

Job Task Analysis

Employer:	STANISLAUS COUNTY
Occupation:	Assistant Engineer/Surveyor Associate Civil Engineer/Associate Surveyor Sr. Engineer/Survey Tech
Company Contact:	Risk Management 1010 10 th Street Modesto, California 95354 (209) 525-5770
Date:	February 2011; February 2019
Analysis Provided By:	Lyle Andersen, PT, CWCE Andersen Physical Therapy, Inc. 1917 Coffee Road Modesto, California 95355 (209) 549-4626

INTRODUCTION: This Surveyor Series JTA addresses classifications listed above performing Surveyor Duties

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.

Under the general supervision of the department manager, the Surveyor performs a variety of field and office engineering work in connection with the construction and maintenance of public works, trains, and supervises technical personnel as required.

SPECIFIC DUTIES: Available through the Human Resources Department.

<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. Broom | 14. Pruning shears |
| 2. Calculator | 15. Radio ladder |
| 3. Cell phone | 16. Rake |
| 4. Copy machine | 17. Saws all |
| 5. Digging bar | 18. Scanner |
| 6. GPS survey units | 19. Shovel |
| 7. Hammer saw | 20. Telephone |
| 8. Hatchet | 21. Total station survey equipment |
| 9. Jack hammer | 22. Traffic cone |
| 10. Keyboard/computer/mouse/monitor | 23. Traffic sign |
| 11. Misc. hand tools | 24. Tri-pod |
| 12. Post hole digger | 25. Vehicle |
| 13. Printer | |

*All employees within the **Surveyor, Assistant Surveyor, Associate Surveyor, Sr. Engineering/Surveying Tech & Engineering Tech** position 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 **Surveyor, Assistant Surveyor, Associate Surveyor, Sr. Engineering/Surveying Tech & Engineering Tech** position.*

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:..... Embankment, slopes	Seldom
2.	Being around moving machinery:..... Traffic, heavy equipment	Occasional
3.	Exposure to marked changes in temperature and humidity: outside temperatures may seasonally vary between 28-110 degrees.	Occasional
4.	Exposure to dust, fumes, smoke, gases, or other irritating substances (specify):..... Blueprint ammonia, road dust	Seldom
5.	Driving: Vehicle	Occasional
6.	Exposure to excessive noise:..... Jack hammer <i>Hearing protection is available</i>	Seldom
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:..... Sloped, underdeveloped ground	Occasional
10.	Working below ground:.....	Not Applicable
11.	Unusual fatigue factors:	Not Applicable
12.	Working with explosives:.....	Not Applicable
13.	Excessive vibration: Jack hammer	Seldom
14.	Working with hands in water or other substance:..... <i>Hand protection is available</i>	Not Applicable
15.	Working proximity:..... Alone: Closely with others:	Occasional Constant
16.	Working inside:.....	Frequent
17.	Working outside:.....	Frequent

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
26-35 pounds:	Seldom
36-100 pounds:	Not Required
Maximum Force: 50 Pounds	

Assistive Devices: One person assistance is available with forces greater than 50 pounds.

Comments: Pushing is utilized with activities such as retrieving, returning, storing, adjusting, moving and/or transporting equipment and supplies (e.g. door, survey paraphernalia). The employee exerts up to 50 pounds of force in a horizontal plane between waist and shoulder height of a distance up to 50 feet when performing job tasks (e.g. open/close door, drawer, placement storage of survey equipment to/from storage rack; travel with cart).

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
26-35 pounds:	Seldom
36-100 pounds:	Not Required
Maximum Force: 50 Pounds	

Assistive Devices: One person assistance is available with forces greater than 50 pounds.

Comments: Pulling is utilized with activities such as retrieving, returning, storing, adjusting, moving and/or transporting equipment and supplies (e.g. door, survey paraphernalia). The employee exerts up to 50 pounds of force in a horizontal plane between waist to shoulder height of a distance up to 5 feet when performing job tasks (e.g. open/close gate, cart, door, file, drawer; placement storage of store survey equipment to/from storage; travel with cart; pull to drag utility ground plate cover). *Pushing is the preferred method of moving carts. Surveying job tasks require loosening and pulling out manhole cover at ground level on a seldom basis.*

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

0-10 pounds:	Occasional	
11-25 pounds:	Occasional	
26-35 pounds:	Seldom	
36-50 pounds:	Seldom	
51-75 pounds:	Seldom	
76-100 pounds:	Seldom	Maximum Force: 80 Pounds

Assistive Devices: One person assistance is available with weights greater than 80 pounds.

Comments: A stand-up lift is utilized with activities such as retrieving, returning, storing, and/or transporting equipment and supplies (e.g. documents, files, and survey paraphernalia). The employee lifts items weighing between <1 pounds and 80 pounds when performing job tasks (e.g. up to 10-pound tripod, up to 15-pound total-station unit, EPS unit components, hand tools, monument well, bucket of asphalt, 80-pound jack hammer, 10 inch PVC couple, 6-foot survey staff, 25-pound digging bar, 20-pound portable 12-volt battery; safety sign; remove/replace utility ground plate cover). *Safe lifting is performed by utilizing a posture of partial squatting and a straight back.*

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:	Frequent	
11-25 pounds:	Occasional	
26-35 pounds:	Seldom	
36-50 pounds:	Seldom	
51-75 pounds:	Seldom	
76-100 pounds:	Seldom	Maximum Force: 80 Pounds

Assistive Devices: One person assistance is available with weights greater than 80 pounds.

Comments: A level lift is utilized with activities such as retrieving, returning, storing, and/or transporting equipment and supplies (e.g. documents, files, and survey paraphernalia). The employee lifts items weighing between <1 pounds and 80 pounds when performing job tasks (e.g. up to 10-pound tripod, up to 15-pound total-station unit, EPS unit components, hand tools, monument well, bucket of asphalt, 80-pound jack hammer, 10 inch PVC couple, 6-foot survey staff, 25-pound digging bar, 20-pound portable 12-volt battery; safety sign; remove/replace utility ground plate cover).

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

0-10 pounds:	Frequent	
11-25 pounds:	Occasional	
26-35 pounds:	Seldom	
36-50 pounds:	Seldom	
51-75 pounds:	Seldom	
76-100 pounds:	Seldom	Maximum Force: 80 Pounds

Assistive Devices: One person assistance is available with weights greater than 80 pounds.

Comments: Weight Carry is utilized with activities such as retrieving, returning, storing, and/or transporting equipment and supplies (e.g. documents, files, and survey paraphernalia). The employee carries items weighing between <1 pound and 80 when performing job tasks (e.g. up to 10-pound tripod, up to 15-pound total-station unit, EPS unit components, hand tools, monument well, bucket of asphalt, 80-pound jack hammer, 10 inch PVC couple, 6-foot survey staff, 25-pound digging bar, 20-pound portable 12-volt battery; safety sign; remove/replace utility ground plate cover).

6.) **OVERHEAD LIFT/PULL DOWN:** *Lifting weighted object from/to chest and overhead height level.*

MAXIMUM REQUIREMENT

0-10 pounds: Seldom

11-100 pounds:

Maximum Force: 10 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 utilized with activities such as retrieving, returning, storing, adjusting, moving and/or transporting equipment and supplies (e.g. survey paraphernalia, safety sign, survey staff; open/close side panel doors on truck).

The employee lifts items weighing between <1 pound and 10 pounds to a maximum height of 72 inches when performing job tasks (e.g. load/unload equipment from/to storage rack on truck/storage). *Variables to overhead reaching will be the employee's height and anthropometric reach.*

7.) **OVERHEAD REACH:**

**MAXIMUM
FREQUENCY:** Seldom

Comments: Overhead reach is performed to a maximum height of 72 inches when retrieving, returning, storing, adjusting, moving and/or transporting equipment and supplies (e.g. survey paraphernalia, safety sign, survey staff; open/close side panel doors on truck). *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 up to a distance of 28 inches when retrieving, returning, storing, adjusting, moving and/or transporting equipment and supplies (e.g. push/pull, open/close door; desktop work; drive vehicle; load/unload equipment; survey staff placement, hand tool work, spray paint, jack hammer; setup/take down cone, sign and tripod survey equipment, monument search; setting survey points; open monument well and other utility wells). *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, storing, adjusting, moving and/or transporting equipment and supplies (e.g. file; utilize storage; load/unload vehicle; walk under fencing, brush, trees, and other natural vegetation; , monument search; setting survey points; open monument well and other utility wells). *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:** Seldom

Comments: Squatting is performed when retrieving, returning, storing, adjusting, moving and/or transporting equipment and supplies (e.g. utilize storage; travel under fencing, brush, trees, and other natural vegetation; reach inside ground hole; monument search; setting survey points; open monument well and other utility wells). *Squatting may be minimized or avoided by substituting alternate positions of bending or kneeling. Partial squatting is a preferred lifting posture.*

11.) **FORWARD BEND:**

**MAXIMUM
FREQUENCY:** Frequent

Comments: Bending forward at the waist is performed when retrieving, returning, storing, adjusting, moving and/or transporting equipment and supplies (e.g. utilize storage, load/unload equipment, survey staff placement, hand tool work, spray paint, operate jack hammer, setup/take down cone, sign and tripod survey equipment; locate monument; monument search; setting survey points; open monument well and other utility wells). Maximum forward trunk flexion required is 60 degrees. *Employee may minimize or 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, load/unload equipment, survey staff placement, hand tool work, spray paint; setup/take down survey equipment; worksite surveillance). *Twisting at the waist may be minimized by turning the whole body, including the feet and working from a swivel office chair.*

13.) **TURN:**

**MAXIMUM
FREQUENCY:** Occasional

Comments: Turning is required to perform job tasks (e.g. load/unload equipment, survey staff placement, hand tool work, spray paint, operate jack hammer, setup/take down survey equipment; worksite surveillance).

14.) **KNEEL:**

**MAXIMUM
FREQUENCY:** Occasional

Comments: Kneeling is required to perform job tasks (e.g. hand digging to recover/set monument and/or survey marker). *Kneeling may be minimized or avoided by substituting alternate positions of bending, squatting, 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 building offer elevators.

17.) **LADDER CLIMB:**

**MAXIMUM
FREQUENCY:** Seldom

Comments: Ladder climbing is required to perform job tasks (e.g. climb in/out of truck bed up to 31 inches in height). Variables to overhead climbing will vary according to the employee's height and anthropometric reach.

18.) **WALK:**

**MAXIMUM
FREQUENCY:** Frequent

Comments: Walking is performed when retrieving, returning, storing, moving and/or transporting equipment, and supplies (e.g. to/from meetings with collaborating agencies and/or colleagues; off-site job tasks, load/unload equipment, survey staff placement, hand tool work, spray paint, operate jack hammer; setup/take down cone, sign, and tripod survey equipment; worksite surveillance; monument search). 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 retrieving performing job tasks (e.g. meetings with collaborating agencies and/or colleagues; desktop work; interview; drive vehicle).

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

**MAXIMUM
FREQUENCY:** Occasional

Comments: Static standing is performed for a maximum of 30-minute intervals when performing job tasks (e.g. survey work; meetings with collaborating agencies and/or colleagues; operate business machine, load/unload equipment, survey staff placement, hand tool work, spray paint, operate jack hammer; setup/take down, sign and tripod survey equipment; worksite surveillance; monument search).

21.) **BALANCE:**

MAXIMUM FREQUENCY:	Frequent
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Comments: Adequate balance is required for safe walking, standing, climbing, 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, survey equipment, jack hammer) when adjusting controls (e.g. drive vehicle, survey, jack hammer). 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 operating/retrieving, returning, storing, adjusting, moving and/or transporting equipment, controls and supplies (e.g. business machine; vehicle, load/unload equipment, survey staff placement, hand tool work, spray paint, jack hammer; cone, sign, and tripod survey equipment; desktop work, miscellaneous office equipment and survey components).

Simple grasping is utilized to perform job tasks (e.g. lift and manipulate objects weighing less than 5 pounds; file; handle document, binder; operate business machine; drive vehicle, load/unload equipment, survey staff placement, spray paint).

Firm grasping is utilized to perform job tasks (e.g. lift and handle objects weighing 5 pounds or greater; load/unload equipment, survey staff placement, hand tool work, spray paint, operate jack hammer; setup/take down cone sign, and tripod survey equipment; adjusting total station; data-collector touch screen).

Fine manipulation is utilized to perform job tasks (e.g. keyboard, mouse; handwrite, sort, file, page turn; survey instrument adjustment; adjusting total station; data-collector touch screen; buttons on GPS equipment).

Eye/hand coordination is utilized to perform job tasks (e.g. keyboard, mouse; handwrite, sort, file, page turn; drive vehicle; survey instrument placement and adjustment).

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:	Frequent
Extending:	Seldom

Comments: Neck movement is required when performing job tasks (e.g. survey and desktop work; meeting; drive vehicle, load/unload equipment, survey staff placement, hand tool work, spray paint, operate jack hammer; setup/take down cone, sign, and tripod survey equipment; locate monument; worksite surveillance; monument search).

Participation in the observation of the work environment allows 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:

Surveyor/Assistant Surveyor/Associate Surveyor

Functional Activities	Maximum Requirements	Functional Activities	Maximum Requirements
<i>Push (Force)¹</i>	50 pounds	<i>Stair Climb</i>	Not Required
<i>Pull (Force)¹</i>	50 pounds	<i>Ladder Climb¹</i>	Seldom
<i>Stand Up Lift¹</i>	80 pounds	<i>Walk¹</i>	Frequent
<i>Level Lift¹</i>	80 pounds	<i>Sit¹</i>	Constant
<i>Weight Carry¹</i>	80 pounds	<i>Stand (Static)¹</i>	Occasional
<i>Overhead Lift/Pull Down</i>	10 pounds	<i>Balance¹</i>	Frequent
<i>Overhead Reach¹</i>	Seldom	<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)¹</i>	Seldom	<i>Firm Grasp¹</i>	Occasional
<i>Forward Bend¹</i>	Frequent	<i>Fine Manipulation¹</i>	Frequent
<i>Twist¹</i>	Occasional	<i>Eye/Hand Coordination¹</i>	Frequent
<i>Turn¹</i>	Occasional	<i>Hand/Foot Coordination¹</i>	Occasional
<i>Kneel¹</i>	Occasional	<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 <i>Amber James HR Manager</i> Contact Person Title Date: <u>4/30/19</u>	Date: _____ Contact Person Title Date: _____
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