SECTION 50 – OIL COMPANY RIGHT-OF-WAY/ EASEMENT REQUIREMENTS

50-1 GENERAL

Work required for this project will encroach, cross, or impact existing and active pipelines and facilities belonging to several oil companies. These companies include Chevron, ExxonMobil, ConocoPhilips and Shell. Reference to "oil company" or "oil companies" in this specification shall refer to any and/or all of the companies and company facilities listed. Pipelines are active, carrying both jet fuel and/or crude oil.

The following minimum design and facilities specifications and load capacity guidelines have been provided by the oil companies and will be binding on the Contractor at all times during work within the easement or right-of-way for the oil pipelines. The terms easement and right-of-way are used interchangeably in this specification. The right-of-way limits are shown on the plans.

In accordance with State and Federal Government Code regulating hazardous liquids, and guidelines for protection of high-risk pipelines, oil company operations and maintenance procedures require Contractors to "Design to Miss" and "Protect-in-Place". Specific requirements to satisfy these procedures include the following, which are described below:

A. Identify Positive Location.

B. Oil Company Review and Approval.

C. Contractor-Written Job Site Safety Plan (JSSP).

D. Minimum Considerations for Protection of High Risk Pipelines.

E. Minimum Facilities Inspection Requirements.

F. Applicable Federal, State and Local requirements.

The Contractor is advised to allow ample time to coordinate site visits, reviews, approvals, and other actions required on the part of the oil companies.

50-2 IDENTIFY POSITIVE LOCATION

Prior to working within the pipeline right-of-way, the Contractor shall determine pipeline elevations a minimum of every 100 feet. This data shall be used to render accurate profile views of the pipelines so that clearance and maximum allowable load capacities (surcharge and/or overburden) over the pipelines can be determined. The Contractor shall plot detail section and/or profile views within the right-of-way (easement) boundaries; elevation of underground facilities in relation to proposed improvements; existing and proposed grade elevations. Easement boundaries and pipeline locations should be surveyed and delineated on site before any work in

proximity to oil company facilities begins. Information shall include surveyed data for Top of Pipe (TOP) and Top of Grade/Existing Grade Elevations (TOG). Profiles and/or section views shall be rendered on the proposed JSSP Site Plan Drawing(s), indicating general pipeline profile TOP and TOG throughout the limits of work within the oil company right-of-way. Potholes will be measured and paid under Section 18 of these Specifications. Contractor to supply air testers for all potholing near fuel pipelines.

Information shall include surveyed data for Top of Pipe (TOP) and Top of Grade/Existing Grade Elevations (TOG). Profiles and/or section views shall be rendered on the proposed JSSP Site Plan Drawing(s), indicating general pipeline profile TOP and TOG throughout the limits of work within the oil company right-of-way. Potholes will be measured and paid under Section 18 of these Specifications.

50-3 OIL COMPANY REVIEW AND APPROVAL

Before beginning construction activity near or over oil company facilities, the proposed final design and construction plans for the Contractor's "protection in place" or "design to miss" plans relative to oil company facilities must be reviewed and approved by the affected oil company facilities representative and oil company engineering or technical services personnel. This review is required to ensure that minimum safe construction offsets for placement of major structures are established outside of oil company easement boundaries, and that consideration of excessive loads have been calculated and compensated for. All responsible parties must agree upon an appropriately engineered solution for construction activities and improvements proposed in proximity to oil company facilities.

No structural encroachments or improvements impacting safe pipeline operations will be permitted within, or immediately adjacent to, oil company easements (e.g., foundations, footings, trees, parallel fencing and/or utilities etc.). Approvals for proposed improvements within the right-of-way will require engineering and technical calculations to determine:

A. Safe construction and equipment offset distances;

B. Appropriate angles of repose;

C. Surcharge or overburden factors.

These requirements are necessary to insure prevention against undermining the proposed improvements in the event of future oil company pipeline maintenance or emergency excavations to access pipeline facilities.

If it is determined by oil company engineering or technical services that adequate cover, clearance or protection from load bearing forces cannot be obtained within the scope of the proposed project design, it will be necessary to modify, relocate, lower in place, or place additional fill above the oil company pipelines. It is expected that when improvements requiring pipeline system design changes are required, the affected oil company will be reimbursed for

actual costs and shall receive payment of estimated costs in advance before scheduling work for such changes. Such changes may include depth of cover modifications, lowering, relocation, or removal of pipelines. The Contractor shall notify the Engineer immediately when any potential conflicts arise which may require changes in oil pipeline alignment.

The Owner and Contractor associated with the project must agree to sign and abide by the terms of an "Acknowledgement of Line Crossing Procedures" and/or "Hazardous Liquid Substructure Notification", prior to work within the oil company right-of-way.

The Contractor shall determine minimum depth of cover requirements to protect pipelines in place from anticipated loads during and upon completion of construction to ensure compliance with the appropriate oil company polices, pipeline safety laws, government codes and other related regulatory requirements. Where less than five and a half feet of compacted soil cover exists, the project design must provide equivalent protection that will not exceed the maximum anticipated aircraft loading.

Minimum heavy equipment safe working offset distances must be determined to ensure that heavy equipment operations are conducted safely away from the pipelines to prevent equipment mechanical or excess load (rupture) damage to the pipelines.

Specification of appropriate equipment placement and safe working offset distances, including outrigger placement, and utilization and excavation methods for grade cuts or fill over pipelines are to be determined before the beginning of any grading operations. Final import fill and grade cuts over oil company facilities must be approved by the respective oil companies before beginning grading activity.

Final approval will be granted by oil company engineers after they have conferred, confirmed and mutually agreed with the Contractor that oil company facilities are adequately protected from excessive load or potential mechanical damage from proposed construction activities and improvements within the right-of-way.

Oil companies will not permit any excavation activity or improvements over or near oil pipelines or facilities without prior compliance review and final permit approval of the project plans and review and approval of a written Contractor Job Site Safety Plan (JSSP). Final permit approval will be granted by each affected oil company.

50-4 CONTRACTOR-WRITTEN JOB SITE SAFETY PLAN (JSSP)

Prior to undertaking any work in the oil company right-of-way, the Contractor shall develop an appropriate written "Contractor Job Site Safety Plan (JSSP). The JSSP will be a collaborative effort between the Contractor and oil company personnel. It shall be reviewed and approved by all affected oil companies prior to construction within the oil right-of-way.

The purpose of the JSSP is to indicate how the Contractor intends to protect oil company pipelines and facilities during, and upon completion of, construction activities. Primary construction conditions of concern requiring consideration are heavy equipment, and materials placement at critical locations, including heavy equipment crossings and/or grading activity over oil company facilities.

No work will be undertaken in the right-of-way until the JSSP has received written approval from all affected oil companies.

The JSSP will summarize project plans for "Design to Miss" and/or "Protect-in-Place" procedures relative to oil company facilities. It will include pipeline protective measures, proper excavation techniques, and an emergency response protocol that will include evacuation, isolation, deny entry, notification, and emergency shut down procedures.

The JSSP will set forth safe construction plans, proper excavation techniques and equipment placement procedures to protect and support existing pipelines from any excessive anticipated static or dynamic loads. Such loads may cause facilities to move or rupture. Heavy vibratory equipment loading must be considered and alternative compaction methods used to avoid direct stress applied to the pipelines.

Utilization of heavy equipment for extensive equipment runs over, or in immediate proximity to, oil company pipelines require potholing for survey of pipeline elevations as described in paragraph 50-2 "Identify Positive Location", above. Existing grades and depth of soil cover above the pipelines and proposed heavy equipment weight ratings are required to determine accurate maximum allowable load capacities of the pipelines.
Minimum consideration for the JSSP includes, but is not limited to, the following:

A. Plans showing results of the "Identify Positive Location" requirements of Paragraph 50-2. A minimum of three (3) section views shall be provided - one on each end and one at the middle of the excavation limits or zone of impact. This information will be presented on a site plan drawing from the project plan set.

B. Determination of "Maximum Allowable Loads" over oil pipelines, and provision for "Design to Miss" or "Protect-in-Place" to prevent rupture due to excessive load stress or mechanical damage.

C. A Vehicle/Equipment list, such as the sample form included at the end of this specification, listing vehicles and equipment which the Contractor proposes to use inside the oil right of way. The list shall include the make, model, and equipment weight ratings, of all vehicles and equipment proposed, with a column for indication of rubber tired (and number of tires) or track mounted equipment type. This data, submitted with the JSSP, will allow oil company engineers to calculate or confirm the maximum allowable loads permitted over oil company facilities.

D. A site plan drawing designating the approved roadway crossings and haul routes

for heavy equipment and materials crossing over oil company facilities. These locations shall be only at the locations pre-approved by the oil companies for proposed "maximum allowable loads". All areas not approved for crossing will be barricaded off and delineated to deny entry. Project plans shall be “redlined” to show “approved for heavy equipment” locations.

50-5 MINIMUM CONSIDERATIONS FOR PROTECTION OF HIGH RISK PIPELINES

A. Excavators must verify exact elevations/depth of cover of oil company facilities in conflict with the project by excavating with hand tools. Oil company facilities are to be exposed by hand digging only, before using power-operated equipment, over or within pipeline easements operated or maintained by oil companies. Depth of cover data obtained during pothole surveys shall be, and shall remain, the proprietary and confidential property of the respective oil company. Contractors may use data obtained for the sole purpose of assisting with design of the project, to determine proper excavation techniques and construction requirements, to protect pipelines in place during project activity over or near oil company facilities, and for preventing unauthorized or illegal encroachment of such facilities.

B. Oil company facilities must be protected from hazards causing pipelines to move or sustain abnormal loads, or excess localized stress and potential pipeline rupture. Anticipated external loads over or near oil company facilities must be provided for, both during construction and upon completion of approved improvements. Depth of cover data must be obtained for calculation of safe load bearing factors which shall be determined before deployment of heavy equipment or placement of load-bearing structures over oil company pipelines is allowed.

C. Final depth of cover over oil company facilities must meet requirements for the expected maximum load application, as approved by oil company engineering and/or technical services departments. Adequate ground cover is critical for maintaining safe pipeline operations. Existing cover over oil company lines is to be field verified by the Contractor under observation of the assigned oil company facilities inspector.

D. Specific details of proposed utilities crossing oil company pipelines shall be planned in advance with the owning oil company. Installation of utility crossings must be placed below oil company facilities and shall provide 24 inches clearance, if feasible. In no case shall clearance be less than 12 inches. Only lateral service crossings are permitted within oil company easements. Parallel utilities are not allowed.

E. Oil company facilities are cathodically protected. In the event that proposed improvements in the oil company right-of-way requires the use of metallic pipes or structures, it is absolutely necessary that arrangements be made for the protection of

oil company facilities in order to prevent problems of electrical interference upon the pipelines.

F. Proposed backfill material must provide pipe support and protection for any pipe coatings. Only rock free native soil, clean sand, or zero sack slurry may be used as backfill material. No cement slurry will be allowed within 24 inches of oil company pipelines.

G. Grade design must provide adequate protective soil cover allowing pipelines to withstand dynamic forces exerted by anticipated traffic loads, during and upon completion of construction activity.

H. Equipment lists specifying fully loaded gross vehicle weights must be provided to confirm that maximum allowable loads will not apply excessive loads or abnormal bearing forces that may cause pipelines to move, rupture or sustain mechanical damage.

I. Proposed grade changes must be approved by oil company facilities representatives and engineering or technical services. Excessive fill will not be permitted over oil company facilities. Changes to existing pipeline cover within 50 feet of any oil company pipeline will require adjustment to insure a minimum of 48 inches cover above the pipelines.

J. To prevent undermining of proposed structures, and to allow for safe construction offset for future routine or emergency pipeline maintenance excavation access, structural improvements in the oil company right-of-way must provide for minimum safe construction offsets of:

(1) A minimum of five (5) feet outside of right-of-way boundaries, or

(2) A one and a half to one (1½ : 1) excavation angle of repose from the pipeline nearest to proposed structures, or

(3) A dimension required by government code, whichever of items 1 through 3 is greater.

(4) Field conditions preventing minimum safe offsets require minimum footing depths of 24 inches to 30 inches or more below the bottom of the deepest pipeline within the easement. In order to prevent stress in excess of maximum allowable loads to the pipelines, footings must ensure that the angle load influence miss underground pipelines. In no case will the face of footings be permitted with less than 36 inches horizontal clearance from the pipeline nearest the proposed structural footings.

K. The right-of-way must be securely maintained with clear, unobstructed, routine maintenance excavation access and emergency ingress and egress at all times, during, and upon completion of, construction improvements

L. The Contractor shall utilize high visibility barricades or K-Rail barriers, of the types as shown on the plans, to field delineate oil facilities. Markers shall include delineation of the right-of-way boundaries and pipeline alignment as shown on project design plans.

M. A preliminary pre-job safety orientation meeting with oil company facilities inspectors, project superintendents and excavation contractor crews shall be held prior to the start of construction. To ensure that Contractor employees and subcontractors are aware of proper actions to follow in the event pipelines are damaged or ruptured and fuel or oil is potentially released, protective measures and emergency response procedures which are presented in the JSSP will be reviewed with all affected project employees at all project safety meetings.

N. Representatives from the Owner, the Contractor, and the oil companies will conduct "tail gate" safety meetings before each new work period and after any new equipment operator turnover.

50-6 MINIMUM FACILITIES INSPECTION REQUIREMENTS

A. An oil company representative for the affected pipeline must be present whenever Contractors are potholing or working over or near oil company facilities.

B. The Contractor shall notify all affected oil company inspectors at the numbers listed below, and Underground Service Alert at (800) 227-2600 a minimum of 2 to 14 working days prior to any on-site work. Oil company contacts are:

[UPDATE / CONFIRN ALL CONTACTS]

ExxonMobil:
Don Kingston
12851 E. 166th St. Room 123
Cerritos, Ca 90703
Office: 310-212-1768

Chevron:
Gerald McClellan
16301 Trojan Way
Bldg. R01/B561
La Mirada, Ca 90638
Project Reference Number: 04-007
Ph:714-228-1530

Cell:714- 228-1503

ConocoPhilips:
Joseph Mendoza
2650 West Lomita Blvd.
Torrance, CA 90505
Cell: 310-466-8188
Pager: 310-841-1539

Shell:
Alan Davis
20945 S. Wilmingon Avenue
Carson, Ca 90810
Office: 559-935-2022 x103

50-7 APPLICABLE FEDERAL, STATE AND LOCAL REQUIREMENTS

Failure to comply with requirements of Pipeline Safety Laws, or other applicable Federal, State or Local laws or regulations, will subject the Contractor to liability for any damage incurred to oil company facilities during excavation or construction operations. Civil and/or criminal penalties may result from failure to comply.

50-8 LOAD BEARING CAPACITY GUIDELINES FOR PIPELINES

The Contractor shall use the information contained in Table 49.1 and Figure 49.1 as guidelines for planning his proposed equipment, operations, and improvements within the oil company right-of-way. Final approval of the adequacy of protection remains with the individual oil companies.

50-9 MEASUREMENT AND PAYMENT

Requirements under this Section will not be measured for payment, but will be considered incidental to the respective work items. Potholing will not be measured for payment except as stated in Section 18 of these specifications.

50-10 SAMPLE FORM

Table 50.2, in the following page, presents a sample of an acceptable Vehicle / Equipment form for inclusion in the JSSP.

Table 50.1 LOAD BEARING CAPACITY GUIDELINES FOR PIPELINES

Maximum Allowable Vehicle Weight

Coverage Over the Top of the Pipe inches	4-inch pipe pounds	6-inch pipe pounds	8-inch pipe pounds	10-inch pipe pounds	12-inch pipe pounds	18-inch pipe pounds	20-inch pipe pounds
6	26,000	15,000	11,000	9,000	7,000	6,000	5,000
12	47,000	27,000	20,000	16,000	14,000	9,000	7,000
18	73,000	42,000	29,000	23,000	20,000	11,000	8,500
24	106,000	60,000	42,000	32,000	27,000	14,000	10,500
30	150,000	82,000	56,000	43,000	35,000	17,000	12,000
36	200,000	106,000	72,000	54,000	43,000	20,000	12,500
42	255,000	136,000	90,000	67,000	53,000	21,000	12,000
48	320,000	168,000	109,000	80,000	62,000	22,000	10,000
Assumptions:							
1.	Grade-B pipe strength						
2.	Lap Weld Joints						
3.	Schedule 10 pipe wall thickness						
4.	Vehicle has 4 wheels						
5.	Weight includes vehicle-driver-cargo-fuel						
6.	Weight does not include dynamic forces of a moving vehicle over rough terrain						
7.	Analysis performed with the typical 1.25 factor of safety						
8.	Internal pipe pressure = 0-psi						

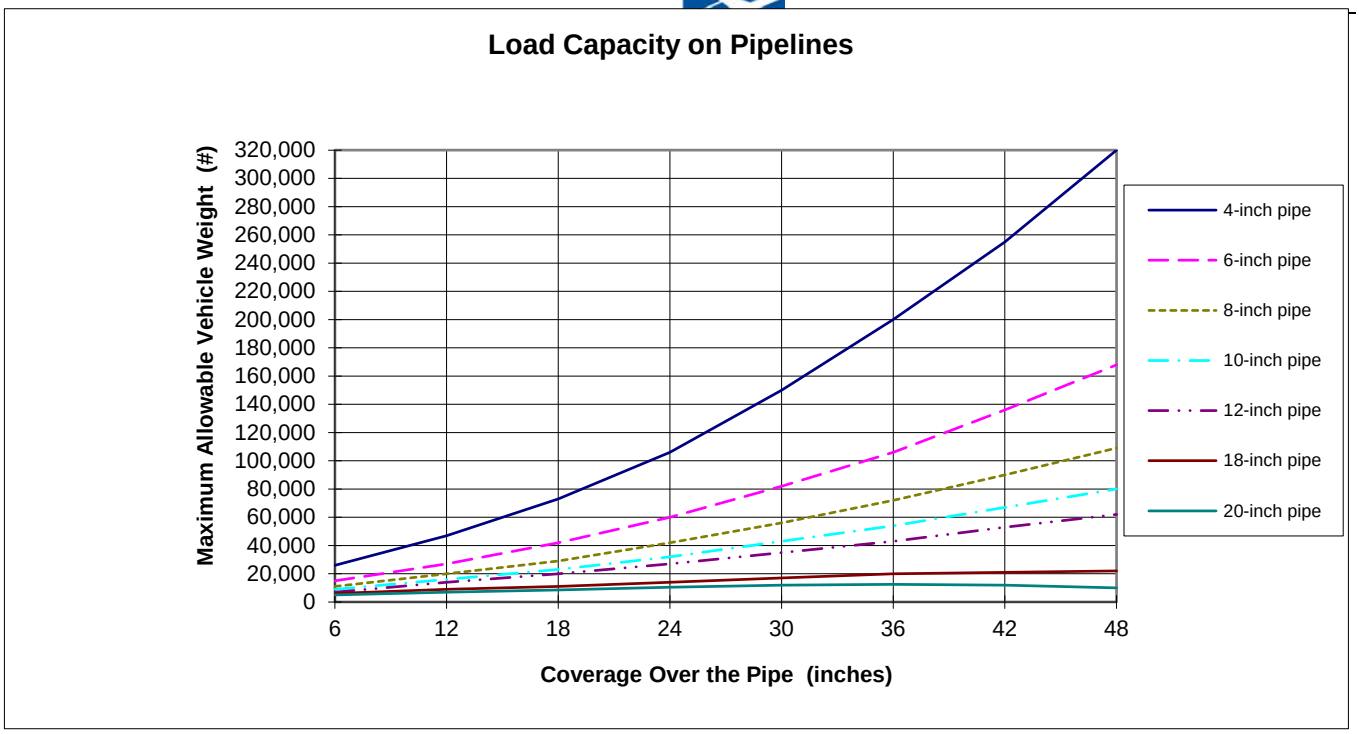
Load Capacity on Pipelines
Maximum Allowable Vehicle Weight (#)
320,000
300,000
280,000
260,000
240,000
220,000
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
6
12
18
24
30
36
42
48
Coverage Over the Pipe (inches)
4-inch pipe
6-inch pipe
8-inch pipe
10-inch pipe
12-inch pipe
18-inch pipe
20-inch pipe

Figure 50.1

TABLE 50.2 – PROPOSED EQUIPMENT LIST CROSSING OIL COMPANY PIPELINES

Equipment	Make/Model	Gross Wt (lbs)	Downward Pressure (psi)	Bucket Size (cu yds)	Rubber Tires (# of tires)	Track Mount (Width & Length)	Submitted by:

END OF SECTION 50