**Design Brief: Public Message Boards at U of T**

**Introduction**


- **Background:**

In June 2013, as part of the Clean Toronto Together initiative, citizens were encouraged to use the public message centres implemented around the city to advertise events and services, instead of using public property such as bus shelters and poles [1]. Around the St. George Campus, these message boards are currently being used by various campus service providers such as tutors and student clubs for advertising. [2]

However, there are many issues regarding these message boards. For example, the gathering of staples causes difficulty for pasting content in an organized fashion. In addition, the current surface made of durable vulcanized rubber [3] is only penetrable by thick staples that are later hard to pull out. Furthermore, the message board does not provide protection for the content against the environment. This creates a visually unpleasant sight which goes against the Clean Toronto Together Initiative, and it obscures the information on the contents.

Therefore, a redesign of public message boards is needed to improve the quality of this service, and to address the needs of campus service providers.

- **Purpose:**

The main purpose of redesigning the bulletin board is to:

1. Be visually appealing per the Clean Toronto Together initiative
2. Prevent creation and gathering of waste (e.g. staples and tape)
3. Prevent damage to the content

- **Definitions:**

**-Content:** Includes posters, advertisements, flyers, rip-off flyers, and anything else that can be put up on public message boards.
**-Waste:** Any leftover material on the message boards, such as old staples, pins, tape, and remains of content that has been taken off.
**-Environment:** Weather such as rain, snow, and wind; bird droppings, water spills, etc.
**-Visually appealing:** Posters put up in an organized fashion, leaving behind minimal waste, with minimal damage possible.
**-Thick staples:** a thick staple refers to a heavy-duty staple, especially suitable for heavy duty outdoor uses such as in securing ground wires to wooden utility poles [4]

## Stakeholders

1. **Municipal Government of Toronto**
   -Responsible for construction and management. Implements bylaw: Toronto Municipal Code Chapter 693, article IV [5] on the regulations on public advertisement
2. **Various campus service providers** (ex. Tutors, clubs, other student services)
   -Provides content to advertise/inform their activities onto message board.
3. **University of Toronto St. George campus maintenance**
   -The message board is cleaned off as necessary by St. George property maintenance [6]
4. **Students**
   -Be informed of content provided by various campus service providers.

## Objectives

- **High Level Objectives:**

1. Allow easy and safe usage/maintenance (S1, S2, S3, S4)
2. Provide sufficient and visually appealing display and protection of content (S2, S3, S4)
3. Be cost-efficient (S1)

- **Detailed Objectives:**

1. Design is durable against environment (HL1)
2. Protection against misconduct for content (HL2)
3. Protects content against the weather and environment(HL2)
4. Reduces or eliminates waste (HL2)
5. Prevents harm towards the user in the event of an accident (HL1)
6. Provide ample space for large amounts of content varying in size (HL1)

**Metrics**

**1. Method of displaying content (DO4)**

| Unacceptable | Satisfactory | Outstanding |
|---|---|---|
| The user can only use tape or heavy duty staples to secure the content onto the board. | Staples, metal pins and tape can be used to secure the content onto the board. | An alternative that does not produce waste is provided on the spot for the user to easily put up their content on the board. |

**2. Method of removing content (DO4)**

| Unacceptable | Satisfactory | Outstanding |
|---|---|---|
| User is unable to remove old content without lingering waste fixed to board. | User can remove old content completely and can remove waste manually with ease. | User can remove the old content on the board completely with no waste remaining. |

**3. Providing ample space for content (DO6)**

-Note: City of Toronto Bylaw 693 Article IV: 693-30.A.1 [5] states that poster size must not exceed 22cm x 28cm.

-Note: Current design's display area: 2x(60.8cm*122cm) (2x2ft*4ft); Height at top of display area: 2.1m

| Unacceptable | Satisfactory | Outstanding |
|---|---|---|
| Provide less display area than current design | Provide same display area than current design | Provide more display area than current design |

**4. Design is durable against environment (DO1)**

| Unacceptable | Satisfactory | Outstanding |
|---|---|---|
| Made of material that can be damaged by physical force or water:<br>- Ex. Wood, cork | Materials light -weight and water resistant but breakable and expensive<br>- Ex. Glass, plastic, | Materials light-weight, water resistant, strong and inexpensive. |

**5. Protection of content against environment (DO2, DO3)**

| Unacceptable | Satisfactory | Outstanding |
|---|---|---|
| Posters are left unprotected [2]  | Protection provided for entire board as a cover (Ex. glass case, hood) that does not interrupt user to paste content. | Protection provided for individual content.<br><br>Ex. Plastic case that opens up to contain posters inside |

**6. Protection/prevention of harm for users during usage and accidents (DO5)**

| Unacceptable | Satisfactory | Outstanding |
|---|---|---|
| Sharp staples or edges that could harm user. | All edges must be smooth to avoid harm when accidentally bumping into the board (Ex. Young children) | No sharp edges or staples; board is smooth.<br><br>No potential injury occurs when interacting with board. |

**7. Material cost of new design (HL3)**

Note: Cost of current design is an estimation based on materials composing design [3] Cost of current design: $500 [7]

| Unacceptable | Acceptable |
|---|---|
| Material cost of new design exceeds the material cost of current design. | Material cost of new design is lower than the material cost of current design |

**Constraints**

1. **Price:** Must score “Acceptable” in M7

-Debt of Toronto Government has been increasing; Lower production cost helps the financial situation of Municipal government [8]

-Prevents the implementation of expensive electronic designs

2. **Height**: The highest point of available area for content must be within reachable height of an average Canadian without using any additional aids.

-Note: Average standing reaching height: Female: 1905mm, Male: 2060mm [9]

3. **Protection of content:** Must meet at least “Satisfactory” in M5

-Preventing damage towards content is significant to properly inform the University of Toronto community for the necessary time period

4. **Safety and injury prevention:** Must score at least “Satisfactory” in M6

5. **Production of waste:** Must score at least “Satisfactory” in M2

-In compliance to the Clean Toronto Together initiative, the design should not create waste and be visually unappealing

**Criteria**

1. **Easy to put up content:** Prefer higher score in M1

2. **Display area**: Prefer score of at least “Satisfactory” in M3

-Content should not overlap for full display; Bigger display area will increase amount of content

3. **Product is durable against environment**: Prefer score of at least satisfactory in M4

-Prefer to have durable product to reduce maintenance and replacement costs

4. **Protection of content:** Prefer higher score in M5

5. **Safety and injury prevention:** Prefer higher score in M6

6. **Production of waste:** Prefer higher score in M2

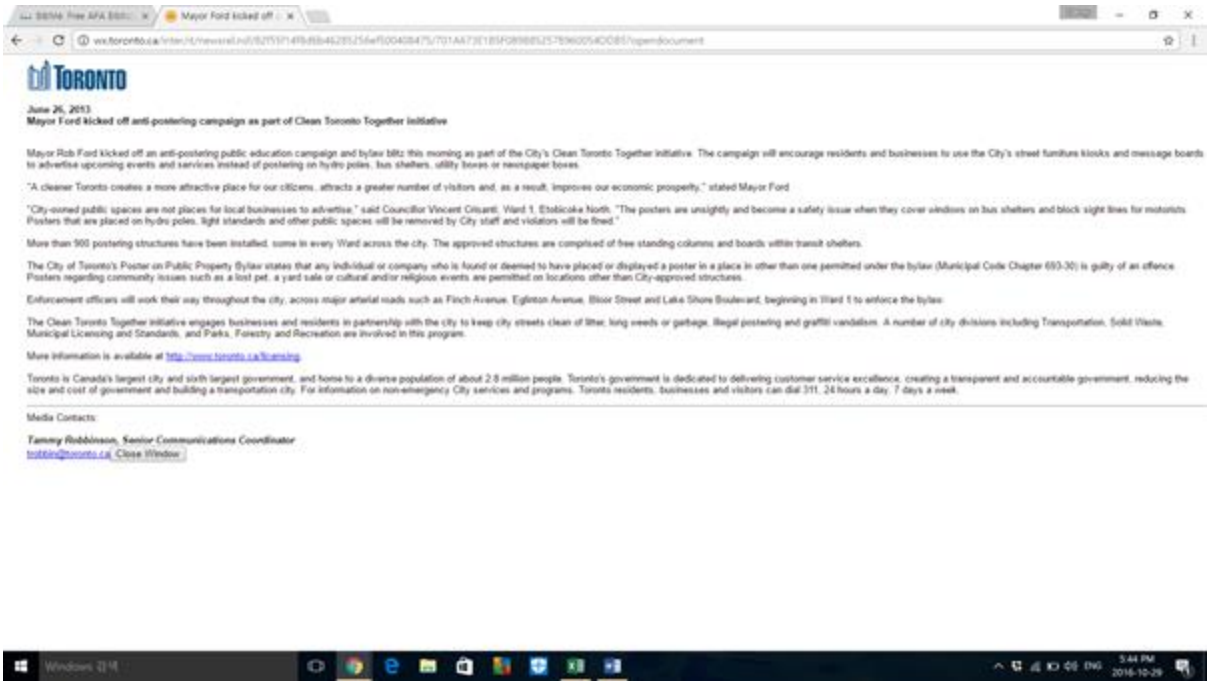
**Reference Designs**



| **Cork poster board** [10] | **Electronic bulletin board** [12] | **Lamp message board** [13] |
|---|---|---|
| PROS:<br>● Cheap<br>● Easy to remove content | PROS:<br>● Prevent creation of waste<br>● Clean, modern appearance<br>● Environmentally friendly<br>● Self charging solar panel system. | PROS:<br>● Occupies less public space for the users. |
| CONS<br>● Cork expands when in contact with water (Ex. rain)<br>● Easily damaged from human misconduct (Ex. Poking holes) [11] | CONS:<br>● Expensive to replace all existing bulletin boards with new model.<br>● Time consuming to apply for position/ cost money | CONS:<br>● Above the reachable height of the users<br>● No protection from weather: storm, rain |
| Does not meet “Satisfactory” in M4 | Does not meet “Acceptable” in M7 | Does not meet Second constraint, nor “Acceptable” in M5 |

**References**


1. Robbinson, T. (2013, June 26). “Mayor Ford kicked off anti-postering campaign as part of Clean Toronto Together initiative”. Retrieved October 25, 2016. http://wx.toronto.ca/inter/it/newsrel.nsf/82f55f14f8d6b46285256ef500408475/701A673E1B5F089B85257B960054DDB5?opendocument

TORONTO

June 26, 2013
**Mayor Ford kicked off anti-postering campaign as part of Clean Toronto Together initiative**

Mayor Rob Ford kicked off an anti-postering public education campaign and bylaw blitz this morning as part of the City's Clean Toronto Together initiative. The campaign will encourage residents and businesses to use the City's street furniture kiosks and message boards to advertise upcoming events and services instead of postering on hydro poles, bus shelters, utility boxes or newspaper boxes.

"A cleaner Toronto creates a more attractive place for our citizens, attracts a greater number of visitors and, as a result, improves our economic prosperity," stated Mayor Ford.

"City-owned public spaces are not places for local businesses to advertise," said Councillor Vincent Crisanti, Ward 1, Etobicoke North. "The posters are unsightly and become a safety issue when they cover windows on bus shelters and block sight lines for motorists. Posters that are placed on hydro poles, light standards and other public spaces will be removed by City staff and violators will be fined."

More than 900 postering structures have been installed, some in every Ward across the city. The approved structures are comprised of free standing columns and boards within transit shelters.

The City of Toronto's Poster on Public Property Bylaw states that any individual or company who is found or deemed to have placed or displayed a poster in a place in other than one permitted under the bylaw (Municipal Code Chapter 693-30) is guilty of an offence. Posters regarding community issues such as a lost pet, a yard sale or cultural and/or religious events are permitted on locations other than City-approved structures.

Enforcement officers will work their way throughout the city, across major arterial roads such as Finch Avenue, Eglinton Avenue, Bloor Street and Lake Shore Boulevard, beginning in Ward 1 to enforce the bylaw.

The Clean Toronto Together initiative engages businesses and residents in partnership with the city to keep city streets clean of litter, long weeds or garbage, illegal postering and graffiti vandalism. A number of city divisions including Transportation, Solid Waste, Municipal Licensing and Standards, and Parks, Forestry and Recreation are involved in this program.

More information is available at http://www.toronto.ca/licensing.

Toronto is Canada's largest city and sixth largest government, and home to a diverse population of about 2.8 million people. Toronto's government is dedicated to delivering customer service excellence, creating a transparent and accountable government, reducing the size and cost of government and building a transportation city. For information on non-emergency City services and programs, Toronto residents, businesses and visitors can dial 311, 24 hours a day, 7 days a week.

Media Contacts:

*Tammy Robbinson, Senior Communications Coordinator*
trobbin@toronto.ca Close Window


2. Pictures taken by Design Brief Team

3. City of Toronto Postering Structures. (2014, August 11). Retrieved October 26, 2016. http://www1.toronto.ca/City%20Of%20Toronto/Municipal%20Licensing%20&%20Standards/1-Files/Toronto%20poster%20column%20locations%20-%20August%202014.pdf

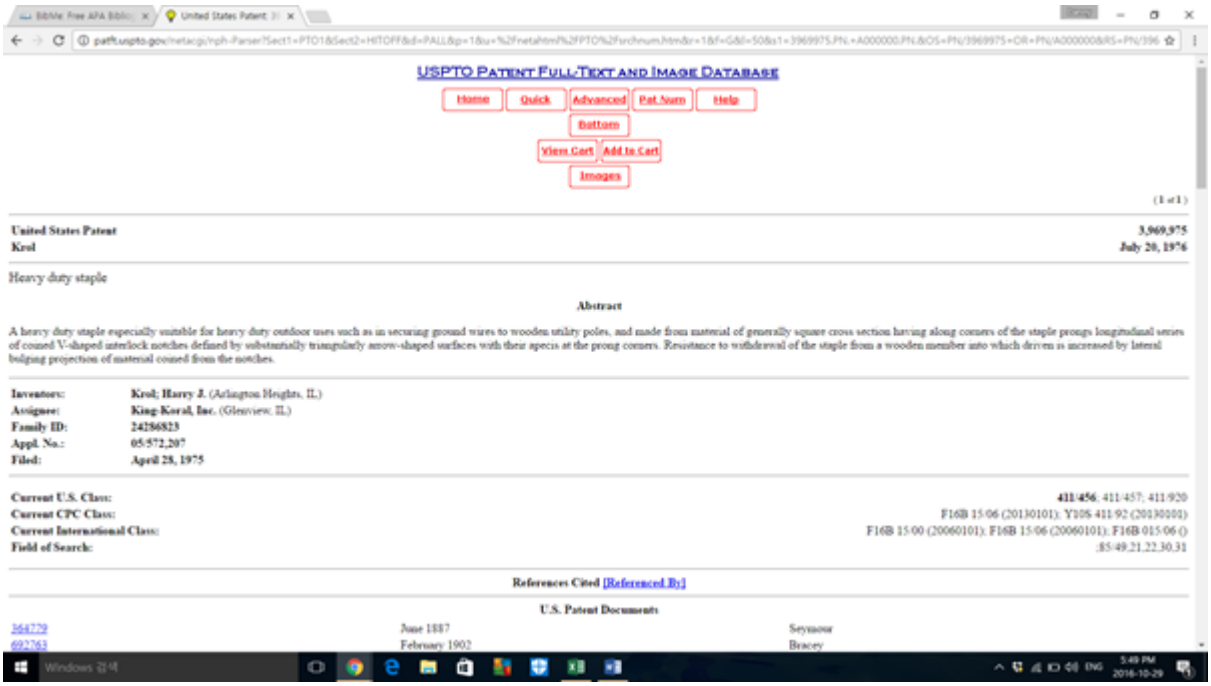

Public Message Centre

beautifulstreetsbeautifulcity

Concept Design & Project Construction Management

Astral Media Outdoor

4. Crol, H. J. (1976, July 20). Heavy Duty Staple. Retrieved October 28, 2016, from http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=/netahtml/PTO/srchnum.htm&r=1&f=G&l=50&s1=3969975.PN. A000000.PN.&OS=PN/3969975 OR PN/A000000&RS=PN/3969975 OR PN/A000000



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(1 of 1)

**United States Patent** **3,969,975**
**Krol** **July 20, 1976**

Heavy duty staple

**Abstract**

A heavy duty staple especially suitable for heavy duty outdoor uses such as in securing ground wires to wooden utility poles, and made from material of generally square cross section having along corners of the staple prongs longitudinal series of coined V-shaped interlock notches defined by substantially triangularly arrow-shaped surfaces with their apexes at the prong corners. Resistance to withdrawal of the staple from a wooden member into which driven is increased by lateral bulging projection of material coined from the notches.

**Inventors:** Krol; Harry J. (Arlington Heights, IL)
**Assignee:** King-Koral, Inc. (Glenview, IL)
**Family ID:** 24256823
**Appl. No.:** 05/572,207
**Filed:** April 28, 1975

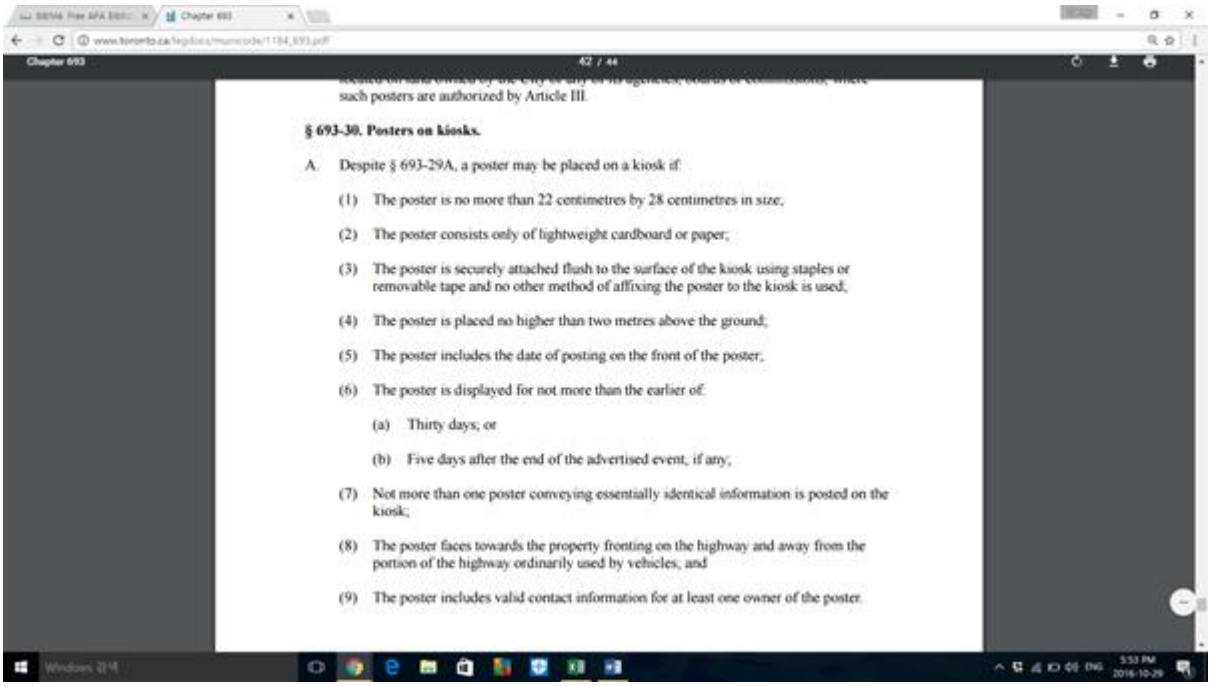
**Current U.S. Class:** 411/456; 411/457; 411/920
**Current CPC Class:** F16B 15/06 (20130101); Y10S 411/92 (20130101)
**Current International Class:** F16B 15/00 (20060101); F16B 15/06 (20060101); F16B 015/06 ()
**Field of Search:** 85/49,21,22,30,31

**References Cited** [Referenced By]

**U.S. Patent Documents**

| | | |
|---|---|---|
| 364729 | June 1887 | Seymour |
| 692763 | February 1902 | Bracey |

5. Toronto Municipal Code: Chapter 693 SIGNS. (2012, June 8). Retrieved October 23, 2016, from http://www.toronto.ca/legdocs/municode/1184_693.pdf



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such posters are authorized by Article III.

**§ 693-30. Posters on kiosks.**

A. Despite § 693-29A, a poster may be placed on a kiosk if:

(1) The poster is no more than 22 centimetres by 28 centimetres in size;

(2) The poster consists only of lightweight cardboard or paper;

(3) The poster is securely attached flush to the surface of the kiosk using staples or removable tape and no other method of affixing the poster to the kiosk is used;

(4) The poster is placed no higher than two metres above the ground;

(5) The poster includes the date of posting on the front of the poster;

(6) The poster is displayed for not more than the earlier of:

(a) Thirty days; or

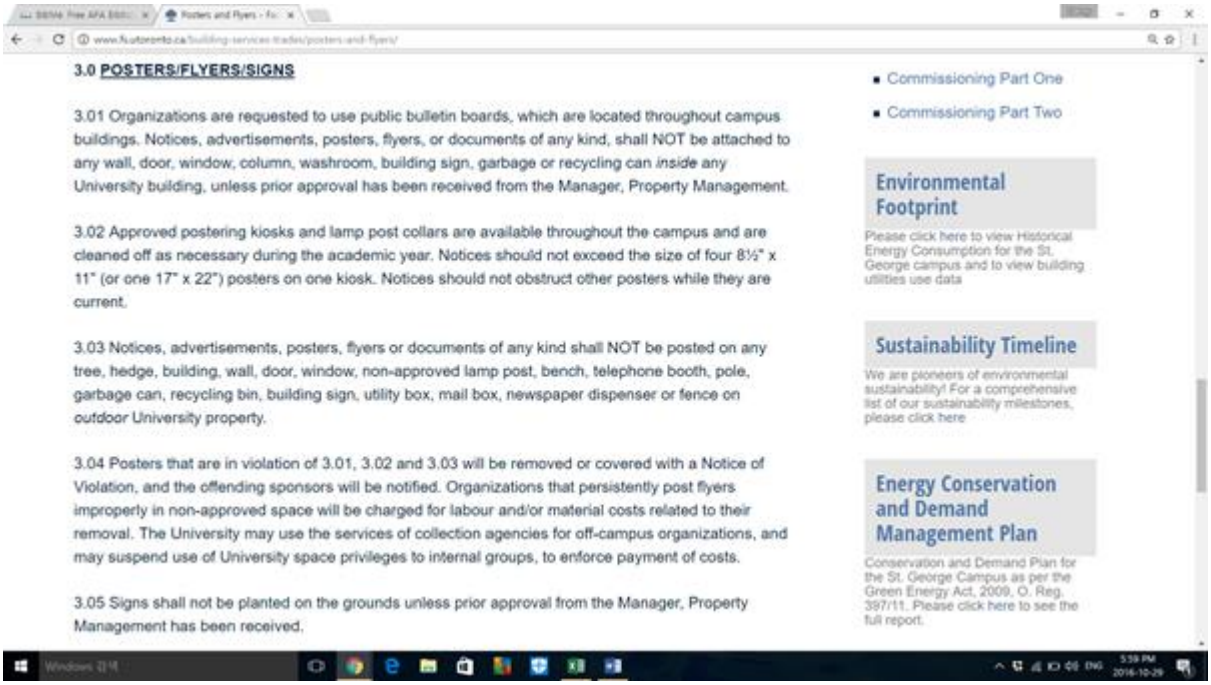
(b) Five days after the end of the advertised event, if any;

(7) Not more than one poster conveying essentially identical information is posted on the kiosk;

(8) The poster faces towards the property fronting on the highway and away from the portion of the highway ordinarily used by vehicles; and

(9) The poster includes valid contact information for at least one owner of the poster.

6. PROCEDURE ON DISTRIBUTION OF PUBLICATIONS, POSTERS AND BANNERS AT THE UNIVERSITY OF TORONTO ST. GEORGE CAMPUS. (n.d.). Retrieved October 25, 2016, from http://www.fs.utoronto.ca/building-services-trades/posters-and-flyers/



**3.0 POSTERS/FLYERS/SIGNS**

3.01 Organizations are requested to use public bulletin boards, which are located throughout campus buildings. Notices, advertisements, posters, flyers, or documents of any kind, shall NOT be attached to any wall, door, window, column, washroom, building sign, garbage or recycling can inside any University building, unless prior approval has been received from the Manager, Property Management.

3.02 Approved postering kiosks and lamp post collars are available throughout the campus and are cleaned off as necessary during the academic year. Notices should not exceed the size of four 8½" x 11" (or one 17" x 22") posters on one kiosk. Notices should not obstruct other posters while they are current.

3.03 Notices, advertisements, posters, flyers or documents of any kind shall NOT be posted on any tree, hedge, building, wall, door, window, non-approved lamp post, bench, telephone booth, pole, garbage can, recycling bin, building sign, utility box, mail box, newspaper dispenser or fence on outdoor University property.

3.04 Posters that are in violation of 3.01, 3.02 and 3.03 will be removed or covered with a Notice of Violation, and the offending sponsors will be notified. Organizations that persistently post flyers improperly in non-approved space will be charged for labour and/or material costs related to their removal. The University may use the services of collection agencies for off-campus organizations, and may suspend use of University space privileges to internal groups, to enforce payment of costs.

3.05 Signs shall not be planted on the grounds unless prior approval from the Manager, Property Management has been received.

- Commissioning Part One
- Commissioning Part Two

**Environmental Footprint**

Please click here to view Historical Energy Consumption for the St. George campus and to view building utilities use data

**Sustainability Timeline**

We are pioneers of environmental sustainability! For a comprehensive list of our sustainability milestones, please click here

**Energy Conservation and Demand Management Plan**

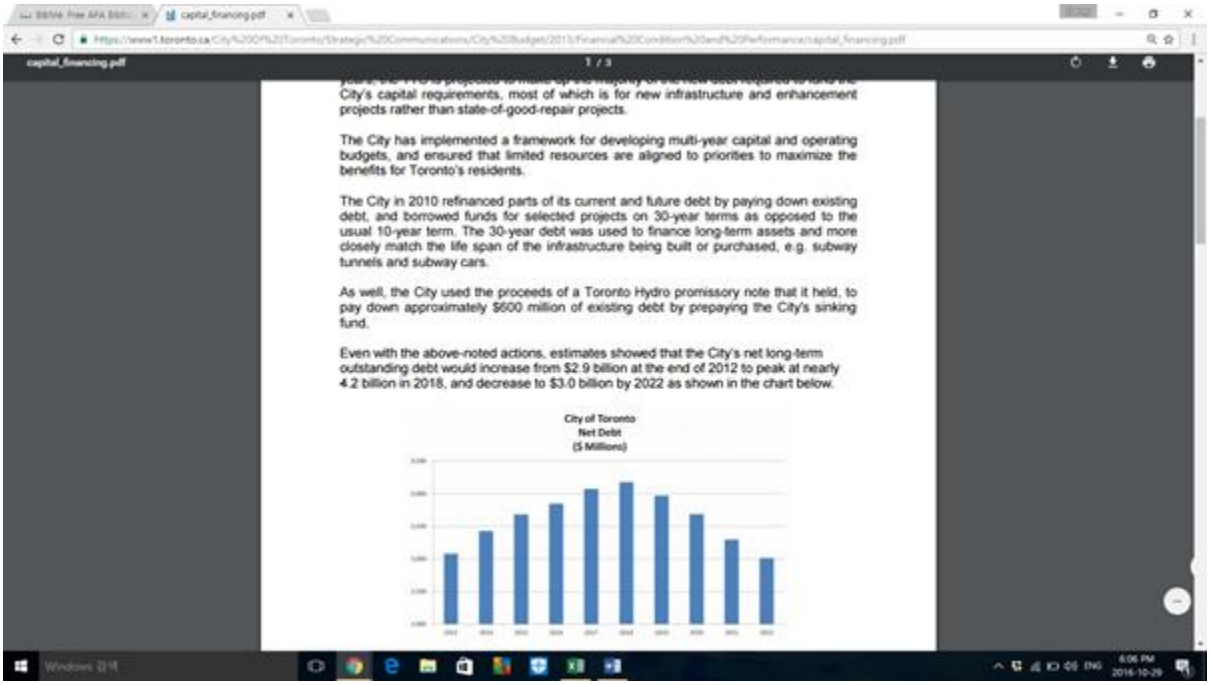
Conservation and Demand Plan for the St. George Campus as per the Green Energy Act, 2009, O. Reg. 397/11. Please click here to see the full report.

7. Chart of materials obtained in CIV102, University of Toronto

**Average Properties of Some Typical Materials** Note that except for density, stiffness and coefficient of thermal expansion, all values have a considerable range

| Material | Weight (kN/m³) | Stiffness E (MPa) | Tensile Strength (MPa) Yield | Tensile Strength (MPa) Ultimate | Compressive Strength (MPa) | Resilience (MJ/m³) | Toughness (MJ/m³) tens /comp | Ductility Max. Elong. (%) Plastic/Elastic | α (10⁻⁶/°C) | Cost ($/kg) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Alloy Steel | 77 | 200000 | 420 | 560 | 420 | 0.44 | 135 | 25/0.21 | 12 | 0.60 | Used in buildings, bridges, cars, etc |
| High Tensile Steel | 77 | 200000 | 1650 | 1860 | 1650 | 6.8 | 55 | 4/0.83 | 12 | 1.50 | Wire ropes, cables |
| High Alloy Steel | 77 | 200000 | 700 | 800 | 700 | 1.22 | 200 | 25/0.35 | 12 | 2.00 | Pressure vessels and tanks |
| Piano Wire | 77 | 200000 | - | 3000 | - | 22 | 22 | 0.2/1.50 | 12 | 1.50 | Brittle material - not used in structures |
| Cast Iron | 70 | 150000 | - | 110 | 770 | 0.04 | 0.06/6 | 1/0.7 | 11 | 0.50 | Traditional cast iron, moulded |
| Wrought Iron | 75 | 185000 | 200 | 350 | 200 | 0.11 | 90 | 30/0.11 | 12 | 1.00 | 99% pure iron, hammered, fibrous |
| Aluminum | 27 | 69000 | 40 | 80 | 60 | 0.012 | 19 | 40/0.06 | 24 | 1.80 | Light, ductile, non-corrosive, soft metal |
| Aluminum Alloy | 27 | 73000 | 470 | 580 | 500 | 1.51 | 50 | 11/0.64 | 24 | 2.50 | Used for canoes, aircraft, etc |
| Copper | 88 | 124000 | 70 | 230 | 200 | 0.02 | 85 | 55/0.06 | 20 | 2.60 | Very ductile metal - rounded curve |
| Bronze | 79 | 105000 | 200 | 390 | 350 | 0.2 | 40 | 12/0.19 | 17 | 2.20 | tin + copper alloy - stronger |
| Gold | 189 | 82000 | 40 | 220 | 180 | 0.01 | 80 | 50/0.05 | | 16.000 | Heavy, expensive metal |
| Granite | 26 | 52000 | - | 11 | 140 | 0.001 | 0.01/0.26 | 0/0.02 | 8 | 0.05 | Strongest and most durable building stone |
| Limestone | 25 | 58000 | - | 8 | 62 | 0.0006 | 0.01/0.09 | 0/0.01 | 6 | 0.03 | Soft, useful building stone |
| Slate | 28 | 95000 | - | 60 | 100 | 0.019 | 0.02/0.10 | 0/0.06 | | 0.08 | Stratified rock with high tensile strength |
| Brick | 19 | 20000 | - | 3 | 20 | 0.0002 | 0.01/0.03 | 0/0.01 | 9 | 0.10 | Fired clay |
| Concrete | 24 | 30000 | - | 3 | 35 | 0.0002 | 0.01/0.10 | 0/0.01 | 9 | 0.05 | Mixture of cement, sand, stone, water |
| Glass | 27 | 69000 | - | 100 | 200 | 0.072 | 0.07/0.8 | 0/0.15 | 20 | 1.50 | Solidified liquid sand |
| Oak | 7.5 | 14000 | 75 | 90 | 60 | 0.23 | 0.3/2.5 | 0.5/0.47 | 3 | 0.70 | Strong, tough, heavy hardwood |
| Spruce | 4.4 | 11000 | 55 | 70 | 50 | 0.19 | 0.2/2.2 | 0.5/0.50 | 7 | 0.60 | Light, strong, durable softwood |
| Tendon | 10 | 900 | 70 | 80 | - | 2.7 | 4 | 1/7.8 | | - | Used as tension ties in mammals |
| Bone | 20 | 17000 | 150 | 180 | 180 | 0.66 | 1 | 0.5/0.9 | | - | Used as struts and beams in mammals |
| Rubber | 9.2 | 7 | - | 20 | 20 | 15 | 20 | 4/300 | 500 | 2.00 | Strange, useful material - low stiffness |
| Spider's Frame Silk | 10 | 4000 | - | 1400 | - | 160 | 170 | 10/35 | | - | Most resilient material |
| Carbon Fibre | 15 | 160000 | - | 1800 | - | 10 | 10 | 0.1/1.1 | | 50.00 | Carbon fibre composites used in aircraft |
| Nylon Fibre | 11 | 5500 | - | 900 | - | 74 | 75 | 2/16 | 80 | 8.00 | Excellent if stiffness not required |
| Kevlar Fibre | 14 | 130000 | - | 3600 | - | 50 | 60 | 1/2.7 | | 50.00 | Super material in many ways |

8. Capital financing and debt. (n.d.). Retrieved October 28, 2016, from https://www1.toronto.ca/City Of Toronto/Strategic Communications/City Budget/2013/Financial Condition and Performance/revenues.pdf

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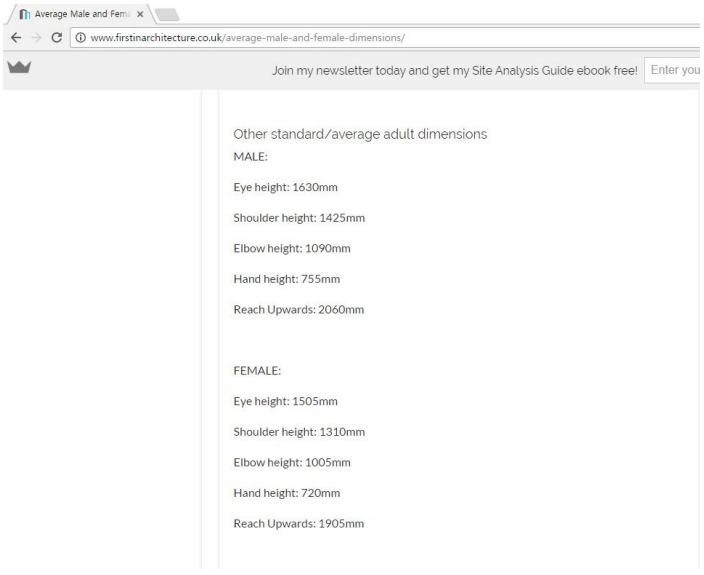


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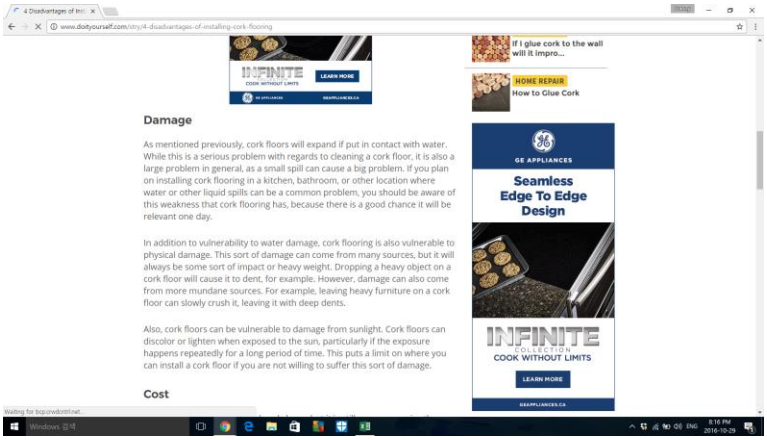


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