

Job Task Analysis

Employer:	Stanislaus County
Occupation:	Senior Civil Engineer Associate Civil Engineers/Associate Surveyor Assistant Engineers/Surveyor Senior Engineering / Surveying Technician Engineering Technician Engineering Aide I, II Transportation Project Coordinator
Company Contact:	Risk Management 1010 10 th Street Modesto, California 95354 (209) 525-5770
Date:	2009; February 2019; Updated November 2023
Analysis Provided By:	Lyle Andersen, PT, CWCE Andersen Physical Therapy, Inc. 1917 Coffee Road Modesto, California 95355 (209) 549-4626

INTRODUCTION: This Engineering Series JTA addresses the classifications listed above working within Traffic Engineering, Design, and Construction Management.

A complete job description is available through Stanislaus County Human Resources. The environmental factors, physical and functional demands for this Job Task Analysis were documented by Andersen Physical Therapy, Inc. The methodology for documentation consisted of on-site visits, using various measuring devices such as dynamometers and scales, as well as observation and interviews with employees and managers. A detailed record was made of the physical and functional demands of the job in terms of force pounds, weight, frequency, height, distance, anthropometric measurements, stamina, and degrees of range of motion. The determination of the frequencies of functional activities is based on standards provided by the National Institute for Occupational Safety and Health (NIOSH) and the Work Practice Guide for Manual Lifting (U.S. Department of Commerce, National Technical Information Service).

The Job Task Analysis is organized as follows: General work description; safety requirements; equipment; environmental factors; and physical/functional demands.

GENERAL WORK DESCRIPTION:

The frequency of the following activities may vary according to the physical requirements of the specific job tasks that the employee may be required to perform at random intervals.

The **Senior Civil Engineer** will supervise staff involved in bridge and road design, transportation management, traffic, and surveying.

The **Associate Civil Engineer** is assigned difficult projects and is given latitude for exercising independent judgement and initiative. This individual may also be in charge of an engineering section in the Public Works Department and has continuing responsibility for the work of that section. This position directs complex field and office engineering work in connection with the design of public works projects and trains and supervises technical and professional personnel. This position is subject to overtime, standby, and callback assignments. Performs related duties as assigned.

The **Assistant Engineer** performs a variety of responsible field and office-engineering duties in the Engineering Division of Public Works. This individual uses judgment and initiative in developing work methods to perform assigned projects and related duties as assigned. This position may supervise sub-professional assistants and entry-level professional engineers in field and office work. This position is subject to overtime, standby, and callback assignments. Performs related duties as assigned.

The **Senior Engineering Technician** performs a wide range of complex technical or para-professional engineering work in connection with engineering design and construction and is the highest classification in the Engineering Technician series. The Senior position is distinguished by the requirement for a high degree of skill in para-professional civil engineering work and the responsibility to provide leadership and supervision to staff in the lower engineering classifications. This position is subject to overtime, standby, and callback assignments. Performs related duties as assigned.

The **Engineering Technician** performs difficult sub-professional engineering office and fieldwork, that may include surveying, construction inspection, drafting, and creating and editing G.I.S layers and maps. This position is subject to overtime, standby, and callback assignments. Performs related duties as assigned.

The **Engineering Aid II** performs a wide range of complex technical or para-professional engineering work in connection with engineering design and construction. This individual works under general supervision and their assignments are reviewed and checked upon completion. The Level II position performs with more independence of action within established guidelines. This position is subject to overtime, standby, and callback assignments. Performs related duties as assigned.

The **Engineering Aid I** performs a wide range of complex technical or para-professional engineering work in connection with engineering design and construction. This individual works under general supervision and their assignments are reviewed and checked upon completion. Employees in this entry-level position are expected to raise questions and ask for help as new or unusual problems arise. This position is subject to overtime, standby, and callback assignments. Performs related duties as assigned.

The **Transportation Project Coordinator** performs and directs transportation engineering work in connection with the development and management of transportation systems. This position is subject to overtime, standby, and callback assignments. Performs related duties as assigned.

SPECIFIC DUTIES: Available through the Human Resources Department at the County of Stanislaus.

<https://www.governmentjobs.com/careers/stanislaus/classspecs>

Safety Requirements: All employees are required to observe company safety procedures and standards to insure individual and collective safety, in addition to avoiding unnecessary risk to oneself, co-workers, customers, and property.

Equipment:

- | | |
|--|-----------------------------|
| 1. Calculator | 6. Software |
| 2. Copy machine | 7. Telephone |
| 3. Engineering and survey equipment as needed. | 8. Vehicle |
| 4. Keyboard / computer / mouse / monitor | 9. Miscellaneous hand tools |
| 5. Printer | |

All employees working within the Senior Civil Engineer / Associate Civil Engineer / Assistant Engineer / Senior Engineering Technician / Engineering Technician / Engineering Aide I, II / Transportation Project Coordinator positions are required to provide physical assistance for all weight and frequency requirement needs of all job tasks in order to maintain a safe work environment. Employees must be physically capable of working in any of the job tasks within the Senior Civil Engineer / Associate Civil Engineer / Assistant Engineer / Senior Engineering Technician / Engineering Technician / Engineering Aide I, II / Transportation Project Coordinator positions.

ENVIRONMENTAL FACTORS



The following percentages are given in terms of an eight-hour workday:

Seldom = 1% - 2%	Frequent = 34% - 66%
Occasional = 3% - 33%	Constant = 67% - 100%

	ENVIRONMENTAL FACTORS	MAXIMUM FREQUENCY
1.	Unprotected heights:	Not Applicable
2.	Being around moving machinery: Traffic	Occasional
3.	Exposure to marked changes in temperature and humidity: outside temperatures may seasonally vary between 28-110 degrees.	Seldom
4.	Exposure to dust, fumes, smoke, gases, or other irritating substances (specify):.....	Seldom
5.	Driving: Vehicle	Occasional
6.	Exposure to excessive noise:..... <i>Hearing protection is available</i>	Not Applicable
7.	Exposure to radiant or electrical energy:.....	Not Applicable
8.	Exposure to solvents or chemicals:..... <i>Refer to MSDS document.</i>	Not Applicable
9.	Exposure to slippery or uneven walking surfaces:..... <i>Occasionally During Construction Inspection</i>	Seldom
10.	Working below ground:.....	Not Applicable
11.	Unusual fatigue factors:	Not Applicable
12.	Working with explosives:.....	Not Applicable
13.	Excessive vibration:	Not Applicable
14.	Working with hands in water or other substance:..... <i>Hand protection is available</i>	Not Applicable
15.	Working proximity:..... Alone: Closely with others:	Not Required Constant
16.	Working inside:.....	Constant
17.	Working outside:..... <i>Construction Inspectors may work outside frequently at times</i>	Occasional

FUNCTIONAL ACTIVITIES



The frequency of the following activities may vary according to the physical requirements of the specific job tasks the employee may be required to perform at random intervals.

PHYSICAL AND FUNCTIONAL REQUIREMENTS

<u>FREQUENCY DEFINITIONS</u>	<u>SELDOM</u>	<u>OCCASIONAL</u>	<u>FREQUENT</u>	<u>CONSTANT</u>
Percent of the Day	1-2%	3-33%	34-66%	67-100%
Material Handling	1-4 Reps	5-32 Reps	33-250 Reps	251-2,000 Reps
Non Material Handling	1-4 Reps	5-32 Reps	33-250 Reps	251-2,000 Reps
Repetitive & Static Work	1-50 Reps	51-250 Reps	251-1,000 Reps	1,001-20,000 Reps

1.) **PUSH:** *Pushing activities may require use of the back in conjunction with leg and arm musculature.*

<u>MAXIMUM REQUIREMENT</u>	
0-10 pounds:	Occasional
11-25 pounds:	Seldom
26-100 pounds:	Not Required
Maximum Force: <u>15</u> Pounds	

Assistive Devices: 2 or 4-Wheeled Cart, Hand Truck. Additionally, one person assistance is available with forces greater than 15 pounds.

Comments: Pushing is utilized with activities such as retrieving, returning, storing, adjusting, moving, and/or transporting equipment and supplies (e.g. cart, door). The employee exerts up to 15 pounds of force in a horizontal plane from waist to shoulder height of a distance up to 100+ feet when performing job tasks (e.g. cart; open/close door, file, drawer).

2.) **PULL:** *Pulling activities may require use of the back in conjunction with leg and arm musculature.*

<u>MAXIMUM REQUIREMENT</u>	
0-10 pounds:	Occasional
11-25 pounds:	Seldom
26-100 pounds:	Not Required
Maximum Force: <u>15</u> Pounds	

Assistive Devices: 2 or 4-Wheeled Cart, Hand Truck. Additionally, one person assistance is available with forces greater than 15 pounds.

Comments: Pulling is utilized with activities such as retrieving, returning, storing, adjusting, moving, and/or transporting equipment and supplies (e.g. cart, doors). The employee exerts up to 15 pounds of force in a horizontal plane from waist to shoulder height of a distance up to 5+ feet when performing job tasks (e.g. cart; open/close door, file, drawer). *Pushing is the preferred method of moving carts.*

3.) **STAND-UP LIFT**: *Lifting weighted objects between floor and waist height.*

MAXIMUM REQUIREMENT

0-10 pounds:	Seldom		
11-100 pounds:	Not Required	Maximum Force:	<u>10</u> Pounds

Assistive Devices: One person assistance is available with weights greater than 10 pounds.

Comments: A stand-up lift is utilized with activities such as retrieving, returning, storing, transporting equipment and supplies (e.g. documents, files). The employee lifts items weighing between <1 pound and 10 pounds when performing job tasks (e.g. file, binder, plans; miscellaneous paper document; reference material; traffic counter). *Safe lifting is performed by utilizing a posture of partial squatting and a straight back. Construction inspectors may seldom lift up to 35 pounds for sample collection asphalt, concrete and/or iron.*

4.) **LEVEL LIFT**: *Lifting weighted objects from between waist and chest height level for a maximum horizontal distance of up to four feet.*

MAXIMUM REQUIREMENT

0-10 pounds:	Occasional		
11-100 pounds:	Not Required	Maximum Force:	<u>10</u> Pounds

Assistive Devices: One person assistance is available with weights greater than 10 pounds.

Comments: A level lift is utilized with activities such as retrieving, returning, storing, moving, and/or transporting equipment and supplies (e.g. engineering documents). The employee lifts items weighing between <1 pound and 10 pounds when performing job tasks (e.g. miscellaneous document, map, plans, binder, forms; traffic counter).

5.) **WEIGHT CARRY**: *Carrying weighted objects between waist and chest height beyond a distance of four feet.*

MAXIMUM REQUIREMENT

0-10 pounds:	Occasional		
11-100 pounds:	Not Required	Maximum Force:	<u>10</u> Pounds

Assistive Devices: 4-Wheel Cart, Hand Truck. Additionally, one or more person(s) assistance is available with weights greater than 10 pounds.

Comments: Weight carry is utilized with activities such as retrieving, returning, storing, adjusting, moving, and/or transporting equipment and supplies (e.g. engineering documents). The employee carries items weighing between <1 pound and 10 pounds between 5 feet and 100+ feet when performing job tasks (e.g. plans, certificate, document, map, binder, forms; laptop computer; measurement device; counter).

6.) **OVERHEAD LIFT/PULL DOWN:** *Lifting weighted object from/to chest and overhead height level.***MAXIMUM REQUIREMENT****0-100 pounds:** Not Required **Maximum Force:** 0 Pounds

Assistive Devices: A vertical ladder, step ladder or step stool is available to bring items to eye or shoulder level.

Comments: Overhead lift/pull down is not utilized to perform job tasks. *Variables to overhead reaching will be the employee's height and anthropometric reach. Traffic division employees are required to lift while mounting traffic counters on to poles to a height of 6 feet on a seldom basis.*

7.) **OVERHEAD REACH:****MAXIMUM FREQUENCY:** Not Required

Comments: Overhead reach is not required to perform job tasks. *A ladder (appropriate height) or step stool may be utilized to bring items to eye or shoulder level. Variables to overhead reaching will be the employee's height and anthropometric reach.*

8.) **FORWARD REACH:****MAXIMUM FREQUENCY:** Frequent

Comments: Forward reach is performed to a distance of 28 inches when retrieving, returning, storing, adjusting, moving, and/or transporting equipment and supplies (e.g. desktop work; file, reading and research; sort, page turn; handwrite; operate copier, printer, facsimile; push/pull cart; open/close door, file, drawer; drive vehicle). *The degree of elbow extension required for reaching will vary according to the employee's anthropometric reach.*

9.) **STOOP:****MAXIMUM FREQUENCY:** Seldom

Comments: Stooping is performed when retrieving, returning, adjusting, moving, and/or transporting equipment and supplies (e.g. file; utilize storage; off-site inspection, job tasks). *Variable to stooping will be the employee's height. Stooping of the head, trunk and knees can be minimized or avoided by substituting alternate positions of squatting, kneeling or bending when performing job tasks.*

10.) **SQUAT:** *(Unloaded)***MAXIMUM FREQUENCY:** Not Required

Comments: Squatting is not required to perform job tasks. *Squatting may be minimized or avoided by substituting alternate positions of bending, half-kneeling or kneeling. Partial squatting is a preferred lifting posture.*

11.) FORWARD BEND:

**MAXIMUM
FREQUENCY:** Occasional

Comments: Bending forward at the waist is performed when retrieving, returning, storing, adjusting, moving, and/or transporting equipment and supplies (e.g. file; utilize storage; construction inspection). Maximum forward trunk flexion required is 45 degrees. *Employee may avoid excessive forward bending of the trunk up to 80 degrees by using alternate positions of bending at the hips, kneeling, half kneeling, stooping, sitting or squatting.*

12.) TWIST:

**MAXIMUM
FREQUENCY:** Occasional

Comments: Twisting at the waist is required to perform job tasks (e.g. drive vehicle, offsite worksite inspection). *Twisting at the waist may be minimized by turning the whole body, including the feet and working from a swivel chair.*

13.) TURN:

**MAXIMUM
FREQUENCY:** Seldom

Comments: Turning is required to perform job tasks (e.g. off-site construction inspection, worksite inspection).

14.) KNEEL:

**MAXIMUM
FREQUENCY:** Not Required

Comments: Kneeling is not required to perform job tasks. *Kneeling may be minimized or avoided by substituting alternate positions of bending, squatting, kneeling, or half kneeling.*

15.) CRAWL:

**MAXIMUM
FREQUENCY:** Not Required

Comments: Crawling is not required to perform job tasks.

16.) STAIR CLIMB:

**MAXIMUM
FREQUENCY:** Not Required

Comments: Stair climb is not required to perform job tasks. Public buildings offer elevators. Maximum number of 21 steps may be climbed.

17.) **LADDER CLIMB:**

**MAXIMUM
FREQUENCY:** Not Required

Comments: Ladder climbing is not required to perform job tasks. *Variables to overhead climbing will vary according to the employee's height and anthropometric reach.*

18.) **WALK:**

**MAXIMUM
FREQUENCY:** Occasional

Comments: Walking is performed when retrieving, returning, storing, moving, and/or transporting equipment and supplies (e.g. to/from customer service counter; meetings with collaborating agencies and/or colleagues; off-site job tasks; inspection of construction worksite; operate business machine; field investigation). Walking length varies between 3 feet and 500+ feet depending on job task.

19.) **SIT:**

**MAXIMUM
FREQUENCY:** Constant

Comments: Sitting is performed for a maximum of 120-minute intervals when performing job tasks (e.g. desktop work, research, read; document sort, page turn, file; conferencing with staff; interview; drive vehicle; meetings with collaborating agencies and/or colleagues). *Specific work tasks may require up to frequent standing and/or walking.*

20.) **STAND: (Static)**

**MAXIMUM
FREQUENCY:** Occasional

Comments: Static standing is performed for a maximum of 30-minute intervals when performing job tasks (e.g. meetings with collaborating agencies and/or colleagues; operate business machines; construction site inspection).

21.) **BALANCE:**

**MAXIMUM
FREQUENCY:** Frequent

Comments: Good balance is required for safe walking, standing, reaching and lifting.

22.) **HAND/FOOT CONTROL:**

<u>MAXIMUM REQUIREMENT</u>	
HAND:	
Right:	Occasional
Left:	Occasional
Both:	Occasional
Either:	Not Required
FOOT:	
Right:	Occasional
Left:	Seldom
Both:	Not Required
Either:	Not Required

Comments: Hand controls are utilized to operate equipment (e.g. vehicle) when adjusting controls (e.g. drive vehicle). Foot controls are utilized to operate equipment (e.g. vehicle).

23.) **UPPER AND LOWER EXTREMITY COORDINATION:**

<u>MAXIMUM REQUIREMENT</u>	
Simple Grasp:	Frequent
Firm Grasp:	Occasional
Fine Manipulation:	Frequent
Eye/Hand Coordination:	Frequent
Hand/Foot Coordination:	Occasional

Comments: Grasping and coordination activities are performed when retrieving, returning, storing, adjusting, moving, and/or transporting equipment, controls, and supplies (e.g. desktop work; business machines; vehicle; collect material samples for inspection and analysis).

Simple grasping is utilized to perform job tasks (e.g. lift and manipulate objects weighing less than 5 pounds; file, operate miscellaneous office equipment; drive vehicle).

Firm grasping is utilized to perform job tasks (e.g. lift and handle objects weighing 5 pounds or greater; files, documents, binders, plans and engineering documents, miscellaneous office equipment).

Fine manipulation is utilized to perform job tasks (e.g. keyboard, mouse; handwrite, sort, file, page turn).

Eye/hand coordination is utilized to perform job tasks (e.g. keyboard, mouse; handwrite, sort, file, page turn; plans and engineering documents, drive vehicle).

Hand/foot coordination is utilized to perform job tasks (e.g. drive vehicle).

Depending on individual hand dominance, one hand may be used more frequently than the other when performing job tasks.

24.) **CERVICAL (NECK) MOVEMENT:**

	<u>MAXIMUM REQUIREMENT</u>
Static Neutral Position:	Frequent
Flexing:	Frequent
Rotating:	Occasional
Extending:	Seldom

Comments: Neck movement is required when performing job tasks (e.g. desktop work; meetings; drive vehicle; off-site construction inspection; plan reading). *Participating in observation of work environment allowing for safe working conditions. Full cervical range of motion is required to safely perform the job tasks.*

{End of Report}



Stanislaus County

JOB TASK ANALYSIS SUMMARY

<u>FREQUENCY DEFINITIONS</u>	<u>SELDOM</u>	<u>OCCASIONAL</u>	<u>FREQUENT</u>	<u>CONSTANT</u>
Percent of the Day	1-2%	3-33%	34-66%	67-100%
Material Handling	1-4 Reps	5-32 Reps	33-250 Reps	251-2,000 Reps
Non Material Handling	1-4 Reps	5-32 Reps	33-250 Reps	251-2,000 Reps
Repetitive & Static Work	1-50 Reps	51-250 Reps	251-1,000 Reps	1,001-20,000 Reps

The following is a summary of the physical demands of the Job Task Analysis that were obtained for the position of:

**SENIOR CIVIL ENGINEER / ASSOCIATE CIVIL ENGINEER / ASSISTANT ENGINEER / SENIOR
ENGINEERING TECHNICIAN / ENGINEERING TECHNICIAN / ENGINEERING AIDE I, II /
TRANSPORTATION PROJECT COORDINATOR**

Functional Activities	Maximum Requirements	Functional Activities	Maximum Requirements
<i>Push (Force)¹</i>	15 pounds	<i>Stair Climb</i>	Not Required
<i>Pull (Force)¹</i>	15 pounds	<i>Ladder Climb</i>	Not Required
<i>Stand Up Lift¹</i>	10 pounds	<i>Walk¹</i>	Occasional
<i>Level Lift¹</i>	10 pounds	<i>Sit¹</i>	Constant
<i>Weight Carry¹</i>	10 pounds	<i>Stand (Static)¹</i>	Occasional
<i>Overhead Lift/Pull Down</i>	0 pounds	<i>Balance¹</i>	Frequent
<i>Overhead Reach</i>	Not Required	<i>Hand Control¹</i>	Occasional
<i>Forward Reach¹</i>	Frequent	<i>Foot Control¹</i>	Occasional
<i>Stoop¹</i>	Seldom	<i>Simple Grasp¹</i>	Frequent
<i>Squat (Unloaded)</i>	Not Required	<i>Firm Grasp¹</i>	Occasional
<i>Forward Bend¹</i>	Occasional	<i>Fine Manipulation¹</i>	Frequent
<i>Twist¹</i>	Occasional	<i>Eye/Hand Coordination¹</i>	Frequent
<i>Turn¹</i>	Seldom	<i>Hand/Foot Coordination¹</i>	Occasional
<i>Kneel</i>	Not Required	<i>Cervical (neck) Movement¹</i>	Frequent
<i>Crawl</i>	Not Required		

¹ The critical demands of the job.

Lyle Andersen, PT

Date: _____
Lyle Andersen, PT, CWCE
Preparer Signature

Date: _____
Contact Person
Title

Sambath Chrun

Date: 2/6/24
Contact Person
Title Deputy Director

Date: _____
Contact Person
Title

LA/gm

Stanislaus County: **SENIOR CIVIL ENGINEER / ASSOCIATE CIVIL ENGINEER / ASSISTANT ENGINEER / SENIOR
ENGINEERING TECH / ENGINEERING TECHNICIAN / ENGINEERING AIDE I, II / TRANSPORTATION PROJECT
COORDINATOR**