクシー等他の陸上交通とモノレールとの乗継所
(9) 関連施設（安全、モノレールの機能性の観点から必要な設備）
(10) 都市交通(鉄道)との効率的な接続の検討（乗り継ぎができる必要事項を考慮すること）
(11) 以下の技術要件を設定すること
1) 鉄道システム及び車両に係る土木工事の要件
2) 電気設備のための土木工事の要件
3) 車両基地、駅舎、他の交通機関との乗継所の土木工事の要件（機能、面積、空間配置等）
4) 鉄道システム及び車両の要件

(12) 積算及び事業実施スケジュールの検討
基本設計と合わせ積算及び本事業の建設スケジュールを検討すること
(13) シウダ・デル・フトゥーロからラ・チョレーラまで延伸の検討

6.8 基本設計照査
重要な箇所の基本設計については外部照査を行う。照査は再委託を通じて実施することとし（本見積りとすること）、基本設計と同時平行で進め設計の遅延に繋がることのないように留意すること。照査については、パナマで使用されている標準設計仕様書を照査のガイドラインとして参照し、照査結果についてはメトロ公社による基本設計の最終化前に適切に反映されるよう、メトロ公社と作業手順について合意すること。

6.9 品質・工程管理計画のガイドライン策定（材料・製品検査体制、仕上がり基準、管理制）
(1) 品質管理計画の策定
建設工事の品質、調達製品の品質、提供すべき役務の品質の確保が必要となるため、内容・対象者・役割・時期・規模・方法などが整理された本円借款事業用の品質管理計画のガイドラインを策定する。
(2) 品質管理計画策定に関する留意点
1) 建設工事の品質確保については使用する材料検査、仕上がり基準、施工体制、施工管理体制などを含むこと
2) 調達製品の品質確保については製品検査体制、適用規格・仕様などを含むこと
3) 役務の品質確保については労働安全衛生体制、施工監理体制などを含むこと
(3) 施工スケジュールの策定
工事スケジュールを検討し、各パッケージの調達・契約の時期から工事着手の時期について、クリティカルパスの管理が容易となるようなスケジュールを作成すること。

6.10 入札評価支援
入札に係る事務手続き、応札者からの入札図書への質問に対する返答、及び応札者の評価等に係る支援を行うこと。

6.11 事業実施監理
(1) コントラクターによる作成文書（詳細設計等）の精査及び一次承認

技術文書、品質管理計画及びメトロ公社による詳細設計に係る要求事項に基づき、コントラクターが作成した本事業に係る全ての文書（土木工事、鉄道システム、鉄道構造物、駅舎等の詳細設計、技術仕様、数量計算等）を精査し、一次承認すること。また、試験方法、維持管理マニュアル等コントラクターにより作成されるその他の文書についても精査し、一次承認すること。これらの一次承認の結果について、メトロ公社に報告し、最終承認取付に関する調整を行うこと。

(2) 実施・監理計画のプログラム策定

本業務コンサルタントが本事業の進捗の記録を行うこと。

1) ソフトウェア"Project for Windows"乃至"Oracle Primavera"を用いコントラクターが実施する業務、各業務に要する時間、コスト及び進捗の相関（interrelación）を示した事業工を作成し、同事業工程プログラムに基づいた事業監理を行うこと。その際には、本事業を進めるにあたり要となるクリティカルパス、事業実施体制を表す組織図を示すこと。同システムは本業務コンサルタントによって試験運用されたものであること（事前に利用されていることが望ましい）。また同事業工程プログラム提案に際しては、コントラクター及びメトロ公社と仕様等を調整の上行い、メトロ公社の担当者も利用可能とすること。
2) コントラクターが行った主要な業務を毎日記録し、同記録はメトロ公社も閲覧可能とすること。
3) 本業務コンサルタントは、毎月初め（5 営業日以内）にメトロ公社に事業の進捗に係る月例報告書を提出すること。
4) 四半期毎に、事業進捗に係る重要な事項を記した四半期進捗報告書を作成すること。同報告書は次の四半期に入った 5 営業日以内にメトロ公社に提出すること。

   なお、上記 3）及び 4）の報告書のフォーマットはメトロ公社と相談の上決定すること。

(3) 施工監理

コントラクターが契約で定められている条件に基づき事業を実施しているか履行確認を行うこと。本業務コンサルタントは施工監理責任を負い、コントラクターによる契約条件の不履行、誤り、逸脱等の有無について監理すること。コントラクターが技術文書で定められたガイドライン、基準、規制、仕様を満たし施工していることを確認・所見表明すること。施工監理にはコントラクターによる環境管理計画の順守の確認、コントラクターが実施した測量の確認等が含まれる。施工監理について想定される業務の詳細は JICA がメトロ公社と締結予定の本業務に係る合意文書を参照すること。

(4) 取り合い（インターフェイス）の調整

本業務コンサルタントはコントラクター間のインターフェイスに係る調整及び管理を行うこと。また、公共サービスの実施機関、民間事業者等と本業務実施に必要な調整を行うこと。

1) 鉄道システムの調整

（基本的に想定されないが）メトロ公社が、コントラクターが鉄道システムを複数の業者から購入することを認める場合には、JICA と所要の確認を経た上で行うこと。システム同士で不具合が生じる場合には、解決策の策定について調整すること。

2) 鉄道システムと土木工事の調整

（基本的に想定されないが）鉄道システムと土木工事が別個の契約となる場合、鉄道システムの据え付けの前に、土木工事及び鉄道システムが各々技術要件を満たすよう所要の確認を行うこと。鉄道システムの据え付け前に、各コントラクターが技術要件を満たしていること、事前の確認がなされたこと、コントラクターによる現場への立ち入り等を定めたミニッツを結ぶこと。

3) 電気設備と土木工事の調整

鉄道システム、及び電気設備のコントラクターが、土木工事コントラクターが工事を行っている現場で、同時平行で作業を行う必要が生じた場合、お互いの作業に影響が生じないように事業実施スケジュールを調整すること。

4) 第 4 架橋との擦り付けに係る調整

第 4 架橋にモノレールを擦り付けるための技術要件検討、仕様の検討及び提案を行い、公共事業省及び第 4 架橋建設事業に係る事業監理コンサルタントと調整を行うこと。

5) 本事業により影響を受ける公共サービスの実施機関及び関係者との調整

本事業のコントラクターによって作成される公共及び民間設備の移転計画を分析し、必要な移転を適切に行えるように、メトロ公社の指示により関係機関と必要な調整すること。想定される移転設備は、水道管、排水管、電気ケーブル、電話線、ケーブルテレビ線等である。移転計画は、必要な作業、予算等の観点から分析すること。

6) 交通庁（Autoridad de Tránsito）との調整

道路の維持管理、安全性の確保、迂回路の設定等については、交通庁、公共事業省、自治体等の関係機関やコントラクターと調整を行うこと。契約に定められた要件が満たされるようコントラクターが作成する交通運営計画をレビューし、迂回路または道路網の介入に対する交通庁から承認取付を支援すること。また、本事業によって影響を受ける道路の状態がコントラクターにより維持されるように（状態が悪化しないように）、最初の状態を確認し道

路の状態維持に係る方法を定めること。

7) コミュニティーとの調整

本事業実施により影響を受ける住民、商業従事者の移転計画作成の支援及び該当者への説明に係る支援等を行うこと。

6.12 メトロ公社への技術支援

メトロ公社が作成する進捗報告書、環境社会配慮報告書、保険計画（Owner Controlled Insurance Program）、メトロ公社に対する技術移転計画、運営・維持管理に係る安全管理計画等の作成支援、並びにコントラクターからの技術移転の支援等を行うこと。

6.13 安全対策

本業務コンサルタントは本事業が安全に実施されるように、以下の業務を行うこと。

(1) 入札図書の作成に際して次の 1)～4)の事項を含めること。

1) 借入国の法律・基準、ODA 建設工事安全管理ガイダンス及び必要に応じて国際機関のガイドライン等国際規範を参照しつつ、工事の安全上の要件を仕様書（specification）の中に明記する。
2) 応札者は上記の発注者要件に対応した安全対策プラン（safety plan）を応札の際に提出する。
3) 応札者は、入札時に人員を指定する必要がある主要ポジションに安全対策担当者を含める。+
4) コントラクターは安全施工プラン（method statement of safety）を建設段階で提出する。

(2) 応札者から提出された安全対策プラン及びコントラクターから提出された安全施工プランをレビューする。

(3) 施工期間中は、安全対策担当者の配置や契約に明記された安全上の要件に従った施工が行われていることを確認すると共に、これらを含む安全対策全般に係る問題点があれば、コントラクターに対し改善を求める。

6.14 広報

日本及びパナマにおいて、本業務が JICA の支援により実施されていることの積極的な広報を行うこと。特にパナマにおいて、駅舎への ODA マークの添付、関連ポスターの設置等工夫を行い、JICA 支援に係る広報を行うこと。

6.15 ドラフトファイナルレポート（DF/R）及びファイナルレポート（F/R）の

作成
ドラフトファイナルレポート（DF/R）は、本業務の完了を確認するものとして、Project Completion Report（PCR）案として作成する。メトロ公社との協議を経て、JICA のコメントを反映した PCR を F/R として提出すること。

7．本業務コンサルタントによる作成文書

本業務を通じ以下の文書を作成すること。

7.1 報告書等

業務の各段階において作成・提出する報告書は以下の通りとする。前期の契約の最終成果品は、(1) 5) 前期業務完了報告書とする。

(1) 業務報告書

1) 業務実施計画書

ア）記載事項：本業務の基本方針、業務方針、調査団の実施体制、作業工程、要員計画等

イ）提出時期：契約開始 1 週間以内

ウ）部数：和文 5 部

2) インセプションレポート

ア）記載事項：本業務の基本方針、業務方針、調査団の実施体制、作業工程、要員計画等

イ）提出時期：契約開始 1 週間以内

ウ）部数：西文：15 部（メトロ公社：10 部、JICA：5 部）

3) 月例進捗報告書①

ア）記載事項：コントラクター選定以後、事業の進捗に係る報告書を毎月メトロ公社に提出すること。

イ） 提出時期：毎月初め（5 営業日以内）

ウ） 部数：西文：2 部（メトロ公社：1 部、JICA：1 部（メトロ公社による承認書（写）及び報告書（写））

4) 四半期進捗報告書②

ア）記載事項：コントラクター選定以後、事業進捗に係る重要な事項を記載した報告書を四半期毎にメトロ公社に提出すること。

イ） 提出時期：各四半期初め（5 営業日以内）

ウ）部数：西文：2 部（メトロ公社：1 部、JICA：1 部（メトロ公社による承認書（写））

*進捗報告書①及び②のフォーマットはメトロ公社と相談の上決定することとするが、②については Project Status Report（PSR）を想定している。また、事業完成時には Project Completion Report（PCR）としてまとめられる

ことを想定している。

**1 年分の進捗報告書（①及び②）について、JICA は毎年度 1 回コンサルタントへの部分払いを行うことを想定している。本契約に基づく支払（前払を除く。）は、メトロ公社による承認を条件とする。

5) 前期業務完了報告書（本文 40 ページ程度）

ア） 記載事項：前期の業務内容。前期の業務内容を後期業務にどのように活かすかも記載すること。

イ） 提出時期：前期契約終了 1 ヶ月前

ウ） 部数：西文：2 部（メトロ公社：1 部、JICA：1 部）、和文：1 部

6) ドラフトファイナルレポート

ア） 記載事項：全ての業務内容

イ） 提出時期：契約終了 3 ヶ月前

ウ） 部数：英文：10 部（メトロ公社：5 部、JICA：5 部）

7) ファイナルレポート

ア） 記載事項：上記ドラフトファイナルレポートに JICA からのコメントを踏まえて修正したすべての業務内容

イ） 提出時期：契約終了 1 ヶ月前

ウ） 部数：英文：10 部（メトロ公社：5 部、JICA：5 部）

エ） CD-R:英文：10 枚（メトロ公社：5 枚、JICA：5 枚）

(2) その他の報告書

1) 設計照査完了報告書

ア） 記載事項：設計照査結果をとりまとめたもの。

イ） 提出時期：基本設計完了後 1 週間以内。

ウ） 部数：西文及び和文を JICA に各 1 部ずつ。

2) 入札図書（案）報告書

ア） 記載事項：6.4 から 6.6 に係る内容（含：基本設計）

イ） 提出時期：契約開始後 6 ヶ月

ウ） 部数：西文：12 部（メトロ公社：10 部、JICA：2 部）

エ） 詳細要領： メトロ公社の合意が得られたものを報告書として提出する。

(3) その他提出書類

1) コンサルタント業務従事月報

コンサルタントは、国内・海外における業務従事期間中の業務に関し、業務

従事月報を作成し、監督職員並びに分任監督職員に提出する。

ア） 記載事項：業務日とその概要

イ） 提出時期：毎月メトロ公社による承認済みの月次進捗報告書①と一緒に提出すること

ウ） 部数：2 部（JICA（中南米部及びエルサルバドル事務所））

7.2 報告書作成についての留意事項

各種報告書の作成にあたっては図表リスト、略語リスト、参考文献等各種リストを記載し、転載するものがあれば、必ず出典を明記する。また、価格・費用等を米ドルで記載する際には、その時点における円貨との交換レートを記載する。

メトロ公社に提出する全ての文書は、書面及び電子データで提出すること。設計図は AutoCAD2015 で作成し、ハード及び電子データで提出すること。文書・図面作成の際には、各々の文書の相関がわかる形にすること。

7.3 報告書の印刷仕様・電子化仕様

ファイナルレポート以外の報告書は簡易製本により作成し、報告書等の印刷・電子化（CD-R）の仕様について「コンサルタント等契約における報告書の印刷・電子媒体に関するガイドライン」を参照する。

報告書全体を通じて、固有名詞、用語、単位、記号等の統一性と整合性を確保する。また、英文報告書の作成にあたっては、その表現振りに十分注意を払い、国際的に有用する英文報告書を作成するとともに、必ず当該部分の経験・知識共に豊富なネイテイブスピーカーの校閲を受ける。

第 3 業務実施上の条件

1．業務の工程

2016 年 4 月から 2022 年 10 月（79 ヶ月）

全業務期間は 79 ヶ月を予定しており、契約は前期と後期の 2 本に区切る。

（1）契約前期：2016 年 4 月～2017 年 12 月（21 ヶ月）

（2）契約後期：2018 年 1 月～2022 年 10 月（58 ヶ月）

契約前期は本事業に係る基本設計作成、入札図書作成支援、入札準備、入札評価支援、第 4 架橋とのインターフェイス調整、事業実施に係る関係機関との調整等、契約後期はデザイン・ビルド方式による建設期間中の施工監理、第 4 架橋とのインターフェイス調整、事業実施に係る関係機関との調整等の業務を予定している。なお、契約後期の業務内容については、契約前期終了時に必要に応じて JICA と協議すること。

2．業務量の目途と業務従事者の構成

（1）業務量の目途

1,856.00M/M

（前期 193M/M、後期 1,663M/M）

※　この業務量には、(2)でローカル人材の活用を想定する者（P）を含む。

（2）業務従事者の構成（案）

本業務には、以下の分野に係る団員の配置を検討しており、ローカル人材の活用が推奨される。ローカル人材の活用が想定される業務について P と記載しているが、本業務にローカル人材以外の活用を否定するものではない。

ローカル人材の活用をする業務については、「コンサルタント等契約における見積作成ガイドライン」に定める直接人件費、その他原価及び一般管理費等の積算によることを認める。

なお、上記業務量を超えない範囲において担当分野の変更・追加又は統合・分離が必要と考えられる場合は、明確な理由と共にプロポーザルにて提案すること。

	担当業務	格付け	ローカル
1	総括/事業管理	2	
2	鉄道事業管理（品質管理）①		
3	鉄道事業管理（品質管理）②		P
4	鉄道計画・設計総括	2	
5	鉄道土木計画・設計総括		
6	鉄道線形計画・設計		

7	鉄道駅建築計画・設計①	3	
8	鉄道駅建築計画・設計②		P
9	鉄道構造物計画・設計①		
10	鉄道構造物計画・設計②		P
11	土質調査計画・管理		P
12	鉄道土木計画・設計①		P
13	鉄道土木計画・設計②		
14	鉄道施工計画総括		P
15	鉄道施工計画（土木）		P
16	鉄道施工計画（電気設備①）		P
17	鉄道施工計画（電気設備②）		P
18	車両基地計画・設計		
19	鉄道システム計画・設計総括		
20	車両計画・設計①		
21	車両計画・設計②		
22	車両計画・設計③		
23	鉄道システム計画・設計（軌道）		
24	鉄道システム計画・設計（通信）		
25	鉄道システム計画・設計（信号）		
26	鉄道システム計画・設計（運転）		
27	鉄道システム計画・設計（電力）		
28	建築設備計画・設計総括		P
29	建築設備計画・設計（電気設備）		P
30	建築設備計画・設計（機械設備）		P
31	建築設備計画・設計（衛生設備）		
32	建築設備計画・設計（垂直移動設備）		
33	建築設備計画・設計（情報設備）		
34	施工監理総括		
35	環境社会配慮①		
36	環境社会配慮②		P
37	労働安全計画①		
38	労働安全計画②		P
39	鉄道駅建築施工監理①		
40	鉄道駅建築施工監理②		P
41	鉄道駅建築施工監理③		P

42	鉄道駅建築施工監理④		
43	鉄道駅建築施工監理⑤		
44	鉄道構造物施工監理①		
45	鉄道構造物施工監理②		
46	鉄道構造物施工監理③		P
47	鉄道構造物施工監理④		
48	地質測量計画・監理①		
49	地質測量計画・監理②		P
50	交通管理計画		P
51	情報システム		P
52	鉄道工事契約		P
53	鉄道工事数量・積算		
54	保険計画		
55	橋梁計画調整	2	
56	業務調整		

3　その他留意事項

（1）安全管理

現地作業期間中は安全管理に十分留意する。現地の治安状況については、JICA エルサルバドル事務所及び JICA パナマ支所などにおいて十分な情報収集を行うとともに、現地作業の安全確保のための関係諸機関に対する協力依頼及び調整作業を十分に行う。また、同事務所と常時連絡が取れる体制とし、特に地方にて活動を行う場合は、現地の治安状況、移動手段等について同事務所（及び支所）と緊密に連絡を取る様に留意する。また現地作業中における安全管理体制をプロポーザルに記載する。

（2）不正腐敗の防止

本業務の実施にあたっては、「JICA 不正腐敗防止ガイダンス（２０１４年１０月）」の趣旨を念頭に業務を行うこと。なお、疑義事項が生じた場合は、不正腐敗情報相談窓口または JICA 担当者に速やかに相談するものとする。

以上

ANNEX I

TERMS OF REFERENCES

SCOPE OF ACTIVITIES OF THE SERVICES

TECHNICAL SPECIFICATIONS

1. DEFINITIONS OF THE ENGINEERING, PROCUREMENT, AND CONSTRUCTION (EPC) CONTRACT FOR THE PROJECT

The project of construction, equipment and facilities for the commissioning of the Line 3 will be implemented by one or more Contractors, according to the procedures to be carried out by the Metro de Panamá. S. A. (MPSA) based on the documentation that the Project Manager (PM) prepares for these purposes.

Works to be carried out as part of the project includes, but not limited to, the followings:

(a) Development of engineering up to the detailed and/or constructive level for each of the civil works project of both operating system of transport and electromechanical installations of all buildings and structures corresponding to this Line, taking into account special emphasis on the interfaces of facilities and systems among them and with the civil works.

(b) Construction of the civil works, which include:

1. Rail platform of the trains in viaducts, which in the case a monorail system is partially integrated to the structure of the viaduct or on the platform of the 4th bridge over the Panama Canal;
2. Way access to the Depot and Workshops with prevision for the continuation of the Line;
3. Stations of passengers and other related required structures, including installation of electric sub-stations as required;
4. Parking lots and interconnections between buses and other public transport systems;
5. Depot and Workshops;
6. Provisional works and infrastructure for offsets of the road transit, both public and private;
7. Relocation of infrastructure of public services and other structures that are to be demolished for clearing the right of way of the transportation system;
8. Restoration of surfaces and public spaces at stations and inter-stations; and,
9. Signaling of the location and information of direction.

(c) Design, supply and installation of all electro-mechanic equipment for the Line and the stations, including but not limited to the followings:

1. system of collecting fares;
2. ventilation;
3. air conditioning;
4. pumping systems;
5. lift (lifts and escalators) systems;
6. system of detection and extinction of fires;
7. lighting system and force;
8. system CCTV;
9. detection of intruders and access control system (SCADI);
10. centralization of the data of the equipment at the station and remote in the Centre of Control operations (CCO) (SCADA);
11. sound public information systems;
12. system of visual information for the public;
13. system of doors in the areas controlled by SIO; and,
14. Depot and Workshops and equipment for maintenance of systems.

(d) Supply and installation of the System of Integral Operation (SIO), which shall include:

1. signalling and automatic ride control;
2. traction power system and auxiliaries;
3. energy storing system;
4. telecommunications; and,
5. centralized control (corresponds to the adequacy of the Operating Control Center (CCO) currently operative, to include the management of Line 3)

(e) Supply of vehicles

(f) Any other activities of construction, supply and installation related to the system or project, including not only the things already indicated for the commissioning of the system, but also all and any other improvements, buildings, habilitation, rehabilitation, repair, remodeling, adequacy of all kinds and nature and any other activity, investment, delivery or expenditure for full compliance with all obligations requirements, conditions and terms of the list of specifications for hiring required for the execution of the project Line 3 of MPSA.

(g) Activities administrative, legal, management, monitoring and control that requires this work for its proper implementation.

(h) Key components of the monorail system will be provided by a nominated sub-contractor in accordance with the MOC and relevant discussions between JICA and the Government of Panama.

2. DESCRIPTION OF THE SERVICES TO BE PROVIDED BY PM

The PM will present the "Services of Engineer for the Elaboration of Basic Design, Assistance in the Process of Bidding and Hiring, Management of Project, referred here in advance collectively as "the Services," unless it makes particular reference to any of the each service included within the scope of the services.

This section details the scope of responsibility of the PM, with respect to the services that should be provided under his/her own responsibility and cost, including all works that may be necessary, in accordance with this Statement and the documents that comprise it, and any other required work to achieve the objectives of this contract, even if they are not expressly indicated in this List of Specifications. The Services will be provided in two stages:

Stage 1: Development of the basic design of the Line with special design of the architecture of the stations, preparation of technical and operational specifications, preparation of bidding documents, assistance in the selection of Contractor(s), meaning the preparation of all the documentation necessary to carry out the execution of the Project of the Line 3 and the assistance to MPSA to realize such processes.

Stage 2: The supervision of the execution of the construction, procurement and installation of electromechanical systems and integral system of transport, and procurement of the monorail system until beginning of the services of the Line, the coordination and management of the interfaces between distinct systems and/or contracts, if any, and the specialized technical assistance required by MPSA.

In each of these stages, it is important to have adequate management of the interfaces between the components of the Line 3 of the Metro and the structure of the 4th Bridge over the Canal of Panama, which shall include technical analysis, specifications of the components of the Line 3 required for the design and construction of the 4th Bridge, and any adaptation necessary to the project of the Line 3 for the efficient integration with structure and platform of the the 4th Bridge project.

For these purposes, the PM will establish the Plan for the Quality Assurance of the Project (Quality Plan), which will be applied in the service provision by means of reviewing the objectives and products expected by MPSA and their consistency with the established programming to achieve such purposes. The Quality Plan shall include the two Stages of the contract of the Project giving special attention to the consideration of all aspects that guarantee that the Design is implemented in accordance with the requirements of MPSA, which shall include at least the following aspects:

a. The clear definition of the objectives and scope of the requirements of MPSA; the establishment of the necessary procedures for its

fulfilment, the documentation associated with the objectives of the Project and the deliverable products;

b. The identification of the relevant quality standards for the design of the Project of the System for the Line 3 and the determination of the requirements to meet the fulfilment of each of them;

c. The identification of internal and external elements that could influence the products or processes;

d. The definition of policies and applicable procedures, like the milestones of control to be implemented, the registration of the suggested changes or corrections, and the verification of the implementation of the recommended corrective actions; and,

e. The identification of the autonomous persons or entities responsible for conducting systematic hearings, which are included in the Quality Plan of the services, whether inside or outside the scope of the PM.

MPSA may, when thus deemed appropriate, request information on the hearing carried out, the corrective actions implemented in the framework of the provisions of the Plan of Quality Assurance and any other information deemed relevant.

2.1. SERVICES OF ENGINEER OF BASIC DESIGN OF THE LINE 3 PROJECT

The first stage of the services of the PM corresponds to the elaboration of the basic design of the Line 3, which includes setting standards in order to manage the development of the Project, the establishment of the criteria of the Project designs, the realization of basic studies required for the Line, the elaboration of plans, specifications and other documents necessary to define the product, which will be purpose of contract for its implementation. This stage will include the construction, equipment and setting of the services of the Line 3. With the exception of the architecture of the stations, the basic designs include the alignment and profile of the Line, the different typical elements of the structure of the viaduct of the monorail and the switch works, auxiliary structures, installation of Depot & Workshops, different interconnections with other modes of transport, proposal of compensation of public services, proposals for urban development in the vicinity of stations, designs of deviation of traffic during the construction of the works and final adaptation of roads, proposals of structures supporting beams of the monorail on the structures of the access to the 4th Bridge over the Panama Canal, and the designs of beams and their supports on the platform of the superstructure of the 4th Bridge, taking into consideration the elements of interface between the platform of the bridge and the beams of the monorail. For the design elements that have interface with the 4th Bridge structures, the PM shall coordinate and assist MPSA to reach agreements of consensus about the criteria, parameters and specifications which will be used by Ministry of Public Works with the PM on the 4th Bridge and the designers who are part of the contract for design and construction of the 4th Bridge.

The design of architecture and structure of the stations should be developed at an advanced level.

2.1.1. TECHNICAL DOCUMENTATION FOR THE BIDDING AND CONTRACT FOR THE CONSTRUCTION OF THE LINE 3

The PM should prepare all the necessary documentation that allows defining the scope, specifications and technical conditions to carry out procedures for the selection of Contractor(s) who will have responsibility for the implementation of the project, construction and integration of the equipment required for the Line 3 of the Metro of Panama in accordance with good engineering and construction practices.

The documents should define and consider the full scope of works necessary for the execution of the project of Line 3 and should include at least the following aspects:

Design criteria, which establish the principles that will control the implementation of the project and the relevant standards, including the seismic criteria that can be applied. The monorail should provide a highly fluid, smooth and comfortable journey. The PM should establish criteria in the specified tolerances for design, construction and installation of interface between the support beam and the monorail vehicles in order that MPSA can reach an agreement with the nominated sub-contractor on the criteria analyzed and proposed by the PM.

Basic Design of the project, consisting of the set of plans that define the project in all its main components and that allow determining its location, size and works to perform. This applies to all elements of the project with exception of the architectural designs that require a more elaborated design level.

General specifications and particulars of construction of works and facilities Functional and technical specifications of the Integral and Operative System (SIO), systems and electromechanical equipment in accordance with the parameters of security, availability, maintainability and comfort, including the dimensioning for each of them.

Complementary design documents, such as the descriptive reports, preliminary calculations, forms of measurement and payment as well as any other documents required for the Contractor(s) to implement works for Line 3.

The PM, prior to the preparation of this documentation, should propose alternative strategies recommended for the implementation of the Line 3 of the Metro for the approval of the MPSA, including an analysis of impact on the time, cost, security, compatibility (with systems installed in Line 1 and functional and operational inter-relationship between various elements and systems), risk (interfaces of the project) and quality, as well as specific considerations for the need of integration with the 4th bridge over the Panama Canal project.

The PM should submit all documents included in this phase of the services in print and in electronic format, both for preliminary versions, to submit to MPSA for its

consideration and observation, as for the final, once the preliminary versions are approved by MPSA, in accordance with the deadlines set out in the work program. In particular, planes will be submitted in electronic format in reduced size, and should be developed in AutoCAD version 2015. In addition, the PM should set the cross-references between documents that facilitate the interrelation and between the disciplines of project.

2.1.1.1. **CRITERIA OF DESIGN**

The PM will prepare a document which establishes the conceptualization of the design of Line 3 and the scope of the development of the engineering details and specifications under the responsibility of the Contractor(s) of the civil works and of the equipment in the execution of the Project, which will be consulted to MPSA before proceeding with the Basic Design of the Project.

In the establishment of the criteria for the conceptualization of the Project, the PM will consider, in addition to the own elements of the functionality of the Line and its features, the conditions of safety, quality, comfort and rationality of necessary costs, such as the geographical and environmental situations, restrictions imposed by other facilities (such as Marcos. A. Gelabert airport and existing infrastructure), seismic area of the project, as well as the needs of connectivity to other modes of transport. Finally, the interaction with the project of the 4th bridge, which will serve as a platform to cross the Panama Canal at the level of the superstructure of the bridge, as well as the access to the 4th bridge shall be considered.

The PM shall propose to MPSA the design criteria, the applicable national and international standards in the field of the transport system and standards of air navigation. Regarding cable-stayed bridges, the PM shall also propose standards of construction, electromechanical installations, safety and attention to people with special conditions, who should be respected in the implementation of the project, and shall include abbreviations, definitions, and corresponding symbols.

With regard to the system of transport of the Line 3, the Criteria of Design shall include, but not limited to, the concepts and parameters that regulate geometry of rail platform, its supporting structures, the station structures, the foundations, the architecture of the stations, installation of drinking water, sanitary facilities, and drains, previsions of ruin, protection from ray, installation of the SIO, electromechanical facilities, auxiliaries in the Line and stations, the Depot and the Workshops, deterrent parking, and interconnections with surface transportation, the restitution of the area affected by the execution of the project, urban improvement, and any other item necessary for the fulfillment of the requirements of security, functionality, operability and maintenance of the Line. The PM shall provide special attention to the establishment of the fundamental criteria to become applicable in terms of hydrology based on principles of security, economy and efficiency.

With respect to the elements that compose of the SIO and the Electromechanical Equipment for the Line and stations, the PM shall determine the criteria to define parameters of quality; reliability; availability; maintainability; security of people, systems, and equipment; comfort of the users; efficiency in energy consumption; rationality of the costs of investment, operation, maintenance, as well as of the required spare parts. Equally, criteria shall be established for the normal operation of the Line and previsions of operation in case its elements and components have faults.

With respect to the security of the system, schemes of operation as well as evacuation should be developed regarding the monorail system, and necessary adaptations should be recommended to ensure safe operation. Especially a technical approach should also be considered, which allows arranging a power supply behind the Line in case of a major fault at the level of National or sectorial electric transmission system.

2.1.1.2. BASIC DESIGN OF THE PROJECT AND OF ADVANCED ARCHITECTURE OF THE STATIONS

For all the works to be built in the execution of the project of Line 3, the PM will develop plans of architecture, structures, foundations, drains, electromechanical installations, sanitary, previsions for grounding and lightning protection, as well as plans of any other discipline that is required, based on design criteria to be applied, in accordance with the deadlines set out in the work program. With respect to hydrology, the PM should consider frequency and maximum run-off of rains returns of 1 in 100 years based on the history of the area of the project or as closely as possible and hydrology and hydraulic conditions of the project site, considering criteria of safety, cost and efficiency for low spots or when the particular characteristics of certain locations or structures requires it, including the pipes and discharges to the sewer network.

The PM should establish the basic designs of each of the electromechanical systems and of the Integral operating system (SIO) for Line 3 and develop the set of plans in which we indicate the necessary previsions in the civil works for the installation of such systems. The PM should develop designs which are to be considered to be the technical interfaces and preparations for the installation, operation and maintenance of each one of the systems and equipment, both regarding the civil works, such as those corresponding to different systems of equipment together. These interrelations will consider, among others, plans for pipes, ducts, pipes, connections, power supplies of power and water, sanitary downloads, interfaces, interface boxes, boards, landing space and any other necessary provision.

The PM should develop, without limitation, the following designs:

2.1.1.2.1. ALIGNMENT OF THE LINE

For the alignment of the Line, the PM should consider platform elevated all the way including the Depot and Workshop areas and the derivation between this facility and the main road except the section relating to the 4th bridge over the Canal, since it shall be responsible for a specific structure that adapts to this element. This path will be set to a scale suitable depending on the alignment horizontal not less than 1:2500, and vertical scale no less than 1:1000, which determine the geometric design of the platform (beam) of the monorail, depending on the conditions that ensure the appropriate safety factors, wagon stability and comfort to the passengers, as well as the civil, hydrologic, hydraulic, structural and geotechnical definition of the geometric parameters of the path. In the development of the path, passenger stations and devices of route or detours should be placed conveniently, which allow Services and Operations of Via Union Temporal (STV), for which restrictions of distances and slopes according to the criteria that have been established should be considered. Special emphasis is placed in the interrelation and coordination that should be taken with the design and implementation of the project of the 4th bridge over the Panama Canal, as well as and the expansion of the Pan-American highway being developed by the Ministry of public works. Within the route of the Line, areas of maneuvers for possible partial operation services as well as strategically and conveniently located parking ways should be considered to facilitate the removal of any train or vehicle in maintenance that should be removed from the movement of trains in the event of disturbance.

For the structure of the monorail which is structured over the rolling beam, via route should take into account implications related to the methodology recommended for evacuation and the different possible scenarios.

The alignment of the road should give special treatment to the area of Albrook where Line 3 will connect with Line 1. The route requires the analysis of locating the route of the Line 3 on Line 1. Analyzing in detail the Albrook station of Line 1 serves as a common facility for both Lines. Finally the geometry of the maneuver of Line 3 on the route of entrance to the yard of Line 1 should be analyzed.

The alignment of the Line 3 should take into account the link with the 4th bridge over the Panama Canal. A path with support structures independent of the 4th bridge to a point and/or range of elevation in both accesses to the bridge should be considered. The path in these two sections should be developed in such a way like a certain elevation, the route of Line 3 will take on the same supporting structure of the accesses of the 4th bridge in both and on the platform of the bridge superstructure. It is anticipated that the route of the monorail will be incorporated into the structure of the 4th bridge on the South side. Parameters and design features of the alignment on the structures of access and the superstructure of the 4th bridge will be agreed with the management of project the 4th bridge and its designers.

2.1.1.2.2. PRE-CONSTRUCTION WORK, TEMPORARY WORKS AND RELOCATION OF PUBLIC SERVICES

The PM should suggest an inventory of the location and the amount of public and private services, such as drinking water and drains, sewage pipes, tubing wiring for electric power, networks of public and private telephony, cable TV and any other located in the area of involvement of Line which could be affected by the construction of this in order to determine which interventions are necessary to allow the relocation of these facilities safely, coordinately and with minimum disruption, so much of these services as of the execution of the work. Similarly, the PM should conduct studies and review plans for the execution, both pre-construction works and temporary works that are required to allow the execution of the construction of the Line.

2.1.1.2.3. PARAMETERS AND CRITERIA FOR TRAFFIC DIVERSIONS

Considering that the execution of the works will lead to temporary or permanent alterations in road network associated with the construction of the Metro Line 3, the PM should analyze the road network in order to establish the parameters and criteria based on which the Contractor(s) of the civil works will prepare the traffic management Plan, according to what Contractor(s) should modify the circulation either temporarily or permanently in the streets, avenues and corridors adjacent to the construction of the Line; analyze effects upon the structures and facilities of public transport and pedestrian paths; the methodology and the provisional construction elements (boards, bridges, high metal, among others) required for its implementation, for the purposes of ensuring that modifications in the roads of the affected area are established with minimum disruption of transit and the development of the works, all in accordance with the guidelines established by the competent authority and the considerations of expanding project of the Pan-American highway that has been developed or is currently being or will be developed in the future.

2.1.1.2.4. ADVANCED ARCHITECTURE OF THE STATIONS

In conjunction with the development of the route of the Line, the PM shall analyze the sites proposed for the location of the stations taking into consideration the geometry and profile of the alignment to determine height of the slab of the vestibule, accommodation of the same structure of station, horizontal and vertical geometry of accesses and its orientations, impact on roads and public facilities, damages to facilities of third parties and needs of urbanization and connectivity. The location of the stations will be suggested with a level of detail for the stations to fit in the Line, with no less than 1:1000 scales, as well as the functional and structural interaction, if it is the case with other modes of transportation and/or deterrent parking.

For the development of the architecture of the stations, the PM should generate an advanced design, supported with calculations, the minimum spacial requirements and the rules that regulate the project. The PM produces plans that contain the development at all levels, including surface, lobby, platform and roofs. It should develop plans and calculations of all the components of stations including roofs, facades, accesses and areas for connection. The design should include the distribution of spaces for movement of passengers in areas paid and not paid, turnstile bars, details of the doors of platform, electric and fixed stairs, and distribution of operational and technical environments. Plans should include sizing both of architectural elements and structures, typology of the elements, analysis of evacuation, user flows and memories of calculation of all the elements of architecture as structure, with sufficient details so that such designs can be provided to the Contractor(s) according to the design developed by the PM. The different modules of access should be developed for the respective implantation of the immediate context of each station, including the urban design development at street level. The PM shall also describe the specifications of all finishes. This scope of design shall apply to each of the 14 stations of the project but with criteria and concepts more standardized and uniform between the four (4) types of stations and different connections with interconnections. The responsibility of the PM will be to submit to MPSA for consideration the conceptualization planned for each type of stations of the Line before proceeding with the design of the stations, sufficiently in advance to allow the fulfillment of the planned Program of Work.

The stations should be designed so that its architecture and support structure, façade, roofs and areas of movement of users facilitate connection with interconnections and deterrent parking.

The winning tender for the contract of civil works shall elaborate on the plans of architecture and structure developed by the PM to all levels of detail for the construction of the stations.

For environments of operation and techniques, the facilitation for their function shall be measured considering the operational aspects and technologies of equipment; the appropriate and functional distribution of spaces to allow the installation, accessibility to facilitate maintenance and replacement of equipment.

The following technical and operational environments shall be considered: electric lighting and power distribution substation; traction substation; environment for signaling and telecommunications; wells, pits and niche of the lifting equipment controllers; environments for conditioned air and ventilation, pumps and others; local station control center (CCL), doors of platforms and operating systems, systems and facilities of information to users and signage, ticketing, vending machine of cards, machines for top-up, and any other environment that contains equipment. In addition, the use of some environments should be considered to generate business activities.

In addition, the PM should consider, in its design, other environments to provide

facilities of services to each person which include, among others, cleaning rooms, for maintenance and trash bins; first aid; toilets and changing rooms; a room for guardians; kitchen area and dining room; staff offices and storage rooms.

In addition and based on the studies of demand conducted previously by staff of Planning of the MPSA with technical support from the PM, the PM should measure the platforms to find a standard among the different types of stations, establish the patterns of movement of users in the stations, locate and measure vertical circulation elements, determine the number of required turnstiles and its location as well as of the other equipment to charge people; also determine the location of access, providing the appropriate closure, areas for appropriate accessibility to the station and previsions of areas for vehicles of maintenance, fire and ambulance.

Regarding the supporting structures of the stations, the same will be developed in such a way that they can easily adapt to the results of studies of soils and geotechnology, which the Contractor(s) who carries out the works will develop in detail. However, for this stage of advanced design of the stations, the PM shall develop the pre-estimation of structures and foundations as recommended, based on the stipulated design criteria and preliminary studies of soils that are carried out at this stage of design. Therefore, the PM shall conduct surveys and laboratory tests of the soil samples of different sites where stations will be located in order to carry out geotechnical analysis required for the pre-estimation of the structures and recommend the most appropriate foundations.

Equally, health, electromechanical, drainage and any other facilities should be designed as they are required for the correct operation of the stations, based on design criteria pre-established and approved by MPSA for their sizing, distribution of space, pipeline route and any other applicable thing. Isometric indicating spaces for the installation of the distinct systems of the stations should also be developed.

The PM should consider and consult with MPSA about finishes in the stations, landscaping and urban renovation of the environment, as well as spaces for the integration of the station with surface transportation systems and their estimation and functionality, based on criteria of aesthetics, safety, durability, facilitation of maintenance and reasonable costs.

Special consideration in the elaboration of the design of the Albrook station should be highlighted, which will serve as direct interconnection of the Lines 1 and 3. For their effects, the

PM should consider all aspects that will be required for their adaptation, adequacy and construction ensuring no impact on the operation of the Line 1 and to enable to mitigate any disturbance which may be generated. For the Albrook station, the PM should develop adaptation schemes to generate a transfer of passengers from the Line 3 to the Line 1 as directly and efficiently as possible, and should propose and design the necessary adjustments of the facilities and complementary structures required.

2.1.1.2.5. ELECTRICAL SUBSTATIONS

The PM should be preferably in the area of the stations, location of traction substations (SET), intended to accommodate equipment required for transformation of energy in medium voltage received from the circuits of the operating company's energy requirements for the supply of trains. An electrical pre-dimensioning system should be created, which allows determining the number of required substations along the Line, considering normal operating conditions, with all the substations in use and operation "degraded" by failure of one or more of the SET.

The PM should dimension substation of power distribution (SEP) of the stations for the maintenance of the SIO equipment and the same electromechanical equipment, as well as for lighting and electricity needed in the environments of each station.

For each SET and SEP plans shall be developed as required, considering the distribution of spaces, previsions for income, operation and maintenance of the equipment as well as any other conditions which should satisfy these areas for their proper functioning.

The sizing of the power system should be supported by calculation reports, diagrams and connection definition of specifications for the major components. The system should consider power sources that offer redundancy and a high level of reliability. Additionally, the PM should analyze and recommend a system of backup power that allows partially operating the Line in the event of loss of the electric power supply of the power supplies. As part of this analysis, the PM should define and agree with the MPSA partial operation mode. Backup recommended by the PM system should include the sizing of the system, the description of the main components and estimated costs of maintenance investment.

2.1.1.2.6. PLATFORM OF ROADS

The PM should generate basic designs to dimension the various elements of the platform of the monorail and its supporting structure. The basic designs should include typical different sections for different ranges of height of the supporting structures standardizing them in 3 or 4 sizes.

In the design of the platform of elevated rail, the PM should consider the structural and geometric conditions of beams of rail of the monorail and of the support infrastructure necessary (capitals, piles and foundations) for the installation of the monorail beams. Moreover, the PM shall consider, in its basic design, the effects that are generated by the movement of trains on such structures as well as the minimum gauges that are to be considered between the bounding and dynamic

structure of the trains and structures present in these high ways.

For the pre-measurement of the supporting structure of the monorail, the PM shall conduct a preliminary evaluation of the seismic risk (preliminary seismic hazard assessment). In addition, for impact of detailed designs that the selected Contractor(s) should develop, the PM should specify the methodology of the detailed seismic risk analyses that will be carried out as part of the detailed designs of the supporting structure of the monorail stations for both beams and supports of the stations.

Similarly, the minimum free distances that shall be retained among elevated structures and public or private streets, roads, the Line 1, the station Albrook, the Depot of the Line 1, pipes of public services or other structures and properties located in the edges of the polygon of influence, in accordance with the regulations established by the competent authorities, should be considered.

In the design of these structures, estimates of the necessary spaces for the installation of electrical wiring, cables for train control, plan for laying optical fiber associated with the System and any other requirements that are necessary to provide the functionality of the system, should be included. If necessary, particularly in structure of the supporting switch works, the PM should determine required longitudinal and transverse drainage, the form of gathering water, and its management.

The PM shall establish design parameters and acceptable maximum or minimum values (as appropriate), to ensure that the structures will support strength during the operation of the System, considering including the analysis of the natural frequency of transversal vibration caused by the interaction between the beam of the high way and the pass of trains, wind conditions, the values of rolling loads and distribution of concentrated loads. Moreover, preparation to resist the efforts of thermal origin and means necessary to allow movement caused by these effects shall be considered; it shall also include preparation that guarantees protection against corrosion of steel surfaces. The PM should make a special emphasis on these analyses in the area where the beams supporting structures will be constructed on the platform of the 4th bridge over the Canal and its consideration on difference between the characteristics of the joints elasticity and dilatation of both structures and effects of vibrations which are transmitted by the superstructure of the bridge shall be made. The PM should consider the supports of the platform of the monorail on the structures of the entrances of the bridge and superstructure. With regard to interfaces of the monorail platform with the 4th bridge supporting structures, the PM should agree on those elements with the PM of the 4th Bridge over the Canal and its designer.

The PM shall define and design, based on different schemes of foundations depending on soil conditions, the typical sections of the supporting structure of the beams, including special structures to natural conditions or on existing structures, such as crossings of rivers, creeks, steep slopes or road intersections, and in its

geometrization the construction tolerances shall be determined, which are required for proper installation on the deflections occurring under the effect of the weight of beam and load of the rolling materials.

The PM should consider the proper way of construction of the curves of the beams with respect to factors such as the slope, the countershaft with respect to the vertical load of the wagons and the impact, the effects of shrinkage and creep of concrete plastic, as well as any other items that will be considered for the proper design of these structures.

Moreover, the PM should consider, in the design of supporting equipment, the efficient transfer of forces from the beams to substructure and preparations that prevent the displacement of the superstructure by effects of the mobile or caused charges during a seismic event, as well as measures or necessary devices preventing the displacement of the same.

2.1.1.2.7. FOOTBRIDGE EVACUATION

If required as part of the structure of roads, either along all the routes of the Line or only in some specific sectors, the design for the construction of a pedestrian walkway should be included with protection that allows the evacuation of people in case of failure of the trains. This structure should allow pedestrian circulation users along the adjacency of the tract and contemplate elements allowing leaving the elevated structure to descend to the surface. For this analysis of evacuation facilities, the PM should evaluate different scenarios and possible alternative designs for consideration of the MPSA.

2.1.1.2.8. ROUTE OF TRANSITION BETWEEN THE YARD AND THE HIGH ROAD

The PM should include the design of prevision for the construction of a transition that connects the main road and Depot, which should consider and provide for the condition of continuation of the Line towards phase 2 while the realization of these works of extension generates disturbances in the operation and availability of the service on the Line in its phase 1 design. For each of the disciplines involved in the execution of this transition, the PM should design the basic plans of structures, foundations, drains, facilities and any other element that is required for the construction of the civil works and installation of the necessary equipment.

2.1.1.2.9. DEPOT AND WORKSHOPS

For the design of the Depot for Line 3, the PM shall dimension the efficient distribution of the spaces, in an area of approximately 10 hectares, located in the vicinity of the city of the future. In this area, the PM should consider the necessary

facilities to handle the final fleet of trains calculated for the horizon of the Line design considering the extension of the same, based on estimates of projected demand and studies that MPSA or the same PM made for this purpose, buildings and requirements for the maintenance of traction power equipment and auxiliary of electronics for control of trains and communications equipment, the electromechanical equipment of the stations, as well as for the coordination of the maintenance of stations and related buildings on the Line and prevision of spaces and facilities for the storage and management of spare parts of different disciplines mentioned. In addition, prevision for the supply of fuel and for the maintenance of special vehicles should be included.

Similarly, the PM should include, in its design, the spaces for administrative units, prevision for the parking of vehicles of staff of operations, maintenance and administrative work in the yard, as well as the facilities required by the personnel that work in the same.

The Depot should be equipped with a network of pathways for conformation and parking of trains. In addition, the necessary buildings for inspection and the major repairs of trains should be included, based on the levels of routines to be carried out and the interconnection of the train parking among themselves and with the various workshops to which they should be dealt with.

In the design of the civil works, the PM should consider that heavy equipment and tools are installed in these buildings (bridges cranes and lifting jacks of bodywork among others) and electrical connections should be provided for the energy of trains in the areas of inspection and repair workshops. A facility for washing trains should also be considered.

The entry and departure of trains, or from the Line, will be managed through a Control Center Depot that will authorize or restrict movements of these on the Depot. Consequently, the PM should make conceptual design of Depot, which allows the operation of trains safely and efficiently as well as the same fluidity. Moreover, the PM should design buildings, including its equipment, for workshops for the maintenance of traction power equipment and auxiliaries, electronics for control of trains and communications equipment, the corresponding to the electromechanical equipment of the stations and those required for the coordination of the maintenance of stations and related buildings on the Line. The PM should include estimates of spaces and facilities for the storage and management of spare parts of various equipment and facilities mentioned, including the areas for reception and dispatch of materials and spare parts, logistics management and quality control required.

In addition, given that the playground equipment will include special vehicles for the mobilization of trains and maintenance of the Line, the PM should consider prevision for a tank, pipes and suppliers, for the supply of fuel, with the provisions that require the storage and handling of flammable substances.

To access railway from the main road, pedestrian and vehicular access are required, as well as any other necessary facilities like levels of pre-dimensioning of architecture, structures, electromechanical and sanitary facilities, detection and fire control and network of drains, including any other necessary installation should be developed.

2.1.1.2.10. PARKING LOTS OF DETERRENCE

Line 3 expects the construction of parking lots of "deterrence", for the purpose of encouraging the sharing of the use of vehicles with the monorail system. In this sense, the PM should develop connectivity and functionality of the integration of these facilities with the different stations of the Line and perform preliminary designs of structures, architecture, turnstiles, necessary sanitary and electromechanical facilities, detection system and fire control, network of drains, pedestrian areas, road modifications needed and any other discipline that is required to facilitate the integration of the parking system.

Structures and facades that will facilitate the direct connection with the parking of deterrence or other interconnections should be seen in the design of the stations.

2.1.1.2.11. INTERCONNECTIONS WITH SURFACE TRANSPORTATION

For Line 3, in the preliminary outline of the project, interconnections that permit the transfer of passengers between the monorail system with the system of buses and other means of surface transport have been planned. The PM should develop functional designs of integration of these systems, considering bus stops; stood cabs and other groups and pedestrian areas, and develop the basic designs of structures, architecture, sanitary and electrical installations, detection and extinction of fires, drainage, road modifications that are required and any other discipline that is deemed necessary.

Given the importance of these spaces as a point of exchange with different feeding systems and their interaction with the stations, it is crucial that the PM considers, in the design, existing and future urban environment activities in order to enhance their effect, taking advantage of the flow of people and services that are induced by the activities with special emphasis on the distribution of the spaces in the way that it does not generate barriers or obstacles that hinder the access or exit the system.

2.1.1.2.12. URBAN PLANNING

The purposes of the urban planning of the environments surrounding the stations are to facilitate the access to the users of the system, provide safe and ample spaces for movement of users, facilitate connectivity with the exchange with other modes of transport systems, and create pleasant and comfortable environments for

users.

In the process of recommending the final location of the stations, its fitting within the existing and future environment that the PM wants to develop should be evaluated comprehensively. Having this in mind, the PM should dimension installation of access to stations and exchange facilities/structures to ensure that the same functions efficiently in the various environments of the stations.

One of the important aspects in the construction of the subway Line is the restoration of spaces affected during its construction, and this fact can be exploited to promote the urban integration of the structures of the Line with the buildings and their surroundings areas. In this sense, the PM should analyze the corridor through which the Line runs and undergoes consideration of MPSA and improvements to be carried out, considering architectural solutions and including landscaping that promote urban renewal in a logical and efficient way with criteria of functionality, safety and reasonable costs.

2.1.1.2.13. RELATED CONSTRUCTIONS

In addition to the structures referred to previously, the PM should consider and design all facilities and buildings that may be necessary for the safety and good functioning of the Line. All the necessary works should be considered with the corresponding justification of their need, even if they are not expressly indicated in this document and subject to the approval of MPSA.

2.1.1.2.14. CONNECTION BETWEEN LINES

Since the technology selected for Line 3 is not a conventional railway type compatible with the facility on the Line 1 of the Metro, it will not be possible to make a connection of service to the level of the routes, and only facilities to connect the Lines in their integration of transport requirements should be provided, considering all the needs and facilities so that the users can connect their journey between a Line and one of the most direct and efficient way.

2.1.1.2.15. REQUIREMENTS IN THE CIVIL WORKS FOR THE INTEGRAL OPERATING SYSTEM (SIO) AND ROLLING STOCK

In the development of the design of Line 3, the PM should establish the requirements and conditions of each of the disciplines that make up the Integral operating system (SIO) and rolling stock, with respect to the works under the responsibility of the Contractor(s) of civil works, as well as other equipment and systems. Equally, the dates that delivery of each of the facilities, environments and areas required by the SIO are submitted and early and late dates MPSA is available should be determined.

For each environment, the PM should carry out, but not limited to, the following activities:

1. determination of the dimensions and conditions of finish or completion required of civil works in the environments of the stations and in the areas in the Line and buildings related to the equipment of the SIO.
2. design of the network of drainage in accordance with the demands of the SIO, in the stations, viaducts and related buildings.
3. determination of the system of pumping the water for firefighting and collection of rainwater and its location, considering low spots and areas where rain predictable flow so requires.
4. design of all the pipes in the structures or surface, required for the wiring of different discipLines of the SIO and elaboration of the plans-guides with detailed mapping of all the Lines.
5. design of grounding previsions required for the various discipLines that comprise the SIO.
6. determination of the access points of the materials and equipment required by the SIO and the conditions thereof.

2.1.1.2.16. REQUIREMENTS IN THE CIVIL WORKS FOR ELECTROMECHANICAL EQUIPMENT

Electromechanical equipment includes fare collection system, ventilation and air conditioning in technical environments, the pumping systems, detection and fire extinguishing system, lighting and power system, the system of visual information to the public, lifting systems (lifts and escalators) Equipment for Access Control and sound public information systems.

The PM shall include, in the advanced design of the project, the provisions that should be met for proper installation of the above-mentioned equipment, which include:

1. The supply of drawn pipes and gutters or trays for wiring of power and control of the equipment.
2. The supply of devices for the ground.
3. The wiring at 277VAC for emergency lighting.
4. The supply and installation of wiring at 120 VAC with exclusive circuit for the power supply of equipment or components that need it.
5. The lights and outlets in accordance with the requirements for the installation of the equipment in each area.
6. Determinations of finishes, drainage, lifting hooks, traps of access, props, doors and switches, if applicable.
7. Construction of niches or projections of spaces for the installation of the equipment.
8. Elements for connection to the ground of the equipment.
9. Finishes required for installation of panels of alarm in the operational area.
10. Supply of water for firefighting.

11. Supply of strength and control boards for required equipment.
12. 12 Installation of the wiring force from distribution boards to terminal boxes left by the civil works.
13. Any other things that are necessary.

With regard to the design of the SIO, the PM should include previsions for the transmission of information of equipment, from the stations to the CCO and the supply and installation of the panels to provide energy for this equipment to be located in the operational area.

2.1.1.2.17. REQUIREMENTS IN THE CIVIL WORKS FOR THE AUXILIARY SYSTEMS OF THE DEPOP AND WORKSHOPS, DETERRENT PARKING LOTS AND INTERCONNECTIONS WITH SURFACE TRANSPORTATION

The Depot and workshops, the parking and the interconnections with surface transportation, from the conceptualization that the PM affects for the definition of its functionality, the sizing to establish initial capabilities and end of each facility and the distribution of the spaces to give the proper use and optimization of areas and land intended for these purposes, the PM should determine the provisions to be considered in the civil works for auxiliary systems necessary for its operation and that will be shaped by the systems of distribution, lighting, drainage, sanitary, and force pump, detection and extinction of fires, ventilation and air conditioning, where required, vertical circulation elements, as well as any other required for the correct execution of the project.

For Depot and workshops, the PM should sustain the considered sizing for these installations based on the requirements of the number of interventions, frequency, duration, simultaneity and other elements of the management of maintenance that is deemed required by the SIO, both in its initial phase as for the moment in which the Line is at its maximum capacity of design. In this analysis, the PM should consider, if appropriate, the different phase of implementation of the project on the basis of extensions or complementation of the system.

2.1.1.2.18. REQUIREMENTS FOR THE SIO AND ROLLING STOCK

The PM should dimension the different elements that compose the SIO (electrification, signaling, trains, telecommunications, and centralized control) and project the future expansion up to the maximum capacity of the Line design. The feasibility of standardizing systems, interfaces and presentations with the existing Lines 1 and 2 of MPSA should be analyzed in such a way to facilitate the operation of Line 3 by making it more compatible and similar to other Lines of the MPSA systems. Systems of signaling, control of trains and centralized control should be detected so that they become the most similar to those installed on existing Lines to facilitate the maintenance and operation of the complete system of the MPSA.

On the basis of projections of demand for Line 3, the PM should conduct analysis of the operation of Line 3 to dimension the fleet of trains and recommend the most appropriate configuration for the year of starting operation and for the 5, 10, 20 and 35 years in the future.

2.1.1.2.19. ESTIMATED COSTS AND TIMETABLE FOR IMPLEMENTATION OF THE PROJECT

From the basic and advanced design developed by the PM and the specifications of the different systems, an estimated cost of the project that details the major components of the project should be developed. Additionally, a GANTT-type schedule and a timeline schedule of the project execution should be developed, which includes the main phases and elements of the implementation process.

2.1.1.2.20. STUDY OF EXTENSION OF THE LINE

Based on the development of the basic design of Line 3, the PM should define the alignment, the location of stations and preliminary turnout of the extension to the west of the Line until the sector of La Chorrera, considering, for this stretch, all the facilities of connection and interaction with other related services associated with Line 3, such as interconnections with other modes of transport and parking lots of deterrence. Similarly, the PM should dimension requirements of electrification of the extension of the Line and consider these requirements in the basic design of the initial phase of the project.

This extension of Line will run from the area of the Depot and Workshops until its integration with the urban sector of La Chorrera. To develop the concept of extension of Line 3, MPSA will carry out a topographic study and surveys of soils with laboratory tests at every 500 meters from the route and location of each new station, using its own resources. The PM should supervise the topographic and soil surveys undertaken by MPSA.

2.1.2. LIST OF SPECIFICATIONS FOR THE BIDDING OF THE PROJECT OF TH E LINE 3

In addition to the request in paragraph 2.1.1, concerning the preparation of the technical documentation that defines the project of Line 3, the PM should provide support to MPSA in the preparation of the list of specifications for the tender of the project of Metro Line 3. To provide this support, the PM should provide specialists with experience in the preparation of lists of specifications in full knowledge of legislation and normative local force on matter of public procurement and with experience in the drafting of EPC (Engineering, Procurement and Construction) contracts.

This documentation shall include all matters in the below relating to the conditions which will control the bidding process such as the demands of the legal, financial and technical requirements of pre-qualification and acceptance of proposals and proponents, the conditions and valuations of scoring proposals, forms for the orderly delivery of the requested information, the conditions and contractual model the estimation of prices, program of implementation of the project and the estimated flow of payments.

1. The PM shall include the following items in the bidding documents:
   (a) List of specifications, considering law and regulations of Panama, the Guidance for Management of Safety for Construction Works in Japanese ODA Projects (September, 2014), and international standards, such as guidelines of international organizations, based on the necessity.
   (b) Requirements for tenders: (1) Submission of a safety plan that meets the requirements in the above guidelines, and (2) Inclusion of personnel in charge of safety measures as one of the main positions in which the indication of persons is required in the bidding documents.
   (c) Requirement for the winning tender: Submission of a method statement of safety at the stage of construction.

2. The PM shall review the safety plan and the method statement of safety submitted by Tenders

3. During the period of construction, the PM shall ensure the placement of the personnel in charge of safety measures and execution of construction meeting the safety requirements provided in contracts, and request the Contractor(s) for improvement in case that there is any problem related to the whole safety measures.

2.2. ASSISTANCE IN THE SELECTION OF CONTRACTOR(S)

The PM should support MPSA in the process of contract of the project of Line 3, giving their support in the administrative procedures of the bidding process that includes the phase of consultation and clarification of the list of specifications, in the analysis of the technical, administrative, financial and programmatic elements and otherwise, things that make up the delivered proposals; assistance to the evaluation committee in the review, provision and verification of data that could serve as support for the evaluation of the proposals; and finally support in shaping the final document and the contract formalization (which involves a process of negotiation and consultation) to subscribe with the Contractor(s) that result in being favored in the decision of the contract for the execution of the project of Line 3.

2.3. SUPERVISION OF THE IMPLEMENTATION OF THE PROJECT

2.3.1. ENGINEERING SERVICES FOR REVIEW OF PROJECT DESIGN

The supervision of the execution of the project design includes the review and concordance of the detailed designs of the project (The PM should inform MPSA of its concordance to the detailed designs proposed by the Contractor(s)), both the civil works, with their specifications, reports and calculations, like the supervision of electromechanical installations of the Line and stations and the SIO which will be developed by different Contractor(s). Likewise, specifications of all systems to be installed in Line 3, calculations of sizing, manuals of operation and maintenance, testing protocols and any other document that generates the Contractor(s) and that are necessary for the execution and commissioning of the project of Line 3, should be reviewed and approved.

QUALITY ASSURANCE PLAN

One of the first aspects to include in the provision of services of the PM corresponds to the verification or determination of rules that should govern the development of the project for the Line 3 of MPSA, the review of studies, designs, plans, specifications and other documents that are required to develop the Contractor(s) and that they are necessary for defining the execution of the project which will run from the preparation of the site, previous studies, construction, equipment and commissioning of Line 3.

To achieve the purposes set in the above, the PM will establish the Plan for the quality assurance of the Project (Quality Assurance Plan), which will be applied to the provision of their services as well as processes and products that the Contractor(s) of design and construction develop, giving special attention to the consideration of all aspects that permit to guarantee that the design and construction are carried out in accordance with the requirements of MPSA, which shall include at least the following aspects:

a. the clear definition of the objectives and scope of the requirements of MPSA. by means of guidelines that will be developed by PM; the establishment of the necessary procedures for its fulfilment, the documentation associated with the objectives of the project and the deliverable products;
b. identification of the relevant quality standards for the design of the project of the Metro system for Line 3 and the determination of the requirements to meet for the fulfilment of each of them;
c. identification of internal and external elements that could influence the products or processes;

d. definition of policies and procedures as well as the milestones of control to be implemented, registration of requested changes or corrections and verification of the recommended corrective actions;
e. identification of persons or autonomous entity responsible for conducting systematic audits included in the Quality Control Program to verify the compliance of the Contractor(s) and the PM.

MPSA may, when thus deemed appropriate, request information about conducted audits, corrective actions implemented in the framework of the provisions of the quality assurance plan and any other information deemed relevant.

DOCUMENTATION FOR THE IMPLEMENTATION OF THE PROJECT

There will be the criteria for the conceptualization of the project of Line 3 by the PM with which should be developed, in addition to elements of the functionality of the Line and its characteristics, conditions of safety, quality, comfort and reasonableness of costs that are necessary, as well as the geographical, environmental and seismic realities of Panama City and the applicable rules. In this sense, the PM should ensure that both standards are respected and met, which apply as criteria established for each element of the project, and require the determination of some criterion that had not considered the studies developed by the PM as part of the elaborated technical documentation. The PM will request it, review and agree with MPSA so that their compliance will be ensured from there.

2.3.1.1. REVIEW OF THE PROJECT DESIGN

For all the works to be built in the execution of the project of Line 3, the PM will review all levels of architecture, structures, foundations, drains and facilities electromechanical, sanitary drinking water, provisions for grounding and lightning protection, as well as any other discipline that is required, based on design criteria to be applied, basic (and advanced in the case of stations) design developed by the PM and the suggested functional and technical specifications, all in accordance with the deadlines set out in the work program. The PM will provide special care in review of suggested hydrological solutions, verifying with the consideration of the frequency and run-off of rains and water, on the basis of the criteria of economy and efficiency for low points or when the particular characteristics of certain locations require it so, including pipes and discharges to the sewer network.

The PM should review all the detail designs of each electromechanical system and SIO of the Line 3 and verify that both the plans and the same work that are all necessary provisions for the installation of these systems. The PM should ensure that they have considered the technical interfaces and previsions for facilitation of installation, operation and maintenance of systems and equipment, both regarding the civil works, such as those corresponding to different systems of equipment together. These interrelationships will consider, among others, previsions for ducts,

pipes, ducts, connections, power supplies of power and water, boxes of interfaces, boards, grounding, and any other necessary provision.

Independent from the basic engineering design of the Line, elements and systems the PM has made and elaborated in the case of the stations, including basic and advanced engineering design of the Line that constitute the basis for the implementation of the construction project shall review all drawings, designs, specifications, calculation reports and any other document which the Contractor(s) develops for the realization of the works and installations checking that standards, criteria, and established conditions are fulfilled and respected for each discipline or part of the project, noting that the project is implemented maintaining the principles and rules of the art of a good engineering. The PM should check, but not limited, the designs and procedures indicated below.

2.3.1.1.1. ALIGNMENT OF THE LINE

The PM should verify that the alignment is predominantly sophisticated and safe in the Yard and in the path of transition between the high route and this, and respect for the criteria laid down in this area, looking for the structure that allows its development, present minor interference with the road, adjacent structures and temporary and/or permanent involvement of estates and surrounding properties. Horizontal and vertical alignments of the geometric design of the route shall ensure appropriate safety factors, wagon stability and comfort to the passengers, as well as the definition of the geometric parameters of the road, considering the civil, hydrologic, hydraulic, and structural and geotechnical aspects. As part of the review of the route of the Line, the PM should analyze the location of each passenger station, noting that it is the most convenient in terms of location for user access, less affecting farms and bonded public surrounding and appropriate to the conditions of the horizontal and vertical Line alignment. The PM should check design conditions, which are decided between MPSA and the Ministry of the Public Works (MOP) of the 4th bridge over the Panama Canal, are met for the sections of the access to the bridge and on the superstructure of the same.

Likewise the PM will verify that design of details developed by the Contractor(s) has considered the extension of the Line to its final terminus in the sector of La Chorrera, considering the location of the new stations. The Contractor(s) does not need to provide detailed designs.

2.3.1.1.2. WORKS OF PRE-CONSTRUCTION, TEMPORARY WORKS AND RELOCATION OF PUBLIC SERVICES

The PM should check designs, scope, amounts of work and budgets of the relocation of all the public and private services located in the area of influence of Line 3 and which could be affected by the construction, in order to verify that interventions that the Contractor(s) suggest are necessary and should allow the

relocation of these services in a safe and coordinated manner, with minimum disruption, both of these services and the execution of the work.

In addition, the PM should review studies and plans for the execution of pre-construction works and temporary works that are required to allow the construction of the Line.

2.3.1.1.3. DIVERSIONS OF TRANSIT

The PM should analyze the road network and check the temporary and permanent effects on the associated road network which will lead to the construction of the Metro, parameters and criteria on which the Contractor(s) of civil works make the Plan of Traffic Management and ensure their timely processing and obtaining permits from the competent authority in this matter by verifying that the referred one indicates, in a precise manner, modification to circulation in streets, avenues and corridors adjacent to the construction of the Line; the methodology and the provisional construction elements (boards, bridges, high metal, among others) necessary for its implementation, programming and duration of interventions and adequate and timely disclosure of the information associated with the road interventions for the purpose of ensuring that modifications in the roads in the affected areas are established with least disturbance of transit and the development of works, in conformity with the guidelines established by the competent authority. The PM should participate in the inspection of the roads affected by the construction and define the conditions in this infrastructure to be restored. The PM should also develop conditions under which civil engineering Contractor(s) shall carry out maintenance of the affected roads during the validity of the contract. The temporary and permanent relocation of stops of public transport buses and pedestrian paths should also be analyzed.

2.3.1.1.4. STATIONS

The PM shall review the architectural designs of detail of the stations that include all the services and requirements necessary for the proper operation of the system, verifying to consider all operational and technical environments as well as their functions and the function of the system as a whole; compliance with the default sizing of the public areas, rail in mind the operational aspects and associated equipment technologies; the appropriate and functional distribution of technical and operational spaces; the requirements of each environment depending on the accessibility of people and equipment in them, which are to be installed and to facilitate maintenance and replacement in the future; and integration with systems of surface transportation and parking of deterrence with the stations.

On the other hand, based on the studies of demand, the PM shall verify fulfillment of the sizing of the platforms, the circulation patterns of the users at stations, doors of platforms, vertical circulation elements, the number of required turnstiles and

their location. The location of access, the catwalks of connection and addressing associated stairs, areas for appropriate accessibility to the station and the preparation of reserved areas for maintenance, fire and ambulance vehicles shall also be reviewed.

The PM will put special attention in the revision of the constructive solutions which suggest the Contractor(s) for the enclosure and protection of the platforms, public lobbies and areas of access to stations, to the climatic conditions of the sector, considering such impact on the appropriate natural ventilation of the public areas, the protection of direct sunlight in areas of circulation and permanence of users and the entry of rainwater, rail this in mind for this ultimate characteristics of the rains that are in Panama. Similarly, in the detailed designs presented by the Contractor(s), it shall be procured to allow the integration of facilities of third-level lobby of the stations.

Equally, the PM shall review the design of all the facilities to ensure the proper functioning of the stations, based on pre-established criteria in terms of their size, distribution and optimization of space, installation route, concealment of pipes, aesthetic if pipes are in sight view, interference between systems, and any other applicable items.

The PM shall analyze and review designs and materials, furniture stores, artifacts and the proposed finishes of the stations, landscaping and urban regeneration of the environment, as well as spaces for integration with the rest of the transport systems, which proposes the Contractor(s) to meet the criteria of functionality, aesthetics, safety, durability, availability, facilitation of maintenance and reasonable costs.

2.3.1.1.5. ELECTRICAL SUBSTATIONS

The PM will review the design of the power supply of the system from the points of interconnection with the company of electric power supply of the city, the sizing and the functional scheme of the rush that will feed the Line 3 of the Metro and will note that the voltage level of interconnection, as well as the sizing of the sub-transmission are suitable to the characteristics and conditions of operation of the Line. The PM will accompany MPSA with regard to the request for rush before the enterprise of electric service in the area and will review the design for the service drop until his arrival LAP Line. Of the sub-transmission, the traction substations (SET) and the power distribution substations (SEP) can be connected. Power to other structures related to Line 3, as interconnections of surface transportation and parking lots of deterrence, subject to specific studies to analyze the suitability of its electric meter dependency, for which PM should analyze the situation and sustain his pronouncement on the matter with a report.

The PM should ensure that the location of electric (SET) substations of traction, intended to accommodate equipment for power trains, is preferably in the area of

the stations or, in exceptional and justified cases, very close and linked to them. The PM should review the capacity and number of necessary substations along the Line, considering the electrical sizing of this, under normal operating conditions, with all the substations in use and under operation "degraded" by failure of one or several of them. The PM will verify the sizing of substations for power distribution (SEP) of each season for the power of lighting, force and all the equipment of the same.

For each SET and SEP substation, the PM will require and review all plans required, considering the distribution of spaces, connections, previsions for income, operation and maintenance of the equipment as well as any other conditions which should satisfy these areas for their proper functioning.

In regards to the bidding for power system sources of support, the PM should analyze and review these installations and equipment to comply with the requirements that they are designed and installed to facilitate the operation, maintenance and future of equipment replacement and that have an efficient connection to the internal distribution of the Metro network.

2.3.1.1.6. RAIL PLATFORM

The PM should verify that the detailed design of rail platform meet all the requirements of the superstructure (boards or beams of rail in the event of monorail) and infrastructure (piles and foundations) necessary for the installation of the platform concerned, guaranteeing to respect the gauges of the trains and the distances from adjacent structures in particular which is generated between the platforms and trains both when they are circulating through the stations and when they remain detained in them.

Likewise, the PM should ensure that templates and minimum distances that should be retained between the elevated road structure and public or private streets, roads, utilities or other structures and properties located on their adjacency. The compliance of dimensions with the structures of Line 1, Albrook station and yard in its area of interception and overlap between Lines 1 and 3 should be checked in a very special way.

The PM should verify that there are adequate estimates for the installation of electrical wiring, cables for train control, previsions for laying optical fiber and other components associated with the system.

In the verification of the design of these structures, the PM should consider particularly structures of supporting switch works, which, in addition to the compliance of dimensions and other requirements, the required longitudinal and transverse drainage should determine the form of collecting and downloading the water.

The PM should check that studies of the frequency of natural transverse vibration, which is caused by the interaction between the beam of the high way and the train fare, conditions of winds, values of rolling loads and distribution of concentrated loads, have been considered. It should also be ensured that previsions to resist the force of thermal origin and means necessary to allow movement resulting from these effects have been considered. Special emphasis on these checks should be made in the sector where the beams supporting structures will be placed on the supporting structures of the accesses to the 4th bridge over the Canal and the platform on the superstructure of the bridge and its consideration regarding the external difference between the characteristics of joints of elasticity and dilatation of both structures, as well as sources of vibrations that are transmitted to the platform via the monorail. The PM will verify that beams designs comply with agreements with the PM on the 4th bridge and its designers.

The PM will verify that most suitable foundations of scheme are selected depending on the soil conditions and seismic risks, the typical sections of the supporting structure of the beams, including special structures to natural conditions or on existing structures, such as crossings of rivers, creeks, steep slopes or road intersections, and its geometrization should determine the construction tolerances required for proper installation on the deflections incurred under the effect of the weight of the beam and the load of the rolling.

The PM should verify and ensure that the proper form of construction of road curves with respect to the parameters as clothoids, beams, cant, contra-flechas for the vertical load of the carriages and the impact, the effects of shrinkage and creep of concrete plastic, as well as any other factors that should be considered for the proper design of these structures.

In addition, the PM will ensure implantation, if necessary, of support devices for the efficient transfer of forces from the beams to substructure and previsions that will prevent the displacement of the superstructure by effects of mobile or caused loads during a seismic event, as well as measures or necessary devices preventing the displacement of the same. With regard to the integration with the supporting structure of the accesses and the superstructure on the 4th bridge platform, it should be verified that props the monorail beams meet the requirements set out in the supporting structures of the same bridge designs. Similarly it should be verified that the proposals and designs make the displacements of the expansion joints of the superstructure of the bridge compatible with the monorail beams and solutions that arise to solve this interaction. The level of involvement of any source of external vibration or movement generated by the bridge structure that affects the functioning of the monorail should also be tested.

Likewise the PM should review the alignment and design of structure for the construction of the transition that connects the main road with yard, including structural plans, foundations, drains, facilities and any other discipline that is required for the execution of civil works and installation of the equipment that is

necessary.

In PM, as part of the structure of roads, well along all the route of the Line, or only in some specific sectors, the design for the proper implementation of a pedestrian walkway with protection that allows the evacuation of people in case of failure of the trains is required. This structure should allow pedestrian circulation for users continuously, without obstacles or elements of locks along the adjacency of the tract and contemplate elements allowing leaving the elevated structure to descend to vehicular routes of the sector.

2.3.1.1.7. DEPOT AND WORKSHOPS

For the design of the Depot of Line 3, PM will note the dimensioning and the efficient distribution of the spaces, to manage the fleet of trains, which will be held in an area of approximately 12 hectares, located in the vicinity of the city of the future in the Arraijan district.

In that area, the PM should check that all the necessary facilities to handle the final fleet of trains, including their parking routes, calculated for the horizon of design of the Line, based on estimates of projected demand and studies carried out to this end, the buildings and the requirements for inspection have been considered, major maintenance and repairs of trains, for the maintenance of traction power equipment and auxiliaries, electronics for the control equipment of railway and communications, electro-mechanical equipment of the stations, structure of routes and switch works, as well as for the coordination of the maintenance of stations and Line related buildings and estimates of spaces and facilities for the storage and management of spare parts of the aforementioned disciplines. It should also confirm previsions for a net of vehicle road, the adequate interconnection of the parking routes of trains with the various workshops, an area for the supply of fuel and for interventions to special vehicles and back-up generators that support the operation and maintenance.

Equally, upon request of the MPSA, the PM should check design of prevision of the spaces for administrative units, parking of vehicles of the operations personnel, maintenance and administrative stood in the Depot, some facility for security forces assigned to the subway system, as well as any other facility required by the institution or by the personnel that work in the same.

The movement of trains in the Depot, including the output or input from or to the area of transfer with the main Line, will be managed through a Management Center of the Depot that will authorize or restrict the movements; the PM should review and approve the detailed design of the Depot that it allows proper operation of trains safely, efficiently and smoothly.

In addition, the PM will verify that the equipment of the workshops for the maintenance of all facilities, including trains, and system infrastructure of the

system is included in the design and requirements of the project.

The PM will verify that the designs of structures of the installation of Depot would be appropriate for the characteristic of soils and seismic risks in the area of implementation. Moreover, the plans of the architecture of the installation of the Depot will be reviewed to ensure compliance with the requirements and ensure that the design is efficient and suitable.

2.3.1.1.8. PARKING LOTS OF DETERRENCE AND INTERCONNECTIONS WITH SURFACE TRANSPORTATION

The PM will ensure that development of designs for accessibility develop and connection of Line 3 with the parking lots of "deterrence", which will encourage the exchange of the use of private vehicles, and verify plans and calculations of structures, architecture, necessary sanitary and electromechanical installations, the network of drainage, drinking water, pedestrian areas, road modifications which are necessary for the efficient operation of interconnections and parking and anything else that is required for its functionality.

Similarly in Line 3 interconnections that permit the transfer of passengers between the system of buses and other means of surface transportation to the Metro system are planned. The PM will ensure that designs for accessibility and connection to the Line, checking the designs of these structures and their facilities considering the spaces of bus stops, taxis and other groups and pedestrian stops, are developed.

These spaces are very important as points of Exchange with different feeding systems and their interaction with the station; therefore, the PM should analyze urban activities existing in the environment, in order to enhance their effect, taking advantage of the flow of people and services that are induced by them, with special emphasis on the distribution of the spaces, so that the design does not generate barriers or obstacles that hinder access to the system or the same output.

2.3.1.1.9. URBAN PLANNING

The PM should analyze the corridor through which the Line runs and consult with MPSA regarding improvements that can be developed in relation to the restitution of the affected areas during its construction, considering options of architectural solutions that include landscaping, which promote urban renewal in a logical and efficient way with criteria of functionality, comfort, and safety at a reasonable cost, promoting the urban integration of the structures of the Line with the buildings and their surroundings areas. Likewise the PM should request and review all concepts and designs of the works developed by the Contractor(s) that are required for proper functionality of Line 3 even if not expressly indicated in specific documents and submit them for the approval of the MPSA, with the corresponding justification

of their need.

2.3.1.1.10. INTERACTION BETWEEN LINES 1 AND 3

For the interconnection of Albrook with Metro Line 1, the PM should analyze more direct alternatives that produce the exchange of passengers between the two systems. Considering the maximum use of the existing Line 1 Albrook station, amendments of the facilities required for an adequate and efficient transfer of passengers for a long-term projection shall be revised. The PM should agree with the Contractor(s) on the best way to schedule amendments at Albrook station so that the station stays operating throughout the period of execution of the modification of the station to cater for passengers of Line 1. At all times the PM should analyze any impact on the existing structures of the Albrook station to ensure its integrity. Gaps in Albrook station should be analyzed to ensure sufficient areas of buffer for the accumulation of passengers under extreme but realistic scenarios. Moreover, the PM should assess the transfer of the passengers who use the existing stairs and elevators and recommend necessary schemes for increased capacity.

The PM should check the design of Line 3, taking all the considerations for the interaction of operation between the two Lines, including all aspects involving the execution of works, the plans of structures, foundations, slabs, roofs, drains and anything else that is required for civil works and the installation of the necessary equipment and ensuring that provisions for the realization of these works do not cause disturbances in the operation of Line 1 in service. It should be ensured that all the Gages, restrictions and safety elements have been placed for the project to develop its respect to Albrook station and yard area.

2.3.1.1.11. REQUIREMENTS OF CIVIL WORKS FOR THE INTEGRAL OPERATING SYSTEM (SIO) AND OF ROLLING STOCK

In the design of Line 3, the PM should review the requirements and conditions that the responsibility of the Contractor(s) of the civil works can be fulfilled on each of the components that make up the integral operating system (SIO) and rolling stock as well as other equipment and systems, analyzing and remembering dates of delivery each of the environments and areas required by the SIO.

For each environment the PM should carry out the review of the activities that are required to ensure proper estimates of these interfaces, especially, but not limited to, the following:

1. Dimensions and conditions of required finishes of civil works in the environments of the stations and in the areas in the Line and related buildings intended for the equipment of the SIO.

2. Network of drainage according to the demands of the SIO in the stations, viaducts and related buildings.
3. System of pumping the water for firefighting and collecting rainwater and its location, considering low points and areas where flow of predictable rain is required.
4. Pipes drawn in the structures or in view, required for the wiring of different disciplines of the SIO and plans with detailed mapping of all the Lines.
5. Previsions of grounding required for different systems that make up the SIO.
6. Access points of the materials and equipment required by the SIO and the conditions thereof.
7. Supporting structures of platforms

2.3.1.1.12. REQUIREMENTS OF CIVIL WORKS FOR THE ELECTROMECHANICAL EQUIPMENT

In the same way, the PM should review the detailed design of all systems and electro-mechanical equipment required for the proper operation of the system and verify the inclusion of provisions for proper installation and functionality, highlighting:

1. The supply of drawn pipes and gutters or trays for wiring of power and control of the equipment;
2. The supply of devices for the grounding;
3. The wiring in stress levels suitable for emergency lighting;
4. The supply and installation of wiring in 120 VAC, with exclusive circuit for the power supply of equipment or components that need it;
5. The lights and outlets in accordance with the requirements for the installation of the equipment in each area;
6. Finishes, drainage, lifting hooks, traps of access, props, doors and switches, if applicable;
7. The niches or previsions of spaces for the installation of the equipment;
8. Elements for the grounding of the equipment;
9. Termination for the installation of panels of alarm in the operational areas;
10. Supply of water for firefighting;
11. Supply of strength and control boards for computers that require it;
12. Installation of the wiring of force from distribution boards to boxes terminals left by the civil works; and,
13. Any other that is necessary.

Likewise, the PM will verify that previsions for the transmission of information of the equipment are included from the stations to the Operating Control Center (CCO) and the supply and installation of panels to provide energy for this equipment, to be located in the operational area.

2.3.1.1.13. REQUIREMENTS OF CIVIL WORKS FOR SYSTEMS AUXILIARY DEPOT AND WORKSHOPS, STATIONS OF DETERRENCE AND INTERCONNECTIONS WITH SURFACE TRANSPORT

The PM should review the designs of all the structures and yard facilities and workshops of Line 3 and verify and endorse its sizing based on the requirements of the number of interventions, frequency, duration, simultaneity and other elements of the management of maintenance that is deemed required by the system, in its initial phase for the moment in which the Line is at its maximum capacity of design. In this analysis, the PM should verify and request the Contractor(s) to make the detailed designs, considering, if appropriate, the various stages of implementation of the project according to the extensions or complementation of the system, on the basis of the requirements and needs which may arise. Similarly, it should be checked that there are pipes and adequate space for the installation of equipment and systems and their connections.

2.3.1.2. **SPECIFICATIONS OF WORK**

In addition to the revision of the plans that make up the design of the project, the PM will review the general specifications and the particular specifications which complement these designs, and consequently, the PM should ensure coherence and consistency among all the documents.

For the purposes of this list of specifications, the information of the project is understood as "Document" and includes the preparation of plans and specifications, descriptive reports, calculation reports, metric computation, as well as any other thing that is necessary for the development of the project.

The PM should review the general specifications for the construction of the civil works corresponding to Line 3 developed by the Contractor(s), in which characteristics, mode, procedures, materials, quality, conditions of security, finishes, tolerances, verifications of positions, as well as any other element deemed necessary to specify to achieve the expected finished work and implementation properties should be defined.

General specifications should consider the definition and scope of the work to be carried out; the duties and responsibilities of each Contractor(s); required permits; the preparation of the site; the treatment of the public services that will interfere or are used; maintenance and traffic control; working methods; the necessary construction equipment; prevision for work camps; pre-construction works; movements, hauling and disposal of material filling or excess of excavation and debris; the quality of all materials used in the work; actions to protect the materials, equipment, people, fauna, flora and historical resources; the construction of buildings or facilities temporary and definitive; restitution of surface; conservation and restoration of buildings; related works; sanitary and electromechanical facilities; works with concrete, steel and metalwork; brick walls; pipes and hydraulic

devices; walls; crammed and exposed pipes, portable trays; miscellaneous (enclosures, glass, carpentry, doors, windows, painting, gates, railings, grates, ceramic, handrails etc.); as well as anything else that is necessary for the proper performance of the work.

In addition, general specifications should include previsions concerning the implementation of the work program; progress reports; reports on accidents that occur during the work; preparation of interim and final construction plans; detailed and plain plans "As Built" and other documents that will be submitted by the Contractor(s).

If necessary, the Contractor(s) shall draw up specifications particular to those aspects of the works that consider particularly specifics and that cannot be regarded as a general condition of the project or, for any particular case, generate an exception to the general specifications. For these situations, the PM should verify and endorse the detailed description of the situation, the location showing the peculiarity, their rail capacity and will review the specific requirements in terms of type, quality, finishing, facilities, machinery, equipment and tools, skilled labor, procedures, performance and security.

The particular specifications should be a complement or an exception of General Specifications and of the plain type, which the PM should see indications of the cross-references among them.

2.3.1.3. **SPECIFICATIONS OF ELECTROMECHANICAL EQUIPMENT**

The PM should review functional specifications and techniques for electromechanical equipment of the Line 3, including the system of collecting tickets, equipment for ventilation and air conditioning in the specific areas that require it, the system of pumping, the system of vertical circulation (elevators and escalators), the system of detection and extinction of fires, lighting and power system, equipment control, detection of intruders and closed circuit TV, the sound information for users, systems of visual information in the public and any other thing that is required for the proper operation of the transportation system.

The PM will verify that these documents consider, without limitation, the following:

1. Applicable rules, definitions, and abbreviations used;
2. General, climatic and environmental conditions of operation of the equipment;
3. General description of each system, its purpose and the elements that comprise it;
4. Features and expected quality of systems and equipment to be supplied;
5. Quality assurance plan;
6. Requirements for availability, maintainability, reliability, and security;

7. Program of work and progress control, considering all the stages, from placement of orders and supplies up to the start-up;
8. Monthly and quarterly reporting of progress of the works;
9. Test procedures for each of the phases of implementation of the work, from their manufacture to their start-up;
10. Conditions and facilities required in the areas for the installation and testing of equipment;
11. Previsions for packaging, transport and handling equipment, from the factory to its installation site, considering specific requirements with respect to factors such as resistance to weather, bumps, shocks, humidity, environmental salinity, among others;
12. Equipment and tools; calibration and certification of the same, when applied;
13. Organization of the work to be carried out by the Contractor(s) and the functional organization chart;
14. Requirements for contractual, technical and administrative coordination for the implementation of the work;
15. Requirements and procedures for the maintenance of systems and equipment;
16. Training to be delivered by the supplier or manufacturer; range of courses, duration and number of people to be trained;
17. List or previsions for spare parts and catalogues of parts for each element;
18. List of all documents, drawings and manuals of operation and maintenance;
19. Form and number of copies of the documents to be delivered by the Contractor(s) for preliminary version as well as for the final version;
20. Certifications and warranties; and,
21. Any other document that is required.

In addition, for each system, the PM should verify all the technical aspects of each equipment, with indication of accuracies and tolerances specific to considering, among other things, factors such as the levels of noise and vibration control; specific installation methods and resources required; interference; electro-magnetic risks; tools and special tools; location and distribution of equipment in environments; special tests required; piping; ducts; filters; sealed; grounding; tightness.

In general, the PM should verify that any other condition or requirement that is necessary have been included in these documents, even if they have not been expressly designated.

Details to consider with respect to some systems:

System of collecting fare

For system of collecting fare, the PM should verify technical and functional specifications to consider its full compatibility with the installed system in other

Lines of the metro system and which is running for the entire system of urban transport in the Metropolitan Area of Panama, through the use of rechargeable batteries, and contactless smart cards that may be used interchangeably to access to the Metro at any of its Lines as well as to MetroBus.

Ventilation and Air Conditioning system

The PM should review the functional and technical specifications of the equipment for ventilation and air conditioning endorsing environments that require it, as described later, and verifying the characteristics and mechanical / thermal levels that are required as well as performance, booking and conditions of backup in case of contingency that each environment requires. The PM should verify that equipment using commercial refrigerants of easy acquisition and that they comply with the rules of protection of the environment and the conditions of operation in case of contingency type fire or smoke; therefore, the PM will have to check the prevision of its interface with other security systems. For the effects clearly related but not limited to, environments that should require ventilation or extraction are: restrooms, changing rooms, kitchen and tanks maintenance, electrical sub-stations, etc.; and environments that require air conditioning are: operating rooms, ticketing, electronic equipment, communications and control, first aid, etc.

Lifting system (elevators and escalators)

For the vertical circulation system, the PM should check specifications of escalators considering that they should be equipment with characteristics and conditions of "Heavy Duty," and the civil and structural requirements should be checked considering the commercial equipment of internationally recognized brands, satisfying the most demanding conditions in terms of dimensions and weight and are of low energy consumption. The PM should verify that the conditions for access and installation of each equipment have been considered and, if appropriate, verify that the facilities have been left in the works for lifting and displacement of these stations and other buildings requiring these equipment for which the element considered with characteristics of manufacturing freight and installation determining responsibility for its delivery and placement should be endorsed. The PM should confirm the existence of information between this document and any other required reference for cases involving more than one Contractor(s) in the supply of the equipment.

For the elevators, the PM should review the number, location, capacity and characteristics of the equipment in total harmony with the design of architecture of the stations and check that the mode of access and exit of each lift is continuous and appropriate for users who usually have special conditions for mobility, as well as the type of internal and external finish that they should have and the responsibility for execution of each element. Special care will be provided in the revision of the requirements for surveillance through cameras of CCTV and

communication that should have the equipment.

Detection and fire extinction system

The PM should check the specifications of this system guaranteeing a high level of automation that ensures timely performance and selection of extinguishing agents appropriate for the safeguard of persons and/or equipment according to the condition to protect, with a high level of reliability, meeting all the legislation that regulates this field of action both at the international level, for mass transit, and local systems, doing so the necessary consultations to the competent bodies and appropriate concordances are carried out.

Lighting and power system

The PM should check specifications for the lighting system and make it a safe, harmonic and homogeneous system with previsions of latest technology trend for maximum efficiency and energy saving. The system should consider the zoning of areas and loads, in such a way as to establish priorities in normal operation and in the event of failure of the power supply as well as the regulation of lighting levels where required.

Equipment for Access Control, intrusion detection and closed circuit TV

The PM should verify that the characteristics and technical requirements of the system for access control, detection of intruders (SCADI) and closed circuit TV so to guarantee total compatibility, interfaces and interrelations with systems installed on the other subway Line and with the computer systems that control them.

Public Visual information systems

The PM should check technical specifications for the system of visual information in the public considering the signaling information and fixed guidance to be placed at stations and their surroundings, in the yard, in the parking lots of deterrence, the interconnections with surface transportation, as well as in related buildings that require it, keeping a uniformity of criteria with regard to other places of installation in the subway system. In terms of screen information for users, the PM should verify specifications of the latest technological trend for maximum efficiency and that screens are in adequate quantity, size, and location so that they comply fully its function.

2.3.1.4. TECHNICAL SPECIFICATIONS AND FUNCTIONAL INTEGRAL OPERATING SYSTEM (SIO) AND ROLLING STOCK

At the level of general definition, the Integral operating system (SIO) will be comprised of equipment and systems corresponding to elements or subsystems that, in case of the monorail track is made up of beams that make up the platform of rail; electrification, for both traction and auxiliaries; signaling; the control of trains; the catenary or collection of traction power system; telecommunications; control of doors of platforms; the centralized control; and all inter-related rolling stock.

The PM should review functional and technical specifications of the SIO for Line 3, noting that it is functional, technical and operational support required for correct action between the elements that comprise it as integrated suite, including rolling stock, as well as equipment and systems operating in other Lines of the Metro. In the case of signaling systems, centralized command and control should seek standardization with existing systems of Lines 1 and 2 of the MPSA and standardize human interface platforms.

For each of these subsystems, the PM will review the specifications considering the requirements of operation, both in normal conditions of operation and in situations of contingencies or degraded due to technical or operational, faulty operation serving the factors of safety of users, staff and equipment, the flexibility in operating performances of the system and the actions of operational strategies, the maximization of the monitoring and control of both local measures, where needed, as centralized; the facilities for the detection and correction of faults, and anything else necessary for the performance of the system is efficient and reliable. The PM shall ensure that the technical specifications for the subsystems comprising the SIO respect conditions of environmental temperature, humidity and atmospheric and electrical and chemical corrosion, mechanical vibration and shock of these systems and equipment, for the purposes that can operate properly and comply with the availability, reliability and useful life for the design.

The PM will verify that these documents consider, without limitation, the following:

1. Applicable rules, definitions, and abbreviations used;
2. General, climate and environmental conditions with respect to the operation of the equipment;
3. General description of the system and the elements that comprise it as well as functional and technical interrelations;
4. Features and expected quality of systems and equipment to be supplied;
5. Quality assurance plan;
6. Requirements for availability, maintainability, reliability and safety of the equipment and systems;
7. Program of work and progress control, considering all the stages of the implementation of the project, from the placement of orders and supplies at the start-up;

8. Organization of the work to be carried out by the Contractor(s) and a functional organization chart;
9. Monthly and quarterly report of work progress;
10. Test procedures for each phase of work implementation from the planning to beginning of the operation;
11. Procedures and program of the set of SIO testing;
12. Conditions and facilities required in the areas and environments for the installation and testing of equipment; interface with other Contractor(s);
13. Conditions and standards of packing, protection, transport and handling equipment, from the factory to the site of installation, including the transfer to the provisional necessary stores, considering specific requirements with respect to factors such as resistance to weather, bumps, shocks, humidity, environmental salinity, among others;
14. Equipment for testing and diagnosis; special tools (with the cross-references between elements); calibration and certification of the same, when applied;
15. Requirements for contractual, technical and administrative coordination for the implementation of the work;
16. Requirements and procedures for the maintenance of systems and equipment;
17. Program of training and organization; list of courses, content, scope, estimated duration, level of preparation required, number of participants and necessary means of support; assessment of the number and qualification of instructors and the realization of the training program; monitoring and remedial action;
18. List of spare parts and catalogues of parts for each element;
19. List of all documents, drawings and manuals of operation and maintenance;
20. Form of presentation and number of copies of all documents to be submitted by the Contractor(s) for the preliminary and final versions;
21. Certifications and warranties to be requested to the Contractor(s); and,
22. Any other factor that is required.

Details to consider with respect to certain elements or subsystems:

Rail Platform

The PM should review the design of the platform on which the rolling stock of Line 3 which will be constituted by the beams that make up rail platform that fits the Rolling Stock and serves as a support and guide of the trains. This platform should ensure a level of security, continuity and comfort or smoothness in the movement of trains, so the precision of its design and implementation of manufacture of beams and its installation should be handled with millimeter tolerances of a monorail system. The PM should ensure appropriate interfaces between the concerned platform and rolling stock, verifying the minimum respect gages and adjacent present structures along the way.

The PM should make special emphasis on the review of the requirements of this platform and its interrelation with the 4th bridge over the Canal, especially with regard to the characteristics of elasticity and expansion of both structures and affectation by the vibrations caused by the performance of the platform of the bridge superstructure. In the same way, the PM should remember and keep control of the support on the structure of access and platform on the bridge, and the installation of the beams and other complementary elements.

The PM should also ensure the proper implementation of the areas of switch works, which will require specific support structures and that consider all the requirements for its construction.

In the case of solution with a conventional technology of Metro type, rail platform will consist of a system of railways for which PM should check the specifications ensuring that they have been considered as the characteristics of the road similar to the one installed in other Lines of the Metro with the aim of having similarity in replacement parts, use of the same machinery and equipment maintenance and the application of procedures and routines of intervention similar.

Electrification for Traction

Regarding the traction power system, the PM should review this system design considering operating conditions similar to those provided in the rest of the Line of the underground, both in normal operation and in the event of a contingency for technical or operational failures and its criterion of backrest shall be such that, in case of failure of a substation, the adjacent should be capable of supplying the energy required for continuity in the provision of the service without any operating restrictions. In the same way, the PM should verify design components and specifications for back-up electric power system.

Signaling, Control of Trains and Communications

The PM should review the characteristics and technical requirements of the subsystems of signaling, control of trains and communications in the way of ensuring the safety, regularity, control and supervision of the operation of trains and control of setting platforms, which should be predominantly automatic, based on proven technology of last generation and to keep the attributes concerned both in regular operating conditions and degraded situations of system operation.

Centralized control

The centralized control for Line 3 is expected to be placed in the operation control room where the operation of the other Metro Lines will be monitored and, consequently, the PM should verify that this element responds to physical and

functional integration and an expansion of existing equipment from other Lines and that the work of installation, testing and operation of the part corresponding to Line 3 do not affect or have some negative impact on the operation of the rest of the system.

Doors of platforms

The PM should verify designs, specifications, equipment, and methods of installation and operational testing of the doors of platform of the stations of Line 3. Similarly, the PM should verify the facilities of electrification and signaling of the doors of platform and of the operation synchronized with trains. By forming an equipment key in the operation of the system, the requirements of availability, maintainability, reliability and safety of the equipment and systems should be verified.

Rolling Stocks

The PM should review the characteristics and technical requirements of the rolling stock for the Line 3, considering the acquisition of highly automated vehicles, of modern and proven technology, designed with energy saving criteria, image and full compatibility with the equipment that make up the SIO and the rest of the project. The PM should set values of reliability, availability, maintainability and safety (RAMS) of this element according to high quality standards for similar systems.

Operational premises

According to the operating conditions, the PM should endorse and determine the required fleet for the initial stage of operation of the Line and the necessary for the formation of the complete fleet for maximum capacity of the Line to the horizon of design, based on the characteristics of the alignment of the Line and have it present in the electrical dimensioning of the Line. It should be considered that the alignment takes into account the possibility of operating by means of complete circuits and cut circuits (long loop and short loop), which allows to optimize the fleet as well as mileage of train travels.

2.3.1.5. **COMPLEMENTARY DESIGN DOCUMENTS**

As a complement of plans and specifications to be developed by the Contractor(s), the PM should review the descriptive reports of each system, the reports of calculations for each structure type and each electromechanical system and the program of work for the execution of the project until its commissioning.

The PM will verify that, in the descriptive reports, the general and specific object is developed for each system or structure considered in the design, technical, dimensional and service characteristics, internal and external impacts to the project that could be generated and any other element that they have implications for the project.

For the calculation reports, the PM will verify the consideration of criteria, procedures and rules of how the calculations will be carried out for each element considered in the design, the considerations which determined the applied values, safety factors, and the use of standardized elements, among others.

For each of the systems, subsystems and elements required for the project, the PM will review the lists of items and agree with the Contractor(s) the codes, its description, and its scope.

For each item that is established, the PM will agree with the Contractor(s) the form of measurement and payment of each one and, if necessary, will define the conditions of recognition of that payment, the currency that will be held and variation in price if any formula. The PM will also include the requirements of the analysis of price units that are required for the presentation, on behalf of the Contractor(s).

2.3.1.5.1. PROGRAM FOR IMPLEMENTATION AND PROJECT CONTROL

PM will review and endorse strategy and integrated planning of the Line 3 project carried out by the (the) Contractor(s), to which the PM should consider the processes of work planning, control of its necessary execution, verification and follow-up as well as the definition of the interaction of activities and mapping of the different processes.

The PM will review and control the informative program type "Project for Windows" or "Primavera", which relate the activities to be carried out by the Contractor(s), the times provided for the realization of each of the activities and the costs and associated resources, which serves as a frame of reference for the control of the progress of the project, in terms of time and cost. In general, such activities should be related to the items set out in the budget of each engagement. In the programming of activities for each engagement, the dates of beginning and ending for each activity and the corresponding gaps. The estimated duration of each activity and the activities that proceed it should be also shown. Likewise, those activities which constitute the "critical route", i.e. which determine the progress of the project should be identified. Similarly, the timeline diagram that Contractor(s) submit and keep the same for project control updated.

In the planning of the Project, the PM should develop, implement, and manage a system of Control of the project, including tools (systems of information management, software, etc.), techniques, methodologies, resources and

procedures that have been tested and, preferably, that have been used by the PM for the management of similar projects.

The PM should coordinate with the Contractor(s) and with MPSA, about the development of a system of control of projects that can be integrated with the used by the Contractor(s), and should properly train staff of MPSA in the use of such a system. Executives and technical advisors designated by MPSA should have access, password, and the software of the Control System of the project at any time. The PM shall deliver a report of the progress of the project to MPSA within 5 working days in the end of each month.

This System of Control of the project should also consider the proposed equipment plan by the Contractor(s), permitting verification that the orders have been issued in a timely manner, and should also verify times for manufacturing, delivery and transportation of products, receipt of these materials and their correspondence with the program of project execution, providing comprehensive monitoring plan to verify its performance.

The development of report that documents the implementation of the project of Line 3 is the responsibility of the PM, for which it should register the significant events of the project through the preparation of updated reports on a quarterly basis, within five (5) days of the conclusion of each quarter.

2.4. INSPECTION AND SUPERVISION OF PROJECT IMPLEMENTATION, COORDINATION OF INTERFACES AND TECHNICAL SUPPORT FOR LINE 3 OF MPSA

Contractual, technical and administrative management of the project is a core part of the services to be provided by the PM. This includes each of the contracts signed by MPSA for construction, equipment, procurement of goods and provision of services that may be required; it likewise includes the supervision and inspection thereof, the coordination of the interfaces between the different elements that condition the access of other Contractor(s) or that must share spaces in the installation and testing phase, as well as technical assistance to MPSA, through the provision by the PM of technical staff and experts required for implementing the project.

2.4.1. SUPERVISION SERVICES FOR THE IMPLEMENTATION OF LINE 3

The PM will be responsible for managing and monitoring compliance with the contractual terms (legal, technical, administrative and programmatic) under each of the contracts signed for the execution of the Project so that the works, services, and procurement of goods are developed pursuant to the provisions of the Project Control and Implementation Program.

The PM is also responsible for the timely detection of omissions, defects and/or deviations that may affect the quality of the works, the execution timelines of the project and its costs, promptly warning MPSA about the consequences of such circumstances.

In providing services, the PM should verify the Contractor(s)' compliance with the norms, standards, regulations and specifications in conducting the studies, the detailed engineering, materials, construction, equipment and implementation of the System. These responsibilities entail efficient management of the resources assigned by the PM to the project, as well as the planning of activities necessary for monitoring and controlling execution of the Project, for which reason he/she must ensure the availability, capability and expertise of necessary personnel under his/her responsibility to carry out the responsibilities of the PM.

The PM should also review the programs and plans developed by each Contractor and verify that they are consistent with the overall program of the project in terms of compliance with the date of commissioning of the Line. Programs shall be submitted to MPSA for consultation, before the start of the works assigned to them. This includes Detailed Programs of the following: Integral Security; Risk Management, Detection, and Prevention and Contingency Plans; Quality Assurance Systems; Program for the Protection, Conservation, and Restoration of the Environment in the execution of Line 3; Forecasts for Traffic Detours and Surface Restitution; Control of Access to Different Project Areas of Metro Line 3, and any other plan that the Contractor(s) must present to MPSA, verifying that the scope and means for its implementation are adequate, defining the measuring methods for its execution, preventative and corrective measures of processes, as well as the audits to be conducted for each.

In the scope of the provision of services, the PM should consider undertaking, without limitation, the following activities:

1. Preparation of the Works Proceed Order and the Final Acceptance Certificate, to be signed by MPSA, for each of the contracts for execution of the project, once all the relevant contractual terms are met. In both cases, the PM should sign said documents and handle the signing by MPSA and the respective Contractor(s).

2. Preparation of the Suspension of Works Order if so required, specifying the reasons causing such. Likewise, the PM shall also prepare the Resumption of Work Order once the conditions that prompted the suspension cease. In both cases, the PM should sign them and handle the signing by MPSA and respective Contractor(s).

3. Preparation of the Substantial Acceptance of the Works Order, which shall include details about conditions of work, the SIO or Electromechanical Equipment to be finished, as long as they don't affect the security or operation of the System. Similarly, the PM shall indicate the concerned proceedings for the solution of pending issues. The PM shall sign said documents and shall handle the signing by MPSA and the Contractor(s). The PM shall manage identified pending issues with Substantial Acceptance and register and control them, in addition to coordinating actions in Contractor(s) to close these pending issues.

4. Preparation of inspection and supervision procedures, including the general and specific aspects for each contract under his/her responsibility, including criteria for the corresponding acceptance or rejection.

5. Elaboration of guidelines that will form the basis for the Contractor(s) to develop specific procedures for the different activities or actions that should be undertaken as part of the scope of the project, including, but not limited to, those procedures corresponding to the execution, delivery, review and concordance of designs; elaboration and concordance of budgets for contracting of third parties; update on the information and implementation plans; notice of variation or deviation in field of an approved design; performance in field before detection of noncompliance, irregularity, poor quality, unanticipated effects, diversion of program; contracting and execution of SSPP relocation to its receipt by the operating companies; assignment of the right of road and access; revision and submission of areas to the Contractor(s) and when the Contractor(s) submits areas; management of waste material; controls for security, identification and access to works. The PM will present these guidelines to MPSA for its agreement.

6. Elaboration of procedures of filing, concordance, and processing of requests for payment to the Contractor(s), based on the guidelines set out in the contract and for MPSA, for concept of advances, price changes and return of the deductions made in accordance with the provisions of each contract; verify the requests for payment submitted by the Contractor(s) and process them with MPSA for the relevant payment. The signature and countersignature of the accounts submitted by the Contractor(s) should be coordinated with the Office of the Comptroller-General.

7. Preparation of procedures for the submission, processing, and concordance of valuations for the work done, based on the guidelines established by

MPSA; review of the relationship of the work done, its supports and its conformation or return, according to what is stated in the relevant contract; likewise he/she shall verify the deductions for payments on account, advance payments and withholdings that apply.

8. Preparation, signing, and processing of records which should be issued in the event of extensions in conformance with the procedure established in different contracts, in conjunction with such or with the respective Contractor(s).

9. Supervision of strict compliance with the rules on safety and industrial hygiene, cleaning and order of workstations, which are laid down in the different agreements, on the basis of the guidelines provided by the PM and agreed with MPSA. Supervise that monitoring procedures and standards are met. Carry out systematic inspections of the various work sites to ensure that they comply with agreed plans and preparing reports on compliance and document evidence. Document non-conformities and follow up on the correctness of the same. Participate in investigations related to incidents or accidents, and document that the Contractor(s) make the program of induction and lectures on safety.

10. Coordinate, negotiate and agree on the Plan of environmental management of the project with Contractor(s). Monitor compliance with the plan and ensure that the procedure and agreed methods are followed. Carry out systematic inspections of the various work sites to ensure that it complies with agreed plans and prepare reports on compliance and document evidence. Participate in independent audits which are carried out.

11. Analysis of requests and orders for change that submitted by both the Contractor(s) and the Metro of Panama, S.A as necessary or to determine if they represent a substantial improvement in the implementation and fulfillment of Project objectives. In this regard, the PM will review its scope and description to ensure that they comply with the applicable requirements and standards, including the impact on program implementation, the reasonableness of the corresponding prices, and the conditions and protocols for acceptance of the works, in conformance with the principles established in the Quality Assurance Plan of the PM and respective Contractor(s).

12. Preparation of documents related to orders of corresponding changes and preparation of the technical support of the same. Negotiate changes in the contract price, terms and other conditions with Contractor(s) as a result of unilateral changes. Manage the signing of such unilateral changes and prepare addenda to contracts when required.

13. Verification of availability, capability, and expertise of the Key and Specialized Personnel assigned by the Contractor(s) to implement the

Project component that is entrusted to them, in order to meet the minimum requirements and have the knowledge and experience required for the activities to be performed. The PM may reject, prior authorization from MPSA, any member of the technical staff and workers of the Contractor(s) when in his/her opinion either of them are unsuitable for carrying out the work or are detrimental to the proper execution of such.

14. Normalization of the processing of information generated in the development of the project, through a communications Plan, including the methodology for processing, coding, registration, and control of communications between the PM, the Contractor(s), and MPSA, previously agreed between the parties involved; of the submission manner and concordance or rejection of tests, reports, plans, descriptive reports and calculations prepared by the Contractor(s) and any other documents required for managing both routine and exceptional Project communications, including the provision that all such documents must be prepared in Spanish. The Communication Plan should be aimed at the proactive and collaborative interaction of the PM and the Contractor(s), as well as external entities related to execution of the Project.

15. Systematic verification of the evolution of the program execution and Project Control; preparation and submission to MPSA of weekly project monitoring reports, monthly and quarterly, indicating deviations from the Critical Path that may affect fulfilment of the programmed timelines and costs, indicating the measures to be taken to correct them. This includes a Project Implementation Plan as a control basis program that contains a breakdown of activities, deviations or adjustments arising during the execution of the Project, the systematic analysis of the execution program and its progress, as well as the recommendations to maintain the Project within limited cost, time and quality, and the recommendation of necessary corrective and preventive actions that may be necessary. The PM must systematically verify the use and performance of the main resources assigned to the Project, including labor, equipment and materials used by the Contractor(s); likewise, the PM must maintain a daily record of the Project execution, documenting the main activities performed by the Contractor(s). MPSA will have permanent access to these records.

16. Research, evaluation, and submission to MPSA of negotiating strategies regarding the claims presented to the Contractor(s); likewise, the PM shall take action with the identification and provide assistance to MPSA for the preparation of claims to the Contractor(s) for noncompliance or defective performance of any of its obligations. The PM will support MPSA in the negotiation of claims, propose and/or review the agreements resulting therefrom and its conditions, verifying the reasonableness of any compensation to be agreed upon.

17. Systematically review the execution of Project costs, including verification of reports submitted by the Contractor(s) with respect to their own controls to determine precision of the same, the accounting structure versus the breakdown of activities, and the projections for formulating the final Project budget. In addition the PM will work with MPSA in the preparation of financial reports for financial institutions, if any, or other reports that may be required.

18. Verification of compliance with the mandatory technical and contractual requirements agreed with the Contractor(s) of the Project, carrying out a comprehensive review of specifications and references provided with the contractual proposals. The PM must confirm consistency of the systems' technical and operating conditions and verify that they are reflected in the detailed engineering or final designs prepared by the Contractor(s) and, once approved by MPSA based on the PM's recommendation, will allow for realization of the works and manufacturing of the equipment.

19. Review of the Traffic Management Plan proposed by the Contractor(s) to ensure compliance with the specified requirements based on the guidelines of the competent authorities; determine the effectiveness of the proposed measures and their implementation for minimal impact of vehicular traffic during Project execution.

20. Verification of the Plan for the Protection, Relocation, and Restoration of Public and Private Services proposed by the Contractor(s); analysis of the impact program of such and act as the liaise, together with staff of MPSA, between the Contactor(s) and state and private agencies responsible for regulating such services to coordinate and schedule related works; submit the recommendations necessary to maintain the Protection, Relocation, and Restoration of Services Program within the Project's objectives and regarding the measures for improving coordination with the agencies responsible for regulating services. This plan shall be submitted for approval by MPSA, based on the PM's recommendation. Carry out the monitoring and inspection of designs, execution of civil works and equipment of public services that is relocated. Verify that the Contractor obtain concordance of designs and acceptance of works with different operators. Check the scope of the proposed work and budgets to recommend a reasonable price of execution of the relocation of utilities.

21. Assistance to MPSA in administrating the inspection, safety, and occupancy certificates and/or permits by local authorities, the allocation of communication frequencies, and coordination with local authorities (fire department, police, medical services, National Environmental Authority (ANAM, Spanish acronym), National Aqueduct and Sewers Authority Institution (IDAAN, Spanish acronym), Ministry of Health, Land Transport and Transit Authority, Ministry of Public Works, municipal authorities and

related public services agencies) during execution of the Project and procurement of operating certificates upon completion of the work.

22. Review of logistics that each Contractor shall submit for concordance by the PM, corresponding to the Execution of Civil Works and Equipment, verifying the requirements of materials and supplies in terms of quantity, quality and opportuneness of the requirements for every case, as well as any other condition deemed necessary.

23. Verification of compliance with the requirements applicable to prefabricated elements and monitoring their availability in corresponding plants according to the manufacturing and logistics programs associated with their transfers.

24. Supervision of sites where the Project will be built to determine the requirements for provisional access roads and the requirements for construction camps and offices for supervision purposes, including the provision of parking services and facilities in order to verify that the Contractor(s) has considered the relevant precautions for the project.

25. Verification of the identification of areas for temporary storage and preliminary assembly of work parts or equipment and the provision of necessary services for the purposes of verifying the reasonableness of the Contractor(s)'s requirements and so MPSA considers them in allocating temporary occupancy areas.

26. Concordance and monitoring of programs for the removal of excavated material or debris and adequacy of the sites receiving them, prepared by him/her or the Contractor(s).

27. Analysis of the technical studies and research carried out by the Contractor(s) and submission of the necessary recommendations to MPSA, including the simulations required to determine the capabilities and sizing/scaling of several Project elements.

28. Review of the development of detailed engineering and final designs of which (the) Contractor(s) are in charge, as detailed in section 3.3.1 of Chapter III These requirements shall apply to detailed design, calculation memories, material specifications, work or installation plans and "As Built" drawings, including gathering field information and precision measurements; likewise, it shall establish a System of Quality Assurance Compliance of Contractor(s) regarding these documents, processes and methods for the review and concordance of changes, including audits as necessary.

29. Preparation of guidelines for the quality of the project management program. Review and verification of the quality program presented by Contractor(s) for the different elements of the project. Verification of samples,

measurements and quality certificates submitted by the Contractor(s). Follow-up on the fulfilment of plans of control and quality assurance for the designs, construction processes, the site preparation work, execution of civil works and installations of equipment, and verification of proofs. The PM should review the quality of the materials and equipment that are used or installed in the project. For such purposes, carry out systematic inspections of all work fronts and document the elements of quality control objects. Prepare statistics and monthly reports on the management of quality of the Contractor(s) and the level of compliance. Follow up nonconformities and manage the closure within the terms and conditions agreed with Contractor(s) the same. Participate in internal and external audit on the implementation of the program of quality management and continuous improvement procedures.

30. Verification of the implementation of the construction processes, quality of materials and implementation of detail designs, flat work, rules, regulations and specifications for civil works and prefabricated elements. The PM must have the technical capacity to verify the results of tests and trials carried out by (the) Contractor(s), as part of his/her quality management of the works.

31. Monitoring of the execution of the works of the Contractor(s) in charge of the civil works, verifying compliance with all contractual requirements, for which the PM should have the technical capability to verify the topography and precision measurements and submit to the Contractor(s) proposals of measures to correct defects and nonconformities. Similarly, the PM must verify that the Contractor(s) carry out the corrections or adjustments of processes and working methods in order to prevent recurrence of nonconformities. In this regard, the PM should systematically verify the log of the nonconformities and submit the corresponding reports required by MPSA, indicating the status of the nonconformities and its solutions.

32. Verification of the amount of works executed by means of field measurements of the relevant materials and elements that compose them, reviewing the quantities of raw materials or semi-finished products that reach the work sites or are produced therein, verifying their conformity to the requirements for the execution of the works. These amounts should be reflected and monitored in monthly work progress reports that both the Contractor(s) and the PM should prepare and submit to MPSA.

33. Systematic verification of compliance with the Environmental Management Plan and Industrial Safety and Health Plan, previously approved by MPSA, based on the guidelines established by the competent authorities including the JICA Guidelines for Environmental and Social Considerations (April, 2010), for all work to be performed by each Contractor. It will include a review of the plans to ensure that they comply with applicable laws and regulations and best industry practices, and present observations on the plans proposed by the Contractor(s) and verify they are adjusted according

to the instructions issued by the competent authorities. Review of mitigation plans will be included in the program of environmental management (PMA) of the project by the Contractor(s), control and monitoring, management of hazardous substances and contingency plans, the monitoring and systematic verification of the implementation of all environmental plans, the review of the environmental documentation produced by the Contractor(s) and the preparation of documents for submission to the national authority of the environment (ANAM), other State institutions and the international financial institutions (IFIS) on the implementation of environmental programmes and plans, and make recommendations to improve and strengthen the environmental program. Personnel of the PM environment should be registered in the register of environmental consultants of the ANAM.

34. Verification of the execution of the manufacturing processes of Electromechanical Equipment and of elements of the system Integral operations (SIO), including Rolling Stock, as well as quality management of the Contractor(s), including inspections and/or non-destructive testing component testing, integrated units and systems in-factory, at storage sites and Project site. Similarly, the PM shall verify that the Contractor(s) have the necessary certifications, issued by the manufacturers, and are in compliance with the standards and specifications laid down in the relevant contract(s).

35. Monitoring of the conditions established in the corresponding contracts, for proper packaging and transport of Electromechanical Equipment of the elements of the Integral Railway System, including Rolling Stock, from the manufacturing and assembly factories to the Line's construction sites, including transfers to and from temporary storage sites thereof, for which the PM must verify their appropriate location and protection. When bringing the equipment to the work site, the PM must verify that the right conditions are given for the area for each piece of equipment, and monitor equipment installation.

36. Participation in the performing of individual tests and tests of the Electromechanical Equipment set and elements of the SIO tests, including Rolling Stock, in accordance with the schedule and protocol provided for each case in the respective Execution Programs.

37. Monitoring of packaging, transport and delivery to work sites of equipment corresponding to communication, signaling and control systems, verifying that the appropriate conditions are given in the areas, both in stations and rails, to receive each piece of equipment. Installation and testing of this equipment should be performed following the schedules and protocols provided for each case in the contracts and the corresponding specifications.

38. Overseeing the preparation, packaging and transport of Rolling Stock in its different stages and to the Depot, verifying that the average load is appropriate and is in accordance with the characteristics of the wagons to transport, and verify the transport path from the port to the parking area, both for their physical characteristics and conditions, as well as for their for protection and security. At the Patio premises, the PM should verify correct wagon unloading and its transport to the parking site on the tracks.

39. Verification of operational integration of railway systems, reviewing the functional characteristics and conditions specified and schemes and designs developed and approved for manufacturing and installation. The PM must verify that the tests, initially individually from each piece of equipment and then integrally among the different systems, present the correct operational integration of these systems and their interaction with the Rolling Stock according to the programs and testing protocols set out in the contract and the corresponding specifications.

40. Verification of reception of spare parts vis-à-vis the contractual list of spare parts, reviewing the list of agreed items, their classification within the typology of materials, their codification in the master catalog of parts, their identification in the type catalogs, their supplier's technical specifications sheet and expected behavior in use. Likewise, the PM should check the conservation condition of each part, the identification of parts and proper packaging for its handling and storage.

41. Checking of manuals and instructions provided by the Contractor(s), whether they have been written by the Contractor(s) or by the manufacturers of sub-contracted equipment and systems, and verification that their content suits the conditions of the Project and that they contain the information needed to execute the operative functions of the system and its equipment, and perform both preventive and corrective maintenance activities.

42. Verification of compliance with the quality management system submitted by the Contractor(s) for installations, integrations and testing of Electromechanical Equipment, the integral system and Rolling Stock. Review and verification of the certificates issued by the Contractor(s) for the installations, integrations and testing, and ensuring compliance with standards, protocols and specifications. For key equipment and rolling stock, the PM should carry out inspections in the factories of equipment to verify quality control program is being applied properly and to witness the factory testing to be agreed with the manufacturer.

43. Verification of adequate capacity of the technical staff of operations and maintenance staff on the part of the Contractor(s), monitoring courses and the quality and contents of material of support and manuals of equipment and systems.

44. Development and coordination of Project Closure Program, after having verified the proper functioning of the whole system, meeting the required specifications. This verification by the PM should cover, among others, the verification of compliance with contractual commitments, administrative closure of the execution of the work or contracts, verification and status of all system guarantees and delivery of all documentation regarding the "As Built" plans, including the updating of the plans with all the modifications that have been approved during the execution of the work, the calculation memories, simulations and dimensioning of systems, operating manuals, maintenance for status of claims regarding insurance policies and their validity, and any other issues deemed relevant to proceed with the Project Closure Program.

45. Register the pending issues after the substantial project acceptance with different Contractor(s). Follow-up on actions taken by Contractor(s) to close the slopes of the project, documenting these actions and approve or disapprove their acceptance. Preparation and signing of the Certificate of Final Acceptance of Works and the Administrative Closure Chart that includes the relationship and amount of all approved and processed valuations, together with the representative of the Contractor(s) and MPSA.

2.4.2. SERVICES OF COORDINATION OF INTERFACES

As part of the services you will provide, the PM will be responsible for the coordination and management of interfaces between the different contracted parties through which the project implementation will be conducted; likewise, you must carry out the necessary coordination with the operators of public and private services in the city, whether for service requirement for operation of the Metro system, or due to being affected by the construction of the Line and with which MPSA will have to interact; with the authorities responsible for regulating land traffic and with the communities included in the polygon of influence of the Line, adjacent to the construction of the Line, that may be affected by the Project.

2.4.2.1. BETWEEN DIFFERENT CONTRACTED PARTIES FOR THE IMPLEMENTATION OF THE PROJECT

These interfaces may include, among others, the following relationships:

2.4.2.1.1. BETWEEN ELEMENTS OF THE INTEGRAL OPERATION SYSTEM

This situation shall arise only if, based on the approach to contracting approved by MPSA more than one (1) contract for the supply and installation of some of the elements of the SIO. The Integral operating system is basically consists of elements that have interdependent technological and functional relationships among them. The PM will be responsible for coordinating the solution of problems that may arise between them, considering, without being limited to, the following aspects:

1. Monitoring the implementation by each Contractor, of interface and compatibility studies between the elements of the SIO, among them and especially with the Rolling Stock, as provided in the Project Execution Plan;

2. Checking consistency between the documents produced by the Contractor(s) of each element of the SIO in each of its phases of execution of the works, verifying that the modifications, adjustments and clarifications that may be necessary to raise in the studies and designs are made to the satisfaction of each of the Contractor(s) involved without affecting either the compliance of the Execution Plan nor the contract prices;

3. Early detection of interface problems and analysis of solutions proposed by each Contractor, so as not affect compliance with established times for the commissioning of the no line or contract prices;

4. Coordination of works in areas that must share two or more elements and/or Contractor(s) of the SIO; and,

5. Coordination of the execution of the works for the service connection between Line 3 and the rest of the Metro, in such a way as not to affect the functionality nor commercial operation of the system.

2.4.2.1.2. BETWEEN ELEMENTS OF THE INTEGRAL OPERATING SYSTEM (SIO) AND CIVIL WORKS

In the case that the contract of the SIO is not an integral part of the main contract of works, the PM will be responsible for coordinating the accesses of SIO Contractor(s) to areas of civil works, so as to allow the start of the installation and assembling their equipment in these areas, as provided in the Project Execution Plan.

Regardless of the situation before exposed, the PM will ensure that prior access to the Contractor(s) of the SIO, at least the following conditions are met:

1. Verification of the dimensions, finishing and cleaning requirements and conditions required for civil works in environments and areas of stations and of the Line, as well as in related structures intended for SIO equipment;

2. Availability and functionality of the drainage network, in accordance with the requirements of SIO equipment, in stations, viaducts and related structures;

3. Availability of electrical, communication, mechanical, hydraulic, sanitary and fire-fighting facilities as required according to specifications;

4. Availability of all windows, ducts and conduits embedded in the structures or in view, required for the cabling of various disciplines of the SIO; verification of consistency with the detailed alignment plans of all conduits; verification that they are free from obstructions;

5. Checking of the required grounding precautions for connecting equipment of the SIO's various disciplines that may require such, and verification of the values and conditions required for each purpose;

6. Verification of the availability of access points for materials and equipment required by the SIO and the conditions thereof;

7. Availability of the means or structures that are required for the installation of the equipment of larger size and weight;

8. Finding of the non-existence of leaks due to rain or other causes in environments in which installing SIO equipment begins, and verification that there are no ducts and conduits uncovered where water could enter in case of rain or flooding in some area; and,

9. Coordination and verification, in case the civil works or finishes are affected during the process of equipment or systems facilities, these facilities are repaired and returned to similar conditions at the time of entry of the Contractor(s) of SIO. Resolve any compensation due to the repair work.

The access of the Contractor(s) of SIO to areas of the system should be formalized through a few proceedings where to register, upon verification, the suitability of the conditions of these, together with the agreements and commitments assumed by the Contractor(s) involved, specifically with respect to access control and surveillance of areas handed over for the duration of SIO's execution of the installation works. This document shall also be signed by the Contractor(s) involved and will include comments from everyone on the status of the work and additional agreements needed to remedy or correct the concerns raised and that allow for the continuation of the civil works, if applicable.

Stands that before the technological solution with a monorail system, PM should pay attention to the interface and relationship that should exist between the rolling stock and the beam that constitutes the platform for train rail, with special emphasis to the joints of beams which in effect of rail, shall ensure a perfect continuity condition, without perception of interruption to the train fare.

2.4.2.1.3. BETWEEN THE SIO, ELECTROMECHANICAL EQUIPMENT, AND CIVIL WORKS

The PM will be responsible for verifying the availability of the facilities required by the SIO with respect to the Contractor(s) of electromechanical equipment in the areas where SIO equipment will be installed or tested and in particular for the following equipment and systems:

1. Water pumping system for firefighting, of rainwater and wastewater, with particular attention to low spots and areas where the predictable flow of water so requires;
2. Systems of drains;
3. Detection system and firefighting;
4. Air conditioning for areas destined to be operating stations, ticketing stations, electronic equipment and control rooms, first aid spaces and any other area not expressly stated herein that may be required;
5. Supply or exhaust ventilation system, as appropriate, for bathrooms, changing rooms, kitchens, maintenance depots, electrical substations, etc.; and,
6. Any other than is necessary for the Assembly and testing of the equipment.

Moreover, the PM should verify the timely availability of the media required by the Contractor(s) of the electromechanical equipment, with respect to the SIO, to carry out the Assembly of equipment and the necessary tests considering the following aspects:

1. Adaptation at 120 VAC, with exclusive circuit wiring and/or backup for power equipment or components that require it;
2. Availability and adequacy of the necessary strength and control boards;
3. Adequacy of the wiring of force from distribution boards to boxes terminals left by the civil works; and,
4. Any other element necessary for the assembly and testing of equipment.

Similarly, the PM will be responsible for the verification of the timely availability of precautions in the civil works for assembly and testing of Electromechanical Equipment, in particular with respect to the following aspects:

1. Availability and adequacy of embedded pipes and tubes or trays exposed to the electric wiring and control of equipment;
2. Adequacy of devices for equipment grounding;
3. Availability of 120VAC, 208VAC, 277VAC and 480VAC wiring;
4. Installation of lights and outlets in each area, according to the requirements for the installation and assembly of equipment;
5. Verification of the adequacy of finishes, drainage, hoist hooks, access traps, supports, raised floors, doors, switches, as appropriate;
6. Verification of the adequacy of the spaces and its dimensions for the installation of equipment;
7. Adequacy of finishes required for the installation of detection or alarm devices in the operating area;
8. Availability of fire-extinguishing system;
9. Availability of raised floors where required; and,
10. Any other element required for this equipment.

Based on the Project Implementation Plan, if simultaneous works to carried out by the SIO Contractor(s) are required, the Contractor(s) of Electromechanical Equipment in areas not yet fully completed by the Contractor(s) of the civil works, the PM shall be responsible for coordinating the activities of the work teams that must interact [with each other], providing solutions for any possible interference that may arise and considering the necessary measures to prevent one of their works from affecting the installations completed or underway by other Contractor(s).

The PM should consider the functional and technical interfaces between teams from the SIO Centralized Traffic Control Center and electromechanical centers, so the interface may centralize the status verification of normal functioning or any other defective condition in such equipment, among which includes the control panels and/or distribution boards associated with electrical equipment for backup services; escalators, elevators and access control systems; pumping system; detection and firefighting system; ventilation system; air-conditioning system, fare collection system, and any other operation under the supervision of the Operations Control Center (CCO, Spanish acronym).

Should any damage be made to the civil works or pre-installed system or

equipment, the PM should analyze the situation and determine the responsibilities, the necessary corrective actions and deadlines for implementing them, with the understanding that such actions shall not jeopardize Project goals or costs. With respect to these decisions, the PM shall record it in writing and shall be signed by all involved parties.

2.4.2.2. COORDINATION WITH THE MINISTRY OF PUBLIC WORKS (MOP), PM, DESIGNER AND CONTRACTOR(S) OF THE 4TH BRIDGE OVER THE CANAL OF PANAMA

The PM should manage a close coordination with the 4th bridge over the Panama Canal project. In the process of this coordination, the PM should maintain a close collaboration with the MOP, the PM of the 4th bridge, as well as designers and Contractor(s) of the project. Together with all those involved in the project of Line 3 and the 4th bridge over the Canal, the PM should establish, define and agree on channels and processes of communication, processes of technical agreements and designs, processes for reviewing designs when elements of the same influence components of one or another project, coordination of the implementation of the work , processes of joint inspections of the works and installations of computers in public areas of both projects, processes of acceptance of the works and installations, and any other process that is required to carry out a successful implementation of both projects.

2.4.2.3. COORDINATION WITH OPERATORS OF PUBLIC AND PRIVATE SERVICES AFFECTED BY THE LINE 3 PROJECT

The PM should review the Relocation of Public and Private Services Plan prepared by the Contractor(s), including the right of way of Line 3 proposed by the Contractor(s) of the civil works, the methodology to be applied and programming of work, so as to agree upon the necessary adaptations, to coordinate together with MPSA, the timely implementation of these relocations so they may be carried out in a safe and orderly manner with minimum disruption of services.

These relocations may include, without limitation, the following: potable water pipes; drainage and sewage pipes; wiring for electricity; telephone networks; Cable TV and other services to be located in the affected area.

Should a relocation service be contracted for any service, the PM must analyze the relevant budgets and the execution conditions of the works and shall recommend the most pertinent solution to the MPSA. The PM will monitor execution of the works so as to respect Project timelines and costs.

In cases where the Metro Service requires for its operation a specific public service to be provided by the corresponding service operator, the PM must make the necessary technical, functional, and contractual arrangements to provide that

service in the time, capacity, and conditions required for both temporary and final situations; in such event, the PM must also coordinate the interventions and interactions of other Line 2 Contractor(s) to obtain the requested service and to perform the acceptance tests required for its proper operation.

2.4.2.4. COORDINATION WITH THE TRANSIT AUTHORITY

The PM should review the Traffic Management Plan proposed by the Contractor(s) to ensure compliance with the requirements established in the contract terms and shall ensure the proper consultations and monitor authorization for rail interventions and detours granted by the competent Transit Authority. Furthermore, the PM shall determine the effectiveness of the measures proposed and their implementation, monitoring if notices and notifications have been made to citizens and pedestrians of the affected areas so as to minimally affect vehicular and pedestrian traffic during execution of the Project.

Modifying traffic and temporary closures of streets, avenues, and lanes adjacent to the construction of the Line and the transportation and installation of construction elements temporarily affecting the roadways (boards, bridges, metal supports, among others) shall be coordinated by the Contractor(s) responsible for the works and shall be under the PM's strict supervision. The PM must also ensure compliance with the authorizations and the timely restoration of road conditions as authorized by the Transit Authority, ensuring that the execution of such works are carried out in accordance with the established terms and deadlines.

The PM should ensure that the conditions of the roads affected by the project, Line 3 should be maintained by the Contractor(s) in good condition and ensure the proper implementation of the program of maintenance unless otherwise contractually agreed. For this activity the PM should carry out an initial inspection of the State of the roads and define instances of application of maintenance activities to keep the roads in good condition. The PM will coordinate with the various departments of the State to ensure the routes keep in good condition and safe, in addition to the refund corresponding to the end of the project.

2.4.2.5. COORDINATION WITH COMMUNITIES

As part of the scope of his/her responsibilities, the PM shall assist MPSA in the development and implementation of the Relocation Plan and resettlement of the population affected by the Line 3 Project, management of the parties involved, communication strategies, relationships with the inhabitants of the direct impact area, handling of complaints and claims, and the Conflict Negotiation and Resolution Plan. In this regard, the PM should be an integral part of the team of specialists of MPSA and of external advisors of communication and development of Metro culture in order to define the processes to mea sure effectiveness of the Project Communication Plan to communities; the PM must also assist in the

development, review, and adaptation of said Project Communication Plan. The PM shall provide for the allocation of specialists to provide the support required by MPSA.

2.4.3. TECHNICAL ASSISTANCE TO MPSA.

As part of the scope of his/her responsibilities, the PM shall advise and provide technical assistance to MPSA for such requested matters, including, but not limited to, the following:

1. Support for the completion of financing procedures of the Project, including assistance in the preparation and submission of technical documents for the Project, its procurement, operation of the System and any other matter requested by financial institutions and/or government entities, as well as analysis of the technical and economic feasibility of the Project;

2. Preparation of reports in compliance with the Plan of Environmental Management and Social of the Project;

3. Consultation on relationships with the communities located in the right of way for the Line 3;

4. Assistance in the Management of the Compensation and Payment Program and Process, to be prepared by MPSA, of the properties and facilities that need to be released for Project implementation and recovery of public easements, including reviewing plans, programs, processes, and work methods for the release of the various required areas, monitoring and control of the progress of its implementation and counseling for negotiating and resolving any conflict which may arise;

5. Integration of the Insurance Administration team with advisers appointed by MPSA for the management of the Owner Controlled Insurance Program (OCIP). In this regard, the PM will receive detailed information from the OCIP and will verify the availability and timely processing of the requirements of insurance companies in order to ensure that the policies needed for the Project are in force and contain the proper coverage. The PM will provide new options for optimizing the OCIP. The PM should coordinate the implementation and performance of the OCIP in close coordination with international reassures and local insurance companies. The PM should keep a record of incidents or claims that should be met through insurance and ensure that such incidents or complaints are attended diligently and solved in the shortest possible time and to the satisfaction of those involved;

6. Preparation of the Technology Transfer Program to the personnel designated by MPSA and provision of institutional strengthening and training to such personnel in the management of metro systems projects;

7. Assistance to MPSA in preparing detailed explanations of the selection of the transportation modality as well as the nominated sub-contractor;

8. Recommendation of changes and improvements in the organizational structure of MPSA, required in order to operate the System, carrying out its operating and maintenance functions, as well as the management of administrative procedures and system expansion procedures;

9. Assistance to MPSA in the selection and hiring process of personnel required to operate the System, designing programs for interviews, psychometric tests, physical and aptitude requirements for each position;

10. Assistance to MPSA in reaching an agreement with a nominated sub-contractor on monorail vehicles and related system;

11. Technical assistance in monitoring and supervising operation of the System of MPSA, once it is implemented and operations start as from the Substantial Acceptance of the Project. The scope of these activities shall be differentiated in the event that MPSA decides to grant operation of the system to a third party;

12. Assistance in using or making changes to the information system ("hardware" and "software") both for business management and System maintenance, as well as support in the implementation of a subsequent or complementary version if the case may be;

13. Support in developing the Security Plan of train movements and persons involved in operation and maintenance of the System;

14. Support in the determination and measurement method of performance indicators for operation and maintenance of the service;

15. Support in the preparation of technical and administrative documents define the list of specifications for the procurement of supplies or required services, as well as support in performing the respective processes and analysis of the proposals received; and,

16. Management of documents related to this project and preparation of reports to JICA.

Likewise, the PM shall provide assistance to MPSA, S.A. in carrying out any study, test, research, and any matter related to the Line 3 that MPSA, S.A. requires.

The management operator shall be responsible for, but not limited to, performing the following functions relating to the PM's services described in this section of the List of Specifications:

1. Review and concordance of functional designs of stations and Depot and Workshops;

2. Verification of SIO compatibility with the rest of the Metro system for purposes of operational integration;
3. Support in inspection and testing of the rolling stock and the rest of the equipment of the SIO;
4. Verification of functionality and acceptance testing of SIO systems and equipment;
5. Suitability of the Centralized Traffic Control Center for the incorporation of Line 3 in the current Operation Control Center;
6. Verification of the conditions of the installed security system;
7. Determination of functional requirements and operational procedures for user integration between Metro lines and other transportation systems;
8. Public relations regarding the Japanese ODA to the Project such as placing ODA marks and setting related posters inside the stations and Depot and Workshop, since the Project is financed thanks to large amounts of contribution by the Japanese tax payers; and,
9. Assistance and support for the operational and maintenance processes of Line 3.

[END]