

# **SURCHARGED AND DIFFERENT FORMS OF RETAINING WALLS**

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Surcharged and Different Forms of Retaining Walls by James S. Tate

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## PREFACE.

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This little Work is intended to supply what has no doubt been often wanted by many Engineers—a certain and ready means of correctly and easily ascertaining the Pressures of Embankments, Submerged or otherwise, composed of different materials; also the Moments of Retaining Walls of different forms of cross-section, to successfully withstand those pressures; so that, by knowing the exact value of each, the right dimensions of the most suitable form of wall for the purpose required can be at once ascertained.

As the method adopted does not involve the use of any long or laborious calculations, it is hoped it will prove useful to the Profession generally.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in the context of public administration and financial management. The text notes that without reliable records, it is difficult to track the flow of funds and ensure that resources are being used as intended.

2. The second part of the document addresses the challenges associated with data collection and analysis. It highlights that while modern technology offers powerful tools for data processing, the quality and consistency of the data itself can be a significant barrier. The document suggests that standardized protocols and training for data collectors are necessary to overcome these challenges and ensure that the information gathered is both accurate and actionable.

3. The third part of the document focuses on the role of communication in organizational success. It argues that effective communication is not just about conveying information, but also about listening and understanding the needs and perspectives of different stakeholders. The text provides several examples of how clear communication can lead to better decision-making and improved outcomes in various organizational settings.

4. The fourth part of the document discusses the importance of continuous learning and professional development. It notes that in a rapidly changing environment, individuals and organizations must stay current in their knowledge and skills. The document recommends regular training, workshops, and conferences as ways to facilitate this ongoing learning process and ensure that the workforce is equipped to handle future challenges.

5. The fifth and final part of the document concludes by summarizing the key points discussed and offering some final thoughts on the future of the field. It expresses optimism about the potential for innovation and progress, provided that the challenges identified are addressed through thoughtful and collaborative efforts. The document ends with a call to action, encouraging all stakeholders to work together to create a more transparent, efficient, and effective system.



## RETAINING WALLS.

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Retaining walls are adopted as a necessary expedient in railway and other practice, often under very peculiar circumstances, as when there is not sufficient room for the slope of the embankment; it being sometimes perched high on a steep mountain's side, and where it would have been hardly possible to construct a railway at all, except by securing it with a massive wall occupying comparatively little space.

When it is also remembered how fearfully terrible any accident would be if it was to occur in such a dangerous situation—if by any erroneous calculation or mistaken judgment on the part of the engineer sufficient strength had not been given to the work, the wall which was to have supported the embankment, suddenly giving way, falling over into a deep ravine or chasm, a large portion of the embankment going

with it, and, it may be also, a passing train—there can be no doubt but that the nature of the material of which the embankment is to be made should be understood, and the best form and requisite dimensions for the wall should be well considered and accurately ascertained beforehand, so that it may be amply strong enough.

At the same time that the wall should be made perfectly secure, it is also often desirable that any unnecessary excess of strength should not be given to it, and so thereby avoid increasing its cost considerably, as the value of work is often very much enhanced when it has to be executed in such inaccessible situations as before mentioned, where all the materials for building it may have to be brought from a great distance.

The engineer thus may be at a loss to determine of what size a retaining wall should be built, so as to be safe against all contingencies that can occur, and yet also to be economical.

In many cases there have been failures which may have arisen from not correctly ascertaining beforehand how the material of

which the embankment is composed will be affected by the alternations of wet and dry weather before it is thoroughly consolidated, and the precise angle at which its slope will stand in either case, thereby causing a considerable difference in its pressure against the wall.

A retaining wall also, as in the case of the wing-walls of a bridge, being built at the same time that the embankment is being filled in behind it, has often to withstand then a considerable greater pressure than it will have to do afterwards when the embankment is settled; this also perhaps when its work is green, and not prepared to resist the pressure intended for it. Sometimes also the punning of the material behind it has (as is often the case) not been done effectually, and a heavy rain changes the dry earth or clay into a wet sludge, causing it to swell considerably.

It therefore being such an important point in railway construction, it would no doubt be very desirable if some simple form of calculation were used, not only strictly accurate, but easily adapted to any circum-